Preparing HGG for its future

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Samenvatting

HGG is een bedrijf dat gespecialiseerd is in het leveren van snijoplossingen van stalen profielen. Dit doen zij op twee verschillende manieren, de eerste manier is het leveren van machines die stalen profielen kunnen snijden. Dit wordt gedaan door HGG Profiling Equipment (HGG PE). Daarnaast levert HGG ook gesneden profielen. Dit wordt gedaan door HGG Profiling Contractors (HGG PC). Dit zijn twee bedrijven onder een naam, HGG. Op deze manier probeert HGG de gehele markt voor gesneden stalen profielen te bedienen.

Deze twee bedrijven zijn geanalyseerd met behulp van de Delft System Approach (DSA). Ook zijn meerdere werknemers van beide bedrijven geïnterviewd om de werkwijze van deze bedrijven door te lichten. Uit deze analyse bleek dat de samenwerking tussen beide bedrijven moeizaam verloopt, maar dat er mogelijkheden zijn voor beide bedrijven om voor elkaar van waarde te zijn. Ook is er bij beide bedrijven de intentie is om de samenwerking te verbeteren.

Om een betere samenwerking te realiseren heeft HGG besloten om het takenpakket van HGG PC uit te breiden. HGG PC richt zich nu voornamelijk op het produceren van gesneden profielen, een rol als productiecentrum, HGG PC wil in de toekomst deze rol veranderen en zich richten op extra taken en zo een 'Experience center' worden. De extra taken die in de toekomst aan het pakket van HGG PC zijn:

- Showroom
  - Hiermee wil HGG PC hun werkwijze demonstreren aan klanten van HGG PE om ze zo te overtuigen een machine bij HGG PE aan te schaffen.
- Ontwikkelingspartner
  - HGG denkt dat een samenwerking tussen HGG PE, een ontwikkelaar van machines, en HGG PC, een gebruiker van die machines, een verbetering kan opleveren voor het R&D proces.
- Trainingscentrum
  - HGG wil klanten en medewerkers opleiden zodat zij beter gebruik kunnen maken van de machines van HGG PE. Dit heeft twee voordelen, aan de ene kant kunnen gebruikers overgehaald worden tot een koop, bij goede begeleiding, aan de andere kant heeft HGG PE minder servicekosten als klanten hun machine correct gebruiken.

Na de analyse en het samenstellen van het nieuwe takenpakket zijn de KPI's voor de nieuwe taken vastgesteld en is een initieel niveau voor de KPI's gegeven. Ook is er een implementatieplan opgesteld om de overgang van productiecentrum naar experience centrum vorm te geven. In dit implementatieplan wordt een lijst van actiepunten genoemd, een planning en verschillende controlemechanismen gegeven.

Door middel van de stappen die in het implementatieplan beschreven zijn te volgen kan het experience centrum gerealiseerd worden.

De KPI's worden gebruikt om de prestaties van het nieuwe HGG PC te evalueren. Hierdoor krijgt de directie van HGG inzicht in de bredere opbrengsten van HGG PC.

Summary

HGG is a company specialized in delivering 3D cutting solutions for steel profiles. This is done in two ways, the first is supplying customers with machines to cut steel profiles themselves. This is done by HGG Profiling Equipment (HGG PE). The second way is to supply cut profiles to size to customers directly. This is done by HGG Profiling Contractors (HGG PC). To the outside these two companies operate under one name, HGG. This way, HGG tries to serve the entire market for cut steel profiles.

Both companies were analyzed using the Delft Systems Approach (DSA), also several employees of both companies were interviewed on the methods of operation of HGG. From the analyses it became apparent that the cooperation between HGG PE and HGG PC was not optimal, but that there are ways in which both companies can be of value for one another. Also the employees of both companies are very willing to improve the cooperation.

In order to realize a better cooperation between HGG PE and HGG PC, HGG has decided to expand the tasks that HGG PC conducts. At the moment, HGG PC focuses mainly on the production of cut steel profiles, they are a production center. In the future HGG PC wants to transform itself from production center to an 'Experience center'. This is done by adding tasks to HGG PC. The extra tasks for HGG PC in the future are:

- Showroom
  - With the showroom HGG PC wants to show customers their way of working in order to entice customers of HGG PE to buy a machine from them.
- Development partner
  - HGG hopes to lower the cost of their R&D program or to improve the outcome of that program by improving the cooperation between HGG PE, a developer of machines, and HGG PC, a user of those machines.
- Training center
  - HGG wants to train customers and employees so they can make better use of the machines of HGG PE. This has two main advantages for HGG, firstly customers can be persuaded to buy a cutting machine from HGG PE when they are properly guided. Secondly, HGG hopes to reduce service costs if customers use their machines properly.

After the analysis and the composition of the new tasks for HGG PC, the KPIs for the new tasks are drafted and an initial level for the KPIs is given. Also an implementation plan is drafted. This implementation plan is drafted to guide the transition from production center to experience center. This implementation plan consists of a list of action points, a time path for those action points and several control mechanisms that need to be implemented.

By executing the implementation plan, the experience center can be realized.

The KPIs are used to evaluate the performance of the new HGG PC. This way the board of directors of HGG will get an insight into the broader revenues of HGG PC.

List of abbreviations

Abbreviation	Explanation
A&B	Assemble & Build
CEO	Chief Executive Officer
CTO	Chief Technical Officer
DSA	Delft Systems Approach
ERL	Edge Rounding Line
FAT	Factory Acceptance Test
HGG	Helmhout Goverse Glijnis (Founders)
HGG PC	HGG Profiling Contractors
HGG PE	HGG Profiling Equipment
KPI	Key Performance Indicator
PPM	Pipe Profiling Machine
RPC 1200	Robotic Profiling Center 1200
RPM	Robotic Profiling Machine
R&D	Research & Development
SAT	Site Acceptance Test
SPC 3000 PT	Static Pipe Cutter 3000 Pipe Trolley
TCL 350	Tube Cutting Line 350
TPC 1000	Transportable Pipe Cutter 1000
UPC 450	Universal Profile Cutter 450

Contents

1 Introduction

HGG, http://www.hgg-group.com/, is a company that specializes in 3D profiling of metal bars, beams and tubes. This is done in two ways HGG Profiling Equipment constructs metal cutting machines and sells these to customers. HGG Profiling Contractors uses these machines to cut metal profiles for customers that are not interested in a dedicated cutting machine, but do have need for cut metal profiles. By offering cutting machines as well as cut profiles, HGG tries to satisfy different needs in the market.

These companies have been run mostly as separate entities and both are self-supporting. However, both companies strongly influence each other and treating them as completely separate companies would not give an accurate description of the situation. Both company parts have been analyzed using the Delft Systems Approach [19], specifically the Black box model and the PROPER model. Due to the fact that HGG Profiling Contractors uses the machines from HGG Profiling Equipment, user feedback and insight into the machines is generated. HGG wants to use the information that comes out of any cooperation to improve the results of both HGG Profiling Equipment and HGG Profiling Contractors. To this end the cooperation between the two companies has already improved over the last few years and HGG wants to expand on this by transforming HGG Profiling Contractors from production center to experience center. However, currently there is no concrete structure or policy on how the cooperation between HGG Profiling Equipment and the new experience center must take place. To this end, a main question is asked:

> *How can the outputs of the HGG PC Experience Center be determined and how should the HGG PC Experience center cooperate with HGG PE?*

In order to answer the main question several sub-questions are drafted as well. The sub-questions aim to answer part of the main question. The sub-questions are:

- What will the HGG PC Experience Center look like?
- What are the KPIs for cooperation at HGG and how are they monitored?
- What has to be changed at HGG to let HGG Profiling Equipment and HGG Profiling Contractors work together more effectively?
- How should the cooperation between HGG PE and HGG PC be controlled?

This report gives advise on how the changes that HGG faces in the coming years will best be handled. The analysis showed that a lot of employees feel that there is some friction between HGG PE and HGG PC and that uncertainty exists on how the plans of HGG to transform HGG PC from production center to experience center will be implemented and deal with the aforementioned friction. The plans of turning HGG PC from production center to experience center have been used as a starting point for the solution of this problem.

The research has come up with advise on how the plans must be implemented and clarified for all employees. This is done by suggesting KPIs for the cooperation, and creating an implementation plan for all steps that HGG PC must make in order to transform from production center to experience center. This implementation plan also contains advise on how the company must be organized in order to make the experience center a success.

In Chapter 2 a company profile will be given in which the company will be introduced and an overview of the company's activities will be listed. Along with a description this chapter will also consist of the Key Performance Indicators of HGG, an analysis of the processes that occur within HGG and the issues that presented themselves after the analysis. Chapter 3 will zoom in on the cooperation between HGG Profiling Equipment and HGG Profiling Contractors and the issues that currently surround the cooperation. Chapter 4 will give a motivation for the main question and explain the sub-questions.

The last part of the report follows the Innovation model by [19]. The KPIs for cooperation are examined in Chapter 6, in this chapter KPIs are identified and a way to monitor them is given. In Chapter 7 an implementation plan is given. This covers the actions that need to be taken to change HGG Profiling Contractors and create a healthy cooperation between HGG Profiling Equipment and HGG Profiling Contractors. Finally the main question and sub-questions are answered in a conclusion in Chapter 8.

2

Company Analysis

HGG, http://www.hgg-group.com/, was founded in 1984 by Hans Helmhout, Piet Goverse and Pieter Glijnis. HGG International B.V. (HGG) consists of two components, HGG Profiling Equipment (HGG PE) and HGG Profiling Contractors (HGG PC) both located at Zuidrak 2, 1771 SW Wieringerwerf, The Netherlands. HGG PE focuses on the design and assembly of several different types of metal cutting machines. HGG PC uses some of those machines to provide cutting services for customers. In Figure 2.1 the organizational structure of both companies are given.

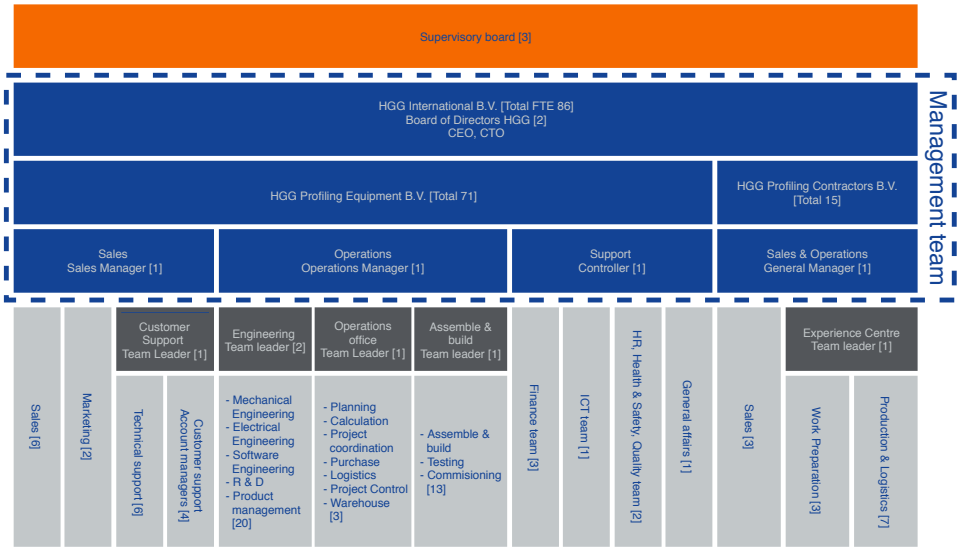


Figure 2.1: Organizational chart of HGG PE and HGG PC

2.1. HGG PE

HGG is led by Chief Executive Officer (CEO) and Chief Technical Officer (CTO), controlled by a supervisory board. The CEO and CTO oversee daily operations, but mostly focus on HGG PE. Below this level there are several managers, they oversee the sales, operations and support department. One level lower, team leaders handle day-to-day affairs of their departments. On the lowest level production is realized by the remaining staff divided into eleven departments. HGG PE employs around 71 FTE and had an order size of €– in 2017. This means that the order size per FTE for HGG PE is approximately €–. The development of the order size over the years can be seen in Figure 2.2. The order size is split by machine type, Edge Rounding Line (ERL), Pipe Profiling Machines (PPM), Robotic Profiling Machine (RPM) and specials. Specials are machines that do not fall into one of the other categories.

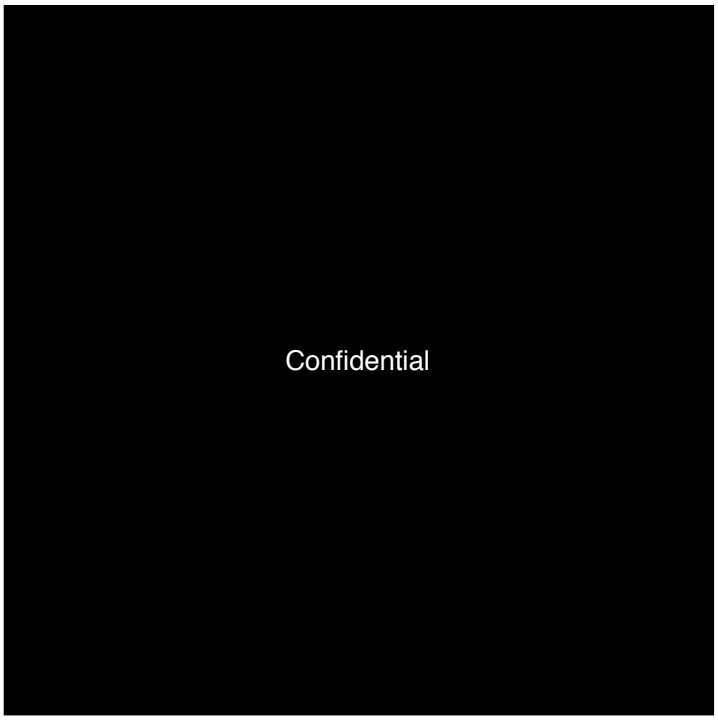


Figure 2.2: HGG PE's order size over the years [6]

HGG PE also has the option to mark parts for identification, reference lines and bend lines. Furthermore edge rounding machines can also be supplied, edge rounding can be done by either rolling, shot blast cleaning or wire brush cleaning.

2.1.1. Customers of HGG PE

Customers of HGG PE are located all over the world and are categorized in four different sectors:

- Ship building
- Steel construction
- Process industry
- Offshore

Figure 2.3: Example of a construction made possible by HGG cutting machines [4]

Figure 2.4: Example of a cut by an HGG PE machine [10]

The sectors are divided because of different activities and different machine types that they require. In 90% of the cases HGG PE will sell one machine to a customer, the remaining 10% either replaces their machine or buys a second machine that extends their cutting

capabilities. After the machine is delivered often only spare parts and consumables are sold to the customer. This is done by the service department.

HGG PE estimates that the market for cutting machines is large enough to sell 200 machines each year, however, HGG PE does not have the resources to sell and produce that amount of machines and only sells around 55 machines per year. HGG PE has around 500 outstanding quotes in various stages of sale. Examples of customers of HGG PE are:

- Heerema - `https://www.heerema.com/`
- Stork - `https://www.stork.com/nl/`
- Siskin Steel & supply - `https://www.siskin.com/`
- Enerflex Ltd. - `http://www.enerflex.com/`
- IMW - `https://www.imw.be/`

Due to the fact that customers only tend to buy one machine and the large variation of machines, the prize of the project can vary between €150.000 and €2 million. The delivery time for a machine ranges from four weeks for a small machine to six months for a big machine. This does not include shipment time, often four weeks, or commissioning time, between three and six weeks.

2.1.2. Competitors of HGG PE

HGG PE has several competitors all over the world. These competitors all come from different backgrounds. Some are dedicated cutting companies, some are welding companies expanding their product range, some are specialized in incorporating robotic arms in different applications and some are local machine building companies who build on demand. HGG PE's main competitor within the pipe profiling market is Mueller Opladen/Watts, `https://www.mueller-opladen.de/en/home-3/`, a dedicated cutting company with many machines in production, similar to machines built by HGG PE. HGG PE identifies several trends in the market and among competitors. HGG PE spots more local competition, customers demand more functionality in one machine, due to software developments simple machines with decent cutting capabilities can be constructed and the distinctiveness between HGG PE and its main competitor, Mueller Opladen/Watts, is getting smaller. Besides Mueller Opladen/Watts, other competitors in this market are:

Figure 2.5: A pipe profiling machine by Mueller Opladen [12]

- Maruhide - `http://www.maruhide.co.jp/en/`
- Vernon/Lincoln - `https://vernontool.com/`
- Prodevco - `http://prodevcoind.com/`
- Microstep - `https://www.microstep.eu/`

For HGG PE's other line of machines, the robotic profiling machines, different competitors are also identified. The background of these competitors is as varied as those of the competitors of the pipe profiling machines. Competitors are:

- PEMA - https://pemamek.com/
- Kranendonk - https://www.kranendonk.com/
- Voortman - https://www.voortmansteelgroup.com/nl/
- PythonX - https://www.pythonx.com/
- Prodevco - http://prodevcoind.com/
- Ficep - https://www.ficepgroup.com/
- Local system integrators

Figure 2.6: A pipe profiling machine by Mueller Opladen [3]

In this market HGG PE also spots some trends, the competition comes from machine building companies and robotic system integrators, this results in competition selling multi-functional robotic solutions. Also this market is not as settled as the market for pipe profiling machines, which may lead to hard competition between producers.

2.2. HGG PC

HGG PC focuses on cutting metal beams, pipes and profiles and is led by a general manager. HGG PC employs 15 FTE and has a turnover of €– in 2017. This leads to a turnover per FTE of approximately €–. The general manager handles affairs and oversees the sales department. The sales department consists of three sales representatives who each focus on a different regional area. The areas are divided as listed below:

- Friesland, Groningen, Drenthe, Overijssel, Gelderland, Flevoland and Germany
- North Holland, Utrecht, North Brabant, Limburg, Great Britain and Scandinavia
- South Holland, Zeeland, Belgium and France

The sales department of HGG PC has the belief that HGG PC is not the cheapest in the market and has no desire to compete on price. HGG PC aims to deliver a high quality product in a short time. The thought behind this is that it is more expensive for a customer to wait longer for an inferior product from a competitor than to use the services of HGG PC. Sales focuses on four different sectors, the sectors are:

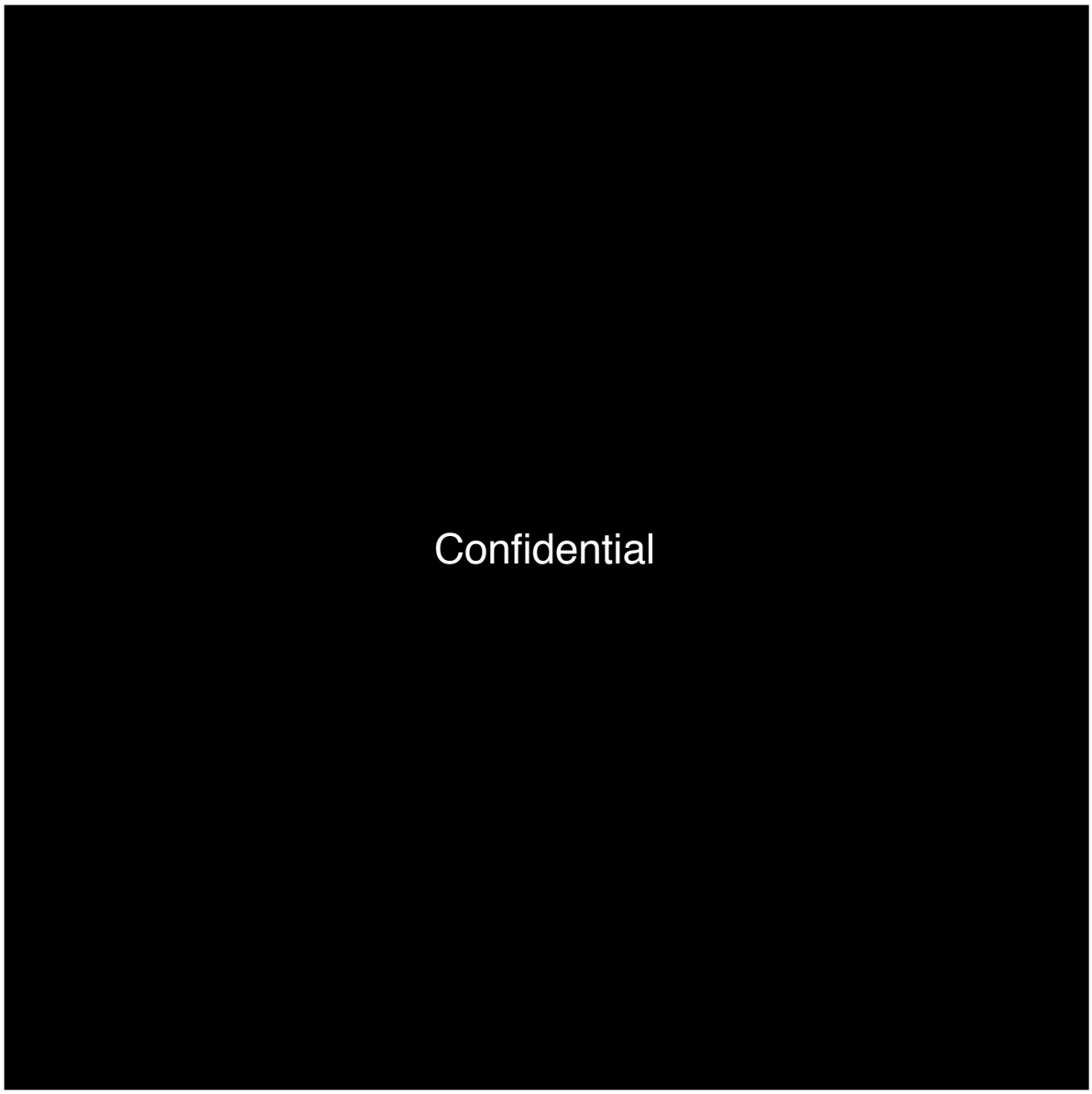


Figure 2.7: HGG PC's turnover between 2014 and 2018, divided per country [9]

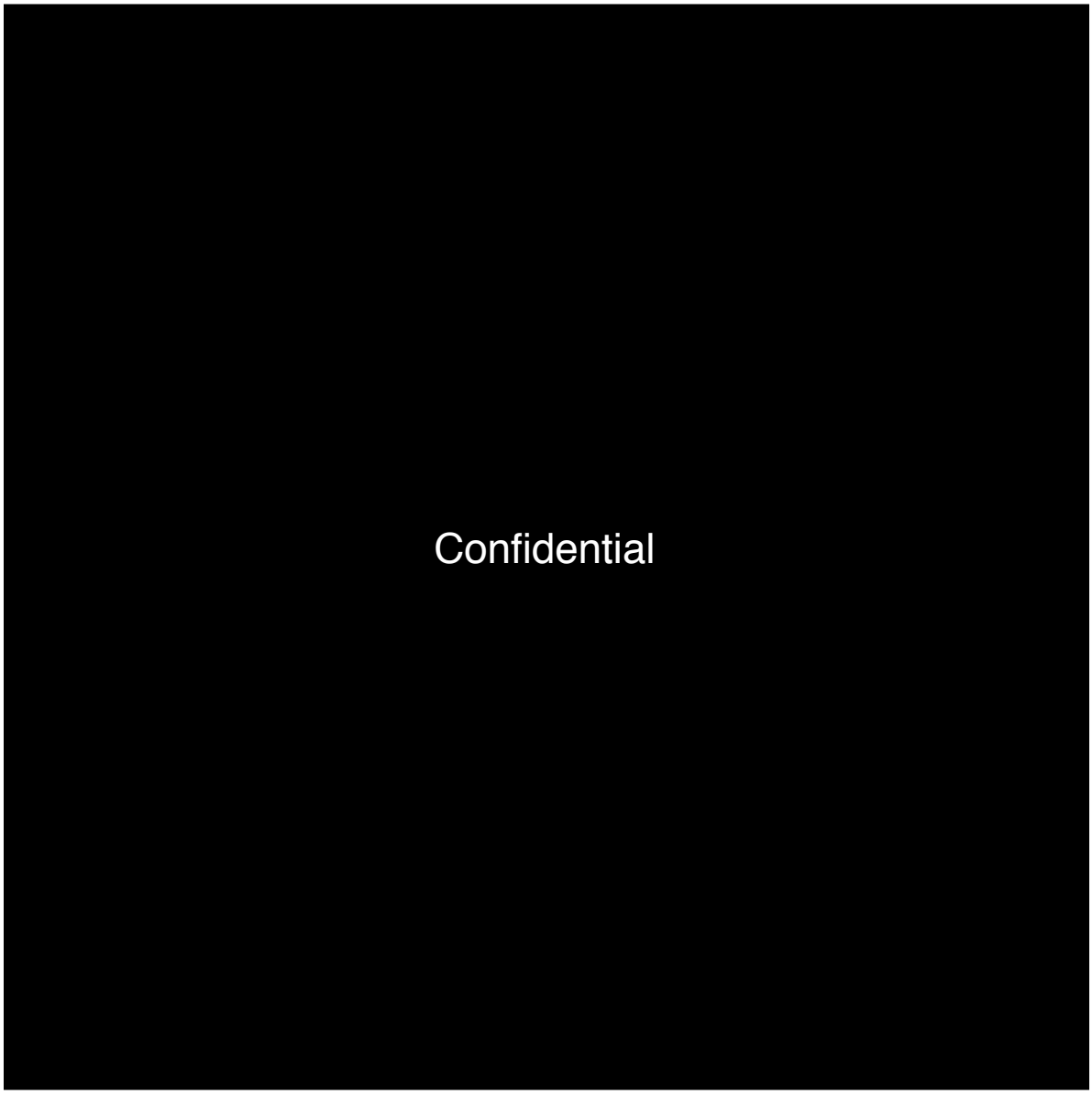


Figure 2.8: HGG PC's turnover between 2014 and 2018, divided per sector [9]

- Ship building
- Steel construction
- Process industry
- Offshore

The generated turnover per sector is shown in Figure 2.8.

Planning, work preparation, production and logistics department are led by a team leader. Planning and work preparation consist of three employees, production is done by six employees with two supporting coworkers and logistics are handled by one employee. Planning and work preparation deal with the planning of projects as well as work preparation to ensure that production runs as smoothly as possible. Work preparation also contacts the customer if projects are unclear or if mistakes are made either by the customer or HGG PC. The last department is production and logistics. The operators man machines

alone or in teams of two depending on the work that needs to be done. E.g. if the product needs a lot of finishing after the cut is made, this is done by an additional operator. When needed, two shifts can be done in one day. This leads to a maximum capacity of $50\ weeks * 5\ days/week * 16\ hours/day = 4000\ hours/year$ for each machine. However, working in shifts is only done when necessary. If normal production without shifts is sufficient, working in shifts is not implemented. This leaves room to act quickly on customer requests or to make machines available for other purposes.

All logistics are handled by one employee who makes sure that all operators have the material they need and that the finished product is brought away. Also this employee is in charge of loading and unloading trucks that arrive at HGG PC.

2.2.1. Customers of HGG PC

HGG aims to automatize the cutting of steel profiles as much as possible. For customers with a sufficient amount of work and production space, HGG PE can supply the appropriate cutting machine. However, if customers have insufficient work or production space to justify the purchase of a dedicated cutting machine, HGG PC can supply the cut profiles for the customer. Usually a customer already has experience cutting steel profiles by hand and encounters the limits of their production capabilities or encounters cuts that are deemed to complicated to be made by hand with consistent quality. Sometimes customers that already have their own cutting machines also seek the help of HGG PC to temporarily increase their cutting capacity. Some of the customers worth mentioning are Heerema Fabrication Group, Meyer Werft, HICE and EMDE.

Figure 2.9: An example of piping used in the process industry cut by HGG [8]

Figure 2.10: The AIDAnova made by Meyer Werft [22]

Process industry

Piping is used extensively in the process industry. The welded connections between pipes as shown in Figure 2.9 is a good example of the type of cuts that HGG PC makes for the process industry.

Ship building

Meyer Werft, `https://www.meyerwerft.de/de/meyerwerft_de/index.jsp`, is a shipbuilding company based in Papenburg, Germany. They specialize in the construction of large vessels, especially cruise ships. The popularity of cruise vacations is on the rise [2], this leads to an increased demand for cruise ships which is good news for Meyer Werft and its suppliers.

Offshore

HICE, `http://www.hulstcableequipment.com/en/home/`, stands for Hulst Innovation Cable Equipment, they manufacture several different machines for the handling and storage of underwater power cables. Due to the length, girth and weight of these cables specialized equipment is needed to ensure proper handling. Due to the number of offshore wind parks rising, HICE seems to have a good market position for the near future.

Heerema Fabrication Group, https://hfg.heerema.com/, is part of Heerema Group and specializes in engineering and fabrication of large and complex structures for the offshore oil and gas industry.

EMDE, https://www.emde.de/en/, is a German company that has several different branches. It focuses on bulk material handling, drilling technology machine and plant construction and wind energy components among others.

2.2.2. Competitors of HGG PC

HGG PC has several competitors that all focus on part of the services that HGG PC offers. This section gives an overview of a selection of competitors of HGG PC and what they focus on.

Laser cutting companies

For thinner materials or customers with high demands on precision laser cutting is often the better choice. Several companies in the Netherlands offer laser cutting services. However, these companies specialize in cutting thin materials, and preferably in large batches. When thicker material needs to be cut, or more specialized one off cuts are needed, these companies are often not suited or interested in the order. This is where HGG PC distinguishes itself from laser cutting companies. Especially thick materials and complex cuts can often be cut better with the help of oxy-fuel cutting or plasma cutting.

Water jet cutting companies

Along with laser cutting, water jet cutting is also frequently used to cut several different materials. Water jet cutting has several advantages over other ways of cutting material. In contrast to other cutting processes, water jet cutting does not create a heat affected zone in the material. Also the surface quality of the cuts is very high and very little finishing is required. However, production speeds tend to be lower when using water jet cutting in stead of plasma cutting or oxy-fuel cutting. Also prices tend to be higher. Examples of water jet cutting companies are L&D Jet Techniek NV, C&W snijtechniek BV and Kinkelder metal solutions.

Figure 2.11: An example of water jet cutting [21]

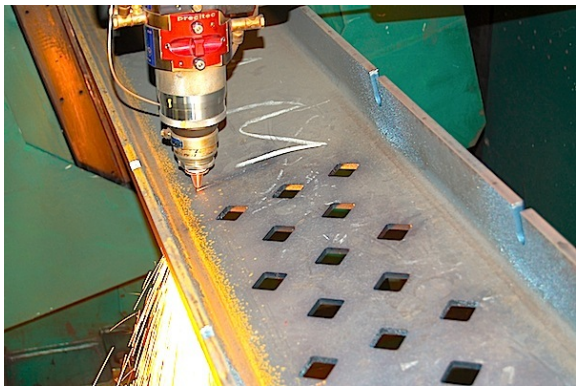


Figure 2.12: An example of laser cutting [17]

Saw and drilling companies

Another type of competitor are saw and drilling companies. These companies specialize in relatively simple cuts and holes. This limits their range of products that they can cut, but due to the nature of the production process they can offer far lower prices than HGG PC. This is because the cutting speed of sawing is higher than the cutting speed of oxy-fuel or plasma cutting, which leads to shorter production times. Examples of companies that offer these services are: Voortman Steel Group and Barteling Buizen.

Construction companies

Some steel construction companies provide similar services as HGG PC, among these companies is OMF Van Acker, who provide cutting services as well as construction services. OMF

is able to cut tubes from 1” up to 48” and is able to profile tubes with a diameter of 88,9 mm up to 1320 mm.

Steel suppliers

Flat and bulb profiles are among the profiles that HGG PC cuts. However, often these profiles can be cut by the material supplier as an extension of their services. Examples of companies that provides these services are De Boer Staal and MWA Snijspecialist.

SAEY Staal is a Belgian supplier to the steel processing industry, in order to increase their product range and meet customer demands the provide laser cutting services. What distinguishes SAEY Staal from other laser cutting companies is that they cut up to 24 mm thick material, which is larger than many other laser cutting companies. On the the other hand customers need to buy their material from SAEY Staal in order to have their material cut by SAEY Staal. This limits the flexibility of customers to choose any supplier they desire.

Foreign competitors

In Germany, ZIS Industrietechnik is specialized in cutting tubes, profiles and thick metal plates with oxy-fuel cutting and plasma cutting. They are able to cut parts with dimensions up to 15 m in length, 1,5 m in diameter, material thickness between 3 and 200 mm and a maximum weight of 5 tonnes. Since HGG PC can cut up to 3 m in diameter and up to 25 tonnes in weight ZIS Industrietechnik has a smaller range of profiles that can be cut. However, within range they deliver similar products and services as HGG PC.

Another competitor located in Poland is Spomasz Zary, which is part of Eiffage Smulders, in itself a part of Eiffage group. Spomasz Zary supplies most of the profiles, that have to be cut, to Eiffage Smulders. Due to lower labor cost this company can compete on price. However, when Spomasz Zary is not able to make a certain cut or time is of the essence, Eiffage Smulders will outsource work to other steel cutting companies. Spomasz Zary is sometimes contacted by outside companies to perform cutting duties for them.

Conglomerates

A company that cuts for others in the same conglomerate is also what happens at Kampstaal B.V. They supply all cut materials for companies within GB Steel Group, as long as it is in their production range. As with Spomasz Zary, Kampstaal B.V. can also be contacted by outside companies to perform cutting duties.

The customer

As stated in Section 2.2.1 most customers of HGG PC already have experience in cutting profiles. This means that customers need to be persuaded that it is better to outsource cutting services, even though customers are capable of performing them. This means that in this respect the customer can be a competitor as well. When a customer can be convinced that their cutting capabilities are inferior to those of a dedicated supplier or that their time can better spent doing other activities, such a competitor can turn into a customer.

2.3. Production facility

HGG is located at Zuidrak 2, 1771 SW Wieringerwerf. At this address a terrain of approximately 23.000 m^2 is set up to produce cutting machines by HGG PE as well as conduct the cutting services provided by HGG PC and its stock. Furthermore, an office and several parking spots are located here. Below a list of the production facilities and the work that takes place at these locations is given.

- Hall 1: Assembly of cutting machines by HGG PE
- Hall 2: Production of cut profiles by HGG PC
- Hall 3: Assembly of cutting machines and storage for HGG PE
- Stockyard: Stock consisting profiles and tubes for HGG PC

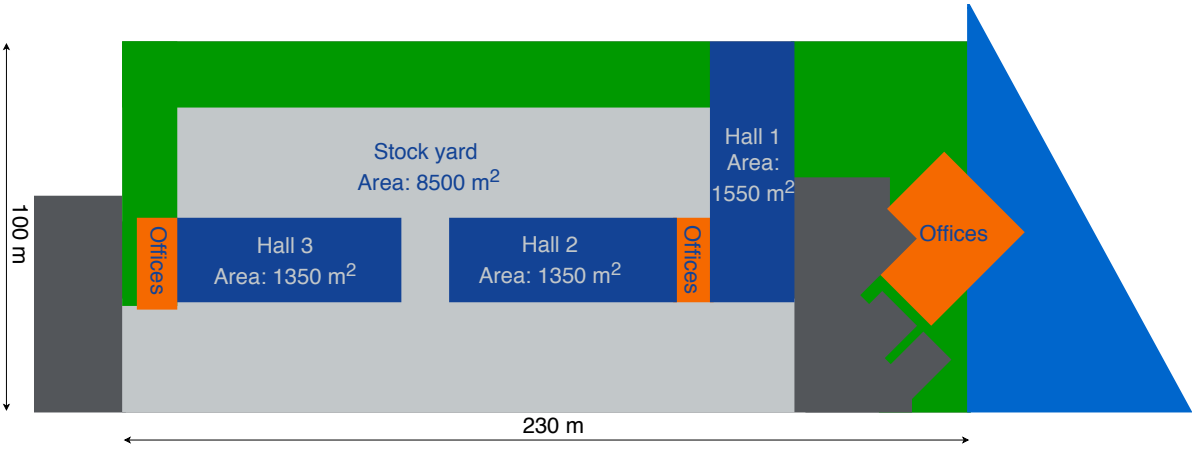


Figure 2.13: A schematic ground plan of HGG

Hall 2 is home to several machines produced by HGG PE. They are used by HGG PC to cut metal beams, pipes and profiles. To this end they use six machines sold by HGG PE. They are:

- SPC 3000 PT
- UPC 450
- TPC 1000
- TCL 350
- Edge Rounding Line
- RPC 1200

All these machines are versions of the machine that HGG PE sells except for the UPC 450 which is a machine that cuts pipes as well as beams and bulb profile. This machine is currently tested in production as a final stage of development. Along with these machines, a machine that cuts large diameter tubes, up to 8 meters in diameter, is also available. However, this is a very small segment of the company and orders for this machine are not actively pursued. Each machine is manned by one or two operators. Along with the operators, one man is in charge of logistics, he loads and unloads trucks, stores the raw material in the stock yard, makes sure that the right material is supplied to the right machine and stores and sorts the finished product. The location of these halls can be found in Figure 2.13. Along with these production halls and stockyard, approximately 1800 m^2 of office space is also present. The offices are marked orange in Figure 2.13.

2.4. Relationship between HGG PE and HGG PC

HGG PE and HGG PC are two separate companies in one holding. As stated earlier, HGG PE focuses on building cutting machines for various profiles. HGG PC uses some of those machines to cut profiles to order. This means that in their day-to-day business both companies have very little interaction. When everything goes smoothly at both companies, they do not need each other to function properly.

Cooperation between HGG PE and HGG PC can yield several advantages for both companies. Due to the proximity of HGG PC to HGG PE, HGG PC can be helped quickly if any problems occur. HGG PE can use HGG PC as a testing ground for new machines and features. However, this cooperation does not run perfectly. This leads to several issues which will be discussed in Chapter 3.

In order to gain insight into HGG and its processes a company analysis is made. This analysis is made using the Delft Systems Approach (DSA). The first step of DSA is to look at

the company as a black box. This method looks at all the inputs and outputs and puts the transformation inside a black box. After all inputs and outputs are listed the black box can be used as a basis of the PROPER model.

2.5. HGG's function and tasks

This section will illustrate the function of HGG and the tasks for the different parts of the company. As can be seen in Figure 2.1 HGG is made up of two parts, HGG PE and HGG PC. Both companies serve a different purpose within HGG. The definition of the function and tasks is taken from [19] and is as follows:

Definition 1 *The function of an element (object or subject) is that which is brought about by that element towards satisfying a need of the greater whole.*

Definition 2 *The task is concerned with what needs to happen or needs to be done in order that the contribution is realized such that the function is fulfilled.*

This definition of the function and task leads to the following function of HGG: *Giving its customers the freedom to create.* This means that the added value of HGG to its customers is that HGG can provide services to ensure that customers cutting needs are met, ensuring their freedom to create. In order to meet the demands of the customer, two companies have been created, HGG PE and HGG PC. Both of these companies have a different task in order to fulfill the function of HGG.

The task of HGG PE is to supply the right metal cutting machine to their customers so that their metal cutting needs are met and the customer can create the best joint. The tasks of the various departments can also be identified. This means that the sales department must find customers, identify their needs and sell the machine, the engineering department must design the machine and any special features, the production department must build and install the machine and the support staff needs to ensure that this process runs as smoothly as possible.

The task of HGG PC is to supply their customers with cut profiles that meet the customers specifications. As with departments at HGG PE, tasks for departments at HGG PC can also be identified. The sales department must find customers that need cut profiles and sell the cut profiles, the planning department needs to make sure that production stays on track and keep an eye on delivery times, the work preparation prepares work instructions for the production department and needs to make sure that it is technically feasible to produce the desired cut, finally the production department must make sure that all raw material is cut and that the material that is sent to the customer.

2.6. HGG's Key Performance Indicators

In order to check if HGG and its components fulfill their task Key Performance Indicators (KPIs) have to be drafted. These KPIs can be different per company part or even per department, but KPIs of departments should not clash with KPIs higher up the hierarchy. The KPI at the highest level is the profit that is made by HGG and to ensure sustainable growth. HGG [5] specifies this as:

- Our aim is to achieve sustainable growth, both financially and in terms of our organizational structure. We grow a minimum of 5% with a minimum EBITDA margin of 15%.
- At least 5% of our turnover is invested in product innovation and development.
- We want to have diversification on 4 regions and 4 segments whereas at least 20% of our turnover comes out of three segments and regions each.

In order to distinguish the KPIs at lower levels, a more detailed description is made in the next subsections.

2.6.1. KPIs of HGG PE

The KPI at the highest level for HGG PE is to increase the profit. This can be done in several ways, for example by increasing the output or decreasing the operating cost. As can be seen in many of the KPIs at a department level can be related to one or both of these.

The KPIs of the sales department of HGG PE are to increase the number of orders of machines and to spread this order intake over four different sectors. This is done to reduce the risk of sectors under performing. Furthermore, the sales department at HGG PE wants to maximize the profit made per project. The aim is to have a 25% margin per project.

The KPIs of the engineering department are to come up with solutions for planned projects that have special requests or difficulties and to so within budget. This KPI is relevant for the software engineering department as well as the mechanical engineering department and the R&D department.

HGG PE also has a planning department, KPIs for this department are to keep the production times and production occupancy in check. The production aims to finish machines in the estimated time and to spot errors in the design, if they occur, before the machine is shipped off to the customer.

2.6.2. KPIs of HGG PC

The KPI at the highest level of HGG PC is to increase the profit. This is similar to the KPIs at the highest level of both HGG and HGG PE.

For the sales department the KPIs are to increase the revenue in sectors that are expected to show growth in the coming years, for example companies operating in the offshore wind sector, furthermore the revenue per customer is checked annually to compare them with previous years. If the revenue decreased in comparison with previous years, but the customers revenue increased or stayed the same, the reason for the decrease is investigated. Furthermore customer visits are highly valued by the sales department as they believe that meeting face to face and seeing the production happen, will increase the knowledge about the customer and the challenges that they face. A last KPI of the sales department of HGG PC is to reduce the follow-up time as much as possible as HGG PC believes this increases the number of sales.

For the work preparation department different KPIs are monitored. One of the most important KPIs is error reduction. Since the errors made have a direct effect on the eventual product, errors can be a costly affair. Another KPI that is monitored by the work preparation is the difference between the budget and actual cost of a project. The goal is to minimize the difference between the budget and the actual costs. Both KPIs are monitored in project leader meetings where the latest projects are evaluated and errors are identified.

The KPIs for the planning department consist of two components. On the one hand the planning department must make sure that the operators, work preparators and machines are all fed tasks and that those tasks are synchronized. Secondly, the planning department must ensure that projects are all completed in time and delays kept to a minimum.

On the production floor different KPIs are monitored as well. Here the production time is one of the most important KPIs. The production time is needs to be under or close to the estimated production time. This is important in order to keep in line with the planning and to make sure that the production goes as fast as possible. Another important KPI that is monitored is the number of errors that are made. The nature of the errors that are made is different than those made by the work preparation department. Whereas errors made in the work preparation department usually deal with errors made in reading the drawings or writing the machine code, errors on the production floor usually stem from incorrect machine settings or from wrong interpretations of the work instruction.

2.7. The black box

The black box model takes in all inputs and all outputs and puts the transformation between input and output inside a black box. Along with the inputs and outputs, the requirements and the performance is also taken into account. In this section, the black box model is made with different levels of abstraction. At the highest level, HGG as a whole is taken into account.

This model is shown in Figure 2.14.

2.7.1. HGG

At the highest abstraction level, Figure 2.14, the inputs and outputs of HGG are the parts and sub-assemblies to assemble the machines and the raw material to cut the profiles to order. The requirements for HGG are the agreed upon delivery time, the price and the quality of the product. The performance is measured by the turnover and the KPIs. The turnover, along with other data, is noted in the annual report. KPIs can be used for internal performance monitoring. Based on these KPIs the performance of a department or a part of the company can be compared to performances of previous years or the performance of other parts of the company.

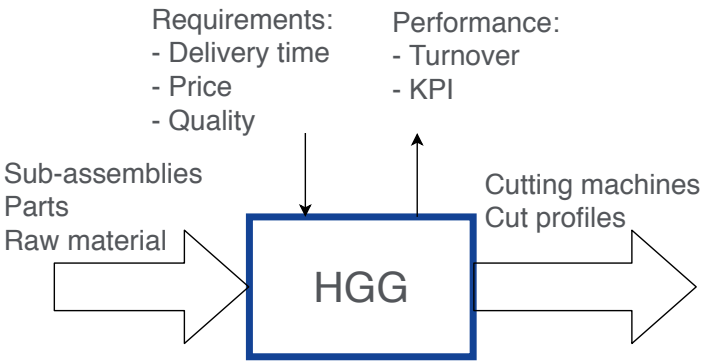


Figure 2.14: The black box model for HGG

When one zooms in on Figure 2.14 it becomes clear that HGG consists of two different companies, HGG consists of HGG PE, which makes cutting machines and sells them, and HGG PC, which uses those machines to cut steel profiles to order. These two companies have separate inputs, outputs, requirements and KPIs. This distinction is made in Figure 2.15. In this figure, the inputs and outputs are split up, according to which black box they enter. Sub-assemblies and parts enter the HGG PE black box to be assembled into a machine. Raw material enters the HGG PC black box, in this black box raw material is transformed into cut profiles. Although the requirements are the same, both companies fill these in differently. For example, delivery times for a machine from HGG PE can be between six weeks and six months, depending on the type of machine, whereas HGG PC tries to deliver all cut material within two weeks after the arrival of the raw material.

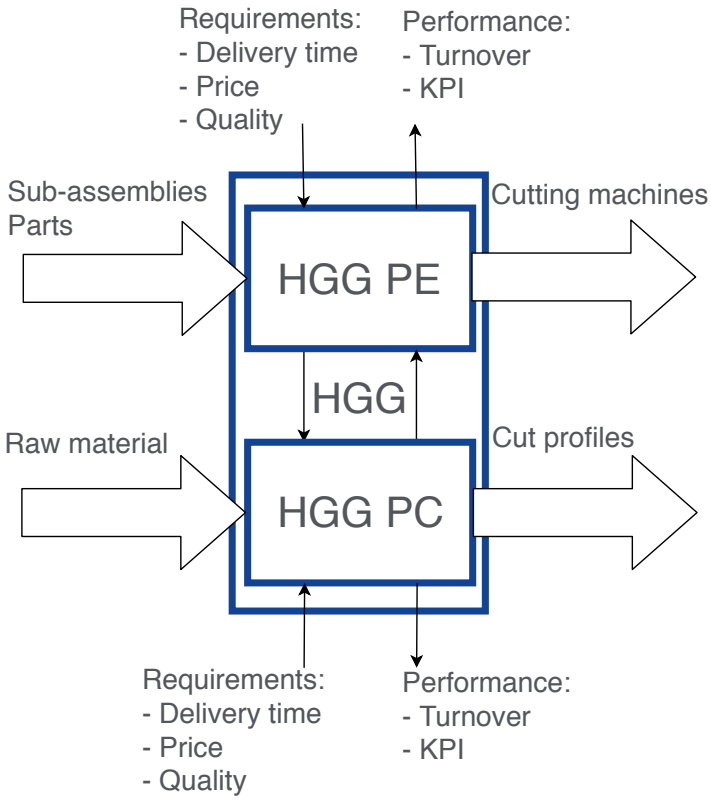


Figure 2.15: The black box model for HGG zoomed in

In order to gain more insight into the proceedings within both HGG PE and HGG PC the next two subsections zoom in even further and will make the black boxes more transparent. The product and order flow within HGG PE and HGG PC is examined in greater detail and the process for a standard order is described.

2.7.2. HGG PE

As shown in Figure 2.15, the inputs of the HGG PE black box are sub-assemblies and parts and the output is a cutting machine. The process of transforming those inputs into a cutting machine has not yet been described. This section gives a description of the way that a standard machine is assembled and delivered to a customer.

When the black box is opened the processes that lead to a fully functional machine are revealed. The resulting processes can be seen in Figure 2.16. This process starts at the relation between the customer (bottom left in Figure 2.16) and the sales department of HGG PE (upper left in Figure 2.16). Either the customer approaches HGG PE or HGG PE sales approaches the customer. In these conversations first the type of machine that the customer needs is determined. When that is known, sales approaches planning & coordination to see what delivery date is feasible and a lowest agreeable price is set. After this negotiations between the customer and Sales are finished and the project can be set in motion.

Before the project can begin a planning and budget has to be made. This is done by the planning & coordination department. The planning ensures that the project is delivered on time and the budget makes sure that the project is profitable. Planning & coordination lets all departments involved know when they need to work on the project.

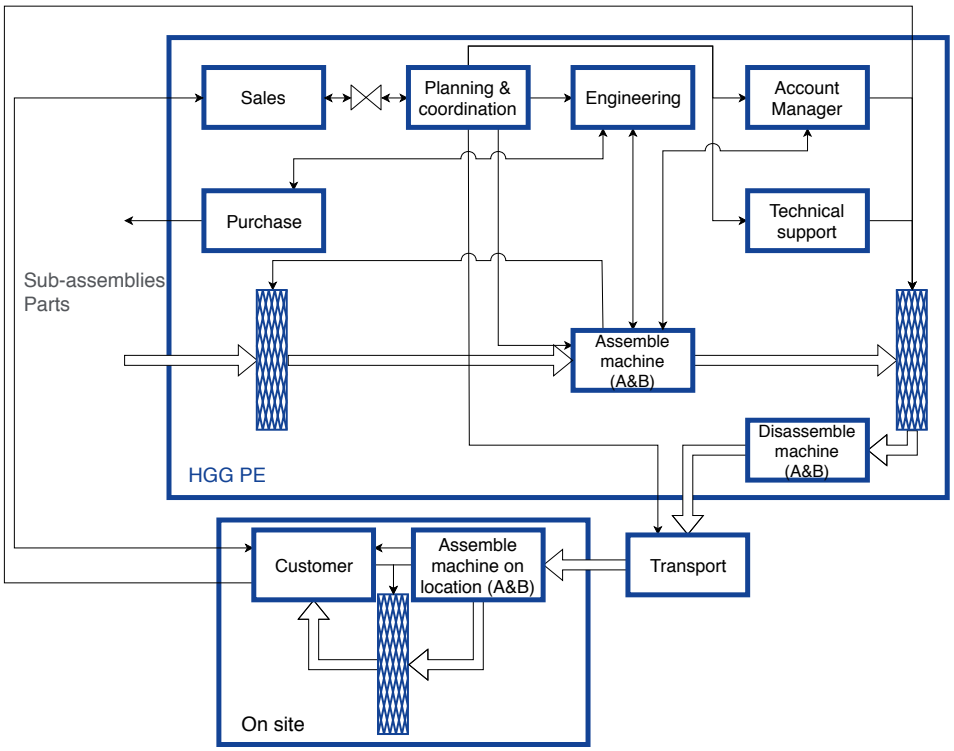


Figure 2.16: The black box model for HGG PE filled in

At the start of the project all parts and sub-assemblies have to be ordered. All these parts and sub-assemblies, unless purchased off-the-shelf, are designed by the engineering department of HGG PE. Along with engineering components, the engineering department is responsible for making up a material list for each project. In this list all components that need to be put into the machine are listed. This list is passed on to the purchase department. This department contacts the suppliers and fabricators of sub-assemblies and negotiates over price and delivery time of different parts.

When parts are delivered the parts are checked by the assemble & build department. In this step all incoming goods are checked for flaws, missing items or wrong parts. If this is the case, additional orders have to be made. With all the correct parts the assembly of the machine can commence. If some issues arise either the engineering department is contacted to help with a technical issue or the account manager is contacted if the problem lies with the customer request or if the problem leads to delays. It is the job of the account manager to communicate this to the customer.

In the mean time, the planning & coordination department has informed the account manager and technical support on the details of the project. The account manager takes over the customer relations when sales is done and together with technical support and the customer a Factory Acceptance Test (FAT) is performed. If the machine performs according to specifications and the FAT is satisfactory, the assemble & build department disassembles the machine and prepares it for transport.

After the machine is delivered on site the assemble & build department is responsible for building the machine back up again. After the machine is built up, the commissioning engineer on site teaches the operators how to operate the machine and the software. When everything is operational and the training is completed, a Site Acceptance Test (SAT) is performed. When the SAT is satisfactory, the commissioning engineer's job is finished and the project can be closed. For any questions after this moment, the customer can contact customer support.

2.7.3. HGG PC

If the black box HGG PC, shown in Figure 2.15 is made more transparent, the processes inside become visible. This process transforms raw material into cut profiles. This section describes the standard procedure that HGG PC uses to transform raw material into cut parts.

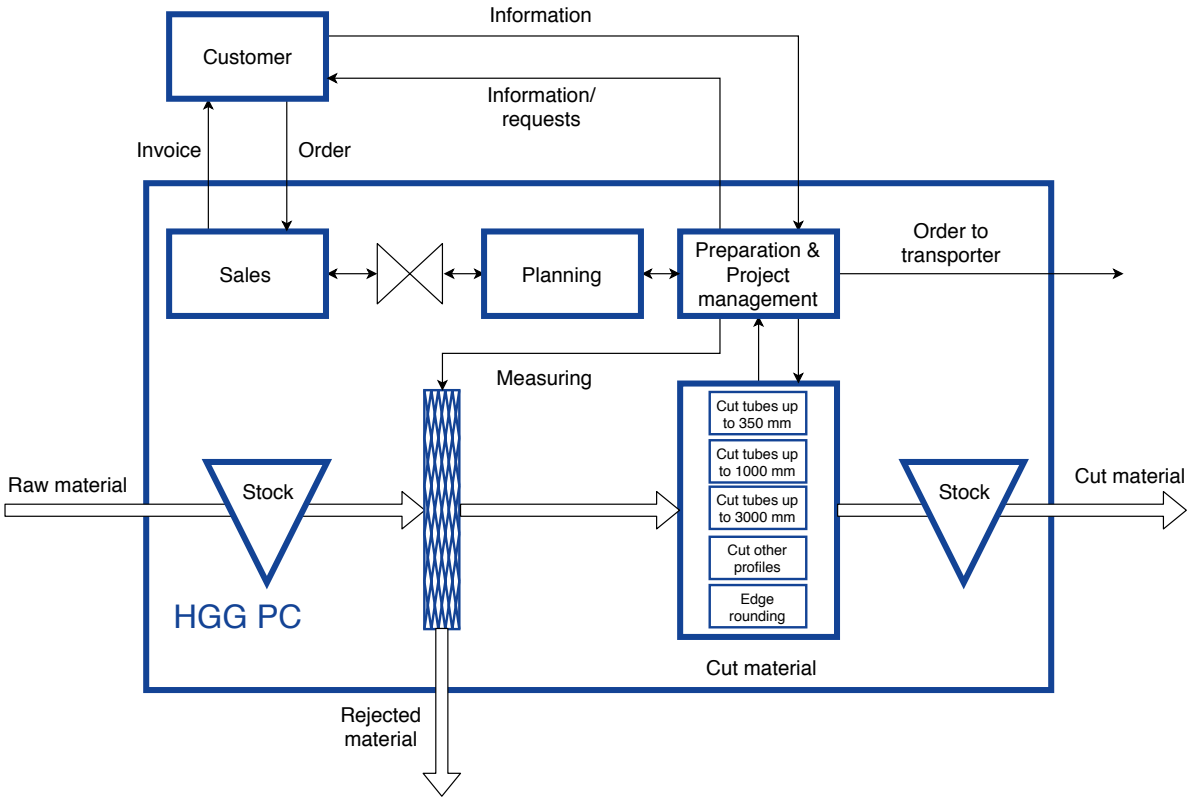


Figure 2.17: The black box model for HGG PC filled in

The process starts with the interaction between the sales department of HGG PC and the customer. Often this customer is a returning customer who is familiar with the work that HGG PC does. Usually, if the customer is already familiar with HGG PC, the customer contacts HGG PC for an offer for cut material. This offer is based on drawings of the customer on which the number of cuts is determined. When the offer is made, the sales department contacts the planning department to see when the production can commence and a reservation is made in the planning. If the customer agrees on the delivery time and price, the reservation is confirmed.

It is up to the customer to make sure that the right raw material is delivered to HGG PC in time, usually at least two weeks before the delivery date, to be cut. This material can come from any supplier that the customer wants, the quality of the material is not important for the cutting process itself. However, when the material arrives at HGG PC it is placed in storage and then checked and measured on diameter and wall thickness by the work preparation department. If there is a delivery that is not complete or material with a different wall thickness has been delivered, work preparation contacts the customer to let them know what has been delivered. HGG PC lets the customer deal with the situation as he sees fit. The customer can choose to have the material cut anyway, the customer can have an agreement with the supplier that different material, than the material expected by HGG PC, had to be delivered or the supplier is tasked with delivering the right material as soon as possible.

Besides controlling incoming material the work preparation department is also responsible for preparing order so they can be processed. The work preparation department is responsible for translating customer drawings and weld specifications into machine instructions. These drawings can be PDFs, 2D drawings or 3D drawings. They have to be made ready to be

loaded into ProCAM, a program made by HGG PE that calculates the optimal cut and nesting options for a part. Along with these preparations a choice on what machine to cut and what time that may take is also made. The choice of machine depends on the type of profile, tubes are divided based on their diameter, if another type of profile needs to be cut the choice of machine depends on the size of the profile and the type of cut that is needed. Finally, if the edges of the profile need to be rounded, this can also be done by HGG PC.

The actual cutting is done by operators on the work floor. They are instructed on the specifics by the work preparation department and the material that needs to be cut is brought to the machine that they operate. On the machine is also the final material check. This is because any curvature of the material is only detected when it becomes noticeable on the machine. If this occurs and it could lead to errors or substandard cuts, the customer is contacted on how to proceed. If the curvature will not lead to errors, or can be avoided the customer is not contacted. If the cutting process occurs without any difficulties the operator reports his progress to the work preparator, who is also project manager, when the job is done. For any questions during the process, the operator can also turn to the work preparator.

When the cutting is completed, the profiles are put into the output stock. When the order or a specific part of the order, called a prio (short for priority), is completed it can be picked up. This is done by the customer or a transporter of his choosing, or this is done by HGG PC in which case the transport is handled by Kaan Transport. Along with the cut profiles, rest material of substantial length is also transported to the customer or discarded by HGG PC. Normally rest material shorter than 1000 millimeter is always discarded by HGG PC.

2.8. PROPER model

The black box model is great at identifying the inputs and outputs of a system and how the system transforms those inputs into outputs, however it does not show the dependencies between the inputs and outputs. To this end the PROPER model is used. The PROPER model for HGG PE is shown in Figure 2.18. The PROPER model for HGG PC is shown in Figure 2.19. These models are filled in with the help of the inputs and outputs that are found in Section 2.7. Since two black box models were made, two PROPER models will be made as well, one for HGG PE and one for HGG PC.

Most of the horizontal arrows in PROPER models can be filled in with the help of the inputs and outputs found in Section 2.7. However, the vertical arrows can not be filled in yet, since these arrows indicate the relations between the functions and these relations have not been examined in the previous section.

2.8.1. HGG PE

The inputs for the PROPER model are taken from the black box model for HGG as shown in Figure 2.15. The input for the 'Perform' block is 'Orders for cutting machines' and the output is 'Handled orders for cutting machines'. In the perform block the orders are handled, they are assessed based on type of machine that is required, special requests from the customer are evaluated, and the delivery time is scheduled along with the installation date.

The 'Perform' block gives tasks to the 'Operate' block. This block has two inputs, sub-assemblies and parts. These parts and sub-assemblies are used in order to create the cutting machines that the customer requires. The 'Operate' block takes resources from the 'Use' block in order to create the cutting machines. The resources that are used are manpower and tools. They are assigned to create a machine and when the resources are done, they are released back to the 'Use' block awaiting a new project to be assigned to. The 'Operate' block reports the progress to the 'Perform' block in order to make sure that the planning is kept up to date, if this is not the case, the 'Perform' block can intervene by issuing a new task.

The outputs of the 'Operate' block are cutting machines and support services. The available cutting machines can been seen in Section 2.1. The support services can be divided into two parts, firstly support is provided when the machine is delivered. This ranges from installation to teaching operators and ensuring the delivery of a properly functioning machine. Secondly, long term service is also provided. This includes delivery of spare parts,

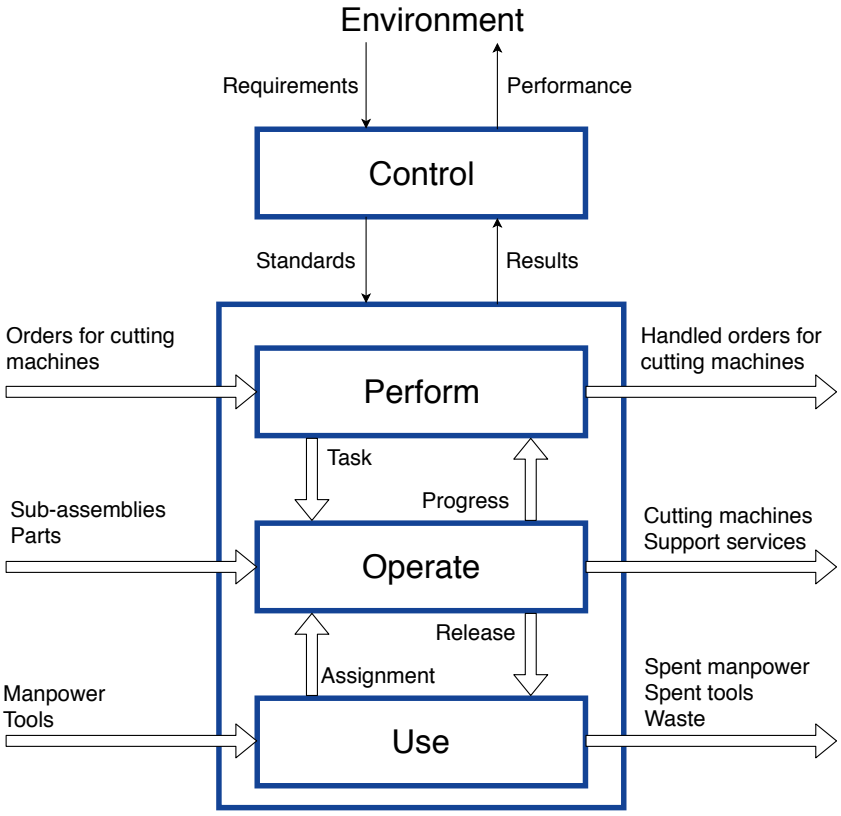


Figure 2.18: The PROPER model with the inputs from the black box model for HGG PE

machine maintenance and software maintenance. Software maintenance can be divided into two categories, the instant solution when a machine breaks down due to a software error and the extension of possibilities with the release of new software.

The outputs of the 'Use' block are the spent manpower, spent tools and waste. These are all things that no one, neither HGG nor the customer, has any use for. They are used up and can be discarded.

The Requirements entering the 'Control' block from the environment consists of special needs to be added to a cutting machine, extra options that are not included in the standard machine. For example, the customer may require in and out feed conveyors of a non standard length, or a marking option on their machine. If these specials are requested enough, they may become standard or modules that can easily be placed on the machine. Another Requirement is the delivery time that customers desire. Delivery times range from four weeks to six months, depending on the type of machine that is ordered and the machines that are already planned. Requirements are transformed to Standards that make sure that the Requirements are met. This includes standards on delivery time, but also performance of the machine. The Results consist of the actual delivery time and the actual configuration of the machine that has been sold. The overall Performance is reported to the customer, if the demands, set at the start of the project, are not met this is handled in the after sales negotiation between HGG PE and the customer.

2.8.2. HGG PC

When constructing the PROPER model for HGG PC, Figure 2.19 is obtained. In this figure the inputs and outputs are put in the right place to see how they relate to one another. As can be seen in Figure 2.19 the 'Perform' block has 'Orders for cut profiles' as input and 'Handled orders for cut profiles' as output. In this block, the orders are handled. This means that incoming orders are evaluated based on the size of the order and the complexity of the order. Here the planning is made in order to keep production running smoothly. The 'Perform' block

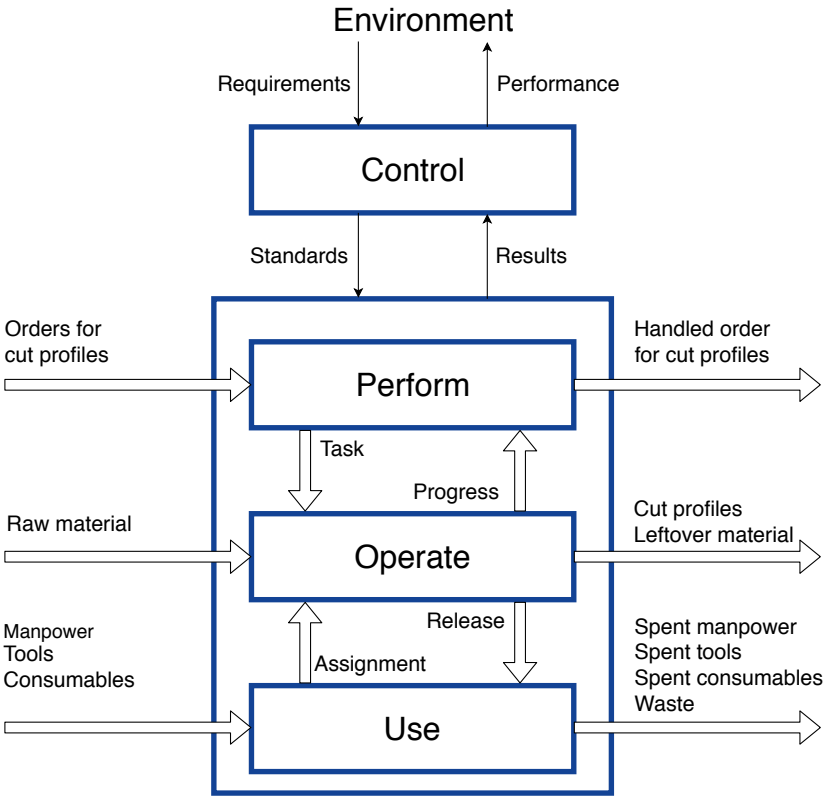


Figure 2.19: The PROPER model with the inputs from the black box model for HGG PC

can be related to the work preparation and planning as listed in Section 2.2.

The 'Perform' block gives tasks to the 'Operate' block. In this block the actual transformation from raw material to the cut profile takes place. In order to complete the transformation from raw material to cut profile, resources must be used. These resources are assigned from the 'Use' block, this means that a machine or operator can be assigned to complete a task in order to create the finished product from the raw material. resources can be anything that is needed to complete the final product. For HGG PC this would be manpower, tools (cutting machines, forklifts etc.) and consumables. The 'Perform' block has to keep track of the operations and for this reason requests the progress from the 'Operate' block. If the progress is insufficient, actions can be taken to ensure that the operation stays on track. When the task is completed, the resource can be released and assigned a new task.

Each block in the system has several outputs. The outputs of the 'Perform' block have already been discussed. As soon as an order is finished it leaves the system. Along with this output, the cut profiles as an output of the 'Operate' block have also been mentioned. However, another output is leftover material. This is material that does not have to be cut, either because the required profiles are already obtained or the material that comes from the machine is too short to be profiled again but still substantial enough to be transported back to the customer. Another option with leftover material is that HGG PC stores it for a customer, for a fee, when requested.

The outputs of the 'Use' block are all resources that have been used up. This varies from resources that are used up instantly, like manpower, to resources that can last for several years, like machines and tools. What all these outputs have in common is that once they are used, they become useless. This means that neither the customer nor HGG PC has any use for them. This is what separates waste from leftover material. Leftover material can still be used to cut profiles in the future or the customer may have other use for it, whereas waste is placed directly in the scrap container. When the customer does not want to receive the leftover material HGG PC can either throw it in the scrap container or use it as test material for future projects.

In the PROPER model the 'Control' block handles all data input from and output to the environment. It is divided into four categories, Requirements, Standards, Performance and Results, these four terms all relate to each other. Requirements are the demands that the customer asks of HGG PC, these can be about delivery times, size tolerance and the shape of the cut. These Requirements are all translated into Standards. According to these Standards, delivery time is two weeks after all material and information for the order has arrived. Tolerances are $\pm$ 2 mm for most cuts and $\pm$ 5 mm for $\varnothing$ 2500 mm pipes or conical tubes. The shape of the cut is modeled using a program called ProCAM created by HGG PE. The cut that is made follows the prescription of the customer. If this is not possible, HGG PC contacts HGG PE and asks if there is a possibility to make the cut happen. If the cut is still not possible, the customer will be contacted to discuss the possibilities to adapt the cut. This will also happen if HGG PC spots a design that will lead to a cut that does not follow the appropriate weld standard, in which case the customer will be contacted as well.

The Results are the information which actually comes out of production. This information reports whether or not the Standards are actually met. It reports on the actual delivery time and errors made in productions. HGG PC aims to deliver two weeks after the material and information is delivered, however, due to limited machine capacity, the delivery of cut I-beams or square tubes can increase to six to eight weeks. This is due to two factors, HGG PC has only one machine capable of cutting these profiles and the work for this machine often consists of a large number of cuts per order, orders can take up more than three weeks of production time which automatically leads to increased delivery times.

If errors occur during the cutting process or if the cuts that are made are not up to standard, an error report is drafted. This report is used to look into the error, whether it is a machine error, an operator error or a software error. If the error cannot be corrected, the customer is contacted to come up with a solution. Internally the error report is used to assess the performance of the machine or the operator. If an error happens often, the reports are used as an indicator to make a change to the machine or the way it is operated.

Finally the Performance is the information that is shared to the customer. Usually, if everything goes according to plan, the customer receives only the cut material, leftover material and an invoice. However, if this is not the case the customer is contacted to inform him of the irregularity. This happens when delivery times are not met or if errors are made that cannot be solved or the customer has to fix themselves. It also happens that errors are spotted by the customer when they start working with the material. If this happens HGG PC is contacted and a solution is found. A common solution is that repair work is done by the customer and the cost of the repair work is divided proportionally between HGG PC and the customer.

2.9. HGG

For HGG PC and HGG PE two black box models and two PROPER models were created. This was done because both companies have very little interaction from day to day. For the most part, HGG PC is a customer of HGG PE and HGG PE is a service and tool provider for HGG PC. This means that the output of the 'Operate' block of HGG PE is one of the inputs of the 'Use' block. Furthermore, HGG PC needs service from HGG PE when machines are not functioning or when cuts cannot be made with the existing capabilities.

One of the services that HGG PC provides for HGG PE is the supply of test possibilities. Whenever a new machine or new feature needs to be tested, HGG PC provides HGG PE with the opportunities to test this. The features can be tested in a purely Research & Development (R&D) environment, or, in later phases of development, in a production setting. This is what currently happens with the UPC 450, mentioned in Section 2.3. Another service that HGG PC provides HGG PE is that potential customers for a cutting machine from HGG PE can see these machines in action at HGG PC. This gives the customer an idea of how the machine will function in their own workshop in the future. This way HGG PC supports the sale of cutting machines by HGG PE. This means that, even though HGG PC and HGG PE are two distinct parts of HGG, they support each other whenever this is possible. A more detailed look into the cooperation between HGG PE and HGG PC is given in the next chapter.

3

Cooperation between HGG PE and HGG PC

As discussed in the previous chapter, HGG PE and HGG PC are run as two separate companies that sometimes interact with one another. This chapter sheds more light on the cooperation between the two companies and the problems that occur when the cooperation does not run smoothly.

3.1. HGG PC in the eyes of HGG PE

From HGG PE's perspective HGG PC has several functions. From a sales perspective HGG PC is a great marketing tool for HGG PE. When customers of HGG PE are interested in a cutting machine, HGG PC can show the entire cutting process from preparation to the actual cutting of a profile. This aspect has several benefits for HGG PE, showing the cutting process answers many questions that customer may have. Also the customer can ask questions directly to experienced users of the cutting machine. Finally it shows confidence in the cutting machine when HGG, as a whole, uses the machines they build themselves to operate a business. This shows customers the strength of the cutting process provided by machines of HGG PE.

Another function that HGG PC can fulfill in the eyes of HGG PE is that of test center. In order to improve machines, feedback from the user is needed to know where they run into problems. HGG PC is uniquely suited for this because of two reasons. The first one is the nature of the work that they do. Most customers of HGG PE fabricate one product or one range of products which lead to many similar cuts for long periods of time. This means that the variety of cuts is very low and customers are not likely to run into problems after initial set up problems. However, because HGG PC cuts material for different customers in different industries and for several different applications, they tend to run into problems quite frequently and need to contact support when that happens. This creates a steady stream of user feedback for HGG PE which they can use to tackle problems that other customers encounter.

HGG PC provides HGG PE with a place to test new machines or new capabilities extensively. This is currently happening with the UPC 450. This machine is in the final stages of development and is tested on how it performs in production, having such a test site in house is a valuable asset to HGG PE's R&D department. Due to the nature of the work of HGG PC and the proximity of HGG PC to HGG PE machines can be rigorously tested before they are introduced to the market. This, along with the user experience that is obtained during use, makes HGG PE better prepared when introducing a new machine or application to market.

HGG PC also supplies HGG PE with steel profiles with specific cuts. This can be either for testing purposes, to see how a specific cut or setting performs, or for marketing purposes, like samples. When these cuts are made, they are often not representative for something that a customer would be interested in, but it does show the versatility of the machines, which is a strong selling point for customers interested in a cutting machine from HGG PE.

3.2. HGG PE in the eyes of HGG PC

From HGG PC's perspective HGG PE's main function is that of supplier of machines. HGG PE has developed and produced the machines that HGG PC uses to cut metal profiles. This is convenient when there are issues with a machine, or if there are specific cuts that customers desire that cannot be made. When this happens HGG PC can contact HGG PE. This can be done through the official channels, HGG PC contacts HGG PE's support department after which the support department will refer the problem to the correct department within HGG PE to solve the issue, but often the department or person within HGG PE is contacted directly by HGG PC. This is due to knowledge that HGG PC has on the workings of HGG PE and its departments. This knowledge, along with the knowledge of the cutting process that HGG PC has, enables them to directly contact the right person within HGG PE. This can lead to problems, however, if the support department is not contacted the problem is not recorded. This way, a machine that often shows irregularities can be listed by customer support as working without any problems and can lead to miscommunication between HGG PE's support department and HGG PC.

Besides HGG PE being the supplier of machines, HGG PE performs several services for HGG PC, including development of custom software to order. HGG has chosen to post several departments, that work for HGG PE as well as HGG PC, at HGG PE, as can be seen in Figure 2.1. These departments are:

- Human Resources
- Finance
- Marketing
- IT
- General affairs

These departments all provide services for HGG PC, since HGG PC does not have these departments itself. The departments all support both HGG PE and HGG PC in their daily business, but are posted at HGG PE. Of all these departments the finance department is the one that is contacted most often. They handle various financial issues for HGG PC, they handle billing, credit checks, purchase payments, hour registration and financial reporting. This means that there is contact between HGG PC and the finance department almost every day. Other supporting departments are only contacted when they are needed or contact HGG PC when they have something to report.

3.3. The future of HGG

As illustrated in the previous sections, there are several relations between HGG PE and HGG PC. However, currently there is no plan to optimize these relations. At this moment a lot of ideas and opinions surround HGG PC as to what is the best course of action for the coming years. Several possibilities to for HGG PC to increase its value for all of HGG have been mentioned, they are:

- Cutting metal profiles
- Showroom
- Experience center
- Generator of user feedback
- Facilitator of R&D tests
- Education center for customers and employees
- Consultancy services

- Sale of work preparation capacity

Cutting metal profiles is what HGG PC currently does to generate a profit and HGG PC can continue to do this in the future. Other options for HGG PC to add value to HGG that are mentioned are derived from cutting metal profiles. The showroom would be a place for HGG PE to display the functionality of their machines to potential customers. This would give HGG PE an edge in terms of marketing and sales. At the moment this is already happening, however there is no clear plan on how HGG PC has to fill in this role.

HGG PC can also be used as a generator of user feedback. Due to the relation between HGG PE, as machine builder, and HGG PC, as machine user, there is a great opportunity to optimize the machines and software by continuously providing HGG PE with user feedback. HGG PC is also interested in doing this for the strategic partners of HGG, Tekla/Trimble, Hyperterm and Messer Cutting Systems [7]. However, at the moment generating user feedback is not done actively. HGG PC is not always up to date with the latest developments and HGG PE does not always use the user feedback that they do get in an effective way. This limits the learning capacity of HGG. There is no clear policy on how this should work and different opinions on how to improve this. This leads to a stalemate because efforts to improve this do not get the necessary attention.

In line with generating user feedback, is the facilitation of R&D tests. Due to the work that HGG PC does, HGG PE can test their machines at an actual customer. This can lead to valuable information to improve a machine. However, due to the nature of R&D work, it can prove difficult to sell material that can be cut on that machine. This is because the machine can fail at unexpected times which can lead to delays. Also, because a new machine is introduced, new customers for the material from this machine need to be found. This can prove difficult as no one is familiar with a new machine. This leads to machines and production space that are not used optimally, since HGG PC might earn more money short term when a proven machine is installed. Although this is not preferred by management, it does illustrate a conflict of interest within HGG.

A different drawback of HGG PC as an R&D facility is that HGG PC as a dedicated cutting company does not represent the majority of customers of HGG PE. Most of these companies are not dedicated cutting companies, but production companies. This can lead to different needs that arise at customers of HGG PE than those that arise at HGG PC. HGG needs to ask itself if HGG PC is the right place for all machines to be tested, especially if machines are developed for a specific niche in the market.

Another opportunity for HGG PC is the education of employees and customers of HGG PE. Currently employees of HGG PE are educated on the cutting process when they start working at HGG PE. They are shown how the machine works and how the process goes. After that they understand the basics of the cutting process and know the background if a customer asks for something. After the employees training stage, they tend not to come back for check ups on their knowledge of the process.

Educating customers is currently done by commissioning engineers of HGG PE. When a machine is installed, they show the customer how the software works and how to operate the machine. However, the suggestion was made that in the future HGG PC can act as a facilitator of workshops for customers that want to expand their capabilities on their machine or want to increase the knowledge of the cutting process. This could be offered as an extra service for customers of HGG PE either as package that they can buy or included in a sale as a learning project. The idea is that such a service would make an HGG machine more interesting for a potential customer.

Another service that was mentioned was consultancy based on the cutting process that HGG PC uses. This process could also be implemented at the production sites of customers to ensure that their material flow is optimized. This service can be included in the sale of a machine or sold separately when customers encounter problems in their cutting process. Trying to sell the HGG PC cutting process has the added benefit of HGG PC being forced to carefully look at their own process. This could reveal areas where improvements can be

made at HGG PC.

Finally, selling work preparation capacity to customers that do not have their own has also been mentioned as a way for HGG PC to make a profit. This can be done in several ways. HGG PE can sell this capacity along with a machine, so a customer does not have to invest in a new work preparator. HGG PC can search actively for extra work among customers of HGG PE that lack the capacity to keep up with their own production. This would lead to a constant part of the work preparation being done for outside customers. Lastly HGG PC can try to pick up some extra work when they are not busy. This would lead to HGG PC only offering work preparation capacity when their is no other work to be done. HGG PC has done work preparation for customers of HGG PE in the past, so there is experience in this field.

3.4. Conclusions on the future of HGG

There is a lot of drive within all parts of HGG to come up with new ways for HGG PC to increase its value for HGG. However, since the staff is not aware of the future course of HGG PC and no clear goal is defined on what HGG PC has to do and has to be, efforts to increase cooperation and to innovate the role of HGG PC tend to start out with good intentions but eventually fade out quietly. The different interests of different departments lead to an intricate web of possibilities and currently that web is not mapped out to its full extend. This makes it hard for all within HGG to see the whole picture and make the right choices.

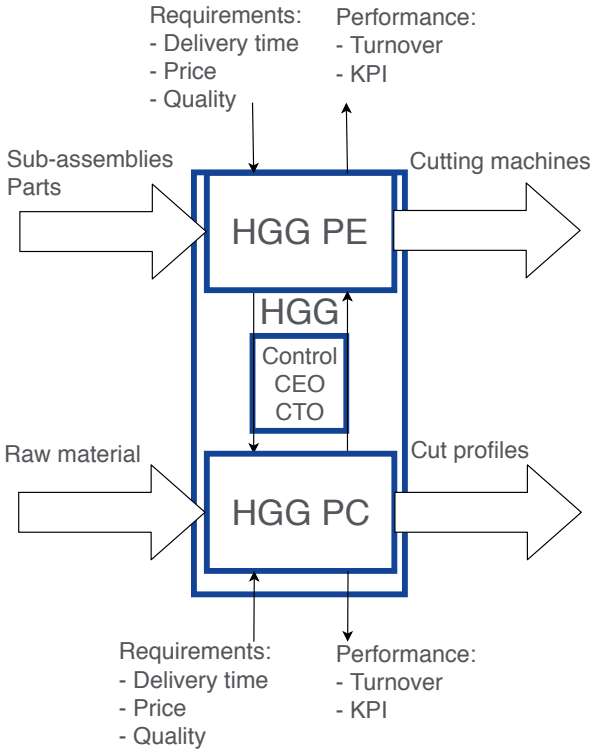


Figure 3.1: The black box models and PROPER models combined

HGG is in need of a clear goal and a clear policy on this subject. Along with clear KPIs that monitor the cooperation between the two company parts, HGG PE and HGG PC. HGG's CEO and CTO must exercise more control in order to set a clear goal and determine the KPI's that are necessary to monitor in order to reach these goals. This is illustrated in Figure 3.1. In stead of treating HGG PE and HGG PC as separate companies with their own inputs and outputs, the CEO and CTO need to control the cooperation and set out a clear course for both companies.

Along with setting a point on the horizon, HGG must also assess look at its own way

of operating and the cooperation between the different company parts. The way that the company is organized at this moment is a result of the past. It will be necessary for HGG to design its company structure to fit the goals that will be set for the coming years.

Taking on this task and going through the process of redesigning the company structure will give the plans and ideas, mentioned in the previous sections, a greater chance of success. It is unlikely that continuing down the same path will lead to new ways of operating and cooperating. In order to achieve this, active management is needed.

4

Problem description

As illustrated in the previous chapter, within HGG there is a lot of willingness to improve the cooperation between both parts of the company. The overall conviction within HGG is that more and better cooperation will lead to increased value for all parties involved. However, currently there is no clear goal or policy on how HGG PE and HGG PC should cooperate and what that cooperation should produce.

The main question of this research is formulated in a way that will help to improve the cooperation between HGG PE and HGG PC. The main question is:

> *How can the outputs of the HGG PC Experience Center be determined and how should the HGG PC Experience center cooperate with HGG PE?*

Answering this question will lead to better coordination of the cooperation between HGG PE and HGG PC. The benefits of extensive cooperation will be examined as well as any costs that can arise due to improved cooperation. In order to answer the main question several sub-questions are drafted as well. The sub-questions aim to answer part of the main question. The sub-questions are:

- What will the HGG PC Experience Center look like?
- What are the KPIs for cooperation at HGG and how are they monitored?
- What has to be changed at HGG to let HGG Profiling Equipment and HGG Profiling Contractors work together more effectively?
- How should the cooperation between HGG PE and HGG PC be controlled?

The first question aims to map the potential ways that HGG PE and HGG PC can support each other. At this moment, there are several ideas on how this could work, as shown in the previous chapter, but a clear view on how it should work is not yet formalized.

The second sub-question is asked to quantify the improvements made by improving the cooperation between HGG PE and HGG PC. Also, the question of monitoring the cooperation trough the KPIs is answered.

The third sub-question is asked in order to map the changes that need to be made in order successfully implement the HGG PC Experience center.

The final question is aimed at implementing a structure of control at both HGG PE and HGG PC. This structure should lead to better and sustained cooperation between the two parts of the company.

The research should deliver a proposal on how the cooperation between HGG PE and HGG PC can be improved and a structure in which this cooperation can be sustained.

5

A new role for HGG PC

HGG PC is currently contemplating its role within HGG. At the moment they are a pure production company, focused on generating as much profit as possible, independently from HGG PE. Next to being a production company, from time to time, HGG PC also functions as a showroom for HGG PE when customers, who are interested in purchasing a machine, come over. However, HGG PC sees potential benefits for extended cooperation with HGG PE and is willing to change its role within the company from purely production to producing and supporting. This change is guided by following the innovation model designed by [19]. In this chapter, the innovation model is explored and the first steps of the innovation model are applied to HGG PC.

5.1. Why change HGG PC?

In Section 2.6 and 2.6.2 the KPI at the highest level of HGG and HGG PC is to increase the profit of the company and to see sustainable profit growth. Although management at HGG is content with the fact that HGG PC turns a profit, sustainable growth over the years is not taking place, as shown in Figure 2.7 and 2.8. Furthermore Figure 2.7 suggests that markets, in countries where HGG PC obtains most of its turnover, do not grow as much as needed. However, as stated in Section 2.2, HGG PC has room in the planning to develop other activities. In order to ensure that HGG PC continues to contribute to the growth of HGG, new roles are defined to expand the possibilities that HGG PC has to support HGG PE.

5.2. Exploring the innovation model and applying it to HGG PC

In order to guide the transformation of HGG PC from production center to experience center, the innovation model by [19] will be used and adapted to the situation at HGG PC. The innovation model, as shown in Figure 5.1, will first be explored and the different parts of the model will be applied to HGG PC in the coming chapters.

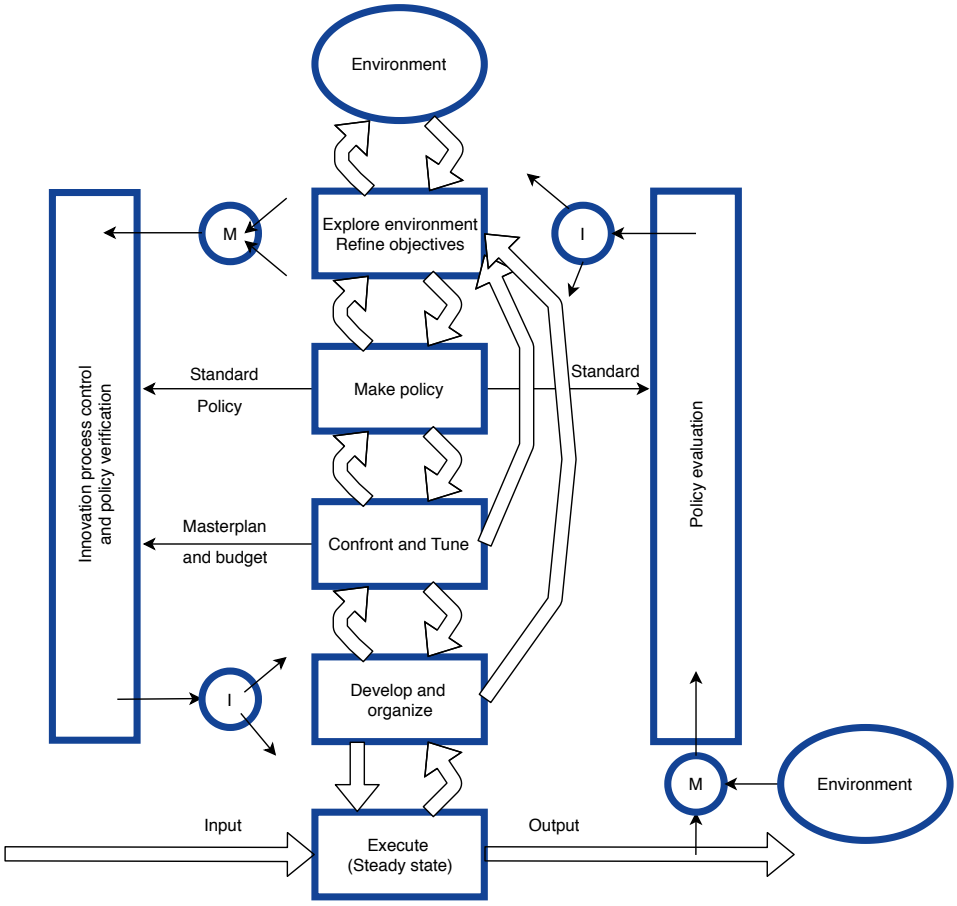


Figure 5.1: The innovation model as proposed by [19]

The first step in the innovation model is exploring the environment and define objectives. This is done to ensure that the goal of the corporation is useful for its customers and aligns with their needs. This part has already been done by HGG. By exploring the environment of HGG PC, HGG found that HGG PC could better function within its environment by innovating and transforming from production center to experience center.

The transformation from production center to experience center and the components that have to be added to HGG PC are described in this chapter. The rest of this report focuses on how the cooperation between HGG PE and HGG PC needs to be controlled in order to increase the chance of success. This is also done on the basis of the innovation model. Looking at Figure 5.1, Chapter 6 is related to the 'Make policy' block. In this block the goals that are distilled from the objectives are translated to KPIs. The KPIs are further detailed in Chapter 6.

In Chapter 7 the innovation model is followed further. The implementation of the extended cooperation and the adjustments that need to be made can be related to the 'Confront and Tune' and 'Develop and organize' block. Chapter 7 will describe how the policy can be implemented in the existing organization along with instruments that will control HGG PC's new way of working, which will be integrated in the 'Execute' block, as well as the cooperation between HGG PE and HGG PC. The instruments that will control the new way of working are a program of consultation, described in Section 7.5, and a new organizational structure, described in Section 7.4.

The innovation model has an iterative character, which can be used to continuously improve the way that business is conducted. Management can use this trait to reset goals, redesign policies or fine tune KPIs. Team leaders can use this to better facilitate employees that will have to execute the cooperation and employees can use it to reflect on their own actions.

5.3. The current situation at HGG PC

As stated in Section 3.3 there are several ways for HGG PC to be of value for HGG as a whole. Currently HGG PC focuses on producing cut metal profiles and functioning as a showroom for HGG PE when asked. This is illustrated in Figure 5.2.

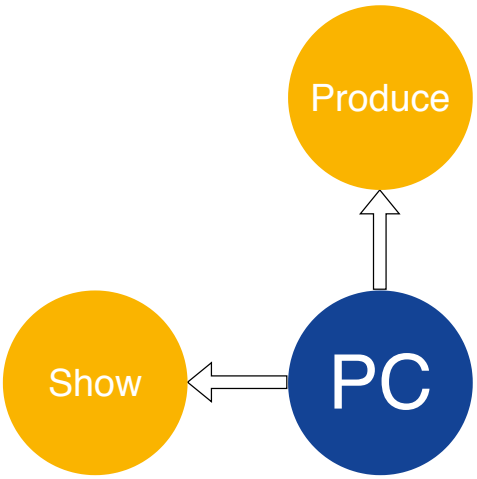


Figure 5.2: The current tasks of HGG PC

Of these two the main focus lays on producing cut metal profiles. Acting as a showroom is only done when prompted by the sales department of HGG PE. This often happens at short notice. The goal of acting as a showroom is to give the sales department of HGG PE an edge in the sales process. The idea behind this is to show customers that machines by HGG PE are good enough to operate a business on and that shows confidence in the product. Additionally, questions can be asked by the customer to work preparators and operators, this way customers can get information directly from experienced personnel.

In most cases HGG PC does not know in advance that HGG PE has a request for them. These request can almost always be granted, however, it means that HGG PC has no control over a portion of their time and has no way of knowing how much of their time will be taken up by HGG PE. Due to the low frequency of the requests this does no lead to problems, however, if HGG PC wants to increase their showroom capabilities and spend more time on sales support, the current way of operating could lead to problems. To summarize, the way that HGG PC cooperates with HGG PE to show off its machines to potential customers is not a good template for further cooperation. Furthermore the cooperation that currently exists to show off machines should be evaluated and adapted.

5.4. Expanding the roll of HGG PC

In order to transform the role of HGG PC in the future, management has defined more tasks for HGG PC in the future. The new tasks are shown in Figure 5.3.

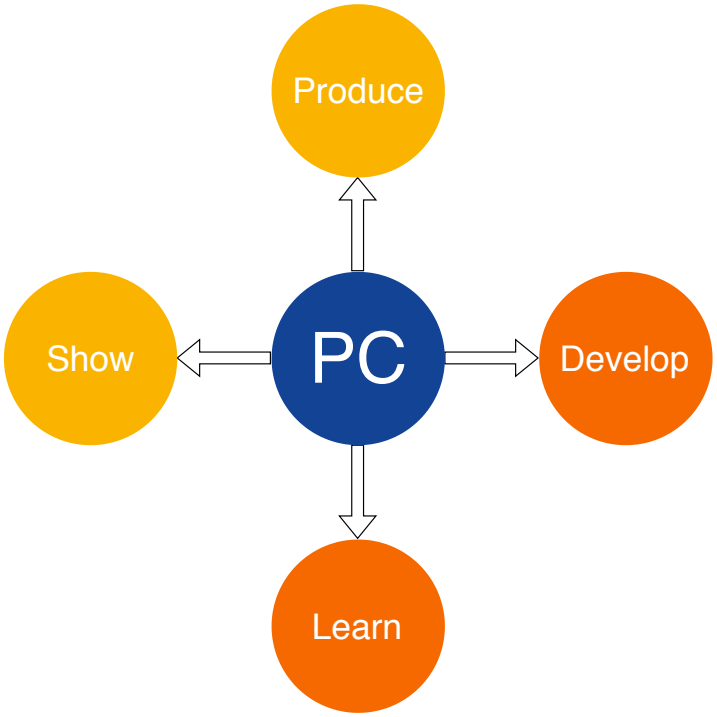


Figure 5.3: The future tasks of HGG PC

By focusing on these tasks HGG PC wants to increase its value to HGG PE. Producing cut metal profiles is currently the main task of HGG PC. As stated in the previous section, functioning as showroom is also done on request. These tasks are shown in yellow in Figure 5.3, these are tasks that HGG PC currently does. The other two tasks, Develop and Learn, will be developed in the future.

With the develop task, HGG PC wants to support HGG PE in the development of new machines and new software. The goal of this new role for HGG PC is to improve the R&D process of HGG PE. The idea is that with the help of the user experience that HGG PC obtains, the R&D capabilities of HGG PE will be improved.

With the learn task, HGG PC will train customers of HGG PE to make better use of their machines. The main goal of this task is to make the purchase of a machine more attractive for potential customers. HGG PC has set the goal of selling training courses with half of the machines sold by HGG PE, this comes down to approximately 20 training courses in 2019. At €5.000 per training this comes down to €100.000 in 2019. By providing additional services and expanding the support that comes with the purchase of the machine, potential customers can be persuaded to purchase a machine. The idea is that extensive guidance in the use of a cutting machine will make it more attractive for customers of HGG PE to buy a machine. The sale of separate training packages to increase the capabilities of the customer is also an option to HGG PC.

Along with making the purchase of a machine more attractive, several other benefits of training customers are identified by HGG. Training the customer to make better use of their machine will lead to higher production of better quality and less prone to service from HGG mechanics and help desk employees. This would reduce warranty costs for HGG as well as free up service mechanics to be assigned other jobs, like assembling and installing new machines.

Also, training different customers with different questions and needs will give HGG insight into what keeps customers busy. Having this input will give HGG information on what to develop in order to keep their customers content.

Employees and service partners of HGG PE can also be trained by HGG PC, which would lead to better educated employees. These employees will have a better understanding of the product that they are working on. Software and mechanical engineers can use that un-

derstanding to get a better grip on the physical issues that surround the machines. Sales engineers can better explain the functions of the machine and its capabilities and commissioning engineers will have more knowledge of the machine that they assemble or install on site. For service partners an advantage of additional training will be extensive independence of HGG. Having independent service partners around the world will increase the service cover of HGG.

As stated in Chapter 3, however, the cooperation between HGG PE and HGG PC is not as good as it can be and adding tasks for HGG PC will not automatically increase the cooperation between these company parts. Therefore a way to smooth this transition from pure production company to production company with extra features needs to be found. This will be done by first assessing the goals and formulating KPIs to monitor the process. This is done in Chapter 6. After the KPIs are defined, an implementation plan is drafted in order to guide the implementation of the cooperation between HGG PE and HGG PC. This is done in Chapter 7.

6

Key Performance Indicators for cooperation

In order to monitor the cooperation, KPIs need to be drafted. These KPIs can be taken from literature, taken from cases of other cooperating companies or drafted by management. In this chapter KPIs will be suggested and motivated and also a way to monitor them will be given. As stated in Section 5.2 this chapter can be related to the 'Make policy' block of the innovation model in Figure 5.1.

6.1. KPIs on cooperation

The cooperation between HGG PE and HGG PC is composed of several parts. These parts correspond with the roles that HGG PC can perform in relation to HGG PE. These roles are, as stated in Chapter 5:

- Producer of cut profiles
- Showroom for sales of HGG PE
- Development partner of HGG PE
- Educator of personnel of HGG PE and HGG PC and customers of HGG PE

Only the first role, as producer of cut profiles, is the sole responsibility of HGG PC. All other roles are defined in relation to HGG PE. For producing cut metal profiles, HGG PC already observes several KPIs as stated in Section 2.6.2. To briefly summarize:

- Profit
- Revenue in specific sectors
- Number of errors in work preparation and production
- Completing orders in the estimated time

For all other roles and the cooperation between HGG PE and HGG PC, some general KPIs can be drafted as stated in [19]. These are productivity and efficiency in order to monitor the performance. Furthermore, controllability, flexibility, quality of labor and innovative power

can also be observed as KPIs. The KPIs need to be relevant to the goals that form the basis of the role, as stated in Chapter 5. Furthermore performing well on KPIs will give the board of directors more grip on the additional outputs, other than profit, that the HGG PC Experience center will produce. Thus giving the CEO and CTO a way to evaluate the performance of HGG PC.

Formerly HGG PC only needed to manage a budget for the production. This meant that each year an estimate of the number of production hours per machine and work preparation hours was made. These hours were multiplied with the corresponding hourly costs to come up with a budget for the year, the cost of running HGG PC for the year. This budget is made in order to monitor the performance of HGG PC in the coming period. When HGG PC will transform itself from production center to experience center, managing a budget will become more complex and harder. Not only does HGG PC need to account for the production hours that will be made, budgets will also have to be made for the showroom, based on the outstanding quotes in consultation with the sales department of HGG PE, the development relationship, based on upcoming projects and general development direction in consultation with the operations department of HGG PE, and for the training center, based on machines sold and the production planning for the coming period. This means that management of HGG PC needs to create a more comprehensive budget to give estimates of all the new roles that HGG PC wants to take on. This will give all parties involved a target to which they can strive and a way to monitor progress of each individual role.

According to [19] the first thing that needs to be evaluated is the theoretical effectiveness which is the ratio between expected result of a measure and the intended result of a measure. This can be seen in Equation 6.1:

$$Effectiveness_{theoretical} = \frac{R_{expected}}{R_{intended}} \tag{6.1}$$

If this ratio is lower than 1, the expected result is lower than the intended result, which means that a measure will not suffice from the start. This means that the measure in question can be discarded.

A second evaluation that has to be made is the theoretical productivity. This is the ratio between intended result and the expected sacrifice, the cost of a measure in the broad sense of the word, of a measure. The ratio is given in Equation 6.2:

$$Productivity_{theoretical} = \frac{R_{intended}}{S_{expected\ with\ that\ means}} \tag{6.2}$$

The actual productivity is determined in a similar way as the theoretical productivity in Equation 6.2, however, instead of the intended result and expected sacrifice, the actual result and sacrifice are used. This can be seen in Equation 6.3:

$$Productivity_{actual} = \frac{R_{actual}}{S_{actual}} \tag{6.3}$$

The standard to which the actual productivity is held is the ratio between the highest possible result given the chosen measure in a certain situation and the lowest possible sacrifice in that situation. This ratio is given in Equation 6.4:

$$Productivity_{standard} = \frac{R_{highest\ possible}}{S_{lowest\ possible}} = \frac{R_{standard}}{S_{standard}} \tag{6.4}$$

From Equation 6.3 and Equation 6.4 two ratios can be obtained, the actual effectiveness, Equation 6.5 and the efficiency, Equation 6.6. The actual effectiveness is obtained by assuming that actual sacrifice is equal to the minimum sacrifice. This leads to a ratio between the actual productivity and the standard productivity, the actual effectiveness:

$$\frac{P_{actual}}{P_{standard}} = \frac{\frac{R_{actual}}{S_{actual}}}{\frac{R_{standard}}{S_{standard}}} = \frac{R_{actual}}{R_{standard}} = Effectiveness_{actual} \tag{6.5}$$

The efficiency is obtained by assuming that the actual result is equal to the standard result. This leads to a ratio between the actual sacrifice and the standard sacrifice.

$$\frac{P_{actual}}{P_{standard}} = \frac{\frac{R_{actual}}{S_{actual}}}{\frac{R_{standard}}{S_{standard}}} = \frac{S_{actual}}{\frac{1}{S_{standard}}} = Efficiency \tag{6.6}$$

We can use the actual effectiveness and efficiency as obtained by Equations 6.5 and 6.6 to relate the actual productivity to the standard productivity, this is done in Equation 6.7.

$$P_{actual} = P_{standard} * Effectiveness_{actual} * Efficiency \tag{6.7}$$

The numbers given in this section give some insight into the performance of the measures that will be taken to improve the cooperation between HGG PE and HGG PC. These numbers can be coupled with KPIs that will given in the upcoming sections. These numbers can be combined with dedicated KPIs for any of the roles of HGG PC to assess the performance of the cooperation.

For each of the roles of HGG PC the result and sacrifices will be given. This will give insight into the performance of all roles that HGG PC will assume. The KPIs, the results and sacrifices will all need to be determined by the parties involved. In order to implement the cooperation between HGG PE and HGG PC a program of regular, periodic consultation will be developed in Section 7.5. In Section 7.5 details on the number of meetings, the frequency of meetings and the topics of meetings will be addressed, along with all stakeholders who will need to attend those meetings.

6.2. KPIs for the HGG PC showroom

In order to assess how well the showroom at HGG PC functions, KPIs on this subject have to be drafted. The goal of the showroom function is to support the sales department of HGG PE in order to let them sell more machines at a better price. KPIs drafted to monitor the showroom function should resemble that goal.

This means that the main KPIs for this role of HGG PC are:

- The number of company visits
- The availability of the showroom
- The quality of the customer experience
- Conversion ratio purchase/visits
- Use of hours and budget as specified

The KPIs listed above aim to shed light on the company visits and their effectiveness. However, the KPIs have not been determined in terms of quantity. For example, HGG PE and HGG PC need to specify the amount of company visits with which they are satisfied. This has to be done in meetings with all stakeholders involved. The aim of the meetings will be to assess the quantity of the KPIs and if extra KPIs are needed to monitor the showroom or if existing KPIs are unnecessary or useless.

These KPIs can be related to Section 6.1, the result is the number of company visits that have taken place. The sacrifices that have to be made is the preparation time, as well as the time that the company visit takes. This sacrifice can be in the form of work preparation time as well as machine production time. The number of visits can be measured, as well as details of the visit like the type of machine or profile that was inspected or the time the visit takes. Other metrics, like customer satisfaction, are harder to quantify, but can also be involved when taking the showroom function of HGG PC into account.

The initial level of the KPIs

In order to know what to strive for in the first iteration of the application of the innovation model, the initial level for most KPIs will be set. These initial levels will be based on what is deemed attainable for HGG and are related to the output of HGG.

The first KPI, the number of company visits, is related to the number of machines that HGG PE hopes to sell. Since HGG PE aims at selling 50 machines annually, the initial level of the KPI is set at 60% of this number, which comes down to 30 visits per year. This number takes into account that not all customers are interested in a visit and that some customers may choose to visit another customer, that HGG PE has already sold a machine to.

On the other hand, not all customers, who visit HGG PC, will purchase a machine. This means that the number of visits per year may grow larger than the number of machines sold annually.

The second KPI monitors the availability of the showroom. In order to function, the showroom will take up production time and will interfere with production. This means that regular production needs to be halted to conduct a company visit. Ideally the availability of the showroom is 100%, however, in the initial phase the minimum availability is set to 80%. This means that eight out of ten times the customer must be able to visit HGG PC at the time of their choosing. HGG PC will only be allowed to reschedule 20% of the time.

The third KPI, quality of the customer experience, is harder to quantify, since the customer experience a subjective matter. This means that a more objective way of indicating the customer experience needs to be found. Therefore, instead of only asking the customer about their visit, HGG can also monitor the number of visits that are conducted without any issues. This will give an indication for the customer experience. It is advised that at least 60% of the visits should be conducted without any issues. This means that the customer will get to see the machine they are interested in, working on the profiles that are relevant to them, at the time that they have initially requested.

The fourth KPI, conversion ratio purchase/visits, is a way for HGG to measure the effectiveness of the company visits over time. It is the goal of the company visits to support the sales department of HGG PE in selling cutting machines. An initial level of 50% of the number of visits should result in a purchase of a machine. If this number is not met HGG will needs to increase the quality of the company visits, be more critical of when a customer is granted a visit or rethink the usefulness of the company visit.

The final KPI, use of hours and budget as specified, is intended as a control mechanism. All new functions of HGG PC will take up a portion of the time and resources that HGG PC has at its disposal. By specifying a percentage of the time and funds with which HGG PC must conduct all their tasks, management can monitor if all tasks are conducted and if some of the tasks do not overshadow the others. It is advised that HGG PC will spent 70% of its time and resources to producing cut metal profiles for its customers. This should be enough to provide a solid stream of revenue for HGG PC to sustain its activities. Approximately 5% of the time and resources of HGG PC should be spent on customer visits. This should prove enough time time to conduct all company visits. it is advised that the development relationship between HGG PE and HGG PC will not take up more than 10% of the time of HGG PC, keeping track of this number may prove difficult since production and development can intertwine. For these projects a distribution must be found, so that time and resources can be attributed to the right role of HGG PC.

For the training center it is advised that 15% of time and resources are reserved for the training center, training customers will take up much time to do right and training will mostly take place during the same hours that production usually takes place. This means that training customers will take up a lot of production time.

6.3. KPIs for a development relation between HGG PE and HGG PC

The development of new machines and applications can be a costly affair. The relationship between HGG PE as fabricator of cutting machines and HGG PC as user of those machines can lead to insights that can reduce the development cost or come up with better ideas. As with KPIs drafted for the showroom function, KPIs for the development relationship should

also resemble the goal that is set for this relationship. KPIs in which HGG is interested are:

- The number of suggestions made by HGG PC
- The number of suggestions picked up by HGG PE
- The improvements of machine specifications
- Projects sold in sectors of interest
- Use of hours and budget as specified

This list of KPIs resembles the KPIs that [13] and [15] suggest. Both sources indicate that R&D is hard to quantify and that not all benefits of R&D can be expressed using numbers. As stated by [15] and [18] R&D can have an impact several years after the initial investment has been done. This means that the benefits of cooperation between HGG PE and HGG PC can take several years before they show. [18] suggests that R&D investments made in the initial year of the cooperation will take some time to leave a mark on the R&D of HGG.

As with the KPIs that monitor the showroom function of HGG PC, KPIs for the development relation between HGG PE and HGG PC need to be determined in terms of quantity. This means that HGG PE and HGG PC need to agree on what number of suggestions will suffice and how many projects need to be sold in sectors of interest at which price, among other things. These KPIs need to be agreed upon by HGG PE and HGG PC. There needs to be some form of coordination between the wants and needs of both company parts. This will be described in Section 7.5.

In order to relate these KPIs to the numbers given in Section 6.1 the result and sacrifice for the development cooperation need to be determined. The result of the cooperation is twofold, on the one hand HGG PC's user feedback will lead to better R&D processes at HGG PE. On the other, due to machine improvements will lead to increased production capabilities for HGG PC. This comes at a cost, the sacrifice that has to be made. Which are the resources spent on development projects at the suggestion of HGG PC. These resources cannot be spent at projects requested by other customers of HGG PE or general development projects. It is possible that projects at the suggestion of HGG PC and projects requested by other customers overlap, in which case HGG PE can hit two birds with one stone.

The initial level of the KPIs

Like the KPIs for the showroom, the KPIs of the development relationship between HGG PE and HGG PC will be set at an initial level which can be used to develop the cooperation further. This section will give an initial value for all KPIs given for the development relationship.

The first KPI is the number of suggestions that are made by HGG PC. In the initial phase the conversation between the different departments will need to be started up. This will lead to a lower number of suggestions in the initial phase, than when the conversation is fully developed. For the initial year at least 1 suggestion per month is aimed for. This will lead to 12 to 15 suggestions in the first year.

The second KPI, the number of suggestions picked up by HGG PE, is aimed at processing the suggestions and developing them into concrete concepts. This processing can have two different outcomes. The idea is developed further and development capacity will be allocated to this end, or the idea is not deemed promising enough and the suggestion is filed and no energy is put into the idea, other than the motivation of why it is shelved. Both outcomes will count as a suggestion that is picked up. However, if a suggestion is ignored by HGG PE and nothing is done with it, the suggestion will not be deemed picked up. Due to this broad definition of when a suggestion is picked up by HGG PE. A high initial value for this KPI is set, 90 % of all suggestions, that come out of the development relationship, will need to be picked up. This comes down to 10 to 13 ideas in the first year. As said previously these ideas do not need to be completely processed by HGG PE but can also be rejected if given proper motivation.

The third KPI, improvements of machine specifications, is aimed at the actual output of the development cooperation between HGG PE and HGG PC. This KPI will track the number

of concepts that will actually be implemented in the machines and which origin can be traced to the development relationship between HGG PE and HGG PC. Since this is an elaborate process, the number of actual improvements is not expected to be high in the initial phase due to time constraints. Therefore the number of actual improvements is set at 3 improvements in the first year. This can be an improvement on the machine, the software or the work procedures that are used, among others.

The fourth KPI, projects sold in sectors of interest, focuses on the learning effects that HGG hopes to obtain by selling projects in certain sectors. HGG hopes to learn more about the issues that manufacturers in a sector encounter by experiencing them firsthand. This means that HGG PC will need to obtain a place in markets that they currently do not have much experience and profitability of these projects is therefore expected to be lower than projects in sectors where HGG PC has more experience. The added value is the experience that HGG, as a whole obtains, by working through these projects. Due to the higher risk of these projects it is advised that in the first year no more than 20% of the projects sold are in sectors of interest. This is not only due to the lower expected profitability but also the uncertainty these projects create in planning. The expected production time is harder to estimate when HGG PC has little knowledge of the final product.

6.4. KPIs for the education of personnel and customers

The final role that HGG PC wants to take on in the future is that of educator of HGG personnel and customers of HGG PE who are interested in extended support in the use of their machine. The goal behind this role is to educate customers on the use of the machine and software and to make it more interesting to purchase a machine by offering extended guidance for buyers. According to [16], the three main categories for an educational institute are academic, research and support. KPIs can be divided into those categories. [16] suggests the KPIs quality of instruction, program quality and variety among others. Especially course quality and instruction quality are also KPIs for the training center. Additionally, HGG hopes to create more cohesion within the company by expanding the knowledge, of the machine it produces, of its employees. HGG PC has set the goal of selling training courses with half of the machines sold by HGG PE, this comes down to approximately twenty training courses in 2019. At €5.000 per training this comes down to €100.000 in 2019. The KPIs for this role are:

- The number of training packages sold per year
- Customer satisfaction on training and guidance
  - Instructional quality
  - Course quality
- Use of hours and budget as specified

Contrary to the KPIs on the showroom and the development relationship some KPIs on the training of customers are already quantified. The number of training packages sold per year is correlated to the number of machines sold per year. HGG hopes to sell training packages with half the machines they sell in 2019. If proven successful at this goal, HGG hopes to increase this percentage over the years to the point where all machines sold include a training for the customer. This means that HGG PC needs to ensure that they can accommodate around twenty training courses in 2019 and this will increase to approximately fifty training courses over the next few years. As stated in Section 2.1.1 the potential market for cutting machines is large enough to sell around 200 machines per year, but HGG PE does not have the capacity to sell and produce that number of machines. However, if the number of machines sold increases when HGG PE grows, HGG PC can expect an increasing number of training courses and needs to plan accordingly.

In order to relate these KPIs to the numbers given in Section 6.1 the result and sacrifice for the development cooperation need to be determined. The result of training customers is in first place the turnover from the sale of training packages, in second place the decrease

of warranty costs and in third place the knowledge that HGG obtains of what keeps their customers busy and how to act on that knowledge. The sacrifices of the training center are the costs that have to be made in order to get everything up and running and the costs that arise from operating the training center.

The initial level of the KPIs

The KPIs for the training center will also be set at an initial level. Contrary to the other roles that HGG PC will take on, management at HGG has already defined the initial level of the first KPI. As stated in the previous section, HGG PC hopes to sell 20 training courses in 2019. This is taken from the number of machines sold by HGG PE, HGG PC hopes to sell training courses with half of the machines sold.

The second KPI, customer satisfaction on training and guidance, focuses on the instructional quality of the trainers and the course quality, how customers have experienced their training. Since it is hard to obtain an objective value for customer satisfaction, it is advised to look at the number of customers that got their training without problems. This number can be used alongside questions about the customers experience and if they see room for improvement in future training courses. Since the training that HGG has in mind is quite extensive, it is vital that customers do not get the feeling that they are wasting their time. It is therefore advised that 90% of all training courses conducted at HGG will be given without major issues. This comes down to 18 training courses in 2019 that will be conducted without major issues. Tracking this number along with the reviews of the training by customers will give a good impression of the level of customer satisfaction.

7

Implementation of increased cooperation

This chapter will lay out plans to increase and improve the cooperation between HGG PE and HGG PC. These plans will consist of a reachable goal and a set of objectives that have to be fulfilled in order to make the cooperation a success. This chapter will also look at any issues that could arise at HGG PE and HGG PC when more cooperation is implemented. Like the previous chapter, this chapter can also be related to blocks in Figure 5.1. In this case the 'Confront and Tune' block and the 'Develop and organize' block. This chapter also describes what is necessary to implement the changes into the steady state and a control mechanism, in the form of a program of consultation is also presented.

7.1. Action plan

As stated in the previous chapters, HGG PC wishes to assume different roles in the future. The main role of HGG PC will be that of producer of cut steel profiles. This will be the main source of income for HGG PC and the other roles are dependent of the main role. The other roles are, showroom for HGG PE, development partner of HGG PE and training center for HGG PE. These roles cannot all be assumed at once. There needs to be a order in which they can be implemented, so that the transformation of HGG PC can go as smoothly as possible. The order in which the new roles will be implemented is:

1. Showroom
2. Development partner
3. Training center

This order is chosen because the nature of the work that is associated with the respective role. Firstly, acting as a showroom already occurs at times, but a structured plan to guide this does not exist. Secondly, using the experience that HGG PC has to come to better solutions to problems is an extension of producing cut metal profiles. Finally, training customers of HGG PE is something new and is therefore chosen to be implemented as last. This is done because a well established relationship between HGG PE and HGG PC will already be in place when this function is implemented. This can help to resolve the difficulties that HGG PC faces when it assumes the additional training center role.

7.1.1. Implementing the showroom

The frequency of visits is low and does not have a great impact on the day-to-day affairs of HGG PC. Often HGG PC is informed that a visit will happen a few hours in advance. Work that has been done will either be billed directly to HGG PE or accumulated over a period of a few months and billed afterwards. This happens by creating a project on which HGG PC can write its hours.

Although this system works, it causes unnecessary disturbances in the work processes of HGG PC. If the number of visits will increase or the complexity of visits will increase in the future, this way of operating will lead to problems. Therefore a new way of conducting the cooperation needs to be implemented, one that will accommodate a larger number of visits that will support HGG PE better and disrupts HGG PC less. Structuring this role and creating an environment in which HGG PE and HGG PC an work together towards a common goal, will be a good step towards a productive cooperation.

In order to ensure that the cooperation between sales of HGG PE and HGG PC runs smoothly, changes in the handling of customer visits need to be implemented. These are:

- Synchronize agendas
- Share information on customer
- Structure billing
- Implement control structure and monitor performance

Synchronize agendas

Sales of HGG PE and HGG PC need to have insight in each others planning. That way sales of HGG PE can see when company visits can be planned best and HGG PC can see if and when customers will be visiting. Fine tuning this process will lead to a minimal disturbance in production for HGG PC and ensures enough time and a proper explanation for visitors of HGG PE.

Share information on customer

Not only the time and date of a visit should be communicated, additional information is necessary as well. Sharing additional information will ensure that the visit runs as smoothly as possible. This information should include the content of the visit, this includes the nature of the work that needs to be done in advance, the work preparation that needs to be shown and the actual cutting that needs to be shown. Furthermore requests on what the customer wants to see and what HGG PE wants to show the customer should be communicated to HGG PC. That way HGG PC and HGG PE are optimally prepared for the visit and can provide the customer with a tailored experience.

Structure billing

All this new information should be detailed and tracked somewhere. Currently cutting services are tracked in projects created by the sales department of HGG PC. These projects are used to track all requests of the customer, number of profiles, types of profiles, mode of transportation, among others. Also these projects are used for the billing towards the customer. Similar projects can also be created for company visits. In these projects all details of the company visit can be tracked and billing towards HGG PE can happen in a similar way as currently happens with other customers. Using these projects, billing and detailing can be centralized.

Implement control structure and monitor performance

In order to check whether the cooperation between HGG PE and HGG PC to run the showroom is a success KPIs have been drafted. These KPIs, turnover, conversion rate and production hours lost, need to be monitored. This means that both sales of HGG PE and HGG PC need to control the performance of the showroom. If the performance is lacking both departments have a shared responsibility to make adjustments.

7.1.2. Implementing the development partnership

When the implementation of the showroom is conducted, the implementation of the development relation can begin. This development partnership consists of new machines, software and applications being supplied to HGG PC by HGG PE on a regular basis. In return HGG PC will give HGG PE user feedback and suggestions for improvements and act as a test center for HGG PE. As with the showroom partnership, several changes need to be implemented in order to increase the change of a successful development partnership. These are:

- Regular installation of new machines
- Regular software updates
- Implement a way to record user feedback
- Show what is done with user feedback
- Implement control structure and monitor performance

Regular installation of new machines

HGG PE spends at least 5% of its turnover in product innovation. This leads to many developments and new applications. This can range from entirely new machines to new additions to existing machines and new software. In order to thoroughly test these new innovations at HGG PC, new machines need to be installed frequently. This has benefits for both HGG PE and HGG PC, HGG PE obtains information on the use of its machines and HGG PC get to work with the newest machines available. Using the latest machines will ensure that the user feedback is relevant and resemble the situation of other customers of HGG PE. It also reduces the risk of problems, that already have been solved, will be solved again.

An additional benefit to installing new machines frequently is that customers visiting HGG PC for its showroom will be able to see the latest technology. This means that when customers arrive at HGG they will get to see what their future machine will look like and not what their future machine looked like ten years ago. This will add to the value of the visit of the customer.

Regular software updates

Similar to installing new machines, software both on the machine as well as in work preparation needs to be updated frequently. The reasoning behind this is similar to the reasoning behind installing new machines. Updating software often makes sure that the user feedback of HGG PC is useful for the developers of HGG PE. This will make sure that development budget of HGG will be used efficiently.

The difference between using a new machine and using new software is that using new software, to some extend, is optional. A work preparator or operator can choose not to update their software or downgrade to an older version. This can happen when a new update removes old features that either the operator or work preparator is accustomed to or the new version leads to bugs that where not in the older version. Although this might solve the short term problems in the production of HGG PC, it can lead to less relevant feedback in the long run.

Record and show what is done with user feedback

The continuity of user feedback from HGG PC to HGG PE relies on the willingness of HGG PC to supply that user feedback. In order to ensure that user feedback keeps coming, HGG PE must show what is does with user feedback and how HGG PE incorporates that feedback in new features. This requires explanation from HGG PE on new features and explanations on why some requests are not implemented. To this end a release note, in which HGG PE can detail all new features, can be used. When keeping track of all release notes, a detailed list of all improvements will be created. HGG PE currently uses the online tool Mantis Bug Tracker, see Figure 7.1, to record suggestions and errors in the design of machines. This feature may also be used in the context of the development relationship between HGG PE and HGG PC. If this can be done successfully implementing a way to record user feedback can be done with relative ease.

Figure 7.1: Mantis Bug Tracker, https://www.mantisbt.org/

Implement control structure and monitor performance

In order to make sure that all involved keep motivated to work on the development relationship some form of control needs to be implemented. On the one hand the operations department of HGG PE, which handles R&D at HGG, need to make sure that HGG PE communicates what is done with all input from HGG PC. On the other hand management of HGG PC needs to ensure that feedback and suggestions keep coming. Monitoring the cooperation on both ends ensures that a constructive relationship can exist.

7.1.3. Implementing the training center

Finally, when both the showroom and development relationships are implemented, HGG PC can turn to its role as a trainer for customers of HGG PE and its employees. With this role HGG PC aims to reach two things, firstly, to support HGG PE in its sales of machine and by increasing the customer support and, secondly, increase the knowledge of employees of HGG PE about the machines that they deal with. Currently all new employees of HGG, both HGG PE and HGG PC, are informed on the machines and the cutting process when joining the company. However, after that initial period, no training or additional courses are given. HGG wants to make sure that its employees know the current state of affairs within the company and thinks that the role of training center can play an important part in this. In order to successfully implement the training center several actions must be taken. They are:

- Create training courses
- Create training accommodation
- Train/hire employees to teach customers
- Create awareness and sell training courses
- Integrate training into production planning
- Follow up on the quality of the training
- Implement control structure and monitor performance

Create training courses

In order to sell training course HGG PC first needs to create those courses. HGG PC thinks that a full training course will take approximately three days. This means that HGG PC has 32 hours to teach the customer all about using the machine, software and additional theory. In this time all topics need to be covered, if it proves to little time the customer may feel like all the training is rushed or the training may need to take longer. If the training does not last long enough the customer may feel like the training is worth the money. All this means that HGG PC must take care in creating the training and planning all courses.

Create training accommodation

Along with creating content HGG needs to provide a place for customers to stay and all necessities to follow the course. This includes all lesson material, a place to receive theory, personal safety gear and catering for the duration of the training, among others things.

Train/hire employees to teach customers

After the content of the training is known, instructors must be found. There are two ways for HGG PC to find instructors, either by hiring additional staff solely for training purposes, dedicated trainers, or educating the current staff so that they can be effective instructors. Both options have their advantages and disadvantages. If HGG PC chooses to hire dedicated trainers, after these trainers have been hired, they first have to be educated on the use of the machine and the software, this will increase the set up time for the training center. If HGG PC chooses to educate the current employees to turn them into trainers, the set up time for the training center will be shorter, however, it is not known if HGG PC employees want to train customers on a regular basis and if they are suited to do so. A third option is to hire dedicated trainers and to let them work alongside HGG PC employees. This way HGG PC can lean on the expertise of their employees and ensure that the content of the training course can be conveyed effectively. Which option will be chosen depends on the number of training packages that will be sold and the ability of the current staff to give the training.

Create awareness and sell training courses

In order to sell any training courses, sales HGG PE needs to create awareness at their customers that training is an option. This can be done by highlighting the option in the sales process of new machines or by actively contacting existing customers in order to bring the new training courses to attention. Not only do the new courses need to be advertised, the advantages of taking a course should be emphasized. HGG needs to think about what it will offer customers who are interested in buying a machine and customers who already own a machine, but are interested in expanding their production possibilities. These situations differ and HGG needs to consider the most effective way to approach both.

Integrate training into production planning

As with the company visits, training courses will take up production time. This means that planning of training courses and production time need to be monitored closely. A paying trainee, who expects a well run course, will not want to wait long time to get excess to a machine used for production. On the other hand, a customer, waiting for their cut profiles, will not be happy when a delivery date is missed. This means that a balance between training and production needs to be found.

Follow up on the quality of the training

Since training its customers is new to HGG, customer feedback and overall experience is very valuable. This enables HGG to improve their training courses and deliver a better experience over time. HGG needs to ensure that customers are satisfied with the training and the overall experience. This will ensure that customers will use their own machine with confidence and less chance of malfunctions.

Implement control structure and monitor performance

In order to evaluate the performance of the training courses. some form of control needs to be implemented. Since the promotion and sale of training courses will be done by sales of HGG PE, one part of the control should be placed there. This branch of the control needs to make sure that enough courses are sold. Afterwards sales can also monitor the customer feedback and give suggestions about the content of the training to HGG PC. HGG PC needs to monitor the content of the training and how it fits in the production planning. This is done because most knowledge on operating the machine and software is located at HGG PC. Furthermore, it gives HGG PC more control over its own planning and the possibilities to move orders around.

7.2. Planning

Once the tasks are detailed, a planning can be made. The planning will give advise on the order in which the tasks can be best completed. This order of tasks is related to the order given in Section 7.1. This means that firstly the showroom tasks will need to commence,

secondly the development tasks will need to commence and finally the tasks for the training center will need to start.

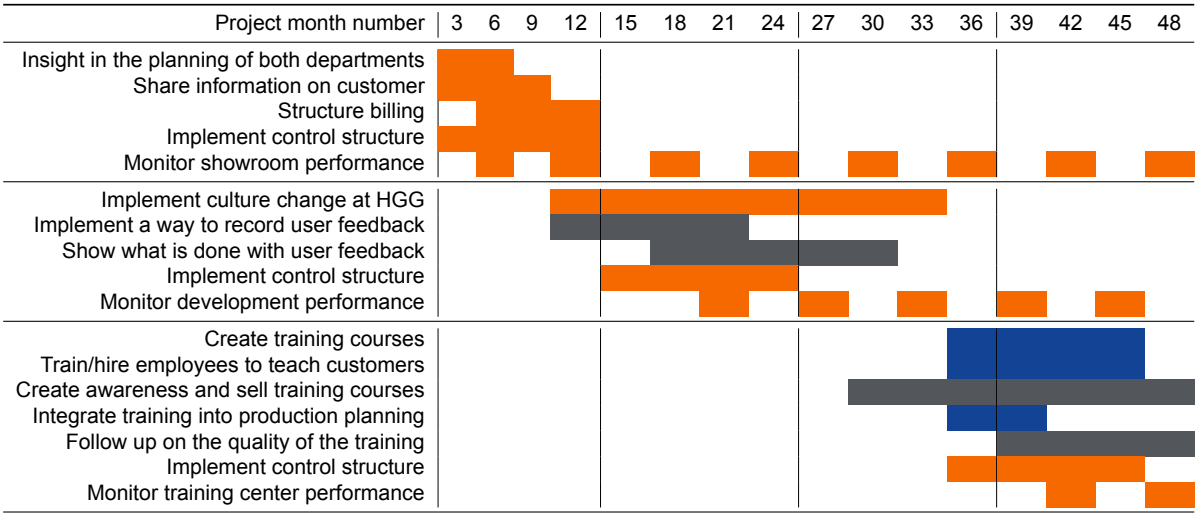


Table 7.1: Planning for the implementation of the different roles of HGG PC
Orange: HGG PC and HGG PE: Blue: HGG PC Gray: HGG PE

Table 7.1 gives an indication of when all tasks should be performed and by whom it must be completed. The first period of transforming HGG PC from production center to experience center must be dedicated to implementing the showroom function. Since this is already something that HGG PC does for HGG PE, on occasion, this function can be added to the daily production of HGG PC. This means that, although new tasks must be added to perform the showroom function at a satisfactory level, the showroom function will be the most familiar to introduce. This also has implications for the duration of the implementation, because of the knowledge that already exists, the estimated duration of implementation is six months. In this period, all tasks that are mentioned in the previous section need to be conducted so that the showroom function can be added and the goals and KPIs set for this part of the HGG PC experience center.

After the first six months the new showroom function is fully operational and HGG PC can obtain experience in operating two functions, producing and showing, simultaneously. It is advised that HGG PC will run the two functions side by side for at least three months. In this time HGG PC should keep their production up to standard as well as conducting several visits. The number of visits and frequency of visits are important aspects to determine the length of this period. It is advised that at least ten visits are conducted and at least two weeks with two visits have occurred.

After HGG PC has adapted to the new situation and performing two separate tasks, the implementation of a third task, the development center, can commence. The additional task is aimed at using the knowledge, gained with the use of the machines, to improve the R&D process at HGG PE. In order to make sure that this will work, HGG PE and HGG PC must ensure that the lines of communication between both parts of the company are good enough for HGG PE to obtain the knowledge learned by HGG PC. The tasks that need to be performed are chosen to create an environment wherein this communication can exist.

Since changing the culture in a company requires a large effort, especially by management [14], the time estimated to take for HGG PE and HGG PC to implement the development partnership is longer than the time estimated to implement the showroom. It is estimated that performing all tasks and starting to adjust the culture within the company will take at least two years. In these two years HGG must set the goals and KPIs that will quantify the development partnership, implement the tools necessary to generate and record valuable information and actively manage the change in company culture. Due to the fact that the development center will be harder to implement as well as the fact that HGG will already

perform two other tasks when the development center will be implemented, more time is taken to implement the development center than the showroom.

The last role that will be added is the training center. With this last role, the HGG PC experience center will be completed. If the planning, outlined in this section, is followed, the transformation from production center to experience center will already be underway for two and a half years. The training center can benefit from the improved communication between HGG PE and HGG PC, as well as the fact that HGG PC will have obtained experience with performing different roles simultaneously. Which means that the implementation of this role can be done in a shorter time than the implementation of the development center. It is estimated that the training center can be implemented in approximately one year. In this year, dedicated personnel must be hired, customers must be made aware of the option of training at HGG and the infrastructure of the training center must be created.

7.3. Organization

In this section the people involved, both internally and externally, the responsibilities for the different tasks are given and how to control the cooperation.

7.3.1. Who are involved?

Internally at HGG several departments will be involved in the cooperation between the two company parts, HGG PE and HGG PC. At HGG PE the sales department will be involved in the showroom and the training center. This is because the sales department will use the showroom and sells the training courses. The development relationship will involve the operations department. This department is responsible for all R&D activities and are involved in that capacity in the development relationship.

At HGG PC all departments will be involved in the cooperation. For a showroom visit planning will be contacted to make sure that the visit does not interfere with production and work preparation and production will show how the machine and software work. Sales will act as contact between HGG PE and HGG PC.

For the development relationship work preparators and operators will be in contact with the operations department of HGG PE. Operators and work preparators will give feedback and input to the R&D personnel of HGG PE. The planning department at HGG PC will make sure that the R&D projects disrupt the production as little as possible. The sales department of HGG PC can be asked to focus on certain markets or type of profiles in order to gain experience on that topic.

Finally for the training of customers planning is involved to ensure that training will not interfere with production. The operators and work preparators will give the training. As with the showroom tours, sales will act as contact between HGG PE and HGG PC.

HGG PC Management and planning will supervise the cooperation and monitor the KPIs. If any of the components of the cooperation doe not perform as expected they can act to ensure that the goals are met, or reevaluate the goals.

Externally some parties can be involved in the setup of the various parts of the cooperation. At HGG Trimergo is used as ERP program. This program is adaptable and if necessary Trimergo can be contacted to adapt or add certain features to their program in order to better accommodate HGG. In order to effectively convey the content of the training courses HGG PC has contacted de Baak, a company specialized in giving training. By doing so HGG PC hopes to create a training that adds value for the customer.

7.3.2. Responsibility and control

The cooperation between HGG PE and HGG PC is the shared responsibility of both departments. The overall control is located at management of HGG PC. Management has the final say when conflict of interest arises. How control is divided between HGG PE and HGG PC is shown in Figure 7.2. It can be seen besides the general control of HGG PC only the production is the sole responsibility of HGG PC. Control of all other roles of HGG PC is shared between HGG PE and HGG PC. This is due the nature of the roles and the fact that both company parts are involved in those roles.

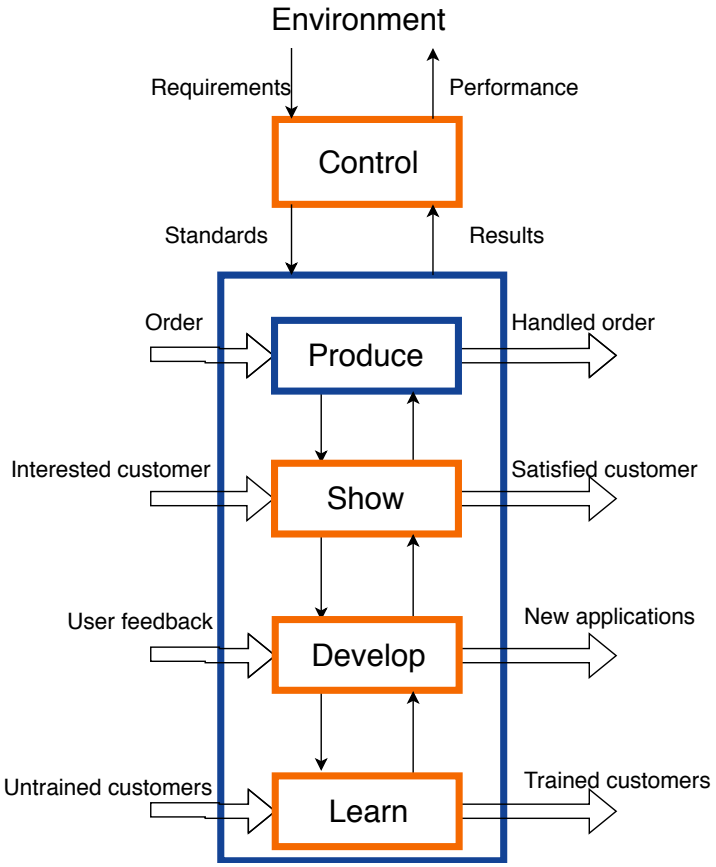


Figure 7.2: Overview of control for the different tasks of HGG PC. Blue is controlled by HGG PC, Orange is controlled by HGG PE and HGG PC

The control of the showroom is divided by HGG PC and sales of HGG PE. HGG PC will control all necessities for the visit, HGG PE will conduct the actual visits and act as contact between HGG PE and its customers. The development relation between HGG PE and HGG PC is controlled by both parties. HGG PE handles all processing of the user feedback, HGG PC controls the constant stream of user feedback. For the training relationship HGG PE controls the sale and promotion of the training courses, HGG PC controls the content and planning of the training courses.

7.4. Organizational structure

To create order in the cooperation between HGG PE and HGG PC, an organizational structure will have to be set up. In this section the organizational structure that will best suit the needs of HGG will be examined and adapted to fit the specific situation.

Types of organizational structure

In literature several different organizational structures are mentioned. They are, among others, the line organization, in which everyone reports to their direct superior, the functional structure, in which anyone can be asked to perform duties related to their expertise at every department, the project based structure, in which for each new project specialized available employees are put on a project under the guidance of a manager, and the matrix structure, in which employees report to two managers, one who is managing the project or product that the employee is working on and one that oversees the department that the employee is part of [11].

These organizational structures are primarily designed for companies with a large number of employees. This means that they have to be adapted in order to fit the cooperation between

HGG PE and HGG PC. The eventual organizational structure will be a mix of several of the aforementioned organizational structures.

Designing a organizational structure for the new HGG cooperation

In order to facilitate and control the cooperation between HGG PE and HGG PC a new company company structure for HGG is suggested. In this new company structure, the support departments of HGG PE, finance, marketing, Human Resources, IT and general affairs, and a new department, Cooperation Support, will be assigned as staff departments, supporting the operating departments of both HGG PE and HGG PC, and reporting directly to the CEO and CTO of HGG. By using this new company structure, the CEO and CTO have more control over the entire company than in the current company structure.

The new organizational structure is shown in Figure 7.3. The organizational structure for the new situation at HGG is based on the PROPER model by [19]. In Figure 7.3 the PROPER models for all both companies are combined under one board of directors, which is supported by staff departments, and both parts of the company are linked together.

All existing departments will keep doing what they have been doing previously, but will sell their hours to HGG PE and HGG PC according to the amount of time that HGG's staff department has worked for either company. The new staff department, cooperation support, will be added to HGG support and will focus its activities on facilitating the cooperation between HGG PE and HGG PC.

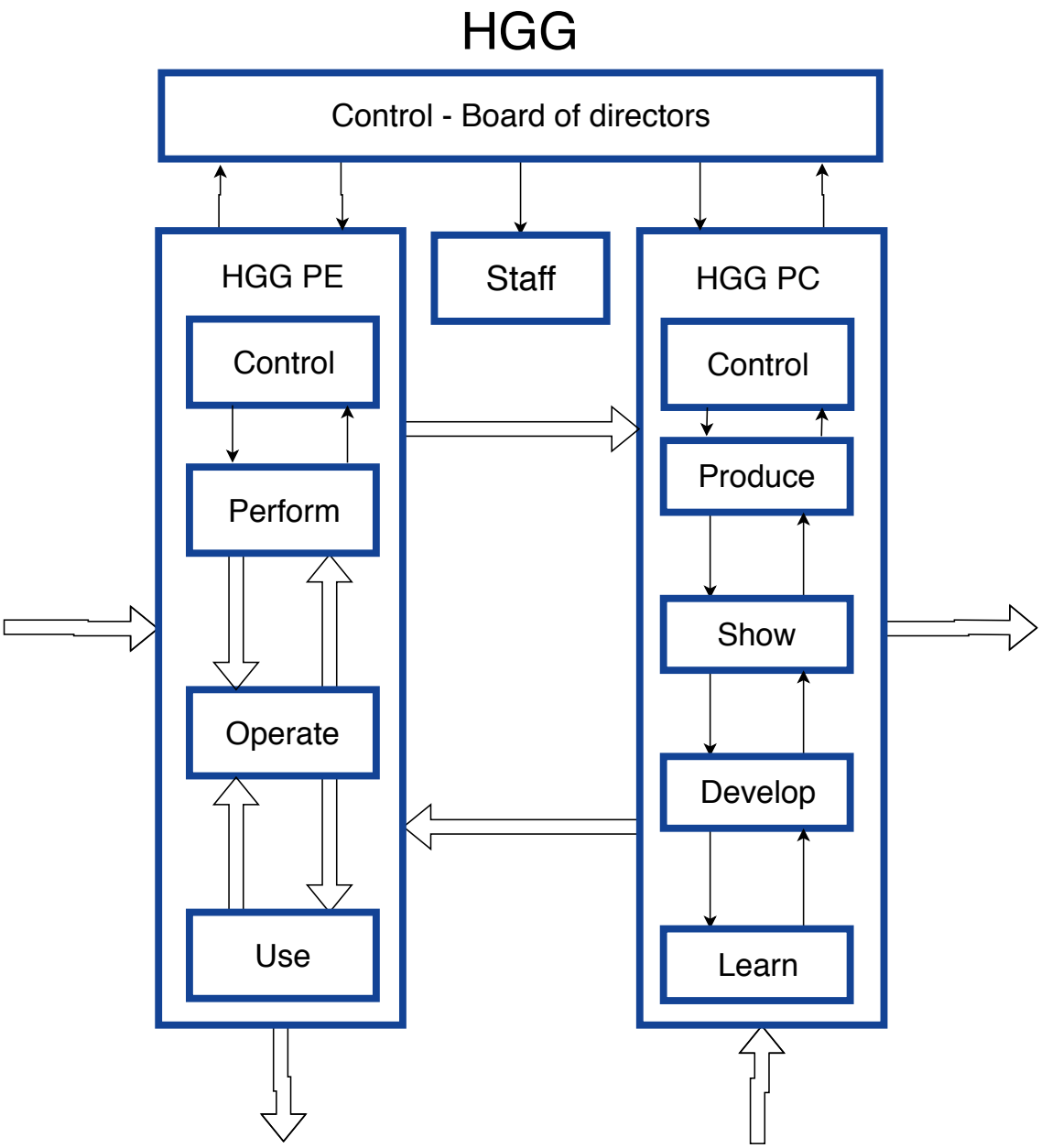


Figure 7.3: Suggested organizational structure for HGG, with HGG Support incorporated

Tasks will include, among others, organize meetings between HGG PE and HGG PC, keep track of progress, facilitate the training of customers and find ways to improve the overall cooperation. To summarize, cooperation support must unburden both HGG PE and HGG PC in their cooperation. This will make it easier for both companies to work together and will lead to less frustration between the two companies.

What will HGG's staff department look like?

As stated above, HGG's staff department will consist of the support department of HGG PE along with a new department, cooperation support. The existing departments do not need to be expanded, since they will not perform additional tasks. The only difference is the way they track their production and bill their hours.

The new department, cooperation support, will need additional people to staff the department. It is advised that people from outside the existing organization will be drawn in for these positions. This is advised because the people working on the cooperation support de-

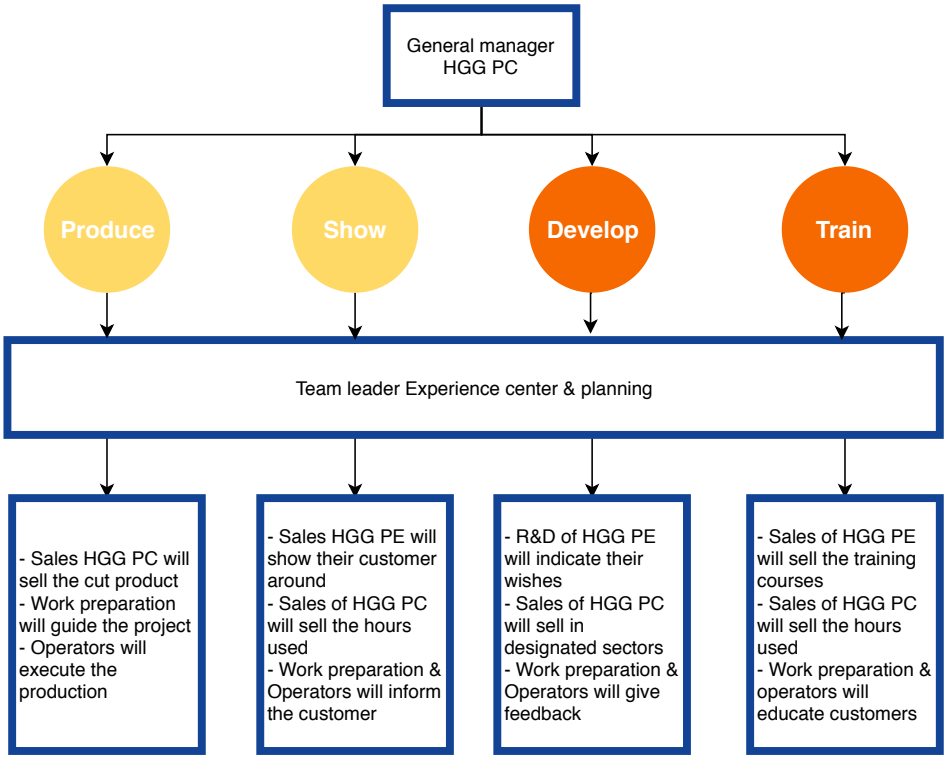


Figure 7.4: Proposed organizational structure and description of tasks per department for the HGG PC experience center

partment cannot be accused of being biased if they have no history within either HGG PE or HGG PC.

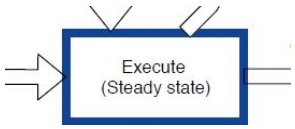
If the amount of work proves to much for one person, the cooperation support department must grow and additional personnel must be recruited. These people may be new to HGG or can be recruited from either HGG PE or HGG PC. If personnel is recruited from inside HGG PE or HGG PC, it is advised that a balance between people with a background at HGG PE and a background at HGG PC will be kept.

Along with facilitating the cooperation, two of the main tasks of of the cooperation support department is to control and improve the cooperation between HGG PE and HGG PC. This should be done by gathering information on the cooperation and report this to the board of directors. Of course employees can pass on information to management themselves, but due to the nature of the tasks the coordination support department will get a unique insight into all aspects of the cooperation. Along with this information, the coordination support department is also neutral and from that perspective can give advise on the cooperation. This can lead to action by the CEO, CTO or even the board of directors if this proves necessary. This way the cooperation support department can act as a control mechanism as well as a facilitating department.

The other control mechanism, the program of consultation is explained in Section 7.5.

The steady state of the Experience center

By zooming in on the project structure that will take place in the new experience center a more detailed picture of the new HGG PC arises. The proposed project structure is based on the line organization and the project based structure.



At the head of the organizational structure stands the manager of HGG PC. He oversees all four roles that HGG PC will play in the experience center. Directly below him, the team leader of the experience center handles day-to-day affairs and the planning for all roles and

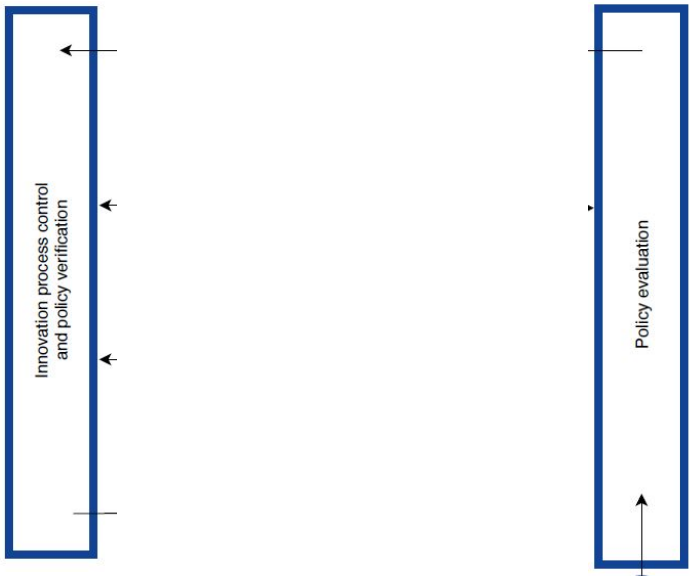
all parties involved. Below the team leader project based teams will be formed for a specific task. This can be short lived teams, for a showroom visit, or teams can be held on longer, for developments and long running tests. The proposed organizational structure is shown in Figure 7.4. The proposed organizational structure resembles the line structure that is present at HGG and will therefore be familiar to all employees of HGG. The tasks that are given in Figure 7.4 are the tasks that will be executed in the steady state, as shown in Figure 5.1, of the HGG PC Experience center.

Given the small size of HGG PC, it is inevitable that people will be part of multiple teams. HGG Support must ensure that all parties involved are fully supported in their work so the employees of HGG PC can focus on the task at hand and make sure that projects can be finished.

The project teams hours can be billed directly to the project that they are involved in, this can be handled by HGG Support. This will create a billing structure that will fit in with the current way of operating of HGG PC. After the project is closed the project team is automatically disbanded and its members free to receive new tasks, or put on new projects.

7.5. Program of consultation

As stated in Chapter 6 a program of regular, periodic consultation needs to be implemented. This program will help to structure and control the organization surrounding the cooperation between HGG PE and HGG PC. HGG Support is not explicitly added to the program of consultation, since they have a facilitating role but HGG Support will not be involved in the content of the program of consultation. This program of consultation will be the basis of both the Innovation process control and the policy evaluation, as shown in Figure 5.1.



The program of consultation will elaborate on Section 7.3.2 and will zoom in further on Figure 7.2. The program of consultation can be split in two different ways, by role of HGG PC or by hierarchical level. Both divisions have a different implication for the cooperation between HGG PE and HGG PC and the content and frequency of the meetings will be pointed out in this section. Firstly the division is made per role and secondly the division is made by hierarchy, as shown in Figure 2.1. This means that the program of consultation will be specified for management, team leaders and employees. Several people in this program of consultation will have dual roles, for example, the planner who runs the planning department is also team leader of production and the sales manager of HGG PE can also be the employee that conducts the company visit. These details will not be explored extensively, it is assumed that if any problems arise due to dual roles these can be solved with minimal effort. In the upcoming sections the program of consultation for the set-up of the experience center is given first, followed by the program of consultation for the showroom, development relationship and

training center.

7.5.1. Setting up the experience center

In transforming HGG PC from production company that also shows its machines from time to time to experience center that connects four tasks, production, showroom, development partner and training center, consultation between different departments within HGG is needed. This section aims to provide a framework in which that consultation can take place.

As stated in Section 7.2 setting up the experience center will happen in a period of roughly four months. In this period management of HGG PC must consult often with all parties concerned. This means that management needs to meet with management of the sales department of HGG PE and the operations department of HGG PE and employees of both departments, as well as outside parties that are involved in setting up the experience center. By doing so the experience center can become a product of a broad vision from within the company.

Transforming HGG PC will influence the way that HGG PC works, but requires cooperation with HGG PE. This is necessary because if HGG PE does not cooperate all efforts at HGG PC will be wasted. With the new experience center HGG PC can support HGG PE in several ways, however, HGG PE must be open to this support. By consulting often at several levels employees at HGG PE can have a say in how they are supported. This will lead to a more cooperative spirit among all employees, optimizing the way that the new facilities of HGG PC are utilized.

7.5.2. Program of consultation for HGG PC's showroom

Noted in Section 7.3, the cooperation between HGG PE and HGG PC to run the showroom at HGG PC involves the sales department of HGG PE and the sales department, the planning department, the work preparation department and production department of HGG PC. On the highest level, management of sales of HGG PE and management of HGG PC will oversee the cooperation and in that way is also involved in the program of consultation. Team leaders will oversee daily operations, and employees will conduct the costumer visits.

Management

At the highest level management of both HGG PC and sales of HGG PE will oversee the cooperation between the two company parts. At this level KPIs, as stated in Section 6.1, must be determined, both quantitatively and qualitatively, and monitored. If the showroom does not live up to expectations, the KPIs should indicate this. When this happens management needs to reflect on the performance of the showroom. It could be that KPIs are not realistic and that everything has been done by employees to accomplish the goals set by management or that performance is substandard and management must intervene.

If all goes according to plan frequent consultation of management will not be needed. Restating KPIs too often will lead to confusion and will not increase the performance of the cooperation. Monitoring KPIs can be done without consultation by merely looking at the numbers. This leads to a suggestion of meeting twice per year. As long as no signals of under performance are picked up, frequent consultation on this level will not add any value to the cooperation.

If management does need to intervene, more frequent consultation might be necessary. Management may need to be more hands on and spend more attention on the cooperation if intervention is needed. Consultation with either team leaders or employees to identify problems and find possible solutions will be needed.

Management will also need to inform team leaders and employees on the goals of the cooperation and the direction that the company wants to go in. Managements assessment of the performance must also be communicated to lower levels. This will make sure that team leaders and employees have a realistic image of their performance.

Team leaders

The team leaders will oversee the day to day operations of the showroom and will be responsible that the goals, set by management, are met. It is the responsibility of the team leaders

that KPIs can be monitored by management. This will lead to a more hands on set of tasks than management has. Team leaders will have to meet up more frequently than management has to. This leads to the suggestion that team leaders will meet up four to six times per year. At these meetings the current state of affairs need to be evaluated, problems need to be fixed and potential hazards for the future need to be identified.

At team leader level the company visits must be coordinated. This means that team leaders need to make sure that information on upcoming company visits is shared between employees along with feedback of recent company visits.

Team leaders must inform the employees facilitating or conducting the company visit of all relevant information. This includes time and date of visit, requests by the customer, nature of work that needs to be done and who has to do it.

Employees

Employees are the ones actually conducting the company visit. This will require someone from sales of HGG PE to act as a tour guide for the customer and people from HGG PC that have to show their work, work preparators and operators. Employees need to know from one another what is expected of them for the company visit and what they need to do to ensure that the company visit is a success.

After the visit is conducted, a short review must be conducted to see if everything went as expected or if anything can be improved. The feedback that comes out of these reviews can either be reported to the team leader responsible or just among employees. Either way the feedback must be recorded if anything substantial is reported. This way company visits can be improved when necessary.

The number of meetings that need to be conducted at this level is related to the number of customer visits. Short briefings in advance and afterwards will be needed to inform employees and evaluate the visits.

7.5.3. Program of consultation for HGG development relationship

The cooperation between HGG PE and HGG PC on development concerns the operations department of HGG PE and sales department, the planning department, the work preparation department and production department of HGG PC. On the highest level, management of the operations department of HGG PE and management of HGG PC will oversee the development relationship and monitor the KPIs. Team leaders will make sure that both company parts needs are met and oversee daily operation. Employees make sure that all research data is produced and processed.

Management

In order to successfully operate a development relationship management of both HGG PC and the operational department of HGG PE need to consult on the expectations that they have of one another. In these meetings, both company parts need to talk about the KPIs for this relationship, as stated in Section 6.1. Not only does management need to quantify these KPIs, also the KPIs need to give an accurate image of the cooperation and management might first need to identify the appropriate KPIs or discard KPIs that prove useless or superfluous.

When the KPIs are identified and quantified they have to be monitored. This can be done in the same way as monitoring KPIs of the HGG PC showroom. When all goes smoothly management does not need to get together often, three or four times per year is recommended. This is more often than is recommended for the showroom, this is because at these meetings the research scope for the coming months must be identified. This means that besides monitoring KPIs at this level, the status of research projects can also be monitored. This gives management more insight in the effectiveness of the R&D program. Management of the operations department can use these meetings to explain what they want to research and management of HGG PC can use these meetings to look for ways to effectively accommodate the R&D department, all the while keeping disturbances to HGG PC to a minimum.

Management needs to communicate their assessment of the performance of the development relationship to team leaders and employees. Also the upcoming research projects and the role that HGG PC can play in them needs to be communicated. This will ensure that team

leaders and employees have a good image of the development cooperation and the products that they are helping to develop.

Team leaders

Team leaders are tasked with overseeing the daily operations of the development relationship. Team leaders are responsible for the fact that goals are met and KPIs can be monitored by management. They are responsible for creating an atmosphere where continued cooperation can exist. This means that each team leader has to facilitate cooperation between those that report to them. Potential issues need to be identified and problems need to be fixed. This all ensures that employees of both company parts are willing to cooperate on coming up with new solutions.

In order to closely monitor this relationship and ensure that friction between various departments are minimized, it is advised that team leaders meet quite often, meetings should happen on a monthly basis. This is advised because a sentiment has developed in which employees of HGG PC feel unheard and employees of HGG PE sometimes feel pressured to come up with solutions on the spot. This may lead to an unhealthy atmosphere and this must be prevented.

Employees

Within the development cooperation between HGG PE and HGG PC, employees of HGG PC are responsible for generating user feedback and properly documenting feedback and other suggestions. Employees of HGG PE are responsible for processing feedback and suggestions. It should be clearly documented what will be done with any suggestions and feedback. Whether this is developed further or if the suggestion is dropped in both cases this should be motivated, this will show that suggestions put in by employees of HGG PC are taken seriously.

The frequency of meetings can vary strongly and will depend on the development cycle of a suggestion or the development made by HGG PE. Open communication and short, 15 to 30 minutes, meetings must be conducted frequently. In these meetings the status of a development must be addressed and questions from both sides have to be addressed as well. This does not have to be planned formally, however notes from such meetings can be important and should be recorded. If any testing is needed or larger issues have to be tackled, a meeting between all parties concerned can be arranged.

7.5.4. Program of consultation for HGG PC's training center

As with operating the showroom at HGG PC, operating the training center requires the sales department of HGG PE and the sales department, the planning department, the work preparation department and the production department of HGG PC. On the highest level, management of sales of HGG PE and management of HGG PC will oversee the cooperation and in that way is also involved in the program of consultation. Team leaders will oversee daily operations, and employees will conduct the training.

Management

As with the showroom and the development relationship, for the training center management of HGG PE's sales department and management of HGG PC must consult on the KPIs of the cooperation. Contrary to the KPIs of the showroom and development relationship, the number of training packages, that has to be sold in 2019, has already been quantified and related to the number of machines sold by HGG PE. However, other KPIs like the experience that customer has and the knowledge level that has to be attained still need to be quantified. This is something that management of both departments need to determine.

Management also needs to monitor the KPIs that they determine. This can be done in meetings that they have two or three times per year. In these meetings the performance of the training center must be assessed. If the training center does not live up to the expectations, management can adjust either the way the training center operates or adjust the KPIs if they are too ambitious. This may also require to increase the number of meetings at this level, as poor performance leads to closer monitoring by management.

If all goes according to plan, close monitoring is not necessary, and the day-to-day supervision can be left to the team leaders. Management does need to inform team leaders and

employees on the goals they have set and the KPIs that will be monitored. Management will also need to communicate their assessment of the performance of the training center to the team leaders and employees.

Team leaders

Team leaders are responsible for the daily operation of the training center. They have to ensure that everyone in their team can operate without difficulties. Team leaders are responsible for the fulfillment of goals set by management as well as making sure that KPIs can be monitored. Making sure that the day tot day operations of the training center goes smoothly leads to more frequent meetings than management has, approximately every two months is recommended. In these meetings the upcoming training courses will be discussed as well as a planning for training courses in the next few months. Possible problems or scheduling conflicts need to be resolved in these meetings as well. Team leaders must communicate the planning and upcoming training courses to the employees so that the schedule is known to all parties involved.

All things considered, the frequency of meetings must be sufficient to solve any difficulties that may arise when operating the training center.

Employees

At employee level meetings between employees of HGG PE and HGG PC do not need to take place. The content and form of training in managed entirely by HGG PC. Incidentally, when customers have very specific training needs, employees of HGG PC can be instructed on the specifics by the employee of the sales department of HGG PE, but training courses should be designed so that the majority of customers do not require specific training. This means that these kind of briefings should be incidental. If specific training needs arise often, the designers of the course must consider inserting that need into the existing training courses.

Employees of HGG PC will need to get regular updates on what is planned from the team leaders. Along with information on the content of the training requested by the customer. The frequency of these meetings depends on the number of training courses that are sold. These meetings can also be used to get feedback from the trainers on the content of the training and the way that the information is conveyed.

7.6. Cost of the Experience center

The total cost of the transformation of HGG PC from production center to experience center is estimated at €100.000. This is specified as follows:

Costs	Amount (€)
Remodel production hall	25.000
Software and outsourcing	45.000
Production hours	30.000
Total	100.000

Table 7.2: Overview of costs associated with experience center

Most of the costs associated with the cooperation between HGG PE and HGG PC is related to the software and outsourcing and the production hours. These costs are made by creating training courses and adapting existing software to accommodate the changes that HGG PC desires. In order to accommodate the employees of HGG PC a new work preparator has been hired. The new work preparator will focus on preparing for the production while the newly available capacity is used to set up training programs and develop the experience center.

As stated in the previous section, many people working at HGG PE and HGG PC will get more responsibilities when the experience center will be in place. This has been mentioned and a warning has also been issued for management and team leaders to focus on the expanding task list of all employees to make sure that people are not overburdened by their new tasks. However, for the most part both employees of HGG PE and HGG PC will focus on

their daily tasks, this means that planning ahead and removing obstacles for cooperation is not a main task of anyone inside HGG. This may not be a problem, however, if cooperation proves strenuous due to irritation on both sides a designated employee can be hired. This would have to be someone with the main priority of facilitating all cooperation. Someone who makes sure that all needs are met for all those involved in a project, someone who maintains a bird eye view on all cooperation. Furthermore this employee will play a vital role in continuously improving the cooperation. Improving cooperation as well as the ways in which the goals are attained will be discussed in the next section.

This person is currently not an employee of HGG and will therefore have to be hired. Costs for hiring a new employee are estimated at €50.000 per year. These costs will have to be added to the estimate when a need for a specific employee arises.

7.7. Risks

There are several risks involved with implementing the new roles of HGG PC and the corresponding cooperation. One of the risks is the fact that the changing role will not fit the employees of HGG PC. In the new HGG PC a lot of new tasks are given to them and this might lower their work satisfaction. However, the opposite is also a possibility, adding new tasks to their work might increase their work satisfaction. This means that adding tasks can have both a positive and a negative effect, however, according to [20], adding tasks to monotonous labor increases work satisfaction as long as the employee can still cope. This indicates that adding tasks can have a positive effect.

Another risk is the culture that has been created over the years at HGG. The two company parts have coexisted for years, but interaction proved difficult. This has created an atmosphere of misunderstanding among HGG PC employees. They have often felt that their input and expertise was not appreciated at HGG PE and as a result of that feeling, some employees do not share new information anymore. ”Since nothing is done with it, anyway.”

Spending time and energy to show that this culture will be countered can help to remove that atmosphere. However, management needs to be aware of the fact that changing culture is hard and that trying to do so will take a lot of effort. [1]

According to [14] culture is that which exist because it has worked in the past, this means that in the past employees of HGG PE and HGG PC did not have much incentive to cooperate with one another. HGG PC must find a way to create a culture in which cooperation is stimulated. Implementing the program of consultation described in Section 7.5 will help in creating such a culture but closely managing the situation and intervening when necessary will be needed.

HGG takes a lot of pride in the way that company parts work together and sees this as a strong point when presenting itself to customers interested in buying a machine or customers interested in outsourcing cutting work. However, as shown in Chapter 3, the cooperation between the company parts is not optimal and most of the implementation plan in this chapter is aimed at improving the cooperation and communication between the departments of HGG PE and HGG PC. According to [14] it is important that management has a clear and realistic picture of the culture within the company. As said, HGG presents itself to customers as optimally benefiting from the cooperation between the company parts. It might not be a problem that HGG presents itself as such to the outside world, but for effective change in culture it is vital that management of HGG is aware that the cooperation is lacking because else it will be impossible for HGG to critically assess its own way of working and improve this so that the new role of HGG PC can be fully utilized.

8

Conclusion & Recommendations

This research set out to identify the weak points in the cooperation between HGG PE and HGG PC and to suggest ways to improve this cooperation. This is done in the light of the changing role of HGG PC. HGG PC transforms itself from production company to experience center, which will be used to showcase the expertise that HGG PC has to offer to both customers and employees of HGG PE. This transformation will be conducted to find new ways for HGG PC to generate revenue and for HGG PE to better cater to the wishes of customers. This report proposes a way in which HGG PE and HGG PC can work together at improving their relation and increasing the gains that arise from cooperation.

From an initial company profile and company analysis it became apparent that cooperation between HGG PE and HGG PC is not as good as it is claimed to be by management. This prompted further research into the working relation between HGG PE and HGG PC. This research led to the main question:

> *How can the outputs of the HGG PC Experience Center be determined and how should the HGG PC Experience center cooperate with HGG PE?*

In order to come up with an answer for this question, several sub-questions were drafted:

- What will the HGG PC Experience Center look like?
- What are the KPIs for cooperation at HGG and how are they monitored?
- What has to be changed at HGG to let HGG Profiling Equipment and HGG Profiling Contractors work together more effectively?
- How should the cooperation between HGG PE and HGG PC be controlled?

The main question will be answered by answering the sub-questions.

What will the HGG Profiling Contractors Experience Center look like?

After the initial analysis of HGG PE and HGG PC, it became apparent that there are several possibilities for HGG PE and HGG PC to work together in new ways. After the interviews, conducted with employees from HGG PE and HGG PC, the list of possibilities for extended cooperation was:

- Cutting metal profiles
- Showroom
- Experience center
- Generator of user feedback
- Facilitator of R&D tests

- Education center for customers and employees
- Consultancy services
- Sale of work preparation capacity

Management of HGG PC has chosen to expand the tasks of HGG PC to increase the revenue and to better accommodate HGG PE and its customers. The new set of tasks are:

- Cutting metal profiles
- Showroom
- Development center
- Learning center

In these four tasks several possibilities from the interviews are combined. Cutting metal profiles remains the main task of HGG PC, in the showroom customers of HGG PE can see how the machine, that they are interested in, functions. The development center will become a place where HGG PE can run tests and learn from the user feedback generated by HGG PC in order to improve the R&D process at HGG PE. Finally, the learning center will be a place where customers of HGG PE, among others who are interested, can learn how to operate HGG cutting machines and software. The overall term for the new HGG PC will be the experience center.

This means that consultancy services and sale of work preparation capacity will not be developed further as a part of the experience center at HGG PC. These two possibilities were not included because potential gains were deemed small and the implementation would distract the focus from transforming HGG PC into a experience center.

What are the KPIs for cooperation at HGG and how are they monitored?

Along with the KPIs that HGG already monitors for both HGG PE and HGG PC, listed in Section 2.6, several KPIs have been drafted in order to monitor the cooperation between HGG PE and HGG PC, in its new capacity of experience center. These KPIs focus on the specific role that HGG PC wants to perform or the cooperation between HGG PE and HGG PC on that topic. For each of the roles of HGG PC some KPIs are suggested. They are:

- **Showroom**
  - The number of company visits
  - The availability of the showroom
  - The quality of the customer experience
  - Conversion ratio purchase/visits
  - Use of hours and budget as specified
- **Development center**
  - The number of suggestions made by HGG PC
  - The number of suggestions picked up by HGG PE
  - The improvements of machine specifications
  - Projects sold in sectors of interest
  - Use of hours and budget as specified
- **Learning center**
  - The number of training packages sold per year
  - Customer satisfaction on training and guidance
  - Use of hours and budget as specified

These KPIs have been drafted based on either literature research or on requests by management. The KPIs are drafted in order to paint a complete picture of the cooperation. If the KPIs do not do so, they need to be eliminated and replaced, if necessary. The final KPI in each list, use of hours and budget as specified, is aimed at balancing all roles of HGG PC. This means that all roles within HGG PC will get a certain amount of time and money allocated to them and the KPI will monitor whether all roles of HGG PC will be given enough attention.

The KPIs will be monitored by management of the involved department of HGG PE and management of HGG PC in a meeting held several times per year. In these meetings not only the KPIs will be monitored, but also assessed whether they still function properly. Team leaders will be responsible for gathering data and filling in the KPIs, so they can be reported to management.

What should a control structure to be implemented at HGG look like?

In Chapter 7 a new organizational structure is proposed. In this organizational structure, a staff department is created. The staff department will consist of the existing support department of HGG PE and a new department, cooperation support. This is done to facilitate the cooperation between HGG PE and HGG PC with the help of an independent partner. The staff department will act as a facilitator of the cooperation, but by keeping track of the progress that HGG PE and HGG PC make and reporting this to the CEO and CTO, will also act as a control mechanism.

Along with the new organizational structure a new project structure for HGG PC is also suggested. This project structure will give HGG PC flexibility and more grip on the various tasks that they will do in the future. For the day to day affairs, at the head of the HGG PC Experience center, the manager of HGG PC is located, he oversees all four roles of HGG PC. One level lower, the team leader oversees day-to-day affairs and is responsible for the planning of all projects. For each project, which can be a customer visit or a training course, a team is assembled to ensure that the project goes as planned. The team exists for the duration of the project, after the project is completed the team will be dismantled and its members freed up to be assigned new tasks.

This organizational structure is supplemented with a program of consultation. This program consists of guidelines on frequency and topics for which consultation is necessary. The program of consultation is divided up per task of HGG PC as well as per hierarchical level. This way the program of consultation will provide HGG a framework in which they can work to improve the cooperation between different departments.

What has to be changed at HGG to let HGG Profiling Equipment and HGG Profiling Contractors work together more effectively?

With the transformation of HGG PC from production center to experience center HGG PC can better support HGG PE in their objectives. The aim of this is that HGG PC can add value to HGG PE by transforming into the experience center. However, HGG PE must be willing to accept that help and make changes themselves so that the effort of HGG PC is not in vain. The things that HGG PE and HGG PC need to implement are mentioned in Chapter 7.

Along with changes in HGG PE and HGG PC the creation a staff department, is advised. This staff department will focus on facilitating and improving the cooperation, along with supporting HGG PE and HGG PC in their tasks. The staff department will consist of all support departments of HGG PE and a new department, cooperation support.

The most important changes for HGG PC are to make the transformation to experience center and implement the proposed organizational structure. HGG PC and HGG PE must implement the program of consultation together with the staff department and make sure that it is respected by all parties. Furthermore, more practical matters also need to be resolved, like the implementation of a shared agenda. This will allow HGG PE and HGG PC to see whether the plans that are laid out for the coming period can be scheduled. The staff department will play an important role in this.

The changes that will occur at HGG PC will influence all that work there. This means that their way of working will change in the future. However, the way of working for employees of HGG PE will not change (as much). Employees of HGG PE will have more interaction with

employees of HGG PC, but otherwise their job does not change. One of the risks identified in Chapter 7 is the culture change that needs to happen both at HGG PC and at HGG PE. This will take up a lot of attention form management and needs to be a constant focus point until the company culture of HGG of lacking cooperation is sufficiently changed.

This all leaves the main question to be answered.

How can the outputs of the HGG PC Experience Center be determined and how should the HGG PC Experience center cooperate with HGG PE?

By expanding the number of tasks that HGG PC will conduct, the output of the company changes. This means that the board of directors of HGG needs to evaluate the performance in a different way then it always has. Currently HGG PC is evaluated by its revenue. However, when the production center is transformed into a Experience center, the desired outcomes of HGG PC will change and these outcomes will have to be taken into account when evaluating the performance of the Experience center.

In order to determine this value, the level of the KPIs are needed to assess the performance of HGG PC. The HGG PC Experience center will be assessed based on the profit that is made and the performance on the KPIs. This way the value of the HGG PC Experience center can be determined in a broader sense than merely the profit that is made.

Cooperation between HGG PE and HGG PC will be realized by transforming HGG PC from production center to experience center. Furthermore, the output of the experience center must be used by HGG PE to better meet their customers demands. This means that one of the products that HGG PC produces is the services that they supply HGG PE.

The cooperation will be controlled by several mechanisms, HGG Support, a new project structure and the program of consultation described in Chapter 7. Both the program of consultation as well as the proposed organizational structure are based on the innovation model and designed in a way that they can be implemented within the existing company with minimal effort. This is achieved for the program of consultation by identifying the different management layers and tailoring the content and frequency of the consultation to the appropriate layer. The proposed organizational structure of the new experience center is designed to look like the existing organizational structure at HGG. This is done so that it is easy for all involved to work within the cooperation, since it feels familiar.

Recommendations

The main issue of HGG was that two companies were operating under one flag, but were not cooperating. Two or more companies operating under the same flag is not uncommon, often companies are split up into different departments with different registrations at the chamber of commerce. Future research can focus on the question if the problems that have arisen at HGG are also taking place in different companies and if the chosen solution in this case can also be applied in other companies.

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A

Implementing a control structure for cooperation

This paper analyses the shortcomings of the cooperation between HGG Profiling Equipment (HGG PE) and HGG Profiling Contractors (HGG PC) in light of the change that HGG PC undergoes from production center to experience center. The analysis has been made based on the Delft Systems Approach (DSA) by [1] and interviews with several employees of both HGG PE and HGG PC. In order to remedy these shortcomings, an implementation plan for extensive cooperation along with Key Performance Indicators (KPIs) to monitor the performance of HGG PC has been drafted.

Problem description

HGG is a company divided into two parts. HGG PE which produces cutting machines and sells them around the world and HGG PC which uses some of those machines to cut parts for it customers, located mainly in the Netherlands and the rest of Western Europe. Together HGG PE and HGG PC try to cover all requests from customers. This leads to opportunities to cooperate, however, the analysis showed that cooperation, although it has improved over the last few years, is not the focus of employees of HGG PE and HGG PC. For the most part the two company parts operate independently, which is not beneficent for the cooperation. From analysis it also showed that employees of both HGG PE as well as HGG PC have the drive to improve this cooperation and they also see the potential benefits of increased cooperation.

With its change from production center to experience center, HGG PC tries to cater to the needs of HGG PE. The goal of this change is that it will improve the showroom, lead to more development suggestions and user feedback and that training of customers and employees can be done at HGG PC. This change is made to help HGG PE grow and increase the turnover of HGG as a whole. However, due to the existing culture of limited cooperation, the efforts made to transform HGG PC will be in vain if HGG PE is not open the input of HGG PC.

Proposed solution

In order to improve the cooperation between HGG PE and HGG PC, a plan is drafted that focuses on both the practical issues that have been identified, as well as the organizational issues that will arise due to the new role of HGG PC and the new requirements that come along with the role change. The suggested KPIs for the new experience center along with practical issues that have to be dealt with are listed below, sorted by new role for HGG PC. Th KPIs will be used by the board of directors to evaluate all the outputs of HGG PC.

Implementing the showroom at HGG PC

The suggested set of KPIs monitors the performance of the showroom, KPIs for the showroom emphasize the availability of the showroom, the quality of the visit and the influence the visit has on the sale of a machine.

- The number of company visits
- The availability of the showroom

- The quality of the customer experience
- Conversion ratio purchase/visits

The practical issues, that have been identified before commencement of the transformation, which have to be resolved are:

- Synchronize agendas
- Share information on customer
- Structure billing

Creating a development relationship between HGG PE and HGG PC

The suggested set of KPIs for the development relationship focuses on the number of ideas that are generated and picked up by the R&D department of HGG PE and the improvements made to machines. The last KPI of this list focuses on the number of steel cutting projects sold by HGG PC in sectors of interest for HGG PE.

- The number of suggestions made by HGG PC
- The number of suggestions picked up by HGG PE
- The improvements of machine specifications
- Projects sold in sectors of interest

The practical issues, that have been identified before commencement of the transformation, which have to be resolved are:

- Regular installation of new machines
- Regular software updates
- Implement a way to record user feedback
- Show what is done with user feedback

Setting up the HGG PC training center

The two KPIs identified focus on the number of training packages sold, this can be related to the number of machines sold by HGG PE, and the customer satisfaction level of all aspects of the training.

- The number of training packages sold per year
- Customer satisfaction on training and guidance

The practical issues, that have been identified before commencement of the transformation, which have to be resolved are:

- Create training courses
- Create training accommodation
- Train/hire employees to teach customers
- Create awareness and sell training courses
- Integrate training into production planning
- Follow up on the quality of the training

In order to ensure that all four roles of the experience center, production, showroom, R&D and training, can be fulfilled, a budget and an hour estimation has to be made for all four roles. A KPI for all roles is drafted; the use of hours and budget as specified. This will ensure that all roles will get the attention necessary and that a balance can be found.

Program of consultation

A program of consultation has been drafted for each of the three new roles of HGG PC. The production is not included this program, because production will remain the responsibility of only HGG PC. Consultation on other roles will be needed, as responsibility for the showroom and training center is divided between Sales of HGG PE and HGG PC, responsibility for the R&D cooperation is divided between Operations of HGG PE and HGG PC. The program of consultation is also an important tool that can be used to actively manage the company culture. This will enable management of HGG to influence the company culture over a longer period of time. [2] The program of consultation makes the distinction between management, team leaders and employees, similar to the distinction that HGG makes in its own organizational structure.

Management

Management of HGG PC and the appropriate department of HGG PE will have to discuss the KPIs that they want to observe, both qualitatively as well as quantitatively. Along with the KPIs the budget and the amount of hours should also be determined at this level. If everything goes smoothly management does not have to consult frequently, a few times per year should suffice.

Management needs to inform team leaders and employees on KPIs, that they have established, and how management wants to monitor the KPIs. The goal that management has set for the cooperation should also be clearly communicated, to ensure that everyone works towards the same goal.

Team Leaders

Team leaders oversee daily operations, are responsible for the goals and need to make sure that KPIs can be monitored. Team leaders need to ensure that problems between departments are quickly resolved and frictions are minimized. This means that team leaders need to consult quite often on an informal basis. That way small issues can be picked quickly and taken away before they can turn into problems.

Employees

Employees are the ones that will conduct the cooperation. Consultation between employees need to occur when necessary, for example: before and after a customer visit, often during the development of an application and incidentally for specialized training courses. These meetings can be used to evaluate progress, or to reflect on customer visit.

Organizational Structure

In order to guide the cooperation a staff department is introduced within HGG. The staff department is made up of the supporting departments of HGG PE, along with a new department, HGG Cooperation Support, as shown in Figure A.1. This change has three main benefits; by introducing the staff department HGG PE will become smaller, and more in balance with HGG PC in terms of employee size. A second advantage is the fact that the frustrations within the cooperation can be smoothed by an independent party. The third advantage is that HGG PC is no longer dependant on HGG PE for supporting services.

By zooming in on Figure A.1, the organizational structure for the HGG PC Experience center appears. This can be seen in Figure A.2. This control structure is based on the existing organizational structure at HGG, but at the bottom end flexible project teams are created for each task an disbanded when this task is completed.

At the head of the HGG PC Experience center the manager of HGG PC is located, he oversees all four roles of HGG PC. One level lower, the team leader oversees day-to-day affairs and is responsible for the planning of all projects. For each project, which can be a customer visit or a training course, a team is assembled to ensure that the project goes as planned. The team exists for the duration of the project, after the project is completed the team will be dismantled and its members freed up to be assigned new tasks. Also noted is the risk that team members lose sight of the priorities due to the increased number of tasks. To mitigate this risk, management or the team leader must keep a close watch on the performance of teams and its members.

An additional benefit, as suggested by [3], is the fact that increased number of tasks will lead to more work satisfaction by employees. This will likely have a positive effect on all who are involved.

Conclusion

In order to successfully implement the HGG PC Experience center, the organization of all of HGG must be adapted, along with the current company culture. If this is not the case, efforts to transform HGG PC will be wasted. Following the steps in the implementation plan and actively steering the company culture will lead to a more cohesive HGG. By drafting KPIs other than merely profit, the outputs of the HGG PC Experience center can be assessed more effectively by the board of directors. This will give a clearer picture of the value of HGG PC for HGG as a whole.

Figures

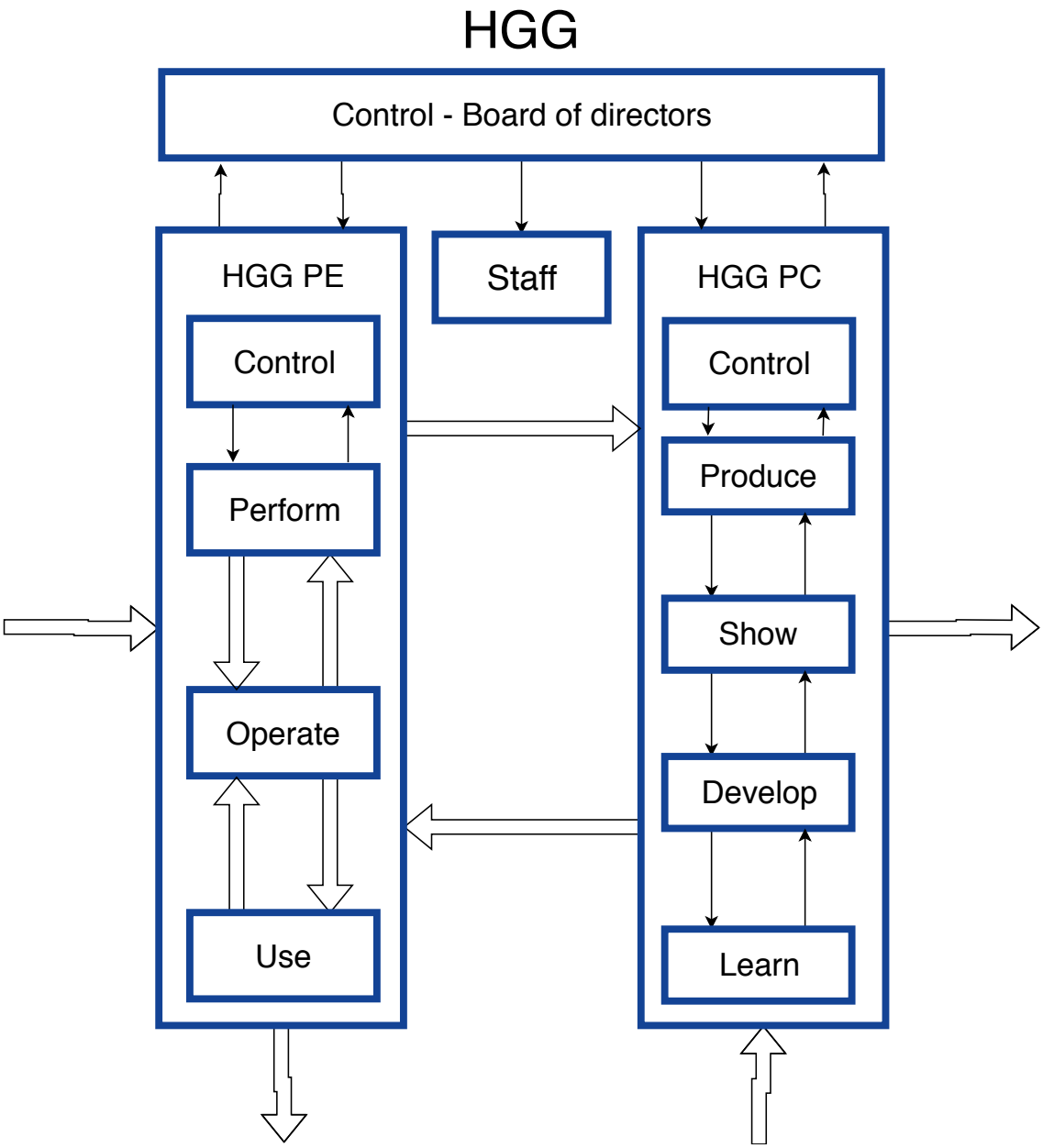

Figure A.1: Suggested organizational structure for HGG, with HGG Support incorporated

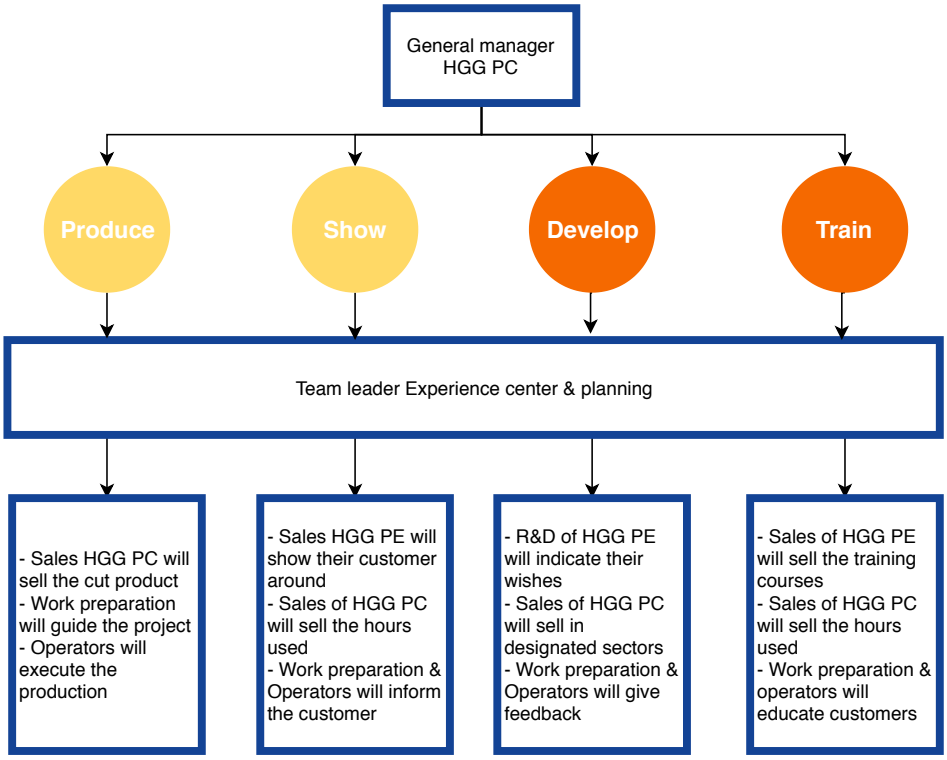

Figure A.2: Proposed organizational structure for the HGG PC experience center

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B

Interviews with employees of HGG PE and HGG PC

In this appendix interviews, that were conducted with employees of HGG PE and HGG PC, are summarized, also the file that was used as a starting point of the interviews is given. The interviews are sorted in chronological order and are in Dutch.

B.1. Interview template

Hoe kan HGG PC zoveel mogelijk van waarde zijn voor HGG?

HGG bestaat uit twee onderdelen HGG PE en HGG PC, de ze twee delen werken samen, maar daarin valt nog wel wat te verbeteren. Dit komt omdat HGG PE en HGG PC verschillende bedrijven zijn waar manieren van werken historisch zo zijn gegroeid of omdat er tekort aandacht aan bepaalde problemen is gegeven. Door deze dingen uit te lichten en verschillende afdelingen binnen zowel HGG PE als HGG PC aan het woord te laten wil ik kijken of hierin een lijn te ontdekken valt en zo de samenwerking te verbeteren. HGG PE en HGG PC leveren diensten en goederen aan elkaar. HGG PC levert verschillende diensten aan goederen aan PE, dat zijn:

- Marketing tool
- Ervaringsdeskundige
- R&D ruimte
- Gesneden materiaal voor marketing of tests

HGG PE levert verschillende goederen en diensten aan HGG PC, dat zijn:

- Snijmachines
- Consumables
- Service provider
- Ondersteunende diensten:
  - HR
  - Finance
  - Marketing
  - IT

Mijn hoofdvraag hierbij staat bovenaan en de deelvragen staan hieronder:

- Op wat voor manieren kan HGG PC waarde toevoegen aan HGG?
- Hoe ziet de relatie tussen HGG, HGG PE en HGG PC eruit?
- Zijn er meer actoren met een vergelijkbare relatie?
- Moet er iets bij HGG PC veranderen om HGG PC meer waarde te laten toevoegen en zo ja, wat?
- Moet er iets bij HGG PE veranderen om HGG PC meer waarde te laten toevoegen en zo ja, wat?

Graag zou ik, onder andere, de volgende dingen van je willen weten:

- Wat houdt jouw functie precies in?
- Waarin heb jij met HGG PE of HGG PC te maken?
- Ben jij in je werk bij klanten dingen tegen gekomen die ook bij HGG van toepassing kunnen zijn?
- Ben jij in je werk bij HGG dingen tegen gekomen die ook bij klanten van toepassing kunnen zijn?
- Wat vind je in je werk positief van het 'andere' HGG?
- Wat vind je in je werk negatief van het 'andere' HGG?
- Zijn er punten waarin je nu al kan zeggen dat samenwerking tussen HGG PC en HGG PE kan verbeteren of waar HGG PE en HGG PC elkaar beter kunnen aanvullen?

Samenvattend: Wat ik moet ik weten van jouw afdeling om HGG PE en HGG PC beter samen te laten werken? Mocht ik iets gemist hebben in mijn verhaal, heb ik fouten gemaakt of als je andere aanvullingen hebt hoor ik dat graag.

B.2. Sales engineers HGG PC

Functie: Sales engineer bij HGG PC

De functie van sales engineer komt neer op het verkopen van machine-uren en werkvoorbereidingsuren voor een zo hoog mogelijke prijs.

Sales engineers krijgen te maken met HGG PE op het moment dat een klant structureel zoveel laat snijden dat doorlooptijden in het geding komen. Mocht het zo zijn dat HGG PC het werk echt niet meer in een acceptabele tijd kan snijden, dan kan de klant in overleg doorgestuurd worden naar HGG PE zodat er een machine aan de klant verkocht kan worden. Anderzijds komt een klant soms via HGG PE bij HGG PC in beeld. Een klant heeft dan een machine gekocht en omdat deze niet de hele range op die machine gesneden kan worden of omdat de productiecapaciteit van die ene machine niet toereikend is en om dit op te vangen wordt HGG PC ingeschakeld.

- Er is een te kort (geen) beleid over waar HGG PC heen moet of hoe de integratie tussen PC en PE plaats zou moeten vinden. Er is sinds dit jaar een toekomstvisie, maar de inhoud is mij nog niet duidelijk.
- Door gebrek aan structuur is het niet altijd duidelijk voor mensen binnen PC wie ze binnen PE moeten benaderen.
- Door frustratie en onbegrip blijft kennis bij HGG PC zitten en gaat deze niet, of te kort, naar HGG PE waar deze kennis van waarde zou kunnen zijn.
- Het onderscheid op papier van de bv's PE en PC zorgt voor veel afstand in de praktijk.
- De afstemming tussen afdelingen van HGG PE en HGG PC is niet goed waardoor er irritaties ontstaan.
- Omdat er geen inzicht is in de planning van PC en van sales van PE, kan het voor komen dat sales ineens voor de deur staat voor een demonstratie voor klanten van HGG PE, terwijl dit niet uitkomt of het werk op dat moment niet geschikt is.
- Er is toenadering tussen de salesafdelingen van PE en PC, maar door de beperkte communicatie en afstemming van agenda en gegevens wordt hier niet optimaal gebruik van gemaakt.
  - Er zou beter in kaart moeten worden gebracht waar de 'andere' sales mee bezig is en wat zij in de markt zien. CRM systemen van PE en PC zijn niet gekoppeld.
- Door de groei van HGG zijn er twee problemen ontstaan:
  - De organisatie is in korte tijd veel groter geworden, hierdoor worden de processen binnen de onderdelen van HGG niet scherp genoeg onder de loep genomen.
  - De verhouding in omzet tussen HGG PE en HGG PC is scheefgegroeid.
- De administratie rond een project zijn omslachtig. Sales van HGG PC merkt in het dagelijkse werk dat er veel handelingen dubbel moeten worden gedaan, hierdoor is de sales afdeling veel tijd kwijt aan administratie die wellicht kan worden geautomatiseerd. Verder wordt er binnen HGG met Trimergo gewerkt. Dit wordt een zwak programma voor sales genoemd. Ook is het qua CRM een onhandig programma.
- Binnen HGG is er niemand die de processen zou moeten stroomlijnen. Niemand wordt hierop afgerekend en dit krijgt dan ook tekort aandacht vanuit HGG.
- HGG PC wordt alleen afgerekend op de gemaakte omzet en hier wordt ook strak op gestuurd. Hierdoor raken andere manieren van waarde toevoegen ondergesneeuwd.
- HGG PC snijdt op verouderde machines en ook de laatste versie van de software wordt niet gewerkt. Dit remt zowel de showroom functie als de gebruikersfeedback functie van HGG PC.

- Klanten van HGG PC weten vaak niet dat machines door HGG PE gemaakt zijn. Dit zou een sterk marketingpunt kunnen zijn voor HGG PC, maar blijkbaar komt dit niet genoeg naar voren.
- Waarom zijn HGG PE en HGG PC nog twee verschillende bedrijven? Er werd gesuggereerd dat verregaande integratie, of zelfs fusie, van de twee bedrijfsonderdelen beter zou zijn voor de toekomst van HGG als geheel. Er zou dan door iedereen aan één doel binnen één HGG gewerkt kunnen worden.

Als iets positiefs aan HGG PE werd gezien dat zij het werken van HGG PC mogelijk maken, maar als negatiefs werd benoemd dat HGG PC door HGG PE als klant wordt gezien en verder geen speciale behandeling krijgt.

B.3. Team leader customer support

De afdeling customer support doet aan klantondersteuning. Dit gebeurt op verschillende manieren klanten, waaronder HGG PC, kunnen bij customer support terecht met vragen over hun machine en kunnen door technical support, zowel software als hardware support, geholpen worden met problemen aan hun machine. Customer support ondersteunt daarnaast ook alle service partners die wereldwijd opereren. In de relatie tussen customer support en HGG PC wordt HGG PC in de eerste plaats als klant gezien. HGG PC kan customer support bereiken op het moment dat er storingen of problemen met de machine of de software zijn. Ook kan het voorkomen dat een snede niet kan worden gemaakt, waarna HGG PC contact opneemt met support om te kijken wat de mogelijkheden zijn. Er wordt ook samengewerkt met PC om tot een goed onderhoudsplan te komen en wordt HGG PC als lead user van machines van HGG PE gezien.

Uit verdere samenwerking tussen HGG PE en HGG PC zou customer support graag zien dat HGG PC gebruikt wordt als een template om per klant onderhoudsplannen op te zetten. Het idee is dan dat op basis van het aantal gewerkte uren bij de klant het onderhoud dan zo optimaal mogelijk kan worden ingepland en onderhoudskosten en break down kosten kunnen worden geminimaliseerd. Zo'n onderhoudsplan zou dan als servicepakket verkocht kunnen worden bij de levering van een machine.

De showroomfunctie die HGG PC heeft, waarbij relatief nieuwe machines draaien om aan klanten te laten zien, zou het leereffect voor customer support kunnen verminderen. Dit komt omdat de problemen die voor customer support interessant zijn pas na verloop van tijd de kop op steken. Customer support geeft aan dat dit geen probleem hoeft te zijn, omdat er van elke versie van de machine meerdere verkocht worden. Hierdoor kan er ook ervaring worden opgedaan, voor het ontwikkelen van een onderhoudsplan, bij andere klanten.

Het zou kunnen dat klanten van HGG PE gebruik willen maken van de wvb capaciteiten van HGG PC, hier zou een goede afstemming tussen beide takken van HGG voor nodig zijn zodat wvb uren niet verkocht worden op het moment dat HGG PC het al druk heeft. Daarnaast zou het een optie kunnen zijn dat HGG PC en rol krijgt in het opleiden van operators en wvb'ers van klanten van HGG PE. Deze kunnen dan bij HGG getraind worden op het installeren van machines, het werken met machines en het voorbereiden van werkzaamheden voor op de machine. Dit zou aan het begin van een project kunnen, als de machine nog moet worden geplaatst, of als klanten willen terugkomen, om nieuwe features van de machine of software te zien, als hun machine al staat.

Samenvattend, vanuit customer support zijn er drie concepten waarin HGG PC meer van waarde zou kunnen zijn voor HGG. De eerste is het verbeteren van de onderhoudsplannen om zo klanten beter te kunnen ondersteunen, de tweede is de verkoop van wvb activiteiten aan klanten van HGG PE en de derde is het opleiden van operators of wvb'ers van klanten van HGG PE.

B.4. Team leader software engineering

Team leader engineering houdt in dat hij onder andere verantwoordelijk is voor de RPC, de PCL, een groot gedeelte van de R&D, de offline software ProCAM en project engineering.Hieronder volgt een verslag aan de hand van een aantal punten die uit het gesprek zijn gehaald. Verschillende manieren voor HGG PC om voor HGG van waarde te zijn, zijn besproken en ook welke hordes er moeten worden genomen om dit voor elkaar te krijgen.Het eerste punt dat langskwam was de showroom/experience center die HGG PC kan zijn en wat daar allemaal voor moet gebeuren om dit goed te implementeren.

- Als je een showroom wil zijn, moet je een perfect bedrijf zijn en dit ook over kunnen brengen. Als het proces nog niet perfect is moet er gekeken worden of dit haalbaar is.
- Het overbrengen is daarin een heel belangrijk onderdeel, hierdoor krijgen klanten een beeld van hoe het HGG proces en machine werken en hoe dit voor hun voordelig zou kunnen zijn. De stappen van Nijntje werden hierin genoemd.
- HGG PC zou consultancy kunnen verlenen op basis van hoe het perfecte proces er bij een klant uit zou moeten zien.

Vervolgens werden er verschillende punten besproken over de mogelijkheden die HGG PC aan HGG PE biedt op het gebied van R&D. Deze punten waren:

- HGG PC is als loonsnijbedrijf niet representatief voor het grootste gedeelte van de klanten van HGG PE. De meeste klanten van HGG PE zijn namelijk geen loonsnijbedrijven, maar productiebedrijven.
- Het zou kunnen dat, als er per machinetype, een productiebedrijf in de buurt (Nederland) werd gezocht, die met een HGG PE machine gaat werken, dit een representatievere afspiegeling van het klantenbestand zou opleveren dan dat de situatie bij HGG PC nu oplevert.
- Bij het automatiseren wordt eerst gekeken naar de simpele en repetitieve taken. Bij HGG PC zijn de snedes over het algemeen complex (klanten van HGG PC weten goed wat ze weggeven). Hierdoor zijn dit niet altijd representatieve problemen die er in de markt spelen vanuit een Service en Engineering oogpunt.
- Daar komt bij dat de voorspelbaarheid van de problemen te laag is om consistent onderzoek op te doen. Dit kan onder andere gelden voor de complexiteit, duur, of frequentie van de problemen.
- Daarnaast hanteert HGG PC een relatief korte doorlooptijd voor het product waardoor het lastig is om een goede R&D feedbackloop te introduceren in het snijproces. Als een oplossing is gevonden en ontwikkeld is de order de deur al uit en kan er niet getest worden.
- Door een hoge bezettingsgraad van machines, wat goed is voor de omzet, wordt er gesneden in de R&D tijd. Als er echter een te lage bezettingsgraad is, is er weinig ruimte voor investeringen. Hierin moet een evenwicht gevonden worden.
- Echter, als HGG PC sales zich specifiek zou richten op sectoren of soorten materiaal die ook voor de R&D interessant is, dan zou dit van grote toegevoegde waarde kunnen zijn voor HGG PE.
- Het zou mooi zijn als de problemen van HGG PC, voor zover die te sturen zijn, aan zouden sluiten bij de ontwikkelrichting van HGG PE.
- De volgende stap in de ontwikkeling van HGG PE is de compensatie van materiaalafwijking om zo uiteindelijk richting volledig robotisch lassen te kunnen maken. Deze stap is echter moeilijk te maken omdat HGG PC alleen snijdt en geen constructies last waardoor de verbinding niet en de afwijkingen daarin niet kunnen worden voorspeld.

- Positief aan de samenwerking tussen HGG PE en HGG PC wordt gezien dat HGG PC verbeteringen aan software en machine kan aangeven.
- Als dit echter te ver gaat en er als HGG PC de ontwikkelingsagenda gaat bepalen wordt dit als vervelend en verstorend ervaren.

Daarnaast werd er ook nog gesproken over de samenwerking tussen HGG PE en HGG PC. De volgende punten zijn daarop van toepassing:

- HGG PE is een globale speler, de snijmachines worden wereldwijd verkocht. HGG PC is een lokale speler, zij concentreert zich voornamelijk op Noordwest-Europa.
- De relatie tussen HGG PE en HGG PC is nu niet duidelijk gedefinieerd. De relatie kan die tussen twee gelijkwaardige bedrijven zijn of een relatie waarin de ene zich dienstbaar opstelt ten opzichte van de andere.
- HGG PC moet op dit moment zoveel mogelijk omzet draaien en daar alles voor in het werk stellen. Dit kan echter in tegenstrijd zijn met de dienstbare relatie tussen HGG PE en HGG PC.
- Als medewerkers van HGG PE worden ingewerkt, komen ze ook bij HGG PC langs om het snijproces te leren kennen. Later verwaterd deze samenwerking echter vaak.
- Er worden op dit moment geen heldere doelstellingen voor HGG PC en de samenwerking tussen HGG PE en HGG PC geformuleerd.
- Er is geen overkoepelend team of persoon binnen de organisatie van HGG die aanstuurt op samenwerking en op de kwaliteit van die samenwerking wordt afgerekend.

B.5. Work preparators

De werkvoorbereiders (wvb) zorgen ervoor dat al het materiaal gesneden kan worden. Dit bestaat uit het controleren van het binnenkomende materiaal, tekeningen van klanten omzetten naar bestanden voor de machines. Daarna verandert deze rol van voorbereider in projectbeheerder. Zij zorgen ervoor dat de productie vloeiend verloopt en dat het materiaal afgevoerd kan worden naar de klant. De wvb heeft voornamelijk met HGG PE te maken als er een storing is of als er specifieke klantwensen zijn. Er wordt dan met de afdeling customer support contact opgenomen om de storing te verlossen of te kijken of de wens van de klant mogelijk gemaakt kan worden. Dit proces gaat inmiddels redelijk goed. Het is verbeterd ten opzichte van een aantal jaar geleden. Dit uit zich in de volgende punten:

- Klachten worden sneller verholpen door HGG PE.
- Registratie van storingen is degelijker, hierdoor is de onderhoudshistorie van machines completer.
- Er is terugkoppeling van HGG PE over de storing en de status hiervan.
- Er is één afdeling support, dit zorgt voor duidelijkheid bij problemen

Deze korte lijnen tussen HGG PE en HGG PC worden als positief ervaren. Voor de RPC is er echter een ander proces dat plaatsvindt op het moment dat er een storing is. Dan wordt vaak Klaas of Peter direct gebeld om naar het probleem te kijken. Dit omdat dat sneller is dan de stap via support te nemen. Er is dan wel het risico dat de problemen niet goed bijgehouden worden. Dit leidt tot kennis verlies en verlies van overzicht. Ook ontbreekt het vaak bij RPC problemen aan terugkoppeling over de status. Over het algemeen komen PRC problemen bij Balder de Wolf terecht en problemen van PPM's bij Dennis Kaarsemaker.

Dit onderlinge verkeer wordt als goed ervaren bij storingen en urgente zaken, maar als het op ontwikkelingen aankomt dan werkt het nog niet. Als ontwikkelingen worden voorgesteld komt er vaak geen terugkoppeling over de status en bloed het proces langzaam dood. Het gevoel leeft dat dit komt omdat HGG PC geen échte klant is, die een gewone marktprijs voor de ontwikkeling moet betalen, dus dat ontwikkelingen voor HGG PC minder aandacht krijgen. Hierin zou HGG PC zelf ook een actievere rol in kunnen spelen door zelf meer te informeren naar de status van projecten en zo de zaken op te gang te houden. Ook werd aangegeven dat klanten van HGG PE misschien behoefte hebben aan iets dat HGG PE niet wil ontwikkelen, omdat het af zou doen aan de machine of omdat de focus van HGG PE niet op dat specifieke vlak ligt. De wvb werkt met ProCAM, bij wvb heerst het gevoel dat gebruikersfeedback van ProCAM niet goed wordt verwerkt. Ook mist wvb release notes bij een nieuwe update. Er wordt dan niet duidelijk wat er veranderd is in een nieuwe versie. Hierdoor ontstaat het gevoel dat terugkoppeling van gebruikerservaringen en input van ideeën niet nuttig is. Ook is de ervaring van wvb dat er in het ontwerp van ProCAM door de programmeurs voor de gebruikers gedacht wordt en niet altijd op de juiste manier. Hierdoor worden functies als onduidelijk ervaren en soms blijven functies ongebruikt, die wel heel nuttig kunnen zijn, omdat ze in het programma verstopt zitten. De wvb stelt voor om bij de ontwikkeling van nieuwe versies meer betrokken te zijn als gebruiker om zo een betere gebruikservaring van ProCAM te bewerkstelligen.

Er is door verschillende mensen binnen HGG aangestipt dat HGG PC als opleidingscentrum zou kunnen dienen om zo medewerkers van HGG PE en klanten van HGG PE op te leiden. Dit zou zowel op het gebied van snijden zelf kunnen, als op het gebied van werkvoorbereiding. In het verleden werd HGG PC wel ingeschakeld om klanten op te leiden bij de klant zelf. Dit werk en het reizen werd leuk gevonden en wvb staat er positief tegenover om hier weer een rol in te spelen. Het opleiden van de klant wordt tegenwoordig gedaan door commissioning engineers van HGG PE, omdat deze dan toch al op locatie zijn. Ook werd aangestipt dat de handleidingen verbeterd zijn waardoor er minder onduidelijkheden zijn bij het gebruik van een machine.

Verder is er onduidelijkheid over de rol als experience center. Wat is dit precies en hoe wordt daar invulling aan gegeven. Als een experience center een showroom moet zijn, waar

zijn dan de nieuwe machines en nieuwe features? Als een experience center een locatie moet zijn waar klanten een HGG proces kunnen ervaren, waar zijn dan de nieuwe software updates en waarom worden werknemers van HGG PC niet bijgeschoold in alle nieuwe mogelijkheden die nieuwe software en nieuwe features bieden? Als een experience center een ruimte is waar HGG kennis opdoet over zijn eigen software en machines zodat er user feedback gegenereerd wordt, waarom worden werknemers van HGG PC dan niet actief ingelicht over nieuwe mogelijkheden zodat daar in het werk mee getest kan worden? Hierin heeft wvb het gevoel dat er kansen onbenut blijven omdat er niet actief op deze functie van HGG PC wordt gemanaged. HGG PE ontwikkeld veel, maar HGG PC wordt hier tekort van op de hoogte gebracht.

Werkvoorbereiding werd in het verleden ook wel eens gedaan voor klanten van HGG PE. Als er dan behoefte was aan wvb capaciteit werd dit voor de klant gedaan. Dit is, net als het opleiden, goed bevallen en zou in de toekomst ook een optie kunnen zijn, mocht er weinig werk voor handen zijn. Sales van HGG PC zou dit dan moeten verkopen. Het lijkt wvb het meest logisch dat dit via Sales van HGG PE loopt om zo klanten van HGG PE te benaderen. Dit zou ook via customer support kunnen lopen omdat die wellicht meer zicht hebben op waar klanten nu mee bezig zijn.

Als punt waar HGG PE en HGG PC op korte termijn op samen kunnen werken werd voorraadbeheer genoemd. Door alles onder één dak te doen met één inkoper zouden er wellicht besparingen kunnen worden gerealiseerd.

Ook komt het voor dat klanten van HGG PE het materiaal wat ze op korte termijn nodig hebben bij HGG PC laten snijden totdat hun machine operationeel is. Dit werkt echter ook concurrerend omdat klanten van HGG PE werk uit de markt onttrekken. Ook is het mogelijk dat HGG PE en HGG PC concurrerend ten opzichte van elkaar opereren. Hierin moet per klant gekeken worden wat de beste manier is om een klant te bedienen en voor HGG zoveel mogelijk aan een klant te verdienen. ‘Het mooiste voor HGG is om een machine aan een klant te verkopen die niet of weinig wordt gebruikt.’

B.6. Team leader mechanical engineering

Als team leader engineering voornamelijk verantwoordelijk voor de PPM's en komt in contact met HGG PC als er vragen zijn over machines of als er upgrades aan bestaande machines moeten worden gedaan.

HGG PC heeft een dubbelrol, aan de ene kant is het een productiebedrijf, aan de andere kant is het een experience center. Wat een experience center precies is, is nog niet duidelijk. Is dit een showroom of een plek om ervaring in het gebruik van de machine op te doen? En hoe moet daar richting aan gegeven worden?

In het bepalen van de waarde van HGG PC voor HGG, is het belangrijk om verbeteringen en kosten zo goed mogelijk te kwantificeren. Zo is bijvoorbeeld user feedback voor HGG PE zeer waardevol en te kwantificeren door de verbeteringen, nieuwe toepassingen en opgeloste problemen van de afgelopen jaren in kaart te brengen. Hierin zit een continue verbeterproces dat in kaart gebracht kan worden. Een voorbeeld wat gegeven werd van een succesvolle implementatie van deze feedback was de autogas pilot op de SPC 3000.

Toen het gebrek aan release notes van ProCAM ter sprake kwam werd de haal en breng cultuur binnen HGG besproken. Dat zou er in dit geval op slaan dat het niet alleen de verantwoordelijkheid van de makers van ProCAM is om over nieuwe features te communiceren, maar ook de verantwoordelijkheid van gebruikers om hier actief naar te vragen.

In het algemeen werd de instelling en kennis van HGG PC als zeer positief ervaren. Als negatief punt werd genoemd dat de verwachtingen en doelstellingen over en weer niet duidelijk zijn. Hierdoor kan frustratie ontstaan. Ter illustratie: "Waarom lost PE mijn probleem niet op? Wij zijn toch experience center? Dan moet het hier in ieder geval werken."

B.7. Manager Sales HGG PE

Verkoopleider van HGG PE, verantwoordelijk voor alle regiomanagers van HGG PE, marketing voor HGG PE en HGG PC en customer support HGG PE.

Vanuit verkoop straalt het gebruik van eigen machines door HGG PC een stukje vertrouwen uit naar de klant. Het bestaan van HGG PC naast HGG PE is onderdeel van het onderscheidend vermogen van HGG t.o.v. de concurrerende machinebouwers. Het feit dat deze machines echt gebruikt worden en als showpiece kan fungeren in de werkplaats voor de klant is hier een belangrijk onderdeel van.

Het bestaan van HGG PC zorgt ervoor dat er tegen sommige problemen al binnenshuis aan wordt gelopen. Dit is niet altijd het geval en met de kennis die wordt opgedaan, wordt nog niet omgegaan. Hierin handelt HGG nog als twee separate bedrijven waarin HGG PE heel veel ontwikkeld op basis waarvan HGG PE denkt dat het nuttig is zonder te luisteren naar HGG PC. Vanuit HGG PE wordt een hoop ontwikkeld omdat het technisch mogelijk is om dit te ontwikkelen, niet zozeer omdat de vraag vanuit de markt er is.

Als experience center kan gekeken worden naar Voortman. Voortman heeft een showroom met machines waarvan een (te) grote zelfverzekerdheid vanuit gaat. Dat is, volgens klanten, niet de uitstraling van HGG. Daarin komt het woord passie meer naar voren en daarom zou een experience center zoals Voortman niet passen. De hal zoals HGG PC die nu heeft is al geschikt als experience center, alleen moeten daar wel dingen aan worden aangepast. Hierin moet vooral gekeken worden naar algehele uitstraling van de werkplaats (rommel, verlichting en belijning) en de flexibiliteit om de klant te laten zien wat hij of zij wil zien als zij langskomen. Het juiste profiel moet beschikbaar zijn als de klant langskomt. Ook moet er aansluiting tussen HGG PE en HGG PC gevonden worden zodat dit soort bezoeken optimaal kunnen verlopen. Verder moeten de werkzaamheden die in de hal worden gedaan aansluiten bij de propositie die HGG PE heeft, HGG PC moet hiervoor de nabewerking tot een minimum beperken, anders kan de klant de indruk krijgen dat hij niet juist wordt ingelicht door verkoop van HGG PE.

De verkoop bij HGG PC zou gericht moeten zijn op sectoren waar HGG PE zich in wil verdiepen, zo kunnen de productiecapaciteit van HGG PC en de leerervaring van HGG PE samenvallen. Hierin moet worden aangetekend dat HGG PE en HGG PC verschillende datasystemen gebruiken en dat in de automatisering nog een stap moet worden gemaakt.

Mochten er in de toekomst meer machines zoals de UPC 450 (dus voor een specifieke markt) worden ontwikkeld, dan kunnen ook die machines bij HGG PC proefdraaien. Het is voor het slagen van een testproject echter belangrijk dat de kaders aan het begin duidelijk worden gesteld. Deze zouden kunnen veranderen tijdens het testproject, maar ook dat moet duidelijk vermeld worden. Hierin is de rol van verkoop van HGG PC heel belangrijk, zij moeten de markt in om het juiste werk in de juiste sector voor deze machine binnen te halen.

Er zijn klanten van HGG PE die hun werk binnen het snijproces efficiënter doen dan HGG PC. Dit is niet zozeer in het snijden en de logistiek daaromheen, maar meer in de verkoop, zoals bijvoorbeeld 247TAILORSTEEL, de administratie, het papierloos werken (wat ook afstraalt op de showroomfunctie van HGG PC) en de kennis over automatisering van het snijproces en vooral managementsystemen die daaromheen opgetuigd worden. Hierin werd ook de STEP koppeling genoemd waar HGG PC niet mee werkt, maar wel als product verkocht wordt. Volgens HGG PC werkt de koppeling niet voldoende, maar vanuit de markt zijn er weinig klachten.

In het verleden werd er vanuit HGG PC niet meegedacht vanuit de behoeftes van HGG PE. Dit is inmiddels beter geworden. Wel is de uitstraling van de hal zodanig onvoldoende dat het niet de juiste uitwerking op klanten heeft.