

University of Twente

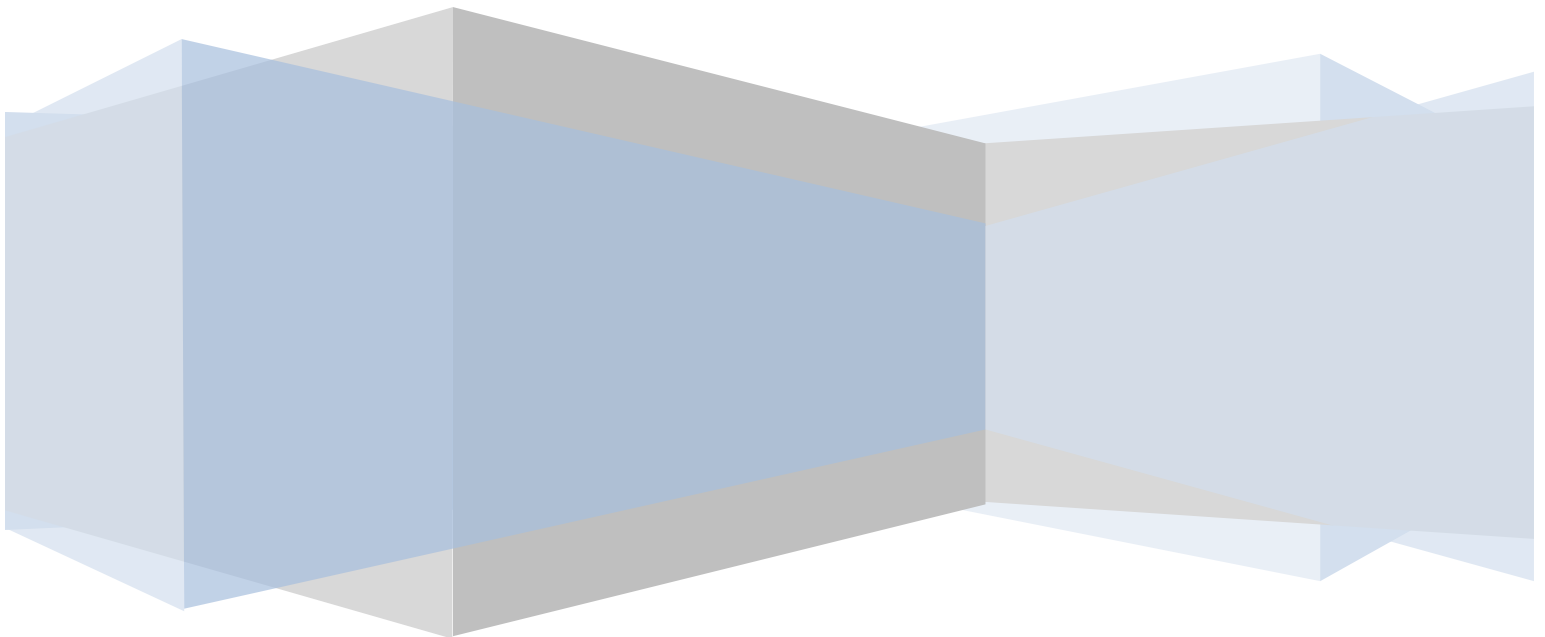
**Determinants of successful implementation of
self-rostering:
Development and test of a new model**

Faculty of Management and Governance
Business Administration
Track Human Resource Management
Manana Rtskhiladze
S 1138898

Supervisors University of Twente

Dr. Ir.Jan de Leede

Prof. Jan Kees Looise



Acknowledgement

This thesis is the result of my seven months research project at the University of Twente. I would like to thank the people who supported and gave me advices during the writing of this thesis. Particularly, I would like to thank my supervisor Jan de Leede for his huge support at every stage of my Master project. I am also very grateful to my second supervisor Jan Kees Looise for reviewing my thesis and giving valuable feedback in order to improve my paper.

Furthermore, I would like to thank all my interview respondents for their willingness to assist me in the process of gathering data.

Finally, I would like to thank my family and friends for their support and encouragement, and in particular my father for the extraordinary support.

Management Summary

Introduction

The goal of this research is to develop a better understanding about the relationship of self-rostering and its individual/organizational outcomes, particularly to identify and categorize the moderating variables influencing this relationship. The outcomes of self-rostering are classified into two groups: individual and organizational outcomes.

The focus is made on the health care sector, as the self-rostering is broadly implemented and studied in this sector.

The main question for this research is:

What are the factors that determine the success of self-rostering in healthcare organizations in relation to the individual and organizational outcomes?

Theory

In the literature, different terms are used for defining the self-rostering concept, such as: self-scheduling, flexible rostering and work time control. The definitions of these terms are more or less the same: the ability to set own's working time in accordance to individual preferences. In most cases this autonomy has agreed limits, however the pure form of self-rostering also exists.

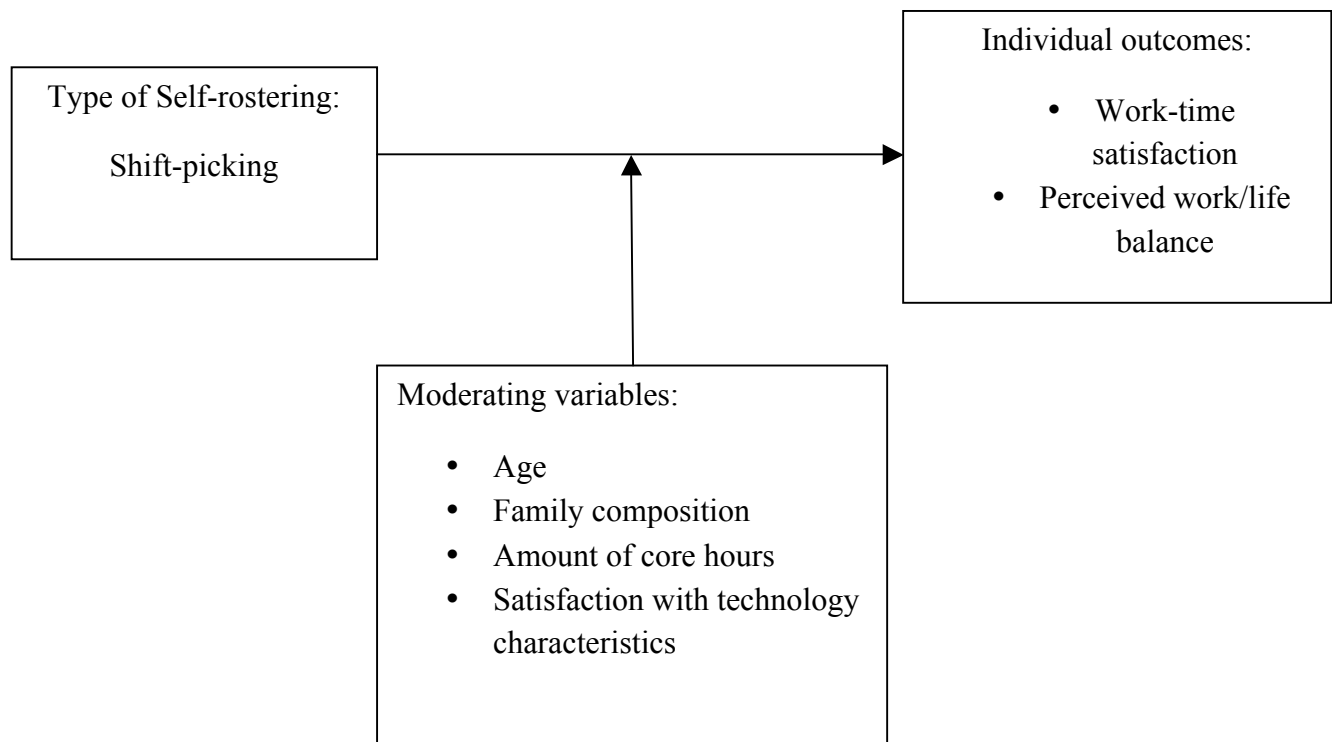
The control of employees over working time is defined as the ability of individual employees to control their working hours. Self-rostering is defined as a work system which gives the employees the possibility to make their own schedule considering staffing needs. Self-scheduling is regarded as one of the techniques to reduce the stress of nurses; this can help in the process of retention of senior and younger staff. The decision about the implementation of self-scheduling may be made as a response to the dissatisfaction of the staff regarding the work/life balance (Kilpatrick & Tremblay, 2006). Societal changes, such as increased numbers of working women, work-leisure time expectation, have led to employees' increased demands for flexibility in order to keep balance between work/family lives. This has resulted in the implementation of alternative working schedules (Baltes, Briggs, Huff, Wright, Neuman, 1999).

In the theoretical chapter the relationships between self-rostering and following individual/organizational outcomes will be reviewed: a) work time satisfaction, b) commitment, c) level of stress, d) work/life balance (WLB), e) flexibility, f) performance, g) costs.

Methodology

The cross-sectional exploratory study has been conducted using multiple methods for data collection; the secondary as well as primary data is collected from the following four elderly care organizations: Sutfene, Warande, HilverZorg and RSZK.

The model presenting testable relationships and moderating effects is developed:



The secondary data is analyzed statistically (SPSS). Frequencies of employees satisfied with work-time aspects and employees that perceive work/life balance is identified. Relation strength between independent and dependent variables, as well as the effects of moderating variables, is assessed first for each dataset and then for integrated dataset; the datasets are integrated in order to have more robust analysis.

Results

According to the findings of this research there is a positive relationship between shift- picking and work-time satisfaction as well as between shift picking and perceived work/life balance. Considering the moderating variables, only the effects of satisfaction with technology characteristics are found to be significant in the case of both relationships.

The insignificant effects of age, family composition and the amount of core hours may be explained by the sample characteristics such as sample size and the fact that it was possible to analyze only the first measurements. Sometime later after the implementation of the project the results may be different.

Conclusions

There was a positive relationship found between shift- picking and work-time satisfaction as well as shift-picking and work/life balance.

Considering the moderating variables, only one proposition for each outcome (work-time satisfaction, WLB) was supported: namely the proposed moderating variable the satisfaction with the technology characteristics, is found to be significant for the relationship of shift-picking and work-time satisfaction, as well as shift-picking and perceived work/life balance.

The findings regarding insignificant effects of other proposed moderating variables might be caused by sample characteristics and by the fact that only the first measurements were analyzed. For other samples, or for later measurements, the effects of moderating variables might be found significant.

The moderating role of satisfaction with the technology characteristics is identified as a significant moderator for both relationships. This finding is very important, as there was no literature found neither regarding the relationship of satisfaction with technology characteristics and work-time satisfaction, nor satisfaction with technology characteristics and WLB. Therefore, this finding is considered to be very important. Organizations implementing self-rostering should not underestimate the role of a supporting software system, as based on the results of this research, it is considered to influence the success of self-rostering in healthcare organizations.

Table of Contents:

1. Introduction	9
1.1. Reason for this research.....	9
1.2. Problem statement.....	10
1.3. Research question.....	10
1.4. Initial conceptual model.....	11
1.5. Outline of the paper.....	11
2. Theoretical framework.....	13
2.1. Individualized work relations.....	13
2.2. The concept of self-rostering, forms of self-rostering.....	14
2.3. The process of implementation of self-rostering.....	16
2.4. Self-rostering and job satisfaction.....	18
2.5. Self-rostering and commitment.....	20
2.6. Self-rostering and the level of stress.....	21
2.7. Self-rostering and work/life balance.....	23
2.8. Self-rostering flexibility and performance.....	24
2.9. Self-rostering and costs.....	25
2.10. Conceptual model and sub questions.....	26
3. Methodological approach.....	29
3.1. Introduction of cases.....	29
3.2. Research approach and limitations.....	30
3.3. Conceptualization and Operationalization.....	31
3.4. Data analysis.....	33
3.5. The testable model and propositions.....	34
4. Findings.....	37
4.1. Self-rostering at Sutfene.....	37
4.2. Self-rostering at Warande.....	40
4.3. Self-rostering at HilverZorg.....	42
4.4. Self-rostering at RSZK.....	45
4.5. General outcomes of interviews.....	47
5. Discussion and results.....	49
5.1. Integrated dataset analysis.....	49
5.2. Cross-case analysis.....	51
6. Conclusions and recommendations.....	57
6.1. Research objectives: summary of findings and resulting conclusions.....	57
6.2. Recommendations for the future research and practical implications.....	58
6.3. Limitations of this research.....	58

References.....	60
Appendix 1.....	65
Appendix 2.....	69

1. Introduction

The first chapter explains the reason for the research and its social relevance leading to the problem statement and research question.

More and more organizations worldwide are implementing self-rostering because of its growing relevance in the New World of Work; offering flexible work arrangements is viewed as a big competitive advantage, as the issue of work/life balance is considered to be one of the critical aspects of attracting and retaining employees. According to the results of a recent *Global Workforce Study* that was conducted in 18 countries and involved 90.000 employees, the work/life balance appeared to be the major driver of retention (McNall, Masuda, Nicklin, 2010).

1.1. Reason for this Research

Considering the importance of flexible work arrangements, the objective of this research is to develop a better understanding and categorization of the factors determining the success of one specific form of flexible work arrangements: self-rostering in healthcare organizations (hospitals, elderly care houses).

The choice of the healthcare sector is determined by the fact that nurse rostering problems appear to be especially complex. Moreover, the current literature about personnel rostering is mainly dealing with nurse rostering issues.

Nursing homes have an important role in the healthcare sector in the Netherlands. Although, compared to other European countries, the Netherlands has a smaller percentage of elderly people (12.8 % of the total population) and the majority of elderly people are living alone, there is still a need for elderly houses, as a considerable number of elderly people are admitted to nursing homes. The description of a Dutch nursing home (verpleeghuis) translates as follows: “an institution which provides temporary or permanent multidisciplinary treatment, guidance and support, and nursing care for elderly patients with long-term, complex health problems, expressed primarily in functional disorders and handicaps” (Ribbe, 1993).

Since the 1990s, the health care workforce shortage is increasing. In order to retain staff management has to offer family friendly practices that give employees the opportunity to balance their work and personal life (Kilpatrick & Tremblay, 2006). As the problems related to nurse staffing appear to have two origins, nursing shortage and staff turnover, self-scheduling practices may be regarded as a tool to reduce turnover. Whereas long shifts, overtime and working during the holidays and weekends may be one of the determinants of turnover (Stordeur & D’Hoore, 2006).

Shortage of nursing staff in elderly care is a problem in many countries and is connected to the high level of work related stress, low job satisfaction and lack of competence development (Hasson & Arnetz, 2006). Considering the importance of self-rostering in the healthcare sector, the majority of studies are conducted in this sector. As healthcare organizations have different staffing needs on different days and shifts, distribution of personnel is more challenging than in other organizations. Furthermore, as hospitals are working for 24 hours, the satisfaction of nurses with working schedules has considerable impact on their wellbeing (Burke et al, 2004). Self-scheduling is regarded as one of the techniques to reduce the stress of the nurses that can help in the process of retention of senior and younger staff. The decision about the implementation of self-scheduling may be made as a response to dissatisfaction of the staff regarding the work/

family life balance (Kilpatrick & Tremblay, 2006). Societal changes, such as increased numbers of working women, work-leisure time expectation, have led to employees' increased demands for flexibility in order to keep balance between work/life and have resulted in implementation of alternative working schedules (Baltes, Briggs, Huff, Wright, Neuman, 1999).

Over the past decade the health sector underwent changes regarding workforce rostering. The traditional way of rostering by a single manager ("departmental rostering") has been replaced by more participative scheduling methods such as self-rostering and team-rostering. In the process of self-rostering, the working schedule is prepared by the employees; usually the managers authorize the final roster (Silvestro & Silvestro, 2000).

By using the available literature found on the subject and empirical data analysis this paper focuses on the relationship of self-rostering and its outcomes that are important and beneficial for both the employees and employers.

1.2. Problem Statement:

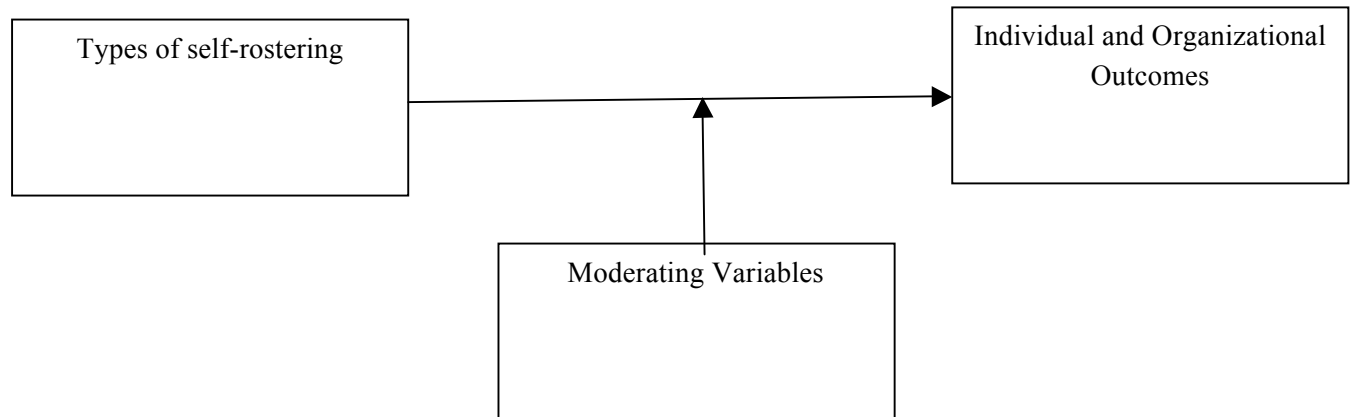
This master project aims at identifying moderating variables that determine the success of self-rostering in healthcare organizations. The focus is made on the following outcomes of self-rostering: a) work-time satisfaction, b) commitment; c) level of stress, d) work/life balance (WLB), e) flexibility, f) performance, g) costs.

As self-rostering gives employees the possibility to control their working time and to be flexible in deciding when to work in accordance to their personal needs, it may have a positive influence on job satisfaction. As employees with higher job satisfaction tend to have higher commitment, self-rostering can be viewed as one of the determinants of commitment. Considering the level of stress, employees that are given a high level of autonomy and flexibility should experience less stress than employees with fixed work schedules. One of the organizational benefits of self-rostering may be increased flexibility; employees having control over their working times are flexible also with changing staffing needs, which is very important. One of the results of self-rostering is expected to be improved performance as employees may get more results orientated, work in their individual most productive times, etc. Considering the costs, they are affected directly and indirectly. The direct effect is that the costs of sick/personal leave are cut. However, there are also indirect effects such as attracting and retaining employees by offering self-rostering. Offering self-rostering is regarded to be a competitive advantage for an organization. Assuming that the relationship of self-rostering and individual/organizational outcomes is influenced by other variables, the main goal of this research is to identify and categorize the moderating variables of this relationship.

1.3. Research Question:

What are the factors that determine the success of self-rostering in healthcare organizations in relation to the individual and organizational outcomes?

1.4. Initial conceptual model



Different types of self-rostering result in individual and organizational outcomes; individual outcomes are viewed as benefits of self-rostering for the employees, whereas organizational outcomes are more related to the benefits for the employers. The relationship of self-rostering and its individual and organizational outcomes is expected to be moderated by different groups of variables.

1.5. Outline of the paper

The following chapter is “Theoretical Framework”; it reviews the literature relevant to self-rostering in relation to individual and organizational outcomes. The chapter starts with employment relations; it is explained how the individualized work relations resulted in a need for flexible working arrangements. It then introduces the concept of self-rostering and its’ classification and moves to the implementation process of self-rostering. Chapters 2.4-2.9 describe the relation of self-rostering to the following individual and organizational outcomes: job satisfaction, commitment, level of stress, work/life balance, flexibility, performance and costs. The second chapter ends with the conceptual framework.

Chapter 3 introduces the cases participating in this research; it then moves to the discussion of methodology approach and limitations of the research. Afterwards the concepts are operationalized and data analysis procedures are presented. The third chapter ends with the actually testable conceptual model and propositions.

Chapter 4 presents the findings for each organization considering secondary data analysis and interview outcomes.

Chapter 5 presents the integrated dataset analysis and cross case analysis leading to the results. Chapter 6 draws the conclusions of this research and provides recommendations for future research as well as practical implications.

2. Theoretical Framework

Introduction

Implementation of self-scheduling is intended to be beneficial for both parties: employers and employees, particularly in the healthcare sector, as the global nurse shortage problem has to be solved. When employees are not able to influence the scheduling process they tend to view the system as unfair and prone to favoritism. This often results in low morale and conflict among staff that may lead to stress dissatisfaction and high turnover rate (Bluett, 2008). In contrast, offering control over working times is considered to be associated with benefits for employees such as higher job satisfaction, higher commitment to the organization and lower stress. These benefits in turn determine the advantages of flexible scheduling for employers: flexible workforce may increase efforts in order to be more productive; they will attract more applicants and will have a higher chance to choose productive employees from larger pool (Shepard, Clifton, Kruse 1996). When offered flexibility and control over their working times employees will have to be flexible themselves, not only in regards to the staffing needs (that results in the efficient use of human resources) but they will also be expected to develop various skills in order to satisfy organizational demands (Gibson, 2003). Moreover, higher commitment and lower turnover will be associated with cost savings (Appelbaum & Golden, 2003). The costs also may be saved also in a way that organizations offering flexible scheduling as a competitive advantage will attract and retain staff without a need for raising salaries (Shepard et. al, 1996). Organizational benefits for applying flexible work practices such as flexible scheduling are various, but they generally include increased job satisfaction, reduction of overtime, decreased absenteeism and better performance. As more and more organizations are interested in implementing flexible scheduling, it is crucial to know what are the required conditions for this intervention (Baltes et.al, 1999).

2.1. Individualized Work Relations

With the process of individualization of employment relations, the need for flexible working time suited to the preferences of employees has emerged. In order to keep a work-family balance, employees require flexible working hours and autonomy for setting their own working time.

During the period 1945-1985 one of the main characteristics of Dutch employment relations was a relatively centralized way of the decision-making process. These relations started to undergo changes towards decentralization and individualization from the 1990s. One of four areas strongly influenced by this process was *working time and leave*. By the law of 1996, companies were given freedom to determine their own working times within legal limits (De Leede, Looise, Riemsdijk, 2004).

As the change of employment relations can be regarded as one of the factors leading to the implementation of flexible working arrangements, there are other factors having crucial importance during the process of changing working norms. For example, the role of the information and communication technologies and globalized economies is also critical for flexible work.

The main characteristics of modern flexible work are non-standard working hours, variety of workplaces and a decentralized organizational structure that gives employees autonomy and responsibility in the decision-making process (MacEachen, Polzer, Clarke, 2008). Workplace flexibility is defined from two perspectives: organizational and worker perspectives. From the organizational view point, workplace flexibility refers to the extent of flexibility that enables organizations to adapt to the environmental changes, whereas from the individual (worker perspective) point of view, workplace flexibility is conceptualized as the level of freedom employees are given in deciding when, where and for how long to work. Worker perspective regards employees as human resources that have specific private life needs. Logically, the more opportunities they are given in order to balance their work and private time, the more committed, engaged and motivated they are (Hill, Grzywacz, Allen, Blanchard, Matz-Costa, Shulkin, Pitt-Catsouphes, 2008). Flexibility refers to the employee's possibility for choice of working hours, suiting their personal needs (MacEachen, Polzer, Clarke, 2008).

There are various definitions and terms describing individualized work relation; Rousseau et al., introduce the term of idiosyncratic employment arrangements (I-deals) that is defined as an individualized relation between employee and employer. The principal features of I-deals are as follows: they are individually negotiated, heterogeneous, benefiting both employer and employee and varied in scope (Rousseau, Violet, Greenberg, 2006).

2.2. The Concept of Self-rostering, Forms of Self-rostering

The idea of giving workers a higher degree of flexibility in working schedules was first introduced in Sweden in the 1960s in response to the pressure of unions. After employers realized the benefits of self-scheduling, such as increased productivity, lower turnover/absenteeism and higher job satisfaction, it became a common practice. Nowadays, more than 50 % of private and public organizations have adopted the self-scheduling practice (Stavrou & Kilanitois, 2010). The concept of self-scheduling was first documented by Jenkinson in 1963, who was the initiator of a self-scheduling project at the St. Georges hospital in London (Bailyn, Collins, Song, 2007).

In the literature, different terms are used for defining the self-rostering concept, such as self-scheduling, flexible rostering and work time control. The definitions of the terms are more or less the same: the ability to set own's working time in accordance to individual preferences. In most cases this autonomy has agreed limits, however the pure form of self-rostering also exists.

The control by employees over working time is defined as the ability of individual employees to control their working hours. According to Berg (2004) working time has two main dimensions: duration and timing. Controlling duration means establishing maximum daily, weekly, monthly or annual working hours. Control over the timing dimension of work means defining when the work will be performed (Berg, Appelbaum, Bailey, Kalleberg, 2004).

By other definitions, self-scheduling is a work system in which employees make their own schedule when staffing needs for a particular unit are presented. The staff of that unit selects shifts according to the requirements. Personnel choices are entered into a roster manually or on a computer spreadsheet (Teahan, 1998). Self-scheduling is considered to be a tool for increasing job satisfaction, autonomy, professionalism, ability of time control and flexibility of employees. Implementation of a self-scheduling program transfers the responsibility of creating schedules from the management to the staff (Zimmermann, 1995). While implementing a self-rostering

system, management may have different intentions. In cases when this system is implemented with family friendly intent, the employees are given the opportunity to schedule their working time considering their individual domestic responsibilities (Thornthwaite & Sheldon, 2004).

According to Stavrou and Kilaniotis it may be assumed that self-scheduling belongs to the group of employee-centered flexible work arrangements as these arrangements allow employees to choose their working place and time themselves. Employees can have a balance between family and work that will have a positive effect on their performance and on organizational effectiveness (Stavrou & Kilanitois, 2010).

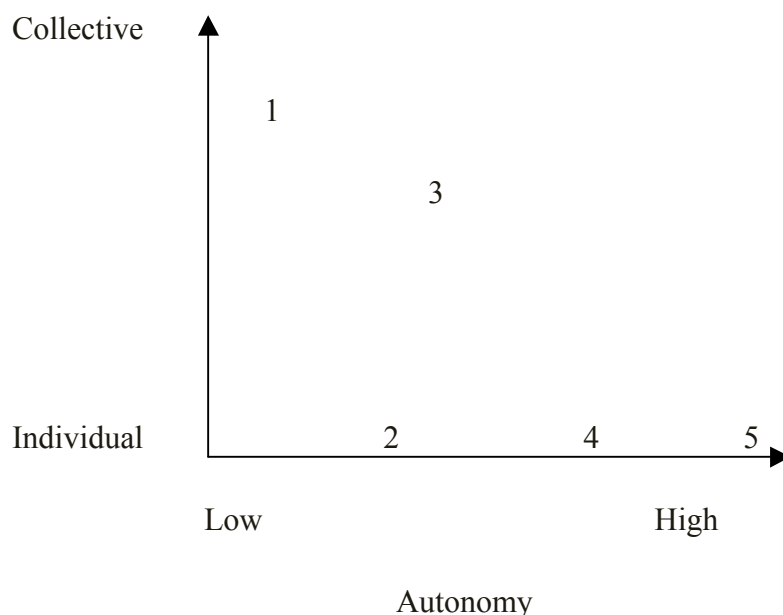
It is worth it to mention that the principles of self-rostering appear to be in accordance with the principles of total quality management (TQM), which encourage managers “to empower their staff with a view to increasing process ownership, motivation and commitment” (Silvestro & Silvestro, 2000,p.527).

NCSI (Nederland’s Centrum voor Sociale Innovatie) classified five forms of self-rostering according to the degree of autonomy an employee has:

1. *Exchange of shifts* - employee has the possibility to adapt a fixed roster to own preferences by changing shifts with coworkers.
2. *Wish-rostering* - employees are indicating their preferences and the scheduler will try to take those preferences into account.
3. *Shift-picking*- employees choose shifts already determined by the organization
4. *Matching* - using a software program, the preferences of individuals are matched to the organizational needs
5. *Full self-rostering*- the time of working is determined by the employee and the employer is adjusting organizational needs to the availability of employee.

The different forms of self-rostering take place on an individual or collective level. Figure 1 shows the level of autonomy and individual/collective characteristics of each form:

Figure 1:



Whereas, according to De Leede (2011) the first form classified above, namely exchange of shifts, is not considered to be a form of self-rostering in the design phase.

In the process of designing the rosters four types of rosters may be designed: 1. Wish -rostering, 2.Shift-picking, 3.Matching, and 4. Full self-rostering. Only after publishing the designed rosters in the phase of use of rosters the shifts may be exchanged. That is the reason why the exchange of shifts is not regarded as a form of self-rostering in the design phase; however, in the publication phase of a roster this still might be an effective means for employee influence.

2.3. The Process of implementation of Self- rostering

The process of implementation of self-rostering has a great impact on the success of this system (Drouin & Potter, 2005). In the process of implementation four phases may be differentiated: assessment, planning, implementation and evaluation. In the phase of *assessment*, scheduling issues that are important for staff should be examined. Every aspect of the organization that may be effected by the self-scheduling and possible obstacles for this system should be identified before the implementation phase. Communication and information sharing with the staff is very important during the planning phase. In case the employees still have doubts regarding self-scheduling, it is recommended to start the implementation phase with a pilot of the project. After completing the pilot project, the thorough evaluation and determination of positive and negative factors influencing self-rostering should follow. It should be taken into consideration whether the staff understands and is content with the program. It is important to allow mistakes in the process of learning and adapting to the new system, though staff members should understand the rules and should be encouraged to ask questions if they are uncertain about any aspects. The management should be ready to be patient during the transition period and be aware that employees will be less interested to support self-scheduling if they are not given appropriate time for adaptation. After the employees recognize their responsibility in scheduling, managers should facilitate the process rather than control it (Bluett, 2008). Another important issue is the cooperation of nurses with management in the process of implementation of self-scheduling. The effectiveness of the implementation process will be higher when the nurses recognize the need for change (Drouin & Potter, 2005).

In the process of implementation of the self-scheduling system, management should differentiate between short-term and long-term goals (Bluett, 2008).

Short-term goals:

- Job satisfaction
- Staff autonomy/control
- Flexibility
- Professionalism (through the development of communication and negotiation skills)

Long-term goals:

- Retain experienced staff
- Assist in recruitment efforts.

According to Zimmermann, for successful implementation of self-scheduling the following steps have critical importance:

- An appropriate amount of time for the trial period: minimum 6 months
- At least 1-2 years are needed for smooth-flowing systems
- Employees need to realize the need for change
- Staff-suggested rule additions are helpful for enforcing consideration (Zimmermann, 1995).

Bailyn et al., described the pilot project of self-rostering that was implemented on one nursing floor and reported the benefits and difficulties associated with this program. According to their findings, during the project nurses felt they had better control over their time and could give better patient care. Another advantage was that the change requests and time spent by the nurse manager decreased and the sense of her perceived annoyance of personnel scheduling decreased as well. Despite of all these benefits, it was still found that not all of the nurses were generating schedules according to the rules. The problem was that the so-called dual agenda, considering both individual needs and needs of the unit, was not kept by some nurses. They perceived self-rostering as their right to put personal needs ahead, forgetting about the other function of this system: namely enhancing the functioning of a unit. This problem was explained by the lack of collective commitment to both sides of the dual agenda (Bailyn et al., 2007).

The case illustrated by Bailyn et al. shows that in the process of implementation of self-rostering, collective commitment should be engaged in order to avoid further difficulties.

Although, there are a variety of benefits of self-rostering it should not be perceived as a panacea. It has a number of valuable advantages, but at the same time there are some bottlenecks associated with implementation of this project. Questions might arise as to why people should spend their expensive time in creating schedules in the era of advanced technology when software is available for automated scheduling (Teahan, 1998). Another difficulty associated with the implementation of self-rostering may be caused by some traditional managers unwilling to share power with employees (Teahan, 1998). Furthermore, one of the complexities associated with the implementation of self-rostering in medium sized and large wards is time consuming negotiations among nurses; although this problem may be solved by an agent based scheduling system (Wang & Wang, 2009).

As large organizational changes tend to cause fear, doubts and even resistance, the implementation strategy of a new shift system has influence over the acceptance of a new system.

Important elements while introducing new system are as follows:

- Worker participation
- Information and communication
- Champions of change

- Adequate project management
- Evaluation of the effects on organization and employees
- More time than expected (Knauth & Hornberger, 2003)

Software support is recognized to influence self-rostering success positively. The software system should be easy to use, be flexible and accessible from other places like the homes of employees. In order to increase fairness, the number of employees that could subscribe for a particular shift should not be limited in the program; if there are more people in a shift than needed, it should be discussed in a meeting as to who will change to another shift.

2.4. Self-rostering and job satisfaction

Successfully implemented self-scheduling has many benefits for the organization. Among them it can lead to increased job satisfaction by offering nursing staff autonomy, accountability and responsibility. Implementation of a self-scheduling system in an American care center seemed to effect staff empowerment positively, as well as solved some everyday problems like interpersonal conflicts, heavy workload, retaining valuable staff and dissatisfaction of employees. This project did not only solve staff problems but also positively influenced team building and morale boosting. The project also resulted in a customer friendly atmosphere that can be explained by the fact that staff with a higher job satisfaction was friendlier in relations with customers (Teahan, 1998).

When staff is involved in the process of scheduling there is less risk that the system will be perceived as unfair (Bluett, 2008). The implementation of flexible work scheduling may have positive effects on employees' perceived autonomy, which will in turn enhance their job satisfaction (Baltes et.al, 1999).

Job satisfaction is a widely studied variable in organizational research because of its effects on various organizational outcomes. As a result of different studies, work/family conflict is in positive relationship with decreased level of job satisfaction.

The study by McNall et al., (2010) examined the relationship between two flexible work arrangements (flextime and compressed workweek) and two organizational variables (a) job satisfaction and (b) turnover intentions, that can be caused by lack of commitment mediated by work to family enrichment. There are two perspectives focusing on work/family balance. According to the first perspective, to be involved in multiple roles results in inter role conflict, whereas according to the second perspective, having multiple functions may be beneficial in a way that some functions may be positively influenced by others. Numbers of studies suggest that being employed may have a positive effect on people's roles in the family. Various terms are used for describing this effect, such as: positive spillover, facilitation, enhancement and enrichment (McNall et al, 2010).

The study by McNall et al., is testing the mediating role of work-family enrichment that is defined as the "extent to which experiences in one role improve the quality of life in the other role" (McNall et al, 2010). The goal of the study was to examine the relationship between availability of flexible work arrangements and work-family arrangements. Afterwards to examine the connection between work/family enrichment and two organizational variables: job satisfaction and turnover. The focus was made on two types of flexible work arrangements, namely flextime schedules and compressed workweek schedules. Flextime gives the employees the opportunity to select starting and ending times for the working day, while compressed

workweek schedules enable employees to work less days each week but for longer times; for example 4 longer days instead of 5 regular ones (McNall et al, 2010).

According to the results, there was a positive relationship found between the availability of flexible work arrangements and perceptions of work/family enrichment. Furthermore, the hypothesis about positive relationship between work-to-family enrichment and job satisfaction was also supported. The hypothesis about a positive mediating role of work-to family enrichment for job satisfaction was approved (McNall et al, 2010).

Both of the forms of flexible work arrangements studied by McNall et al., can be related to self-rostering due to the similarity of the characteristics; both flextime and compressed workweeks are similar to one form of self-rostering, namely *wish-rostering* as this form enables employees to indicate their preferences and the scheduler tries to take those preferences into account. Similarly, in the case of flextime, employees are indicating their preferences, regarding the starting and ending times of the workday, while compressed workweeks enables employees to indicate their preferences regarding the quantity and length of working days in a week.

It is interesting, that the perceived level of autonomy has a mediating effect in this relationship; when employees perceive a high level of autonomy and flexibility in meeting family duties the level of job satisfaction increases (Derrat, Amyx, Bennet, 2010). This fact may be explained by the impact of control construct on psychological wellbeing and performance of employees; two main categories of the control model are differentiated: perceived control and actual control (Smith and Barton, 1994). Even not “real”, but perceived control may have the same effects on job satisfaction, stress level and commitment of employees (Brooks & Swailes, 2002). Degree of job satisfaction depends on the level of perceived schedule flexibility (Jang, Park, Zippay, 2011). Besides perceived autonomy (control) over schedule, fair assignment of employees to the shifts and appropriate distribution of workloads are very important for self-scheduling success. Fairness is perceived as the balance of violations and preferences for all employees. In self-scheduling the staff has to choose and sign up for shifts they want to work; in this case the scheduling is based on individual preferences but still may lead to conflicts that the unit manager has to deal with (Stolletz & Brunner, 2011). For example allowing nurses to reserve some shifts in advance will be perceived as not fair (Lo, Lin, Wang, Dai, Wong, 2007). Furthermore, if nurses schedule their working time individually and then negotiate informally, there is a high risk of conflicts, as the outcomes depend on nurses’ ability to negotiate and cooperate. In addition, as the negotiation process is informal and no records are kept, most probably the self-scheduling may become unfair and will lead to conflicts. Because of increased conflicts some wards have even ceased the practice of self-rostering (Ronnberg & Larsson, 2010). Accommodation of fairness aspects in the process of scheduling increases job satisfaction and consequently reduces absenteeism (Stolletz & Brunner, 2011). Distributive and procedural forms of perceived fairness are closely related to employees’ job satisfaction and commitment (Rodwell, Noblet, Demir, Steane, 2009). Nowadays the quality of the roster is evaluated by the extent in which individual preferences are considered, the way these preferences are quantified and the level of fairness in assigning employees to the schedules; it determines the perceived fairness of the nurses (Maenhout & Vanhoucke, 2009).

Perceived fairness in a roster is viewed as a desire to distribute the workload among staff members equally (Bradbeer, Findlay, Fogarty, 2000). Even distribution of the workload among nurses is very important for perceived fairness of nurses. In order to maintain fairness among staff, nurses who have had unplanned absences should catch up with their unperformed duties (Maenhout & Vanhoucke, 2011).

Moreover, according to the study by Dirks and Ferrin (2002), trust in leadership demonstrated a relationship with attitudinal variables; one of the strongest relationships was found between trust and job satisfaction ($r = .51$) (Dirks & Ferrin, 2002).

2.5. Self-rostering and commitment

One of the main approaches explaining an employers' decision about adopting family-friendly work practices is high commitment theory. According to this approach, family friendly work practices can be regarded as strategic HRM decisions aiming at increasing employees' commitment towards the organization (Thornthwaite & Sheldon, 2004). According to Halpern, scheduling control influences employees' commitment that is related to job satisfaction and work related stress (Halpern, 2005). High nurse turnover rates add to the increasing costs of healthcare. The management of the healthcare sector is concerned about the reasons of turnover. According to the study of Strachota et al (2003), if the hospitals want to reduce turnover and retain qualified nurses they should provide flexible scheduling, adequate staffing levels and performance based rewards and recognition (Strachota, Normandin ,O'Brien, Clary, Krukow, 2003).

Motivational benefits of self-rostering, leading to a reduction of staff turnover are identified as follows:

- Greater staff satisfaction
- Higher commitment
- Improved co-operation and team work empowering personnel and increasing their control for work-family balance
- Increasing flexibility and predictability of the working schedule (Bailyn et al, 2007).

As low commitment usually is positively related to the willingness to quit (Brooks & Swailes, 2002), the results of McNall et al., regarding the relation between flexible work arrangements and turnover intentions, mediated by work-family enrichment, should be taken into consideration in order to improve understanding of the relationship between self-rostering and commitment.

According to the results of the study of McNall et al., which is described in more detail in the previous section, a negative relationship was found between work-to-family enrichment and turnover intentions as hypothesized. The hypothesis about a negative mediating role of work-to-family enrichment on turnover intentions was supported (McNall et al, 2010).

Brooks and Swailes conducted another study aiming at analyzing the relationship between a nurse's ability to influence their working time and a commitment to nursing. The study was conducted in the National Health Service (NHS) of the United Kingdom. Flexible working arrangements were introduced in NHS after realizing a nurse shortage; this was done in order to solve the problems related with recruiting, retaining and encouraging nurses.

As a result of the study, they found that night nurses had lower level of professional commitment compared to nurses with flexible schedules or day nurses. They also found that influence over shift pattern and realization of shift preference, were positively but not significantly related to the level of professional commitment (Brooks & Swailes, 2002).

Smith and Barton (1994) state that there are two main perspectives explaining the relationship between flexible scheduling and absenteeism/turnover: according to the first, the pragmatic

approach, when employees have flexible working schedules, they can arrange non work activities easily, without being absent at work. The second perspective has motivational character and states that the positive relation between flexible scheduling and attendance is caused by perceived increase in autonomy and control (Smith & Barton, 1994).

Considering the problem of turnover, the changes in the structure and culture of working time are strongly recommended; it is also argued that a higher level of flexibility can promote retention. The article by Moen et al., (2011) examines the effects of an organizational innovation ROWE (Results Only Work Environment) on turnover. ROWE is focused at changing standard working hours with flexible working times and is rather result orientated.

The study by Moen et al., (2011) aims at investigating the relationship between ROWE turnover intentions and actual turnover. The key finding of this research was that the actual turnover of the employees that have participated in ROWE was reduced by 45.5 %. (Moen, Kelly, Hill, 2011).

Another study was conducted in Australian intensive care units (ICUs) in order to determine the factors that have the greatest importance for retention of nurses. According to the results, some elements of rostering practices appeared to be critical for nurses in the ICU. Fairness /equality is considered to be one of the variables that all respondents considered to be very important (Darvas & Hawkins, 2002).

Trust in leadership is found to have significant positive relations with organizational commitment ($r = .49$) and negative relations with turnover intentions ($r = -.40$) (Dirks & Ferrin, 2002).

2.6. Self-rostering and the level of stress

Work related stress is a characteristic of the work place, where employees are facing the demands that are incompatible with processes such as information processing, planning and execution. The stress of the job depends more on the workers perceived controllability of the stressful aspects of the job, than on the nature of the job (Halpern, 2005). According to Karaseks model, the highest risk of work related stress occurs when job demands are high and individual control over work is low (Theorell & Karasek, 1996). When the employees are given the possibility to decide how they will work, they are able to develop coping strategies that can decrease the negative effects of stress. Giving employees some flexibility in their work hours, introducing flexible work practices will provide them with control that in turn will reduce the stress level (Halpern, 2005). Nurses tend to have high risks for stress associated with work/life balance. In general women still have primary responsibility for domestic duties and in combination with high demands at the work place, nurses report poor work/life balance (Skinner, Dijk, Elton, Auer, 2011). The profession of nursing has always been regarded as demanding, so traditionally the women that were choosing this profession did not have families and children. Nowadays the situation has changed; the nurses have families that they have to take care of and a profession that demands a lot of time and energy. Not surprisingly researchers came to the conclusion that the introduction of flexible rostering is essential for the retention of nurses (Chang, Hancock, Johnson, Daly, Jackson, 2005). Shift work may be beneficial for nurses if it fits their requirements, but very often, inflexible shift scheduling is a cause of work related stress. A flexible rostering system that gives employees the opportunity to control their work time and workplace enables them to balance work/life and leads to declines in work related stress (Skinner et. al, 2011). The results of the study by Mursula et al., suggest that work time control may have

an effect on the health of female personnel. The control over working time was found to be associated with self-related health status, psychological distress and sickness absence (Mursula, Vahtera, Kivimäki, Kevin, Pentti, 2002). Different scheduling systems may be used in order to prevent the stress of nurses. For example: self-scheduling may be beneficial in small units, but may cause difficulties when applied to larger ones (more than 35 employees) (Drouin & Potter, 2005). The possibility of having control in the work situation has been for a long time regarded as a tool for stress reduction. However, recently it was argued that giving employees freedom and control over their working time may not reduce, but rather increase the level of stress, as this kind of flexible environment leaves individuals responsible for defining goals, setting priorities and drawing the line between work and private life. In order to test the effects of allowing employees having control over their working time a survey was conducted in Sweden that included 800 employees living with a partner and/or children. According to the results no negative effects of freedom in controlling their own working time were found; the job control has not changed the nature and remained the same after almost three decades; as Robert Karasek stated, job control is not source for stress, on the contrary it enables individuals to cope better with the environment (Groenlund, 2007).

The study conducted by Chiang et al., adds to the Karaseks job demand-control model, that regards stress as a cause of interaction of job demand and control by suggesting that only increased job control cannot mitigate stress, as it can be constrained by contextual factors of the workplace, such as HRM policies, work related resources and practices. According to the results of the study of Chiang et al. (2010), job stress was found to be influenced by both the job content and context (Chiang et. al, 2010).

There is a growing interest concerning the potential effects of workplace flexibility on health. It is suggested that offering flexible work arrangements positively influences the health condition of employees, giving them an opportunity to balance their work and family lives (Grzywacz, Carlson, Shulkin, 2008). The goal of the study by Grzywacz et al (2008) was to improve the understanding of the flexibility effects on employees' health. The data from several businesses, from different industries (N=19,704), was used in order to test the relation of different flexible work arrangements (flextime, compressed workweeks and their combination) and work related stress. According to the results, individuals participating in formal flexible work arrangements are characterized by lower level of work related stress and burnout, than those not participating in formal flexible work arrangements. Moreover, according to the results, employees that participated in flextime reported less stress than employees participating in compressed workweeks and the combination of compressed workweeks/flextime (Grzywacz et al, 2008). Flextime and compressed workweeks in the study by Grzywacz et al, (2008) were operationalized in a same way as in the study by McNall et al (2010); accordingly as stated above (chapter 2.4) they are similar to the self- rostering (*wish-rostering*).

Organizational justice, the term that is used to identify employees' perceived fairness, can provide insights for job stress. The perceptions of fairness have multidimensional character and represent employees' subjective evaluations regarding distribution of workload, bonuses, promotions, etc., (distributive fairness); perceived fairness of procedures the management uses: for example staff evaluation procedures (procedural fairness); the level of respect towards employees (interpersonal fairness); and the information sharing about decision making processes. The results of studies have shown the direct negative relationship between perceived fairness and stress-related outcomes of employees (Rodwell et. al, 2009).

2.7. Self-rostering and work/ life balance

One of the main reasons for implementing self-rostering in health care organization is the nurses' crucial need for availability of work-time scheduling that enables them to find a balance between work and private time. The perception of imbalance between work and private time causes the stress of an employee as they feel that work and/or family demands are not fulfilled properly.

The feeling of unfulfilled demands influences an employees' performance and their ability to experience satisfaction in either role (Nelson & Tarpey, 2010).

According to Gregory & Milner (2009), employees' work/life balance priorities are categorized in three main groups: working time arrangements, parenting leave entitlements and childcare. In cases when organizations provide support for balancing employee's work/life, job satisfaction is found to increase. Enabling employees to experience control over their work schedules is related to higher job satisfaction (Gregory & Milner, 2009). The positive effects of work/life balance on job satisfaction are widely recognized; satisfaction with work/life balance issues is often related to the work-time satisfaction (Pryce, Albertsen & Nielsen, 2006).

Though work/life balance is an individual outcome, there are organizational factors that are found to have negative influence: for example work overload, irregular and inflexible schedules, long working hours and lack of control over own schedules. An individuals' perception that work and family demands are accommodated by their work schedule can decrease work/family conflict (Nelson & Tarpey, 2010).

The study by Nelson and Tarpey (2010) examined the relationship between work-time satisfaction and work/life balance and found a positive significant relationship (Nelson & Tarpey, 2010).

Work/life balance practices, such as flexible scheduling may moderate in the relationship of job demands and stress: work/life balance practices have the role of organizational support resource, helping employees with balancing their work/life time. Besides, the availability of work/life balance practices may mean to employees that their organization is caring about them. That can decrease stress associated with high demands of work. Finally, work/life balance practices can also help employees adapt to the work and mitigate the stressors of work environment (Chiang, Birtch, Kwan, 2010). Having or perceiving control over working process is linked with positive outcomes and the lack of control is associated with strain and stress. Being able to choose a particular shift and flexible rostering has moderating effects on the stress associated with working shifts (Smith & Barton, 1994).

According to the study of Jang et al. the availability of work/life balance programs has the moderating effect in the relationship between scheduling control and mental health and scheduling control and job satisfaction (Jang et. al, 2011).

The effects of age, family composition and the amount of core hours on WLB was investigated by Lyness and Kropf (2005) in headquarter and non-headquarter organizations. According to the results of headquarters participants, age was found to be significantly related (positive relationship) to the work/life balance, whereas there was no significant correlation found between family composition and work/life balance. Amount of working hours per week was found to be in significant negative relationship with work/life balance. However, none of the variables were significantly related to work/family balance for the non-headquartered participants (Lyness & Kropf, 2005).

2.8. Self –rostering, flexibility and performance

Flexibility is a vital part of modern rostering techniques. The concept of flexibility is discussed in general management literature. General management literature discusses flexibility at two levels: organizational and employee level. By flattening hierarchies and making the focus on core competencies organizations became more agile and more adaptable to the changes. Employees are expected to be flexible in a sense that they have to develop a variety of skills to handle different situations; on the other hand, employers have to be flexible by offering the staff work/life balance possibilities (Gibson, 2003). The approach of self-rostering is more time consuming than other approaches such as centralized rostering and unit rostering but self-rostering has benefits of boosting performance and morale of employees through developing a pleasant working environment (Hadwan & Ayob, 2009). The property literature regards flexibility at two levels: the portfolio and individual property level. Organizations want to have a property portfolio that will be flexible with the economic and business industry; at the same time they want to have flexible employees. Individuals are expected to adapt quickly to the organizational changes and to be able to fulfill various functions (Gibson, 2003).

In the research by Baltes et.al (1999) it was hypothesized that more flexible flextime would lead to better positive effects, whereas according to the results, this hypothesis was not supported; less flexible flextime programs (5 or more core hours) appeared to be more effective than more flexible programs (less than 5 core hours) (Baltes et. al, 1999). According to these results the amount of core working hours has moderating effects in the relationship between flexible schedules and their outcomes.

Flexible scheduling is one of the tools used by employers in order to increase employees' productivity (Jang et.al, 2011). In the context of flexible schedules, the assessment of performance is results oriented; it is not measured by the time spent at the workplace but by results. When employees are aware of the fact that while evaluating their performance it is their results that count not the time spent, their willingness to make efficient use of the working time increases. Full time workers that are offered flexibility in scheduling are working on average 3 hours more than full time workers without flexibility (Appelbaum & Golden, 2003). Having control over their work enhances employees' happiness, which can be beneficial for the organization as positive emotions may positively influence employees' performance (Atkinson & Hall, 2011). Flexible scheduling may have an impact on performance while influencing productivity in following ways:

- Workers may increase their effort, work harder, or work smarter in order to have appropriate results. They may be more helpful for other workers and be more interested to monitor them in order to have the better results. Employees may choose to work during their personal peak hours- when they are most productive
- Companies that offer flextime will attract more applicants and will have chance to choose the most productive workers from larger applicant pools (Shepard et al. 1996)

Moreover, participation in formal flexible work arrangements is negatively related to stress, that in turn results in better health and performance (Grzywacz et al, 2008). As health is believed to be very important in workplace performance and it is positively influenced by flexible working hours, it may be concluded that flexibility also contributes to better organizational performance (Grzywacz et al, 2008). Staff rosters may have great effect on the working environment. The performance of nurses will be the best if they work in the environment that suits their needs and

considers their preferences about working schedules. The nurses will feel responsibility to work more efficiently if their employers will treat them nicely and provide them with fair work schedules (Ibrahim, Chuprat, Ahmad, Haron, Ibrahim, 2010).

The results of the studies about the relation of work/life balance practices and organizational performance suggest that even if work/life balance practices do not help employees to solve work family conflicts, they still enhance organizational performance via other routes, such as improved productivity (as employees are able to work during their peak hours) and social exchange processes that result from employees perception of organizational support (Beauregard & Henry, 2009). Furthermore, proponents of flextime argue that the system can be beneficial for both employees and employers. As people are productive in different times, employees are able to adjust their working schedules to their bio-clock; to choose to be working when they feel they are the most productive, that will enhance their job performance. Flextime can also positively influence employees' productivity indirectly by increasing their job satisfaction and autonomy and decreasing absenteeism and stress (Yang & Zheng, 2011).

Trust in leadership was found to have a relatively small but significant relationship with performance ($r = .16$) (Dirks & Ferrin, 2002).

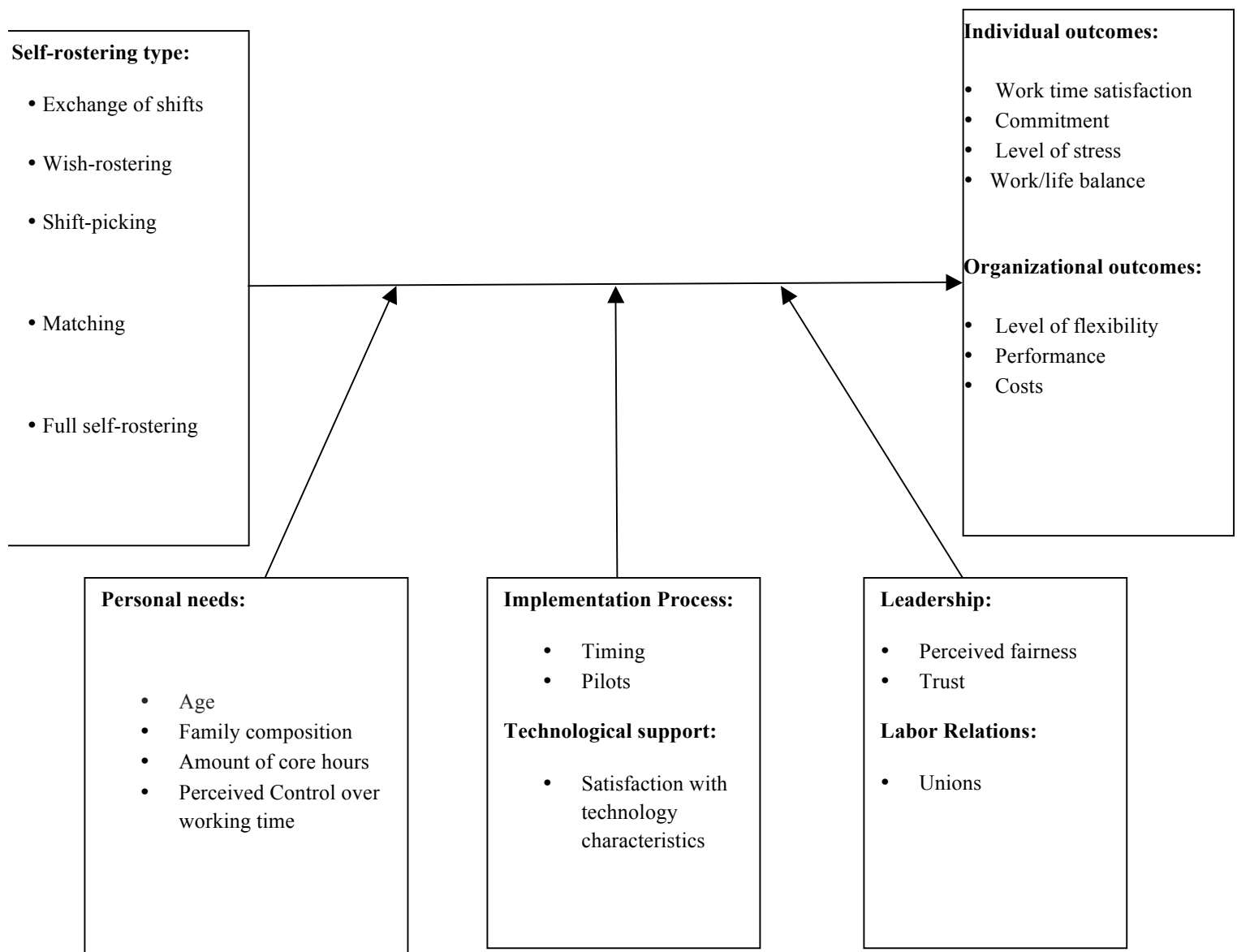
2.9. Self-rostering and Costs

Like the implementation of any other new program, implementing flextime is also related to costs for an organization; mainly the costs are associated with training, usually for managerial staff, helping with understanding and dealing with the new program, increased managerial control and monitoring caused by spread and varied work times (Yang & Zheng, 2011). Considering this, often employers do not implement flexible work practices, they do not want to pass the control over working time to employees; the reason for this is the fear of increased costs, although they fail to realize that the causes of stressful working conditions are among the largest costs of employers (Halpern, 2005).

Offering flexible scheduling may save the cost employers normally pay for sick leave and personal leave. According to the study by CCH in USA, 21% of employees use sick time while actually being healthy in order to fulfill family duties and spend time with family. If they would be provided with flexible scheduling they would be able to balance their work/family time and they may use less sick and personal time (Baughman et al, 2003). Cost savings associated to a lower level of turnover may also be a consequence of flexible scheduling (Appelbaum & Golden, 2003); moreover employers that want to attract and retain valuable employees can offer flexible scheduling instead of higher wages (Shepard et. al, 1996). Offering flexible work arrangements may improve organizational performance via different routes among them reduced overheads, when employees are working from home (Beauregard & Henry, 2009). Furthermore, decreased stress levels in the context of flexible scheduling may also influence cost savings. Stress of employees may increase the cost of an employer in two ways: first, short term absences that have an influence on costs may be just the way for stressed employees to handle stress. The second stress related cost may be the turnover of stressed employees: employees who are going to leave their job will most likely be less productive and the costs of hiring and training of new employees can be very high (Halpern, 2005).

The influence of trade unions may moderate the relationship. In many European countries, trade unions are involved in the process of the negotiation of reforms or self-regulating policy adaptations. However, when governments or employers see that the reforms are getting impossible they try to weaken labor's voice for more adaptability; being aware of this, trade unions are more willing to compromise (Ebbinghaus, 2011). Flexible working arrangements are often regarded as threatening by trade unions; they are afraid about the erosion of traditional working weeks and perceive flexible working arrangements as a tool that serves employers interests by disregarding traditional patterns of working such as shift-work and overtime (Skorstad & Ramsdal, 2009).

2.10. Conceptual model and sub questions



Sub Questions:

- What is self-rostering?
- What is the influence of *personal needs* on the relationship of self-rostering and its individual/organizational outcomes?
- What is the influence of *implementation process* on the relationship of self-rostering and its individual/organizational outcomes?
- What is the influence of *technological support* on the relationship of self-rostering and its individual/organizational outcomes?
- What is the influence of *leadership* on the relationship of self-rostering and its individual/organizational outcomes?
- What is the influence of *labor relations* on the relationship of self-rostering and its individual/organizational outcomes?

To sum up the findings of literature review, the implementation process of self-rostering is considered to be quite complex. Communication and information sharing among staff has crucial importance, as the need for change should be recognized. Moreover, in order to make self-rostering more effective, a supportive software system is recommended.

The relations of self-rostering and following individual/organizational outcomes are reviewed: job satisfaction, commitment, level of stress, level of flexibility, performance and costs. It is proposed that the implementation of self-rostering is associated with higher job satisfaction, commitment, level of flexibility and performance. On the other hand, it is associated with lower level of stress and costs; it is also proposed that the moderating variables of this relationship are mainly associated with personal needs of employees, implementation process, technological support, leadership and labor relations.

The next stage of this research will introduce research methods to be used to capture empirical data, a research strategy to be adopted, data collection techniques and sample selection.

3. Methodological approach

Introduction

The cross-sectional exploratory study is conducted using multiple methods for data collection and analysis (Saunders, Lewis, Thornhill, 2009).

The choice of multiple methods is determined by the fact that quantitative, as well as qualitative, methods for data collection and analysis should be used.

The research is exploratory, as the main goal is to provide better understanding of the relationship of self-rostering and its individual/organizational outcomes, as well as categorize moderating variables of this relationship. According to Babbie, one of the purposes of exploratory studies is the desire for better understanding of a particular subject (Babbie, 2007). This chapter will introduce the cases, explain how the research question is approached, operationalize concepts and describe the data collection techniques and data analysis procedures.

3.1. Introduction of cases

The secondary, as well as primary data, was gathered from elderly care organizations that started the pilots of self-rostering projects approximately one year ago.

Case № 1- Sutfene

Sutfene is an elderly care organization that offers 24 hours care services for elderly people. It has over 1000 employees; clients are offered care or special treatment individually according to their needs and habits.

In Sutfene the pilot project of self-rostering started in May 2011 in the two locations: Bastion Kroonwerk /Hoorwerk and Spijk Bungalows. The type of self-rostering is the combination of shift-picking and exchange of shifts; the rosters are made by the organization, though afterwards during the team meeting employees have possibility to exchange shifts.

Case № 2- Warande

Warande is an elderly care organization focused on quality and development. Warande has various offers for elderly people; home care, fitness and rehabilitation, intensive nursing care, four living centers and hotel.

In Warande the pilot project of self-rostering was implemented in September 2011. The type of self-rostering is shift-picking; the staff can see the shifts and the number of employees needed for each shift in a special software system and they can choose the shifts they prefer to work, though in the last stage some employees have to change their chosen shifts.

Case № 3- HilverZorg

HilverZorg is an elderly care organization including mental care for elderly. It consists of three residential service centers, one residential care center and four nursing homes.

HilverZorg has more than 1500 employees and around 2000 customers. The pilot of self-rostering started in February 2011. The form of self-rostering is shift picking; a specially designed software system enables employees to see the shifts and the number of employees

needed; among these shifts they can choose the ones they prefer to work, though in the last stage some employees have to change their preferred shifts.

Case № 4- RSZK

RSZK is an elderly care organization that consists of nine nursing homes and two care objects. The organization offers various services according to the individual care needs of clients. The mission of RSZK is to ensure good quality of life for their clients.

The pilot project of self-rostering started in December 2010. The form of self-rostering is the combination of wish-rostering and shift -picking. First employees are indicating their preferences regarding the shifts they want to work; the scheduler tries to take these preferences into consideration while making the roster. As it is usually very hard to consider the preferences of all the employees, in the last stage some employees have to pick shifts (that are not exactly the ones that they indicated in the beginning).

3.2. Research approach and limitations

As a result of literature review the conceptual model is developed. The limitation of this research is that not all the relationships presented in the conceptual model (in ch.2) are testable.

Using the secondary data from surveys conducted in the elderly care organization presented in the above chapter, the relationship between specific type of self-rostering namely, shift picking and two individual outcomes: 1. Work-time satisfaction and 2. Perceived work/life balance can be tested.

Considering moderating variables: effects of age, family composition, amount of core hours and satisfaction with technology characteristics are tested on the relationships between:

1. Shift-picking and work-time satisfaction and 2. Shift-picking and perceived work/life balance.

There is also a limitation regarding the moderating role of age; the effects of age on work-time satisfaction and WLB that are explained by the age of children, captures only employees with children; moreover these effects can be more explained by employees' phase in life than actual age. Moreover, the possibility to use only first measurement data is regarded to be another limitation of this research, as later measurements tend to show a clearer picture of the relationships.

Regarding the collection of the primary data, the qualitative interview method will be used. The interviews will be conducted with project/HR managers of the same elderly care organizations where the questionnaires for the secondary data analysis are carried out. The managers were chosen regarding their competence and involvement in self-rostering project management for each organization. The managers will evaluate the effects of self-rostering on its individual and organizational outcomes, and discuss the moderating variables presented in the research model. For guiding the interviews, an interview protocol was used (Appendix 2) that grasps the structure of an interview. Though, the interview testing power is limited as the interviewees were asked to evaluate trends according their observations regarding self-rostering, its outcomes and moderating variables; so the data obtained from interviews cannot be used to test relationships.

3.3. Conceptualization and Operationalization

Self-rostering types:

Information regarding self-rostering types is derived from secondary data and/or interview; questions about scheduling procedure are asked and the type of self-rostering is defined.

Individual outcomes:

Work time satisfaction

In this research, the information about job satisfaction elements, such as satisfaction with current roster, overtime and control over own schedule will be derived from secondary data: questionnaires from the health care organizations that have implemented self-rostering.

The questions measuring satisfaction with the current roster try to find out what is perceived as important for the employees while judging about the satisfaction with the current roster; for example “My current schedule gives me the possibility to combine my work and private life”; for answers a Likert-style rating scale was used in order to indicate how strongly the applicants agreed or disagreed with the statements. Besides that, specific points of a roster were listed and applicants should indicate how satisfied they were with a single point. While measuring satisfaction with overtime, the focus was made on the number of extra hours, distribution and compensation. The part of the questionnaire that was measuring the satisfaction with the control over ones working time was aiming at finding out the employees’ need for controlling the schedule and their opinions about possible consequences.

Commitment

Questions regarding the effects of self-rostering on commitment will be answered during the interviews with HR and/or the project manager of each organization. It will be discussed whether the level of commitment grew after implementation of self-rostering in order to find out the changes in the level of commitment. The questions will be asked about turnover rates and the number of sick leaves before and after implementation of self-rostering.

Level of stress

The influence of self-rostering on the level of stress will be discussed by interviews with HR and/or the project manager. They will discuss whether the implementation of self-rostering had any effects on the level of stress. During the interview, questions will be asked about the observable changes in employee stress level after implementation of self-rostering. It will be explored if there was any data available measuring stress before and/or after implementation of this program.

Perceived Work/family balance

Perceived Work/family balance is measured by questionnaire (secondary data). The questions measuring satisfaction with the current roster involve statements about work/family balance such as: “I find it important to have opportunity to schedule my work so that it suits my personal needs”, “How often is your private life in conflict with working longer hours?”, “My current schedule gives me possibility to combine my work and private life”.

Organizational outcomes:

Level of flexibility

Level of flexibility will be measured by interviews; by asking managers what are the difficulties associated with changing staffing needs, or how difficult it is to fill less favorable shifts; the managers will be asked to recall problems associated with these issues and to explain these problems if they are able to recall them; the aim is to assess the flexibility of staff in terms of their availability in different shifts in emergency situations.

Performance

Performance will be also measured using qualitative interview. The aim is to find out if the performance of employees was influenced by implementation of self-rostering; more specifically the interviews will be aimed at finding out if the efficiency, quality, timeliness, and safety as performance measures have been influenced by implementation of self-rostering.

Costs

As costs are always recorded, it would be easy to find out the relationship between self-rostering and costs, however this study does not test this relationship as in the first phases the cost are expected to increase due to the implementation process; all the organizations that participated in research have implemented self-rostering more or less recently, therefore it was found inappropriate to measure the effects of self-rostering on costs.

Moderating variables

Personal needs:

The amount of core hours is measured by questionnaire (secondary data) by identifying the amount of core hours employees have to work.

Perceived control over working time is also measured by questionnaire items such as: “Do you need more control over your schedule so you will be better able to take into account your personal needs?” “Do you prefer different starting times of the shifts?”

Questions regarding *family composition* and *age* are included in the questionnaire.

Implementation process:

Timing and pilots are measured by interview; the aim is to find out when the project was implemented, as an appropriate amount of time for the trial period is a minimum of 6 months. It is also asked if the pilot of the project was introduced first and if the employees have realized the need for change before implementing the system.

Technological support:

Satisfaction with technology characteristics is measured by questionnaires; moreover, during the interview it will be discussed what are the technological characteristics needed for effective self-rostering.

Leadership:

Perceived fairness and trust will be discussed during the qualitative interview; the managers will be asked to share secondary data and/or experiences that could lead to judgment about perceived fairness or trust, whereas it may be very subjective.

Labor Relations:

Labor relations. During the interview it will be explored if other stakeholders, trade unions, have influence over implementation of self- rostering; if they are involved in the decision making processes.

Data collection techniques:

Variables	Secondary data	Interviews
Self-rostering type		X
Work time satisfaction	X	
Commitment		X
Level of stress		X
Level of flexibility		X
Performance		X
Costs		
Perceived WLB	X	
Amount of core hours	X	
Perceived control over working time	X	
Family composition	X	
Age	X	
Timing/pilots		X
Software system	X	X
Perceived fairness/trust		X
Labor Unions		X

3.4. Data analysis

Secondary data will be analyzed statistically. First of all, frequencies of employees that are satisfied with work-time aspects and that perceive work/life balance will be identified. The following step will be assessing the strength of the relationship between the moderating variables and work-time satisfaction and between the moderating variables and perceived work/life balance. The effects of moderating variables will be compared to each other by comparing the correlation coefficient.

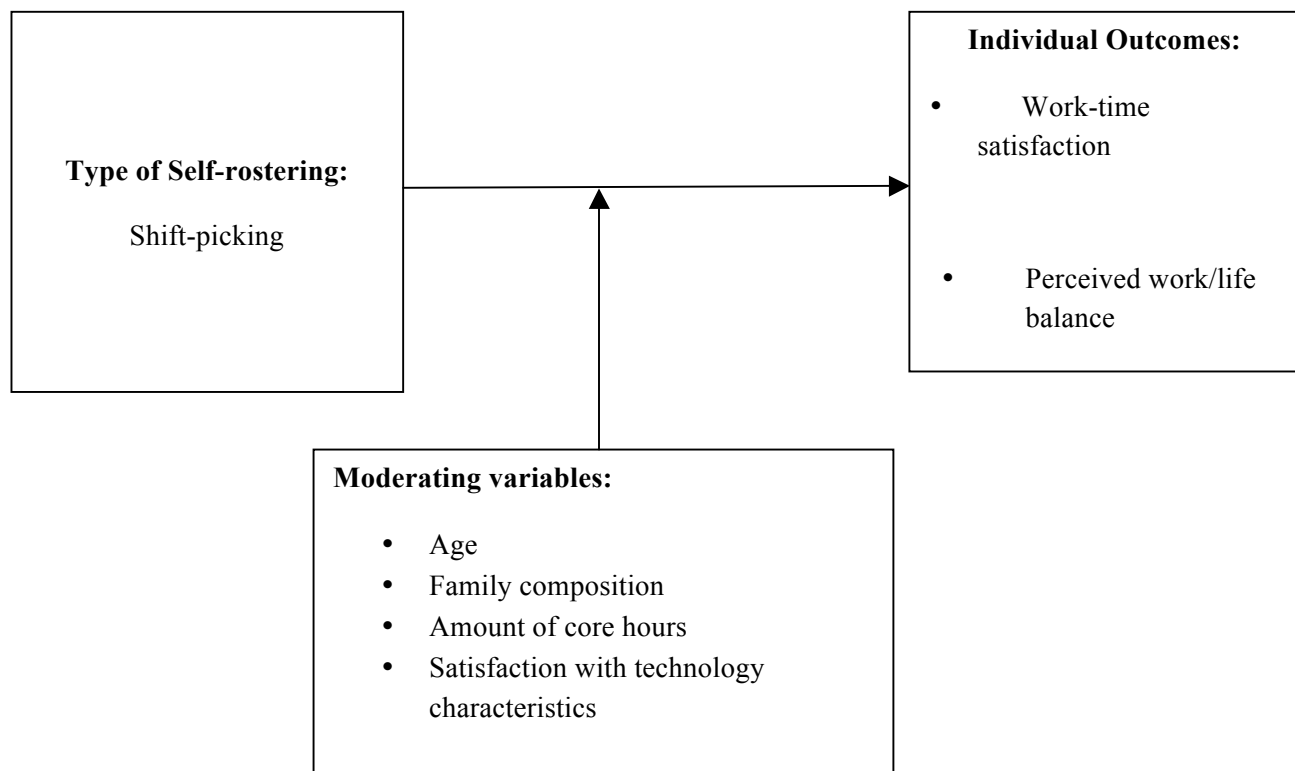
Relationships between work-time satisfaction aspects and the following moderating variables will be tested: age, family composition, work/family balance, amount of core hours and satisfaction with technology characteristics.

The percentage of employees desiring more control over their roster will be identified for each organization.

The procedure described above will be performed to each organization's dataset (SPSS) first, but afterwards, for a more robust analysis the datasets will be integrated and the procedure of finding out frequencies and significant relationships will be repeated. As for correlation analysis of the bivariate data that is measured on ordinal, interval, or ratio scale a nonparametric test should be used (Puri, B. K, 2002) the correlation analysis of this study is conducted by using Spearman's rank correlation coefficient.

3.5.The testable model and propositions

The conceptual model presented in chapter 2 could not be investigated completely, as some of the variables presented in that model were not covered by secondary data .The relationships and moderating effects that are tested statistically are presented in the model and propositions below:



The main propositions of the study (Proposition 1 and Proposition 2) expect to find a positive relationship between self-rostering, (specifically, shift-picking) and two individual outcomes: work-time satisfaction and WLB (work/life balance).

Moderating effects of age on the relationships of shift picking/work-time satisfaction and shift picking/WLB is expected to be negative as the employees with younger children (in most cases these employees are younger themselves) are predicted to be more satisfied with the shift-picking opportunities than their colleagues with older children (in most cases these employees will be older themselves). This fact is expected to be determined by the fact that employees with younger children need more flexibility from their job in contrast to the employees with older children, because these children have fixed schedules, are more independent; their parents sometimes prefer to have fixed schedules themselves and know that they will have all the evenings and weekends free. In addition, negative moderating effects of age on the relationship of shift picking and perceived WLB are expected; it is predicted that the younger employees (that are expected to have younger children) will perceive better WLB than their older counterparts (with older children). This proposition is explained by the necessity of flexible scheduling for employees with younger children.

The number of family members is expected to moderate positively on the relationship of shift picking and work-time satisfaction; employees who are single and/or have less family members may not see the need of shift-picking and may prefer to have a fixed traditional schedule, whereas for the employees with more family members, having the opportunity of shift picking is expected to increase work-time satisfaction as it is considered to be more necessary. Similarly, because of need for flexibility for employees with more family members, it is expected that the number of family members will positively influence the relationship of shift-picking and perceived WLB.

The moderating role of the number of core hours on the relationship of shift-picking and work-time satisfaction is expected to be positive as employees with more core hours are expected to value the opportunities of shift-picking more. This fact is expected to be determined by higher need for flexibility for employees with more core hours. Analogically employees that have more core hours to work are expected to need flexibility (shift-picking in this case) in order to perceive WLB, whereas their counterparts with less core hours may have work life balance without any supportive work arrangements.

No literature was found about the relationship of self-rostering and the satisfaction with technology (software) characteristics. It is expected that the satisfaction with the self-rostering supportive software characteristics will have positive moderating effects on the relationships of shift- picking /work-time satisfaction and shift- picking /WLB.

Propositions

Proposition 1: Introducing shift picking will be positively related to work-time satisfaction.

Proposition 1a: The effects of shift -picking on work-time satisfaction will be moderated by age: the positive effects of shift picking on work-time satisfaction will be stronger for younger employees.

Proposition 1b: The effects of shift -picking on work-time satisfaction will be moderated by family composition: the positive effects of shift picking on work-time satisfaction will be stronger for employees with more family members.

Proposition 1c: The effects of shift-picking on work time satisfaction will be moderated by the amount of core hours: the positive effects of shift picking on work-time satisfaction will be stronger for employees that have more core hours to work.

Proposition 1d: The effects of shift picking on work time satisfaction will be moderated by satisfaction with technology (software) characteristics: the positive effects of shift picking on work time satisfaction will be stronger for employees that are satisfied with technology characteristics.

Proposition 2: Introducing shift picking will be positively related with perceived work/life balance.

Proposition 2a: The effects of shift picking on perceived work/life balance will be moderated by age: the positive effects of shift picking on perceived work/life balance will be stronger for younger employees.

Proposition 2b: The effects of shift picking on perceived work/life balance will be moderated by family composition: the positive effects of shift picking on perceived work/life balance will be stronger for employees with more family members.

Proposition 2c: The effects of shift picking on perceived work/life balance will be moderated by the amount of core hours: the positive effects of shift picking on perceived work/life balance will be stronger for employees that have more core hours to work.

Proposition 2d: The effects of shift picking on perceived work/life balance will be moderated by satisfaction with technology (software) characteristics: the positive effects of shift picking on perceived work/life balance will be stronger for employees that are satisfied with technology characteristics.

4. Findings

Introduction

In order to identify moderating variables of the relationship of shift- picking and its outcomes, secondary data (questionnaires from elderly care organizations that are in the process of the implementation of self-rostering) was analyzed. Besides analyzing secondary data, in order to gather more information, qualitative semi-structured interviews were conducted with the managers of some healthcare organizations that were also participating in the previous survey mentioned above.

In this chapter all the interviews and secondary data analysis, sorted by elderly care organization will be discussed.

4.1.Self-rostering at Sutfene

According to the Project manager of internal benchmarking and self-rostering, the form of self-rostering in Sutfene is nowadays the combination of shift-picking and exchange of shifts; the roster bureau makes the rosters for the whole organization and afterwards, during the team meeting, employees have the possibility to exchange shifts according to their preferences.

The current process of self-rostering was described as follows:

- The roster bureau is responsible for making rosters for the whole organization
- Employees get rosters from the roster bureau and are asked to indicate their preferences regarding the shifts they wish to work
- After employees configure the rosters according to their preferences, team meetings take place; team meetings are arranged in order to discuss the compatibility of employees' preferences and staffing needs. Employees take part in the negotiation process that results in creation of final roster.

Though not every employees preferences can be taken into consideration, all of the employees are involved in the decision making process.

4.1.1. Self-rostering and work-time satisfaction

In order to measure the work-time satisfaction of employees the secondary data was analyzed statistically. According to frequencies, 88.1 % of respondents are either very satisfied or rather satisfied, 4.4 % are neither dissatisfied nor satisfied and 7.5 % are rather dissatisfied or dissatisfied with the current roster in general.

Considering the special points of work-time satisfaction two aspects were analyzed: satisfaction with the possibility to influence one's own roster and the ability to exchange shifts.

According to frequencies, considering specific aspects of roster satisfaction and the ability to combine work and private life the results are as follows:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
The possibilities to influence the creation of your own roster	88.2 %	7.4 %	4.4%
The ability to exchange shifts	92.6 %	2.9 %	4.4%

Percentage of employees that are able to combine their work and private life: 91.2 % either agrees or completely agrees with the statement that they have the ability to balance between their work and private life time, 5.9 % neither agree nor disagrees, and only 2.9% does not agree with this statement.

4.1.2. Moderating variables

The secondary data (questionnaires) provides the possibility to measure the effects of some moderating variables from my research model, namely: age, family composition and amount of core hours.

Age was grouped in four groups according the year of birth: I- 1949-1959, II- 1960-1969, III- 1970-1979, IV-1980-1987. The age was distributed in the sample as follows:

The percentage of applicants being very satisfied or rather satisfied with the current roster was indicated for each group. The results for this sample are as follows:

Age group:	Satisfaction with current roster	Satisfaction with possibilities to influence creation of own roster	Satisfaction with possibilities to exchange shifts	Ability to balance work/life time
I -29.4%	95%	95%	100 %	100 %
II-36.8%	88%	92%	92%	92%
III- 16.2%	81.8 %	81.8%	81.9 %	72.8 %
IV-8.8%	66.7 %	100 %	100 %	83.4 %

Correlations

There was no significant correlation found between different aspects of work-time satisfaction and age; neither was a significant correlation found for age and work/life balance.

Regarding the effects of family composition on work-time satisfaction: the results showed that there is significant negative correlation between the number of family members and satisfaction with the ability to exchange shifts $r = -.322$, $p = .007$; no significant correlation was found between family composition, general current roster satisfaction and other aspects of work-time satisfaction.

No significant correlation was found between family composition and perceived work/life balance.

Amount of core hours was not significantly related to any aspect of work-time satisfaction; no significant correlation was found between amount of core hours and perceptions of the ability to balance work and private time.

As the need for more control is a very important factor for self-rostering the percentage of employees desiring more control was calculated for the whole organization and different departments. 59% of respondents from the whole organization think that they need more control over their schedule.

As the project of self-rostering had different success in two departments, it was found to be interesting to explore the differences in general roster satisfaction of these two departments. According to the results, the percentage of employees satisfied with the current roster is different; though the majority of employees are satisfied with current roster in both departments 94.7 % of employees of Bastion Kroonwerk /Hoornwerk are either very satisfied or rather satisfied with current roster, whereas 79.3 % of employees of Spijk Bungallows show the same results.

In Bastion Kroonwerk/Hoornwerk 49 % of employees indicate a need for more control, while in Spijk Bungallows 72 % think that they need more control over their schedule.

There is considerable difference between the two departments regarding the need for more control. That can be explained by fact that as Bastion Kroonwerk / Hornwerk had earlier introduced some aspects of self rostering, employees got their needed control over their working time; similarly the fact that the percentage of employees needing more control is higher in Spijk Bungallows can be caused by the fact that employees were not offered self control opportunities before the actual introduction of self- rostering.

4.1.3. Interview outcomes

According to the observations of the Project manager of internal benchmarking and self-rostering, the majority of moderating variables listed in the group of personal needs have influence on the individual/organizational outcomes: mainly on job satisfaction, commitment, level of stress and performance. However, she cannot agree that age is moderating in a way that the older employees are resistant to change, as she stated it is more the period in ones' life than age that matters. For example mother with younger children is less flexible than the one with teenage children.

Regarding the implementation process she thinks that using pilots are very important for the future success of the project of self-rostering. Considering technological support, she perceives it as crucial and reports that they are going to implement new software that will be easy for employees to use, as nowadays employees themselves have no access to the software.

According to the interviewee, perceived fairness and trust is also regarded to be beneficial for successful self-rostering, the example of this is the team meetings where employees are able to discuss their preferences and take part in the decision making process.

In this case there are no unions involved, the only one influence is from branch organization "Actiz" that is stimulating self-rostering; so the influence is positive.

4.2. Self-rostering at Warande

According to the HR advisor and project manager of *Individual rostering at Warande*, before the implementation it was difficult to adjust numbers of employees to the staffing needs; sometimes there were more people than needed; that is associated with higher costs and sometimes, in contrary, less people on shifts than needed.

The project of self-rostering started in six departments; the type is shift-picking. The process of rostering was described as follows:

- Organization provides employees with rosters according to staffing needs that is presented in special software system;
- In the first round of self-rostering, employees choose their favorite shifts; employees are given points for choosing unpopular shifts;
- In the second round, employees are able to exchange shifts according to staffing needs; in this round they are given points according to their flexibility: the more flexible they are, the more points they are given;
- If there are still more/less people in shifts than needed, the planner will choose among employees who have to change shifts; this choice is made according to the points that employees have; the more points they have the less is the probability that the planner will choose them.

4.2.1. Self-rostering and work time satisfaction

In order to evaluate the satisfaction with work-time satisfaction aspects, the following questions were analyzed:

How satisfied are you with:

- Current roster in general
- The possibilities to influence the creation of your own roster
- The ability to exchange shifts

The results were as follows:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
Current roster in general	87.1 %	7.5%	5.4 %
The possibilities to influence the creation of your own roster	85.2 %	9.1 %	5.6 %
The ability to exchange shifts	74.7 %	14.9 %	10.3 %

The percentage of employees that think that their roster gives them the possibilities to find balance between work and private life is distributed as follows: 83.7 % either agrees or completely agrees with the statement that their roster enables them to combine work and family life, 12.8% of respondents neither agrees nor disagree and only 3.5 % either disagrees or completely disagrees.

4.2.2. Moderating Variables

Age was grouped in four groups according to year of birth: I- 1947-1958, II- 1959-1968, III 1969-1978, IV- 1979-1991.

The percentage of employees, being either very satisfied or rather satisfied with work-time satisfaction aspects and WLB was calculated for each group:

Age group:	Satisfaction with the current roster:	Satisfaction with possibilities to influence creation of own roster:	Satisfaction with possibilities to exchange shifts:	Perceived WLB
I-23.9%	72.7 %	78.9 %	80 %	75 %
II- 33.7%	90%	73.7%	78.9%	83.3%
III- 16.3 %	96.2%	92.3%	68%	96.2%
IV-26.1%	91.3%	91.3%	72.7%	76.2%

Correlations

No significant correlation is found between age groups and roster satisfaction neither between age groups and perceived work/ life balance.

Family composition is in significant negative relationship with current roster satisfaction $r = -.238$, $p = .024$. Other aspects of roster satisfaction were not found to be in a significant relationship with family composition.

Family composition is significantly correlated (negative correlation) to the perceived balance between work and private time $r = -.240$, $p = .027$. The more members the family has, the less is the perceived balance between work and private life.

Amount of core hours is not significantly correlated neither to any aspects of roster satisfaction nor to perceived work/life balance.

Satisfaction with technology characteristics is significantly correlated with work-time satisfaction aspects as well as perceived work/private life balance:

	General Current roster satisfaction	Possibilities to influence creation of own roster	Possibilities to exchange shifts	Possibilities to combine work/life
Technical way of seeing roster	$r = .289$, $p = .016$	$r = .422$, $p = .0$	$r = .418$, $p = .0$	$r = .306$, $p = .013$

Technical tools for influencing realization of roster	$r=.425, p=.0$	$r=.624, p=.0$	$r=.530, p=.0$	$r=.354, p=.004$
Technical tools for exchanging shifts	No significant correlation	$r=.470, p=.0$	$r=.595, p=.0$	$r=.362, p=.004$

Regarding the need for more control for the whole organization 68 % of the respondents think that they need more control over their schedule.

4.2.3. Interview outcomes

As the second measurement is not yet conducted it is hard to discuss the results of self-rostering; according to the observations of the interviewee in the beginning people did not like the project but after some period the majority of employees started to see the benefits of this project. As she said: “majority of employees are getting more satisfied and more flexible as their preferences are taken into consideration”.

The interviewee agreed about the effects of moderating variables of the group of personal needs; according to her observations nurses with families and children mostly dislike this project of self-rostering; it was explained by need of flexibility. Nurses with families and children prefer to work traditional rosters and have free weekends and evenings. Moreover, she cannot see any effects of age or gender neither on individual nor on organizational outcomes of self-rostering.

The moderating variables from the group of implementation process, namely timing and pilots, are regarded to be important by the interviewee; it is believed that pilots should involve departments with different difficulty level in order to find out all the possible drawbacks of the system.

Considering technological support, the characteristics of the software system are viewed as a very important moderating variable; that is why they have chosen the system that is connected to the internet and is flexible to use. Employees can use it from homes and via smart phones; moreover, it is very easy to use as employees of older age groups have absolutely no difficulties using it.

Thanks to the software system the process of self-rostering is transparent, and that influences the perceived fairness and trust of employees. Those variables affect the outcomes.

Regarding labor relations, the only organization that needs to be informed about procedures is the Employees’ council, though they are not interfering.

4.3. Self-rostering at HilverZorg

The type of self-rostering in HilverZorg is shift- picking. The process of scheduling is exactly the same as in Warande, as both of these organizations are using the same software system.

4.3.1. Self-rostering and work time satisfaction (first measurement)

For evaluation of the satisfaction with the specific aspects of the roster, the following list of questions was analyzed:

How satisfied are you with:

- Current roster
- The possibilities to influence the creation of your own roster
- The ability to exchange shifts

The results for two measurements are as follows:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
Current roster satisfaction	77.7%	8.3%	13.9%
2 nd measurement (Current roster satisfaction)	64.2 %	17.9%	17.9%
The possibilities to influence the creation of your own roster	65.7%	22.9%	11.4%
2 nd measurement (The possibilities to influence the creation of your own roster)	75.7%	10.4%	23.9%
The ability to exchange shifts	59.1%	32.4%	8.4%
2 nd measurement (The ability to exchange shifts)	53.6%	14.5%	21.9%

The perceived work/life balance (for two measurements) are presented in the following table:

	Agree/completely agree	Neither agree nor disagree	Disagree/completely disagree
WLB 1 st measurement	65.3 %	20.8 %	13.9 %
WLB 2 nd measurement	69.1 %	25%	5.9 %

4.3.2. Moderating variables

Age was divided in four groups: I-1947-1956, II- 1957-1966, III- 1967-1976, IV- 1977-1987.

Satisfaction with current roster and perceived WLB was measured in every age group:

Age group:	Satisfaction with the current roster:	Satisfaction with possibilities to influence creation of own roster:	Satisfaction with possibilities to exchange shifts:	Perceived WLB:
I-30.9%	71.4 %	75%	55%	76.2 %
II- 41,2%	78.6%	66.6%	62.9%	71.4 %
III-13.2%	87.5%	55.5%	55.5%	37.5%
IV-14.7%	80 %	55.5%	70%	40%

Correlations

No significant correlation was found between the age and any aspects of roster satisfaction.

Age is found to be significantly correlated with the perceived work/private life balance $r = .254$, $p = .038$. Older employees perceive better possibilities to control work/life balance.

Family composition was not significantly related neither to the aspects of roster satisfaction nor to perceived work life balance in any of measurements.

Amount of core hours is not significantly related to any of aspects of roster satisfaction or to perceived work/life balance in any of the measurements.

The technology characteristics are found to be in relationship to work time satisfaction aspects as well as perceived work life balance:

	General Current roster satisfaction	Possibilities to influence creation of own roster	Possibilities to exchange shifts	Perceived WLB
Technical way of seeing roster	$r = .482$; $p = .0$	$r = .480$; $p = .0$	$r = .661$; $p = 0$	$r = .475$; $p = .0$
2 nd measurement	$r = .453$; $p = .0$	$r = .573$; $p = .0$	$r = .485$; $p = 0$	$r = .400$; $p = .001$
Technical tools for influencing realization of roster	$r = .516$; $p = .0$	$r = .601$; $p = .0$	$r = .524$; $p = 0$	$r = .443$; $p = .0$
2 nd measurement	$r = .585$; $p = .0$	$r = .744$; $p = .0$	$r = .576$; $p = 0$	$r = .471$; $p = .0$
Technical tools for exchanging shifts	$r = .526$; $p = .0$	$r = .487$; $p = .0$	$r = .682$; $p = 0$	$r = .433$; $p = .0$
2 nd measurement	$r = .565$; $p = .0$	$r = .704$; $p = .0$	$r = .711$; $p = 0$	$r = .331$; $p = .006$

76% of respondents, according to first measurement and 80% according to the second one stated that they needed more control over working time.

4.3.3. Interview outcomes

After the second measurement, the current roster satisfaction has decreased. 77.7 % were very or rather satisfied with current roster according the first measurement whereas the percentage of very or rather satisfied employees dropped down to 64.2 % according to the second measurement. According to the project manager, these results are surprising as the first measurement showed that employees needed more control over their working time but after giving them the control the satisfaction with roster decreased. The interviewee stated the reasons for these results should be found out; he supposes that the reason may be the responses only from employees who are not satisfied or the fear of having control. According to the interviewee, though people wanted more self-control after getting it they are less happy because they have a fear to be responsible for control.

Regarding the moderating variables of the conceptual model, he considers work/family balance to be a very powerful moderator that is also proven by results. Amount of core hours does not differ among employees in the long run; the working time is balanced in a way that employees who get one month contracts with less working hours will get the contract with more hours for the next month.

The project manager assumes that the moderating variables like family composition, age and gender should have influence on the relationship of self-rostering and its outcomes. Though, according to the measurement results there is no correlation found between these variables and work time satisfaction.

Regarding implementation process, timing and pilots have crucial importance as the interviewee stated. He thinks that with good project management, the project timing should not be a problem that in turn will influence the relationship of self-rostering and its outcomes. He argues that it is crucial to train staff before implementing a project so that they fully understand the need of the project and the potential benefits. According to him, training can be viewed as an additional moderating variable.

Considering technological support; according to the interviewee, offering employees a flexible system that is easy to use will have a positive impact on the relationship of self-rostering and its individual/organizational outcomes. In an ideal situation, the planner does not have to change anything after the third round, so it could be a kind of full self-rostering but it needs time.

The project manager considers giving employees less room for discussion after decisions are made to be important for the success of any project, in this case self-rostering.

4.4. The Self-rostering at RSZK

The type of self-rostering is a combination of Wish-rostering and shift-picking. The team leader, based on the preferences of the employees, makes the roster. Afterwards “open” shifts are presented in the software system and the employees can choose among them.

4.4.1. Self-rostering and work time satisfaction

The sample consisted of 51 participants. 90.2 % of employees were either very satisfied or rather satisfied with current roster; 7.8 % was neither satisfied nor dissatisfied and 2 % was rather dissatisfied.

The results for the satisfaction with the specific aspects of roster are presented in the following table:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
The possibilities to influence the creation of your own roster	90.2 %	7.8 %	2 %
The ability to exchange shifts	98 %	-	2 %

Regarding the perceived work/life balance, 92.1 % of respondents perceive the ability to balance their work/private time, 3.9 % neither agree nor disagree with the statement and 4% of respondents think that their roster does not give them possibilities to balance between work and private time.

4.4.2 Moderating variables

Age was distributed in the four age groups: I-1946-1956, II 1957-1966, III-1967-1976, 1977-1991. Satisfaction with roster aspects and perceived WLB was measured for each age group:

Age group:	Satisfaction with the current roster	Satisfaction with possibilities to influence creation of own roster:	Satisfaction with possibilities to exchange shifts:	Perceived WLB:
I- 20.4%	90 %	90%	100%	100%
II-44.9%	90.9 %	95.4%	100%	100%
III-20.4%	80 %	70%	90%	70%
IV-14.3%	100 %	100%	100%	30%

Correlations

No significant correlation was found between the age of employees and roster satisfaction aspects. The age of the respondent is found to be significantly correlated with the perceived work-private life balance $r = .428$, $p = .002$. Older employees perceive better balance.

Family composition is also not found to be in significant relationship with roster satisfaction aspects, nor with work/life balance perception.

Amount of core hours is found to be in significant negative relationship only with the current roster satisfaction: $r = -.311$, $p = .026$. The more core hours respondents have the less satisfied they are with the current roster. Amount of core hours is not found to be significantly related with work/life balance perception.

Correlation between satisfaction with technology characteristics and work time satisfaction and between technology characteristics and perceived work life balance:

	General Current roster satisfaction	Possibilities to influence creation of own roster	Possibilities to exchange shifts	Possibilities to combine work/life
Technical way of seeing roster	No significant correlation	$r = .457$; $p = .001$	$r = .452$; $p = .002$	$r = .324$; $p = .026$
Technical tools for influencing realization of roster	$r = .406$; $p = .005$	$r = .510$; $p = .0$	$r = .525$; $p = .0$	$r = .340$; $p = .019$
Technical tools for exchanging shifts	$r = .326$; $p = .027$	$r = .469$; $p = .001$	$r = .558$; $p = .0$	$r = .427$; $p = .003$

51 % of respondents think they need more control over their schedule.

4.5. General outcomes of interviews

The interviews provided the possibility to gather the detailed information about the process of self-rostering for each organization and supportive software characteristics.

As a result of the three interviews it was found that all of the interviewees agreed with the importance and relevance of moderating groups presented in the conceptual model. According to their observations the majority of moderating variables listed in the model might have positive effects on individual and organizational outcomes of self-rostering. The effects of age were more explained as effects of a period in life, rather than age. Family composition was considered to be an important moderator, though in contrast to the propositions of this research, two of the interviewees (Sutfene and Warande) stated that employees with older children are more satisfied with the self-rostering opportunities than their counterparts with younger children. Pilots were considered to be very important according to all the interviewees.

Finally, it was reported that Unions (or any kind of labor relations) had no influence on the relationship of self-rostering and its' individual/organizational outcomes.

5. Discussion and Results

Introduction

For more robust analysis this chapter presents the results of the integrated dataset analysis and identifies similarities and differences for the results of different cases.

5.1. Integrated dataset analysis

The dataset of first measurements of all four of the elderly care organizations was integrated, which consists of 285 respondents. The use of the first measurement for the integrated dataset analysis was determined by the fact that the second measurement was not conducted in every organization but only in HilverZorg. For this reason, integrating the second measurement of HilverZorg with the first measurements was considered to be inappropriate.

Work-time satisfaction:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
General current roster	85.5%	7.1%	7.4%
Possibilities to influence creation of own roster	81.9%	12%	6.1%
Possibilities to exchange shifts	77.9%	15.2%	6.9%

Work/ life balance:

	Completely agree/agree	Neither agree nor disagree	Completely disagree/disagree
Possibilities to combine work and private life	82.3%	11.6%	6.1%

The percentage for each age group for satisfaction with the work time satisfaction aspects is displayed in following table:

Age group:	General satisfaction with current roster:	Satisfaction with possibilities to influence creation of own roster	Satisfaction with possibilities to exchange shifts	Satisfaction with the WLB abilities
I (27%)	80.8%	82.1%	80%	86%
II (35%)	86.2%	81.5%	81.5%	85.8%

III (21%)	89.1%	80.4 %	69.1%	78.2%
IV(17 %)	87%	86.6%	83.3%	70.5%

Correlations

No significant correlation is found between age and work-time satisfaction aspects. Nor was any significant correlation found between age and work/life balance. No significant correlation was found between family composition and work-time satisfaction aspects or family composition and work/life balance.

Amount of core hours is not significantly related to work-time satisfaction aspects; amount of core hours is not significantly related to work/life balance.

Significant correlation was found between the satisfaction with the aspects of technology characteristics and satisfaction with the aspects of work-time satisfaction and WLB:

	General Current roster satisfaction	Possibilities to influence creation of own roster	Possibilities to exchange shifts	Perceived WLB
Technical way of seeing roster	$r = .350; p = .0$	$r = .480; p = .0$	$r = .573; p = 0$	$r = .407; p = 0$
Technical tools for influencing realization of roster	$r = .439; p = .0$	$r = .602; p = .0$	$r = .558; p = 0$	$r = .418; p = 0$
Technical tools for exchanging shifts	$r = .350; p = .0$	$r = .512; p = .0$	$r = .634; p = 0$	$r = .435; p = 0$

Satisfaction with technology characteristics:

	Very/rather satisfied	Nor satisfied neither dissatisfied	Very/rather dissatisfied
Technical way of seeing roster	60.8%	23.6%	15.6%
Technical tools for influencing realization of roster	57.7%	25.8%	16.5%
Technical tools for exchanging shifts	55.2%	30.4%	14.4 %

For the integrated dataset, 64.7 % of respondents think that they do not need to have more control, while 35.3% state the opposite.

The results for the proposed moderating variables suggest that for this sample no significant moderating effects were found regarding age, family composition and the amount of core hours.

The only significant moderating variable appeared to be satisfaction with technology characteristics.

These results may be explained by the size of the sample; the moderating variables may be found significant for a bigger sample. In addition, as the integrated dataset is composed of the first measurement datasets, it may be assumed that more time is needed in order to identify the strength of the moderating effects.

5.2. Cross-case analysis

This section aims at comparing the results of different organizations and to demonstrate the results for the whole dataset.

Type of self-rostering

The type of self-rostering is similar for all of the four organizations as shift-picking is present in every case. Workforce needs are determined by the organization and then the employees can choose their favorite shift. However, the pure form of shift-picking is introduced in Warande and HilverZorg, whereas the form of self-rostering in Sutfene is the combination of shift picking and exchange of shifts and respectively in RSZK the combination of wish-rostering and shift-picking.

In most of the cases (except Sutfene) the process of self-rostering is related to the special software program that has 3 rounds.

In Warande and HilverZorg the software system enables employees to see work force needs on different shifts. In the first round, employees choose their favorite shifts. In the second round, if the organizational workforce needs are not satisfied and/or there are too many people on some shifts, employees are changing shifts. In the very last round, if there is still insufficient workforce on some shifts and lack of employees on others, the team leader chooses the employees that have to change shifts (in accordance to their points).

A different kind of software system is implemented in RSZK. First, the team leader is making rosters according to preferences of employees and then employees are given ability to pick “open” shifts that are presented in special software.

In the case of Sutfene the process is different, as they do not have a supporting software system yet. After receiving schedules from the roster bureau, there are meetings in order to decide who will stay on their chosen shifts and who has to change.

Self-rostering and work-time satisfaction

According to Proposition 1, introducing shift picking will be positively related to work-time satisfaction. For measuring work time satisfaction four aspects from the questionnaire were analyzed:

- Current roster satisfaction
- Satisfaction with the possibilities to influence roster
- Satisfaction with the possibilities to exchange shifts

The percentage of respondents that are satisfied and/or very satisfied with work time satisfaction issues are presented in the following table:

	Sutfene	Warande	HilverZorg (1 st)	RSZK	Integrated dataset	HilverZorg (2 nd)
Current roster satisfaction	88.1 %	87.1 %	77.7%	90.2%	85.5 %	64.2%
Satisfaction with the possibilities to influence roster	88.2%	85.2 %	65.7%	90.2%	81.9 %	75.7%
Satisfaction with the possibilities to exchange shifts	92.6%	74.7 %	59.1%	98%	53.6 %	59.1%

According to the results RSZK has the highest satisfaction with work time satisfaction issues followed by Sutfene and Warande and HilverZorg (1st measurement).

Considering the second measurement of HilverZorg, the satisfaction with the possibilities to influence roster is higher after the second measurement, whereas current roster satisfaction and satisfaction with the possibilities to exchange shifts are lower.

The result for integrated dataset analysis show that the majority of employees are satisfied with the work time related issues.

Moderating variables

Age was not found to moderate on the relationship between self-rostering and work-time satisfaction in any of the organizations, nor for the integrated dataset; that leads to the rejection of the proposition 1a. Similarly, according to the integrated dataset analysis, there is no significant relationship between family composition and work-time satisfaction aspects.

Amount of core hours had no significant effects in any organizations except RSZK where the significant negative relationship was found between the amount of core hours and current roster satisfaction; the significance of this relationship was not relevant for the integrated dataset.

Satisfaction with technology characteristics is found to be in significant relationship with work-time satisfaction issues for every organization and accordingly for the integrated dataset; so the proposition 1 d is supported by data.

To sum up, the first set of hypotheses is partially approved with the analyzed data. According to this data, introducing shift- picking is positively related to work time satisfaction.

The propositions about the moderating effects of age, family composition and the amount of core hours on work time satisfaction are not approved according the integrated dataset analysis; the satisfaction with technology characteristics is found to be the most significant moderator for the given data as it is significantly related to work time satisfaction issues for every organization.

However, it should be mentioned that the finding regarding the proposed moderating variables that were found insignificant might be determined by the sample characteristics such as size and timing (only first measurement); in another sample these moderators might be found significant.

Self-rostering and work/life balance

According to Proposition 2, introducing shift- picking will be positively related with the perceived work/private life balance.

The percentage of employees that perceive good work/private life balance is presented in the table below:

	Sutfene	Warande	HilverZorg (1 st)	RSZK	Integrated dataset	HilverZorg (2 nd)
Perceived work/private life balance	91.2 %	83.7 %	65.3 %	92.1%	82.3%	69.1 %

These results show that the perceived work/life balance is highest in RSZK, followed by Sutfene, Warande and HilverZorg. It is also shown that the percentage of employees perceiving good work family balance in HilverZorg is higher after second measurement, though these results are conflicting with the percentage of more need for control that has increased after the second measurement.

Moderating variables

Regarding the moderating variables, age is not found to be significant for the entire dataset correlation analysis. Moreover, according to the integrated dataset analysis, no significant relationships are found between family composition and WLB. Respectively, no significant relationship was found between amount of core hours and WLB.

The satisfaction with technology characteristics is found to be in positive relationship with the perceived work/life balance for every organization and accordingly to the whole dataset. So, Proposition 2 d is supported.

To conclude, the second set of propositions is partially approved; the main effect of shift picking on perceived work/life balance is supported by data. The proposition 2a, 2b, 2c are not approved, whereas proposition 2d, the effects of satisfaction with technology characteristics, is supported for the whole sample.

As mentioned above, the results regarding the insignificant effects of moderating variables other than satisfaction with technology characteristics may be explained by the sample characteristics, such as size and timing of measurement. For bigger sample and/or for later measurements (not only first measurement), the moderating role of age, family composition and amount of core hours may be found significant for the relationships of shift picking and work time satisfaction, respectively shift picking WLB.

Table with all the propositions regarding the integrated dataset:

<i>P. 1:</i> Introducing shift picking will be positively related to work-time satisfaction	Approved
<i>P.1a:</i> The effects of shift- picking on work-time satisfaction will be moderated by age: the positive effects of shift picking on work-time satisfaction will be stronger for younger employees.	Rejected
<i>P. 1b:</i> The effects of shift- picking on work-time satisfaction will be moderated by family composition: the positive effects of shift picking on work-time satisfaction will be stronger for employees with more family members.	Rejected
<i>P. 1c:</i> The effects of shift-picking on work time satisfaction will be moderated by amount of core hours: the positive effects of shift picking on work-time satisfaction will be stronger for employees that have more core hours to work.	Rejected
<i>P. 1d:</i> The effects of shift picking on work time satisfaction will be moderated by satisfaction with technological (software) characteristics: the positive effects of shift picking on work time satisfaction will be stronger for employees that are satisfied with technology characteristics.	Approved
<i>P. 2:</i> Introducing shift picking will be positively related with perceived work/life balance.	Approved
<i>P. 2a:</i> The effects of shift picking on perceived work/life balance will be moderated by age: the positive effects of shift picking on perceived work/life balance will be stronger for younger employees.	Rejected
<i>P.2b:</i> The effects of shift picking on perceived work/life balance will be moderated by family composition: the positive effects of shift picking on perceived work/life balance will be stronger for employees with more family members.	Rejected

<i>P. 2c:</i> The effects of shift picking on perceived work/life balance will be moderated by amount of core hours: the positive effects of shift picking on perceived work/private life balance will be stronger for employees that have more core hours to work.	Rejected
<i>P. 2d:</i> The effects of shift picking on perceived work/life balance will be moderated by satisfaction with technological (software) characteristics: the positive effects of shift picking on perceived work/life balance will be stronger for employees that are satisfied with technology characteristics.	Approved

6. Conclusions and Recommendations

Introduction

The overall aim of this research was to advance an understanding of factors determining the success of self-rostering in elderly care organizations. The specific research objectives were, in the context of elderly care organizations, to:

- Test the relationship between specific forms of self-rostering and its individual and organizational outcomes
- Identify moderating variables that determine the success of self-rostering.

The following section will revise the research objectives above, summarize the findings and offer conclusions based on the findings. After that, recommendations for future research will be discussed.

6.1. Research objectives: summary of findings and resulting conclusions

Due to the limitations of the study it was impossible to test empirically all of the results found in the literature.

The empirical study tested the moderating effects on the relationship of shift-picking and its two individual outcomes: work-time satisfaction and perceived work/life balance. The moderating effects of the following variables were tested:

- Age
- Family composition
- Amount of core hours
- Satisfaction with technology characteristics

It was found that shift picking is positively related to the work time satisfaction and work/life balance.

Considering the moderating variables, only one proposition for each outcome (work time satisfaction, WLB) was supported, namely the proposed moderating variable satisfaction with the technology characteristics, was found to be significant for the relationship of shift-picking and work-time satisfaction, as well as shift-picking and perceived work/life balance.

The moderating role of satisfaction with the technology characteristics is identified as a moderator for both relationships. This finding is considered to be very important as there was no literature found regarding the relationship of satisfaction with technology characteristics and work-time satisfaction, nor satisfaction with technology characteristics and WLB. Therefore, this finding may be important for practical implication.

6.2. Recommendations for the future research and practical implications

For further research it is suggested to test empirically the main effects as well as moderating variables presented in the conceptual model p.26.

Besides that, in order to have robust results, it is very important to have measurements of individual and organizational outcomes for at least two years in conditions of self-rostering, as it is very important to evaluate the success of any project including a self-rostering project continuously over time.

Another recommendation concerns the sector of research. This research is focused on self-rostering success in the healthcare sector, because this is the sector where self-rostering is mainly implemented but considering the trend of implementing self-rostering in other sectors as well (for example, entertainment sector: casinos etc), it may be interesting to apply the conceptual model to different sectors and to make a comparative analysis.

Taking into consideration these recommendations would offer an improved chance of the conceptual model being adopted successfully.

As this research explored the importance of the supportive software system for the outcomes of self-rostering, namely work-time satisfaction and work/life balance, it is encouraging the implementation of supportive software systems in organizations that have introduced self-rostering.

6.3. Limitations of this Research

One of the limitations of this research is that not all of the relationships presented in the conceptual model (in ch.2) are testable.

The secondary data is giving the possibility to test the relationship between the specific type of self-rostering (shift-picking) and two individual outcomes: 1.Work-time satisfaction and 2.Perceived work life balance. Regarding the moderating variables the following ones are testable:

- Age
- Family composition
- Amount of core hours
- Satisfaction with technology characteristics

There is also a limitation regarding the moderating role of age; the effects of age on work time satisfaction and WLB are explained by the age of children that captures only employees with children; moreover these effects can be explained more by employees' phase in life than actual age.

Moreover, the possibility to use only first measurement data is regarded to be another limitation of this research, as the later measurements tend to show a clearer picture of the relationships. For example, for later measurements the moderating effects of age, family composition and amount of core hours in the relationship between shift-picking and individual/organizational outcomes might be significant.

Another limitation of this study is the limited interview testing power as the interviewees were asked to evaluate trends according to their observations regarding self-rostering, its outcomes and moderating variables; so the data obtained from interviews cannot be used to test relationships.

References:

Appelbaum E, Golden L (2003) The failure to reform the workday, *Challenge*, Vol.46, No.1, pp.79-92.

Atkinson C, Hall I (2011) Flexible working and happiness in the NHS, *Employee Relations*, Vol.33, No.2, pp.88-105.

Babbie E (2007) *The Practice of Social Research, Twelfth Edition*

Bailyn L, Collins R, Song Y (2007) Self-scheduling for hospital nurses: an attempt and its difficulties, *Journal of Nursing management*, no.15, pp.72-77.

Baltes B.B, Briggs, T.A, Huff J. W, Wright J. A, Neuman G. A (1999) Flexible and Compressed Workweek Schedules: A Meta-Analysis of Their Effects on Work-Related Criteria, *Journal of Applied Psychology*, Vol.84, No.4, pp.496-513.

Baughman R, DiNardi D, Holtz-Eakin D (2003) Productivity and wage effects of “family-friendly” fringe benefits, *International Journal of Manpower*, Vol.24, No.3, pp.247-259.

Beauregard T.A, Henry L.C (2009) Making the link between work-life balance practices and organizational performance, *Human Resource Management Review*, Vol:19, pp.9-22.

Berg P, Appelbaum E, Bailey T, Kalleberg, A (2004) Contesting Time: International Comparisons of Employee Control of Working Time, *Industrial and Labor Relations Review*, Vol.57, No.3

Bluett L (2008) Self-scheduling: Facilitate, don't control, *Nursing management*.

Bradbeer P.V.G, Findlay C, Fogarty T.C (2000) An Ambulance Crew Rostering System, *Evo Workshops*, pp.267-279.

Brooks I, Swailes S (2002) Analysis of the relationship between nurse influences over flexible working and commitment to nursing, *Journal of advanced nursing*, 38 (2), pp.117-126

Burke K.E, Causmaecker P, Berghe G, Landeghem H (2004) The state of the art of nurse rostering, *Journal of Scheduling*, 7, pp.441-449

Chang E.M, Hancock K. M, Johnson A, Daly J, Jackson D (2005) Role stress in nurses: Review of related factors and strategies for moving forward, *Nursing and Health Sciences*, 7, pp.57-65

Chiang F.F.T, Birtch T. A, Kwan K.H (2010) The moderating roles of job control and work life balance practices on employee stress in the hotel and catering industry, *International Journal of Hospitality Management*, 29, pp.25-32.

Darvas J.A, Hawkins L.G (2002) What makes a good intensive care unit: a nursing perspective, *Australian Critical Care*. 15 (2), pp.77-82.

- Derrat M, Amyx D, Bennet R (2010) An investigation into the effects of work family conflict and job satisfaction on salesperson deviance, *Journal of personal Selling and Sales management*, Vol. XXX,no.3, pp.239-251.
- Dirks K, T, Ferrin D. L (2002) Trust in Leadership: Meta-Analytic findings and implications for Research and Practice, *Journal of Applied Psychology*, Vol.87, No.4, pp.611-628.
- Drouin R, Potter M (2005) Flexible Scheduling- exploring benefits and limitations, *American Journal of Nursing*, Vol:105, Issue:11, pp.72 E-72 F
- Ebbinghaus B (2011) The role of trade unions in European pension reforms: from “old” to “new” politics? , *European Journal of Industrial Relations*, Vol:17, No:4, pp.315-331.
- Gibson V (2003) Flexible Working Needs Flexible Space? Towards an alternative workplace strategy, *Journal of Property Investment and Finance*, Vol.21, No.1, pp. 12-22.
- Gregory A, Milner S (2009) Editorial: Work-life balance: A matter of choice? *Gender, Work and Organization*, Vol.16, No.1.
- Groenlund A (2007) Employee Control In The Era of Flexibility: A Stress Buffer Or Amplifier?, *European Societies*,9:3, pp.409-428.
- Grzywacz J.G, Carlson D.S, Shulkin S (2008) Schedule flexibility and stress: Linking formal flexible arrangements and perceived flexibility to employee health, *Community, Work and Family*, Vol.11, No.2, pp.199-214.
- Hadwan M, Ayob M.B (2009) An Exploration Study of Nurse Rostering Practice at Hospital University Kebangsaan Malaysia, *2nd Conference of Data Mining and Optimization*.
- Halpern, F, D (2005) How time-flexible work policies can reduce stress, improve health, and save money, *Stress and health*, 21, pp.157-168.
- Hasson H, Arnetz J. A (2008) Nursing staff competence, work strain, stress and satisfaction in elderly care: a comparison of home-based care and nursing homes, *Journal of Clinical Nursing*, 17, pp.468-481.
- Hill E.J, Grzywacz J.G, Allen S, Blanchard V.L, Matz-Costa C, Shulkin S, Pitt-Catsoupes M (2008) Defining and conceptualizing workplace flexibility, *Community, Work & Family*, Vol:11, No: 2, pp.149-163.
- Ibrahim M.H.A, Chuprat S, Ahmad R, Haron H, Ibrahim N.K (2010) A Review On The Workload In The Nurse Rostering Problem, *Information Technology*, Vol:3, pp.1591-1595
- Jang J, S, Park R, Zippay A (2011) the interaction effects of scheduling control and work-life balance programs on job satisfaction and mental health, *International journal Of Social Welfare*, 20, pp.135-143.
- Kilpatrick K, Tremblay, L.M (2006) Shiftwork- What Health Care Managers Need to Know, *The health Care Manager*, Vol:25, No:2, pp-160-166

Knauth P, Hornberger S (2003) Preventive and compensatory measures for shift workers, *Occupational Medicine*, Vol. 53, pp.109-116.

Leede J, Looise J, Riemsdijk M (2004) Collectivism versus Individualism in Dutch employment relations, *Human Resource Management Journal*, Vol:14, No:1, pp:25-39

Lyness K.S, Kropf M.B (2005) The relationships of national gender equality and organizational support with work-family balance: A study of European managers, *Human Relations*, 58, 33, pp.33-60.

Lo C. C, Lin C, C, Wang C.T, Dai T, J, Wong D (2007) Artificial Immune Systems for Intelligent Nurse Rostering, *Proceedings of the 2007 IEEE IEEM*, pp.862-866.

MacEachen E, Polzer J, Clarke J (2008) "You are free to set your own hours": Governing worker productivity and health through flexibility and resilience, *Social Science and Medicine*, 66, pp: 1019-1033

Maenhout B, Vanhoucke M (2009) Branching strategies in a branch-and-price approach for a multiple objective nurse scheduling problem, *Journal of Scheduling*, Vol:13, No:1, pp.77-93.

Maenhout B, Vanhoucke M (2011) An Evolutionary Approach for the Nurse Rostering Problem, *Computers and Operations Research*, 38, pp.1400-1411

McNall L, Masuda A, Nicklin J (2010) Flexible Work Arrangements, Job Satisfaction, and Turnover Intentions: The Mediating Role of Work-to-Family Enrichment, *The Journal of Psychology*, 144(1), pp.61-81

Moen P, Kelly L.E, Hill R (2011) Does Enhancing Work- time Control and Flexibility Reduce Turnover? A Naturally Occurring Experiment, *Social Problems*, Vol.58, issue 1, pp.69-98.

Mursula L, Vahtera J, Kivimäki M, Kevin M, Pentti J (2002) Employee control over working times: associations with subjective health and sickness absences, *J Epidemiol Community Health*, 56, pp:272-278.

(Nederlands Centrum voor Sociale Innovatie)

Nelson M.F, Tarpey R.J (2010) Work Scheduling Satisfaction And Work Life Balance For Nurses, *Academy of Health Care Management Journal*, Vol:6, No:1, pp.25-36.

Pryce J, Albertsen K, Nielsen K (2006) Evaluation of an open-rota system in a Danish psychiatric hospital: a mechanism for improving job satisfaction and work-life balance, *Journal of Nursing Management*, Vol.14, pp.282-288.

Puri B.K (2002) SPSS in practice, Second edition, Oxford University Press Inc.

Ribbe M.W (1993) Care for the Elderly: The Role of the Nursing Home in the Dutch Health Care System, *International Psychogeriatrics*, Vol.5, No.2, pp.213-222.

Rodwell J, Noblet A, Demir D, Steane P (2009) The impact of the work conditions of allied health professionals on satisfaction, commitment and psychological distress , *Health Care Management Review*, 34 (3), pp. 273-283.

Ronnberg E, Larsson T (2010) Automating the self-scheduling process of nurses in Swedish healthcare: a pilot study, *Health Care Management Science*, 13, pp.35-53.

Rousseau M, Violet T, Greenberg J (2006) I-Deals: Idiosyncratic Terms in Employment Relationships, *Academy of management Review*, Vol.31, No.4,pp. 977-994

Saunders M., Lewis P., Thornhill A, (2009) *Research Methods for Business Students*

Shepard E.M, Clifton J. T, Kruse D (1996) Flexible Work Hours and Productivity: Some Evidence from the Pharmaceutical Industry, *Industrial Relations*, Vol.35, No.1, pp.123-139

Silvestro R , Silvestro C (2000) An evaluation of nurse rostering practices in the national Health Service, *Journal of Advanced Nursing*, Vol:32 (3),pp.525-535

Skinner N, Dijk P, Elton J, Auer J (2011) An in-depth study of Australian nurses' and midwives' work-life interaction, *Journal of Human Resources*, 49 (2), pp. 213-232.

Skorstad E.J, Ramsdal H (2009) Flexible organizations and new working life: a European perspective

Smith L, Barton J (1994) Shiftwork and personal control: Towards a Conceptual Framework, *European Work and Organizational Psychologist*,4(2),pp.101-120.

Sparks K, Faragher B, Cooper, C. L (2001) Well-being and occupational health in the 21th century workplace, *Journal of Occupational and Organizational Psychology*, 74, pp. 489-509.

Stavrou E ,Kilanitois C (2010) Flexible Work and Turnover: An Empirical Investigation across Cultures,*british Journal of Management*, Vol.21,pp. 541-551.

Stolletz R, Brunner J. O (2011) Fair optimization of fortnightly physician schedules with flexible shifts, *European Journal of Operational Research*

Stordeur S, D'Hoore W, THE NEXT STUDY GROUP (2006) Organizational Configuration of Hospitals succeeding in attracting and retaining Nurses , *Journal of Advanced Nursing*, Vol:57, Issue:1, pp.46-58.

Strachota E, Normandin P, O'Brien N, Clary M, Krukow B (2003) Reasons Registered Nurses Leave or Change Employment Status, *JONA*, Vol:33, No:2, pp:111-117.

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

Theorell T, Karasek R. A (1996) Current Issues Relating to Psychosocial Job Strain and Cardiovascular Disease Research, *Journal of Occupational Health Psychology*, Vol.1, No. 1, pp. 9-26.

Thornthwaite L & Sheldon P (2004) Employee self-rostering for work-family balance, *Employee Relations*, Vol.26,No.3, pp.238-254

Wang Z, Wang C (2009) Automating Nurse Self- Rostering: A Multiagent Systems Model, *International Conference on Systems, Man and Cybernetics*

Yang S, Zheng L (2011) The paradox of de-coupling: A study of flexible work program and workers' productivity, *Social Science Research*, Vol:40, pp.299-311.

Zimmermann P (1995) How we do it, Self-scheduling in the emergency department, *Journal of Emergency Nursing*, Vol:21, no.1

**Appendix 1: The sample of the Questionnaire,
Part 1- General Information**

1. What is your year of birth?	19..
2. Where do you work?	<div style="text-align: right;"> A 1 <input type="checkbox"/> 1 A 2 <input type="checkbox"/> 2 A 3 <input type="checkbox"/> 3 B 1 <input type="checkbox"/> 4 B 2 <input type="checkbox"/> 5 Other namely. <input type="checkbox"/> 6 </div>
3. For how long have you worked in this department?	<div style="text-align: right;"> Less than 1 year <input type="checkbox"/> 1 1-5year <input type="checkbox"/> 2 5-15 year <input type="checkbox"/> 3 Longer than 15 years <input type="checkbox"/> 4 </div>
4. What is your function?	<div style="text-align: right;"> Residential assistant <input type="checkbox"/> 1 Residential care director <input type="checkbox"/> 2 Care giver. 3 (IG) <input type="checkbox"/> 3 Helping lev.2 <input type="checkbox"/> 4 Nurse lev.4 <input type="checkbox"/> 5 Student <input type="checkbox"/> 6 Other, namely <input type="checkbox"/> 7 </div>
5. How many hours do you work? (in case of minimum and maximum contract, please start from the minimum)	<div style="text-align: right;"> 12 hours or less per week <input type="checkbox"/> 1 More than 12 hours but less than 20 hours per week <input type="checkbox"/> 2 20 hours or more but less than 32 hours per week <input type="checkbox"/> 3 32 hours or more per week <input type="checkbox"/> 4 I have 0 hour contract/ no fixed contract <input type="checkbox"/> 5 </div>
6. What is the composition of your family?	<div style="text-align: right;"> One person family <input type="checkbox"/> 1 two persons family <input type="checkbox"/> 2 Single parent family with children at home <input type="checkbox"/> 3 two parents, with children at home <input type="checkbox"/> 4 Other <input type="checkbox"/> 5 </div>
7. Does your partner have a paid job?	<div style="text-align: right;"> Yes, he/she has a paid job <input type="checkbox"/> 1 No, he/she does not have a paid job <input type="checkbox"/> 2 Not applicable <input type="checkbox"/> 3 </div>

Part 2- Satisfaction with the Current Roster:

How satisfied are you?	Very dissatisfied	Rather dissatisfied	Neither dissatisfied nor satisfied	Rather satisfied	Very satisfied
8. How satisfied are you with the current roster in general?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
What is important?	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
9. I find important to be able to exchange shifts.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

10. I find it important to have opportunity to schedule my work so that it suits my personal needs.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
11. I find regularity in my roster very important.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
12. My current schedule gives me possibility to combine my work and private life	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
13. I think that this roster has sufficiently taken into account the demands of our clients.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

How satisfied are you with the following specific points in the current roster? (only one answer) (even if you do not have changing shifts, indicate below whether you are satisfied)					
How satisfied are you with:	Very dissatisfied	Rather dissatisfied	Neither dissatisfied nor satisfied	Rather satisfied	Very satisfied
14. The order of various alternative shifts.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
15. The number of day shifts in a row.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
16. The number of evening shifts in a row.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
17. The number of night shifts in a row.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
18. the number of full weekends off.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
19. The number of weekends with one free and one work day.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
20. The distribution of working and days off.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
21. The granting of leave.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
22. The distribution of holidays over the year.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
23. The possibilities to influence the creation of your own roster?	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
24. The ability to exchange shifts.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
25. The way you can see the schedule.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
26. The period in which you will receive your final roster.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

Part 3 –Overtime:

Here are some questions about overtime. By overtime we mean if you work for more than a half hour extra at your work (only one answer).

	Very dissatisfied	Rather dissatisfied	Neither dissatisfied nor satisfied	Rather satisfied	Very satisfied
27. How satisfied are you with the number of extra hours per year?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
28. How satisfied are you with the distribution of extra hours on the staff?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
29. How satisfied are you with the ability to compensate your overtime in the time off?	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
30. How often is your private life in conflict with working longer hours?					Never <input type="checkbox"/> 1 Sometimes <input type="checkbox"/> 2 Often <input type="checkbox"/> 3 Always <input type="checkbox"/> 4
31. What is for you in generally least attractive shift?					early shift <input type="checkbox"/> 1 late shift <input type="checkbox"/> 2 Night shift <input type="checkbox"/> 3 <input type="checkbox"/> 4

Part 4- Control over own schedule:

There are opportunities to get more control over your working hours. Below are asked the questions about your need to control your own schedule and your opinion about possible consequences.

32. Do you need more control over your schedule so you will be better able to take into account your personal needs?	Yes <input type="checkbox"/> 1 No <input type="checkbox"/> 2
33. Do you prefer different length of shifts, or not? (you can tick more than one answer)	No <input type="checkbox"/> 1 Yes, I prefer shorter day shift <input type="checkbox"/> 2 Yes I prefer shorter morning shift <input type="checkbox"/> 3 Yes I prefer shorter evening shift <input type="checkbox"/> 4 Yes I prefer shorter night shift <input type="checkbox"/> 5 Yes, I prefer longer day shift <input type="checkbox"/> 6 Yes, i prefer longer morning shift <input type="checkbox"/> 7 Yes, i prefer longer evening shift <input type="checkbox"/> 8 Yes, i prefer longer night shift <input type="checkbox"/> 9 Other, nl..... <input type="checkbox"/> 10
34. Do you prefer different starting times of the shifts? (you can tick more than one answer)	No <input type="checkbox"/> 1 Yes, the early shift should start earlier <input type="checkbox"/> 2 Yes, the early shift should start later <input type="checkbox"/> 3

	Yes, the late shift should start earlier <input type="checkbox"/> ₄ Yes, the late shift should start later <input type="checkbox"/> ₅ Yes, the night shift should start earlier <input type="checkbox"/> ₆ Yes, the night shift should start later <input type="checkbox"/> ₇ Other, nl..... <input type="checkbox"/> ₈
--	---

	Completely disagree	Disagree	Neither agree nor disagree	Agree	Completely agree
35. Sometimes I feel forced to work in particular shift because of the shortage of staff	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
36. I do not mind to work(occasionally) for other departments if I can schedule my own needs	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅
37. Having an overview of my surplus./fewer hours gives me more flexibility.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅

Appendix 2: Interview guide

Process of scheduling:

- 1) What is the form of self-rostering in your organization?
 - In what ways are employees participating in the process of scheduling?
 - Can you describe the rostering process?
- 2) How is self-rostering related to individual outcomes (job satisfaction, commitment, level of stress)?
 - Have you measured any of the individual outcomes before and after introducing self-rostering?
 - If not: has self-rostering influenced any of the individual variables according to your observation?
 - If yes: in what ways?
- 3) How is self-rostering related to organizational outcomes (level of flexibility, performance, costs)?
 - Have you measured any of the organizational outcomes before and after introducing self-rostering?
 - If not: has self-rostering influenced any of the individual variables according to your observation?
 - If yes: in what ways?
- 4) Do you think that the relationship between self-rostering and its outcomes are moderated by the following moderating groups: personal needs, implementation process, technological support, leadership and labor relations?
- 5) Which of the groups do you find more important? Do you have any data regarding moderating variables?
- 6) Would you add other moderating variables that you do not see in my model but find important?