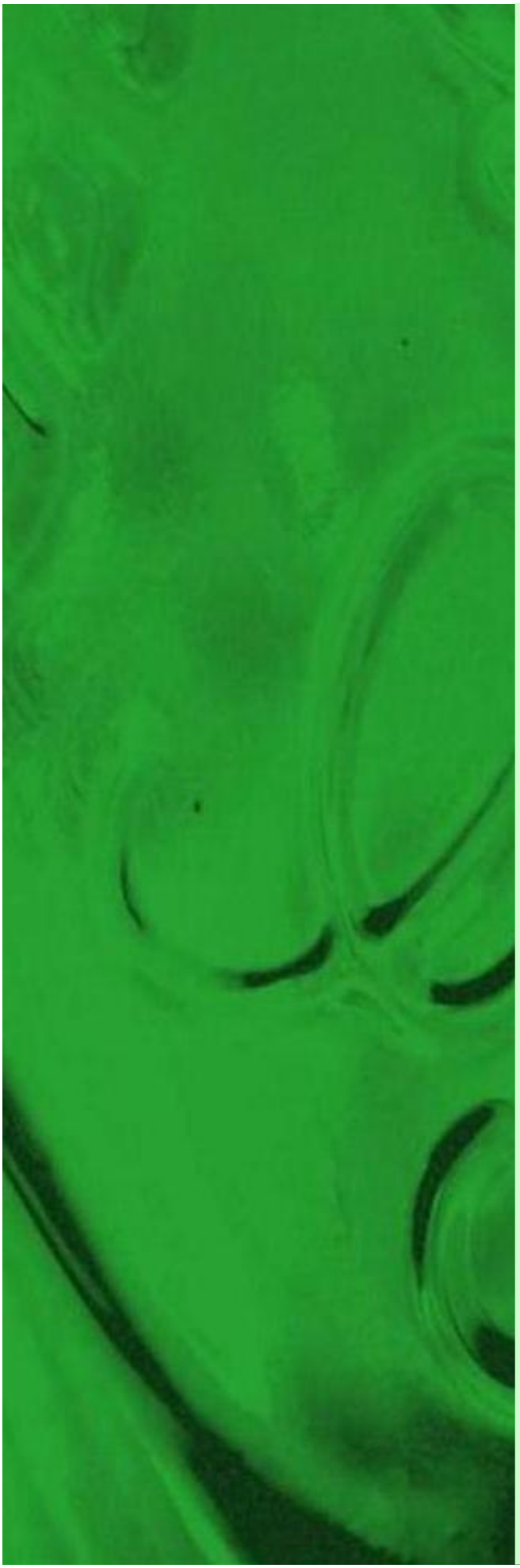


UNIVERSITY OF TWENTE
Faculty of Management and Governance
Business Administration
Human Resource Management

When there's time, there's Grolsch

Feasibility study of flexible work schedules at Grolsch

M.A.E. van Aard
s0146412

January 09

When there's time, there's Grolsch

Feasibility study of flexible work schedules at Grolsch

STUDENT OF THE UNIVERSITY OF TWENTE

M.A.E (Marieke) van Aard
s0146412
Faculty of Management and Governance
Business Administration
Master track Human Resource Management

SUPERVISORS ROYAL GROLSCH N.V.

A. van der Linden
Warehouse Manager
Internal Transport and Warehouses

E. Bakker
Sector Chief of Staff

SUPERVISORS UNIVERSITY OF TWENTE

Dr. Ir. J. de Leede
j.deleede@utwente.nl

Prof. Dr. J.C. Looise
j.c.looise@utwente.nl

DATE AND PLACE OF PUBLICATION

Enschede, January 22, 2009

Grolsche Bierbrouwerij Nederland B.V.
Brouwerslaan 1
Postbus 55
7500 AB Enschede
053 – 4833333

University of Twente
Drienerlolaan 5
Postbus 217
7500 AE Enschede
053 - 4899111

"If I could save time in a bottle, the first thing that I'd like to do
is to save every day till eternity passess away, just to spend them with you"
Jim Croce, 1973
(Used in a Grolsch commercial "Komt tijd, Komt Grolsch" in 1997)

Foreword

As a student Business Administration of the University of Twente I had to choose a master track. The choice of the track 'Human Resource Management' was easily made, because I have always thought of people as the most important resources of a company. During one of the courses of the master track I got in touch with the subject 'self-rostering', and I was immediately interested in this subject. The idea that the company was no longer solely in charge of the work schedules, but that employees have got a say in it too, was something that appealed to me right away. The fact that 'self-rostering' was one of subjects of the master thesis theme 'Individualization of the employment relationship' gave me the opportunity to study the subject more in depth.

Fortunately, Royal Grolsch N.V. has given me the opportunity to study the subject in a practical situation. From April until November 2008 I have tested the feasibility of flexible work schedules at the Internal Transport and Warehouses department. Flexible work schedules are a way of self-rostering in which the forklift drivers receive more control about their work schedules. With flexible work schedules Royal Grolsch N.V. wants to achieve a higher level of flexibility, productivity and efficiency. The forklift drivers are able to combine their work with the activities within their personal lives. After testing the feasibility, several rostering scenarios (possibilities) have been designed and one scenario has been chosen. An advice has been given to implement this kind of rostering system. The results of the feasibility study and its results have been published in this report.

The research and report could not have been realized without the help of several persons. Firstly, I want to thank Royal Grolsch N.V. and the Internal Transport and Warehouses department, for giving me the opportunity to study the subject 'self-rostering' in a practical situation. I especially want to thank Ms. Alexandra van der Linden for giving me the support and feedback needed for conducting the research and writing this report. I also want to thank Mr. Erik Bakker and all the employees of the Internal Transport and Warehouses for helping me getting all the information needed and for being so willing to help me. I also want to thank the supervisors Dr. Ir. Jan de Leede and Prof. Dr. Jan Kees Looise for the feedback and ideas they have given me during the research. They have taught me to conduct a research and look at it more critically. Their instructions will also be useful for future 'challenges'. Last but not least I want to thank all the experts interviewed. They have enriched my view of the new revolutionary phenomenon in the field of HRM: self-rostering.

Enschede, November 2008
Marieke van Aard

Summary

A research has been conducted at the IT&M department of Grolsch about the feasibility of flexible work schedules. The central question of the research is:

"To what extent are flexible work schedules feasible at the IT&M department of Royal Grolsch and, when it is feasible, how can a flexible work schedules system be designed and implemented?"

Besides the feasibility test, possible flexible work schedules systems (scenarios) are designed, one scenario has been chosen and advices are given to implement this flexible work schedule system. To guide the research and the advices several sub-questions have been formulated that are answered in several chapters of the report.

1. *What is self-rostering, how can its feasibility be assessed, how can a self-rostering system be designed and implemented and what does the literature say about that?*

In the literature several definitions and descriptions of self-rostering were given. Based on this information a new definition of self-rostering has been developed:

"Self-rostering is a system where (1) an employer creates a framework based on the organizational requirements in which (2) employees can indicate their preferences concerning working hours, working days or shifts, that, (3) by means of an authorized scheduling group or individual, (4) and possibly with the support of computer software and/or after a compromising dialogue between employees, (5) results in work schedules where the needs of the employee and the demands of the employer converge."

The feasibility of self-rostering can be tested by means of seven preconditions:

1. All parties involved should be willing to work with self-rostering;
2. The management should have strong leadership;
3. The corporate culture should allow self-rostering;
4. The self-rostering group should have a sufficient size;
5. The self-rostering group should have a homogeneous composition based on working skills and a heterogeneous composition based on the demographic aspects of the workforce;
6. There should be a feeling of collegiality between the employees;
7. It should be possible to predict the working demand sufficiently in advance.

Because literature about self-rostering is rare, interviews with experts in the field of self-rostering were conducted. The experts have given the necessary information to develop guidelines for designing a self-rostering system. The first guideline formulated concerns 'compile a project group'. The project group should consists of a representative of the union, representatives of the group for whom self-rostering is intended, a planner, a representative of the management (the initiators) and a neutral external party. Secondly, SMART goals should be formulated in order to measure the results of self-rostering. Another important aspect in designing a self-rostering system is that it should meet the preconditions set by the employer, the employees and by law and regulations. Thirdly, it is advisable to define possible self-rostering systems in order to compare the different scenarios and choose the best one. And finally, an individual rewarding system should be developed because self-rostering will result in individual rosters.

Regarding the implementation of a self-rostering system, guidelines has been developed as well. Firstly, it is advisable to run a pilot in order to measure the (positive and negative) consequences and assess the goal attainment. With implementing self-rostering 'time' is an important aspect, because people find it difficult to change. Nothing should be rushed. Also supportive management is important to make self-rostering a success. The management should be enthusiastic to motivate the parties involved in the self-rostering process. Finally, to stimulate the parties involved and create support, it to inform them well enough about the self-rostering philosophy.

Based on this information a conceptual model has been developed:

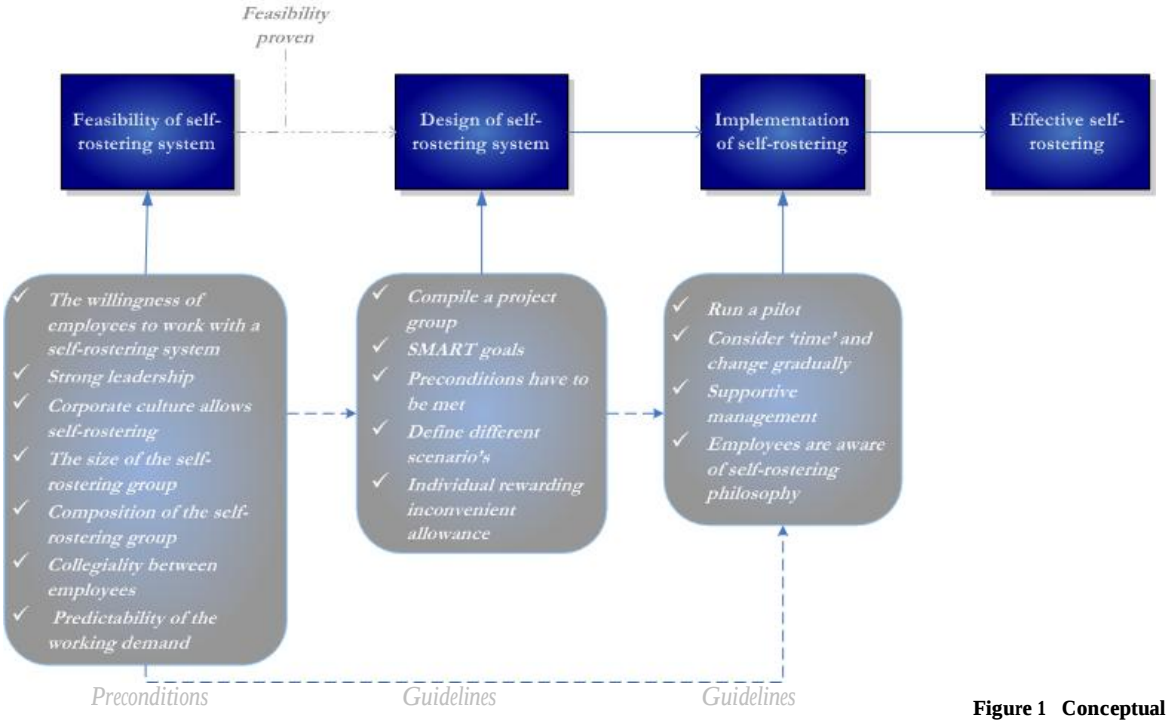


Figure 1 Conceptual model

2. *"Are flexible work schedules feasible at the IT&M department taken the preconditions from the Theoretical Framework into consideration?"*

The feasibility has been tested based on a feasibility number. The feasibility number has been calculated based on a formula: $\mathbf{F(X \geq 0) = \Sigma(R_n W_n)}$, in which *R* stands for the result of the measurement of the precondition, the *W* stands for the weight of the precondition, the $_n$ for the number of preconditions and *F* for the feasibility number which makes it possible to give a judgment of the feasibility. Based on the preconditions flexible work schedules are feasible at the IT&M department of Grolsch. However, the feasibility was not tested very strongly (with a feasibility number of 1.00 on a scale from -8.16 to 8.16). This weak tested result is mainly due to the fact that the forklift drivers had a low willingness to work with flexible work schedules and the insufficient predictability of the working demand. Moreover an average-score on 'strong leadership' and 'composition of the self-rostering group' have contributed to a weak confirmation.

3. *"What are the different scenarios (possibilities) of flexible work schedules at the IT&M department based on the wishes, goals and framework conditions set by the employer (Grolsch) and the wishes of the employees (the forklift drivers and the team leaders)?"*

The wishes of the forklift drivers, team leaders and management were gauged and were combined in a 'meet-must-may be'-model, which has been taken into consideration during the designing stage of the scenarios.

Figure 2 'Meet-must-may be'-model

Two scenarios have developed. The first scenario concerned the 'blocks schedule' scenario in which the forklift drivers can choose between different blocks, depending on the shift they are classified in for that week. The second scenario concerned the 'fixed and flexible working times' scenario in which a part of the forklift drivers workforce stays in fixed groups and do not have to schedule flexibly. The other forklift drivers, who cooperate voluntarily, can choose between different flexible blocks. The first scenario realizes economical flexibility more, whereas the second scenario focuses more on social flexibility.

4. *Which scenario should be introduced at the IT&M department and how should Grolsch implement this flexible work schedules system?*

The project group has chosen the scenario 'Fixed and flexible working times' as the flexible work schedules system that should be introduced at the IT&M department. In this system 21 persons stay in the fixed group. For the 'flexible' group 13 employees are needed. The 'flexible' employees choose their preferable flexible blocks over a period of a month. Every rostering period another group can indicate its personal preferable blocks first. The rules for the choosing process are amongst others determined by means of labor agreements and the Working Hours Act. The concept of 'self-managing' teams could be included in order to meet the wishes of forklift drivers and team leaders to let the forklift drivers chose their preferable work places.

For the implementation of the flexible work schedules system it is advisable to run a pilot. For the pilot at least 10 persons are needed for the 'flexible' group and 3 persons of the 'fixed' group should function as a kind of 'back up group'. Because the working demand of the IT&M department is difficult to predict a pilot period of one year is advisable. In one year several seasons and situations will occur. Criteria for determining if flexible work

schedules should be implemented based on the outcomes of the pilot are formulated based on the overall goals of flexible work schedules that are set by Grolsch.

Conclusion

For assessing the feasibility of flexible work schedules at the IT&M department of Grolsch the concept self-rostering was studied. The practical situation at Grolsch could therefore be compared to the theoretical background. It turned out that even though two preconditions were not fully met it did not lead to any difficulties regarding the feasibility of flexible work schedules at the IT&M department. It can be stated that the preconditions formulated for this research will measure the feasibility of self-rostering, but that the importance of the elements of these preconditions depends on the context of the organization or the department where self-rostering is implemented.

The feasibility of flexible work schedules at the IT&M department was not strongly confirmed. This was due to the fact that the willingness to work with flexible work schedules was negatively tested as well as the predictability of the working demand. The willingness was negatively influenced by the feeling of insecurity of the forklift drivers concerning the intentions and the consequences of the system and the feeling distrust of the team leaders regarding the competency of the forklift drivers to make an effective work schedules. These negative feelings can be improved by means of a pilot. The predictability of the working demand is insufficient due to ad hoc adjustments of other departments. A communication plan should be made in which clear agreements are made about an acceptable adjustment period and how adjustments should be communicated.

The scenario that was designed and chosen – 'Fixed and flexible working times' – does not differ that much of the current way of scheduling. The flexible work schedules system is a formalized approach of the flexibility of the current scheduling system, with the advantage that the social flexibility is reinforced. The pilot that has been defined in the research will help to implement the 'Fixed and flexible working times' system successfully. It will also help to create support for the system

Flexible work schedules are a process that can only be successful if all parties involved make sacrifices and compromises. Therefore, it is important that all parties cooperate and communicate with each other. If this is realized, flexible work schedules are absolutely feasible at the IT&M department and be successfully in creating an effective working environment.

Contents

Chapter 1

Ordinary people think merely of spending time. Great people think of using it.
(Author unknown)

Introduction

1.1 GROLSCH

Royal Grolsch N.V. (from now on called 'Grolsch') is a beer brewery situated in Enschede. The organization was founded in 1615 and has approximately 875 employees. Apart from its focus on the Netherlands, the company's home market, Grolsch is active internationally in about 70 countries.[1] Since February 12 of 2008 Grolsch is an independent subsidiary of SABMiller plc.[2]

The Internal Transport and Warehouses department provides the distribution of beer from and to the customers. The department is responsible for the flow of filled beer bottles to the warehouse, the delivering of empty bottles to the production department and the loading the trucks. The Internal Transport and Warehouses department has 50 employees. Thirty-one FTE's of those persons are the main focus of the research: the forklift drivers.

1.2 REASON ASSIGNMENT

The workforce at Grolsch is ageing, especially in the Supply Chain department. This has consequences for the HRM-policy. This issue has received increased interest after the collective labor agreement discussion of 2007. Grolsch was approached and joined a project concerning life cycle policy. A research was conducted at Grolsch consisting of two parts. The first part concerned the use of HR-practices and the allocation of financial resources in relation to different age groups. This analysis was conducted in order to create awareness about the problem. The second part consisted of in-depth interviews. The results of these interviews showed that the employees would like to work more flexibly. It furthermore inspired Grolsch to give their employees more influence on their working time. At the department 'Internal Transport and Warehouses' (in Dutch 'Intern Transport & Magazijnen', *IT&M*) Grolsch want to implement this idea by means of flexible work schedules (FWS). With flexible work schedules the employees can choose their own preferable working hours within a framework set by the employer. Flexible work schedules are also called 'self-rostering'[3]. Flexible work schedules are intended for the forklift drivers at the IT&M department. Currently, they are primarily working in different kinds of shifts: some employees work according to a three shift contract (morning, afternoon and night shift), others work according a two shift contract (morning and afternoon shift) and there are forklift drivers that do not work in shifts but in office hours (8.00 am until 4.30 pm, a day shift).

[1] Financial report Royal Grolsch, 2007
[2] http://www.koninklijkegrolsch.nl/
[3] **N.B.: Grolsch uses the term *flexible work schedules*. In this report the words 'self-rostering' and 'flexible work schedules' are considered interchangeable.**

With flexible work schedules Grolsch wants to improve the level of flexibility, productivity and efficiency. By giving employees more influence in their working times - so flexibility is realized for the employee as well as the employer - a feeling of responsibility is created. The increased feeling of responsibility and the more *efficient*[4] use of the human resources will have a positive influence on the productivity (Segers, 2008). Besides, Grolsch want to keep the employee motivated up to the retirement.

1.3 ASSIGNMENT

Grolsch has the intention to introduce flexible work schedules. However, the feasibility of this new scheduling approach is unknown to the department. The author of this report was asked to study the feasibility of flexible work schedules at the IT&M department. She has to find out what the preconditions are in which flexible work schedules can be realized.
The assignment, as described, can be summarized in the following sentence:

"Perform a feasibility study on flexible work schedules at the IT&M department of Grolsch"

Because the author of the report thinks the feasibility study does not conclude the research, two parts have been added. Possible flexible work schedules are designed and one scenario has been chosen. The actual implementation of the flexible rostering system is not a part of the assignment, but an advice is given instead on *how* this new system can be implemented. The following is added to the assignment:

"Design possible flexible work schedules systems, choose one scenario and give an advice of how to implement the system."

1.4 RESEARCH QUESTIONS

To guide the research a general research question has been formulated. This question has been deducted from the description of the assignment.

"To what extent are flexible work schedules feasible at the IT&M department of Royal Grolsch and, when it is feasible, how can a flexible work schedules system be designed and implemented?"

In order to give an answer to the main research question several sub-questions have been formulated:

1. *What is self-rostering, how can its feasibility be assessed, how can a self-rostering system be designed and implemented and what does the literature say about that?*

In order to assess the feasibility of flexible work schedules, the purpose of self-rostering is studied. In this purpose several elements are included:

- A definition is created, based on descriptions of self-rostering found in the literature;
- What organizations want to achieve with self-rostering (the goals) is defined;
- The typology of self-rostering is illustrated;
- The relation between self-rostering and Human Resource Management (HRM) is discussed;
- Preconditions for the assessment of the feasibility are defined;
- The guidelines of designing and implementing a self-rostering system are studied.

[4] Efficient means that the number of human resources can be adjusted to the exact working demand and capacity demand. The problem concerning overstaffing and underemployment will decline.

The result of this sub-question led to preconditions that assess the feasibility of self-rostering and thus flexible work schedules at the IT&M department of Grolsch. It also facilitated the design of a flexible rostering system and a suitable advice for implementing the system.

2. *"Are flexible work schedules feasible at the IT&M department taken the preconditions from the Theoretical Framework into consideration?"*

This sub-question is a key question because it partly answers the research question. In order to answer this sub-question, interviews are conducted with the initiators of the flexible work schedules project, with the people for whom it is intended and with the people whose tasks are directly influenced by it. The preconditions are deducted from the first sub-questions and are the measuring points for the assessment of the feasibility. The results of this sub-question are an input for the next sub-questions.

3. *"What are the different scenarios (possibilities) of flexible work schedules at the IT&M department based on the wishes, goals and framework conditions set by the employer (Grolsch) and the wishes of the employees (the forklift drivers and the team leaders)?"*

In the interviews conducted to measure the preconditions, the interviewees were asked about their goals and wishes concerning flexible work schedules. Also framework conditions of flexible work schedules at Grolsch are defined in the interviews. The goals, framework conditions and wishes are used for designing possible flexible work schedules systems (scenarios). The different flexible work schedules systems are compared with realized work schedules based on historical data. The information gathered with this question can be used for the next sub-question.

4. *"Which scenario should be introduced at the IT&M department and how should Grolsch implement this flexible work schedules system?"*

After designing flexible work schedules systems for the IT&M department, one scenario is chosen that will be introduced at the IT&M department. An advice is given about how this flexible work schedules system can be implemented. The final sub-question guides this process.

1.5 RESEARCH MODEL

The following model visualizes the different aspects of the research. The secondary blocks define the aspects being studied.

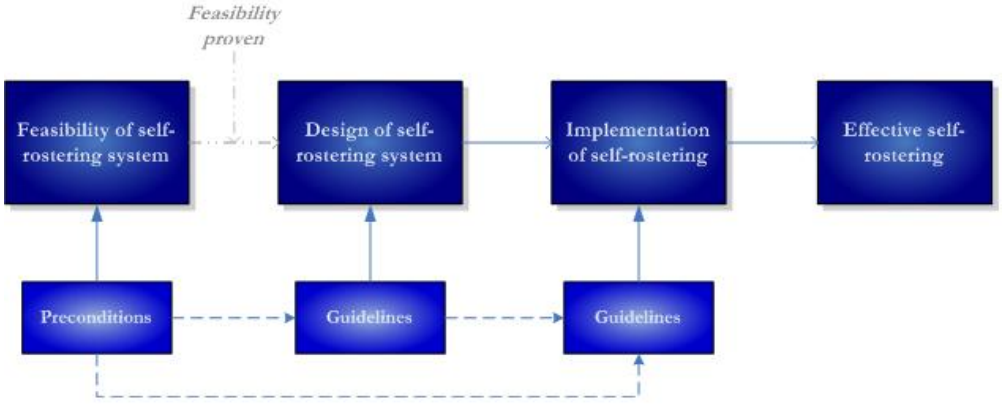


Figure 3 Research model (basic)

1.6 RELEVANCE OF THE RESEARCH

1.6.1 Social relevance

Preventing shortage

The Dutch society is ageing. The prosperity has increased and health care has improved. With an increased prosperity and improved healthcare, the life expectation is increasing as well. Furthermore, the increasing life expectancy is accompanied by a decrease of birth rates. These developments could lead to a structural shortage on the labor market. Self-rostering can be a tool to keep the employee optimally employable and motivated until retirement by realizing a work-life balance. It also realizes more productivity and efficiency for the employer. Both outcomes could help to prevent the deficit.

Effective preparation of a self-rostering system

A self-rostering system can only be successful if the employees support the system. Therefore a preparation is needed in which all parties concerned need to be involved, in order to design a solid system and eventually implemented it. This research will study the effective preparation of the design and implementation of a self-rostering system.

1.6.2 Scientific relevance

The research also has scientific relevance. The subject 'self-rostering' is relatively new and not much has been written about it. Most researches and publications are about self-rostering in the health sector. Other industries have not been studied. Therefore this research has been conducted at a logistics department. Moreover, most researches are about the *results* of self-rostering. No attention has been paid to the *design* and *implementation* of a self-rostering system (the process). For this reason this research could also give a contribution to the knowledge of self-rostering in the field of the design and implementation of the system.

1.7 STRUCTURE REPORT

The report consists of different parts. This introduction is the first part of the report. The second, called 'Theoretical Framework' discusses the theoretical background of self-rostering (flexible work schedules). Attention has been paid to what self-rostering actually is[5], what the relation is between self-rostering and Human Resource Management (HRM), what the preconditions are in order to assess the feasibility of a self-rostering system, and what the guidelines are for designing and implementing a self-rostering system. In the 'Methodology' part the operationalization of the constructs (*the preconditions*) of the research will be discussed. Also the methodology of gathering the information for the flexible work schedules project will be discussed. The 'Results' part will summarize and compare the results of the interviews and assess the feasibility of flexible work schedules at the IT&M department. The design of flexible rostering systems and the advice about the

[5] Besides the report's author, two fellow students have conducted a research about self-rostering. Because there has not been published much about self-rostering, some parts of the report are realized by joint writing of the students. Some parts can be found literally in the reports of M.H.P. Lam *("Exploring the conditions that contribute to a successful design and implementation of self-rostering"*) and M.T.M. Mwiya *("Exploring the effective use of self rostering: a contingent approach"*).

implementation of the system at the IT&M department will be defined in the 'Design' part. A general evaluation of the research will be given in the part called 'Conclusion and recommendations'.

In the last part of the report extra components are included. Sources used are summarized in 'References'. Abbreviations and words that might not be known by the reader are placed in the part 'Glossary'. Elements that have not been included in the report, but can be used as background information for understanding the report more clearly are included in the Appendixes.

1.8 METHODOLOGY

In order to realize the research some preparation has been done. To complete the Theoretical Framework several scientific articles have been studied. Because not many scientific articles have been published, experts in the field of self-rostering have been interviewed to gather more information.

For the practical part of the research a project group has been formed as a reference group. The group, existing of forklift drivers, management and a team lead (who is also a representative of the works council) and the author of the report as the external party were asked to give their ideas about flexible work schedules and give their reaction to some outcomes of the research. Furthermore interviews were conducted with forklift drivers, management and team leaders. These interviews were used as input for the feasibility test of flexible work schedules and for designing a solid flexible rostering system. The results of the feasibility test have been processed in designs of possible flexible work schedules systems and an advice for implementing flexible work schedules.

Chapter 2

The bad news is time flies. The good news is you're the pilot
(Michael Altshuler)

Theoretical Framework

In this chapter the theoretical part of the research will be discussed. The context (reason) of self-rostering will be defined first. In the second section the concept 'self-rostering' will be defined. Also the definition, typology and goal of self-rostering will be included. Self-rostering is a part of HRM. The relation between both will be discussed in the third section. The fourth section defines the preconditions to assess the feasibility of self-rostering in an organization or department. The design of a self-rostering system will be discussed in the fifth section. Guidelines for implementing self-rostering are given in the sixth section. The last section summarizes and visualizes the process from the assessment of the feasibility of self-rostering up to the implementation of efficient self-rostering. In order to realize this, the following sub-question has been formulated:

"What is self-rostering, how can its feasibility be assessed, how can a self-rostering system be designed and implemented and what does the literature say about that?"

2.1 REASON SELF-ROSTERING

The idea of self-rostering has been originated from successive developments: the individualization of the employment relationship and life cycle policy.

Life has become more and more about the development of the 'self'. The 'individual' is considered increasingly important. And so are personal wishes and needs. (*Sociaal Economische Raad*; SER; 2001). This individualism is evident in the employment relationship and translated in several individualized HR-practices, based on contract variety, variable working times, (individualized) reward systems and performance measurement, and personal training and development (Looise & De Leede, n.d.). The individualized HR-practices are formalized what De Leede, Looise & Van Riemsdijk (2004) call 'a third' contract: *"a new type of written contract between individual employees and managers emerges. Alongside the individual formal labour contract, drawn up entering the company (first contract), and the collective agreement (second contract), a 'third contract' is developing, containing explicit expectations on effort, output and rewards"* (p. 10-11). The individualized employment relationship has led to a shift of the bargaining level: from a national level to industry and company level (Looise & De Leede, n.d.).

A result of the individualization of the employment relationship is the life cycle policy. Life cycle policy is an HR-policy which takes the different needs and wishes of an individual employee into consideration: needs and wishes that are dependent on the *life phase* someone is in. By taking the different life phases and the needs and wishes into account, employees will be longer employable, motivated and work healthy. It offers employers the opportunity to use the personnel more efficiently and thus increase the productivity. These aspects will have a positive influence on the return of the organization. A dialogue is a necessary tool to adjust the mutual goals of the employer and employee (van Buul & Maas, 2004; CNV, 2006; SES West-Brabant, 2006; FNV, 2007).

Individualization of the employment relationship resulted in a HR-policy, the life cycle policy, which can respond to the different needs of an individual in a particular phase of life. A practice that could realize that is self-rostering. Self-rostering seeks to align work obligations with the activities of the private life by means of the aspect 'time' and with that meet the needs of both the employee as well as the employer. The relation between the three developments has been visualized in figure 4. The meaning of self-rostering will be explained in the next section.

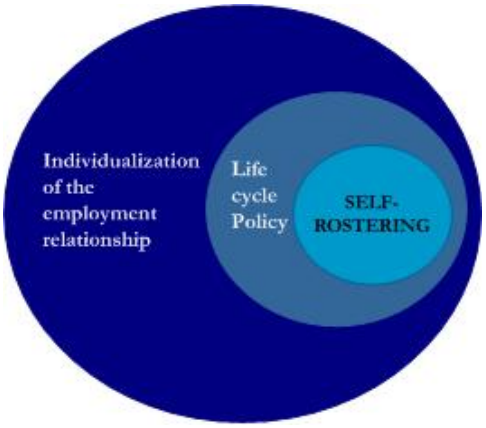


Figure 4 Link between individualization of the employment relationship, life cycle policy and self-rostering

2.2 SELF-ROSTERING

2.2.1 Flexibility: a two-sided perspective

Social-economic relations have changed in the Netherlands over the past years. The prosperity has increased and the employee has become more emancipated. More so, due to the increasing amount of women entering the labor market, the domestic patterns have changed as well. Employees prefer sufficient time off and opportunities in order to smoothly combine paid work with the care of children and household, study or volunteer work.

Not only the employees have displayed a need for more flexibility; the employers have as well. Companies are dealing with a global economy in which, in some industries, products and services have to be delivered 24/7. An efficient allocation of labor is necessary to be competitive and to be able to effectively respond to fluctuations in the labor supply.

As demonstrated the need for flexibility is a complex statement. It deals with two perspectives: flexibility from an individual employee (and household) perspective, also called *social flexibility*, and from an organizational perspective, which is also referred to as *economical flexibility* (Veldman, 2005, p. 1).

Two-sided flexibility and scheduling

Nowadays, work schedules are made using a top-down approach in which the employer determines when the employee has to work. This approach increases the workload (*Nederlands Centrum voor Sociale Innovatie*, NCSI, n.d.), because employees have to work when they are asked to, even though these moments are inconvenient. It is also possible that the employee has to work extra hours to meet the market demand. This influences the workload in a negative way.

Not only employees experience pressure from the personal needs and the needs of the organization, the employer feels pressure too, namely the personal needs of the employee and the obligation to meet the market demand. The two-sided pressure of the employees can be decreased by giving them co-determination in their work schedules. This way they can schedule their personal needs around the demands of the organization. However, this is not sufficient to 'solve' the two-sided pressure of the employer. The organization has also demands that have to be taken into consideration. Self-rostering is a tool to realize that. This

tool takes into account the variability in workload and the individual wishes of the workers concerned.

2.2.2 Definition of self-rostering

Different ways to describe self-rostering

Self-rostering is a relatively new subject in the field of HRM in the Netherlands. However, scientists have already proven the positive results of a self scheduling system in other countries. The concept scientists use in their research for self-rostering differs. The most commonly used concept is *'self-scheduling'*, which is used by Hung (1992), Zimmerman (1995), Dearholt & Feathers (1997), Hoffart & Willdermood (1997), Teahan (1998), and Bailyn, Collins & Song (2007). Silvestro & Silvestro (2000) call it *'flexible rostering'*, Ala-Mursula, Vahtera, Kivimäki, Kevin, Pentii (2002) use *'worktime control'* and Drouin & Potter (2005) refer to it as *'flexible scheduling'*. The concept *'self-rostering'*, which will be used in this report, is also used by Thornthwaite & Sheldon (2003) and Wortley & Grierson-Hill (2003).[6]

Reformulating and creating a definition

Even though the scientists use different names, the descriptions resemble self-rostering. In order to create one workable definition, the different descriptions of self-rostering used in the literature are summarized in the table below.[7]

AUTHOR	DEFINITION SELF-ROSTERING	MAIN TYPIFICATIONS
DESCRIPTIONS AND DEFINITIONS OF SELF-ROSTERING		
Hung (1992)	*"**Self-scheduling** means employees, usually as a group, develop their own schedules."* (p. 6)	- Employees choose their own work hours (scheduling working hours) - Schedule developing could be in a group
Teahan (1998)	*"**Self-scheduling** may be described as a system wherein a group of staff [members] or a self-scheduling committee, when presented with the staffing needs for a particular unit or area by a manager, make their own schedule."* (p. 361)	- Group makes their own work schedules on the base of staffing needs
Silvestro & Silvestro (2000)	*"**Flexible rostering** is where each rostering period is planned individually (typically 4 – 6 weeks at a time). Shifts are allocated on the basis of manning requirements which reflect anticipated demand patterns, as well as myriad other rostering parameters, including staff's preferences for off-duty."* (p.527)	- Individual work schedule planning - Demand of employer and staff preferences are regarded - Scheduling shifts
Ala-Mursula, Vahtera, Kivimäki, Kevin, Pentii (2002)	*"[**Worktime control** is] operationalised as perceived control over starting and ending times of a workday, the opportunities to take breaks and to deal with private matters during the workday, the scope for influencing the scheduling of shifts, the scheduling of paid days off and vacations, and the opportunities*	- Flexibility - Adjusting working time to personal needs - Scheduling working hours and days

[6] Where the concept 'self-rostering' is used in this report, also 'self-scheduling', 'flexible rostering', 'workime control' and 'flexible scheduling' apply.

[7] Not all names mentioned at the "different ways to describe self-rostering" part are included in the table. Those authors that are included give a definition or a description of self-rostering in their research article. The others did not and only mention self-rostering. That is why those names are not included in the table.

	to take unpaid leave." (p. 272)	
Thornthwaite & Sheldon (2004)	*"Employee **self-rostering** systems enable individual employees to tailor working hours to maximise their compatibility with domestic responsibilities. Such rosters would (…) allow employees to choose to work mornings, afternoons or school hours only, or some combination of different hours each day."* (p. 239)	- Work-life balance - Flexibility - Scheduling working hours
Drouin & Potter (2005)	*"**Self-scheduling** [is] a form of flexible scheduling in which [employees] can determine their own work hours."* (p. 72E)	- Employees choose their own work hours (scheduling working hours)
Nederlands Centrum voor Sociale Innovatie (NCSI) (no date)	*"Bij zelf roosteren ontwerpen werknemers het eigen rooster langs hun voorkeuren, eisen en wensen aan de arbeidstijden en het combineren van werk en privé."* (p. 1)	- Employees design their own roster based on their own preferences
Lubbers (2008)	*"Bij zelfroosteren bepaalt eerst het management hoeveel personeel op welke dagen en uren nodig is (bezettingseisen). Daarnaast maken werknemers hun wensen kenbaar door aan te geven welke uren zij willen werken (persoonlijke werkrooster). [De informatie] gaat in de computer en daar rolt iets moois uit, namelijk een ideaal rooster voor werknemer en werkgever."* (p. 15)	- Scheduling of hours - Demand and wishes of employer and employee are reconsidered - Computer could give a perfect work schedule for employer and employee
Vos (2008)	*" [Met] 'zelfroosteren' ontwerpt een kleine groep werknemers voor een periode van vier tot twaalf weken in onderling overleg de eigen werktijden. (…) Vooraf bepaalt de manager voor de hele planningsperiode voor elk uur hoeveel personeel hij minimaal nodig heeft en maximaal kan gebruiken. Daarbij geeft hij ook de vereiste kwalificaties aan. (…) De tweede stap is dat werknemers binnen het aangegeven tijdkader aangeven wanneer wij willen werken en wanneer zij vrij willen zijn. (…) Bij zelfroosteren geldt echter de eis dat de einduitkomst binnen de minimum- en maximum grenzen moet vallen. Het is aan de werknemers zelf om zodanige compromissen te sluiten, dat aan die eis wordt voldaan.(…) De eindoplossing geeft de manager een bezetting die voldoet aan de door hem gestelde randvoorwaarden"* (p. 15)	- A work schedule is made on the basis of staffing needs and employee preferences - Compromise of employees
Zeggenschap (2008)	*"Zelfroosteren betekent dat een groep werknemers eigenhandig de roosters maakt. Dit op basis van een door de werkgever vastgesteld bedrijfstijdkader, waarbinnen is aangegeven aan welke kwantitatieve en kwalitatieve eisen moet worden voldaan. Bij het ontwerpen van de roosters bepalen de werknemers zelf de begin- en eindtijden c.q. de duur van hun diensten en worden geacht met elkaar in gesprek te gaan om de individuele wensen te synchroniseren met de door de werkgever vastgelegde eisen" (p.6)*	- Company time frame determined by employer - Starting and ending time determined by employee - Synchronize wishes (compromise of employees)

Table 1 Descriptions self-rostering

The different definitions and descriptions have several similarities concerning the intention and execution of self-rostering:

- The requirements of the employer are taken into consideration;
- The needs of the employees are taken into consideration;
- Flexible scheduling of hours, days or shifts;
- Scheduling is realized in a group or individually;
- A computer program can support the scheduling process;
- The work schedule is a result of a compromise between employees.

Although there are different descriptions and terminologies for self-rostering in the literature, the essence of the systems described overlap. All definitions and descriptions are based on the idea that the needs of the employee and the requirements of the employer have to converge. The goal of self-rostering is creating a two-sided flexibility: for both employers and employees.

For self-rostering, employers create the framework, based on their requirements, in which employees can choose their own working hours. This way the employer can take the flexible working demand into consideration. Employees, on the other hand, can choose those working hours (or days or shifts) that meet their own needs and create their own flexibility. When the inputs of the employer as well as the employees are known, a provisional schedule can be formulated by an authorized group or individual. A computer program can be used as a supporting tool. When this provisional schedule is created, possible fits and misfits become visible. It may be that not all working hours, working days or shifts are fulfilled. A dialogue can be initiated by the employees - which could be lead by the authorized group or individual - to come to some kind of compromise, so all working hours, workings days or shifts are fulfilled. The result is an adjusted, final work schedule. This process has been visualized in figure 5.

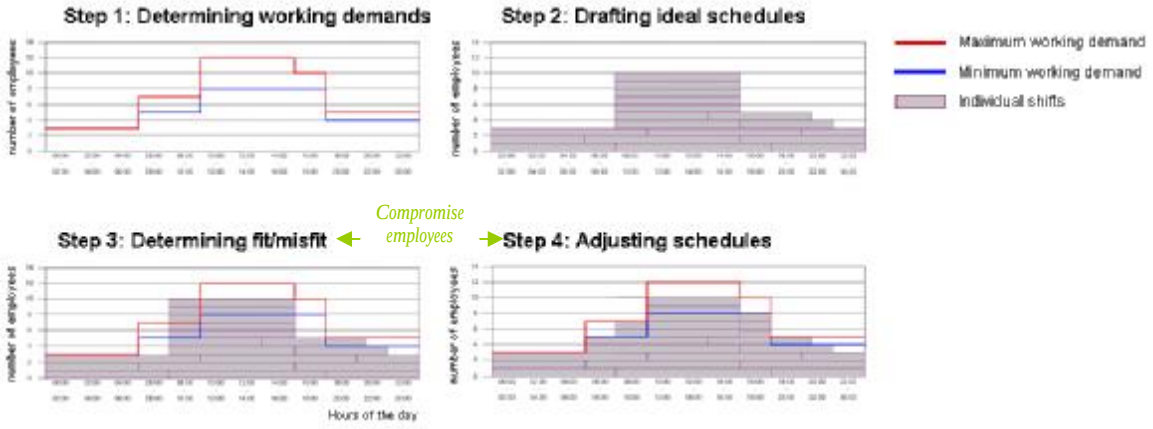


Figure 5 Compromise employees in making work schedules
Based on Déhora (2008)

Taking the description into consideration, a definition can be formulated. This definition will be used in this research:

"Self-rostering is a system where (1) an employer creates a framework based on the organizational requirements in which (2) employees can indicate their preferences concerning working hours, working days or shifts, that, (3) by means of an authorized scheduling group or individual, (4) and possibly with the support of computer software and/or after a compromising dialogue between employees, (5) results in work schedules where the needs of the employee and the demands of the employer converge."

This definition is visualized in the figure below.

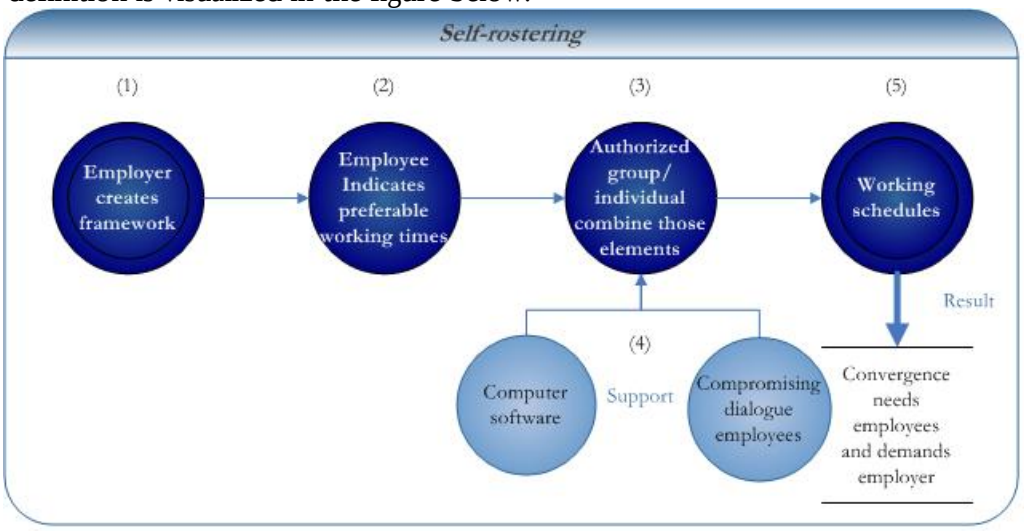


Figure 6 Visualization definition self-rostering

2.2.3 The goal of self-rostering

The adoption of self -rostering has differing premises in different organizations because not all organizations decide to use this system for the same reasons. However, various articles have documented some of the key goals of self-rostering. Through the different reasons ascertained to the use of self-rostering, one can recognize a trend that shows its 'root causes' for implementation. To carefully realize these goals, both theoretically and practically based assumptions are highlighted in order to converge towards a more reliable answer to the question as to why companies implement self-rostering systems.

Theoretically based assumptions

It is documented in Beer, Spector, Lawrence, Mills and Walton, (1984), that *"changing values of the work force, particularly relative to authority, are causing corporations to reexamine how much involvement and influence employees should be given and what mechanisms for employee voice and due process need to be provided"* (p.5). Therefore, one of the ways in which organizations have sought to realize this employee involvement, influence and voice is through the adoption and implementation of self-rostering. It can thus be said that management also decides to use self-rostering in order to share influence and work to create greater congruence of interests between management and the employee groups represented through these mechanisms.

Beer et al. (1984) additionally states that corporations are reexamining traditional assumptions about career paths and taking into account employee lifestyle needs in transferring employees and scheduling work - a goal that is similarly realized through self-rostering. And so, what are the advantages of providing employees with influence through flexible work time scheduling such as self-rostering?

Various authors have highlighted many advantages that are premised on the provision of flexible work schedules. For instance Swart (1974); Fields (1974); Nollen & Martin (1978); Orpin (1981); Schein, Mauner, & Novak (1977) and Kim & Campagna (1981) suggest that organizational attachment, attendance, and job attitudes are favorably associated with flexible work schedules. Similarly, authors Pierce and Newstrom (1983) indicate in their research that

"symptoms of stress appear to decline subsequent to the implementation of a flexible working hour arrangement" (p.247). Furthermore, it is argued that providing the employee with flexibility in work scheduling expands his opportunity to respond to personal demands. This consequently expands his opportunity to fulfill needs in the non-work domain. Flexible working hours can also contribute to the quality of working life through increased work related autonomy and responsibility (Pierce and Newstrom, 1983).These authors also suggest that a flexible working hour arrangement can provide the context for a more efficient utilization of the human 24-hour clock and can decrease the amount of stress. Therefore, do the advantages increase in accordance with the level of work time flexibility? Pierce and Newstrom (1983) report that *"the more time autonomy that employees perceive that they have for scheduling their work and non work time, the more their work related attitudes and behaviours will be influenced"* (p.249) It was also noted in their research that the greater the flexibility of the schedule, or the greater the amount of discretionary time, the higher the level of performance was. Time autonomy additionally had a significant correlation with employee attitude variables as it was noted that the direction of the relations suggested that employee satisfaction and organizational commitment increased with increasing degrees of perceived time autonomy, while psychological stress declined.

Practically based assumptions

Interviews with experts have lead to some practically based assumptions. Segers (2008)[8] stated that an important advantage for the organization is that self-rostering increases productivity by increasing efficiency. Self-rostering is more efficient than the 'old' way of making rosters by dividing work in shifts. In the 'old' manner the ups and downs in the work load are flattened by organizing work in shifts. By means of self-rostering these ups and downs can be taken into consideration (the needed staff is in line with the required work).
Employee satisfaction also increases, because they are given more responsibility. This is particularly the case for higher educated workers.
Other advantages of self-rostering for organizations are:

- Self-rostering reduces overtime, because work can be scheduled according to productivity needs. A consequence is that the need for hiring personnel flexibly will decrease;
- The sickness rates decrease thanks to self-rostering. Because employees feel more involved with the roster and the work they are less willing to call in sick;
- Self-rostering is a tool to attract and retain new employees.

Self-rostering has also got advantages for the employees. They are able to combine their work with their private life and realize a work-life balance. Also the feeling of responsibility increases thanks to receiving more autonomy. The third party, the customers, encounters the advantages of self-rostering too. Employees who chose their own working times are better motivated and deliver better quality and service.

Oegema, Van de Riet & Van Nijen (2008)[9] stated that the advantages of self-rostering are the creation of a work-life balance for the employees and the possibility for the employers for profiling them as an attractive employer.

[8] An elaboration of the interview with the expert Esther Segers has been included in the appendixes.
[9] The elaboration of the interview with the experts Koos Oegema, Albert van de Riet and Alexander van Nijen is included in the appendixes.

Overview
Having looked at the theoretical and practical assumptions and the views of experts as to why the self-rostering system is used, one can conclude that the *main* goals of self-rostering are as follows:

- Create congruence of interest between management and employee groups
- Increase organizational commitment
- Increase employee satisfaction
- Retain and attract employees
- Increase productivity by increasing efficiency

2.2.4 The typology of self-rostering

In this research two types of typologies are used: one concerning the process and one concerning the results of self-rostering. Next to the dimensions also the forms of self-rostering will be discussed. These aspects are used to create self-rostering models.

Typology of the process of self-rostering
The first dimension that can be derived from the definition formulated in section 2.2.2 is ***autonomy***. With self-rostering employees can indicate their preferences concerning working hours, while they used to have little or no involvement in the creation of the rosters. The term autonomy literally refers to *'regulation by the self'* (Deci & Ryan, 2006, p. 1557). The more autonomy the employees have over the creation of their roster, the more responsibility, control and influence they have. The amount of autonomy is based on the demand set. For example, if an organization creates a fixed basis roster, where 60% of the amount of work is already divided and the other 40% can be filled in by the employees themselves, the amount of autonomy would not be as high as when the organization creates a basis roster where 10% is fixed and the other 90% can be determined by the employees.

A second dimension can be described in terms of ***participation***. Déhora (Segers, 2008) makes a distinction between the participation of the employee in a group or individually when compiling the final working roster. The roster can be completed with or without a *group discussion* (respectively a high and low degree of participation). When a roster is completed by means of a discussion between two or more persons it has a high degree of participation. When the roster is completed without a dialogue it has a lower degree of participation.

Typology of the results of self-rostering
The typology of the results of self-rostering differs from one aspect with the former typology. This typology also knows the degree of autonomy, but focuses besides that on the number of people for which the roster is intended. This dimension can be described in terms of ***individual*** versus ***collective*****.** The amount of people for whom the roster is intended determines the degree of individualism or collectivism. When the roster is intended for just one person, it is called 'individual'. If the roster is intended for the whole employee group, it is called 'collective'. Also intermediate forms exist.

Forms of self-rostering placed in the model
The *Nederlands Centrum voor Sociale Innovatie* (NCSI) has made a classification of forms of self-rostering. They identified five forms of self-rostering:

- ***Exchange of shifts***: it gives the employee the possibility to adapt their fixed roster to their own preferences by changing shifts with colleagues;
- ***Making an inventory of preferences***: the employee can indicate what his or her preferences are. The scheduler will try to honor those preferences, but this is not guaranteed;
- ***Shiftpicking***: employees can choose between shifts that are determined by the organization;
- ***Matching***: the preferences of the employees will be matched to the needs of the organization by a software program. Bottlenecks that might occur will be solved in consultation with the employee and the employer;
- ***Full self-rostering***: the employee determines when he or she wants to work and the employer will adjust his needs and working times to the availability of the employee.

Segers (2008) uses another classification of self-rostering. Forms that are complementary to the classification of NCSI are:

- ***Shifts:*** every employee has to work according shifts that are organized by the employer;
- ***Wish rosters:*** employees can indicate when they cannot work. Rosters are adjusted to private preconditions. For example: Wednesday's off for taking care of the children;
- ***Availability rosters:*** employees should indicate their availability for the next 48 hours. Based on the availability a company will make a roster. This form of self-rostering is used in call centers;
- ***Shiftbidding:*** this form is used mainly in the United States. Employees receive 100 bidding points at the start of every year. With those bidding points they can bid on their preferable shift. The one that has the most bidding points placed on a particular shift will receive that shift;
- ***Self-rostering:*** An employee is able to indicate his or her preferable working hours within a framework set by the employer (matches 'making an inventory of preferences' of the classification of the NSCI).

Dimensions and forms of self-rostering placed in a model

Autonomy

The forms mentioned above differ on the amount of autonomy an employee has. An employee has no autonomy when he or she has to work according predetermined shifts. The autonomy is low when the only freedom of choice an employee has is the possibility to exchange shifts. With full self-rostering on the other hand, the degree of autonomy is very high: the employee indicates when he or she wants to work and the employer will adjust his needs to that. With self-rostering or making an inventory of preferences (where the preference of the employee can only be realized within the framework of the employer; unlike full self-rostering where the employer adjust its requirements to the preferences of the employee) the autonomy is also high, because of the possibility to indicate the personal preferences. The other forms -'shiftpicking', 'shiftbidding', 'matching', 'wish rosters' and 'availability rosters'- have a lower degree of autonomy than self-rostering, but a higher degree than working in shifts, because the employees have something to choose.

Participation

According to Segers (2008) self-rostering is characterized by a collective level. Self-rostering is also called *Group wise rostering.* Also 'matching' and 'exchange of shifts' are realized by two or more persons. The employee indicates his or her preference individually, but the final roster is compiled by means of a *group discussion* with at least two persons. It is about working together to get a closed work schedule. The other forms of self-rostering are based on a more individual level. The employer decides the framework in which the employee can make different kinds of choices, depending on the self-roster method used. The roster is *not realized by a discussion* and the *demands of the employer are still dominating.*

Individual versus collective

When organizations work with shifts the rosters are collective. The working rosters are intended for all those people who work in the shift. With self-rostering and full-self-rostering, the work schedule that is created is specially created for that particular person. It is adjusted to the personal needs. This is also the case with for other forms of self-rostering, *but* then the rosters are more adjusted to the needs of the organizations. The rosters will be 'shared' by more than one person or have a small deviation (for example: an employee works usual hours, but has the Wednesday afternoon off to take care of the children). Thus, with (full) self-rostering the rosters are more 'employee focused', while the other forms are more 'employer focused'.

The different typologies of self-rostering are visualized in figure 7 and 8.

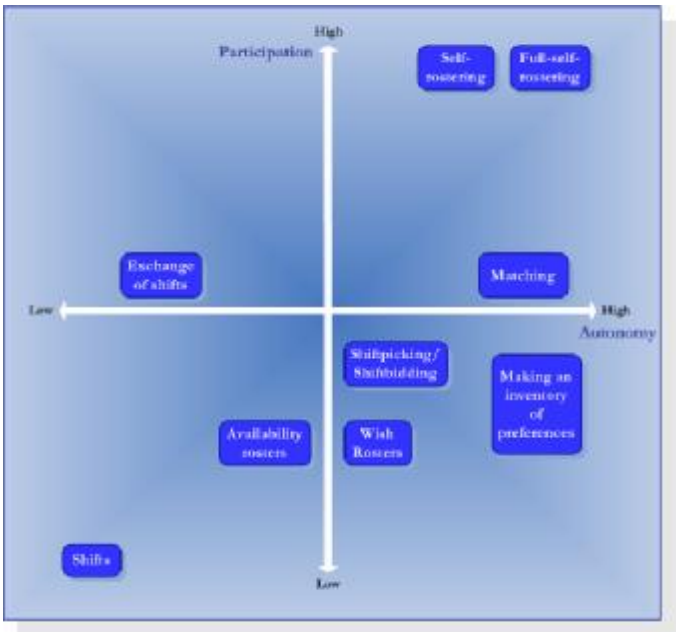


Figure 7 Typology self-rostering (process)

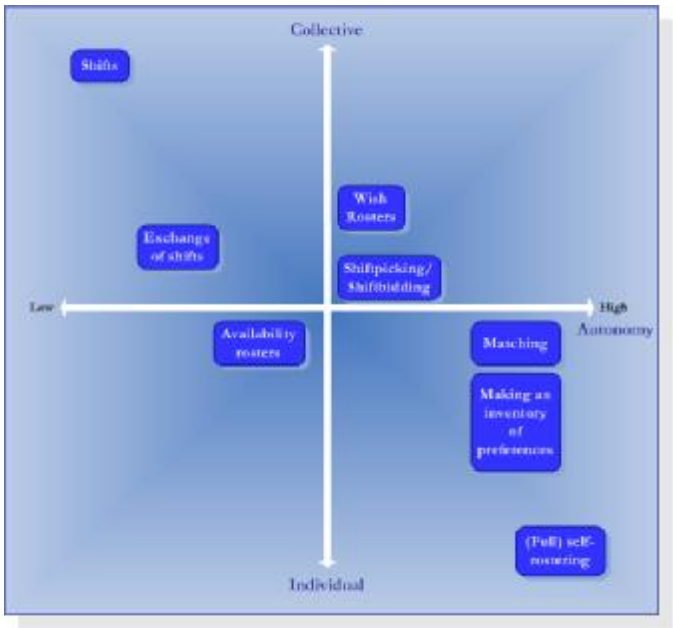


Figure 8 Typology self-rostering (results)

2.3 SELF-ROSTERING AND HRM

For this part of the theoretical framework, the Harvard model of Beer, Spector, Lawrence, Mills and Walton (1984)[10] is used. The Harvard model outlines four HR-policy areas: employee influence, human resource flow, reward systems and work systems (Beer et al. p 7-10)[11]:

- *Employee influence* is about the question how much autonomy and responsibility the organization must delegate to its employees. With self-rostering an employee receives more influence. The organization has to decide how much influence the employee receives; as is described in section 2.2.4 of this chapter.
- *Human resource flow* concerns the responsibility of managers for managing the flow of people in an organization – in flow, through flow and out flow. For self-rostering it means that employees should have an as broad as skill mix as possible, so an employee can fulfill as much work places as possible. The human resource flow should focus on the development of the employees to realize that.
- With the incentives in a *reward system*, both financially as non-financially, an organization can create and maintain the organization it wants to be and stimulate the kind of behavior and attitude the management want of their employees. Self-rostering has also consequences for the reward systems. An organization introduces self-rostering for several reasons. To achieve the goal of self-rostering an organization can stimulate the desired behavior by incentives. An example could be to create a reward system that motivates to work on less preferable hours, so closing a work schedule should be less difficult (Groen[12], 2008).
- *Work systems* define the arrangement of people, information, activities and technology. Self-rostering is about managing time. Time is an aspect of work systems. With the right use of time, the employees will be more motivated and more committed to the work they have to perform (Groen, 2008). This attitude will help realizing the goals of the organization, e.g. efficiency.

The four HRM policies areas lead to evaluation criteria of HRM. They are called *'competence'*, *'commitment'*, *'congruence'* and *'cost effectiveness'* or *'the 4 C's'*. When considering whether an HR-policy will have a positive influence on the organization, its employees and its society, the following questions concerning the 4 C's should be questioned:

1. To what extent do HR-policies enhance the commitment of people to their work and their organization? *(Commitment)*
2. To what extent do HR-policies attract, retain and/or develop people with skills and knowledge needed by the organization and society, now and in the future? *(Competence)*
3. What is the cost effectiveness of a given policy in terms of wages, benefits, turnover, absenteeism, strikes and so on? *(Cost effectiveness)*
4. What levels of congruence do HR-policies and practices generate or sustain between management and employees, different employee groups, the organization and community, employees and their families, and within the individual? In other words: to which extent do the goals of the employees and those of the organization congruence? *(Congruence)*. (Beer et al., 1984, p. 19; Delmotte, Lamberts, Sels & Van Hootegem, 2002).

[10] The figure of the Harvard model is included in appendix 2.
[11] The Harvard model concerning the four areas of HRM activities is included in appendix 2.
[12] The elaboration of the interview with expert Sam Groen has been included in the appendixes.

2.4 PRECONDITIONS FOR ASSESSING FEASIBILITY OF SELF-ROSTERING

To assess the feasibility of self-rostering preconditions are needed. These preconditions will help to determine the (level of) feasibility. The preconditions are deducted from the literature, the theoretical framework and the view of experts in the field of self-rostering.

2.4.1 Preconditions mentioned in literature

Although self-rostering is a new philosophy in the Netherlands, several scientists have studied and evaluated the system. From these investigations and evaluations, one can derive some preconditions that have to be taken into consideration when the feasibility of a self-rostering system in a department or an organization is assessed. The preconditions found in the literature are summarized in the tables below.

AUTHOR	PRECONDITION QUOTE	DEDUCTED PRECONDITION
PRECONDITIONS OF THE FEASIBILITY OF SELF-ROSTERING		
Hoffart & Willdermood (1997)	*"(…) five factors influenced a successful outcome in all cases: (1) committee structure, (2) staff education, (3) negotiation skills, (4) development of guidelines and (5) managerial support." (p. 42)*	Managerial support is important for self-rostering to succeed.
Silvestro & Silvestro (2000)	*"Small wards of under 35 staff appear to be ideally suited to self-rostering, which increases staff motivation and commitment, but the roster is simple enough to be fully and quickly evaluated by the manager with responsibility for signing off the roster."* (p. 533)	The self-rostering group must not be too big to prevent complexity. A small group (35 employees or smaller) is the ideal size.
Drouin & Potter 2005)	*"One major concern about self-rostering is that the size of a unit affects whether or not this system is feasible."* (p. 72E)	The size of the self-rostering group is important.
Osse & Dragstra (VOF De Woorden) (2001)	*"Voorwaarden waarom inspraak in roosters kans van slagen heeft:* - *de afstand tussen werkgever en werknemer moet niet te groot zijn* - *de groep die over eigen rooster moet overleggen moet niet te groot zijn* - *onderling vertrouwen en solidariteit moeten redelijk zijn* - *er ligt al een handzaam/werkzaam (geautomatiseerd) basisrooster."* (p. 41)	The manager should treat his subordinates as equal. The self-rostering group should not be too big. There should be a feeling of solidarity and mutual trust in the self-rostering group. A basic schedule should be present to be able to develop a self-rostering system.
De Leede & Peltzer (2008)	*"Het werkt het beste op afdelingen die:* - *een homogene samenstelling hebben,* - *een goede manager hebben,* - *een win-win agenda nastreven."* (p. 5)	The department/organization has a homogeneous composition. The department/organization has a good manager. The department/organization pursuits a win-win situation (it sees the advantages for both employer and employee).

Lubbers (2008)	*"(…) voorwaarde is wel dat de samenwerking binnen de groep goed is. Collega's moeten bereid zijn om een uurtje meer of minder te werken om de planning rond te krijgen."* (p. 16)	Within the self-rostering group there should be a good feeling of collegiality.
Vos (2008)	*"Het realiseren van (…) winst aan werknemerskant vereist wel dat de groepssamenstelling van de zelfroosteraars zo gevarieerd mogelijk is (…). Een goede spreiding over leeftijden, man-vrouwverhouding en samenlevingsverbanden verhoogt de kans op succes bij zelfroosteren."* (p.18) *"(…) [de bedrijfscultuur moet] rijp zijn voor zelfroosteren."* (p. 19)	To increase the success of self-rostering the group must be varied: - Different ages - Division of men and women - Different domestic ties The corporate culture must lend itself for self-rostering.

Table 2 Preconditions feasibility self-rostering

The main preconditions that affect the feasibility of implementing self-rostering in an organization or department according to the literature are:

- Strong leadership
- The size of the self-rostering group
- Collegiality between employees
- Supporting corporate culture
- Composition of the self-rostering group

Strong leadership

Self-rostering can be feasible when the manager of the self-rostering group maintains a strong leadership (Wortley & Grierson-Hill, 2003). Although the employees are the ones that create the dialogue - to compromise on a work schedule - the manager should have a supporting role in the first stage of the introduction of self-rostering. His or her appearance should be an example for the employees and the way they should negotiate when they have to determine the work schedules on their own.

The size of the self-rostering group

Several authors suggest that the group for whom self-rostering is intended should not be too big (Silvestro & Silvestro, 2000; Osse & Dragstra, 2001; Drouin & Potter, 2005). A big group makes it difficult to make a closing work schedule, because there are too many wishes and needs that have to be taken into consideration. Segers (2008) and Groen (2008) suggest that if the group is too big (more than approximately 80 people) the group should be divided in subgroups.

Collegiality between employees

Self-rostering is about compromising. Not every wish can be realized in the final work schedule. Employees should create a dialogue with each other to come up with a solution for the unfulfilled working hours, days or shifts. A feeling of solidarity and collegiality is important to realize work schedules on the basis of a self-rostering system.

Corporate culture allows self-rostering

Introducing self-rostering is a change process. A corporate culture should have the capacity for change. If the corporate culture creates room for change, introducing a new scheduling system would be feasible.

Composition of the self-rostering group

The composition of the self-rostering group can be divided in two dimensions: a composition based on working skills and a composition based on the background of the employees (demographic backgrounds). The composition of the self-rostering group based on working skills should be homogeneous (De Leede & Peltzer, 2008). If the workforce has similar working skills they can be widely deployed. However, a self-rostering schedule will only succeed if the employees do not have similar needs and wishes. Therefore the composition of the self-rostering group based on the demographic backgrounds of the employees should be heterogeneous (VOS, 2008; Segers, 2008; Groen, 2008). People with different backgrounds will have different needs, which will make creating a closing roster easier.

2.4.2 Preconditions described by experts

In the interviews with the experts in the field of self-rostering some complementary preconditions for the feasibility of self-rostering were mentioned. The preconditions are summarized in table.

EXPERT	PRECONDITION	ELABORATION
PRECONDITIONS FEASIBILITY ACCORDING TO EXPERTS		
Segers (2008)	*All parties involved should want a self-rostering system*	If there is no support for the system, self-rostering will not work.
Groen (2008)	*Supporting IT*	The company should have supporting Information and Communication Technology to make self-rostering realizable.
	Organizational power relations	The employer should no longer be superior, but must be at the same level as the employees with who can be spoken equivalently about work rosters.
Oegema, Van de Riet, Van Nijen (2008)	*Employees should trust the management for implementing self-rostering*	Employees should trust the management that they want the best for them. Without trust, the willingness of accepting self-rostering will be low.

Table 3 Preconditions feasibility self-rostering according to experts

2.4.3 Remaining preconditions

After defining the preconditions of feasibility found in the literature and described by the experts, the list is, according to the author of this report, not yet complete. One precondition is missing; namely *the predictability of the working demand*[13]. Most of the work schedules made by a self-rostering system are created in a certain period. The working demand (the amount of work in order to estimate the capacity need) should be known or can be predicted sufficiently to be able to realize a (provisional) roster in advance.

[13] The precondition is based on the operationalization of roster problem complexity, described by Silvestro & Silvestro (2000, p. 530).

2.4.4 Preconditions to assess feasibility

1. *Strong leadership*
2. *The size of the self-rostering group*
3. *Collegiality between employees*
4. *Corporate culture allows self-rostering*
5. *The willingness of all parties involved to work with a self-rostering system*
6. *Composition of the self-rostering group*
7. *Predictability of the working demand*

2.4.5 Weighting the preconditions

The preconditions described in the previous section are listed in no particular order. To make a more concrete analysis of the feasibility of self-rostering at the IT&M department of Grolsch, the preconditions are weighted based on the perception of the experts in the field of self-rostering. The experts were asked to give their idea of importance of the defined preconditions. These ideas resulted in a weight for that particular precondition. By weighting the preconditions, an order of importance is realized, which will make the analysis more concrete[14]. The results of the weighting process are summarized in the table below. The preconditions are arranged from the highest to the lowest weight.

PRECONDITIONS	SEGERS (DEHORA, 2008)	GROEN (FNV, 2008)	OEGEMA ET AL. (NS, 2008)	OVERALL CONCLUSION
SUMMARY WEIGHTING THE PRECONDITIONS FEASIBILITY OF SELF-ROSTERING (SR)				
The willingness of all parties involved to work with a self-rostering system	++ *Very important*	++ *First feasibility factor according to expert*	++ *Very important*	 (2,00)
Strong leadership	+ *Quite important*	++ *Very important*	++ *Very important*	 (1,67)
Corporate culture allows self-rostering	+ *Success depends on the Self-rostering group*	++ *Employees should accept change*	++ *Employees accept change*	 (1,67)
The size of the self-rostering group	+ *Group should be between 15 and 80 employees*	+ *Need minimum of 5 people. Bigger? Then sub-groups*	++ *Very important*	 (1,33)
Composition of the self-rostering group	+ *Homog.:+ (not necessary, solutions for mixed skills)* *Heterog.: + (facilitate as much as possible individual preferences)*	+ *Homog.: + Makes SR easier* *Heterog.: + Makes SR easier.*	± *Homog.: - not mentioned* *Heterog.: +. The group should also be heterogeneous, because different people have different wishes*	 (0,83)

[14] This will be explained in section 3.3.2

Collegiality between employees	- *Not mentioned*	+ *Important*	+ *Important*	(0,33)
Predictability of the working demand	*0* *Not mentioned, but advice given about dealing with less insight*	*0* *Not mentioned, but advice given about dealing with less insight*	+ *SR will work easier at organization with stable demand*	(0,33)

Table 4 Summary weighting the preconditions feasibility of SR

Explanation of weighting process

Every argument the experts have given is translated into a mark. The reasoning received a '++' when they experts thought it was very important, a '+' when they thought it was important, a '±' when not every aspect was mentioned by the experts, a '0' when the reasoning was not directly given by the experts, but was indirectly described via another question and a '-' when it was not mentioned by the experts at all. Every sign received its own 'weight number'. All values were added up and dived by three, so the average was calculated. The average eventually determines the total value (the weight) of the precondition. This weight will be used when the feasibility according to the precondition is determined.

Sign	++	+	±	0	-
'Weight number'	2	1	0,5	0	-1

Table 5 'Weight number' of signs

2.5 DESIGN OF SELF-ROSTERING SYSTEM

Previous research and literature focused primarily on the *results* of self-rostering. No attention was paid to the actual design of a self-rostering system. That is why this component of self-rostering is included in this research. Several self-rostering experts were asked to give their ideas and share their experiences on designing a self-rostering system.

2.5.1 The start of the designing process

Segers (2008) advises to compile a project group. The self-rostering project group should consist of several parties. Firstly, it is advisable to include a representative of the union. Agreements that have been made with the union should be taken into consideration. Furthermore, representatives for whom self-rostering is intended should be involved when a self-rostering system is being designed. It is wise to include persons who are in favor of the new system and persons who do not like the idea. The third party that should be involved is the planner. He or she knows the preferences of the employees, knows the company rules, statutory basis and his or her responsibilities will change when introducing self-rostering.

When creating a self-rostering project group several characteristics are important:

- The members should be goal oriented. One person should be responsible for the 'goal management';
- The planner should have economical and mathematical abilities;
- A person that has a motivating and stimulating role should be included;
- Communication should be on a clear and frequent base (no hidden agenda's).

Besides the project group, the goals of the self-rostering project should be formulated. Those goals have to meet the SMART requirements: **s**pecific, **m**easurable, **a**ttainable,

relevant, **t**ime-sensitive (Loo, n.d.) Only then a clear communication between all parties concerned is possible. The goals are also used for measuring the project results afterwards.

2.5.2 The design of the system

For the design of a self-rostering system several factors should be taken into consideration. The first consideration that has to be made is which preconditions have to be met. These preconditions are set by the organization. The preconditions of the organization will define the 'borders' for the self-rostering system.

The preconditions are also influenced by laws and regulations. A law that has to be taken into consideration is the Working Hours Act *(Arbeidstijdenwet)*. In the Working Hours Act rules are included about the maximum hours a day or a week an employee is allowed to work and the extent of rest period an employee is entitled to. These rules are for the health, safety and welfare of an employee. Other regulations that have to be taken into consideration are the collective agreement and personal agreements that are already made between the employer and an employee (Segers, 2008).

A self-rostering system can be designed by formulating different possibilities of self-rostering for the organization. NS has used this technique for its own self-rostering project (Oegema, Van de Riet Van Nijen, 2008). It is also important to include those employees for who self-rostering is intended. Their input can be used for designing a self-rostering system that matches their wishes, which will also increase the support for the system (Segers, 2008). Furthermore, it is advisable to include an external party in the designing process. This party is not prejudiced and is neutral and contributes to the design of a more fair system (Groen, 2008).

Also a rostering period has to be defined. The rostering period is the period of which the employees can indicate their preferences. The exact rostering period depends on the work fluctuation. Periods of four to sixteen weeks are most commonly (Segers, 2008).

Rosters can be realized with the support of a software program. The wishes of the employees are inserted, as well as the shifts/working hours that need to be fulfilled. The software program calculates the most effective roster. An effective roster is a roster with a low penalty score; a score that arises when not all wishes of the employees can be fulfilled (Oegema et al., 2008). By completing a roster with a software program, no discussion between employees is needed. A software program is useful for large self-rostering groups because in these groups the transparency is lost.

An organization which designs a self-rostering system, should also consider the allowances of the employees. Because the working times will be strongly individualized by self-rostering, an inconvenient allowance *(onregelmatigheidstoeslag)* is applicable (Oegema et al., 2008). This can be a tool for managing labor and time. It can stimulate working on less preferable hours (Segers, 2008). However, before introducing this tool it should be clear what less preferable hours are (Groen, 2008).

Before the self-rostering system can be implemented it is advisable to discuss the rules of self-rostering. All parties concerned should know the rules of scheduling by means of self-

rostering. An information session would help create understanding for the self-rostering system and its rules. A forum discussion can be used for that (Segers, 2008)

Groen (2008) has given some additional advice that should be taken into consideration when designing a self-rostering system:

- *Take all the time you need.* By rushing the design (and implementation) employees might get the feeling that self-rostering is 'pushed' by the management and that their opinions are not important. This will negatively influence the support of the employees.
- *Think not in terms of results, but in terms of a process.* By only thinking in terms of results the actual process will be repressed, which will influence the quality (effectiveness and efficiency) of the system negatively.

2.5.3 Guidelines for designing self-rostering system

The ideas of the experts on the design of a self-rostering system lead to several guidelines. Guidelines are points that have to be taken into consideration when a self-rostering system is designed. Contrary to preconditions, guidelines do not have to be met, but are advices for realizing a self-rostering system. The guidelines (summarized in table 6) can help when an organization or a department want to design a self-rostering system.

GUIDELINE	ELABORATION
GUIDELINES FOR DESIGNING A SELF-ROSTERING SYSTEM	
Compile a project group	A project group should be compiled consisting of a representative of the union, representatives of the group for whom self-rostering is intended, a planner and a neutral external party. The author of this report thinks a representative of the management (initiators) should also be included.
SMART goals	SMART goals should be formulated, to be able to measure the results of self-rostering in the future.
Preconditions have to be met	Preconditions are set by the employer, the employees and by laws and regulations. These have to be met.
Define different scenario's	Different solutions for a self-rostering system (scenarios) should be defined in order to compare the different possibilities and choose the one that fits the best to the preconditions set by the employer. In these scenarios, the rostering period should be included and clear rules for self-rostering should be set. Also the possibility of using a software program can be included.
Individual rewarding **à** *inconvenient allowance*	Self-rostering results in individual rosters. Therefore should employees be rewarded individually by means of an inconvenient allowance

Table 6 Guidelines for designing a self-rostering system

2.6 IMPLEMENTATION OF SELF-ROSTERING

The next step after designing a self-rostering system is implementing the system. Before the system is used throughout an organization or department it is wise to start a pilot. A pilot can be used to determine the attainment of the goals set by the organization. The effectiveness of the self-rostering pilot can also be measure by the 4C's ('competence',

'commitment', 'congruence' and 'cost effectiveness') of the Harvard model (Beer, Spector, Lawrence, Mills & Walton, 1984), elaborated in section 2.3. The pilot can give an indication of the progression of the process too. However, it cannot predict behavior of *all* parties when the system is actually implemented; it is just an *indication* (Segers, 2008).

The pilot can be seen as an experiment. An experiment examines the effect of an independent variable on a dependent variable. The independent variable takes the form of an experimental stimulus, which is either present or absent (Babbie, 2007, p. 222). With the case of the pilot the *self-rostering aspect* is the *independent variable* (the cause) and the results (whether it has an effect on *the areas* the employer would like to change with self-rostering; for example sickness rates) are the *dependent variables*. Both independent and dependent variables must be operaitionalized. In order to measure the effects of the self-rostering experiment it is advisable to include a pre-test and post-test in the experiment (pilot) design.. Babbie (2007) states: *"subjects are measured in terms of a dependent variable (pretesting), exposed to a stimulus representing an independent variable, and then remeasured in terms of the dependent variable (posttesting). Any differences between the first a last measurements on the dependent variable are then attributed to the independent variable"*. Besides that, the pilot design should include an experimental group and a control group. The experimental group is the group to which a stimulus has been administered. In addition, the researches also observe the control group which does not receive the experimental stimulus (Babbie, 2007, p.223)

For the self-rostering pilot it means that information has to be gathered about the current situation of the areas (for example, the current sickness rates) for the pre-test. This can be compared to the results of the pilot (the post-test). The experimental group will use self-rostering and the control group will be scheduled according to the current way of scheduling. The use of an experimental group and a control group in a self-rostering experiment has several advantages. Firstly, the control group allows the researcher to detect any effects of the experiment itself (Babbie, 2007, p. 223). Second, by using people in the experimental group that are open to the self-rostering idea, support can be created by those in the control group who are skeptical towards self-rostering. If the experiment shows that self-rostering has a positive effect on the employees in the experimental group, it is possible that other people (people in the control group) *do* want to use self-rostering. This increases the support for the self-rostering, which will have a positive influence on the results of the project (the effectiveness).

Introducing a self-rostering system involves a *change process*. Parties involved, mainly the employees, will have to get used to a new situation. With self-rostering employees will have to get used to several aspects:

- receiving more responsibility (Segers, 2008; Oegema, Van de Riet & Van Nijen , 2008);
- start thinking as an individual *("what do I want?")* instead of following collective instructions *("you have to work according to this shift contract")* (Groen, 2008; Oegema et al., 2008);
- learning to think in opportunities (Groen, 2008).

A change process will not always run smoothly. Especially when the change influences the salary of the employees, resistance can be expected (Segers, 2008). To prevent problems the parties involved should be well informed about the meaning of the new system. It is also

advisable to introduce one change at the time (Segers, 2008) or introduce the new situation step by step (Groen, 2008).

After a period of time the organization or department has the experience of self-rostering and is getting used to the new way of creating a working roster. This period is called adaption period. The adaption time of self-rostering depends on the organization it is implemented in (Groen, 2008). Groen states that the adaption period is at least nine months to a year. Segers (2008) and Oegema, Van de Riet & Van Nijen (2008) agree with him on that matter.

From the view of the experts several guidelines can be deducted. Like the guidelines for designing a self-rostering system, the guidelines for implementing self-rostering do not have to be met, but are advices that could be taken into consideration. The guidelines deducted from the experts' view are summarized in the table below.

GUIDELINE	ELABORATION
GUIDELINES FOR IMPLEMENTING SELF-ROSTERING ACCORDING TO THE EXPERTS	
Run a pilot	With a pilot an indication of the situation when self-rostering is implemented throughout the complete department or organization can be realized and the attainment of the self-rostering goals can be assessed.
Consider 'time' and change gradually	People find it difficult to change. They have to get used to the new situation. To increase the change of success, the self-rostering system should be implemented gradually. Next to that the aspect 'time' is important. It takes some time to implement the system; nothing should be rushed. Furthermore, it takes some time before all parties involved are used to the new way of scheduling (the adaption period). An adaption period of a year is common.

Table 7 Guidelines for implementing self-rostering according to experts

Also in the literature several guidelines for implementing self-rostering were defined. The main guidelines for implementation are described in the table below.

AUTHOR	GUIDELINE QUOTE	DEDUCTED GUIDELINE
GUIDELINES FOR IMPLEMENTING SELF-ROSTERING ACCORDING TO LITERATURE		
Hoffart & Willdermood (1997)	*"(…) five factors influenced a successful outcome in all cases: (1) committee structure, (2) staff education, (3) negotiation skills, (4) development of guidelines and (5) managerial support."* (p. 42)	A committee which supports the scheduling process is advisable. Staff should know the self-rostering philosophy and should be informed about it. Negotiation skills are necessary for the employee concerned in the self-rostering system. Guidelines are needed to prevent underemployment on unpopular days, like weekends and holidays. Management should support the idea of self-rostering
Silvestro & Silvestro	*"[The managers of the wards investigated] emphasized the importance of investing in training*	Inform the employees concerned to create support.

(2000)	*every staff member on the ward to understand fully the rostering problem and to appreciate the implications of their shift allocation decision."* (p. 531)	
Wortley & Grierson-Hill (2003)	*"One of the keys to success of the trails was the positive and re-affirming attitude of ward managers. They were enthusiastic about self-rostering and believed in the process. Without strong leadership self-rostering would not be possible."* (p. 42)	As a (project) manager it is important to be enthusiastic and convincing about the potential of self-rostering.

Table 8 Conditions for implementing self-rostering from literature

The main conditions for implementing self-rostering according to the literature are:

- Supportive management
- Employees are aware of the self-rostering philosophy

Supportive management

The role of the management is important when a self-scheduling system is introduced. That has been proven in previous research: *"One of the keys to success of the trails was the positive and re-affirming attitude of ward managers. They were enthusiastic about self-rostering and believed in the process. Without strong leadership self-rostering would not be possible"* (Wortley & Grierson-Hill, 2003, p. 42). It is important that the manager understands self-rostering well (Hoffart & Willwood, 1997), so the employees get well informed and enthousiastic about the self-rostering system. They are the ones that have to convince the employees of the potential of the system.

Employees are aware of the self-rostering philosophy

To make self-rostering a success it is important to inform and/or educate all staff involved. It would influence the support of the system positively. Education reveals the program's value and decreases the possibility that staff will see [self-rostering] as a management gimmick to increase productivity (Hoffart & Willdermood, 1997, p. 45).

Guidelines for implementing self-rostering

The guidelines for implementing self-rostering at an organization or a department are summarized below:

1. *Run a pilot*
2. *Consider 'time' and change gradually*
3. *Supportive management*
4. *Employees are aware of self-rostering philosophy*

2.7 CONCEPTUAL MODEL

In this chapter several aspects are described for realizing an effective self-rostering system. Firstly the feasibility of self-rostering at an organization or a department should be assessed. If self-rostering is feasible a system can be designed. The next step is implementing the system so self-rostering can be realized. All these steps have several preconditions or guidelines in order to realize effective self-rostering. The preconditions can be translated in guidelines that can amplify or improve the feasibility of self-rostering. The process is summarized in the following conceptual model.

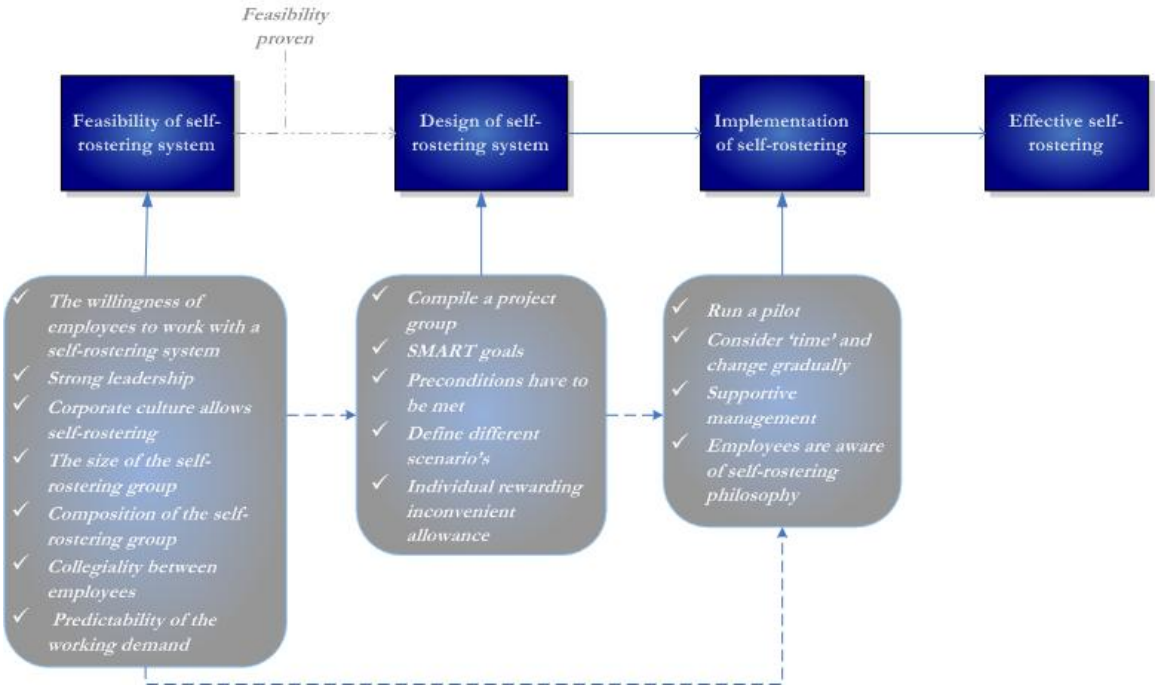


Figure 9 Conceptual model

Chapter 3

Time is our most precious asset, we should invest it wisely.
(Michael Levy)

Methodology

3.1 OPERATIONALIZATION

In order to measure the feasibility of flexible work schedules (self-rostering) at the IT&M department of Grolsch, the preconditions that are formulated in the Theoretical Framework have to be operationalized. This will be realized in this section. The preconditions will be operationalized by means of single and multiple indicators (Babbie, 2007). Interviews were conducted in order to gather information about the preconditions.[15] The preconditions that have to be operationalized are:

PRECONDITION	ELABORATION
OVERVIEW PRECONDITIONS FEASIBILITY SELF-ROSTERING	
The willingness of all parties involved to work with a self-roster system	All parties involved should support self-rostering in order to make it successful.
Strong leadership	A strong and supportive manager is needed to motivate the self-rostering group.
Corporate culture allows self-rostering	The corporate culture should support change.
The size of the self-rostering group	A large group makes scheduling complex; a small group reduces the choosing possibilities.
Composition of the self-rostering group	The composition determines the extent and difficulty of self-rostering.
Collegiality between employees	Employees should be willing to help their colleagues out in order to make a closing schedule.
Predictability of the working demand	In order to make a roster and to determine the rostering period, there must be an insight in the working demand.

Table 9 Overview preconditions feasibility self-rostering

The willingness of all parties involved to work with a self-rostering system

Self-rostering will only work if all parties are willing to work with the system. To determine the willingness the management (including the team leaders) and the employees (the forklift drivers) are asked indirectly and directly if they want to work with self-rostering. The employees are asked *indirectly* if they want more right of say about their working times by means of questions and statements. The questions and statements[16] that are formulated for the forklift drivers to measure the willingness indirectly are:

[15] For the interviews, an interview protocol with questionnaires is formulated. The interview protocol is included in appendix 2.
[16] The questions and statements mentioned in the chapter 'Methodology' are in Dutch, because all interviewees at Grolsch are Dutch.

- *"Ik zou graag meer inspraak willen hebben op de uren die ik moet werken."*
- *"Ik zou graag meer inspraak willen hebben op mijn vrije dagen."*
- *"Ik zou graag meer inspraak willen hebben op de taken die ik uit moet voeren."*
- *"Ik zou graag meer verantwoordelijkheden willen hebben"*
- *"Ik zou graag samen met mijn collega's een werkrooster willen maken."*
- Als je zou mogen kiezen uit de volgende mogelijkheden van het indelen van werktijden, waar gaat je voorkeur naar uit?:
  - Het kiezen van een dienst. Je kunt kiezen uit 3 soorten diensten (vroeg, middag of nacht).
  - Je geeft aan wanneer je *niet* kan werken. Je werkrooster wordt hier op aangepast.
  - Je geeft aan wanneer je graag zou willen werken en de planner kijkt of deze kunnen worden ingeroosterd op basis van de bezettingsbehoefte van die week.
  - De werkweek wordt variabel: de start en eindtijden variëren. *Bijvoorbeeld:* op de ene dag werk je van 10.00u tot 18.00u en de andere dag werk je van 6.00u tot 14.00u en op weer een andere dag werk je van 16.00u tot 0.00u.
  - Ik zou niet anders willen. Zoals het nu wordt gedaan vind ik prima.

Besides, both employees and team leaders are asked *directly* if they want to work with flexible work schedules:

- Zou je met flexibele werkroosters willen werken?
  - Onder welke voorwaarden wel en onder welke voorwaarden niet?

Strong leadership

The feasibility of self-rostering is determined by the strong leadership of the manager. What defines 'strong leadership'? According to Teahan (1998) important qualities of a manager are the will to share power and risk, trust the staff to manage the process and the desire to empower them. The trust measured here is trust based on competency: do the team leaders trust the forklift drivers to make an effective and closing roster? In this research these aspects are translated to questions that are asked to the team leaders. The team leaders are asked what they expect their role will be in the flexible work schedules process. This defines the *indirect* measures of strong leadership. By asking about their expected role and *interrogating*, their point of view concerning empowerment can be measured. The question (and by interrogating), that measures 'indirect' the leadership qualities of the team leaders, is:

- Hoe zie jij je rol in het flexibele werkroosters proces?

The will of the team leaders to share power and risk is asked *directly*, in which the aspect 'trust of competence' by means of interrogating has also been taken into consideration:

- Zou je de verantwoordelijkheid van het maken van roosters bij een andere functiegroep, zoals heftruckchauffeurs, willen leggen?

Corporate culture allows self-rostering

For a corporate culture to support self-rostering, thus change, it is important that it allows people to be creative. Radical ideas and risk taking should be encouraged (McEwen, Carmichael, Short & Steel, 1988). For this research managers are asked to give a description of the corporate culture of Grolsch and of the IT&M department and team leaders are asked to give a description of the corporate culture of department:

- Hoe zou u de bedrijfscultuur van Grolsch omschrijven?
- Hoe zou je de bedrijfscultuur van de afdeling IT&M beschrijven? Collegialiteit? Ruimte voor ideeën?

Also the indicators 'freedom to give ideas' and 'the extent of which ideas are appreciated' are included in the questionnaire for the forklift drivers by means of statements:

- *"Ik krijg voldoende vrijheid om eigen keuzes te maken."*
- *"Mijn ideeën voor oplossingen worden gewaardeerd."*

The size of the self-rostering group

The size of the self-rostering group determines the success of self-rostering. The group should not be too large or too small. Silvestro & Silvestro (2000) proposed a small group of fewer than 35 employees. This increases staff motivation and commitment. Moreover, a smaller group has less complex rosters so it can be fully and quickly evaluated by the manager who is responsible for signing of the roster (p. 533). Segers (2008) states that a self-rostering group should be between 15 and 80 people. Oegema, Van de Riet & Van Nijen (2008) advises a group size of at least 15 to 20 persons. For this research a group size between 15 and 40 employees will be used as an indicator for the sufficient size of the self-rostering group.

Composition of the self-rostering group

The composition of the self-rostering group exists of two dimensions: a homogeneous composition concerning working skills and a heterogeneous composition concerning the demographic background of the employees. Both dimensions can be measured by several indicators.

The homogeneous composition can be measured by looking at the working skills of the employees (the forklift drivers) of the department. The amount of work places the employees are able to fulfill is deducted from a skill matrix. At the IT&M department there are nine workplaces. The working skills are homogeneous if at least 75% of the 31 forklift drivers are able to fulfill seven work places or more.

The heterogeneous composition can be measured by looking at different indicators. Vos (2008) describes that a heterogeneous composition should exist of different ages, a good man-woman ratio (of about 1:1) and different domestic ties (one person household, a two person household with children, family without children or with children who do not live at home, single parent household). These indicators are applied to the employee information of the IT&M department.

Collegiality between employees

Collegiality and solidarity are needed in order to make a closing schedule. How do you measure 'collegiality'? According to Lubbers colleagues should be willing to work an extra hour or an hour less to get the planning closed (Lubbers 2008, p. 16). In other words, employees should be willing to help each other out when necessary in order to make a closing schedule. In this research the subordinates are asked how they feel about helping a colleague or if their colleagues are willing to help them. The statements that are used for the measurement of 'collegiality' are:

- *"Ik ben altijd bereid om mijn collega te helpen."*
- *"Mijn collega's zijn altijd bereid mij te helpen."*

The collegiality has also been measured by means of the descriptions of the IT&M department, given by the management and the team leaders.

Predictability of the working demand

In order to design a roster, an insight is needed in the working demand and the number of people that are needed for that. The predictability of the working demand will be measured by extent in which the planner can make a final roster in advance. This is realized by asking (and interrogating) the team leaders how they currently make a work schedule:

- Kun je een omschrijving geven van de wijze waarop nu werkroosters worden gemaakt?

A period of four up to sixteen weeks is most common (Segers, 2008). The predictability of the working demand is sufficient, when it can be predicted four up to sixteen weeks in advance.

Before the research started it was known that the period in which the team leaders can make a final roster was short. Therefore, the wishes of the employees (the forklift drivers) were also taken into consideration in order to find a suitable solution. The following question was asked in order to measure the wishes of the forklift drivers:

- Hoe ver van te voren zou je willen weten wanneer je moet werken?

3.2 DATA COLLECTION

To measure the preconditions, data is needed and have to be collected. Data of the IT&M department (overview of working skills and workforce data) are used for the preconditions 'the size of the self-rostering group' and 'composition of the self-rostering group'. This is used to deduct the information needed. For the other preconditions and to gauge the wishes of the possible flexible work schedules system of the parties involved interviews are conducted. Interviews are being conducted with the different groups:

- *Management.* They have initiated the flexible work schedules project for the forklift drivers at the IT&M department. In order to assess the feasibility the intentions of the initiators must be gauged. The management determines the preconditions that have to be met in the flexible work schedules system: they determine the framework in which flexible work schedules are realized. To gather more information about the intention of the flexible work schedules and to determine the preconditions interviews are conducted with the two persons who are involved with the initiation of the project.
- *Forklift drivers.* The forklift drivers are the ones for who the flexible work schedules are intended. One part of the feasibility research is the interest in flexible work schedules *and* what they would like to include in the flexible work schedules system (their wishes). Individual interviews are initiated with six forklift drivers in which the needs and/or wishes are gauged. The six forklift drivers are chosen, based on their age and type of contract (a fix contract or a seconded contract and type of shift contract). Besides that a subscription list is handed over to the team leaders, so the forklift drivers that were not questioned and want to share their opinion had the

possibility to do so. Three forklift drivers are questioned complementary to the six chosen forklift drivers.

- *Team leaders.* The team leaders are the planners, so the introduction of a self-rostering system will affect their responsibilities. What the four team leaders think of that and what their wishes are concerning self-rostering is gauged during individual interviews.

The interviews that are conducted can be qualified as 'qualitative interviews'. A qualitative interview is *"an interaction between an interviewer and a respondent in which the interviewer has a general plan of inquiry, including topics covered, but not a set of questions that must be asked with particular words and in a particular order. (…) A qualitative interview is essentiality a conversation in which the interviewer establishes a general direction for the conversation and pursues specific topics raised by the respondent"* (Babbie, 2007, p. 306). The qualitative interviews are semi structured. In this form a topic list is used, in which subjects and a preference of question order is included (Baarda, De Goede & Teunissen, 2005).

3.3 DATA ANALYSIS

3.3.1 Results interviews

The results (the answers) of the interviews are labeled (categorized): text fragments are provided with a name or another code (Baarda, De Goede & Teunissen, 2005) and filtered to a smaller text so it can be easily compared (the original quotes are used for the actual analysis in chapter 4 'Results'). Next to the different themes used for the structure of the interviews, the questions and answers are linked to the preconditions. The result is a reduction of a large amount of data to a collection of labels, which is called *open coding* (Baarda et al., 2005). The research question and sub-question 2 are the starting point when the data is analyzed.

The information from the IT&M department is compared to the preconditions 'the size of the self-rostering' and 'composition of the self-rostering group' and their indicators. This way the needed information can be deducted.

3.3.2 Measuring feasibility

The outcomes of the interviews will lead to an assessment of the feasibility of flexible work schedules at the IT&M department. To make the assessment of feasibility more concrete, a 'feasibility number' ***(F)*** will be connected. In order to calculate the feasibility number, the information gathered from the interviews and the department should be quantitative. Therefore these measurement results of the preconditions will be translated into a number ***(R)***: every precondition will receive an appraisal based on an analysis. When the precondition is negatively tested it will receive a '-'; it will receive a '±' when it is average ('not sufficient enough, but not insufficient'), and a '+' when it has a positive contribution to the feasibility of flexible work schedules. The different signs have different values: the '-' equals '-1', the '±' stands for '0' and the '+' is valued by a '1'.

The measurement results of the preconditions will be multiplied by the weight of the precondition (as explained in section 2.4.5) ***(W)*** - in which **n** stands for the number of preconditions **-,** which will result in a total appraisal of that particular precondition ***(A)***. The sum of all appraisals of the preconditions will result in a feasibility number. The feasibility

number should be positive to make flexible work schedules feasible. An overview of the calculation of the feasibility number and the corresponding formula has been visualized in figure 10.

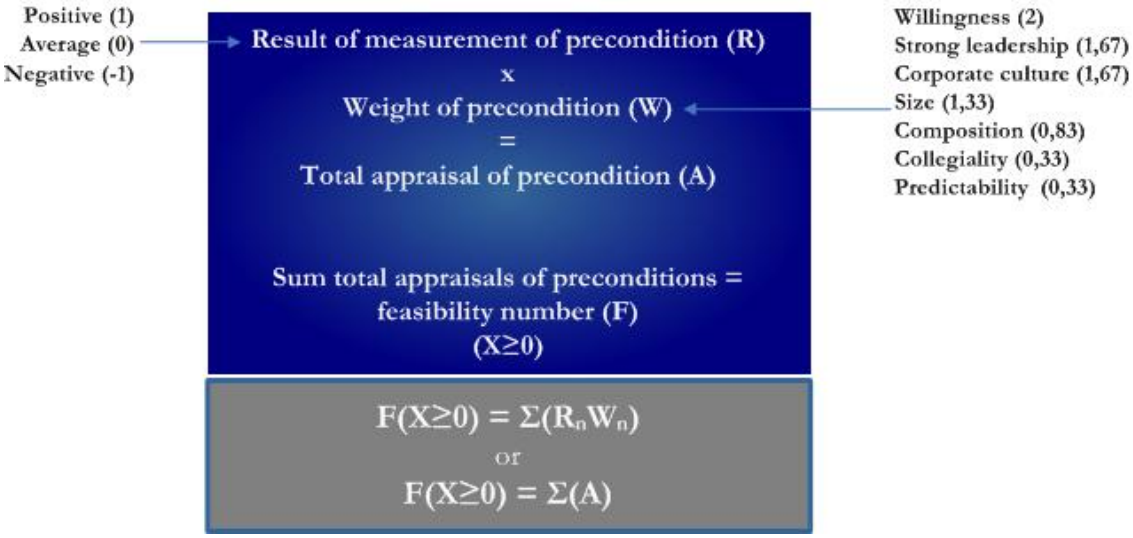


Figure 10 Formula calculation feasibility flexible work schedules

3.3.3 Project group

As Segers (2008) suggested, a project group for this research has been compiled. The project group consists of two managers, eight forklift drivers and a team leader who also is a representative of the union. The author of the report is also a part of the project group in the role of external party. The goal of the project group is to discuss the project and compare the different intentions, opinions and ideas of all the parties involved in the self-rostering project to eventually come to a solution that everyone approves.

Chapter 4

You will never 'find' time for anything. If you want time you must make it.
(Charles Buxton)

Results

The feasibility preconditions deducted from the Theoretical Framework and elaborated in Methodology can be applied as preconditions for testing the feasibility of flexible work schedules at the IT&M department of Grolsch. In order to do that, interviews were conducted with the management, the forklift drivers and the team leaders. In the interviews the parties were asked about their opinions and ideas about flexible work schedules. The results of the interviews and the analysis of the preconditions are defined in this chapter. The central question for the interviews and for this chapter is therefore:

"Are flexible work schedules feasible at the IT&M department taken the preconditions from the Theoretical Framework into consideration?"

4.1 THE WILLINGNESS OF ALL PARTIES INVOLVED TO WORK WITH A SELF-ROSTERING SYSTEM

The most important precondition to determine the feasibility is the willingness of the parties involved to work according to a self-rostering system. The willingness of a flexible work schedules system[17] is measured by means of questions that were asked to the forklift drivers and the team leaders.

4.1.1 The willingness of the forklift drivers

The willingness of the forklift drivers was tested indirectly and directly. Firstly the forklift drivers were asked about their idea of several aspects of flexible work schedules, without specifically referring to flexible work schedules. It concerned statements about the right of say about working hours, the right of say about days off, the right of say about the execution of tasks, having more responsibilities and the willingness of making a work schedule together with their colleague forklift drivers. After those statements the interviewees were asked directly about their willingness to work with flexible work schedules.

Right of say about working hours
Most forklift drivers do not want to have more right of say about working hours (56%). Most respondents value the sense of consistency and security of their current work schedule. With the current way of scheduling they know exactly what to expect and can adjust their private life to it.

The forklift drivers that do not have a clear opinion about the right of say about working hours (22%), have the opinion that they already have right of say in the working hours. If they have something privately planned during one of their shifts they can always consult with their team leader to reschedule their shift.

[17] The concept 'flexible work schedules' is used instead of self-rostering, because it is the term used by Grolsch.

Of the forklift drivers interviewed, 22% said they would like to have more right of say about their working hours. They would like to adjust their working hours in order to match their private life.

Right of say about days off
The majority of the interviewees (78%) do not want to have more right of say about their days off. Currently, the days off are partly determined by 13 flexible ATV[18]-days and 13 fixed ATV-days. According to a part of the interviewees they can consult with the team leaders if the scheduled ATV does not fit their personal schedule. They are contented with the current way of scheduling the ATV-days.

There are also forklift drivers who want more right of say about their days off (22%). They think the ATV-days are obligated and that they have no influence on it now. ATV-days are scheduled inconsistent: one week it is the Tuesday, the other week the Wednesday. Some forklift drivers find this unpleasant.

Right of say about the execution of tasks
A part of the forklift drivers (11%) say it does not matter how much influence they have on the execution of tasks. Two third of the interviewees doe not want to have more right of say about the execution of tasks. The terminal in the forklift determines the execution of the tasks. Others say that the team leaders are responsible for the 'execution' of tasks. They assign tasks to the forklift drivers. Those forklift drivers are contented with the current situation.

Those who *do* want more right of say about the execution of tasks (22%), connect the work places and the tasks that have to be done at those places. They want to have more right of say about the work places they have to work at. The forklift drivers have work places they favor and prefer to work there. Other forklift drivers in favor of more right of say about the execution of tasks do not like the idea of the terminal telling them what to do and want because of that more right of say about the execution of tasks.

More responsibility
The absolute majority (89%) does not want more responsibility besides their forklift driver responsibilities. In their opinion they already have sufficient responsibility. They have complementary tasks next to their function. A few interviewees want more responsibility (11%), because they are not content with the degree of responsibility they currently have.

Making a work schedule with colleagues
About the idea of making a work schedule with colleagues, 89% of the forklift drivers do not favor the option. The majority of this group expects that conflicts will occur between employees for the 'best' work schedule. Currently, the team leader has the upper hand in making the schedule. The forklift drivers that are not in favor would like to maintain that. This way it can be prevented that always the same persons have the best work place and working times.

[18] Reduction in working days, *arbeidstijdverkorting*

The respondents that *are* in favor of the idea of making a work schedule together (11%) think that the workplaces will be distributed more fairly. They have more influence on their own working time and work places when they make the schedule by themselves and chose the ones that best fit to their preferences.

The willingness to work with flexible work schedules (direct)
The majority of the forklift drivers (67%) does not like the idea of flexible work schedules. They prefer the current way of scheduling. A few respondents referred to it as *"already flexible"*, *"most ideal"* and *"perfect"*. Some of the respondents work a day shift and do not think flexible work schedules are possible for them and therefore do not want to work with flexible work schedules.

Those respondents who do not want to work with flexible work schedules are asked under which conditions they *do* want to schedule flexibly. A general answer was that they do not want to change under any condition, because they are satisfied with the current way of scheduling. It offers them security: the working hours are fixed, which they appreciate, and these fixed hours gives them the right of a fixed bonus in the form of a team surcharge. They do not want to give up those certainties.

One third of the interviewees are in favor of the idea of flexible work schedules. They want to work with flexible work schedules. However they set some preconditions: they want to keep the working hours they have now (the type of shift contract they already have) and the team surcharge.

4.1.2 The willingness of the team leaders

Most team leaders (75%) want to work with flexible work schedules. Nevertheless, in their opinion, the current way of scheduling is already flexible. The team leader that does not favor flexible work schedules agrees with them on that. However, the team leaders that *do* favor flexible work schedules think the current way of scheduling is complex and can be more efficient.

4.1.3 Feasibility according to precondition

The forklift drivers are asked indirectly and directly about their willingness to work with flexible work schedules. Indirectly and directly the majority of forklift drivers does not want flexible work schedules (figure 11).

This result was to be expected. The researcher asked the forklift drivers in the project group about the expected reactions of their colleagues. Their colleagues are afraid that flexible work schedules will negatively influence their team surcharge. The project group members think that when that is the case,

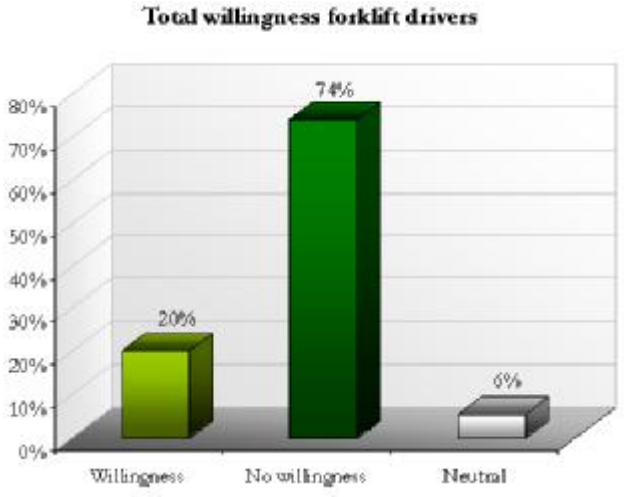


Figure 7 Total willingness of forklift drivers to work with flexible work schedules (indirect and direct willingness)

there will be no or less support for flexible work schedules. This anxiety on their financial security results in a negative attitude towards flexible work schedules. The forklift drivers do not want to change, because they are content with their current situation and thus financial security.

Another reason why they do not want to change according to the project group members is that the forklift drivers strongly appreciate the consistency of their schedules. The forklift drivers work in standard shifts with fixed hours and schedule their private life around it. They are afraid to loose this stability, which makes, according to them, combining work and private life more difficult. Some forklift drivers are also afraid that their working day will be longer, because they would have to travel during rush hours, which means that their traveling time will increase. These aspects also contribute to a negative attitude towards flexible work schedules.

A third reason why the forklift drivers do not want to change is because in the past Grolsch has changed a lot. Flexible work schedules are *"just another change"*. The need for change is not clear to them.

The team leaders, on the other hand, *are* willing to work with flexible work schedules. They see the advantages of flexible work schedules for the forklift drivers (a better work-life balance) and for themselves (more flexible and efficient scheduling), as shown by their responses on the interview questions.

When the willingness of the forklift drivers and the team leaders are combined, it becomes clear that the majority (71%) of the IT&M department do not favor the idea of flexible work schedules. Of the other interviewees of the IT&M department, 24% are willing to work with flexible work schedules and for 5% it is the same if they have to work with flexible work schedules or not.

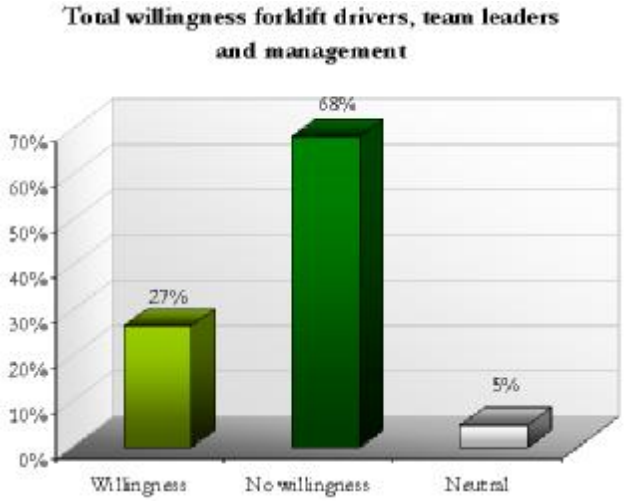


Figure 12 Total willingness IT&M department (forklift drivers, team leaders and management)

So far, in this analysis the willingness of the management has not been taken into account. For the analysis the total willingness of forklift drivers, team leaders and management is used, because the precondition says *"the willingness of **all parties** involved to work with a self-rostering system"*. When the opinion of the management is added to the total willingness – their willingness is 100% since they initiated the project –, the overall willingness increases (figure 12). However, the indirect and direct willingness of the forklift drivers and the willingness of both team leaders and management show that the majority of the interviewees do not support the idea of flexible work schedules. It can be concluded that the precondition 'willingness' is negatively tested.

4.2 STRONG LEADERSHIP

For this precondition the team leaders are the 'leaders', because their function will be directly influenced by flexible work schedules. They should have the will to share power and risk, trust the staff (the forklift drivers) to manage the process and should have the desire to empower them (Teahan, 1998). The team leaders were asked about their expected role in the flexible work schedules process and about their willingness to let the forklift drivers make the work schedule in the future.

4.2.1 Expected role in flexible work schedules process

With flexible work schedules the role of the team leader as planner will change. They will no longer be the responsible person who makes the work schedules, but will be a teacher and coach during the implementation process.

The team leaders confirm the role a 'manager' will have in a flexible work schedules process. Most of them expect that they have to support the forklift drivers when they make a work schedule by themselves. One team leader thinks he is the one that determines the capacity need and decides to hire temporary workers if the wishes of the forklift drivers do not meet the capacity need. Another team leader thinks his role as 'support' starts when the forklift drivers have difficulties with closing the schedule: the team leader has the final decision so a closing schedule is realized. One of the team leaders does not like that idea of being the arbitrator all the time. A fourth team leader thinks the role of a team leader in the flexible work schedule process is the registration of the working hours. Some team leaders said (without asking specifically) they will not have any difficulties with delegating the scheduling responsibility to the forklift drivers. They have the will to empower their 'staff'.

4.2.2 Willingness to delegate responsibility of scheduling

The team leaders were asked directly if they would like to delegate the role of planner to the group of forklift drivers. The willingness to empower the forklift drivers regarding scheduling differs: 50% *do* want to delegate the responsibility and, 50% *do not* favor the idea. It can be said that team leaders are equally distributed about the willingness to share power and risk.

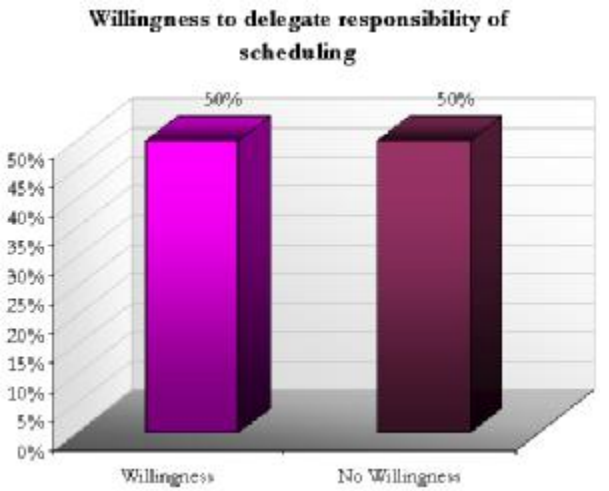


Figure 13 Willingness team leaders to delegate responsibility of scheduling

Another aspect that measures strong leadership is trust: trust concerning competency. Team leaders should trust the forklift drivers to manage the flexible work schedules process. Although they are willing to share power and risk and empower the forklift drivers, the team leaders do not trust them. The team leaders expect that there will be a struggle for the 'best' work schedule. Some forklift drivers are very dominate. Those persons will have, according to the team leaders, the best schedules. The team leaders think that always the same persons will have the 'worst'

work schedule. One team leader thinks that the forklift drivers take advantage of the situation by taking days off that are in favor of their personal life (like a Fridays and Mondays), but is negative for the employer. It can be said that the team leaders do not trust the forklift drivers because they think they are not competent enough to make a fairly and effective work schedule.

4.2.3 Feasibility according to precondition

Strong leadership is the will to share power and risks with the employees, empower them and trust the employees to manage the process. The aspects are not strongly confirmed. The willingness to share power and risk is divided. This opinion might be influenced by the fact they do not trust the forklift drivers making the work schedule on their own. This is a remarkable result, given the fact that the team leaders state that they will not have any difficulties with delegation the scheduling responsibility when there willingness was asked indirectly. It can be stated that the team leader would like to delegate the scheduling responsibility, but that they do not trust it, because they are anxious it will not result in effective work schedules (they think the forklift drivers are not competent enough in making an effective and closing work schedule). The precondition 'strong leadership', therefore, has been partly validated ('±').

4.3 CORPORATE CULTURE ALLOWS SELF-ROSTERING

For a corporate culture to support flexible work schedules it should support change. To measure that the indicators 'freedom to give ideas' and 'the extent of which ideas are appreciated' are used. Before these indicators are analyzed a description will be given of the corporate culture.

4.3.1 Corporate culture of Grolsch

The corporate culture of Grolsch is described by the management interviewees as informal and social. The company is traditionally a family business, especially when there were two establishments: one in Groenlo and one in Enschede. In the establishment at Groenlo everyone knew each other and everyone looked after each other. When the two establishments were combined this feeling decreased.

4.3.2 Corporate culture of the IT&M department

The corporate culture at the IT&M department is described as a 'we-culture' by the team leaders. However, there is a feeling of consensus of the shift groups: a shift group easily blames other shift groups for mistakes that were made.

The management describes the culture of the IT&M department as 'flexible'. The department is the last link in the total process and is depended on other departments .The flexibility of the employees of the IT&M department is a strong point. Another success factor is the solidarity with the brand. As a logistic department the employees feel responsible for delivering a qualitative good product to the customers and personally look after that.

Management and team leaders agree on the fact that the employees on the department are not change-minded. A (culture) change is therefore difficult to realize. However, the employees are always willing to cooperate.

4.3.3 Room for ideas at the IT&M department

The room for input and ideas for the employees (in this case the forklift drivers) is important for a corporate culture to support change. The forklift drivers were asked about their opinion about the freedom they have to give process improving ideas and about the extent to which they think their ideas are appreciated.

The majority of the interviewed forklift drivers (56%) agreed to have sufficient freedom to give ideas. With the execution of tasks they can propose solutions to make the task more efficient (time saving, safer, etc.).

The part of the forklift drivers that did not agree with the statement (44%) said they are restricted to what the terminal told them to do. Also the team leaders decide which tasks have to be done and by whom. These forklift drivers had the idea that they do not have any influence.

Of the forklift drivers interviewed, the majority (78%) believes that the ideas that are given are appreciated by the management and the team leaders. Most ideas are put forward on own initiative by the forklift drivers. Ideas are also stimulated, according to the team leaders. The team leaders are always open for new ideas. Ideas can also be given in the work meetings. However, not all ideas are used. It depends on the priority of the idea, according to the team leaders. Not every forklift driver appreciates that. The interviewees that did not agreed with the sufficient appreciation of ideas (22%) had this opinion, because they had the feeling their ideas were not used.

4.3.4 Feasibility according to precondition

Flexible work schedules mean change on the IT&M department. To realize this change the corporate culture should support that. Radical ideas should be stimulated. There is sufficient room for process improving ideas, think 64% of the forklift drivers and team leaders (figure 14). Ideas are stimulated by the team leaders, but most ideas are put forward on own initiative. The ideas and solutions that are used by the management and team leaders lead to a more efficient progress of the process. Thus, it can be said that the corporate culture at the IT&M department supports change (and flexible work schedules).
However, this result is remarkable given the fact the team leaders and management agree that the

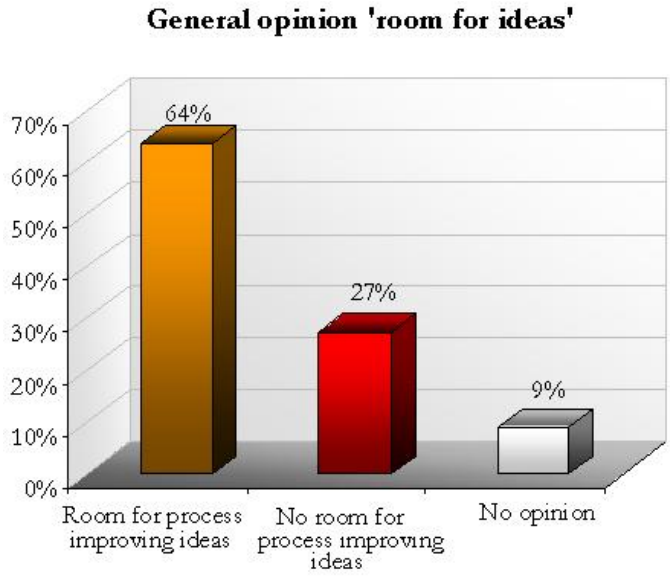


Figure 14 Room for ideas according to forklift drivers and team leaders

employees of the IT&M department are not change minded. This can be explained. Change is a natural reaction of a human being. As Piderit (2000) quotes *"the most prevalent way of analyzing resistance is to see it as a reactive process where agents embedded in power relations actively oppose initiatives by other agents"* (p. 784). Changes at the IT&M department are mostly initiated by the management (higher power agents). It can be said that the initial reaction of the employees on these change ideas is resistance. They do not want to change. Nevertheless, the forklift drivers are always willing to cooperate. Thus, they resist change, but are open to give their opinion and ideas to *support* the *change process*. This kind of room for ideas (process supporting ideas) supports the positive contribution of corporate culture to the feasibility of flexible work schedules.

4.4 THE SIZE OF THE SELF-ROSTERING GROUP

A part of the feasibility of flexible work schedules is determined by the size of the flexible work schedule group (the self-rostering group). The flexible work schedules group consists of the persons for whom flexible work schedules are intended. In this case the flexible work schedule group consists of the forklift drivers at the IT&M department. The IT&M department has 31 forklift drivers that are the fixed base of the workforce[19]. As described in the Methodology part, the size of the flexible work schedules group is sufficient when the amount of members lie between 15 and 40 employees. Thus, the flexible work schedule group at the IT&M department has a sufficient size.

4.5 COMPOSITION OF THE SELF-ROSTERING GROUP

The composition of the flexible work schedules group (self-rostering group) exists of two dimensions: one dimension based on skills (that should be homogeneous) and one dimension based on life cycle phase/background (which should be heterogeneous). The two different dimensions 'homogeneous' and 'heterogeneous' will be studied in the next two sub-sections.

4.5.1 Homogeneity of flexible work schedules group

According to De Leede & Peltzer (2008) a flexible work schedules group should be homogeneous based on the skills the group members have. Homogeneous work skills are easier to deploy and therefore support making a closed work schedule more effortlessly. In chapter 3 'Methodology' it is stated that the homogeneous composition can be measured by looking at the amount work places the employees can be deducted.

The department IT&M has nine workplaces. Grolsch states that the forklift drivers at the IT&M department should at least govern seven work places. In August 2008 71% of the forklift drivers govern at least seven work places[20]. This result does not meet the requirement that was set in the Methodology part. In that chapter it was stated that at least 75% of the 31 forklift drivers should govern seven workplaces or more. Currently, this indicator does not meet the requirement of the precondition.

[19] Sometimes the operations require more forklift drivers. When there is a shortage temporary workers are hired. The temporary workers are not included in the analysis.
[20] An overview of work place control, prepared by Grolsch (in Dutch) can be found in Appendix 2.

4.5.2 Heterogeneity of flexible work schedules group

According to Vos (2008) a heterogeneous self-rostering group consists of different ages, a good man-woman ratio (of about 1:1) and different domestic ties. The heterogeneity of flexible work schedules group is analyzed based on those indicators.

Age

As shown in figure 15, the flexible work schedules group at the IT&M department consists of several age groups: younger than thirty years old, between thirty and younger than forty years old, between forty and younger than fifty years old and fifty years old and older. However, the majority of the flexible work schedules group (>50%) is older than fifty. It thus can be said that the requirement of different ages has been met, but that it is not a strong confirmation taken into account the large number of persons older than fifty years old.

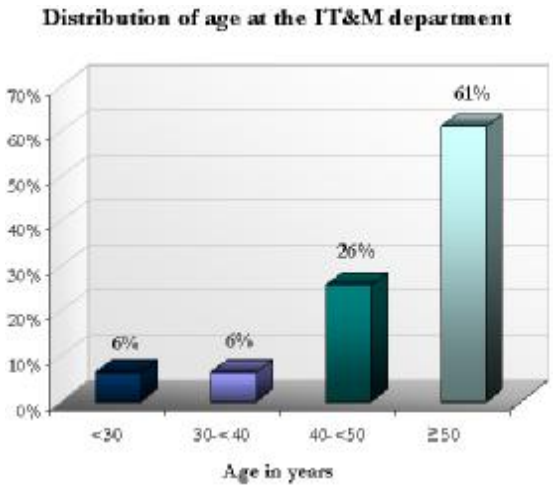


Figure 15 Distribution of age of forklift drivers at the IT&M department

Man-woman ratio

The ratio man-woman is insufficient at the IT&M department. All forklift drivers are men. In the past there were female forklift drivers at the IT&M department. However, the skewed man-woman ratio then (there was only one female forklift driver) led to problems. Until there is a near equal man-woman ratio is realized, there will be only male forklift drivers at the IT&M department.

Different domestic ties

The third indicator of heterogeneity of a flexible work schedules group is the different domestic ties within the group. Domestic ties define the different compositions of the households the forklift drivers are in. Each domestic tie has different needs. A distinction has been made between 'single household', 'two person household without children/children living away from home, 'two person household with children living at home' and 'single parents with children living at home'. [21]

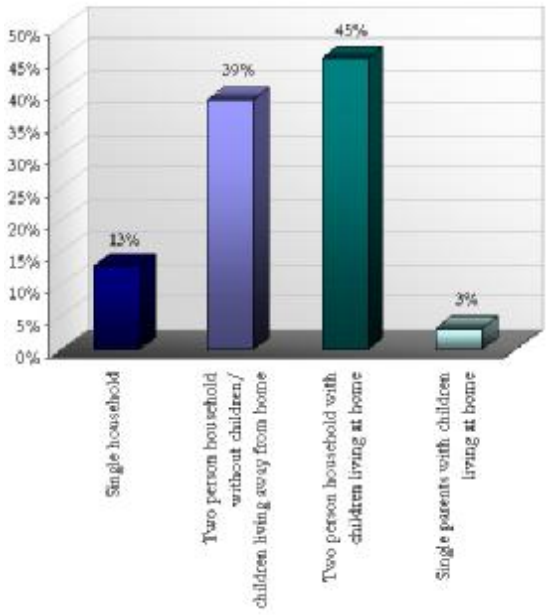


Figure 16 Distribution of domestic ties forklift drivers at IT&M department

As shown in figure 16 there is a sufficient distribution of domestic ties. Although the

[21] This indication is being used by the *Centraal Bureau voor de statistiek (CBS)*: http://www.cbs.nl/nl-NL/menu/methoden/begrippen/default.htm?ConceptID=610

distribution of age is more focused (most people are fifty years old or older), the domestic ties are more spread. This will positively influence the feasibility of flexible work schedules.

4.5.3 Feasibility according to precondition

The composition of the flexible work schedules group is sufficient when it has a homogeneous composition based on working skills and a heterogeneous composition based on the backgrounds of the forklift drivers.

Currently, the homogeneity of the working skills at the department is insufficient. The insufficiency can be explained. Recently, a few forklift drivers are added to the fixed workforce of forklift drivers at the IT&M department. They still have to develop themselves in order to fulfill more workplaces. The capability of fulfilling more workplaces and therefore increasing the percentage will be realized in the future. Next to that a few forklift drivers that were already included in the fixed workforce of forklift drivers are in a schooling project in order to fulfill more workplaces. This will also have a positive influence on the homogeneity of the working skills. Thus, the homogeneity is currently insufficient, but will be sufficient in the future if the fixed workforce stays the same.

The heterogeneity of the flexible work schedules group is not strongly confirmed. The department has different ages, but the majority is older than fifty. Also the man-women ratio is not sufficient, because all forklift drivers are men. However, this aspect will not be taken into account very strongly, because Grolsch does not see the low ratio as a problem. According to Grolsch, a workforce with only male employees can also have different needs concerning working times. The third aspect of a heterogeneous composition, the distribution of the domestic ties, has been confirmed, because the flexible work schedules group consists of various compositions of households.

The overall conclusion is that the composition of the flexible work schedules group is currently not adequate enough (but not insufficient, so'±'). The heterogeneity may improve in the future when the group of employees older than fifty retire and are replaced by younger forklift drivers. It can also improve when those 'new' forklift drivers are female. However an increase of female forklift drives is not realistic: given the problematic experiences in the past with female forklift drivers, the chance it will occur is small. In the future when the homogeneity and the heterogeneity of the composition of the flexible work schedules group improve, the precondition will be sufficient assessed.

4.6 COLLEGIALITY BETWEEN EMPLOYEES

Collegiality is the willingness to help a colleague out when he or she asks for that (Lubbers, 2008). The forklift drivers, the team leaders and the management are asked about their opinion of the collegiality on the IT&M department.

4.6.1 Collegiality according to forklift drivers

The collegiality according to the forklift drivers have been measured by asking them how they feel about helping a colleague and if their colleagues are willing to help them too. All forklift drivers asked agreed that they are willing to help their colleague. The reason of help differs. Most forklift drivers help to prevent problems in the progress of the operations. One forklift driver said he helps for collegiality reasons:

"One should positively associate with the colleagues. Every person is a colleague, regardless if the person has a fixed contract or is a temporary worker. Good cooperation is important."

The kind of help they offer differs too. Most interviewees are willing to shift shifts when that is more convenient for the other forklift driver. Others help by assisting the forklift driver with his task.

Of the forklift drivers interviewed 89% thinks their colleague is always willing to help them. The other forklift drivers (11%) think that it depends on the person if he wants to help. Overall it can be said that the forklift drivers assess the collegiality as 'sufficient'.

4.6.2 Collegiality according to team leaders

According to the team leaders there is a feeling of collegiately among the forklift drivers. They will do a lot for each other. However, as discussed earlier, there is a difference between shift groups. They easily point at other groups when problems arise. There are also some forklift drivers who see that work has to be done (work that was not scheduled), but leave that to other colleagues. Nevertheless, the overall impression of the team leaders is that people are fraternal and are willing to shift shifts or support a colleague whenever they are asked.

4.6.3 Collegiality according to management

The management supports the opinion of the team leaders. They also think the forklift drivers of the IT&M department do a lot for each other. The forklift drivers are very flexible when they need to be. It is never a problem to shift shifts. Also towards the IT&M department the forklift drivers are fraternal and flexible. If they are asked to work weekends they will to help the department out.

4.6.4 Feasibility according to precondition

The overall conclusion is that there is a feeling of collegiality at the IT&M department. The forklift drivers are willing to help their colleague out when that is necessary. This is required for flexible work schedules, because it will make a closing work schedule more easily. Currently, the forklift drivers are willing to shift shifts to help a colleague and the department. This willingness will come at hand if the IT&M department decides to introduce flexible work schedules.

4.7 PREDICTABILITY OF THE WORKING DEMAND

The predictability of the working demand will help determine the rostering period when flexible work schedules are introduced. The planners (the team leaders) were asked to give a description of the way they currently make work schedules and to give an indication of the period in which the work schedule becomes final. Also the forklift drivers were asked about the rostering period. They were asked how much in advance they want to know when they have to work.

4.7.1 Predictability of the working demand according to team leaders

The capacity need depends on the working demand. The working demand in its turn depends on action reports, export cargos, production planning and empty goods. Most of these factors are planned in advance, but are ad hoc revisited. The production planning, for

example, is final only five days in advance. Therefore it is, according to the team leaders, difficult to predict the working demand more than a week ahead. The forklift drivers receive every year an overview of the shifts they have to work. The exact work place they have to fulfill can only be scheduled a week in advance.

4.7.2 The opinion of the forklift drivers concerning predictability of the working demand

The forklift drivers were asked about their opinion of their current rostering period. They all had the same opinion: the way the work schedules are announced now is sufficient. The forklift drivers prefer to receive the working times a year ahead, so they can adjust their private obligations to that. The schedule of the fulfillment of work places should be announced a week ahead. Some workplaces could take longer than eight hours. If the forklift driver knows this a week ahead, he can take that into account. The forklift drivers do not want another rostering period.

4.7.3 Feasibility according to precondition

The precondition 'predictability of the working demand' was defined to assess the rostering period. Segers (2008) stated that a rostering period of four up to sixteen weeks is most common and thus sufficient for flexible work schedules. For the IT&M department the rostering period is only a week. The forklift drivers do not want a larger rostering period. For them the current rostering period is sufficient. However, for flexible work schedules the current rostering period is insufficient.

4.8 FEASIBILITY OF FLEXIBLE WORK SCHEDULES AT IT&M DEPARTMENT

The following table shows the results of the feasibility study:

PRECONDITIONS	RESULT	WEIGHT NUMBERS	TOTAL	OVERALL RESULT
FEASIBILITY OF FLEXIBLE WORK SCHEDULES				
The willingness of all parties involved to work with a self-rostering system	-	 (2.00)	**-2**	
Strong leadership	±	 (1.67)	**0**	
Corporate culture allows self-rostering	+	 (1.67)	**1.67**	
The size of the self-rostering group	+	 (1.33)	**1.33**	

Composition of the self-rostering group	±	 (0.83)	**0**	
Collegiality between employees	+	 (0.33)	**0.33**	
Predictability of the working demand	-	 (0.33)	**-0.33**	
				1.00

Table 10 Feasibility of flexible work schedules (X>0)

The second column of table 10 shows the results of the analysis of the precondition. Like explained in section 3.3.2 every sign has got its own value (table 11). These results of the measurement of the preconditions, combined with the 'weight numbers' of the preconditions are needed to give an indication of the feasibility of flexible work schedules at the IT&M department of Grolsch. In order to give a conclusion of the feasibility, the feasibility number has to be calculated. In section 3.3.2 a formula is created in order to calculate this feasibility number

Sign	-	±	+
Value	-1	0	1

Table 11 Values of sign connected to analysis preconditions

$$F(X \geq 0) = \Sigma(R_n W_n),$$

in which *R* stands for the result of the measurement of the precondition (second column table 10), the *W* stands for the weight of the precondition, the $_n$ for the number of preconditions and *F* for the feasibility number which makes it possible to give a judgment of the feasibility. When the formula is applied to the measurement results of Grolsch the feasibility number '**1.00**' arises. As stated the feasibility number must be positive in order to make flexible work schedules feasible. The overall result is bigger than 0 (it is positive), so it can be concluded that flexible work schedules ***are feasible*** at the IT&M department.

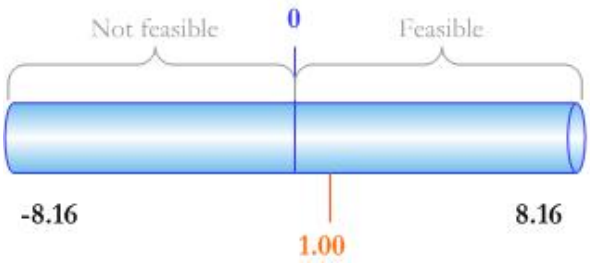


Figure 17 Score of feasibility IT&M department on scale minimum and maximum score feasibility

However, the feasibility has not been strongly confirmed. If the feasibility test was tested maximal, the score would be 8.16. If the feasibility was tested most negative, the score would be -8.16. The score of the IT&M department is 1.00 and is therefore just slightly closer to the maximum feasibility.

Until now, only a provisional conclusion can be made about the feasibility of flexible work schedules at the IT&M department. Flexible work schedules are, based on the preconditions, feasible, but that is not strongly confirmed. Only when several preconditions are improved or amplified the feasibility of flexible work schedules will be convincingly confirmed. In the next chapters advices are given to realize that.

Chapter 5

Make use of time, let not advantage slip
(William Shakespeare)

Design

In the previous chapter it is concluded that flexible work schedules are, although limited, feasible at the IT&M department of Grolsch. However, the feasibility was not strongly confirmed. Therefore the possible flexible work schedules systems (scenarios) that are designed in this chapter will have an extra purpose. Several scenarios will be designed and applied to historical data, so a comparison can be made with the realized work schedules. By visualizing the flexible work schedules system the IT&M department, in particular the forklift drivers, will have a better idea of the possibilities (and consequences) of the new scheduling system. This could eventually contribute to a more positive feasibility number. The project group will choose one of the scenarios's that best suits the demand of Grolsch and the wishes of the forklift drivers. For the chosen flexible work schedules system an implementation advice will be given.

The current way of scheduling is included in appendix 4. The current way of scheduling will come at hand when the scenarios are designed, given the fact that not every forklift driver would like to cooperate in a flexible work schedules system. The scenarios are designed together with the goals and framework conditions set by the management and the wishes of all parties involved. In order to realize that a 'meet-must-may be'- model is created that will be taken into consideration when the scenarios are designed. To realize the defined structure of the chapter 'Design' the following sub-questions are formulated:

"What are the different scenarios (possibilities) of flexible work schedules at the IT&M department based on the wishes, goals and framework conditions set by the employer (Grolsch) and the wishes of the employees (the forklift drivers and the team leaders)?"

and

"Which scenario should be introduced at the IT&M department and how should Grolsch implement this flexible work schedules system?"

5.1 ASPECTS FOR THE DESIGN PROCESS OF THE SYSTEM

The interviews that have been conducted at the IT&M department are not only used to assess the feasibility of flexible work schedules. They are also used to gauge the goals, framework conditions and wishes of Grolsch and the wishes of the forklift drivers and the team leaders concerning a flexible work schedules system. These aspects have to be taken into consideration when the scenarios are designed. The results of the interviews concerning goals, framework conditions and wishes are elaborated in the next sections.

5.1.1 Goals flexible work schedules of Grolsch

The management has initiated flexible work schedules to achieve some goals which will positively influence the process at the IT&M department. The goals Grolsch want to achieve

are enhanced flexibility, increased productivity and improved efficiency. The goals are needed for the design and implementation of the flexible work schedules system.

Enhanced flexibility
As described in section 2.2.1 flexibility exists in two forms: social flexibility and economical flexibility. With flexible work schedules Grolsch want to achieve both. They want to introduce flexible work schedules mainly to realize social flexibility. Grolsch want to give their employees (the forklift drivers) the opportunity to combine their personal life with their working life. Currently, the forklift drivers adjust their personal life to their working life, but with flexible work schedules the forklift drivers can adapt their working life to their personal life. By giving the employees more control over their working time, the motivation will increase, which will contribute to keeping the employees healthy at work up to their retirement.

Secondly, Grolsch also wants to realize economical flexibility. Grolsch is looking for a solution to adjust the capacity need easier to the demand from the market (the working demand) and have found the solution in flexible work schedules.

Increased productivity
Grolsch want to increase the productivity at the IT&M department by giving the forklift drivers more right of say about their working times. By giving the forklift drivers more influence on their working times a feeling of responsibility will arise. This feeling of responsibility will be translated in the work forklift drivers execute. Because they feel responsible for their own created roster, they will feel more responsible for their work. With (collective) shift rosters it is easy to blame others for mistakes that are made. With more individualized rosters this is difficult to do. Therefore a stronger feeling of responsibility for their work will originate, which, hopefully, will lead to an increase of the productivity.

Improved efficiency
Currently, the IT&M department of Grolsch is deployed by means of several shift contracts. Especially working in a three or two shift is inefficient. The working demand is spread over the three or two shifts, which means it is possible that there is too much or too little work for everyone in that shift. By working with flexible work schedules, the number of human resources can be adapted more precisely to the working demand. Human resources are thus used more efficiently with flexible work schedules.

5.1.2 Framework conditions set by Grolsch

Like described in the theoretical framework "*[flexible work schedules are] a system where (1) an employer creates a framework based on the organizational requirements in which (2) employees can indicate their preferences concerning working hours, working days or shifts, that, (3) by means of an authorized scheduling group or individual, (4) and possibly with the support of computer software and/or after a compromising dialogue between employees, (5) results in work schedules where the needs of the employee and the demands of the employer converge.*" In this section the first part - (1) - of the definition will be described. The framework is needed to define the 'boundaries' in which the flexible work schedules can be realized. In the interviews that were conducted at the IT&M department the management was asked to define these boundaries (framework conditions). They defined several conditions. A distinction is made between 'hard' boundaries and 'soft' boundaries. Hard boundaries are those boundaries that concern the *organization* and *management* of flexible

work schedules. The soft boundaries define the secondary aspects, but are not less important.

Hard boundaries
The first condition is that the flexible work schedules must meet the working demand sufficiently. The working demand will be the base on which the flexible work schedules will be realized. It determines the capacity needs, thus the boundaries in which the forklift drivers can indicate their working time preferences.

Not only is the working demand important according to Grolsch. The interests and aspirations of the employees are important too. The flexible work schedules also need to fit the wishes of the forklift drivers and team leaders. Their needs need to be taken into consideration when the flexible work schedules system is designed and when the actual work schedules are realized.

In the flexible work schedules system the work places need to be included. They define the work on the IT&M department and define the fulfillment of the capacity need. Furthermore, the current system of the IT&M department should be maintained. The IT&M department is currently managed by a system that organizes the tasks the forklift drivers need to execute.

Besides that the flexible work schedules process needs to be manageable. The consequence of flexible work schedules is that it increases the aspects that need to be taken into consideration when creating a work schedule. These aspects need to be manageable without increasing the workload of the team leaders.

With the realization of work schedules made by the flexible work schedules system, several boundaries are set by collective agreements or by laws. Agreements made in the collective labor agreement (in Dutch *CAO*) need to be taken into consideration. Also the Working Hours Act defines the boundaries in which flexible work schedules are realized. These external defined boundaries need to be taken into account according to the management.

Soft boundaries
The first soft boundary is that the scheduling process by means of flexible work schedules is fair: everyone should have the same chance for a 'good' roster. What defines 'good' depends on the personal wishes of the forklift drivers.

The last condition that needs to be taken into consideration is the biological clock of the employees. With flexible work schedules the work schedules of the forklift drivers will be less stabile. This may not influence the performance of the forklift driver. To keep the forklift driver healthy and alert the biological clock needs to be taken into consideration.

5.1.3 Considering wishes of all parties involved

In the interviews the management, team leaders and forklift drivers were asked about their wishes concerning a possible flexible work schedules system. These wishes are taken into account when a flexible work schedules system is designed. The wishes of all parties involved are elaborated in the following sub-sections.

Wishes forklift drivers

The forklift drivers were asked about their ideal way of scheduling shifts: everything was possible; there were no boundaries. Most interviewees described the current way of scheduling. Some forklift drivers would like to work four days of nine hours, for different personal reasons. This wish was also confirmed in the second project group meeting. It was discussed that four work days of nine hours was acceptable. Working days of twelve hours were unacceptable because it would negatively influence the quality of the work done and the safety. A forklift driver has indicated that he would like to work only in the afternoon shift.

In the first project group meeting also ideas for possible flexible work schedules systems were discussed. One project member suggested that just a few forklift drivers per shift could schedule flexibly. The other employees of that shift work according the 'common' working times of that shift. The 'flexible' employees could always be the same persons, or they can rotate with others in that shift.

The last question that was presented to the forklift drivers concerned a question to gauge what has to be taken into consideration when flexible work schedules are introduced. Most forklift drivers would like to maintain their team surcharge and the ATV-days. Some indicated that they would like to have a fixed ATV-day, because the day the forklift drivers have a mandatory day off differs every time. Others indicated they would like to have more right of say about the fulfillment of the work places. Some say that forklift drivers should fulfill those work places that they perform very well.

Wishes team leaders

The team leaders were asked about what they think could change on the IT&M department. Several team leaders indicated that they were not content with the current cargo planning and production planning. These kinds of planning changes a lot, which leads to difficulties in meeting the working demand with the scheduled capacity. They would like to enhance the flexibility on the department, to meet the ever changing working demand. Others would like to improve the communication between production planning department, the cargo planning department and the IT&M department, so the working demand is more fixed.

They were also asked to give a description of their ideal way of scheduling. One team leader described an option. In this option a blank planning was the basis. On the blank planning the forklift drivers could indicate *when* they would like to work and at *which* work place. Another team leader would like to have a clear planning on which the exact capacity need can be adjusted. The team leader would like to adjust the capacity need precisely to the flexible working demand: he would like to have to possibility of a flexible work week in which the start and ending times are variable. One team leader would like to cope with the flexible working demand concerning export cargo by means of expending the period for preparing and loading the freight. This way arrears are prevented. The fourth team leader would like to use Rostar Flex for realizing flexible work schedules. Wish-lists of the forklift drivers should be inserted in the software program of which a working schedule can be made. The system should also rotate the forklift drivers to several working places automatically. Shifted day shifts should be accomplished by temporary workers.

Aspects that have to be taken into consideration when flexible work schedules are introduced are, according to the team leaders, retaining the ATV-days, rotation of the work places, more flexibility so less temporary workers are needed and the support of an IT-system so all the wishes of the forklift drivers could be taken into consideration.

Wishes management
The management was asked which aspects they would like to see included in the flexible work schedules system. They state that they would like to have an effective work schedule in which there is (1) a clear insight in the working demand and (2) fits the wishes of the employees. Furthermore, the skills of the forklift drivers should be taken into consideration. Every forklift driver should be able to fulfill all workplaces so rotation can be realized and working skills are maintained.

Also suggestions were given by the management for possible flexible work schedules. The management would like to have a flexible work schedule system that is based on fixed shifts. These shifts exist of several blocks: each block has got its own starting and ending time. The forklift drivers can enroll themselves for the various blocks, four to three months in advance. Two weeks in advance the work schedule becomes final. This way the team leaders can adjust the capacity more precisely to the flexible working demand. The team leader will always have the final decision.

5.2 POSSIBLE FLEXIBLE WORK SCHEDULES: SCENARIOS

5.2.1 Applying guidelines for designing flexible work schedules system

In the Theoretical Framework the guidelines for designing a flexible work schedule system (self-rostering system) are defined (section 2.5.3.). In this section the guidelines will be applied to the situation at the IT&M department.

Compile a project group
As described in the chapter 'Methodology' (section 3.3.3) a project group has been compiled which consists of forklift drivers, a team leader (who is also a representative of the union), management member (the initiators) and a student of University of Twente (author of the report as the external party). The purposes of the project group are to discuss results and generate ideas for the flexible work schedules project. This guideline has already been accomplished.

SMART goals
In section 5.1 the goals of the flexible work schedules project at Grolsch are defined. These goals, however, are broad described. As described the goals should be SMART. Therefore the goals described should be made specific, measurable, attainable, relevant and time-sensitive. In the following sub-sections advices will be given of possible SMART goals.

Enhanced flexibility
Grolsch could measure the social flexibility. Do the forklift drivers experience any difference with flexible work schedules personally? The SMART goal of enhanced flexibility could therefore be: *one year after introducing flexible work schedules 75% of the forklift drivers that work with flexible work schedules are satisfied with their social flexibility.*

Grolsch could measure the economical flexibility by means of the number of forklift drivers that wants to work with flexible work schedules and therefore can be deployed flexibly. This way the capacity can easier be adjusted to the flexible working demand, so the more forklift drivers want to work with flexible work schedules, the more flexible the capacity can be adjusted to the working demand. After all, Grolsch stresses that flexible working schedules are based on voluntary participation. The SMART goal for economical flexibility therefore could be: *the amount of forklift drivers that work with flexible work schedules one year after introducing the system is 50% of the workforce*.

Increased productivity
The increased productivity Grolsch wants to measure by looking at the time needed for a work place a month. With flexible work schedules the productivity should increase, so the amount of hours needed for a work place should decrease. The SMART goal for 'increased productivity' could be: *the average number of hours that are spend on a work place a month should decrease with 3% one year after flexible work schedules are introduced.*

Improved efficiency
The improved efficiency is measured by means of the amount of hired temporary workers. When the fixed workforce is used more efficiently the number of hired temporary workers should decrease. The SMART goal could be formulated as: *the number of hired temporary workers (exclusive seconded workers) should decrease with 5% one year after flexible work schedules are introduced.*

Preconditions have to be met
Based on the goals, framework conditions and wishes of the forklift drivers, team leaders and management, several aspects can be defined, which can be used as 'preconditions' for developing flexible work schedules at the IT&M department. These preconditions are visualized in figure 18. The model consists of three parts:

- a **meet** part. This defines the goals that are set and have to be *met* by means of flexible work schedules;
- a **must** part. These are the framework conditions that *must* be taken into consideration, because they define the boundaries of the framework of flexible work schedules at the IT&M department;
- a **may be** part. The 'may be'-part exists of the wishes of all parties involved. They are considered when the scenarios are designed and *may be* included in (one of) possible the flexible work schedules system(s).

Figure 18 Aspects for designing flexible work schedules system at IT&M department

Individual rewarding

Currently, every forklift driver receives a team surcharge. The value of the surcharge depends on the kind of shift contract he is working to. This is a collective rewarding. However, when flexible work schedules are introduced, the work schedules of the forklift drivers become more individualized. An individualized reward system would be more appropriate. Grolsch is developing a clock hours matrix (*klokurenmatrix*) that can be used for realizing individual rewarding. In the developing process of the clock hours matrix the aspect of stimulating forklift drivers to work on less preferable hours could be taken into consideration (Groen, 2008): working on hours that are less preferable can be rewarded with a higher bonus percentage. In order to realize that, it must be defined what is understood by 'less preferable hours'. Nevertheless, the clock hours matrix has not been developed for flexible work schedules. It is a system Grolsch wants to use throughout the organization and is independent of flexible work schedules.

Define different scenarios

The last guideline of designing a flexible work schedules system is designing different possibilities of flexible work schedules: scenarios. This is accomplished in the next section.

5.2.2 Scenarios

In this section two scenarios are defined. The scenarios are designed based on ideas from the management (scenario 1) and the forklift drivers and team leaders (scenario 2).

Scenario 1: variable work week realized by a 'blocks schedule'

In the first scenario the different shifts are dived in different blocks. Every block has got its own working times[22]. The forklift drivers keep their yearly working times schedule, so they keep their regular shift. The forklift drivers can indicate their favorite blocks for the shifts in which they are classified. So if a forklift driver has a morning shift in a particular week, he can choose block 1, 2, 3 or 4 of the morning shift. The indication can be realized based on a planning board. The team leaders will make an indication of the capacity need per block for the rostering period, based on the working demand. The forklift drivers can 'enroll' themselves for the available blocks they prefer.

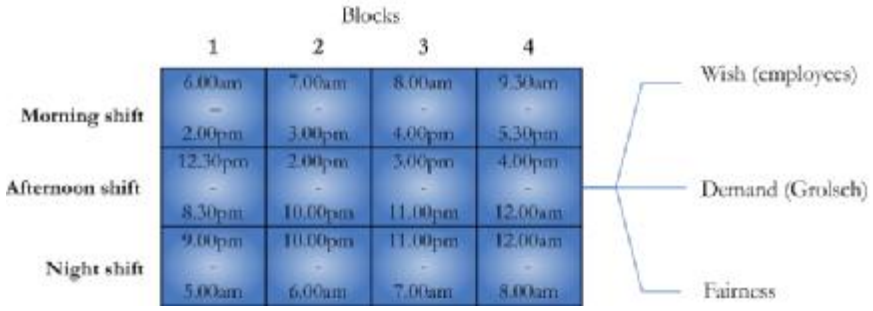


Figure 8 Scenario 1: Blocks schedule

Preconditions 'meet, must and may be'- model

Does this scenario meet the aspects for designing a flexible work schedules system at the IT&M department?

Meet: goals

With the blocks a variable working week is realized, which can adjust the capacity need to the flexible working demand (economical flexibility). With that, also efficiency is realized. By means of the 'blocks schedule' the forklift drivers are able to adjust their work to their personal needs, thus social flexibility is realized. However, social flexibility is limited realized. The forklift drivers still depend on the shift in which they are classified in. With this scenario, more individualized rosters are realized. As described before, this could increase the productivity.

Must: framework conditions

As explained, this scenario meets the working demand and the interest and aspiration of the forklift drivers. Because the current way of scheduling is maintained, the work places and systems are the same. Also the basic working time arrangements stay the same. Therefore it can be said that the labor agreements and laws concerning working times are not violated and the biological clock will not be negatively influenced.

The system will be more complex than the current way of scheduling, because the preferences of the forklift drivers have to be taken into consideration and compromises have to be found to make the work schedules closed. The process is still manageable, but will be more complex. When this scenario is chosen rules has to be developed to make the process fair.

May be: wishes

In this scenario the team leader has the final decision. The complexity can be decreased by using information technology (for example the current used system 'Rostar Flex').

[22] The scenario is based on an eight hour work day.

Scenario 2: Fixed and flexible working times

The second scenario (figure 20) is based on aspects of the previous scenario, but is supplemented with wishes and ideas of forklift drivers and team leaders.

Figure 20 Scenario 2: fixed and flexible working times

The aspect is the blocks structure of the first scenario and is supplemented with the idea that not all forklift drivers want to work with flexible work schedules. Forklift drivers that do not want to work with flexible work schedules can stay in the shift they are classified in. These forklift drivers are called the 'fixed group'. The forklift drivers that *do* want to work with flexible work schedules have the possibility to choose. Which blocks they can choose from depends on the working demand and capacity need which is determined by the team leader. The flexible blocks determine the working times[23] of the forklift driver.

Preconditions 'meet, must and may be'- model

Meet: goals

Flexibility is realized by means of the flexible blocks, so the capacity can easily be adjusted to the flexible working demand and the forklift drivers can choose the flexible block that best suits their personal situation. Furthermore, by means of the flexible blocks the forklift drivers can be deployed more efficiently. It is also expected that the productivity will increase. The forklift drivers have more right of say about their working times which will have a positive influence on their motivation: more motivation means a better productivity.

Must: framework conditions

The flexible blocks realize an adjustment of the capacity to the flexible working demand, because the flexible blocks are based on an indication of the working demand[24]. Thus, this scenario meets the working demand sufficiently. By giving the forklift drivers the opportunity to choose their working times their interests and aspirations are taken into account. The work places and systems do not change in this scenario, so this 'must' is also met. Because the forklift drivers are able to choose their own working times, the process becomes more complex. To limit the complexness flexible blocks are introduced. The freedom to choose different working times also has consequences for labor agreements and laws. Rules for choosing should be made so labor agreements and laws are not violated. The

[23] The scenario is based on an eight hour work day.
[24] An overview of this working demand can be found in appendix 5.

biological clock should also be taken into account with that. Another 'must' that has not be confirmed yet is 'fairness'. Rules have to be formulated to realize this aspect.

May be: wishes
With the 'Fixed and flexible working times' scenario several wishes are fulfilled. By means of the flexible blocks the forklift drivers can choose for the working times that best suit their social flexibility needs. By adjusting the capacity need of the blocks to the working demand economical flexibility is realized. In this scenario the team leader has the final decision.

5.3 TESTING SCENARIOS BASED ON HISTORICAL DATA

The scenarios described in the previous section are applied on historical data and compared with the realized work schedule. By doing this, consequences of the system for the IT&M department become more clear.

To gather historical information a period was selected. In consultation with one of the team leaders the months April and September of 2008 were chosen for the visualization. April was the most occupied month: the workload was high. September on the other hand had a low workload. To keep the visualization clear two weeks were chosen on which the scenarios were applied. For April the week of April 7 to April 11 of 2008 was chosen. It was the most occupied week in that month. For September the week of September 22 to September 26 was chosen to apply the scenarios. In comparison with other weeks of September, this week had the lowest workload. Thus, two extremes were chosen on which the scenarios were applied.

The scenarios are visualized by looking at the needed capacity per hour (based on realized capacity) and subsequently apply this capacity need to the possible blocks of the scenarios. The results are possible work schedules with a flexible work schedules system. In the appendix 6 all realized and possible flexible work schedules are included.

By visualizing the different scenarios, several aspects can be noticed. Firstly, with scenario 1 the capacity can be more flexible adjusted to the working demand, because the complete workforce works flexibly. In this report, the note has been made that it should be taken into consideration that not every forklift driver would like to work with flexible work schedules. With scenario 1 every forklift driver is obliged to choose a shift. The aspect 'voluntary', which Grolsch thinks is important, is violated in this scenario. Nevertheless, if the forklift driver do not like to work flexibly (have deviant working times), he can choose for block 1 of the morning shift, block 2 of the afternoon shift and block 2 of the night shift. However, it will not be possible to choose these blocks every time. It depends on the indications his colleague forklift drivers have given.

Secondly, with scenario 2 the possibilities to choose are limited. In the example a large number of fixed group persons have been chosen, because of the expected limited willingness to work with flexible work schedules. The choosing possibilities will increase when there are more forklift drivers that are willing to work with flexible work schedules and the number of fixed group persons will decrease. Besides, an important advantage of the second scenario is that the forklift driver is not restricted to the shift is he classified in when he chooses a flexible block. Therefore, the realization of social flexibility is more effective in scenario 2.

Thus, it can be said that scenario 1 is more effective to realize economical flexibility and scenario 2 is more effective to realize social flexibility. The kinds of flexibilities both help to realize an efficient classification of the workforce. Grolsch should consider which aspect they think is most important. They want to introduce flexible work schedules to realize social flexibility. Nevertheless, economical flexibility is important too. Grolsch has to choose the best scenario. This is realized in the next section.

5.4 THE CHOSEN SCENARIO ELABORATED

In order to choose the scenario which will be introduced at the IT&M department, a collective approach has been chosen. In the project group meeting of October 30 the scenarios and the application of the scenarios on historical data were presented. At the end of the meeting the persons present were asked to choose their favorite scenarios. The majority of the project group has chosen scenario 2 *'Fixed and flexible working times'* as their favorite scenario; thus this system will be introduced at the IT&M department. In this section the scenario will be more concretely defined by means of rules and compositions.

5.4.1 General arrangements: how does the system work?

As explained earlier, with the 'Fixed and flexible working times' system the persons who do not favor to work according to flexible working times stay in the shift they are classified in (the 'fixed' group). Those who do want to work flexibly (the flexible group) can choose between six flexible blocks.

Number of fixed and flexible employees

The 'Fixed and flexible working times' system exists of a fixed work group of employees and a flexible group. To realize the 'Fixed and flexible working times' system the exact number of 'fixed' and 'flexible' employees is needed. In consultation with a team leader an overview is created of the minimal and maximum needed employees for a day.[25] The number of 'fixed' and 'flexible' employees can be deducted from this overview: per day the group of 'fixed' employees should exist of 21 persons and the flexible group should have 13 members. In the following table the number of 'fixed' and 'flexible' employees are divided over the different kinds of shifts.

	Morning shift	Afternoon shift	Night shift	Day shift
Number of 'fixed' employees	7	8	2	4
Number of 'flexible' employees	3	4	0	6

Table 12 Overview number of 'fixed' and 'flexible' employees per shift

But what about the precondition of feasibility 'size of the self-rostering group'? This precondition states that the group should have at least 15 employees. With the division of 'fixed' and 'flexible' employees, only 13 persons will work according to flexible work schedules, which is less than 15 employees. The answer is that the number of 'fixed' and 'flexible' employees is not that 'black' and 'white' as it seems. A 'grey area' also exists in which the 21 'fixed' employees are also included. This 'grey area' is defined in the next subsection.

[25] This overview is included in appendix 2 (figure 5).

Fixed and flexible employees: the 'grey area' defined

It cannot be said that an individual can *only* be 'fixed' or 'flexible'. There is a 'grey area'. The 'gray area' is organized based on employer's initiative and employees' initiative.

Employer's initiative

It depends on the capacity need how many persons exactly are needed in the fixed group and flexible group. It may happen that a person that is classified in a 'fixed' shift has to work a 'flexible' shift or vice versa. If this change of type of shift is needed, the team leader needs to discuss that with the forklift driver(s) concerned. A forklift driver is not obliged to change his preferable shift: change is voluntary. The change will only occur when the forklift driver(s) is (are) willing to do that. A forklift driver cannot be approached more than four times per rostering period to change his shift. If the situation does not approve any other possibility[26] and the forklift driver is approached more than four times in one rostering period, the forklift driver concerned will be rewarded: at the next indication session he will be the first of his indication group to indicate his preferences.

Employees' initiative

It is also possible that a forklift driver has chosen for a flexible block, but that it turns out that a 'fixed' shift better suits his personal agenda. The forklift driver may exchange a shift with a colleague. There are a number of rules related to the exchange of a shift. The forklift driver should approach the colleague at least a week in advance. If the colleague agrees to change shifts the team leader should be informed. A forklift driver can only exchange shifts on own initiative two times in one rostering period. If a forklift driver wants to exchange shifts more than twice in one rostering period, he will be last of his indication group to indicate his preferable blocks at the next indication session.

Choosing blocks

The blocks the forklift drivers can choose from are determined by the team leaders. They will make an indication of the needed capacity per flexible block for a rostering period.

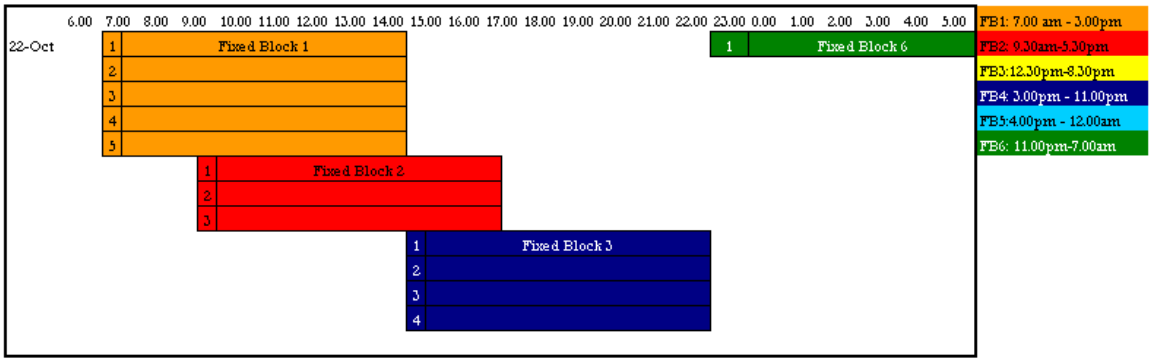


Figure 21 Example indication capacity need per flexible block for October 22

The forklift drivers can enroll themselves on their preferred flexible blocks. The enrollment can be realized by means of a planning board at the office of the team leaders. The forklift drivers write their name in the block they would like to work in. The name of the forklift driver can only be written down if the capacity need of the block has not been fulfilled yet. If

[26] The capacity need can only be adjust correctly to the working demand if a forklift driver in a particular shift changes his shift.

the capacity need of a particular block has already been fulfilled, the forklift driver has to choose another block that is still available.

The forklift driver can choose different flexible blocks in one week or can choose to work according to the same working times as the planning board allows that to do so. The forklift drivers are free to make their own working time decisions, as long as they stay within the rules of the labor agreements and laws (this will be defined in another sub-section).

Indication groups

If all 'flexible' employees indicate their preferences at the same time, not every forklift driver will have the same chance for 'the best' work schedule. To make the indication process more fair indication groups should be compiled.

The IT&M department has 31 forklift drivers. For the 'Fixed and flexible working times' there are 34 employees needed. These 34 employees are based on a maximal capacity and working demand. Currently, temporary workers are hired to intercept this increase of capacity need. It can be stated that 3 persons of 'flexible' employees will be temporary workers[27]. Ten flexible workers are 'left' that are allowed to indicate their preferences. To increase the fairness smaller indication groups should be compiled. The 'flexible' group will be divided in five indication groups: every group existing of two persons. The first rostering period Group 1 can indicate their preference first, followed by Group 2, Group 3, Group 4 and Group 5. In the second rostering period Group 2 can indicated their preference first, than Group 3, Group 4, Group 5, followed by Group 1; etcetera. Also the person in the indication groups that can indicate there preferable working times first vary every rostering period. This cyclical indication process in visualized in the figure 22.

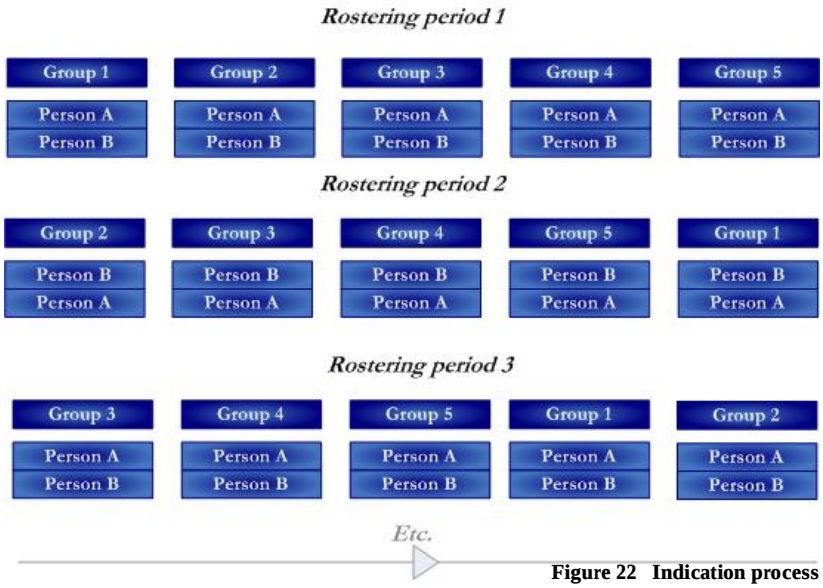


Figure 22 Indication process

Rostering period

The rostering period is the period about which the forklift drivers can indicate their preferences. As explained in the Theoretical Framework the rostering period should be between four to sixteen weeks. A realistic rostering period has been determined in consultation with the project group and a team leader. The rostering period for the 'Fixed

[27] Given the fact that the willingness to work with flexible work schedules is low at the IT&M department, most persons want to be in the fixed group. Therefore, here is chosen to settle the 'surpluses' with the flexible group.

and flexible working times' system should be one month. For example: in the first week of April the forklift drivers can indicate their preferable blocks for the month May. This rostering period is called the *'planning horizon'*. One week before the work schedule becomes operational, the schedule is fixed. Only the team leader has the authorization to change the schedule after that when it is necessary. This fixed period is called the *'frozen window'*.

Labor agreements and law

The choosing process of the blocks is restricted to a number of rules. Those rules are determined by labor agreements and laws.

Labor agreements

Collective labor agreement

Grolsch has got her own collective labor agreement. In this labor agreement some rules concerning working time are included that apply to 'Fixed and flexible working times':

- A workweek has a maximum of 45 hours (fixed work week);
- The maximum working time a day is 9 hours (fixed work day);
- Employees older than 55 years old are not allowed to work more than 10 hours a day (overtime included) and 45 hours a week.

ATV-days

In the interviews forklift drivers have indicated they would like to maintain their ATV-days. The ATV-days will remain. The rules of ATV-days of the current situation apply also on the 'Fixed and flexible working times' system.

The team leaders are the ones that will determine the arrangements of the ATV-days. ATV-days will be assigned in the way it is currently realized: by means of 13 fixed and 13 flexible ATV-days. The fixed ATV-days cannot be scheduled in the months May, June, July, August and the second half of December. The flexible ATV-days will be scheduled flexibly in a year. Flexible ATV-days will be assigned when there are more forklift drivers available than the working demand asks for. The allotment of ATV-days will be announced individually to the forklift driver concerned at least 12 hours in advance by the team leader.

Law

An important law that has to be taken into consideration with flexible work schedules is the Working Hours Act. The Working Hours Act describes several rules concerning working times and rest periods. The rules of the Working Hours Act that have to be taken into consideration with 'Fixed and flexible working times' are:

- Between two working days there should be rest period of at least 11 hours (an exception can be made in one week - once in 7x24 hours: the rest period can be shorten to 8 hours);
- After a night shift there should be a rest period of at least 14 hours (an exception can be made in one week - once in 7x24 hours: the rest period can be shorten to 8 hours);
- After three or more night shifts there should be a rest period of at least 46 hours;
- An employee is not allowed to work more than 60 hour a week;
- An employee is not allowed to work more than 13 hours per 24 hours and 12 hours per shift;

- In 16 weeks an employee should maximally work for 40 hours averagely when he or she has had 16 or more night shifts in that period;
- In 16 weeks an employee is not allowed to work more than 36 night shifts;
- In case of consignation, an employee should maximally work 48 hours a week averagely over 16 weeks;
- Consignation 11 hours before and 14 hours after a night shift is not allowed.

5.4.2 Work areas: self-managing teams

It was stated by some interviewees that they would like (the forklift drivers) to have more right of say about the fulfillment of work places. In the project group meeting of October 30 2008 the persons present were asked if this aspect should be added to the second scenario. During the meeting a possible solution to give forklift drivers more right of say about work places was introduced. The idea concerned the possibility to give the forklift drivers the authority to fulfill the work places by themselves. The approach works as follows: forklift drivers are divided in teams; depending at what time they have to work. Each team is responsible for a 'work area'. Every work area consists of several work places. The team is responsible for fulfilling these work places.

This approach is called *'self-managing teams'*. Self-managing work teams are groups of interdependent individuals that can self-regulate their behavior on relatively whole tasks (Cummings & Griggs, 1977; Goodman, Devadas, & Hughson, 1988: quoted in Cohen, 1993, p. 4). This approach fits the 'Fixed and flexible working times' system. Each work place depends on specific working times and each flexible block resembles specific working times. Each block is thus responsible for another work area.

Advices for design

The idea of self-managing teams has been postulated at the end of the research period of the author of the report and is independent of flexible work schedules. Therefore, this research does not include a tangible design of self-managing teams. Nevertheless advices will be given that were found in the literature that Grolsch could take into consideration when they design self-managing teams.

Figure 23 MMCW-model, Molleman (2000)

Firstly, Grolsch has to decide if self-managing teams are feasible for the IT&M department. In order to assess this, the organization can use the MMCW-model of Molleman (2000). This model highlights the leeway organizations have to design and develop self-managing teams and consists of the modal verbs 'must', 'may', 'can' and 'will'. Molleman defines the model as follows: *"(…)the 'must' question refers to the need for self-management in the light of characteristics of the products and services to be made and in the context of the work processes needed to realize these outputs: 'is there a relationship between variety in environmental demands and the need for local decision making?'. The 'may' question is 'are there opportunities for local decision making?'. This question deals with organizational work design issues that may facilitate self-management. The skills and abilities of the employees, which are needed to make self-managing teams work, are covered by the modal verb 'can'. 'Can' alludes to the question: 'Have the team*

members enough skills and knowledge to make local decisions?'. The modality 'will' is the focus in the fourth and last question: 'are team members willing to make local decisions?'. This question refers to the attitudes of workers to working in self-managing teams. These attitudes are shaped by personal needs and motives as well as by environmental factors like social norms and group cohesion." (p. 891)

Secondly, Grolsch should consider the fact that a team consists of people and that those people are the primary actors but often act on behalf of the organization and will act in its interest. Therefore, monitoring systems (primarily) and reward systems (possibly) should be developed to ensure that they will act in the organization's interest (De Leede, Nijhof & Fisscher, 1999). Monitoring systems could be a daily or weekly meeting with the teams. With reward systems a solution does not have to be a *positive* reward. Also a negative reward (like a warning or in the most extreme case dismissal) can be used to stimulate desirable behavior. In order to monitor (and evaluate) and reward, rules and criteria are needed. The rules and criteria should be deducted from the goals Grolsch set for self-managing teams.

In consultation with a team leader a provisional disposition has been made for work areas. These work areas are based on the current disposition of the warehouses. The work areas are visualized in figure 24 [28]. The work places 'centraal magazijn'. 'winteropslag' and 'orderpicken' are not included in current work areas. These work places cannot be included in one of the work areas, because they are located too far from the other work areas or work places. Therefore it is difficult to survey the total working demand. A solution could be to make of the three remaining work places a secondary work area: persons who are classified in this work area should determine how the work places should be distributed among the 'work area members' according to the planned working demand of that day.

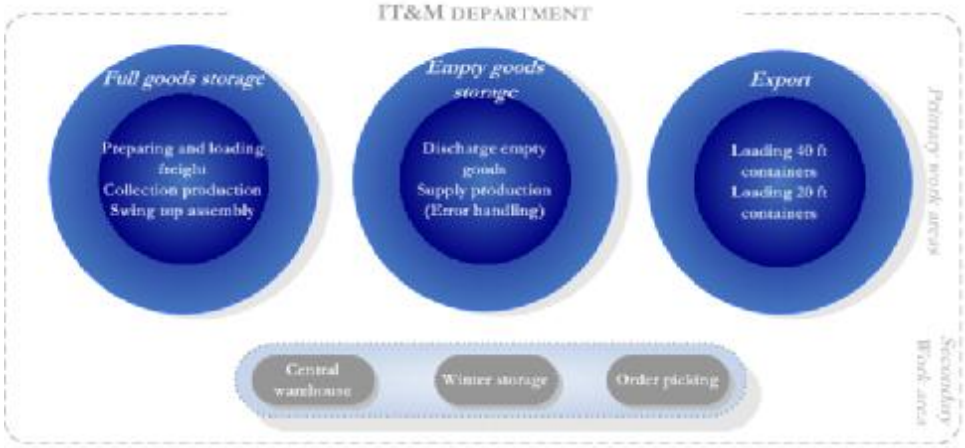


Figure 24 Disposition possible work areas

A note must be made for the work place 'laden 40 ft containers'. This work place requires specific skills. Nevertheless, most forklift drivers who currently work at the 'Export' area own these skills.

5.5 IMPLEMENTATION OF FLEXIBLE WORK SCHEDULES

In order for flexible work schedules to be successful, it should be implemented effectively. In the Theoretical Framework some guidelines were given to realize this. In the next sections

[28] The work areas and work places are in Dutch because they are commonly used names at the IT&M department.

these guidelines will be applied to the flexible work schedules at the IT&M department of Grolsch.

5.5.1 Run a pilot

General design pilot

A pilot is initiated in order to measure the effects of the resolved change. The pilot of flexible work schedules at the IT&M department of Grolsch can be compared to an experiment. Like with every experiment the pilot at the IT&M department consists of two kinds of variables: an independent variable (flexible work schedules) and depend variable (whether it has an effect on *the areas* the employer would like to change with self-rostering). The variables need to be operationalized. What flexible work schedules exactly are is explained throughout this report. The dependent variables are formulated in section 5.1.1 and will be operationalized by making them SMART:

- Enhanced flexibility: *"a year after introducing flexible work schedules 75% of the forklift drivers that work with flexible work schedules are satisfied with their social flexibility"*; *"the amount of forklift drivers that work with flexible work schedules a year after introduction the system is at least 30% of the workforce"* (economical flexibility);
- Increased productivity: *"the average number of hours that are spend on a work place a month should decrease with 5% a year after flexible work schedules are introduced";*
- Improved efficiency: *"the number of hired temporary workers (exclusive seconded workers) should decrease with 5% a year after flexible work schedules are introduced"*.

In order to measure the effects of the flexible work schedules 'experiment' it is advisable to do a pre-test. In a pre-test the current situation is measured, without the stimulus of flexible work schedules. For example, information has to be gathered about the current feeling of social flexibility of the forklift drivers, the current average hours that are spend on a work place a month and the number of hired temporary workers of the last year. After finishing the flexible work schedules pilot information have to be gathered about the same subjects. This way the situation without flexible work schedules can be compared with the situation after the experiment (post-test). The results of flexible work schedules will become more clearly.

In order to get valid results in the post-test it is advisable to include an experimental group and a control group in the experiment concerning flexible work schedules. The experimental group will work according to the flexible work schedules system. The control group keeps on working with the current way of scheduling. These two groups can be compared. Changes in the experimental group can therefore be more validly assigned to the stimulus of flexible work schedules.

Size of pilot group

Grolsch thinks it is important that the forklift drivers should work voluntarily with flexible work schedules. Therefore, the forklift drivers in the experimental group should be the persons that already want to work with flexible work schedules and are open for working according to flexible working times. As described in the sub-section 'Indication groups' in section 5.4.1 at least 10 persons will schedule flexibly in the 'real' situation. In order to validly measure the effects of flexible work schedules, the experimental group should exists of 10 persons. Besides the 10 persons in the experimental group, forklift drivers should be selected

to be the 'fixed' group. The persons in the control group are the 'fixed group', but there are persons needed as a kind of 'back up group'. As stated in the sub-section 'number of fixed and flexible employees' it is stated that there are 13 employees needed to fulfill the flexible blocks at a maximum working demand. Three employees should be selected from the control group (and thus 'fixed' group) that are willing to work flexibly when necessary (they are the persons in the 'grey area'). After all, one of the SMART goals is to decrease the amount of hired temporary workers thus the human resources should be found in the current workforce. These persons will work occasionally according flexible work times, and most of the times according to there preferred fixed hours. Thus, a total of 13 volunteers are needed for the pilot: 10 in the experimental group and 3 on which an appeal can be made if the working demand asks for it.

Pilot period

In the Theoretical Framework it is stated that the average period for employees to get used to a new scheduling situation is nine months to a year. This adaption period should be taken into consideration when the exact period of the pilot is determined. Because the working demand of Grolsch does not have a clear pattern, it is advisable to set a pilot period of a year. In a year several season changes and situations will occur. The system of flexible work schedules can therefore be broadly tested.

Criteria

A pilot at the IT&M department will be initiated in order to determine if flexible work schedules should be implemented. In order to make this decision criteria are needed. The most important criteria are the goals that are set for the flexible work schedules project. The formulation of the goals should therefore be adjusted to the pilot situation:

- Enhanced flexibility: *"after the pilot 75% of the forklift drivers in the experimental group are satisfied with their social flexibility"*; *"the amount of forklift drivers that would like to keep on working with flexible work schedules or want to work with the system after the pilot is 90% of the experimental group and 5% of the control group"* (economical flexibility);
- Increased productivity: *"the average number of hours that are spend on a work place a month should decrease at least 1% after the pilot period";*
- Improved efficiency: *"the number of hired temporary workers (exclusive seconded workers) should decrease with at least 1% after the pilot period".*

Furthermore, the effectiveness of flexible work schedules can be measured. This can be realized by using the 4C's of Beer, Spector, Lawrence, Mills & Walton (1984). In order to assess the effectiveness the IT&M department has to ask itself the following questions:

- To what extent do flexible work schedules enhance the commitment of people to their work and Grolsch? (commitment)
- To what extent do flexible work schedules attract, retain and/or develop people with skills and knowledge needed by Grolsch and the IT&M department, now and in the future? (competence)
- What is the cost effectiveness of flexible work schedules in terms of wages, turnover and absenteeism? (cost effectiveness)
- To what extent do the goals of the forklift drivers and those of the IT&M department congruence? (congruence)

Supervisor of the pilot
The supervisor of the pilot should be an external party. An external party has a neutral position and therefore be more subjective with supervising, guiding and evaluating the pilot. Currently, there is no one appointed as supervisor of the pilot. Supervising the pilot can be a (bachelor) assignment of a student. Also the development of the self-managing teams can be included in the assignment. The 'vacancy' of supervisor of the pilot concerning flexible work schedules is declared at the University of Twente.

5.5.2 Consider 'time' and change gradually

Flexible work schedules mean change. The forklift drivers and the team leaders have to get used to this new approach of scheduling. Especially for the forklift drivers this change has a big influence on them: both professionally as privately. They have to work more flexibly, which will have influence on their appreciated feeling of consistency and security. Besides, in the current situation they do not have to 'think for themselves': currently decisions about working times are made by the team leaders and they adjust their private life to it. With flexible work schedules they become responsible for their own working schedules. This new feeling of 'responsibility' is an aspect they have to get used to as well.

'Time' is another aspect that is important in the implementation and change process. Nothing should be pushed. If flexible work schedules are pushed, the idea of the system as a management 'gimmick' - some forklift drivers currently have -, will be enforced. Therefore, Grolsch should take sufficient time for the implementation of flexible work schedules to get used to the new situation. In order to structure these advices, an action plan is drafted in the next sub-section.

Structure pilot: action plan
'Time' and 'change gradually' can be managed by means of a pilot. As mentioned in the previous section the pilot period should be one year (the aspect 'time' is hereby achieved). In this year the forklift drivers have to get used to the change called 'flexible work schedules'. Because of the changes the parties involved in the flexible work schedules project have to persist, it is advisable to change gradually. This is realized by means of an action plan[29] that describes the different stages of the pilot and implementation process:

Phase 1: Measuring current situation
This phase takes place before the start of the pilot. In order to measure results of flexible work schedules, the current situation should be measured (pre-test). Information that needs to be gathered is information about the current flexibility, productivity and efficiency:

- the current feeling of social flexibility needs to be measured (flexibility);
- the average number of hours that currently is spent on a work place a month (productivity);
- an overview of the number of hired temporary workers of last year (efficiency).

This phase should be executed two months before the pilot starts.

Phase 2: Introducing flexible work schedules

[29] In this action plan only the implementation of flexible work schedules is included. The implementation of self-managing teams is not considered, because this new approach is still in the development phase.

In this phase the forklift drivers are introduced with the meaning of flexible work schedules for the first time. For months the philosophy of flexible work schedules has been discussed, but now the time has come that the parties of the IT&M department have to experience its effects by themselves. Phase 2 is all about education. The forklift drivers should learn how the system exactly works and the team leaders have to experience what it is like to make a working schedule with different working times. Education sessions should be organized, that are guided by the supervisor of the pilot. In these education sessions the concept of flexible work schedules will be introduced. The education sessions can also be used to let the forklift drivers and team leaders practice with flexible work schedules. This phase should be executed a month before the pilot starts.

Phase 3: Start pilot
In the third stage of the implementation process the pilot is started. The forklift drivers and the team leaders will start to work with the flexible work schedules system. In this phase possible imperfections or problems will become clear. In order to keep the system running it is important that this imperfections and problems are discussed openly and solutions are found. Therefore, it is wisely to have a weekly meeting with the pilot group, forklift drivers and management about the progression of the pilot. Difficulties and improvements can be discussed so the pilot can be more successfully continued. The weekly meetings will take place in the first three months of the pilot.

Phase 4: Monthly evaluation
After three months the project members have learned to work with the system and most imperfections will be solved. A weekly meeting will not be necessary. The focus of the pilot will shift form 'development' towards 'evaluation'. Every month an evaluation session should be organized in which all aspects of the pilot will be discussed and evaluated. These evaluation sessions can also be used as 'mile stone' moments in which critical decisions are made concerning steps that have to be taken for enhancing the flexible work schedules system.

Phase 5: Final evaluation
The fifth and final phase of the pilot will be the most critical one. This phase will be about the final evaluation. The final evaluation will evaluate the overall pilot. The evaluation will determine, based on the evaluation criteria, if flexible work schedules will be introduced at the IT&M department definitely.

5.5.3 Supportive management

Supportive management has been proven as one of the success factors of a flexible work schedules (self-rostering) project (Wortley & Grierson-Hill, 2003; Lam, 2008). Self-rostering projects that had an enthusiastic manager turned out to be more successful than projects without a supportive manager. Although a change process will not be smoothly all the time, it is important that the manager, in the case of the IT&M department the Warehouse manager and the team leaders, are enthusiastic about the project and its possibilities and advantages. They are the examples for the forklift drivers that have to work with the new system and will be influenced by the appearance of the management. The management should convince the forklift drivers of the possibilities of the system. During the implementation process the management should therefore be teachers who teach the forklift

drivers to work with flexible work schedules, trustees to which the forklift drivers can turn to if they experience any troubles or difficulties, and evaluators that points out the strong and weak points in the flexible work schedules process. The management is responsible for keeping the forklift drivers motivated for the project.

5.5.3 Employees are aware of the self-rostering philosophy

The forklift drivers should be well informed about the flexible work schedules project. The information process has started with compiling the project group. However, the project group is just a start. As described in the action plan information sessions should be held about the concept of flexible work schedules. Furthermore, the forklift drivers should always be informed about the latest developments and the consequences for their work. Keeping the forklift drivers informed about the consequences will positively influence the support of flexible work schedules.

5.5.4 Implementing flexible work schedules and clock hours matrix

Currently Grolsch is developing a clock hours matrix that will realize more individual rewarding. It is an independent tool that, after approval of the works council and the unions, will be implemented throughout the organization. The clock hours matrix can be used in combination with flexible work schedules. Nevertheless it is not advisable to introduce the clock hours matrix at the same time as flexible work schedules. Flexible work schedules create a new situation the IT&M department has to get used to. If the clock hours matrix is implemented simultaneously, the IT&M department has to get used to two new situations. Segers (2008) agrees on that matter and states that it is not advisable to implement two kinds of change at the same time. Thus, it is advisable to introduce flexible work schedules first.

The clock hours matrix should be implemented after the implementation of flexible work schedules. Nevertheless, the implementation (or pilot) period of flexible work schedules can be used to *introduce* the clock hours matrix. Every month the financial consequences of the worked hours according to the flexible work schedules system and the clock hours matrix can be calculated, discussed and compared with the 'old' rewarding system (team surcharge) for every forklift driver individually. This way every forklift driver will have a clear idea of the clock hours matrix and what it means for him personally. The clock hours matrix should be introduced as open as possible, so that the forklift drivers do not face surprises or are left with uncertainties.

Chapter 6

Time is neutral and does not change things. With courage and initiative, leaders change things.
(Jesse Jackson)

Conclusions and recommendations

6.1 SELF-ROSTERING

The main question of the research was: ***"To what extent are flexible work schedules feasible at the IT&M department of Royal Grolsch and, when it is feasible, how can a flexible work schedules system be designed and implemented?"*** In order to give an answer to this question the concept 'self-rostering' was studied. The Theoretical Framework has ensured that a comparison could be made between the theoretical situation concerning self-rostering and the practical self-rostering situation at Grolsch. This comparison has produced some interesting differences.

Firstly, one of the preconditions of the feasibility of self-rostering is the '*composition of the self-rostering group*'. One of the aspects of this precondition is that the self-rostering group should be heterogeneous based on the demographic background of the employees. One indicator to measure that is 'gender'. It was stated that a self-rostering group should have both male and female members in order to have different wishes concerning working times. The opposite has been proved successfully at Grolsch. The self-rostering group - the forklift drivers - consists of only male members. Nevertheless, this homogeneous composition based on gender has never been a problem to get different needs. It will not lead to any difficulties concerning different working times needs.

Secondly, the size of the self-rostering group was described in the Theoretical Framework. The size of the group should have at least 15 members. In the chapter 'Design' a flexible group of 10 employees has been advised. Even though the total group that will directly (the 'flexible employees') and indirectly (the 'fixed' employees) work with flexible work schedules will have sufficient members according to the precondition (as explained in the subsection ''*Fixed and flexible employees: the 'grey area' defined*'), the 10 'flexible' employees solely will not lead to any difficulties concerning closing the work schedules and even will help to make the scheduling process less complex; a precondition Grolsch has set for flexible work schedules.. Although the current scheduling software 'Rostar Flex' can support the scheduling process to a certain extent, the majority of the process will be realized based on discussion and consultation. A group of 10 persons will be sufficient for the IT&M department to organize these discussions and consultations.

Thus, it can be stated that the preconditions formulated for this research will measure the feasibility of self-rostering, but that the importance of the elements of these preconditions depends on the context of the organization or the department where self-rostering is implemented. In future research the validity of the feasibility preconditions should be studied in order to have valid preconditions that can be applied at other organizations or departments that would like to implement self-rostering.

6.2 FEASIBILITY OF FLEXIBLE WORK SCHEDULES

Returning to the main question, the feasibility of flexible work schedules at the IT&M department has been tested, based on the preconditions formulated in the Theoretical Framework. It was concluded that flexible work schedules are feasible. Nevertheless, the feasibility was not strongly confirmed. This was due to several factors: the willingness of mainly the forklift drivers was negatively nested, as well as the predictability of the working demand.

6.2.1 The willingness to work with a self-rostering system

The willingness of all parties involved to work with flexible work schedules is insufficient. Without willingness there is no support for the system. And without support flexible work schedules will not succeed. Their limited willingness is influenced by their resistance to change. This resistance can be explained by means of several factors.

The first factor is the *distrust* the forklift drivers have towards the management. They are not totally aware of the possibilities of flexible work schedules and therefore see flexible work schedules as a 'gimmick' of the management to decrease costs.

Secondly, the forklift drivers resist change, because they are *afraid for the unknown*. They appreciate the consistency and security they have with the current scheduling system and are afraid to lose that with flexible work schedules.

Thirdly, and probably the most important factor, the forklift drivers *fair the responsibilities* they will get with flexible work schedules. In the questionnaires the forklift drivers were asked if they would like to have more responsibilities next to the tasks they currently execute. Of the respondents, 89% do not want additional responsibilities. This unwillingness can be explained. Until recently forklift drivers did what they were told to do. If things did not proceed as they wished, they could blame others for that. Team leaders have confirmed that in the description of the corporate culture. With flexible work schedules they will be the ones who decide what (and more specifically *when*) tasks should be executed. By receiving more responsibilities, the forklift drivers become accountable for their own input. Therefore it could be that these newly acquired responsibilities deter them.

Thus, the willingness to work with flexible work schedules is influenced by different reasons of fairness of the forklift drivers. It can be stated that they are not unwilling to work with flexible work schedules as a system, but that they are insecure about its intensions and consequences. This idea is confirmed in the chapters 'Results' and 'Design'. The chapter 'Results' has shown that despite their reluctance the forklift drivers are willing to give ideas and opinions which support the change process. In the chapter 'Design' the wishes of the forklift drivers are included. These wishes are based on the question if they would like to describe their most ideal way of scheduling. Even though most respondents described the current way of scheduling there were also forklift drivers that would like to have more right of say bout their days of working hours. Consequently, the will to have more influence on the scheduling process exists.

Not only the forklift drivers are afraid of the consequences of flexible work schedules. As defined in section 4.2 the team leaders are concerned too. They do not trust the forklift

drivers of making an effective work schedule, because the forklift drivers could take advantage of the situation. The distrust of competency has a negative influence on the willingness to work with flexible work schedules. Uncertainties of forklift drivers and team leaders can be declined by means of a pilot because they will experience the consequences of flexible work schedules and what it exactly means for their (personal) situation. The pilot will eventually have a positive influence on the willingness to work with flexible work schedules.

6.2.2 The predictability of the working demand

According to the precondition for assessing the feasibility of self-rostering, the predictability of the working demand is currently insufficient. For the rostering period, as described in the chapter 'Design', an insight in the working demand is needed of one month in advance. Currently, only a global indication can be realized based on a tactical planning. However, the planning changes a lot because of ad hoc adjustments, so it is difficult to make a final work schedule in advance. These ad hoc adjustments can be explained. The departments who make these adjustments (the departments of which the IT&M depends on) are not aware of the consequences their decisions have at the IT&M department.

For improving the precondition 'predictability of the working demand', the tactical planning should be more fixed. A clear communication plan has to be made between the IT&M department and the production planning and the export cargo planning. In this plan clear agreements should be made about an acceptable adjustment period and how adjustments should be communicated. Advisable is to create a frozen window. After this period no adjustments can be made. The frozen window should be the same as the frozen window in the flexible work schedules system: one week before the planning and thus work schedules become operational.

Also external agreements should be included in the communication plan. The IT&M department depends of its customers too. Promotions will increase the working demand, which will have consequences for the capacity need and thus working schedules. For the 'promotion customers' the same frozen window applies as that of the production planning and export cargo planning.

6.3 DESIGN AND IMPLEMENTATION OF FLEXIBLE WORK SCHEDULES SYSTEM

After designing two scenarios the scenario 'Fixed and flexible working times' has been chosen. Even tough it is a new system it has similarities with the current way of scheduling. In the interviews the forklift drivers and some team leaders described the current way of scheduling as 'already flexible'. People could exchange shifts if that better fits the personal agenda. With the flexible work schedules system forklift drivers still have the opportunity to exchange shifts. Also the ATV-days will be maintained and used at moments when the capacity supply is bigger than the capacity demand.

A few things change. Firstly, the forklift driver has the opportunity to choose its own shift instead of working to irregular hours because the team leader asked him to do so. The initiative of changing shifts, shifts from employer to employee. Another aspect that will change is that the 'flexible' employees are no longer restricted to the shift they are classified in. If a forklift driver would like to work only according to afternoon shift hours, it is

possible with this flexible work schedules system. This meets the wish of the forklift drivers in the 'meet-must-may be'- model to have adjusted working times to fulfill social flexibility needs.

It can be stated that the scheduling process according to the flexible work schedules system does not differ that much of the current way of scheduling. Agreements that are currently made can still be made in the new system. The flexible work schedules system maintains these values, but formalizes them. Thus, to a certain extent the flexible work schedules system is a formalized approach of the flexibility of the current scheduling system, with the advantage that the social flexibility will improve.

A pilot could help to smoothly implement the scenario. The pilot will give an indication of the meaning of flexible work schedules when it is introduced officially. The forklift driver could base his decision on the experiences in the pilot. The pilot can also be used to create support. As was measured with the interviews, the forklift drivers do not have a convincing willingness to work with flexible work schedules. This willingness can increase if they see the positive results and experiences of their colleague forklift drivers that cooperate in the pilot. Furthermore, some team leaders do not trust the forklift drivers as being competent of making a work schedule by themselves. With a pilot the forklift drivers can develop this competence of making a work schedule. The team leaders, in their turn, will encounter the positive experiences and results of this process, which will have a positive influence on their opinion concerning the competences of the forklift drivers and the trust they have in them. Their willingness to delegate the scheduling responsibilities could therefore increase. Thus, by letting the forklift drivers and the team leaders experience what it exactly means to work with flexible work schedules, the support could increase, which will have a positive influence on the results of the flexible work schedules project.

Flexible work schedules can only be successfully if it is implemented effectively. The advices given in the chapter 'Design' could help Grolsch to realize that. Nevertheless, it is up to Grolsch and its employees to make flexible work schedules a successful system.

6.4 FINAL WORD

Flexible work schedules are a process that can only be successful if all parties involved make sacrifices and compromises. Therefore, it is important that all parties cooperate and communicate with each other. If this is realized, flexible work schedules are absolutely feasible at the IT&M department. Consequently, the department will be successful in creating an effective working environment.

References

Ala-Mursula, l., Vahtera, J., Kivimäki, M., Kevin, M.V., & Pentti, J. (2002) Employee control over working times: associations with subjective health and sickness absences. *Journal of Epidemiol Community Health, Vol. 56,* p. 272-278.

Baarda, D.B., Goede, M.P.M., de, Teunissen, J. (2005) *Basis Kwalitatief Onderzoek.* Groningen/Houten: Wolters-Noordhoff bv.

Babbie, E. (2007). *The practice of social research (International Student Edition).* Belmont, CA: Thomson Wadsworth

Bailyn, L, Collins, R., & Song, Y. (2007). Self- scheduling for hospital nurses: an attempt and its difficulties, *Journal of Nursing Management, Vol.15,* p. 72-77.

Bardoel, E.A., Tharenou, P. and Moss, S. (2001). Work-family Practices and Accommodating Work-family Workplaces: A Combined Institutional and Resource Dependent Theory Explanation, working paper, Monash University Faculty of Business and Economics, Melbourne, 31 January.

Baur, T.K. (2004). High performance workplace practices and job satisfaction: Evidence from Europe. Institute for the Study of Labour (IZA), Bonn, Germany, Discussion paper No. 1265. August.

Beer, M., Spector, B., Lawrence, P.R., Mills, D.Q., & Walton, R.E. (1984). *Managing Human Assets.* New York: The free press.

Buul, G.J.D.M. van, & Maas, J.F.J. (2004). Praktische adviezen voor de ontwikkeling en implementatie van levensfasegericht personeelsbeleid. Fontys Hogeschool voor Personeel en Arbeid & Sector Zorg en Welzijn

Christelijk Nationaal Vakverbond in Nederland [CNV] & Qidos. (2006). *Handboek levensfasegericht personeelsbeleid*. CNV, Utrecht

Cohen, S.G. (1993) Designing effective self-managing work teams. *Centre for Effective Organizations,* University of Southern California, Los Angeles.

Dearholt, S.L., & Feathers, C.A. (1997). Self-scheduling can work. *Nursing Management, Vol. 28(8),* p. 47-48.

Deci, E.L. & Ryan, R.M. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality, Vol.74,* p. 1557-1586

Déhora. (2008) Zelfroosteren met Time Care, Optimaal voor medewerker én organisatie. Retrieved at 2 June 2008, via http://www.dehora.com/planning/Dehora-Dossier-Zelfroosteren-met-Time-Care.pdf

Delmotte, J., Lamberts, M., Sels, L., Hootegem, G., van (2002). Cahier 2: Waarom en hoe van dit onderzoek. *Personeelsbeleid in KMO's: een onderzoek naar de kenmerken van een effectief KMO-personeelsbeleid* Katholieke Universiteit Leuven

Drouin, R., & Potter, M. (2005). Flexible scheduling. Exploring the benefits and the limitations. *American Journal of Nursing, Vol. 105 (11),* p. 72E-72F.

Federatie Nederlandse Vakbeweging [FNV Bondgenoten] (2007). *FNV Bondgenoten: een leven lang prettig werken. Levensfasebewust beleid van FNV Bondgenoten,* Ed.: van der Stigt, J., Stichting FNV Pers, Amsterdam

Felstead, A., Jewson, N., Phizacklea, A. and Walters, S. (2002). Opportunities to work at home in the context of work-life balance. *Human Resource Management Journal, Vol. 12(1),* p. 54-76.

Fields, C. J. (1974). Variable work hours- its mony experience. *Personnel Journal, Vol. 53(*9), 675-678.

Frey, B. S., Benz, M., and Stutzer, A. (2002). Introducing Procedural Utility: Not only What, but also How Matters. Institute for Empirical Research in Economics Working Paper No. 129. University of Zurich, Zurich.

Groen, S.(2008). *Interview 21 August 2008*, 16.15h – 17.30h at FNV Bondgenoten, Varrolaan 100, Utrecht

Hoffart, N., & Willdermood, S. (1997). Self-scheduling in five med/surg units. *Nursing Management, Vol. 28 (4),* p. 42-46.

Hung, R. (1992). Improving productivity and quality through workforce scheduling. *Industrial Management,* p. 4 -6

Kim, J. S. and Campagna, A. F. (1981). Effects of flexitime on employee attendance and performance: A field experiment. *Academy of Management Journal, Vol.. 24*, 729-741.

Lam, M.H.P. (2008). *Exploring the conditions that contribute to a successful design and implementation of self-rostering* Unpublished record. Master thesis, Business Administration HRM, University of Twente, 17 October 2008.

Leede de, J. , Nijhof, A.H.J. & Fisscher, O.A.M. (1999) The myth of self-managing teams: A reflection on the allocation of responsibilities between individuals, teams and the organisation. *Journal of business ethics, Vol. 21 (2-3),* p. 203-215

Leede, J. de, & Peltzer, F. (2008). *Studiereis NCSI Zelfroosteren Stockholm*, 21-22 februari 2008. Unpublished record. Nederlands Centrum voor Sociale Innovatie, 26 February 2008.

Leede, J. de, Looise, J.K., & Van Riemsdijk, M. (2004). Collectivism versus individualism in Dutch employment relations. *Human Resource Management Journal, Vol. 14(1),* p. 25-39.

Loo, T. (n.d.) *Create SMART Goals.* Retrieved at 9 October, 2008, via Selfgrowth.com: http://www.selfgrowth.com/articles/TristanLoo5.html

Looise, J.K., & Leede, J. de (n.d.). Collective bargaining innovation in the Netherlands, what does it really mean? Decentralised and individualized employment relations in a long-term perspective. University of Twente, Enschede

Lubbers, A. (2008). Het Zweedse wondermiddel. Innoveren met zelfroosteren. *Intermediair PW, Vol. 3,* p. 14-17.

McEwen, N., Carmichael, C., Short, D., & Steel, A. (1988). Managing Organizational Change – A strategic approach. *Long Range Planning, Vol. 21*, p. 71-78.

Molleman, E. (2000) Modalities of self-managing teams; the "must", "may", "can" and "will" of local decision making. *International Journal of Operations & Production Management, Vol. 20 (8),* p. 889 – 910.

Mwiya, M.T.M. (2008) *Exploring the effective use of self rostering: a contingent approach.* Unpublished record. Master thesis, Business Administration HRM, University of Twente, 22 October 2008.

Nederlands Centrum voor Sociale Innovatie [NCSI] (n.d.). *Startnotitie: Flexibele inzet van personeel en tijd.* Retrieved 13 February, 2008, via http://www.nsci.nl, but original document does not exist anymore. Comparable document can be found on http://www.ncsi.nl/activiteiten/Projecten/Flexibel%20organiseren%20Zelfroosteren/

Nollen, S. D. and Martin, V. H. (1978). Alternative work schedules, part 1: flexitime. American Management Association Survey Report; AMACOM.

Oegema, S.M., Van de Riet, A., Van Nijen, A. (2008). *Interview 27 August 2008*, 10.00h – 11.30h at Nederlandse Spoorwegen, Laan van Puntenburg 100, Utrecht

Orpin, C. (1981). Effects of flexible working hours on employee satisfaction and performance: A field experiment. *Journal of Applied Psychology, Vol.. 66,* 113-115.

Osse, P., & Dragstra, D. (2001). Inspraak in roosters. In VOF De Woorden, *Spelen met werktijd. Hoe flexibiliteit werkgevers én werknemers ten goede kan komen* (p. 39-41). FNV Pers, & FNV-vrouwensecretariaat.

Piderit, S. K. (2000). Rethinking resistance and recognizing ambivalence: a multidimensional view of attitudes toward an organizational change. *Academy of Management Review, Vol. 25 (4),* p. 783 794.

Pierce, J. L. & Newstrom, J. W. (1983). The Design of Flexible Work Schedules and Employee Responses: Relationships and Process. *Journal of Occupational Behavior, Vol. 4(4*), 247-262.

Rechtspoor (Admin.). (2008). Zelfroosteren: ja, nee of misschien? *FNV Bondgenoten, Rechtspoor*, Maart 2008, p. 4-6.

Sample, J.A. (1984). Nominal Group Technique: An Alternative to Brainstorming [Electronic version] *Journal of Extension. Vol. 22(2).*

Schein, V. E., Mauner, E. H. and Novak, J. R. (1977). Impact of flexible working hours on productivity. *Journal of Applied Psychology, Vol. 62*, 463-465.

Segers, E. (2008). *Interview 16 July 2008*, 11.00h – 13.15h at Déhora, Gelderlandplein 75d, Amsterdam

Silvestro, R., & Silvestro, C. (2000). An evaluation of nurse rostering practices in the National Health Service. *Journal of Advanced Nursing, Vol. 32 (2),* p. 525-535.

Sociaal Economische Raad [SER] (2001). Veranderende arbeidspatronen: trends, ontwikkelingen en mythes. In Sociaal Economische Raad, *Levensloopbanen: gevolgen van veranderende arbeidspatronen* (p. 17-38). SER, Den Haag.

Sociaal Economische Samenwerking West-Brabant [SES West-Brabant]. (2006). *Levensfasebewust beleid: Klaar voor de toekomst!* SES West-Brabant, Roosendaal

Swart, J. C. (1974). What time shall I go to work today? Business Horizons, 17(5), 19-26.

Teahan, B. (1998). Implementation of a self-scheduling system: a solution to more than just schedules! *Journal of Nursing Management, Vol. 6 (6),* p. 361-368.

Thornthwaite, L., & Sheldon, P. (2004). Employee self-rostering for work-family balance. Leading examples is Austria. *Employee Relations, Vol. 26 (3),* p. 238-254

Veldman, A.G. (2005). *Flexibilisering van arbeidstijd en arbeidsduur: dilemma's van sturing en regulering.* Retrieved 8 May, 2008, via University of Utrecht, NARCIS, provider of scientific publication web site: http://igitur-archive.library.uu.nl/law/2006-0803-202602/Veldman_05Arbeidstijden.doc

Vos, P. (2008). Geen diensten plannen, maar uren verdelen. Zelfroosteren: win-win voor werknemers en werkgevers. *Werkgeven, Vol. 8,* p. 14-19.

Wortley, V, & Grierson-Hill, L. (2003). Developing a successful self-rostering shift system. *Nursing Standard, Vol. 17(4),* p. 40-42.

Zeggenschap. (2008). Een nieuw wondermiddel? Zelfroosteren is in de mode. *Zeggenschap, Maart 2008,* p. 6-8.

Zimmerman, P.G. (1995). How we do it: Self-scheduling in the emergency department. *Journal of Emergency Nursing, Vol. 21*, p. 58 -61.

Glossary

In this overview the abbreviations and words that might not be known by the reader are summarized.

CAO	Collective arbeidsovereenkomst (Collective labor agreement)
FWS	Flexible work schedules
Heterog.	Heterogeneous
Homog.	Homogeneous
HRM	Human Resource Management
IT&M	Intern transport en magazijnen. (Internal Transport and Warehouses). The department in which the research has been conducted
P&O	Personeel en Organisatie (Personnel and Organization)
Rostar Flex	Rostar Flex is a planning tool developed by Paralex. The system is used at the IT&M department to make work schedules for the forklift drivers. *For more information: http://www.paralax.nl/nl/17/producten/rostar_flex.htm (in Dutch)*
SR	Self-rostering

Appendixes

APPENDIX 1 ELABORATION INTERVIEWS EXPERTS SELF-ROSTERING

Elaboration Interview Esther Segers, Déhora

Interviewee: *Esther Segers (Déhora)*
Interviewers: *Mondwa Mwiya, Marieke van Aard (University of Twente)*
Date: *Wednesday July 16th 2008*
Place: *Déhora, Amsterdam*

Reason interview: Esther Segers is an expert in the field of personnel planning. She works for Déhora which is a company that has got a special interest in self-rostering. The information gathered will be a fruitful addition for the research of the feasibility of self-rostering and designing a self-roster system.

General
Déhora Consultancy Group (Déhora) is a company which is specialized in personnel planning and working times. It was established about 20 years ago and has 100 employees in establishments in the Netherlands, Belgium and Poland.

Esther Segers is a sales manager at Déhora. Her specialization involves the influence on working times, software and advanced scheduling and planning solutions (APS).

In 2006, Déhora got involved with the subject self-rostering when the CEO of Déhora, Ben Jansen, met Leendert Venema of Time Care. Since 1993, Time Care provides support solutions for self-rostering. The organization is located in Sweden, a country in which self-rostering has been used for years and has been proven successful. Déhora has visited companies that already use self-rostering, to see how the system is performing.

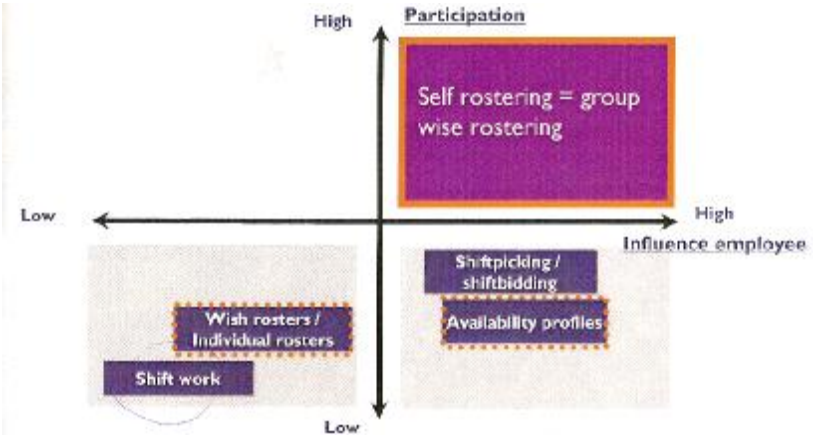
Introducing self-rostering in the Netherlands, Déhora is currently primarily talking to companies that encounter complex rostering issues and work 24/7. Besides that, the company is publishing articles about self-rostering. November 2007 a media hype around the topic 'self-rostering' started, with increasing attention of employee organizations for various articles in newspapers, Management Team and Intermediair about the self-rostering concept. Events were, and still are, organized to further inform all parties about the concept.

General self-rostering

Forms of self-rostering
Self-rostering involves the influence of employees on working time. According to Esther Segers there are several forms of self-rostering:

- Shifts: every employee has to work according to shifts that are organized by the employer.
- Wish rosters: employees can indicate when they cannot work. Rosters are adjusted to private conditions. For example: Wednesday's off to take care of the children.
- Availability rosters: employees should indicate their availability for the next 48 hours. On base of the availability, the roster will be made. This form of self-rostering is used in call centers.
- Shift bidding: this form is used mainly in the US. Employees receive 100 bidding points at the start of every year. With those bidding points they can bid on their preferable shift. The one that has the most bidding points placed on a particular shift will receive that shift.

- Shift picking: the organization determines which shifts have to be fulfilled. Employees can choose the shift they want to work. A disadvantage of this method is if you are not in time, you won't be able to pick the shift/roster you want. Thus, there is no equality between employees.
- Self-rostering.



Self-rostering

Currently, the power of making a roster is in the hands of the company. However, employers would want to have an influence on their roster. Self-rostering is a system that realizes those employee needs. With self-rostering:

1. the employer determines the staffing needs per hour or quarterly.
2. the employees give an indication on when they want to work (individual decision)
3. a match will be made between the needs and wishes of respectively employer and employees. Some misfits will arise. Employees have to work together to make the roster fit (group process).

It is important that the employer makes clear rules for the employees concerning the indication of preferable hours.

With self-rostering the laws and agreements made with unions (collective agreements) have to be taken into consideration. The agreements made with the employee should also be considered (like, Thursday evening off to go to soccer practice).

The advantages of self-rostering are:

- it increases productivity by increasing efficiency. Self-rostering is more efficient than the 'old' way of making rosters by dividing work in shifts. In the 'old' manner the ups and downs in the work load are flattened by organizing work in shifts. By means of self-rostering these ups and downs can be taken into consideration (the needed staff is in line with the required work).

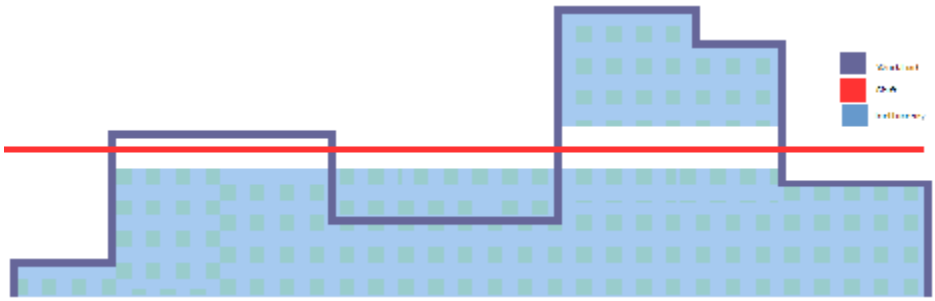


Figure 25 Old way of rostering is inefficient

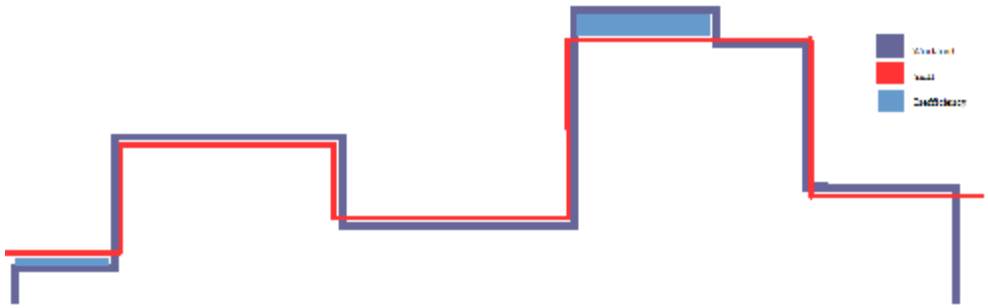


Figure 26 Self-rostering is more efficient

- Employee satisfaction increases, because they are given more responsibility. This is particularly the case for higher educated workers.
- Self-rostering reduces overtime, because work can be scheduled according to productivity needs.
- The sickness rate decreases thanks to self-rostering. Because employees feel more involved with the roster and the work, they are less willing to call in sick.
- Self-rostering is a tool to attract new employees.

Although self-rostering is a positive development in the human resource management, the system also knows a disadvantage. A consequence of self-rostering is that it takes the employees time to make their own roster. Based on Swedish experience, this approximately will take employees 5 to 10 minutes a week.

Another challenge can be the Collective Labor Agreements. One of the critical success factors is that employees really have to have the possibility to make choices. As soon as there are too many collectively agreed labor rules, choices are automatically restricted. To increase working time possibilities for employees, companies can decide to allow individual deviation from collective rules. This means a system can be build from collective protection, and individual extension, if desired by the individual. It goes without saying that a company is not allowed to demand individual deviation. Deviation must only be allowed on individual request .

Self-rostering has already been proven successful in the healthcare sector. According to Esther Segers it is mainly used in this sector because it is difficult to attract qualified personnel. Self-rostering can be a tool to attract and retain personnel. Self-rostering can work in other sectors given that the factors discussed in the following sections exists. Occupations for which self-rostering (in the ultimate way, where predefined shifts are replaced by free times to be chosen) will not work are for example, an airplane pilot or a driver in the public transport sector. He/she has to be there at particular times and cannot have some hours off in between.

Feasibility of self-rostering

The following are some preconditions that are necessary for self rostering feasibility as noted in the interview with Esther Segers:

- Like mentioned above, employee must be able to have a choice. An organization must not have a 'nine till five' protocol, because that will make it difficult for the employee to choose something.
- People must be interchangeable. Employees must be able to fulfill several work places. This makes scheduling by means of self-rostering less difficult.
- Understaffing is not advisable, because the roster can not be completed when there are vacancies (self-rostering is not a solution for understaffing).
- The self-rostering group should exist of people from different life phases (heterogeneous group). Dealing with different wishes makes scheduling people easier (for example younger people want to work less preferable hours to receive bonuses, and employees with little children want to work during school hours). When the group is homogeneous some agreements have to be made to ensure the completion of the schedules.
- Employees should want a self-rostering system.

Designing a self-rostering system

When creating a self-rostering system the following points of interest need to be taken into consideration:

- A responsible project group should be compiled that appreciates a collective way of thinking and is willing to see the organization succeed. The members of the group want to help solving the problem. It is also advisable to include a planner who knows the different needs of personnel, so that these can be taken into consideration when designing the system.
- The project can only be successful as soon as SMART goals are preliminary set. Only then clear communication is possible. SMART goals are also the only way to objectively measure project results afterwards. Goals could be for example: decrease absence through illness, reduce overtime, scale down number of temporarily hired employees, reduce number of shift swapping, increase employee satisfaction, etc.
- An information session would help create understanding for the self-rostering system. By scheduling a forum discussion where people are free to ask questions about the system, one can gain an insight into employees opinions.
- Ask people if they like the idea of self-rostering. If they are not interested, a self-rostering system should not be introduced.
- Use someone who is enthusiastic about self-rostering as the project manager. Ask employees about their preferences. These can be taken into consideration when the self-rostering system is designed.

When creating a self-rostering system, several parties should be involved. It is advisable to include a representative of the union. Agreements that have been made with the union should be taken into consideration. This can be realized by including a representative of the works council. Representatives of the group for which self-rostering is intended, should be involved as well when designing a self-rostering system. It is wise to include people in favor and against the new system. The third party that should be involved is the planner. He/she knows the preferences of the employees, knows the company rules, statutory basis and his/her responsibilities will change when introducing self-rostering.

The period in which employees can define their preferences until the provisional roster depends on the level of work fluctuation. The average is four to six weeks. When the workforce is more dynamic the defining period should be shorter.

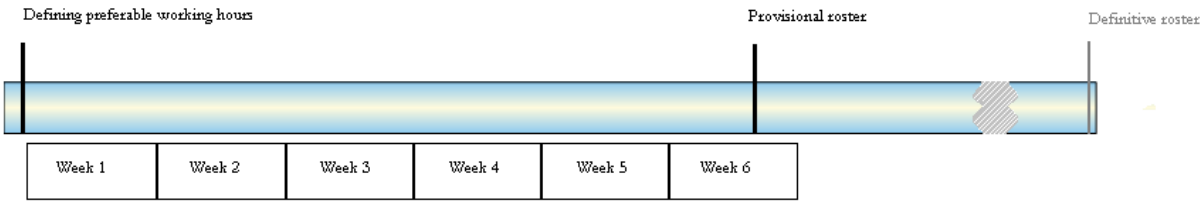


Figure 27 Period between defining preferences and provisional roster

When creating a self-rostering project group several characteristics are important:

- The members should be goal oriented. Everyone should know what the goals are. One person should be responsible for the 'goal management';
- The planner should have economical and mathematical abilities;
- A person that has a motivating and stimulating role should be included;
- Communication should be on a clear and frequent base (no hidden agenda's);
- The self-rostering project group should be heterogeneous in terms of life cycle phases, but homogeneous in terms of skills (for interchangeability)

For self-rostering the minimum and maximum number of people required, needs to be determined in advance. When the required people can only be determined in a short period, an organization should self-roster the minimal needed staff. The maximum needed staff is scheduled for a period of four to six weeks provisionally. They will be informed on a short term if they are really needed.

Implementing self-rostering

It is advisable to create a pilot to test the effects of self-rostering. Some points of interest should be taking into consideration when implementing a self-rostering system:

- Before the pilot starts, it is important to discuss the rules of self-rostering;
- Employees should participate voluntary and not be coerced;
- Show more good will towards the people who work in unfavorable hours. Time Care can give support when managing this;
- The scheduling 'puzzle' should be relatively easy. Complex ones have too much criteria and are thus susceptible to misunderstandings;
- An adaption period of six to twelve months is advisable;
- A self-rostering group should be between 15 and 80 people. If the group consists of more than 80 people, the group should be divided in sub-groups;
- The organizational structure is not important, because the group that has been given self-rostering makes its own choices;
- In organizations where the 'bottom up' approach is used, there is more willingness to implement self-rostering;
- A pre-test (of for example sickness rate and complains about the roster) is needed to be able to see the results of self-rostering;
- A pilot cannot predict behavior of all parties concerned when the system is actually implemented.

Introducing a self-rostering system involves a change process. Employees will have to get used to receiving more responsibility. In order to prevent problems the parties concerned should be well informed about the meaning of the new system. It is also advisable to introduce one change at a time. Changes with salary could lead to more confusion.

Factors affecting self-rostering effectiveness

For this part of the interview, a table has been made which summarizes the interview responses towards the theory based factors, and towards other questions raised.[30]

Theoretical based factors	Interviewee opinion
Adaptation period	• Agree- Adaptation period of 6 – 12 months is advisable
Gender	• Not sure- Not certain of the generalized perception that females are more suitable for self rostering.
Type of employee	• Agree- Computer literate people are more suitable. Higher educated employees are suitable due to their perceived sense of responsibility.
Type of manager	• Agree- Managers who have good knowledge about change management, who can openly communicate, who motivate, and keep the organizations goals in mind.
Size	• Agree- The group should be between 15 and 80 people. This group should be able to choose its preferences.
Organizational power relations	• Agree- Organization should have a dual commitment culture.
Organizational structure	• Disagree- Organizational structure is not exactly important because it is dependant on the group that is given self rostering.
Extra factors perceived by interviewee	• Involve employees in the process of making rules about self rostering. • Rules should be clear to all parties involved in the self rostering process. • Rules should be structured within the confines of the labor laws. • Facilitate as much as possible individual preferences. • People have to be mutually interchangeable and considerate of one another. • Group of employees should be heterogeneous in life cycle but homogeneous in terms of skills. • Employees should actually want and prefer this system before it is implemented. • Higher educated employees because this reduces problems of complaints due to lack of understanding of the whole self rostering procedure. It would be helpful to start an information session about what self rostering is. Then schedule a forum discussion where people are free to ask questions about the system and finally gaining insight as to what the people's opinion is about the system. • Use a pre-pilot and post-pilot measurement scheme to predict its effectiveness before fully implementing the

[30] The blank spaces in the table indicate that the questions were not asked, but are asked later by e-mail. Response on that has not been received yet. The blank spaces will be filled in after receiving the answers.

	system. • Give goodwill to employees who work less favorable hours.
List of factors in terms of importance	
Why self rostering is more prevalent in the health sector than other sectors	• Very difficult to attract personnel in the health sector and that is why this system is more prevalent there. The manufacturing sector is just moving from the shift system and is still adapting.
Whether or not self rostering can work in the manufacturing sector.	• Self rostering can work in this sector given that the factors discussed earlier exist.
Type of organization perceived as likely to achieve a successful self rostering outcome	•
The kind of external environment that supports self rostering	•
Does self rostering require more autonomy and individualism than it has in its real form?	•
Any unique characteristics that you would look for in a candidate applying as self rostering manager?	•

Summary of consistency of opinions with theory

With the exception of gender and organizational structure, the interviewee agreed with all factors raised in the theory . Unfortunately there have been no gender researches carried out yet. Besides practical experiences, gender differences are not evident. The fact we do not have gender specific information does not mean it still can be a very relevant question.

Summary of additional factors as noted from the interviewee

The following factors have been derived from the interview in addition to the theoretical based ones:

- Stakeholder involvement in the SR process.
- Level of clarity as regards the rules of self rostering to all parties.
- Extent of individualism in the process.
- Interchangeability and level of consideration amongst employees.
- Heterogeneity and homogeneity attributes.
- Willingness of the employees to undergo this process.
- Education level of parties involved.
- Pilot results.
- Incentives for less preferable working hours.

Additional information

Esther Segers has given the interviewers additional information about self-rostering in hard copy. Marieke received more information about Time Care by e-mail. Esther Segers agreed to answer some questions left by e-mail. Some questions have been sent to her after the interview.

Elaboration Interview Sam Groen, FNV Bondgenoten

Interviewee: *Sam Groen (FNV Bondgenoten)*
Interviewers: *Mondwa Myiwa, Marieke Lam, Marieke van Aard (University of Twente)*
Date: *Thursday August 21st 2008*
Place: *FNV Bondgenoten, Utrecht*

Reason interview: Sam Groen is an advisor in working time at FNV Bondgenoten and is a member of the knowledge group 'Self-rostering' of NCSI. He was interviewed to get also a view of the employee-side on self-rostering.

General
Sam Groen is an advisor of working times for the board, other organizations and works councils. He got involved with self-rostering when Déhora introduced it in the Netherlands. The director of Déhora - a friend of mr. Groen - was interested in involving a trade union with self-rostering. Cooperation was the result.

General self-rostering
The interest in self-rostering has risen from the need to anticipate more efficiently on the work load of the employer. Beside that, the employee has a need to combine work and private life more efficiently. FNV thinks that the influence of the employee on working time can be increased. Self-rostering is a positive tool to experiment with that. It has had positive results in other countries and sectors and can be implemented in the Netherlands. Comparing to other unions FNV is the most positive about the new concept.

Self-rostering is more prevalent in the healthcare sector because in the healthcare sector employees act more as an individual. Beside that most employees are women and women have a bigger need for flexibility. Furthermore, in the healthcare sector people have been working with individual rosters. In other sectors people are working with more collective rosters. For those sectors the change to individual roster is more difficult. Nevertheless Mr. Groen considers the concept as a feasible possibility for other sectors as well, especially for service oriented organizations. He gave an example of the metal industry. Metal mechanics already work individually and have evening- and weekend shifts. Self-rostering could help them to manage their time more efficiently.

The advantages of self-rostering are, according to Mr. Groen:
- A company can adjust the working time to production need;
- Employees want to say more about their working time and self-rostering is a tool to realize that;
- Increase of productivity. This has been proven in organizations who work with self-rostering in Sweden.

Mr. Groen said there is also a disadvantage of self-rostering:
- It takes a lot of time to design and maintain a self-rostering system.

Self-rostering has consequences for unions. There is a development in which unions think more individually when it concerns employees. This is partly due to consumer demands, which will make individual choices more likely. Mr. Groen gave an example about the opening hours of stores. More stores are open after 18.00h and in weekends. This has consequences for the working times: they become more flexible.

The more individuals have the influence on working times, the more the unions will step back. It is not the case that unions loose their power. Unions react on that by not holding on to collective burns, but by supporting individually thinking. On the other hand, the employees are afraid for the individualization, because they are anxious for loosing their collective 'security'.

Feasibility
Mr. Groen defines the following factors as important factors to determine the feasibility of self-rostering:

- *Both parties should get along.* Both parties should be willing to work with self-rostering
- *Sufficient workers.* The self-rostering group needs sufficient workers. There is no maximum of the size of the self-rostering group. If the group is large (f.e. 1000 employees), the group can be divided in several smaller groups.
- *Different backgrounds.* The self-rostering group should have different backgrounds. Different backgrounds mean different needs, which make self-rostering easier.
- *ICT must be good*. The company should have supporting ICT to make self-rostering realizable.

The willingness of both parties to work with self-rostering is by far the most important factor, according to Mr. Groen.

Factors affecting self-rostering effectiveness
The adaption period of self-rostering depends on the organization it is implemented in. From experience Mr. Groen said that the adaption period is at least nine months until a year before the organization and its employees are used to work with the system.

Other aspects that influence the effectiveness of self-rostering are:

- *Age*. The younger generation thinks more individually (which is needed for self-rostering) than the older generation.
- *Type of manager*. An enthusiastic manager is needed for self-rostering to be effective. Beside that he/she has to learn about working times.
- *The size of self-rostering group*. The self-rostering group should exists of at least five or six persons. For discussing the roster small groups are preferable. When it concerns shift bidding groups should be bigger.
- *Flat organizational structure.* This can also be a result of self-rostering. Employer and employee become more equal. The employer is no longer a superior, but can be seen as one at the same level as the employees with whom can be spoken equivalently about the work rosters. When an organization has an asymmetrical relationship between employer and employees, the self-rostering approach should be more collective.

Education is *not* an important factor for succeeding self-rostering.

According to Mr. Groen, the following characteristics need to be taken into consideration when a self-rostering manager is applied:

- The person should be open to a flat organization.
- He or she should be able to define the workload exactly.
- The manager must think from an individual perspective.

Designing a self-rostering system
The following factors have to be taken into consideration when designing a self-rostering system:

- *Take all the time you needed;*
- *As a designer, do not think in terms of results, but in the designing process;*
- *Keep all the persons involved informed and include them when designing the system;*
- *Do not see the system as a solution for less costs and workers, because that is not the main goal of the system*

Mr. Groen thinks that the self-rostering group should be more homogeneous concerning skills to make self-rostering more easy. It also depends on the amount of people in the working group. If you have a few people who know a particular skill, it is difficult to self-roster because those people do not have many options to choose (do not have the opportunity to be flexible). It is not necessary to have people with exactly the same skills.

When the working demand and capacity need can only be predicted on the short term, the unpredictability should be isolated. A solution could be to let the employees choose whether and when they want to work with the 'unpredictability'. In this period (for example a week) the employee will not have a stable roster, but will be scheduled by demand: he/she will work 8 hours straight, but with different start and ending times every day, depending on the workload of that day.

Implementing self-rostering
Implementation means change. One of the changes is that an employee must start thinking as an individual. He/she has to learn to think in opportunities and to express their wishes. They must express what they want, without borders (what do you want when everything is possible and if there are no restrictions). A discussion is needed to express the differences with colleagues. To let the employees get used to change, it is advisable to introduce self-rostering step by step.

Klokurenmatrix
FNV has introduced the 'klokurenmatrix' because there were too many differentiations between rosters in companies: for example a department who works with shifts has employees who work with different shift contracts (employees work according to the 2 shift and the 3 shift). If an organization or department has such a differentiation it is difficult to work with a collective allowance system. Therefore the 'klokurematrix' have been introduced. It realizes individual rewarding and makes it possible to compare fulltime and part-time workers.

When you develop a 'klokurenmatrix' you have to take into consideration what inconvenient working hours are. Those hours should be rewarded. Mr. Groen has together with AWVN developed 'klokurenmatrixen' for several companies. He promised to send some examples by mail.

Elaboration Interview Koos Oegema, Albert van de Riet and Alexander van Nijen, Nederlandse Spoorwegen (NS)

Interviewees: Koos Oegema, Albert van de Riet, Alexander van Nijen, NS (Oegeman et al.)
Interviewers: *Mondwa Myiwa, Marieke van Aard (University of Twente)*
Date: *Wednesday August 27, 2008*
Place: *NS, Utrecht*

Reason interview: NS has already been experimenting with self-rostering for conductors and train machinists. The interview was conducted to get more information about self-rostering and to get more insight in their experiences developing and implementing (testing) self-rostering.

General
Koos Oegema is project manger of the self-rostering project. He is an information manager (IT) at the personnel and organization department of NS.. He was asked for the project, which started 2 years ago, because he has experience with managing conductors.

Alexander van Nijen works for NS since 2001. He is a manager at the planning department. He has worked at various places for NS. and was asked to join the project in November 2007.

Albert van de Riet is an HR professional at NS.. He works for NS. since 1987. Mr. Van de Riet works for the department HR information management and got involved with rostering problems in 1997. In 2006 he joined the self-rostering project.

The self-rostering project at NS started two and half years ago. (Self-rostering is not implemented yet, the organization is only experimenting with it.) The idea of self-rostering was introduced because the organization wanted fewer rules for planning and wanted to be an attractive employer, now and in the future. Because of self-rostering personnel should get more motivation because they are able to create a good work-life balance. The idea was supported by a labor agreement which said the NS. should experiment with self-rostering as a part of social innovation.

The project is initiated to experiment with self-rostering. It is organized at very small, small and big locations for train machinists and conductors. In Amsterdam, for example, 450 people are involved with the project. They had the opportunity to hand in their wishes for 13 weeks. That combined resulted in a lot of factors that had to be taken into consideration: 450 people indicated their preferable starting and ending times, for different shifts. The working demand for the roster was based on the logistics and the time table of the trains.
The self-rostering system existed of three factors: the collected wishes, the shifts that needed to be fulfilled and the software that calculated the rosters. With the software rosters are made. It will take one hour up to 24 hours to make a closing roster. A roster receives a penalty when not all wishes can be fulfilled. The roster with the lowest penalty becomes the final roster.

General self-rostering
The advantage of self-rostering according to NS is the creation of a work-life balance which will result in more satisfied employees. The employees of NS at the trains need to be available for 24 hours, 7 days a week, but they take that for granted.
Next to that the workforce is ageing which will lead to a tight labor market. With self-rostering NS wants to be an attractive employer.
Another advantage according to NS is the increased insight in the working demand and the availability and needs of the employees. In the old situation you had a theoretical roster and you needed people for that, but it was not sure the people were available. With self-rostering an organization has insight in the needs and availability of the people, so it knows exactly how many people it has for the roster.

Oegema et al. states that self-rostering also has got disadvantages. The biggest disadvantage is that it is difficult to implement, because people are used to the old situation. Another disadvantage is that it takes a lot of time to design and implement it. This disadvantage does not count for new organizations.

Oegema et al. advises not to push self-rostering, but let the employees pull it. Mr. Van de Riet used a metaphor of a pig: *"if you push a pig it will show resistance, but when you pull it by the tail it will run away"*. The more an organization pushes it, the more resistance it will get from the employees. Oegema et al. also said that an organization has to question if it has the software to support self-rostering and if the employees like the new kind of roster. And more importantly, do the employees trust the management for introducing self-rostering? The employees have to trust the software too. For implementing self-rostering the organization has to take the time for it and introduce it step by step. Another aspect that has to be taken into consideration is that with self-rostering all employees become equal. There is a group that loses some, and a group that gains some.

Factors that determine the feasibility of self-rostering are, according to Oegema et al., trust and the technical solution. If the group is too big, the transparency is lost. Moreover the management and the union should have a strong believe in the concept and understanding it. Oegema et al. believes self-rostering will work more easily at an organization with stable shifts. At NS they have to deal with flexible shift because trains leave and arrive at different times. Finally, the self-rostering group should

be of a sufficient size. The minimum group size should be 15 or 20. The group should also be heterogeneous, because different people have different wishes. Also, a larger group has more wishes.

Oegema et al. gave some extra advices: a self-rostering project will always lead to resistance. Therefore a manager should really support the system. Next to it, start with experimenting with it and show the results to all people involved to keep people motivated.

NS is an example the self-rostering can work in other sectors than the healthcare sector. The organization also believes self-rostering will work in a production company where shifts are used. Oegema et al. perceive call centers as more likely to achieve successful self-rostering because they have a lot of part time workers.

Mondwa handed out an overview of factors of effective self-rostering. Mr. Oegema, Mr. Van Nijen and Mr. Van Riet responded on that:

- *Adaption period.* An organization should not push self-rostering. Employees need time to get used to it. The adaption period is between 6 and 12 months. According to Mr. Van de Riet it is comparable to a pregnancy: if it concerns a pregnancy of a person or an elephant that is however the question.
- *Gender*. Oegema et al. expected that females were more in fond of using self-rostering. However, after evaluation it turns out that there is no difference between men and women.
- *Type of employee.* Those with negotiation skills will have the best rosters.
- *Type of manager*. If the management does not believe in the concept, it is doomed to fail.
- *Size of self-rostering group*. If you have a fixed working demand, the group should be large.
- *External environmental pressures.* It helps when other countries already succeed with self-rostering to get organizations motivated for the concept.
- *Organization's power relations.* There is always distrust of employees towards the management.
- *Organization structure*. A flat organizational structure contributes to all changes. The structure of the organization is not the most important factor. The power relations are more important.
- *Level of collegiality*. Collegiality was not a factor of effectiveness at NS, because software makes the roster.
- *Individual focus.* Self-rostering is not always about the individual, but a compromise between individuals.
- *Employee's level of knowledge about the self-rostering system*. Oegema et al. discovered a correlation between the employees that are not informed well and the low evaluation they have given.

A self-rostering manager should not be a control freak, because with self-rostering there is less grip on the process. Besides, the manager should be more of a people manager instead of a process manager.

Designing a self-rostering system

Oegema et al. created several ways for self-rostering, but they didn't work. A software program gave the solution. Oegema et al. talked to stakeholders about the self-rostering system. It took a year and a half to talk about the concept.

The rostering period for self-rostering should, according to Oegema et al., be 13 weeks. However, the shorter the period, the better, because there will not be a lot of change.

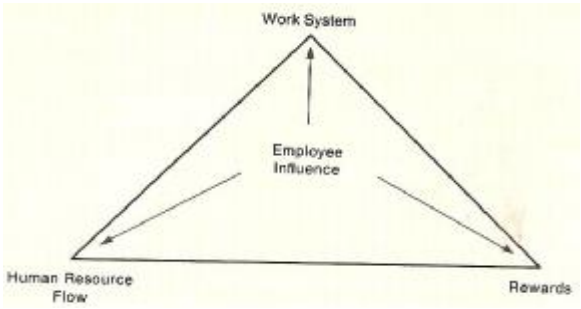
Oegema et al. advices to reward employees with self-rostering more flexible instead of collective. Employees should be rewarded for every hour they work outside the 'convenient' hours.

Implementing self-rostering

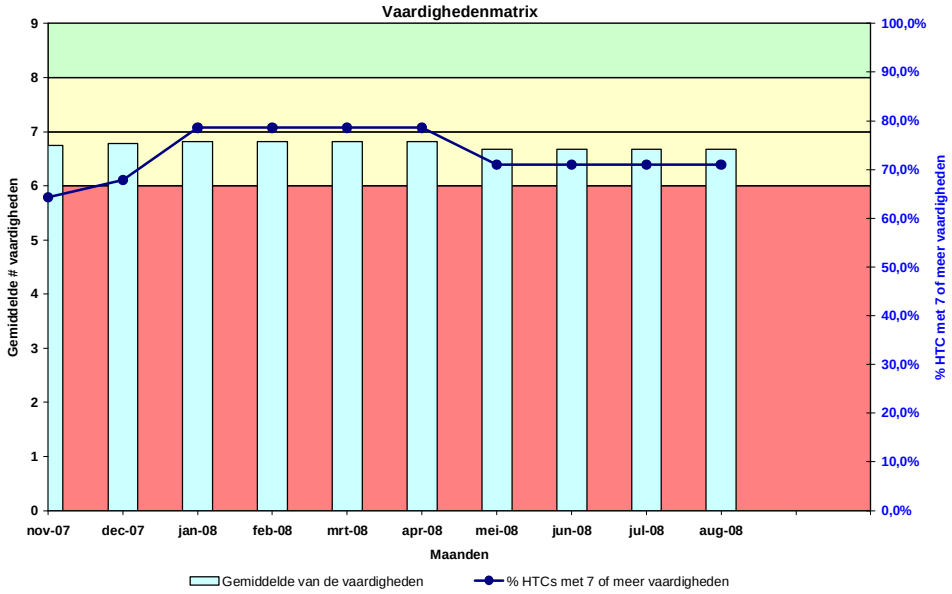
Oegema et al. gave some advices for implementing self-rostering. An organization should see self-rostering as a development. There should be room for failures in the process. Another aspect that has to be taken into consideration is the change for the employees. By giving them influence they receive a responsibility they are not used to. Employees are not used to think for themselves. The most important advice Oegema et al. have given is that people should believe in the concept.

APPENDIX 2 USED FIGURES

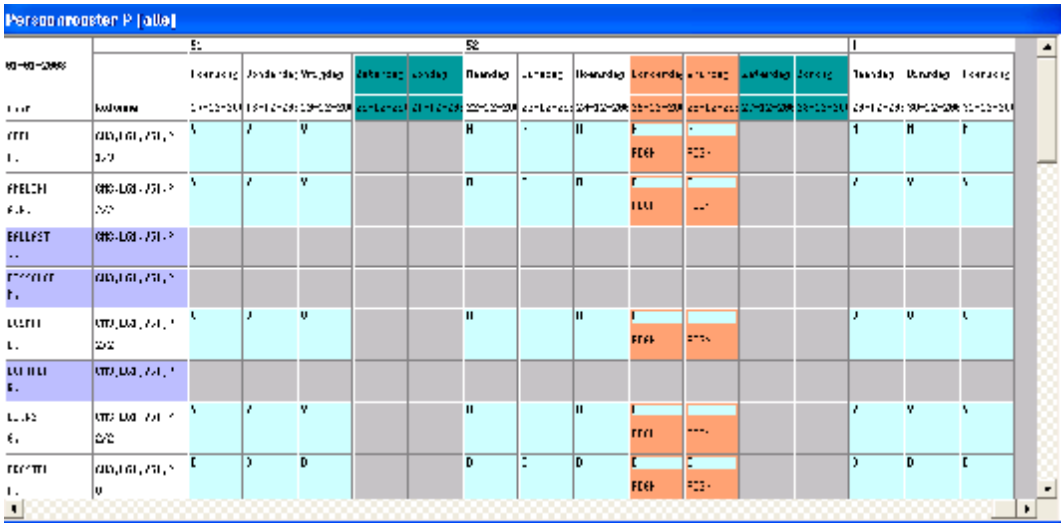
1. Harvard model: HRM policies (Beer et al., 1984)



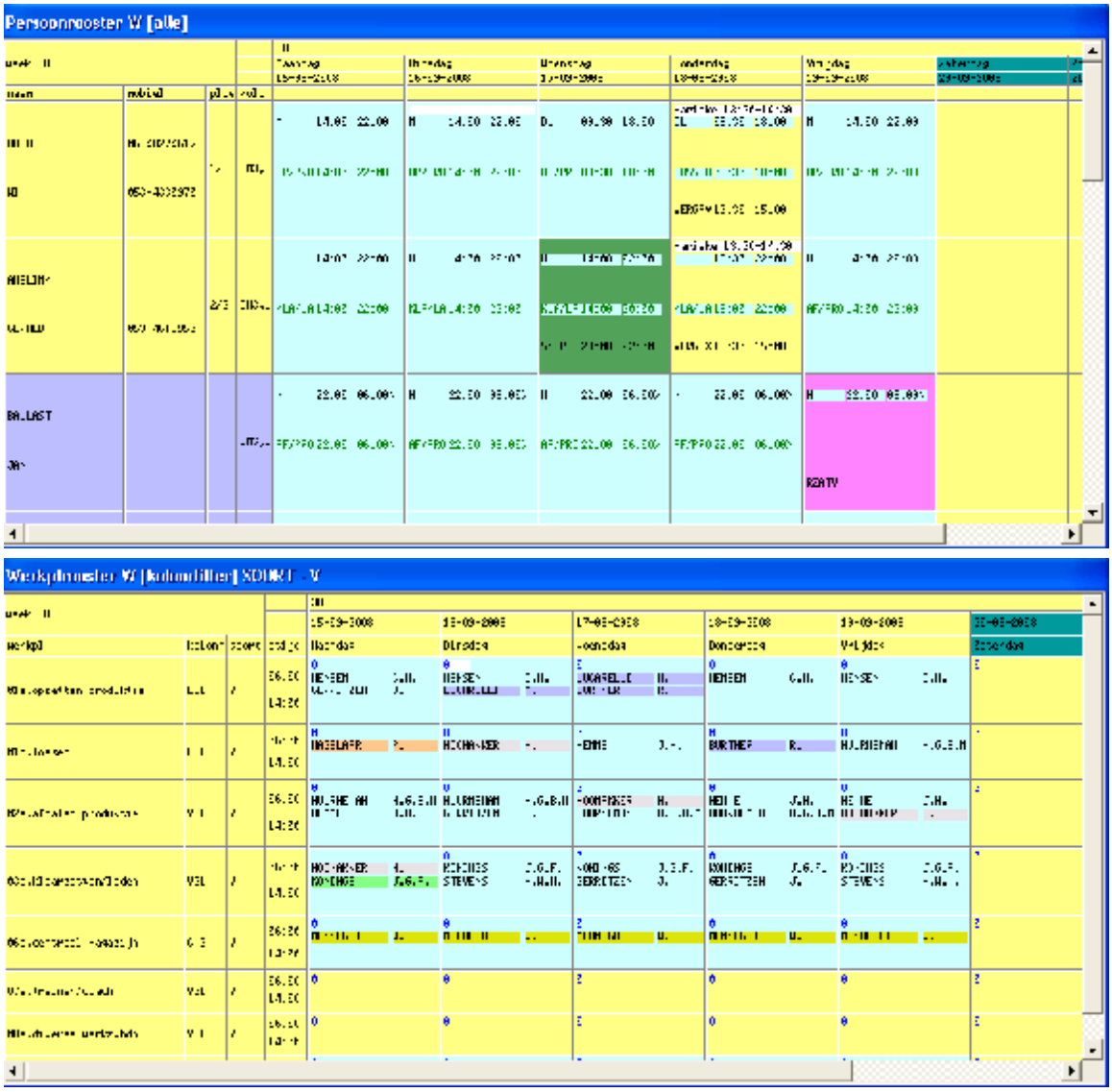
2. Overview of workplace control, prepared by Grolsch (in Dutch)



3. Screenshot year planning Rostar Flex



4. Definitve week planning Rostar Flex



5. Determining the number of fixed en flexible employees

	Morning shift			Afternoon shift			Night shift			Day shift		
Capacity	**Min.**	**Max.**	**Flex.**	**Min.**	**Max.**	**Flex.**	**Min.**	**Max.**	**Flex.**	**Min.**	**Max.**	**Flex.**
Leeggoed	2	3	1	2	3	1	1	1	0	0	0	0
Winteropslag	0	0	0	0	0	0	0	0	0	1	2	1
Afhalen volgoed	1	2	1	1	2	1	0	0	0	0	1	1
Klaarzetten/laden	2	3	1	2	4	2	0	0	0	0	1	1
Laden export 40 ft	0	0	0	0	0	0	0	0	0	1	2	1
Laden export 20 ft	0	0	0	0	0	0	0	0	0	1	2	1
Orderpicken	0	0	0	1	1	0	0	0	0	1	1	0
Centraal magazijn	1	1	0	1	1	0	0	0	0	0	1	1
Beugelmontagelijn	1	1	0	1	1	0	1	1	0	0	0	0
	7	**10**	**3**	**8**	**12**	**4**	**2**	**2**	**0**	**4**	**10**	**6**

Total mimal capacity	21
Total maximal capacity	34
Totaal flexible capacity	13
Fixed capacity per dag	**21**
Flexible capacity per day	**13**
Fixed capacity morning shift	**7**
Fixed capacity afternoon shift	**8**
Fixed capacity night shift	**2**
Fixed capacity day shift	**4**
Flexible capacity morning shift	**3**
Flexible capacity afternoon shift	**4**
Flexible capacity night shift	**0**
Flexible capacity day shift	**6**

APPENDIX 3 INTERVIEW PROTOCOL

The interviews and discussions for collecting data are structured by questions and or statements. The questions and statements are united in questionnaires. The questionnaires for the different target groups are included in this interview protocol.

Questionnaire management

Introductie

1. Introductie van de interviewer (Marieke van Aard)
2. Master thesis Bedrijfskunde, HRM, Zelfroosteren (flexibele werkroosters)
3. Uitleg opdracht bij Grolsch flexibele werkroosters
4. Doel van het gesprek: meer te weten te komen over achterliggende reden project en bepalen van randvoorwaarden voor flexibele werkroosters.
5. Randvoorwaarden van het interview:
    a. De resultaten van het interview zullen alleen worden ingezien door interviewer en begeleiders van UT en Grolsch;
    b. Interview resultaten zullen anoniem worden verwerkt;
    c. Het interview duurt ongeveer een uur.
    d. Indien een antwoord niet kan of wil worden geven is dat mogelijk. Niet verplicht tot antwoorden.

Algemeen

1. Wat zijn de kritische succesfactoren van Groslch? Wat maakt Grolsch bijzonder?
2. Grolsch is niet alleen een kwalitatief hoogstaand merk, maar ook een gevoel en profileert zichzelf zo ook naar de consument toe. Hoe zou Grolsch zich *in de toekomst* willen profileren?
3. Hoe zou u de bedrijfscultuur van Grolsch omschrijven?
4. Hanteer Grolsch momenteel al levensfasebewust personeelsbeleid? Zo ja, wat houdt dit beleid in? Zo niet, waarom is er voor gekozen dit beleid (nog) niet te hanteren?

Onderzoek levensfasebewuste arbeidsvoorwaardencultuur bij Grolsch

5. Vorig jaar hebben het FNV en expertisecentrum LEEFtijd een onderzoek uitgevoerd naar de levensfasebewuste arbeidsvoorwaardencultuur bij Grolsch. Wat is de aanleiding voor dit onderzoek geweest?
6. Wat is uw rol geweest in dit onderzoek?
7. Waarom is er destijds gekozen om dit op de afdeling 'Supply Chain' uit te voeren?
8. Wat is er, naast het initiatief voor het project flexibele werkroosters op de afdeling IT&M, gedaan met de resultaten van het onderzoek?

Afdeling IT&M

9. Wat zijn de kwaliteiten van de afdeling IT&M?
10. Wat zijn de knelpunten van de afdeling IT&M?
11. Wat zou er volgens u kunnen veranderen op de afdeling IT&M?

12. Hoe zou u de bedrijfscultuur van de afdeling IT&M beschrijven?
13. De gemiddelde leeftijd en het gemiddeld aantal jaren dat iemand werkzaam is bij Grolsch is erg hoog op de afdeling IT&M. Hoe zou u dat kunnen verklaren?
14. Wat heeft Grolsch tot op heden gedaan om voor de 'oudere' medewerker? (op HRM gebied)

Project flexibele werkroosters

15. Wat is de reden geweest voor het project betreffende flexibele werkroosters?
16. Wat is het doel van flexibele werkroosters op de afdeling IT&M?
17. Wat verwacht u dat de positieve gevolgen van flexibele werkroosters zijn?
18. Wat verwacht u dat de negatieve gevolgen van flexibele werkroosters zijn?
19. Welke aspecten zou u graag verwerkt willen zien in het flexibele werkrooster systeem?
20. Aan welke voorwaarden moeten de flexibele werkroosters voldoen?
21. Ik stel u zo meteen een aantal mogelijkheden voor van flexibel roosteren. Welke manier van roosteren heeft uw voorkeur?:
    a. De heftruckchauffeurs kunnen kiezen uit 3 soorten diensten (vroeg, middag of nacht). *Hoe staat men tegenover de mogelijkheid om op diensten te bieden?*
    b. De heftruckchauffeurs geven aan wanneer ze *niet kunnen* werken. Het werkrooster wordt hier op aangepast.
    c. De heftruckchauffeurs geeft aan wanneer ze graag zouden willen werken en de planner kijkt of deze kunnen worden ingeroosterd op basis van de bezettingsbehoefte van die week.
    d. De werkweek wordt variabel: de start en eindtijden variëren. *Bijvoorbeeld:* op de ene dag wordt door een heftruckchauffeur gewerkt van 10.00u tot 18.00u en de andere dag van 6.00u tot 14.00u en op weer een andere dag van 16.00u tot 0.00u. *Mogelijkheid tot aanpassen behoefte personeelsbezetting*
    e. Ik zou niet anders willen. Zoals het nu wordt gedaan vind ik prima.
22. Door middel van informatie technologie kunnen veel processen gemakkelijker of efficiënter worden uitgevoerd. Software ondersteuning is ook mogelijk bij flexibele werkroosters. Hoe staat u tegenover software ondersteuning bij de uitvoering van flexibele werkroosters.
23. Wanneer er geen beperkingen zouden zijn (alles is mogelijk), hoe zou volgens u het flexibele werkrooster systeem eruit zien? Welke aspecten dienen er daarin te worden meegenomen?
24. Denkt u dat flexibele werkroosters haalbaar zijn op de afdeling IT&M? Waarom of waarom niet?

Klokurenmatrix

- Uitleg klokurenmatrix

25. De heftruckchauffeurs worden nu beloond middels een ploegentoeslag. Hoe zijn deze toeslagen bepaald?
26. Hoe zou volgens u de klokurenmatrix eruit zien? Waaraan zal het moeten voldoen? Welke aspecten dienen er in te worden opgenomen?
27. Zijn er al personen bezig geweest met de klokurenmatrix? Wat is het resultaat hiervan?

Remarks

Which questions will be asked exactly depends on the person interviewed. The relation between the student and the interviewee is different, so sometimes aspects are already known and would not have to be asked. It is also possible that not all the questions are relevant for the interviewee. These questions will be left out in the particular interview too.

Questionnaire forklift drivers

The questionnaire for the focus group discussion and for the individual interviews is the same. This questionnaire will be in Dutch because the interviewees are all Dutch.

Introductie

1. Introductie van de interviewer (Marieke van Aard)
2. Master thesis Bedrijfskunde, HRM, Zelfroosteren (flexibele werkroosters)
3. Uitleg opdracht bij Grolsch flexibele werkroosters
4. Uitleg van de structuur interview:
    a. **Reageren op vragen en statements + toelichting geven (waarom wel of niet).**
    b. Doel van het interview: een zo'n helder mogelijk beeld te krijgen van de wensen van de heftruckchauffeurs met betrekking tot flexibele werkroosters.
5. Randvoorwaarden van het interview:
    a. Het groepsgesprek duurt ongeveer een uur;
    b. De resultaten van de gesprekken worden alleen gebruikt door de interviewer;
    c. Naam en andere herleidbare gegevens zullen niet worden vermeld. Discretie is dus gegarandeerd;
    d. Iedere mening is een mening, dus iedere inbreng is welkom.
6. Duidelijk maken dat het slechts een onderzoek betreft. De invoering van flexibele werkroosters is nog niet zeker.

Huidige manier van roosteren

1. Wat zijn de voordelen van de huidige manier van roosteren (het werken in ploegendiensten)?
2. Wat zijn de nadelen van de huidige manier van roosteren (het werken in ploegendiensten)?
3. "*De huidige manier van roosteren is flexibel.*"
    a. In hoeverre liggen de roosters vast?
    b. Is er mogelijkheid tot het ruilen van diensten?
4. "*Mijn collega's en ik zijn breed inzetbaar*" (bereidheid om andere werkplekken te vervullen)?
5. "*Ik ben altijd bereid om mijn collega te helpen.*" (individu **à** groep)
6. "*Mijn collega('s) zijn altijd bereid mij te helpen.*" (groep **à** individu)
7. "*Ik krijg voldoende vrijheid om eigen keuzes te maken.*"
    a. Is dat zo bij de verdeling van taken?
    b. En op andere gebieden?
8. "*Mijn ideeën voor oplossingen worden gewaardeerd.*"
    a. Worden deze ideeën op eigen initiatief aangedragen? Of wordt dit door leidinggevende (teamleider/manager afdeling) gevraagd?
9. "*Ik ben erg tevreden met de huidige manier van het indelen van diensten.*"
    a. ("Op een schaal van één tot tien"?)

Gewenste manier van roosteren

10. Hoe ver van te voren zou je willen weten wanneer je moet werken? Hoe is dat nu?
11. "*Ik zou graag meer inspraak willen hebben op de uren die ik moet werken.*"
12. "*Ik zou graag meer inspraak willen hebben op mijn vrije dagen.*"
13. "*Ik zou graag meer inspraak willen hebben op de taken die ik uit moet voeren.*"
14. "*Ik zou graag meer verantwoordelijkheden willen hebben*"
15. "*Ik zou graag samen met mijn collega's een werkrooster willen maken.*"
    a. (meer verantwoordelijkheid bij werknemers, minder bij teamleiders)

16. Wat zou je graag anders zien met betrekking tot het indelen van diensten?
17. Als je zou mogen kiezen uit de volgende mogelijkheden van het indelen van werktijden, waar gaat je voorkeur naar uit?:
    a. Het kiezen van een dienst. Je kunt kiezen uit 3 soorten diensten (vroeg, middag of nacht). *Hoe staat men tegenover de mogelijkheid om op diensten te bieden?*
    b. Je geeft aan wanneer je *niet* kan werken. Je werkrooster wordt hier op aangepast.
    c. Je geeft aan wanneer je graag zou willen werken en de planner kijkt of deze kunnen worden ingeroosterd op basis van de bezettingsbehoefte van die week.
    d. De werkweek wordt variabel: de start en eindtijden variëren. *Bijvoorbeeld:* op de ene dag werk je van 10.00u tot 18.00u en de andere dag werk je van 6.00u tot 14.00u en op weer een andere dag werk je van 16.00u tot 0.00u.
    e. Ik zou niet anders willen. Zoals het nu wordt gedaan vind ik prima.
18. Als je je ideale manier van het indelen van diensten zou moeten beschrijven, hoe zou dat er uitzien? (alles is mogelijk, geen beperkingen)
    a. Waar dient dan rekening mee gehouden te worden?

Flexibele werkroosters

- Uitleg flexibele werkroosters

19. Wat is je mening over flexibele werkroosters?
20. Wat verwacht je dat de positieve gevolgen van flexibele werkroosters zijn?
21. Wat verwacht je dat de negatieve gevolgen van flexibele werkroosters zijn?
22. Zou je met flexibele werkroosters willen werken?
    a. Onder welke voorwaarden wel en onder welke voorwaarden niet?
23. Denk je dat flexibele werkroosters bij Grolsch mogelijk zijn?
    a. Waarom is het (on)mogelijk?
    b. Wat zou er moeten veranderen om het wel mogelijk te maken?
24. **Stel:** flexibele werkroosters worden ingevoerd, met welke aspecten dient er rekening te worden gehouden?
    a. Wat zou men gehandhaafd willen blijven zien (ATV dagen, andere aspecten?)?
    b. Welke nieuwe aspecten dienen er te worden toegevoegd (vb. meer vrijheid bij het invullen van taken)?
25. Nog aanvullingen?

Remarks

The outcomes of the interviews will be discussed in the working group that is established for the flexible work schedules project. This project group exists of management (initiators), a representative of the works council, a team leader and forklift drivers. The forklift drivers who are anticipating in the focus group discussion are not the same persons as the forklift drivers in the working group. This is done deliberately to create a broader picture.

Questionnaire team leaders

This questionnaire will be in Dutch because the interviewees are all Dutch.

Introductie

1. Introductie van de interviewer (Marieke van Aard)
2. Master thesis Bedrijfskunde, HRM, Zelfroosteren (flexibele werkroosters)
3. Uitleg opdracht bij Grolsch flexibele werkroosters
4. Randvoorwaarden van het interview:

   a. Het groepsgesprek duurt ongeveer een uur;
   b. De resultaten van de gesprekken worden alleen gebruikt door de interviewer;
   c. Naam en andere herleidbare gegevens zullen niet worden vermeld. Discretie is dus gegarandeerd;
   d. Iedere mening is een mening, dus iedere inbreng is welkom.
5. Duidelijk maken dat het slechts een onderzoek betreft. De invoering van flexibele werkroosters is nog niet zeker.

Afdeling IT&M

1. Wat zijn de kwaliteiten van de afdeling IT&M?
2. Wat zijn de knelpunten van de afdeling IT&M?
3. Wat zou er volgens jou kunnen veranderen op de afdeling IT&M?
4. Hoe zou je de bedrijfscultuur van de afdeling IT&M beschrijven? Collegialiteit? Ruimte voor ideeën?

Huidige manier van roosteren

5. Kun je een omschrijving geven van de wijze waarop nu werkroosters worden gemaakt? Hoe worden de roosters van de heftruckchauffeurs gemaakt? Hoe worden de roosters van de teamleiders gemaakt? Welk systeem wordt hiervoor gebruikt?
6. Wat zijn de voordelen van de huidige manier van roosteren (het werken in ploegendiensten)?
7. Wat zijn de nadelen van de huidige manier van roosteren (het werken in ploegendiensten)?
8. Ben je tevreden over de huidige manier van roosteren? Waarom of waarom niet? Wat zou je veranderd willen zien?

Gewenste manier van roosteren

9. Zou je de verantwoordelijkheid van het maken van roosters bij een andere functiegroep, zoals heftruckchauffeurs, willen leggen? Waarom of waarom niet?
10. Wat zou je graag anders zien met betrekking tot het indelen van diensten?
11. Als je zou mogen kiezen uit de volgende mogelijkheden van het indelen van werktijden, waar gaat je voorkeur naar uit?:
    a. De heftruckchauffeurs kunnen kiezen uit 3 soorten diensten (vroeg, middag of nacht). *Hoe staat men tegenover de mogelijkheid om op diensten te bieden?*
    b. De heftruckchauffeurs geven aan wanneer ze *niet kunnen* werken. Het werkrooster wordt hier op aangepast.
    c. De heftruckchauffeurs geeft aan wanneer ze graag zouden willen werken en de planner kijkt of deze kunnen worden ingeroosterd op basis van de bezettingsbehoefte van die week.
    d. De werkweek wordt variabel: de start en eindtijden variëren. *Bijvoorbeeld:* op de ene dag wordt door een heftruckchauffeur gewerkt van 10.00u tot 18.00u en de andere dag van 6.00u tot 14.00u en op weer een andere dag van 16.00u tot 0.00u. *Mogelijkheid tot aanpassen behoefte personeelsbezetting*
    e. Ik zou niet anders willen. Zoals het nu wordt gedaan vind ik prima.
12. Als je je ideale manier van het indelen van diensten zou moeten beschrijven, hoe zou dat er uitzien? Waar dient dan rekening mee gehouden te worden?

Flexibele werkroosters

- Uitleg flexibele werkroosters

13. Wat is je mening over flexibele werkroosters?
14. Wat verwacht je dat de positieve gevolgen van flexibele werkroosters zijn?
15. Wat verwacht je dat de negatieve gevolgen van flexibele werkroosters zijn?
16. Zou je met flexibele werkroosters willen werken?
17. Hoe zie jij je rol in het flexibele werkroosters proces? Wat zullen je verantwoordelijkheden worden? Wat zou je graag aan verantwoordelijkheden willen hebben? Welke verantwoordelijkheden ben je bereid te delegeren?
18. Denk je dat flexibele werkroosters mogelijk zijn bij Grolsch op de afdeling IT&M? Waarom of waarom niet? Wat zou er moeten veranderen om het wel mogelijk te maken?
19. **Stel:** flexibele roosters worden ingevoerd, met welke aspecten dient er rekening te worden gehouden? (Wat zou men gehandhaafd willen blijven zien (ATV dagen?)?, Welke nieuwe aspecten dienen er te worden toegevoegd (vb. meer vrijheid bij het invullen van taken)?)

APPENDIX 4 CURRENT SITUATION OF MAKING WORK SCHEDULES

5.1.1 Scheduling

Currently, the team leaders of the IT&M department are responsible for the creation of the work schedules. Once a year a year planning is made with Rostar Flex[31], in which the working times for the individual forklift driver are defined[32]. The precise fulfillment of the work places is realized a week in advance. The fulfillment of the work places depends on the working demand. The working demand, in its turn, depends on action reports, export cargos, production planning and empty goods. Based on experience, the team leaders will full in the number of forklift drivers of which he thinks are needed to fulfill the working demand. Any shortages are solved by hiring temporary workers.

5.1.2 Shifts contracts

The working times of the forklift drivers depends on the shift contract they have. The shift contracts can be divided in three groups:

- Three shift contract. Forklift drivers that have a three shift contract work three different shifts: a morning shift (from 6.00am until 2.00pm), an afternoon shift (from 2.00pm until 10.00pm) and a night shift (from 10.00pm until 6.00am).
- Two shift contract. In this kind of shift contract forklift drivers work according to two different shifts: a morning shift (from 6.00am until 2.00pm) and an afternoon shift (from 2.00pm until 10.00pm).
- Day shift contract. Some forklift drivers work according to a days shift contract. They work according to office hours: from 8.00am until 4.30pm.

The IT&M department is employed from Monday 6.00am until Friday 10.00pm. The forklift drivers that have a night shift receive an ATV-day on Friday; unless there is an extra production batch scheduled at Friday evening.

5.1.3 Flexibility of current work schedules

The current way of scheduling was described by the team leaders and forklift drivers as "*flexible*". The forklift drivers can change shifts with their colleagues if that better suits their personal agenda (for example: change an afternoon shift for a morning shift so the forklift driver can go to a parent night at the primary school of his kids.). Most of the time this request is honored, when it is discussed with the team leader and it fits the capacity need.

Not only the forklift drivers can fulfill their flexibility needs. The team leaders can also adjust the work schedule to the economic flexibility need of the department. If the working demand asks a higher capacity need at another moment that day, they can ask the forklift driver to reschedule his shift (for example the forklift driver works from 9.30am until 6.00pm or work a day shift instead of a afternoon shift). This way the department can cope more effectively with a flexible working demand.

Nevertheless, these flexibility needs are realized based on an ad hoc decision and is not included structurally in the scheduling process. The realization of flexibility needs can, as discussed before, be accomplished by means of flexible work schedules.

[31] An explanation of Rostar Flex can be found in the Glossary
[32] Screenshots of the different kinds of planning are included in appendix 2.

APPENDIX 5 INDICATION OF THE WORKING DEMAND

In consultation with the team leaders an indication is created of the (average) working demand. The team leaders were asked individually if they could give an indication of the working demand per hour during the day.[33] With these indications an average has been calculated which has been used by formulating the flexible blocks:

	TL 1	TL 2	TL 3	***Average***
1:00 am	Average	Quiet	Average	***Average***
2:00 am	Average	Quiet	Average	***Average***
3:00 am	Average	Quiet	Average	***Average***
4:00 am	Average	Quiet	Average	***Average***
5:00 am	Average	Quiet	Average	***Average***
6:00 am	Average	Average	Occupied	***Average***
7:00 am	Quiet	Average	Occupied	***Average***
8:00 am	Quiet	Average	Occupied	***Average***
9:00 am	Average	Average	Average	***Average***
10:00 am	Occupied	Occupied	Occupied	***Occupied***
11:00 am	Occupied	Occupied	Occupied	***Occupied***
12:00 pm	Average	Occupied	Occupied	***Occupied***
13:00 pm	Quiet	Occupied	Occupied	***Average***
14:00 pm	Quiet	Average	Average	***Average***
15:00 pm	Average	Average	Average	***Average***
16:00 pm	Average	Average	Average	***Average***
17:00 pm	Occupied	Occupied	Occupied	***Occupied***
18:00 pm	Occupied	Occupied	Occupied	***Occupied***
19:00 pm	Occupied	Occupied	Average	***Occupied***
20:00 pm	Average	Average	Average	***Average***
21:00 pm	Quiet	Average	Average	***Average***
22:00 pm	Quiet	Quiet	Average	***Quiet***
23:00 pm	Average	Quiet	Average	***Average***
12:00 am	Average	Quiet	Average	***Average***

Figure 9 Indication team leaders working demand

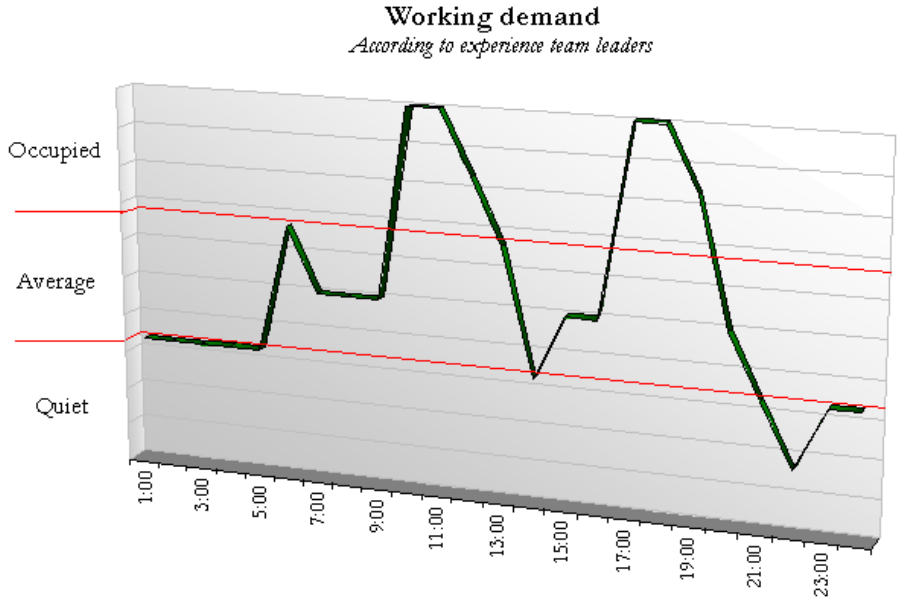


Figure 10 Average working demand during the day

[33] The IT&M department has four team leaders. During this phase of the research one team leader was on holiday.

APPENDIX 6 TESTING SCENARIOS BASED ON HISTORICAL DATA

The next pages included the realized work schedules and work schedules based on the scenarios of flexible work schedules systems.

NOTES