Algorithms changing jobs: The Role of the HR Professional

Master Thesis MSc Business Administration
Track Human Resource Management

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Date:	29 April 2021
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Management summary

The rising use of algorithmic decision-making within organizations increasingly affects different aspects of a job. This leads to the fact that job design is affected. In this study, we explore how the role of the HR-professional changes given the indirect influence of algorithmic decision-making on job design. Consequently, we explore how the tasks and responsibilities, competences and value creation changes of HR-professionals. In order to find out how the role of the HR-professional changes, we used an exploratory research using secondary data analyses and expert interviews. Based on the analyses of WOB proposes, multiple other documents, and interviews with 17 experts, we found the following: due to the influence of algorithms on job design, the role of the HR-professional is expected to shift towards a strategic role. Especially, the role of the HR-professional is envisioned to shift to a strategic role where HR-professionals focus on the department- and organizational level and where data becomes increasingly important. Particularly, to lack of storing data and using data for advising stops the HR-professional from shifting to the strategic role.

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1. Introduction

The rise of Smart Technology, Artificial Intelligence, Robotics, and Algorithms (STARA) is changing the way people work (Brougham & Haar, 2018). Especially, digital devices that everyone uses, such as smartphones, are increasingly tracking our everyday lives and collect more and more data all around, such as data from social networks, online shopping and blogs (Newell & Marabelli, 2015). All the data collected by the digital devices can be put in the 'big data' umbrella. Consequently, with all the big data that is collected, algorithms can process this data and use it to predict particular outcomes (Newell & Marabelli, 2015). Algorithms can also be described as a sequence of steps that takes values for input and produces values or a set of values as output and is mostly used as a tool to solve specific problems (Cormen, Leiserson, Rivest, & Stein, 2009; Lee, 2018). Organizations increasingly use algorithms within their processes, such as for decision-making. Consequently, the use of algorithms within the decision-making process impacts the humans within the organization. This shift of humans making decisions towards algorithms making especially strategic decisions requires further attention.

There is an overall agreement on the fact that new technologies, such as algorithms, significantly change the overall work structure (Frey & Osborne, 2017; Parker & Grote, 2020). Especially, when looking at the role of algorithms, the rising use of algorithms influences a relatively large part of the employment, resulting in employment being at risk in the future. However, not *whole jobs* will disappear, but specific *tasks* of a job will be automated or disappear (Frey & Osborne, 2017; Nankervis, Connell, Cameron, Montague, & Prikshat, 2019). Here, jobs are defined as a specific job structure in which employees conduct a certain set of tasks within a given time frame (Ali & Zia-ur-Rehman, 2014; Foss, Minbaeva, Pedersen, & Reinholt, 2009). In addition, these changes in tasks will not only affect low-skilled workers, but will affect workers in all layers in the organization as the replacement of tasks are not only the routinized tasks, but also more often tasks that need human intelligence can be automated (Brougham & Haar, 2018; Frey & Osborne, 2017). So, algorithms are potentially affecting the jobs of all employees, as all types of tasks can be automated and jobs are expected to change.

When these algorithms are used for decision-making processes in organizations, this is called algorithmic decision-making (Clark et al., as cited in Bader & Kaiser, 2019). Algorithmic decision-meaking refers to the automation of decisions such as routinized, but also non-routinized decisions, additionally, it can be considered as a kind of isolated control with standardization of routinized workplace decisions (Mohlmann & Zalmanson, 2017). However, the use of algorithmic decision-making within businesses requires some caution (Newell & Marabelli, 2015). First, the transparency of how algorithms process information and how decisions are made is mostly lacking or too difficult to understand, which may result into a 'black-box' society where employees lose touch with their tasks (Goodman & Flaxman, 2017; Newell & Marabelli, 2015). Second, the automation of tasks can also result in loss of skills (Parker & Grote, 2020). Especially, humans who mostly only have routinized decision-making tasks in their job, get distanced from their decision making, which leads to the losing track of data sources and information processing which is an continues basis for knowledge and decision making (Shollo & Kautz; as cited in Bader & Kaiser, 2019). Lastly, algorithmic decision-making can also result in social, ethical or legal issues, such as bias or discrimination (Lepri, Oliver, Letouze, Pentland, & Vinck, 2018). For example, the input data may be poorly weighted or data models are used in a different context which results in organizations taking decisions that turn out more negative than should be for customers (Lepri et al., 2018). So, several studies point at the potential negative consequences of algorithmic decision-making, however, it remains clear that tasks can be automated and therefore jobs will be affected.

The role of humans within the organization remains crucial as there are still tasks and responsibilities that need human interpretation and action, meaning that algorithms are not able to conduct all tasks themselves (Brynjolfsson & McAfee, 2014; Nankervis et al., 2019; Parker & Grote, 2020). Job design is most important to consider, as it entails the content of a job and its characteristics that can be used to (re)arrange a job (Habraken & Bondarouk, 2017; Hackman & Oldham, 1976). Job design is important for multiple reasons. First, the characteristics of job design have found to be related to different individual- and organizational outcomes, such as the effectiveness and productivity, the skill-level of employees, job satisfaction and the motivation of the employee (Ali & Zia-ur-Rehman, 2014; Habraken & Bondarouk, 2017; Parker & Grote, 2020). Consequently, if organizations want to strive for continuous improvement of productivity and work experience of employees, the redesign of work is important (Hackman & Oldham, 1976). Second, as aforementioned, many jobs will be affected by the algorithmic decision-making, leading to tasks that are affected, for example within a job where a part of customer communication is taken. Additionally, employees might need different skills to execute their tasks (Nankervis et al., 2019; Parker & Grote, 2020). Therefore, the (re)arrangement of work should be considered, as humans remain crucial in organizations (Habraken & Bondarouk, 2017).

Despite the fact that studies have examined the increasing use of algorithmic decision-making within workplaces, we argue that more research is necessary. Primarily, current research focuses on the technology side, meaning that the people side is being neglected (Habraken & Bondarouk, 2017; Raisch & Krakowski, 2020). As designers of algorithms aim at maximizing algorithmic performance, the human, organizational, and societal implications are forgotten (Raisch & Krakowsi, 2020). Meaning that for example, the direct effect of algorithmic decision-making on job design of employees, such as necessity of other skills, more training or different educational attainment are not dealt with enough. However, in this research we particularly focus on the implications for HR-professional, namely, the indirect effect of algorithmic decision-making on job design on the role of the HR-professional. First, with the use of algorithmic decision-making in organizations, HR-professionals are put in a catch-up position in which they need to ensure the HR practices evolve in order to help the organizational change (Hempel, 2004). Consequently, the HR-department including the HR-professional needs to redesign their role and its necessary competences and HR practices (Isari, Bissola, & Imperatori, 2020). Second, as the field of HRM contacts most parts of an organization, the use of algorithmic decision-making which drastically influences job design will also influence the role of the HR-professional. Third, it is expected of the HR-professional to play a role in this development, as job design is seen as one of the primary practices of HRM (Habraken & Bondarouk, 2017). For that reason, more research is necessary on the role of humans, especially HR-professionals, and what the influences of technology mean for humans in the organizational context.

As argued that the influence of algorithmic decision-making on job design indirectly influences the role of the HR-professional, it is necessary to explore the role of the HR-professional more detailed. Consequently, the field of Human Resource Management (HRM) comes into play, as it concerns "all those activities affecting the behavior of individuals in their efforts to formulate and implement the strategic needs of the business" (Schuler, 1992, p.30). HRM is therefore affecting most parts of an organization and acknowledges the human side, consequently, HRM literature can give more insights in the influences of technology on humans. However, not only the HR-department executes HR-activities, this is acknowledged by research into the HR function which is described as "all managerial actions carried out at any level regarding the organization of work and the entry, development and exit of people in the organization so that their competencies are used at their best in order to achieve

corporate objectives" (Valverde, as cited in Valverde, Ryan, & Soler, 2006). Within this HR function, the role of the HR-professional has largely been ignored in the empirical literature (Wilkinson, Bacon, Redman & Scott, 2010), whereas the HR-professional has been identified as one of the primary players in HRM processes (Jackson, Schuler, & Werner, as cited in Renkema, Bos-Nehles, & Meijerink, 2020). When introducing technology, the design of organizations and jobs transforms, this leads to the necessary changes in the HR function (Hempel, 2004). Additionally, the primary administrative task of the HR-department is shifting to a strategic-partner role (De Bruyn & Roodt, 2009; Hempel, 2004). With the aforementioned developments in HRM, HR-professionals need to adapt to meet the challenging demands and create value with the development of skills, responsibilities, and competences (Hempel, 2004; Ulrich, Younger, Brockbank, & Ulrich, 2013). With the influences of technological applications such as algorithmic decision-making, the role of the HR-professional consequently changes by increasingly advising tasks towards the line-managers that execute increasingly more HR-tasks (Chytiri, 2019). The developments that affects the role of the HR-professional are particularly interesting to investigate in the public sector for multiple reasons. First, the context the public sector operates in differs from the context of the private sector, particularly the degree of caution, red tape, and political influences (Steijn, Groeneveld, & van der Parre, 2010). Especially when it comes to decision-making, within the public sector the decision-making process is more complex due to political influences, the layers of managers and the red tape. These differences in context influence the decision-making process and consequently influence the creation of the HRM-policy and practices, which influences the role of the HR-professional. Second, recently developments in the public sector led to the fact that organizations need to cut-back in resources and ensure the quality of services for the consumers (Knies, Boselie, Goud-Williams, & Vandenabeele, 2018). New forms of data analysis, such as algorithms, are increasingly being used also to improve the experience of the citizen (Veale & Brass, 2019). With the increasing use of algorithmic decision-making and the consequences for the services given to consumers, this also influences the job design of employees. According to Knies et al. (2018), this development ensures that studies of HRM and the public sector are highly relevant. Lastly, Boserlie, Van Harten, and Veld (2019) argue that the role and position of HR-professionals in public sector contexts as for example designers and facilitators of HRM in public sector areas are highly relevant. To our knowledge, empirical studies focusing on the changing role of the HR-professional due to algorithmic decision-making on job design are lacking in the public sector (Parker & Grote, 2020; Wilkinson et al., 2010).

For these reasons, the objective of this study is to explore how the role of HR-professional changes with the influence of algorithmic decision-making on job design in the public sector. So, this study is focused on the following research question: *How does the role of the HR-professional change given the influence of algorithmic decision-making on job design in the public sector?* By answering this research question, this research contributes to the literature in multiple ways. First, we contributed to the HRM literature by examining the role of the HR-professional with the influence of algorithmic decision-making on job design. Consequently, we showed that the role of the HR-professional is envisioned to change to a strategic role where the focus is on the department- and organizational level and where date becomes increasingly important. Second, we found that for the sample organizations in the public sector we investigated, the organizations currently do not make maximum use of the available data. This makes the shift to the strategic role more difficult. Third, this study found that there is a shift in roles between the line-manager and the HR-professional. Especially, the line-manager currently executes the operational HR-tasks and is also responsible for the guidance of the employees when their jobs change due to the use of algorithms and the tasks such

as training. Fourth, this study found that public sector organizations currently do not use algorithmic decision-making that extensive, as mostly the organizations see the negative consequences such as less human view in decision-making and all the rules and regulations they have to adhere to. In addition, this study provides some practical recommendations, such as that organizations should invest more in their line-managers and need to ensure that the line-manager have the right training and the right competences in order to guide their employees. Furthermore, the HR-department and the HR-professionals are currently not using the available data optimally, therefore, public sector organizations should focus more on the use of data, as this also helps the shift of HR-professionals to the strategic role.

This paper will continue in chapter 2 with a literature review about the influence of algorithmic decision-making on job design. In addition, the current role of HRM will be discussed and the possibilities of how the role of the HR-professional can be with regards to job design. In chapter 3, the methodology will be discussed. Chapter 4 will contain the results of the research. Lastly, in chapter 5 a discussion, conclusion and recommendations will be given.

2. Theoretical Framework

As aforementioned, the design of jobs should be reconsidered as the increasing use of algorithmic decision-making affects humans within the organizational context. Consequently, the role of the HR-professional is important, as for the HR-professional, different tasks and responsibilities could change. Therefore, in this chapter a critical literature review will be given.

2.1 Algorithmic decision-making

Algorithmic decision-making can be seen as decisions that are data-driven and that uses the data collection by different digital devices (Newell & Marabelli, 2015). Digital devices, social media, and other online sources are the fuel for the collection of big amounts of data (Newell & Marabelli, 2015). In addition, Mohlmann and Zalmanson (2017) state that algorithmic decision-making refers to the automation of decisions. Furthermore, it can be considered as a standardization of routinized workplace decisions, but also non-routinized decisions such as decisions regarding as hiring, criminal sentencing, or stock trading (Lepri et al., 2018; Mohlmann & Zalmanson, 2017). Specifically for the public sector, algorithms can automate administrative and process-driven tasks (Berryhil, Heang, Clogher, & McBride, 2019). Consequently, this increases the efficiency in the public sector and freeing employees up to focus on more meaningful work (Berryhil et al., 2019). Accordingly, algorithmic decision-making is based on the relationships that are identified within the collected data, striving to the best strategic decisions (Newell & Marabelli, 2015). For algorithmic decision-making large data-sets are needed. For that reason, the data used for algorithms is also called *big data.*

This algorithmic decision-making is taking a spot into the workplace decisions (Bader & Kaiser, 2019). Traditionally, making decisions has been one of the most human-centered tasks that occurred in jobs, because humans have the ability to use their experiences, knowledge and intuition to make the right decisions (Newell & Marabelli, 2015; Shollo & Galliers, 2016). With the introduction of algorithmic decision-making, it first had the function of description, meaning that algorithms were used to provide specific information. But, as the possibilities with big data have increased, the prediction of data analytics and the best strategic decisions are given (Bader & Kaiser, 2019; Van der Vlist, 2016). For example, algorithms are used for performance evaluation of public employees, assess criminal risk or search for fraud (AI Now, 2018).

Besides the place of algorithms within the workplace, algorithms can take different types of decisions, Diakopoulos (2016) identifies four of them: prioritize, classify,

associate, and filter. First, prioritizing, relates to emphasizing certain information above other information, which can be done by using algorithms (Diakopoulos, 2016). Second, classification decisions are about the ability of algorithms to classify entities to a specific group or class with some logical key characteristics (Diakopoulos, 2016). Third, the association decision, relating to the creation of relationships among entities which result in easier interpretations for humans (Diakopoulos, 2016). Fourth, the filtering decisions, made by the algorithm based on a set of criteria to filter some information out of it, which is not fitted with the prescribed criteria (Diakopoulos, 2016). With all these possibilities of decision-making, discrimination can be a problem. For example, for prioritizing, criteria for ranking the information is necessary (Diakopoulos, 2016). So, designers of algorithms should carefully consider the criteria they program, as the subjectivity of the designer can be incorporated relatively quick, leading to discrimination. Designers of these algorithms should consider their own bias, as otherwise algorithms classify entities wrong (Diakopoulos, 2016; Newell & Marabelli, 2015).

With all the possibilities of decisions and predictions algorithms can produce, potential consequences have been identified for the employee. On the one hand, the use of algorithmic decision-making has negative consequences, such as a lack of transparency, employees who lose involvement with their tasks, and the ambiguity about the responsibility of the made decisions (Goodman & Flaxman, 2017; Newell & Marabelli, 2015). On the other hand, multiple researchers assume that there are also positive consequences, such as efficiency, and with the use of more data better decision-making and the ability to execute more higher-value tasks (Bader & Kaiser, 2019; Parker & Grote, 2020; Berryhil et al., 2019).

To sum up, algorithmic decision-making is about striving to the best decision, which can be done by prioritizing, classifying, associating and filtering criteria. Consequently, lack of transparency and los of involvement with tasks can occur when decisions are taken over. However, others argue that better decisions can be made and that employees get the ability to execute higher-value tasks.

2.2 Job design
As aforementioned, the job design is important to consider. This will be shortly explained in the following section.

More and more research has been conducted on the organizational context and its influence on job design, such as the influence of technology, structure, and leadership (Brass, 1985). Job design (i.e. work design) is a necessary instrument, as the economy has shifted to a knowledge and service economy and the effects of globalization demand organizations to redesign the work within their organizations (Grant & Parker, 2009). Additionally, the redesign of jobs is necessary to ensure that employees have the right skills to conduct tasks related to their jobs. As mentioned, algorithmic decision-making influences tasks, and therefore the redesign of work should be considered to ensure that employees fit their job, as they need to have the right skills and knowledge to keep executing their tasks. In this study, job design is defined as the content of a job and its characteristics that can be used to (re)arrange a job (Habraken & Bondarouk, 2017; Hackman & Oldham, 1976).

There are multiple perspectives on job design and its job characteristics. For example, the Job-Characteristics Model (JCM) of Hackman and Oldham (1976), which identifies and describes the relationships between the job characteristics and the individual responses to work. The core job dimensions identified are skill variety, task identity, task significance, autonomy, and feedback (Hackman & Oldham, 1976). Additionally, it is argued that there are three critical psychological states, namely: experienced meaningfulness of the work, experienced responsibility for outcomes of the work, and knowledge of the actual results of the work activities (Hackman & Oldham,

1976). The model identifies that skill variety, task identity, and task significance belong to the psychological state experienced meaningfulness of the work, whereas autonomy relates to the level of experienced responsibility and feedback relates to knowledge of the actual results (Hackman & Oldham, 1976). Lastly, these psychological states affect personal and work outcomes, such as high internal work motivation, high quality work performance, high satisfaction within work, and low absenteeism and turnover (Hackman & Oldham, 1976). However, there appears to be a moderating effect that can explain the differences between people. This individual growth need strength factor includes the strength of a person's need for personal development and thus moderates the relationship between job characteristics and psychological states, and also the relationship between psychological states and the outcomes (Hackman & Oldham, 1976).

What should be noted is that there is also some criticism on the JCM, for example the weak relationship between job characteristics and the objective performance, the missing definition of job characteristics (Habraken & Bondarouk, 2017), or the possible situation where enriched jobs are only preferred when the pay also increases (Grant & Parker, 2009; Morgeson et al., 2013). As a consequence, the JCM has been expanded by researchers in terms that jobs are not only characterized by core tasks, but that jobs are also characterized by knowledge, for example job complexity, information processing, and problem solving (Grant & Parker, 2009). Additionally, jobs are also characterized by physical tasks, such as, work conditions, ergonomics, and physical demands (Grant & Parker, 2009). These aforementioned extensions do not only affect the motivation, identified by Hackman and Oldham (1976), but also the creativity and the safety as outcomes (Grant & Parker, 2009). Despite the criticism on the JCM, Parker, Morgeson and Johns (2017) argue that the five job characteristics defined by the model are key work features. However, it is argued that there are more work characteristics than the five identified by the JCM (Parker et al., 2017).

The job-demand resources model (JD-R) and job demands-control model adds more insights in the work characteristics, as it concentrates on the job demands and job resources (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Karasek, 1979). The main assumption of the JD-R model is that every factor that may be a risk factor for job stress, can be grouped into job demands or job resources (Bakker & Demerouti, 2007). First, job demands, such as high work pressure or emotionally interactions, can be defined as the physical, social or organizational aspects that need cognitive and emotional attempts and skills which lead to physical or psychological costs (Bakker & Demerouti, 2007). Second, job resources are the physical, psychological, social or organizational aspects that help achieving goals, can reduce job demands, or activate growth and development (Bakker & Demerouti, 2007). Additionally, job resources are primary related to interpersonal and social relations, such as supervisor and co-worker support, to the organization of work, such as participation in decision-making, and to the level of task, such as skill variety, task significance, and performance feedback (Bakker & Demerouti, 2007). With regards to job demands and job resources, which enable employees to have control over their work, Karasek (1979) argues that especially jobs where the demand is high and control is low, these can be considered as "high-strain" jobs. Consequently, job control, or job resources can therefore be motivational, as it is expected that it leads to high work engagement, and excellence performance, or it can be argued that job resources fulfill basic human needs (Bakker & Demerouti, 2007; Karasek, 1979). Lastly, the interaction between the job demands and job resources can increase motivation as well, where it is proposed that job resources can be buffered to deal with the job demands, meaning that different job resources can have a role as buffer for different job demands (Bakker & Demerouti, 2007).

To conclude, following Parker and Grote (2020), job design can be defined by the following five characteristics, partially based on the studies of Hackman and Oldham (1976) and Bakker and Demerouti (2007): (1) job autonomy and control, (2) skill variety and use, (3) job feedback and related work characteristics, and (4) social and relational aspects, and lastly (5) job demands. However, antecedents should be considered, which can be seen as a link between the organizational practices and outcomes, such as performance or well-being (Parker, Wall, & Cordery, 2001). These antecedents are factors that influence and/or constrain the choices for the design of the work, these can be internal, external or individual (Parker et al., 2001). This is in line with Parker and Grote (2020) who also state that organizations should consider the factors that influences the work design (e.g. technology, organizational attributes or managerial choices), and consequently actively make choices to try and positively influence the factors influencing work design.

2.3 Influence of algorithmic decision-making on job design
When technologies were introduced in organizations, it brought organizations the opportunity to replace easy tasks or dirty work (Parker & Grote, 2020). The use of technology within organizations can have positive impacts, such as larger scalability, while negative impacts can also occur, for example the risks that it brings for the work and workers (Parker & Grote, 2020). Consequently, the introduction and use of digital technology, such as algorithms, is not necessarily positive or negative, as it can bring all kinds of consequences for different actors. Kranzberg (1986) argued the following: 'technology is not necessarily good, nor bad; nor is it neutral' (p. 545). This also relates to whether organizations decide to implement algorithmic decision-making to automate tasks, or to augment, relating to job enrichment (Fahr, 2011; Habraken & Bondarouk, 2017). Besides the simple decision-making tasks that can easily be automated, nowadays complex cognitive tasks and management tasks can be taken over by algorithmic decision-making (Parker & Grote, 2020). Examples of these complex tasks are decision-making on who might commit fraud, but also for police departments decision-making on in which neighborhoods extra checks must be carried out. Frey and Osborne (2017) distinguished workplace tasks into routine tasks, non-routine tasks, manual tasks and cognitive tasks. All these aforementioned tasks can partly be automated with algorithmic decision-making. However, algorithms are not able to have the same perceptions as humans and therefore algorithms cannot be seen as complete substitute for humans (Frey and Osborne, 2017). Consequently, the automation of tasks can also be reframed into augmentation, relating to the ability to see automation instead of a threat into an opportunity for the organization (Davenport & Kirby, 2015). When augmentation is applied to algorithmic decision-making, it can enable employees to conduct tasks that are superior or more fulfilling than before (Raisch & Krakowski, 2020). This can lead to job enrichment for employees, as adding meaning to jobs can enhance job enrichment.

As argued before, the influence of technology, such as algorithmic decision-making is difficult to determine. Slocum and Sims (as cited in Brass, 1985) argue that the changes that technology brings in characteristics of job design, will unavoidably bring uncertainty into the work field. This relates partly to the role of the line-manager, who is mainly responsible for the job design of employees and partly due to the uncertainty of the influences of technology on the different parts of job design (Brass, 1985). Accordingly, with the uncertainty that technology brings, organizations are unsure on the procedures to use, which therefore requires some flexibility of the employees, as there are no programmed routines (Brass, 1985). Additionally, it is argued that technologies are continuously improving and are able to do new and unheard things, which also increases the uncertainty within the work field (Brynjolfsson & McAfee, 2014).

It is known that jobs change when algorithmic decision-making is implemented. Especially the focus on job design ensures that the employee can use their competences, needs and values (Parker & Grote, 2020). So, humans remain crucial within organizations, as not whole jobs will be automated and the interaction between technology and humans should be optimized (Frey & Osborne, 2017; Parker & Grote, 2020).

2.3.1 Job design characteristics affected by algorithmic decision-making

Technology, including algorithms, can influence job design in multiple ways. First, Parker and Grote (2020) investigated the potential positive and negative effects on job design, including potential moderators. First, job autonomy, which as aforementioned, can be separated into decision-making and control (Hackman & Oldham, 1976; Parker & Grote, 2020). For the decision-making process, algorithms are taking over this process. Positive effects of this overtaking of algorithms are the possibility of localized decision-making, and information from big data that can support the decision-making (Parker & Grote, 2020). However, the negative effects on decision-making can be that designers of algorithms only consider all the tasks that can be automated, but do not think about what is left for employees for tasks to conduct, which turns employees into supervisory controllers (Parker & Grote, 2020). For the control, employees lose a part of their control over the decision-making process within their job which may result in lower engagement. Consequently, this leads to the necessity of rearrangement of the job to ensure that employees remain engaged. This rearrangement of jobs is also one of the practices of the HR-professional.

Second, skill variety and use, where also the low and high uncertainty can be distinguished. When there is high uncertainty, the employee should have significantly more and better skills to use to deal with unpredictable tasks, then when the uncertainty is low. Additionally, positive effects can be that routinized cognitive tasks will be replaced, whether negative effects are the increased standardization of tasks, and less use of skills when employees should monitor (Parker & Grote, 2020). This is in line with what Frey and Osborne (2017) argue, that automation has the ability to replace the cognitive tasks, leading to a skill erosion. As aforementioned, for the HR-professionals, the rearrangement of jobs is one of the HR practices that HR-professionals execute to support the employees.

Third, feedback, which is something that employees can seek for from sources such as supervisors and/or co-workers. However, Parker & Grote (2020) have identified effects, such as the positive effects that more specified feedback can be given and that algorithms might give more 'objective' feedback. Furthermore, negative effects are identified such as that the automation of tasks reduces feedback, and that automation leads to a reduced opportunity for learning (Parker & Grote, 2020). In addition, two types of strategies for feedback can be differentiated, namely: automate and informate. First, automate, relates to the automation of operations where human effort and skills are being replaced (Zuboff, as cited in Parker & Grote, 2020). Second, informate, relates to the information given by automated processes that can provide feedback and information to employees which enhances the complex decision-making of employees (Zuboff, as cited in Parker & Grote, 2020). Consequently, automate will probably result in lower quality of jobs, whereas informate results in higher quality of jobs (Zuboff, as cited in Parker & Grote, 2020). Especially, algorithms can both automate and informate, which results in the fact that the influence of algorithms on the feedback for employees is unknown.

Fourth, the social and relational aspects, where especially the influence of algorithms may have a negative effect. The increase in abstract data and the reduction in

shared understanding of the algorithm can be seen as a negative influence (Parker & Grote, 2020).

The last characteristic of job design is job demands. Positive effects of algorithmic decision-making on job demands may be a decrease in physical demands and increased cognitive demands (Parker & Grote, 2020). The negative effects are the increased administrative demands and the increase in performance monitoring (Parker & Grote, 2020).

Besides the five aforementioned job design characteristics, Parker and Grote (2020) also defined some possible moderator effects. First, for the individual-level, employees can over- or under accept the technology that is implemented which can lead to different potential effects from technology on job design (Parker & Grote, 2020). For example, employees may over accept the use of the algorithm and therefore fully rely on the outcomes of the algorithm. Consequently, this leads to the fact that employees do not think themselves and just follow the outcomes of the algorithm. Additionally, the technology-related characteristics also can have a moderating effect, such as the type of technology, performance of the technology, and the interaction of technology with humans (Parker & Grote, 2020). Furthermore, at the organizational-level, moderating effects can be the operational uncertainty, the organizational strategy and the level of routineness in working tasks (Parker & Grote, 2020). Lastly, at the macro-level, moderators can be laws and regulations to work with algorithms (Parker & Grote, 2020).

So, as aforementioned, algorithms affect job design and the focus should be more on the optimization between humans and technology. Algorithms do not affect one part of job design, but are expected to affect multiple parts of job design (Frey & Osborne, 2017; Parker & Grote, 2020). There is no predetermined effect of algorithms on one of the characteristics of job design, as there are moderators on multiple levels, which causes different effects. As a consequence, the effect of algorithmic decision-making on job design is not determined explicitly.

2.4 HR function and the role of the HR-professional
 After we describe algorithmic decision-making, job design and the influence of algorithmic decision-making on job design and its characteristics, we now turn to the function of HR and to one of the actors of the HR-processes, namely HR-professionals. Additionally, specific aspects of the public sector will be discussed. As it is clear that all types of jobs can have tasks which can be automated and that consequently jobs will change with the use of algorithmic decision-making, the role of HR(professionals) should be considered. As jobs are affected by algorithms, there occurs a situation in which the job will change as some tasks will be automated, or the employee will lose some of their autonomy in decision-making. Consequently, this is an issue for HR, as this affects multiple employees, and with the increasing use of algorithms this trend can be seen in multiple layers within the organization, which raises questions around themes such as team composition, competences and skills. The HR-department and its employees have some HR-tools, such as learning and development, talent management and mobility, that can help to answer these questions and help the organization to deal with these influences of technology, and especially algorithms.
Furthermore, it is expected of HR-professionals to cope with certain problems that affect employees and therefore, the role of the HR-professional should be considered to look how HR-professionals cope with the changing demands.

First, the HR function has been defined as "all managerial actions carried out at any level regarding the organization of work and the entry, development and exit of people in the organization so that their competencies are used at their best in order to achieve corporate objectives" (Valverde, as cited in Valverde, Ryan, & Soler, 2006). This indicates that HR-activities are not only conducted by the HR-department, but also by

other actors within the organization. The "HRM triad" shows the primary players in the HRM processes, including HR-professionals, line-managers, and employees (Jackson, Schuler, & Werner, as cited in Renkema et al., 2020). In addition, research found that top management and external agencies also conduct activities regarding the HRM function (Valverde et al., 2006). Therefore, we further look at the HR function especially in the public sector.

2.4.1 HR function and public sector
The aforementioned HR function has drastically changed over the years in multiple ways. First, due to the reallocation of the HR function, line-managers within the organization increasingly conduct decisions regarding HR, whereas HR-professionals and HR managers are more directed towards strategy formulation and execution (Sujan, Bhasin, & Mushtaq, 2020). This has also resulted in the fact that line-managers are becoming more and more important for proper implementation of the HR-policy (Bos-Nehles, 2010; Steijn, Groeneveld, & van der Parre, 2010). However, with the use of algorithms, there are two options with regards to the role of the line-manager. Algorithms can enhance line-manager by executing for example career management, but algorithms can also lead to HR centralization (Isari et al., 2020). These options differ with each HR practice (Isari et al., 2020). Second, the function of HR has shifted over the years, moving from an administrative role to a strategic-partner role (De Bruyn & Roodt, 2009; Ulrich et al., 2012). This acknowledged shift to a more strategic role also brings challenges for HR-departments within the public sector, as there are still some differences in context between the public- and private sector organizations. First, public sector organizations do not operate in a market situation, have to deal with a lot more legal frameworks, often supply more goods and products that are monopolistic, and there is more red tape, meaning that there are more complex structures and intern procedures (Steijn et al., 2010). These differences in context also influence the decision-making process within the organization, as with more political influences, more red tape and more layers with managers, decision-making process is more complex. Besides these context differences, the public sector also shifts to a more customer-oriented focus. This results in the fact that the processes for customers are more important than the processes and activities that not directly involve customers. Consequently, the role for HR should be reinvented as the value creation for of HR for the organization should be clear (Knies et al., 2018). Additionally, the HR-professionals have more challenges due to different developments. Challenges such as the right fit between person and function, being an attractive employer and the change in careers of employees asks of the HR-professional to reconsider their HR-policy (Steijn et al., 2010). In addition, Truss (2008) found that not only the HR function changes in the private sector, but also in the public sector. However, it should be noted that within the public sector, the HR-department needs to deal with more stakeholders, resulting in less stable goals and a greater inclination to implement only from top-down (Truss, 2008).

2.4.2 Influence of technology on HR function
This shift in roles of the HR function can mainly be assigned to the use of technology, including algorithms, enabling HR to set themselves free from routinized tasks and give possibilities for HR-professionals to become a strategic partner (Bell, Lee, & Yeung, 2006). In the paper of Ulrich (1997) (as cited by Marler & Parry, 2016) it has been identified that the HR function changes to the strategic business partner role. In addition, the strategic-partner role also includes the HR-department focusing on adding value by increasing the human capital and the culture within the organization (Ulrich et al., 2012). Besides this value creation by the strategic-partner role, Ulrich and Dulebohn (2015) state that HR-professionals should go beyond this and connect HR with the business, but

also with the business context. This outside/inside approach relates to the fact that HR should also align the expectations of actors outside the business, for example customers, investors or communities (Ulrich & Dulebohn, 2015). Besides the agreement by multiple authors that the role shifts from the administrative role to the strategic business partner role, this is supported and facilitated by multiple technological applications. For example, e-HRM influences the HR function, where E-HRM can be defined as 'a way of implementing HRM strategies, policies, and practices in organizations through the conscious and direct support of and/or with the full use of channels based on web-technologies' (Ruël, Bondarouk, & Looise, 2004, p.16). E-HRM relates to the fact that IT-enabled changes occur in the HR function that shifts to a more strategic point of view, as the aforementioned definition shows that tasks are executed at tactical or strategic tasks (Lepak & Snell, 1998). Additionally, analytics and artificial intelligence are also found to facilitate the HR-professionals to get in that strategic business partner role, as it helps HR-professionals to advise line-managers with the most important issues regarding human capital (DiRomualdo, El-Khoury, & Girimonte, 2018). In sum, HR has a whole new function within companies, creating value for actors inside the business such as employees, but also creating value for actors outside the company has become the new standard for HR. This shift towards the strategic business partner role is facilitated by the increasing use of different technological applications.

As identified, different technological applications can be seen as one of the biggest drivers of change regarding the HR function and the role of the HR-professional. Consequently, with the shift to strategic-partner, there is prove that the roles and responsibilities of HR-professionals are also shifting (Lawler & Mohrman, 2003). First, as technology is implemented and tasks are being automated, the responsibilities of HR-professionals might change. In addition, due to the transformation in roles, it is required to upgrade the skills and competencies of HR-professionals (Ulrich & Dulebohn, 2015). Without HR-professionals gaining new skills and competences, they are not able to manage future challenges, for example globalization and sustainability (Ulrich & Dulebohn, 2015). Therefore, HR-professionals also shift in competences as they need other competences in order to develop strategies which contribute to the organization (Lawler & Mohrman, 2003). Consequently, Lawler and Mohrman (2003) found in their study that HR-departments are most effective when they have the ability to add value as a strategic business partner role, where HR is involved in the development and implementation of strategies. This is also acknowledged by Ulrich et al. (2012) who defined six roles for the HR-professional. Thus, it can be argued that the current role of the HR-professional should also create value for the organization. So, as the increasing developments within business context arise, such as the introduction of algorithmic decision-making, it is argued that HR-professionals should upgrade their skills and knowledge and revise the roles in order to meet the changing demands in order to create value for the business (Ulrich, Brockbank, Johnson, & Younger, 2007).

To conclude, for the HR-professional, the following parts can be identified: tasks and responsibilities, value creation, and competences. With regards to the public sector, it can be argued that the context of public sector organizations differs from private sector organization with regards difficulty in decision-making, red tape and the number of layers in the organization and line-managers. Consequently, it is argued that for both types of organizations the HR function shifts, as e-HRM, analytics and AI are all found to influence and facilitate the changing role to strategic business partner. However, how the HR function takes shape when using algorithmic decision-making in the public sector is unknown.

2.4.3 Role of HR professional and job design

Now the role of the HR-professional is described, the relation with job design should be further explained. In the high-performance work systems (HPWS) literature and strategic human resources management (SHRM) literature, the importance of job design has been neglected (Becker & Huselid, 2010; Wood et al., 2012). This can be related to the fact that theories dealing with job design are focused on micro-level, meaning dealing with specific aspects of an individual's jobs, whereas HPWS and SHRM are dealing with meso- and macro level outcomes, for example whether the organization accomplishes the strategic goals (Becker & Huselid, 2010; Wood et al., 2012). However, job design is one of the most researched practices within the human resource management (HRM) literature, as job design has important impacts on for example the employee motivation (Foss et al., 2009). In relation to the role of the HR-professional, it has been identified that HR-professionals should manage future risks, such as the possible risks of algorithmic decision-making on jobs (Ulrich & Dulebohn, 2015). Therefore, HR-professionals should cope with job design, as algorithms create risks for the disappearance of tasks, which the HR professional should manage. But, besides the HR-professional who copes with job design, the design of jobs is not only top-down anymore. For example, line-managers also execute tasks regarding the (re)arrangement of jobs (Morgeson et al., 2013)

As a result and following the study of Ulrich and Dulebohn (2015) and Tomassen (2016), in this study, the role of HR-professionals will be investigated in the context of the influence of algorithmic decision-making on job design in the public sector with tasks and responsibilities, competences, and value creation of HR-professionals. In this context, tasks are defined as an activity that fits in a job and that should be executed within a timeframe, examples of HR-tasks are implementing HR strategies, administrative tasks, compensation, legal matters, and organizational assessment (Ramlall, 2006). Responsibilities are defined as the tasks that are defined by the organization that belong to a certain job and for which the employee is responsible to execute well. Additionally, competences are defined as "an underlying characteristic of a person that leads to or causes superior or effective performance" (Yeung, 1996, p. 119). The value creation is defined as the contribution of some type of value to the business success, such as for example increase in well-designed jobs leading to multiple individual-level outcomes, such as creativity. Additionally, Ulrich et al. (2013) argue that the greatest value can be achieved through (1) connecting people through technology, (2) aligning strategy, culture, practices, and behavior, and (3) sustaining change.

With the explanation of the main concepts of algorithmic decision-making, job design, the HR function, and role of the HR-professional, a research model is proposed (Figure 1). Within this model, algorithmic decision-making in the public sector influences job design of employees and influences multiple parts of job design. There are also arrows within the figure that propose multiple roles of HR. The arrows between the role of the HR-professional and the influence of algorithmic decision-making on job design show a bi-directional relationship. This relates to the fact that the HR-professionals can take on two different roles. First, HR can stand an active role, where the HR-professional takes an active stance in changing job design, which can primarily be seen as a top-down approach. Second, HR can have a passive role, where HR waits to see whether there is a demand from bottom-up to change job design and consequently look how this will change their role. Therefore, looking whether HR-professionals are in front with new developments or whether HR-professionals waits and sees how the role changes is examined. These arrows propose the two aforementioned roles and in the figure is proposed that the arrow pointing to the role of HR-professional relates to the passive role, whereas the arrow pointing towards the influence of algorithmic decision-making to

job design relates to the active role. Besides one of these two roles, the three aforementioned parts of the role of the HR-professional will be considered and examined how these are affected currently by the use of algorithmic decision-making.
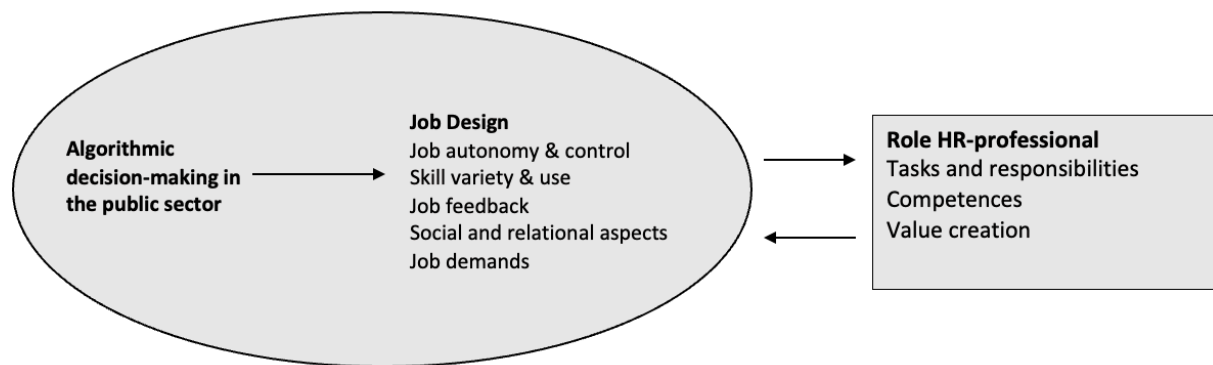

Figure 1. Research model

3. Method

To find out what the role of the HR-professional is and how this changes with the influence of algorithmic decision-making on job design, an exploratory qualitative research is conducted. Therefore, the following chapter discusses how this study is conducted, including research design, sample selection and data analysis.

3.1 Research design

In order to answer the research question, an exploratory qualitative research approach is used. To begin with, the choice for an exploratory study fits, as this is a relatively new topic within the public sector literature and research. As also argued by Boserlie et al. (2019), the role and position of the HR-professional within the public sector is highly relevant to study, as algorithms are increasingly used to create efficiency and higher quality services for citizens. Consequently, with the increasing use of algorithmic decision-making and its influence on the jobs of employees, the HR-professional needs to redesign its role and function (Isari et al., 2020). Therefore, looking into the role of the HR-professional when algorithmic decision-making influences job design is an understudied topic in the public sector. In addition, with the use of a qualitative approach, an in-depth understanding of the meanings and perceptions of a phenomenon can be developed (Basit, 2003). Additionally, a qualitative research approach can provide rich descriptions and insights in important phenomena, and respondents have the ability to give detailed descriptions of these phenomena (Drisko, 2005; Morrow, 2005; Tracy, 2010). So, the perceptions of individuals are explored with the use of this qualitative research method in order to examine how the role of the HR-professional changes with the given influence of algorithmic decision-making on job design.

To answer our research question, we chose to conduct expert interviews and combined this with the analysis of secondary data. First, secondary data analyses is an analyses of data what is already available and collected by someone else for another purpose (Johnston, 2014). WOB proposes, news articles and other publicly available information are collected and used for analyses. This secondary data analysis is conducted to get a clear picture of what kind of algorithms the public sector uses and how this might affect job design of employees. Consequently, this information from the secondary data analyses is used to create a short description/case of information which were told to the experts who are interviewed. We have chosen to conduct expert interviews because experts have a broad overview of the developments in the public

sector and have in-depth insights in the role of the HR-professional and/or the use of algorithms within the organization. With the use of expert interviews, their viewpoints are questioned on the role of HR-professionals when public sector organizations use algorithmic decision-making and this influences job design. An expert can be described as a person who is responsible for a concept, an implementation or ability to solve a problem and as someone who has relevant explicit knowledge (Mergel, Edelmann, & Haug, 2019). Semi-structured interviews were conducted, especially, main themes have been discussed with the interviewees. These main themes are digitalization/algorithmic decision-making, tasks and responsibilities, competences, value creation.

3.2 Data collection
In order to conduct both the secondary data analyses and the expert interviews, samples for both methods are selected. First, for the secondary data analyses, annual reports of municipalities and regional water authorities are collected of the organizations the experts work for. Furthermore, the WOB proposes are collected from the NOS and some publications of the A&O fund municipalities, an organization that does research in the public sector, has been analyzed. Second, for the expert interviews, all the experts have working experience in the public sector or have some knowledge about the sector. Furthermore, the experts have been selected for their knowledge about the HR role and its activities within an organization. Therefore, an expert in this study can be HR-professionals, HR Advisors, but may also be researchers who also conducted studies within the public sector or professionals working in the public sector but not within HR. As a consequence, experts working in the public sector, for example in municipalities, regional water authorities are contacted to ask whether they want to participate in the interview. The sampling strategy was to contact experts which are information-rich cases within the public sector that fit the study (Coyne, 1997). In order to ensure that the experts have both knowledge about the developments in the sector and in-depth insights in influences of algorithmic decision-making, all experts were asked about their function, work experience and further information was given about the study and some sample questions. The experts could then indicate if they were able to provide some more practical information about algorithmic decision-making in their organization and about the changing role of the HR-professional. The interviews are conducted between 01 December 2020 and 08 January 2021. All of the interviews were held in Dutch. For this study, 13 interviews have been conducted, where in total 17 experts participated.

The interviews are semi-structured, which allowed the researcher to ask some additional questions about interesting topics that were addressed by the interviewees. Furthermore, at the beginning of the interview, some information about the study, the different themes and the anonymity are discussed. In addition, the interviewees are asked whether the interview can be recorded. Additionally, the interviewees are asked to describe their organization and their work. Then, information about the current use of algorithmic decision-making in the public sector is given, to ensure that the experts have the same idea of applications that are being used. After this is clear for the interviewee, the themes were brought up. Consequently, the interviewees were informed about the fact that they could give their answers based on the current developments in the organization and what they expect for the upcoming years. After a few interviews were conducted, we found that the best way to conduct the interviews is to talk about the main themes and not to have standardized questions, because in all interviews, the interviewee talks about different situations which require different questions. Especially, the themes found in the theory such as tasks, responsibilities, value creation and competences are further discussed with the interviewees. Besides the aforementioned themes, the interviewees were also asked to discuss some other important subjects that are related to those other themes, such as digitalization. All the interviews were

conducted digitally, with Zoom, Skype or via phone. All the interviews took between 30 minutes and 1 hour. After all the questions were discussed, the interviewee was asked whether they had some other ideas or themes that were not discussed in the interview. Lastly, the interview was thanked for their time and were asked whether they had feedback on the interview or things to improve.

In order to ensure the validity and trustworthiness of this study, multiple actions have been taken. First, as aforementioned, the interviewees are all treated anonymously and some of the interviewees have requested to read the transcript of the interview and then give approval. All of the interviewees gave their approval for recording the interview and the transcript, none of the experts required changes in the transcript. Furthermore, from the theory, multiple themes have been derived that were further explored in the interviews. Additionally, besides the proposed themes, the interviewees were free to talk and express themselves about other topics they think that are related and important for the subject and the study. Lastly, for the reliability and validity, thick description of the theory, method and findings is necessary. This means that the reader has the ability to understand the participant's point of view, which will be established by providing quotes of transcriptions in the findings (Morrow, 2005; Tracy, 2010). So, showing how the themes from the theory have been derived and how this is reflected in the results increases the validity (see appendix 1).

Function	Type of organization	Time of the interview
Strategic HRM-advisor	Municipality	51 minutes
Senior business advisor	Municipality	57 minutes
Chief Information Officer	Municipality	58 minutes
4 Senior business advisors	Municipality	48 minutes
Policy officer	Municipality	47 minutes
Advisor HR and legal position	Municipality	35 minutes
HR-advisor	Municipality	38 minutes
HR-advisor	Municipality	44 minutes
Team manager HRM & organization	Regional water authority	59 minutes
Team leader organizational policy & strategic advisor HR	Regional water authority	53 minutes
Advisor HR&IT	Regional water authority	58 minutes
Program manager	Organization that advises municipalities	28 minutes
Principal consultant specialised in AI and digitalization	University	35 minutes

Table 1. Overview interviewees

3.3 Data analysis
The interview transcripts and documents were analyzed with the use of the program Atlas.ti. This program is used to code the raw data. As aforementioned, some themes have been derived from the theory, namely tasks and responsibilities, competences, value creation, role of the line-manager and role of HR-department. These themes have been the base for conducting the interviews. Furthermore, these themes have also partly been the basis for analyzing and coding the transcripts.

For this explorative study, the inductive analysis is primarily used to code the transcripts. We found that the best way to code the transcripts was to code according the inductive analyses approach. Inductive analysis is described as "approaches that

primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher" (Thomas, 2006, p. 238). This definition is alike with the grounded theory of Corbin and Strauss (1990). To start the inductive coding process, the transcripts are closely red and the meanings within the transcripts are considered. This relates to the fact that the raw data will be red thoroughly to get familiar and understand the transcripts (Thomas, 2006). Then, with the use of open coding, the data was broken down into pieces of text which are given labels (Corbin & Strauss, 1990). Some examples of labels are advising based on data, data-minded, employees do not fit with the function, less administrative tasks, and soft skills. In all, 110 codes have been created from the transcripts. Lastly, similar labels were grouped together (Corbin & Strauss, 1990). Related to axial coding, where "through the coding paradigm of conditions, context, strategies, and consequences, subcategories are related to a category" (Corbin & Strauss, 1990, p. 13). So, the subcategories are grouped into broader categories, or 1st order constructs that belong to one group will be grouped into 2nd order constructs. For example, learning and development, strategic personnel planning and recruitment and selection are all labels that are put in the same category, namely the tasks of the HR-professional. When this was done, the categories are linked to other categories, relating to for example hierarchy, relationships or sequences (Thomas, 2006). For example, the tasks of the HR-professional, competences and responsibilities all belong to the same category, namely the role of the HR-professional, but also that the tasks and responsibilities of the line-manager and the HR-professional influence each other, as they are intertwined with each other. In all, five 3rd order constructs have been created, namely: role of the HR-professional, role of the line-manager, HR-department, algorithms, and public sector. Next, there are fourteen 2nd order constructs and over all those 2nd order constructs, there are 110 codes divided. When the field notes and coding have been conducted, the coded information allows the researcher to relive the phenomenon and to place the perception in relation with another phenomenon (Timmermans & Tavory, 2012).

To conclude, with the use of inductive data analysis, the secondary data and expert interviews were transcribed and coded with a clear sequence of steps to come to the most important structured data. By continuously rereading the available data, the researcher looked whether no important data is left behind when coding.

4. Findings

In this chapter the results will be presented which are derived from the data analysis. First, important characteristics of the public sector will be discussed and the use and impact of algorithms within the public sector. Second, the changing role of the HR-professional, line-manager and HR-department will be presented.

4.1 Public sector

As aforementioned, the public sector differs in characteristics from the private sector. First of all, the organizations within the public sector are not in a market situation, meaning that there is no profit motive, resulting in the fact that the necessity for change is low. The improvement of processes is occurring, however, the steps taken to innovate are very small. Consequently, there is a danger that organizations in the public sector stay behind, as compared to organizations in the private sector, as one of the interviewees explained:

I think it is good to realize that when you look at the bulk of the organizations in the public sector, I think they are about 10 or 15 years behind the business world. We do not have a profit motive anyway, we have a lot of products and services that need to be delivered anyway and if something is not profitable a company would divest it and within the public sector, that is precisely a product or task

that belongs to the public sector because if you leave it out, you no longer have that facility or product. That is just such a different dynamic. (CIO municipality)

Additionally, risk-taking is mentioned as an important factor impeding the use of algorithms. Resulting in the fact that large reports including all the possible risks and opportunities need to be inventoried. Most of the time, writing these reports takes so much time that when the report is finished, new opportunities or threats will come up. This results in the fact that public sector organizations are holding themselves back because of the risk of failure and because they are afraid of negative publications. So, within the public sector, implementing new ideas or projects such as algorithms can be found hard. As the organizations do not have profit motive and the fear of failure is high.

4.2 Use of algorithms within the public sector

First of all, among the interviewees, the definition of algorithms and the influences of algorithms were hard to determine. Some interviewees did not know what algorithms were and how these algorithms can be incorporated within the organization and how these implementations could affect the current organization and its processes.

I do not have a clear picture of what algorithms are. If you talk about digitalization or robotization, that are topics that are really important within the regional water authority. Those topics I understand and I have a clear picture of. When you talk about algorithms, I do not know what effect it will have on tasks of employees. (HR-professional regional water authority)

Moreover, the interviewees who were aware of algorithms were confused by the many definitions that are available. For example, an HR-advisor of a municipality argues that when you Google, there are so many definitions that it is confusing for them to understand what algorithms contain.

Digitalization and implementation of algorithms

Some of the respondents are aware of algorithms and its influences within the organization, resulting in the fact that these interviewees already think and handle more with regards to the implementation and use of algorithms. The majority of the interviewees agreed that the algorithms can enable HR-professionals or other employees within the organization to advise or make decisions that are more reliable. What is important is that most of the interviewees argue that the use of algorithms will be complementary, the decision-making process will not be taken over by algorithms, but the algorithms can help the decision-maker to retrieve a more reliable decision. They argue that it is more reliable because employees will not make decisions anymore on work experience or gut feeling, but they have the facts and can act on that. Especially because the interviewees argue that employees have a certain picture in their mind of how some part of the municipality looks like, but the facts derived from the data may show something else.

   The use of algorithms within the organization may be restrained by barriers for implementing algorithms within the public sector. First, there must remain a human view within the process and consequently the organization needs to explain how the algorithm is build and works. Moreover, there are more barriers for implementing algorithms within the public sector, on the one hand, this ensures the right use of algorithms with the right dataset and without fraud-sensitive information, but on the other hand, this prevents organizations from using algorithms.

It is currently still seen as a resource for the HR employee. (Team manager regional water authority)

Nevertheless, I think it is important to continue to apply the human perspective in decision-making. Based on personal beliefs, I would advise vary cautiously on the use of algorithms where it affects

people. I believe that there should always be a human view as well (Advisor HR&IT regional water authority)

Certainly, in the public sector, they say, you can only apply algorithms if you can explain it, not only leave it to the computer, but also still put a human component in it. There are only more barriers being put up as to why you cannot do it, instead of being able to apply it. (CIO municipality)

Furthermore, some interviewees argue that the first step of using or implementing algorithms is the digitalization of processes and capturing the data. They argue that without the digitalization of processes and the storage of the data, algorithms cannot be implemented. This relates to the fact that data may not be available or when data is not stored correctly, the creation and programming of algorithms becomes really hard when the necessary data is not available. Consequently, the majority of the interviewees argued that the organization already digitizes their processes, but is not fully ready to take the next step and to start to implement algorithms. One of the interviewees argued that besides the digitalization within the organization, it is necessary to first collect the data that is necessary to build the algorithms and consequently implement and use the algorithms. A majority of the interviewees argues that HR-professionals are not even aware of which data they should collect and capture and how to capture this to ensure that the best analyses can be executed. Especially, some interviewees argued that data from HR-processes is not collected, but also data from other processes or sources is not collected because they do not know which data is valuable and which data is necessary for algorithms. This makes the discussion of using algorithms within the organization even harder, as lots of people are not aware of the effects and positive influences algorithms can have.

One of the things we notice is that our data is not in order. That has actually been the case for a number of years already. Under the guise of only recording what we really need for our tasks and nothing more than that, to counter bureaucratization to ensure that we only ask residents for the essentials. This also means that you will be short of data. Especially because there is no need from the organization. (HR-advisor municipality)

You must have your digital basis in order if you want to apply algorithms, otherwise you will get the wrong results and you will determine a policy based on the wrong information, which is of course the last thing you want. (HR-advisor municipality)

In all, algorithmic decision-making is currently not used that extensively within the public sector organizations, as the negative consequences are seen as more important and the data is not in order to use the algorithms in the decision-making process. So, overall, the interviewees argue that at this moment, algorithmic decision-making is not used that extensively. However, interviewees have identified some positive consequences of algorithms in the decision-making process and advising.

Influence of digitalization and algorithms on job (design)
Now it is clear that capturing the data is the first step in thinking, talking and implementing algorithms, the impact of algorithms in the overall organization can be further discussed. During the interviews, when algorithms were discussed, most of the interviewees quickly shifted towards talking about digitalization and steps they take to for example implement e-HRM. Therefore, the topic digitalization is further discussed with the interviewees and questioned how far the organization is with digitalization of processes in the organization and how the interviewee sees the role of digitalization with regards to algorithms. Digitalization, but also algorithms are influencing the work of employees and therefore influencing work processes within the organization. First, many of the administrative tasks are being automated, resulting in the following consequences:

employees need different competences, functions may be altered, employees may not fit with the requirements of the altered function, digital skills are necessary, and secondary vocational education (i.e. MBO) positions are disappearing.

As digitalization and algorithms are implemented, it influences the way in how employees can execute their work. As the interviewees argue, digital skills are necessary to keep executing the tasks, such as ability to use for example Teams, Zoom, and knowledge of mobile technologies. Additionally, other competencies are necessary, such as analytical skills or more skills to understand the flow of processes within the organization and what the influence is of the employee within these processes. When the employees are not able to keep up with the developments, this will result in a mismatch between the employee and their function. This especially happens with functions that contain a large share of administrative tasks that are routinized, because these can be automated relatively quickly. In fact, a majority of the interviewees mentioned that particularly the secondary vocational education positions within the public sector organizations are at risk because of digitalization and use of algorithms.

The fact is that we see that, this is also due to the fact that more and more things are technical and algorithms and so on, that we now have far fewer MBO functions. That is really going to end. Less and less MBO students are needed, so everything will be HBO or WO. (HRM-advisor municipality)

In those functions is just a bit easier work so to speak. Often more within the lines. It's a bit more routinized work. The moment the routine work is digitized by algorithms, it will disappear. (HR-advisor regional water authority)

Currently, the decrease in secondary vocational education function causes already new issues for the organization. Given that organizations in the public sector have an example function within the Netherlands as they are funded by the government and therefore need to show a good example of diversity within the organization. The majority of the interviewees argue that this diversity within the organization will be a new issue for the public organizations, as secondary vocational education functions are automated and therefore will disappear. This will have implications for the internship policy, as for the long run, the organization can only offer higher professional education and scientific education student internships which leads to fewer diversity of education levels within the organization. According to the interviewees, digitalization and algorithms influence the work of multiple functions within the organization, which leads to new issues for HR, but also for the organization overall, as questions rise such as will the organization structure change and how to ensure that municipalities for example will not be elite organizations where only higher educated people can work. Which one of the interviewees states as follows:

Because otherwise it will be an elite spot, then as an organization you will only be for HBO/WO. Then you cannot contribute to the social objectives (HRM-advisor municipality)

To sum up, we found that for some interviewees, algorithms are hard to define and to determine what impact it has on the tasks executed by employees. However, the interviewees who are familiar with algorithms and its impact, the first, and probably most important, step is to capture and safe the data that is necessary to conduct the wanted analysis. These analyses are necessary, because the professionals argue that decisions are made more reliable when decision-makers can rely on up-to-date data than on their gut feeling and experience. Furthermore, digitalization and algorithms are influencing especially the functions where lots of administrative tasks are executed, as these tasks can be automated relatively quickly and easily. These automation of tasks results in new issues for the organization, as public sector organizations want to contribute to their social objectives and have an exemplary function.

4.3 (Changing) role of the HR professional

We find that the interviewees see that the role of the HR-professional will change, and that this can be partially attributed to the digitalization of HR-tasks, but also due to the changes in organization structure, such as the increasing execution of operational HR-tasks by line-managers. In this chapter, this will further be discussed in terms of tasks, responsibilities and competences of HR professionals. Remarkably, during the interviews, all interviewees quickly shift to talking about the changes they expect over the coming years for HR-professionals. Therefore, when talking about the HR-professional, line-manager, and HR-department, all is described in the future changes that are expected to happen.

4.3.1 Tasks and responsibilities

Within this section, the tasks and responsibilities of the HR-professional will be further discussed. To begin with, the responsibilities for the line-manager will be shortly discussed, as this influences the tasks and responsibilities of the HR-professional. Second, the changes in tasks for HR-professionals is further described.

More HR responsibilities for line-managers

As within the most public sector organizations, the line-managers did get more space to execute their own personnel policy within their department, also called integral management by most interviewees.

In principle, it is the case that the manager must provide integral leadership, so it is up to them to take action on all aspects. (HR-advisor municipality)

A manager is mainly responsible for the operational HR activities and an HR advisor is available for that manager (HR-advisor municipality)

This integral management (i.e. HR devolution) has an effect on the tasks that will be executed by HR-professionals and the responsibilities of HR-professionals. As the line-manager is executing more operational HR-tasks this influences the role of the HR-professional. Basically, operational HR-tasks are identified as job interviews, coaching of the employees and assessment interviews. In this, the HR-professional has no responsibilities but only advises the manager what to do. In all these activities, the line-manager is responsible for the decisions that are being made and the outcomes.

As a result, managers are increasingly taking over HR responsibilities, which changes the typical HR function in roles and composition. (Business advisor municipality)

The fact that the line-manager executes more and more operational HR-tasks also shows besides the influence of algorithmic decision-making that the role of the HR-professional should be further looked into, as tasks, responsibilities and competences might change accordingly.

Tasks and responsibilities of HR-professionals shift to strategic

According to the interviewees, it is expected that HR-professionals will move towards difference is responsibilities for the long-term such as the strategic overview and the long-term focus. These responsibilities for HR-professionals show that the shift from the operational HR-tasks, such as job interviews, assessment interviews and workplace guidance are all taken over by the line-manager. Besides the shift of HR devolution, there are also HR-tasks that are being automated by algorithms and digitalization.

I think that the focus of HR will shift in the near future anyway, more due to the digitization that I have mentioned earlier. You will also see that in our team we are less concerned with making letters and answering simple questions. (Senior business advisor municipality)

I expect that especially the range of duties of our HR-advisors, who now have quite a broad range of tasks, including the task of writing letters that ultimately ends up with them. I can imagine that in the future that range of tasks will narrow slightly. (Advisor HR and legal position municipality)

As we can take from the aforementioned quotes, the tasks of the HR-professionals are shifting from administrative to more tactical and strategic tasks which consequently leads to the shift in responsibilities between the line-manager and the HR-professional. So, besides the shift within the organization where secondary vocational education functions are automated, this happens also within the HR-department where the administrative HR-tasks are automated and digitized. As a consequence, simple tasks such as sending letters or making employer's statements are now things that employees can do themselves. Owing to this, some of the administrative HR functions will change as probably these functions will be adjusted as the systems also should be checked and controlled. However, the adjustment of functions may also lead to other knowledge, competences and skills, which consequently may lead to the fact that a function will be lift to a higher educational level. The latter will be further discussed in chapter 4.5. So, it is expected that the tasks executed by HR-professionals will shift more to the execution of tactical and strategic tasks. This shift can partially be assigned to the automation and digitalization of HR-processes and tasks and the HR devolution, which is further described as follows:

The transition from HR-systems, for example, that you really completely switch to E-HRM. The role of the HR assistant is very different. At first, they had a lot of administrative tasks, while now they actually have the task of when things go wrong they will come to you. (Team manager HRM regional water authority)

Then you see that the expectation is that the people who do the HR administration, so everything about the personnel data, that that work will be robotized, so all repetitive work that will go away. (Business advisor municipality)

The findings show that line-managers are taking over the operational HR-tasks, which in turn will affect the task distribution among HR actors.

Changes of HR tasks because of algorithms

It is useful to get a clear picture of what tasks HR-professionals execute and how these changes with the influence of algorithms. To begin with, the HR-professionals advise the line-managers with certain HR-issues. Therefore, the HR-professionals have frequently meetings with the line-manager to discuss new developments, but also advise the line-managers on important decision to take. What the majority of the interviewees argue is that the advice the HR-professionals make for the line-managers will be based more on data and outcomes of analyses when algorithms are implemented within the organization. The interviewees argue that in the coming years, HR-professionals will not advise anymore on their gut feeling, but will advise based on data:

It is expected that HR analyses will become one of the most important parts of HR. This technology offers possibilities for analyzing the existing workforce, profiles of applicants, et cetera. (strategic advisor HR regional water authority)

I think that you can also substantiate things much better and see trends. Perhaps you can estimate more reliable prospects. Now you do your best with the data you have, but sometimes it is also a gut feeling, we think it will go this way. If you just have data, you can base your decisions on that much better. (Business advisor municipality)

As the aforementioned interviewee argues, currently, data is not stored in the right way to also use the data to execute analysis with to give advice based on reliable information. Therefore, the interviewees argue that one of HR-professionals new tasks should be the recording of data. HR-professionals should improve the quality of the data that is stored and map which data is useful to store and which data is not. Currently, most interviewees find that within their systems, data is not stored correctly and is not useful for the implementation of algorithms or for some simple analyses based on data. Which is further described as follows:

The quality of the data in the systems is generally of mediocre quality because there is often no policy and implementation in the field of information management, which means that the possibilities of the technology cannot be optimally utilized. (Business advisor municipality)

The data must of course be in order. I think we are lagging behind. (Advisor HR&IT regional water authority)

Now it is clear that according to the interviewees, data in their organizations is not stored at the right way, this will be for organizations one of the first issues to consider and to act. In addition, the implementation of algorithms within the organization, which may result in changes in tasks, competences, team compositions and educational levels for employees, requires new tasks for HR-professionals or tasks that become more important over time. Therefore, the tasks that will become more important or are new can be found in table 2. The tasks that are expected to change due to the implementation of algorithms and the digitalization can be divided into three different categories, namely: changing function tasks, personnel development tasks, and strategic tasks.

Changing function & personnel development tasks executed by HR-professionals
As argued by one of the interviewees, that works at an organization that support organizational development and professionalization of employees, when algorithms are implemented, functions will change. This asks for HR to change their perspective and to put emphasis on some specific HR-tasks. As the function will change, HR-professionals need to reconsider the job profiles to see what changes, which new competences are necessary or which skills are necessary. This could mean that HR-professionals will focus more on job profiles and will see whether there is still the fit between the current employees and the changing job profiles. When this fit is not there, there are multiple possibilities, first, the employee can meet the demands of the function by learning and development of their skills and knowledge. Second, there can be a situation where the employee cannot upskill and improve their knowledge which raises the question whether the employee can stay within the organization or whether the HR-professional should consider a reorganization within for example a team. However, it is not only the choice of the HR-professional, the employee also has a voice within this and in his/her career. Consequently, HR-professionals will focus more and will spent more time on the career and mobility of employees. This means that HR-professionals will focus more on guidance, relocation and other issues.

For example, by deploying people more widely, by training and taking them with you. Then you don't have to fire people, but the package changes. You want people who come along and who have the competences for that. In any case, you want it to be considered and not that you as an organization are surprised by that. (Strategic advisor HR regional water authority)

No, that is more of a development of how to keep people suitable. Sometimes people cannot keep up with the organization, and sometimes the organization cannot keep up with the people, they are there and both are reasons to say goodbye or for relocation. (Business advisor municipality)

Besides that, it could be that new demands or new competences and skills are wanted that are currently not in the organization, then, HR-professionals should hire staff temporary or recruit and select with the future perspectives in mind. This relates to the more tactical and strategical responsibilities that HR-professionals have.

As a result, these changes can also be taken into account within the recruitment and selection process and thus perhaps demand for other positions. (Policy officer municipality)

Strategic tasks executed by HR-professionals
As aforementioned, it is expected that HR-professionals will focus more on the long-term and the tactical and strategic goals, which also results in other tasks executed by HR-professionals. Especially, as professionals argue is that HR focuses more on organization wide projects instead of individual issues. For example, the creation of the strategic personnel planning has mentioned by a lot of professionals as a HR-tool that becomes increasingly important. With this tool, the HR-professionals will try to create an overview in which it becomes clear which functions will change due to developments and what other skills, competences or jobs are necessary for the upcoming 3-5 years. However, the HR-professional does this together with the line-manager, because they know more about the developments on the work floor and sometimes with the employee, because they have the most knowledge on their job and what might change.

So, I think that if we integrate that method, then every manager together with the HR-advisor should first do a session with the team, look together on what do we see coming our way. (CIO municipality)

For the organization to look okay these colleagues also have other skills that we will soon need anyway. How can we use them in a different way and help them through that change. So, we sometimes say yes, your job is canceled, but your job isn't because we have other jobs for you. (Team manager HRM regional water authority)

Lastly, some interviewees argue that culture will be more important for HR-professionals. Specifically, it is argued that HR-professionals will deal more with the attitude and behavior of employees. This also can be incorporated in the HR-strategy and vision which increasingly becomes important because of the shift of HR-professionals to a more long-term oriented focus.

Type of tasks	HR-tasks	Description	Quotes
Changing function tasks	Recruitment and selection	The selection process for finding, selecting, and appointing a suitable candidate for a job.	*"Management wants us to recruit more and more in a future-oriented way in recruitment and selection. So, start to hire people 'okay he/she can already do this, but that is not the main task, because they also have skills for the future'." (Professional municipality)*
	Job profile	Description of the duties/ of an employee with the desired competences and skills.	*"Tasks and functions will have to be tinkered with in order to achieve a good balance between performance requirements and the knowledge and skills of employees. 'Job tools' are available for this, such as job innovation, job crafting, job carving and team crafting." (Professional municipality)*

	Hiring staff (temporary)	Mapping the demand and hiring someone for a temporary period.	*"So, you saw a lot of new people coming the past years, people being hired to take care of things temporarily." (Professional municipality)*
Personnel development tasks	Career and mobility	Changes in career regarding tasks, function, employer or region.	*"Management and HR have made plans to look at how you will retrain people, how you will guide people to a different career, because for a number of people it appears that the requirements that are now being set too high. So, how are you going to help them to another career, either within the municipality or outside." (Professional municipality)*
	Learning and development	Making new knowledge available and ensuring that employees also use it in their work.	*"And learning and development. So how can we educate and make sure people keep up. We saw, for example, that in this group of employees in the MBO position, that the digital skills were actually not in order in a very large group. So I think there is also a task for HRM. How can we educate those people so that they keep that work fit." (Professional regional water authority)*
Strategic tasks	Organization wide projects	Picking up signs throughout the organization and create organization wide plans.	*"That is certainly part of your role, in fact, you should signal that if you see that this is happening in several places or if you see changes, you are expected to advise proactively." (Professional regional water authority)*
	Strategic personnel planning	Preparing, designing and implementing strategic policy for the inflow, advancement and outflow of personnel.	*"We also currently have drawn up a strategic personnel plan. This not only concerns the developments of the personnel, but also the developments of the organization." (Professional municipality)*
	Culture	Collection of norms, values and behavioral expressions that are shared by the members of the organization and that bind the members to each other.	*"I am involved in the culture a lot because you see that attitude and behavior is important. How can we as HRM get that culture in such a way that people come along in terms of attitude and behavior." (Professional municipality)*
	HR-policy/vision/strategy	Mapping themes, goals and long-term plans and translating that to current tasks and projects.	*"You will make a policy of what do you do with redeployment candidates, how do you keep them employable, what kind of development programs are you going to offer them." (Professional municipality)*

Table 2. New HR-tasks or tasks that become more important

To sum up, the interviewees identified some new tasks that might be executed by HR-professionals, such as tasks with regards to the changing functions within the organization, personnel development tasks, and strategic tasks. With these new tasks or tasks that become more important, there are also new responsibilities for HR-professionals. Besides these new tasks, the interviewees argued that also some basic tasks for HR-professionals will remain, such as payroll and absenteeism.

4.3.2 Competences
According to more than half of the interviewees, when tasks and responsibilities of HR-professionals will change, it is expected that consequently the necessary competences will change. First, one of the interviewees argued that there would be no changes in the competences, however, the majority of the interviewees agreed that some competences would change or that more competences are necessary. The core of the HR-professionals are the soft skills, such as conversation skills, but also reading the body language of employees are identified as the core skills. Most interviewees argue that these skills (i.e. competences) should not change and that these remain important. However, in table 3 is an overview of the new identified competences.

To start with, the interviewees argue that when increasingly more processes and tasks are digitized and automated, then HR-professionals should also keep up with these developments and should be able to cope with these changes. As a consequence, digital skills and technical skills are necessary to keep up with the developments and being able to execute the daily tasks properly and efficiently. Furthermore, as it is expected from HR and because HR-professionals shift more towards the tactical and strategic tasks, HR-professionals need more strategic skills, evidence-based and analytical skills to be able to read data-analyses and being able to see the consequences of that for the long-term. In addition, HR-professionals need to develop themselves in methodology such as agile/design thinking. One of the interviewees argues that the public sector organization makes decisions with care which takes much time, however, as it is argued, HR-professionals need to learn how to make decision relatively quickly to keep up with the developments and to add value and keep market share. Lastly, HR-professionals should become more creative, because the changes in functions and the shift in tasks that are important for HR-professionals ask of the HR-professional to come up with solutions and ideas that are new or unique. Consequently, this asks some creativity of the HR-professional.

Competences HR-professional	Description	Quotes
Design/analytical thinking	Knowledge of methods to solve problems iteratively in multidisciplinary teams	*"IT developments are going fast. IT departments often work with agile methodology. HR is used to the older method with longer lead times for planning and execution. This is a problem. It takes too long for IT departments, with the consequence that they themselves gather the right people around them. As a result, HR may lose market share."* (Professional municipality) *"More analytical skills. I think those are really competencies that not everyone has at the moment. So, really that insight into those figures and being able to link that and place that."* (Professional municipality)

Management competences/computable or conceptual thinking	Being able to see the flow of the processes within the organization and their own role within these processes. Being able to also think in financial issues and other perspectives.	*"In addition, I think that computable thinking is becoming increasingly important, this means that HR (professionals) must better understand their role in the process." (Professional municipality)* *"Such as conceptual thinking (putting it in a more abstract framework). As a result, I think that the soft side of HR may also be partly replaced." (Professional regional water authority)*
Creativity	Ability to invent and/or create new things.	*"I think it requires more creativity, we already see that. To do the job well you just have to be a little more creative than you used to be. That makes the work more fun in that respect." (Professional municipality)*
Digital/technical skills	Know how to use the digital systems and digital devices.	*"Nowadays, as an HR employee you must have good digital skills." (Professional regional water authority)* *"This will be replaced by activities to manage the use of technology, assess the quality of algorithms. This requires different knowledge within HR." (Professional municipality)*
Evidence-basd/data minded	Ability to make decisions based on data and research.	*"If you are talking about competences, then the first bottleneck is already beginning to emerge. That an HR professional will be asked to be more data-minded." (Professional municipality)*
Educational skills	Ability to give and receive feedback and communicate clearly.	*"Learning and development indeed, how to do that in a good way. So basically, educational skills. I think you're going there a little bit more." (Professional regional water authority)*
Strategic skills	Helps you to think in an orderly way. It helps you to think long-term and what you want to achieve.	*"So, not only those soft skills, but also think much more strategically. So, even if you hear this and you see this happening, how do we ensure that we can continue to deliver value." (Professional municipality)*

Table 3. New HR-competences

Besides the fact that tasks and responsibilities and competences of the HR-professional are expected to change. The interviewees argued that some factors have an influence on how the influence is of algorithmic decision-making on job design and consequently on the role of the HR-professional. First, there is a difference is the technology acceptance of HR-professionals, this consequently influences the way the role of the HR-professional might change as when HR-professional do not accept the technology, the shift to the strategic role becomes harder. Advising without data becomes even harder when looking at the long-term consequences.

Not everyone is receptive, still not, when you come up with numbers. Because you see that people flee very quickly in questioning the figures. Which definitions did you use and where do they come from and is it all correct. You get more discussions like that. By mainly discussing this, you do not have to talk about your own competence change and behavioral change and what that actually means for your work. (Senior advisor municipality)

Next to the acceptance of technology, educational attainment is expected to influence the expected changing role of the HR-professional. Especially, for the more administrative HR-roles, the work changes towards controlling processes and solving problems. For higher educated HR-professionals, the expected shift is towards the

execution of strategic HR-tasks. Third, the interviewees expect that the organizational strategy influences the changing role of the HR-professional, especially a strategy that is long-term oriented and is focused on the coming technological applications and its changes, the role of the HR-professional is expected to change more quickly. Furthermore, the laws and regulations are expected to influence the use of algorithms and consequently the indirect influence on the changing role of the HR-professional. As one of the interviewees argues, the laws and regulations around the use of algorithms are still unclear.

There are not national frameworks and guidelines that we can support ourselves with. Above all, you need to be transparent and you have to be ethical. Furthermore, you need to figure it out yourself. (HR-advisor municipality)

Lastly, a few interviewees expected that the size of the municipality influence multiple parts. First, it is expected that the bigger the municipality and consequently the bigger the HR-department, the fewer roles of HR-professionals will change, as these departments have a higher likelihood of hiring a new HR-professional that has the needed competences. Second, it is expected that the size of the municipality is influencing how quickly and how much algorithms are being used. Especially, the interviewees expect that larger municipalities consequently use more algorithms. However, one of the interviewees questions this expectation, namely:

The thing you often hear is that large municipalities are further along with algorithms. I doubt it, because I think the small municipalities certainly apply it, but that they actually apply it as a bit unconscious and incompetent and that does not prevent much fuss. There it is also generally still manageable. If you look at large municipalities, some are working in three disciplines with algorithms, all of which do that in a different way. What you see is that they are too big to connect. (CIO municipality)

In sum, with the takeover of operational HR-tasks by the line-manager (i.e. HR devolution), the responsibilities of the HR-professional are expected to shift to more tactical and strategic responsibilities. This results in the fact that HR-professionals will focus more on the long-term and execute more tasks that are related to that, such as strategic personnel planning, culture, learning and development and recruitment and selection. The interviewees argued that there are some competences that HR-professionals need to develop, such as competences to execute the strategic tasks or competences to keep up with the developments within the organization such as the digitalization and automation of processes. Lastly, technology acceptance, educational attainment, size, laws, and strategy are expected to influence how big the expected shift of the role of the HR-professional is.

4.4 (Changing) role of the line-manager
As discussed in chapter 4.3, in most public sector organizations the line-manager executes the operational HR-tasks, such as assessment interviews, job interviews or answer basic HR-questions about employment contracts et cetera. The interviewees argued that in the last few years, the role of the line-manager has changed significantly within the organization. Therefore, in this chapter, the role of the line-manager will be further discussed with regards to the tasks, responsibilities and competences.

4.4.1 Tasks and responsibilities
As aforementioned, integral management (i.e. HR devolution) changed the responsibilities of HR-professionals, but also the responsibilities of the line-manager. As the line-manager is currently responsible for all the operational HR-tasks and makes all

the decisions with regards to that. The interviewees argued that at first, the shift was hard for line-managers because they liked the fact that they had a HR-advisor that helped them with all the operational tasks and now, the HR-professional only advises with the more difficult issues and questions. Consequently, the line-manager executes more administrative tasks within the system, for example when an employee wants an employer's statement or is sick. Which results in the fact that the line-manager is ultimately responsible for all the issues and decisions made with regards to the employees within their department and the staffing.

So, the moment someone leaves or vacancies become available, we will look at are you going to transfer that vacancy one to one or is there something going on. You will fill that in with the space you have. The decision to do this differently really rests with the manager. (HR-advisor municipality)

In addition, the line-manager also needs to focus more on the long-term and get a clear picture of the changes that may come and affect their department and team. These long-term vision from the line-manager is also important for the HR-professionals, as they together can work on the strategic personnel planning. This leads to the fact that some HR-tasks are executed by both HR-professionals and line-managers. Such as the strategic personnel planning is one of those tasks that managers and HR-professionals execute together, and sometimes also together with the employees within the department, this is called a dynamic strategic personnel planning. The Chief Information Officer argues that there are more decental HR-tasks, so the execution of HR-tasks is not only within the HR-department, but also executed more lower in the organization.

Those managers are busy with strategic personnel planning to see what will my department look like in five years and what kind of file will I have. They try to overlap pictures and see where the misfit is. (HRM-advisor municipality)

The way I see this is that the manager must therefore know even better and look even further ahead where such a field is headed and where such an employee actually has less or more of the short-term perspective in sight. Such a manager must know much more about the longer strategic development perspective. (Business advisor municipality)

Next to the strategic personnel planning, the line-manager also needs to discuss development and changes within the department with the HR-advisor. Here, the HR-professional has the role of advisor and maps out angles that the manager might not have thought of. However, one of the professionals argues that there are some challenges and difficulties with the question whether the HR-department (central) should support the managers (decentral) or whether this should be reversed. Especially with developments that are coming up, the question arises who should initiate this and with these changes who is supporting who to implement this.

The signal actually always comes from the manager, who has an idea of what is needed and where the tension is. (Team manager HRM regional water authority)

What you already see anyway that there is no clear balance between, in the context of developments, it comes from the decentralized or centralized and who supports who. Does central support decentral or is decentral the supporter of central. (CIO municipality)

Next to the strategic personnel planning and reporting the changes to HR, the line-manager also needs to, as aforementioned, execute other operational HR-tasks, such as assessment interviews, management of employees, recruitment and selection, and lastly, decision-making based on data are mentioned multiple times as tasks executed most by managers. These tasks have mainly been taken over from HR-professionals due to the shift from HR-professionals to the tactical and strategical tasks. Furthermore, due

to the digitalization and automation, employees can execute simple HR-tasks, such as request vacation days, request maternity leave or report overtime. This leaves the tasks such as job interviews or other conversations for the manager together with the striking matters of employees because the manager is closest to the employee.

With the digitalization or the implementation of algorithms, the line-manager is the first to pick up the signs that tasks will change for employees. Additionally, the line-manager is responsible for picking up these signs and to act accordingly. In a project where a chatbot was implemented, the organization found that extra tasks needed to be executed by the employees. Within this project, the line-managers guide the employees with these changes and, if necessary, arrange training. However, within this project, the organization found that line-managers executed all the tasks regarding guiding employees. HR-professionals did not play a role within the implementation and use of algorithms. The program manager said the following:

Then the question is that the manager can figure it all out himself, so he can do that, does he have the time and does he want or need help with this. Then it will help with making a plan or implementing the plan. With both, it may be the case that making the plan and implementing the plan requires advice and this can be found from the HR advisor or it can be found from external advisors. My estimate is that it is quite specialized and that it is supplied by the market rather than by HR. (Program manager municipality)

However, some interviewees argue that because the employees have so much specialized knowledge within their function, the line-manager is not able to help them anymore with complex issues, because the line-manager cannot have specialized knowledge for all functions within their team. This leads to the question how the line-manager should manage his employees and how to assess employees. Some interviewees argue that maybe a new management style is necessary where employees are not assessed on the hours they work but on the output they deliver. Especially, when algorithms come into play, one of the interviewees argues that the management style probably needs to be reconsidered and maybe the organization structure will also need to be reconsidered. The interviewee argues that line-managers should focus on helping the employee and identifying the needs of the employee instead of focusing on absenteeism and days off. Consequently, this also asks other competences from a line-manager, which will be discussed extensively in 4.4.2.

The knowledge of the content lies within the organization unit itself, we notice that the manager only has to ask the right questions. (Policy officer municipality)

If you then go back to the organizational structure, the manager is almost no longer able to properly coach his employee in that, because what should he coach him on now, on his professional knowledge, on his *collaboration phenomenon, so we don't even know where we have to manage on (Business advisor municipality).*

4.4.2 Competences
As aforementioned, the line-manager executes increasingly more operational HR-tasks due to HR devolution. Therefore, other competences are necessary for the line-manager in order to execute these operational HR-tasks properly. Besides the operational HR-tasks that the line-manager currently executes, the line-manager also should focus and focuses more on the longer-term developments. The execution of the operational HR-tasks by line-managers are not directly traceable to the introduction or use of algorithms, but digitalization of processes (a prerequisite for the use of algorithms) affects the shift of tasks of HR-professionals from administrative to more tactical and strategic tasks and therefore, HR develution helped this shift and created space for HR-professionals to execute other tasks. So, in order for managers to hold job interviews, assessment

interviews and to help employees with questions and their needs, first soft and conversation skills are necessary. These soft and conversation skills are important to show empathy in conversations and to help employees.

Besides the execution of these basic HR-tasks, the interviewees argue that within the public sector, the departments or teams are developing more like separate business units. Consequently, these business units are becoming small enterprises where the line-manager is responsible for all facets, like HR, finance et cetera. This results in the fact that line-managers need more competences to run a business unit besides the competences such as substantive knowledge. The interviewees argue that within the public sector, over the past years, some employees within the teams are promoted to manager. In that situation, line-managers have substantive knowledge, but lack business management, agile thinking, and data-minded competences. This has been identified by a number of interviewees as an issue within the public sector organizations, as these managers need to learn and develop themselves as managers.

The fact that someone has professional knowledge does not always mean that that person is also a good manager. (Business advisor municipality)

We are now selecting completely different team coaches (managers). Those team coaches have the management skills. The knowledge of the content lies within the organizational unit itself, we notice that the manager only has to ask the right questions. With us, the stress is that team coaches are drawn to the content and that they have less time to manage. (HR-advisor municipality)

For HR, this gives new challenges for the recruitment and selection for line-managers and the function profile of line-managers, because this changes as the role of the line-managers changes and its tasks to execute changes.

Competences manager	Description	Quotes
Agile/design thinking	Knowledge of methods to solve problems iteratively in multidisciplinary teams	*That's what it really is, agile and design thinking, those are the methods you have to work with. Those methods just don't exist, they aren't standard skills of the people now.*
Business management	Knowledge and skills to follow processes within the organization, with influences from the organization and the market.	*The added value of middle management is mainly a business administrator, who must focus much more on the euros and innovation within the department, or the development of the employees.*
Data-minded	Ability to make decisions based on data and research.	*There you should also be able to have a different conversation with that data in your backpack.*
Conversation skills	Possessing skills such as listening, speaking, and concentration necessary to communicate.	*The manager has to have a good conversation with the employee and he has to start the conversation. I see that you can no longer keep up with the work or the work is going to change and how do we deal with this.*
Soft skills	Personal traits, social skills, communication skills, language skills, personal habits, kindness, and optimism.	*You can gather knowledge, but the way you have an emotional connection with something makes you unique and that uniqueness is becoming increasingly important.*
Professional knowledge	Knowledge about certain subjects that	*There must be a balance between people and task-oriented leadership I have helped people-oriented and task-oriented management with managers, so I was*

functions within the team deal with.	*able to steer on content from time to time and not just hold coaching conversations.*

Table 4. Competences manager

To summarize, the line-manager plays an important role with regards to the execution of HR-tasks. Furthermore, the line-manager picks up signals from the employee when things are going wrong or when there is a mismatch between the employee and their function. Consequently, the line-manager is responsible for the employees within their team to ensure their well-being and the fit between their competences/knowledge and the requirements of the function. Additionally, line-managers will continue to focus more on the long-term and will discuss these developments with HR-professionals. Furthermore, with the implementation and use of algorithms, it is expected that line-managers will guide their employees with the changes they go through, where the role of the HR-professional is more as a coordinator. Lastly, as teams or departments will become increasingly more independent and will be seen as business units, this results in the fact that line-managers need other competences, such as data-minded and business management competences.

4.5 (Changing) HR-department
Lastly, in this section we show how the role of the HR-department as a whole is expected to change. HR departments particularly focus on three aspects: (1) the team composition, (2) the different roles that the HR-department plays within the organization, and (3) the value creation of the HR-department.

4.5.1 Team composition
To begin with, the team composition of HR is expected to change as the role of the HR-professional changes and the tasks of the HR-professional change. Consequently, as new competences are necessary for HR-professionals and not all new tasks and competences can be executed within the existing positions and by the working employees, new positions are necessary which changes the team composition of HR. Some of the interviewees argue that the HR-professionals currently working are not capable of executing the expected new tasks, and therefore, new functions within the HR-department are necessary. However, other interviewees argue that the HR-professionals might be capable of executing the new tasks, but that some of the tasks, such as specialization within data usage is not for the current HR-professionals. From the interviewees, the following new functions have been derived: HR-advisor based on HR-data, application manager, data analyst, training advisor and management consultant.

As aforementioned, one of the conditions for using algorithms properly is to store the data, which is acknowledged as a new task for HR-professionals. So, in order for HR to collect all necessary data in a good and clear manner, it is argued that some new functions should be introduced to execute the matching tasks. These functions with regards to the usage and storage of data and the use/analyses of this data results in the following functions, namely: HR-advisor focused on data, application manager, and data analyst. First, it is expected that a separate HR-advisor will be joining the team because this part of HR will become more important as algorithms and other digital developments are implemented. Furthermore, the function of application manager will be part of the HR team. This application manager communicates users about functionalities and provides maintenance and control performances of the systems. Lastly, the data-analyst may be introduced within the HR-team, within this function, the data-analyst executes tasks with regards to the collection and control of data in order to process it into information. So,

therefore, it is argued that three new functions regarding the data collection and processing within the HR-team are expected to be included.

There you will soon also have someone who will also focus on HR data and HR analytics. It will not be asked of every consultant as a competence, but it will be a specialism within HR. (Strategic advisor regional water authority)

Increasingly providing data and explaining why things have been introduced into data. In that position, I mainly expect you to work on that. (Business advisor municipality)

I suspect that there will be a dimension in HR, of people who are simply specialized in analyses, links of HR data. (HR-advisor municipality)

Besides the new functions around data, it is argued by some interviewees that functions such as training advisor and management consultant will be introduced in the HR team. Within some public sector organizations, there is already a training advisor, but it is argued that within all HR-teams, there should be someone who specifically executes tasks with regards to the training and development of employees and the tracking of the developments that require new training issues. Additionally, it is argued that an management consultant can be included in the HR team, as the tasks of HR-professionals will be more towards the tactical and strategic side, a management consultant can advise and help the HR-professionals with the view on the flow of processes within the organization and overseeing the combination of different facets that need to be aligned in order to give better advise.

For example, we have also hired an organizational consultant from an external agency for these reorganizations to provide guidance, but of course we just have to do that ourselves. (HR-advisor municipality)

In all, as the interviewees argue, within the HR-team, there should be some new functions. Especially, functions with regards to the use of data within the HR-advises and within the organization are necessary to be introduced in the HR-team. Additionally, a training advisor and management consultant can be included in the team to ensure that there will be put more emphasis on the training and development of employees and to ensure that the HR-team and professionals have a more widespread view.

4.5.2 Role of HR within organization
Within the organization, the HR-department has a certain role and the actors within the organization have a certain view of the HR-team and department.

View on the HR-department
To begin with, some of the professionals within the HR-department noticed that the HR-department is sometimes seen as less than other departments and that the HR-department is placed at the back. For example, the departments in the public sector that are directly providing services for the citizens are seen as more important, such as work and income department. Moreover, one of the professionals argues that HR is seen as a policeman within the organization because they only concerned with following the rules. As a consequence, HR-professionals are not included in projects or technologies that will be implemented and will have an impact on the employees, such as algorithms. One of the professionals argues that when things go wrong in such project groups, then, the HR-department is included because they need to fix the problem. Here, the professional argues that HR should be included in the start of such projects and must think along in advance. So, within the organization, the view on the role of the HR-department is not helpful for the HR-professionals, as they are sometime not included in important projects,

but they are also seen as policeman and the HR-department is placed at the back, because the organization views the departments such as the social domain as more important.

I do notice that P&O is under considerable pressure, which is seen as something internal, with our own people, but that should not be at the expense of the services and the service towards the people. In the spatial domain with the arrival of the environmental law or in the social domain with the arrival of youth, the tozo, social assistance, and such matters are often seen as more important than the P&O part. (Business advisor municipality)

There was a municipality where HR had researched the image of HR within the organization and that was the image of a police officer. So, HR is mainly there for the HR rules and compliance with HR rules, we must have done this and must do this and so. (Program manager municipality)

We are really sometimes forgotten. We have noticed that certain things are started without us being involved. Just take a look at this is our plan, would you like to see what you think of it from your profession and what data do you have for it. That question is still not asked enough. Only when things have already been set in motion, or things go wrong, or threaten to go wrong, we come into the picture. (Business advisor municipality).

HR playing a proactive role as coordinator
Besides how the actors within the organization view the HR-department and its professionals, it has also been discussed what the interviewees think the role of HR should be when algorithms are introduced in the organization, or when digitalization is in a progressed state. In table 5, all the expected roles for HR by the interviewees are given. These will be further discussed.

First of all, it is argued that HR should be a coordinator within projects. For example, with the implementation of algorithms, one of the professionals argued that probably, HR will have the role as coordinator and will make sure that the manager can support the employees in the change process and that if the manager needs support or help that HR makes sure that manager will get that, relating to the support and advise role of HR. Additionally, this asks for HR involvement and a proactive role. HR should be included in the front of the decision-making process and HR needs to be aware of the changes that are coming and the possible impact it has on the organization.

I think that when HR starts to beat the drum, we are doing the wrong thing. HR should not sit in the stands, they should really go hand in hand together with that manager and get to work on this. (Team manager regional water authority)

That HR is a kind of help in the background or is a kind of specialist. (HRM-advisor municipality)

HR moving to strategic and business roles
Moreover, with the implementation and use of algorithms, some professionals argue that HR will have the role of data provider. Within this role, HR-professionals should storage and provide the data necessary to conduct data analyses in order to make data-based decisions (i.e. data provider). Consequently, with the aforementioned developments, tasks and roles that HR will have it is likely that there will be more distance between HR and the employees, as managers take over a lot of HR-tasks and HR is likely to become more in the role of business administrator. This is an interesting finding, as HR can become more strategic and a coach, because of this distance between them and the employee and because this gives HR the opportunity to become a serious interlocutor within the organization as the focus will be more on strategic and tactical issues. As one of the professionals argue, HR should align more with the IT-department, because they can together make sure that the digital basis is right, but also that for the long term, the

employees can handle these changes and that managers know how to handle these change processes.

HR must play an active role, both on strategic/tactical and operational level and must connect this with IT. If you don't combine this, you won't make it into the future. What can be a danger to HR is that they are not IT people, so they need to develop IT competencies or work with IT to continue to create added value. That is why it is important for HR to keep market share. (Advisor HR&IT regional water authority)

Role of HR	Description	Quotes
Coordinator	Make sure things are arranged in a coherent way.	*That HR can at most play a coordinating role, this market party is there to help you.*
Support and advise	Helping and advising managers and employees.	*We only advise on this and try to give him insight into what do you see in the future, what does that look like.*
Proactive	Look ahead and act without waiting.	*Our department could change in that regard, perhaps more towards the business, which is what we actually aspire to. So being at the forefront of the organization, so not looking at where the organization is going and how we adjust our HR policy accordingly. So actually advise in advance.*
Business administrator	Engaged in a broad view of the organization and market environment.	*I also think you are going to see that HR is getting a bit further away from people.*
Coach	Help someone achieve work-related goals.	*HR is now more or less set up as a coach.*
Data provider	Collector and distributor of information.	*To be able to find useful insights and to make statements about HR policy and interventions, high quality personnel data is required. Process design (recording), system design and ownership (data owner) are roles that are missing within HR and must be introduced.*
Interlocutor	Participant in conversation who asks critical questions and tries to look at the problem from different angles.	*So he will really have to do that if he wants to remain a good discussion partner.*
Strategic	Long term planning.	*I also think if HR has undergone a development from troubleshooter to business partner and are still working on, and that also affects HR analytics, to make the transition more towards a strategic business partner.*

Table 5. Roles of HR (department)

In all, the view within the organization of HR is not helping the HR-department to advise at the front and to advise within the implementation of new projects. Consequently, HR needs to take some roles such as data provider, coordinator and interlocutor.

4.5.3 Value creation
Finally, the professionals argued that some of the value creation would change, as the tasks, responsibilities, competences and roles of HR-professionals change. These changes in value creation are, according to the professionals, not fully allocated to the algorithms, but with the influences of digitalization there are changes in the value creation of HR.

Value creation by soft skills

First, one of the interviewees argued that primarily the salary payment creates the most value for HR, as this is at the heart of HR. However, it is also argued that the value creation of salary payment will not change due to digitalization or algorithms. Moreover, absenteeism is also one of the parts that creates value as an HR-department, but is also found to not change due to developments within the organization. As the absenteeism will always be an important part for HR, however, as argued by the interviewees, with the increasing digitalization and use of algorithms, better use of data can ensure that the tasks around absenteeism can be executed better. In addition, the soft skills and expertise of the HR-professional is one of the parts that professionals argue that creates value for the organization. Especially, keeping an eye at the employees and managers and making sure that a match remains between the people and the organization. Besides the development that HR shifts more to the tactical and strategic side, the professionals argue that HR should not solely go to the business side, it is important that HR also has the soft skills which creates value.

I think this is not only very important for HR people, but for our profession because if we become like all managers are, then the organization loses a very important component that is also aware of other things than just results in the work. I think a social counterpart is very important. (Business advisor municipality)

Currently, a lot of value is added to the people side of the organization. In particular the use of human capital, so on the soft side. (HR-advisor municipality)

Value creation by executing organization wide projects

Furthermore, the professionals argued that HR will create more value as the department will work less on the individual level and will increasingly work on themes throughout the organization. As the managers will work more on the individual level, this creates space for HR to add value for the organization to pick up broad themes. For example, one of these themes is the labor market communication. Especially in the public sector, the question remains how to recruit staff that has the right competences and knowledge and how to keep them in the organization. As the majority of the professionals argues that the competition with the private sector is strong and that for some functions there is a shortage on the market. Consequently, for HR, the value creation lies within a good communication and attracting the right people.

So that the labor market communication runs smoothly and then the introduction goes well and the work remains interesting. (HR-advisor municipality)

Value creation as data expert

Next, another way for HR to create value will be the increasing collaboration with other organizations. This allows for more information to be gained which can be used within the organization. Consequently, with the information gathered from other organizations but also the data gathered within the organization, HR can create value for the organization by advising based on data. As aforementioned, HR will play a large role in the data storage and use of data. This allows HR to become a valuable interlocutor that also can help with the implementation of algorithms and can help the manager by the support of the change process when algorithms come into play and the functions are changing. Lastly, partly with the increasing use of data but also the shift of HR to a tactical and strategic role, the value creation also lies in the long-term focus. This long-term focus helps HR to execute the matching tasks of the tactical and strategic role.

I think that you can also substantiate things much better and see trends. Perhaps more reliable prospects can begin to estimate. Now you do your best with the data you have, but sometimes it is

also gut feeling, we think it will go this way. If you just have data, you can base decisions on that much better. I think that can also add another value in that way. That you can tell more based on data than you can now. (HRM-advisor municipality)

The added value of HR is also very much in that you can have that conversation and that you can try to collect data about your employees and in this way map out who you have in house and what is needed. (Policy officer municipality)

In sum, the HR-department are expected to change with regards to the team composition, the role within the organization and the value creation. Some new functions concerning data and learning and development are important to add within the HR team. Furthermore, the role of HR changes to a more strategic role where HR advises based on data and where HR supports the manager and coordinates help when necessary. Lastly, HR will increasingly create value for the organization as they focus more on projects for the whole organization instead of individual cases. According to the interviewees, this ensures that HR shifts to the strategic role.

4.6 Towards a framework of the influences of algorithms on the role of the HR-professional and the HR-department

Based on our findings we created a framework displaying the expected influences of algorithms on the role of the HR-professional and the HR-department (see figure 2). We find that according to the interviewees, algorithms have the ability to influence job design of employees within the organization, which consequently is expected to influence the tasks and responsibilities of HR-professionals and line-managers. However, digitalization and data storage are necessary to create and implement algorithms.

It is expected that the influence of algorithms on job design consequently influences the role of the HR-professional and the line-manager, resulting in the fact that the division in roles between line-manager and HR-professional changes. First, the role of the HR-professional is expected to change in the way that tasks and responsibilities focus more on tactical and strategic purposes. This shift in the tasks of HR-professionals can also partially be contributed to the HR devolution, where the operational HR-tasks are not executed anymore by HR-professionals, but the line-managers are mainly executing the operational HR-tasks. This shift in tasks results in the fact that line-managers are focusing more on the individual cases and the individual guidance besides the focus on team level, and the HR-professionals are focusing more on department-, and organizational level.

As tasks are expected to change, this consequently influences the competences necessary for an HR-professional, as the HR-professional needs these new competences in order to execute their new tasks better. For the execution of tactical and strategic tasks, the HR-professionals should focus more on working with data and therefore need competences to advise with data. However, the new competences identified for HR-professionals are not necessary for the current HR-professionals in the HR-department. Multiple contextual factors have been found to influence the strength in how far the role of the current HR-professionals will change. First, it depends on the size of the public sector organization and the HR-department, as for large organizations including bigger HR-departments, there is more room to hire new HR-professionals with the new competences that are necessary. However, for smaller HR-departments, the team composition does not change that quickly and the chance is bigger that one of the current HR-professionals needs to learn and develop the competences that are necessary. Second, the educational attainment of the HR-professional is a factor that influences the way of the extent to which the influence of algorithms on job design affects the tasks and responsibilities of the HR-professional. For the lower educated HR-professionals who primarily conduct administrative tasks, due to digitalization, these HR-

professionals see their current tasks disappearing and changing towards more tasks for controlling the processes and problem solving. For higher educated HR-professionals, the influence of algorithms on job design can be found more in the shift from operational HR-tasks to the strategic HR-tasks. Third, technology acceptance influences the whole flow of changes, as HR-professionals that are not willing to change or to use more data and therefore will not accept the use of algorithms within the organization, will have fewer changes in tasks and responsibilities and competences. Fourth, the rules and laws created by the government about the implementation of algorithms within public sector organizations can enable but also hold back the intensive use of algorithms. Therefore, the influence on the role of the HR-professional also depends on how many laws and rules there are and if this restrains the use. Lastly, the strategy of the organization influences the changes in the role of the HR-professional. The strategy can consequently restrain or enable the implementation and use of algorithms. So, there is a significant shift in the roles of the HR-professional and the line-manager due to the influence of algorithmic decision-making on job design. Where multiple contextual factors influence the strength of the changes for the role of the HR-professional.

Lastly, the changing role of the HR-professional consequently influences the HR-department. In all, the HR-department changes in roles within the organization but consequently also changes the value creation for the organization. Especially, the execution of organization wide projects and being a data expert as HR becomes increasingly important due to the influences of algorithmic decision-making on job design.
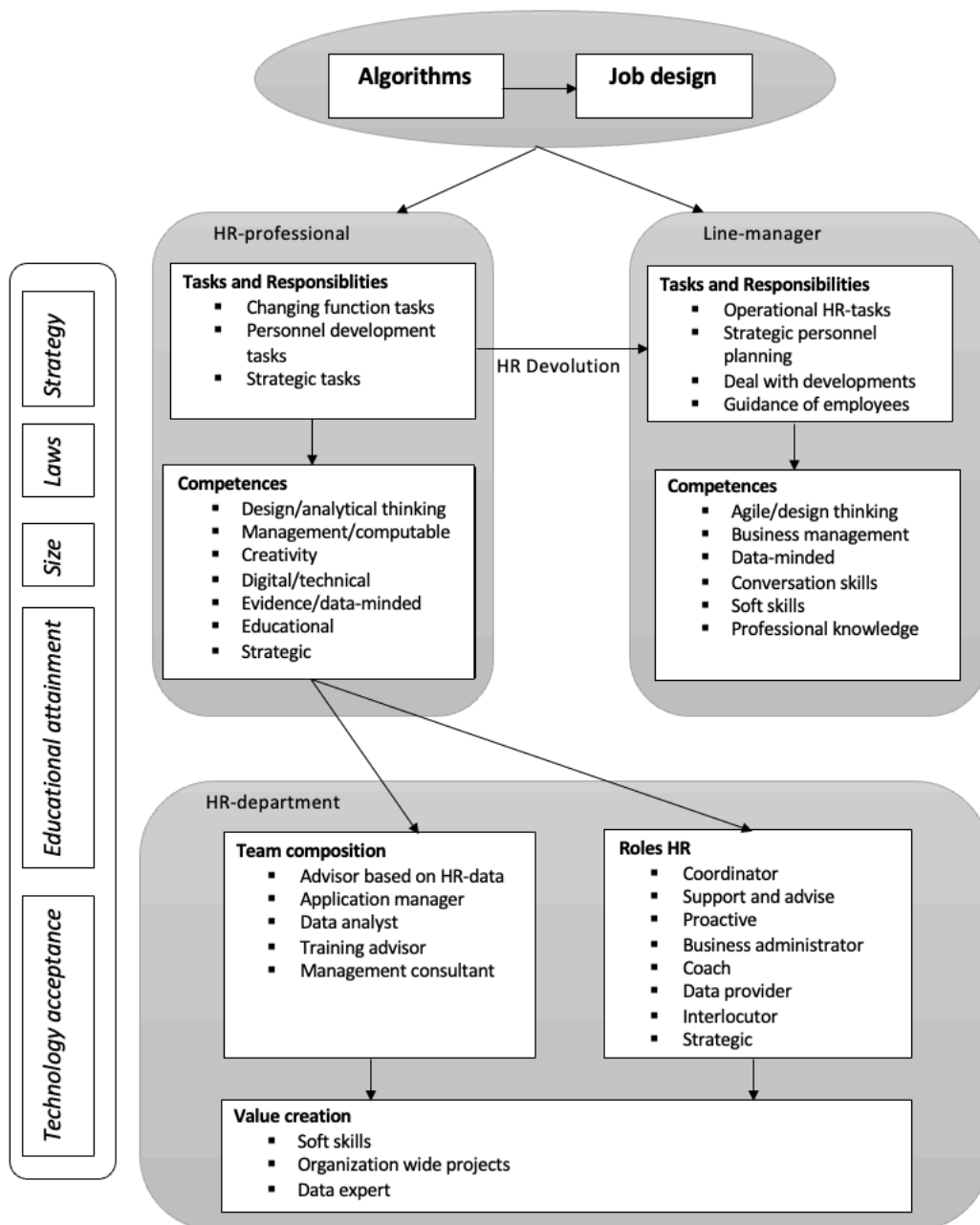
Figure 2. Influence of algorithms on HR-professionals, line-manager and HR-department.

5. Discussion

The aim of this study was to explore the role of the HR-professional and how this role changes when algorithms influence job design. The influence of algorithms on a specific job or function can differ. For example, necessity of new competences, execution of other tasks, or the necessity of new educational attainment. With these aforementioned consequences, the role of the HR-professional was unknown. Therefore, this study discovered that at this moment, the role of the HR-professional is not shifting or not shifting that significantly due to the indirect influence of algorithms on job design. Notably, it is found that during the interviews, all the interviewees talked about the future and their envisioned changes. This results in the fact that it is expected that the role of the HR-professional will make a significant shift over the coming years due to the influence of algorithms on job design. However, within how many years this shift will take place remains unknown. This expectation that the role of the HR-professional will shift towards a more strategic role is already defined and argued over the last 10 till 20 years. For example, Lawler and Mohrman (2003) already argued that at that time, little change was notable in the shift of HR towards the strategic role. Especially, Lawler and Mohrman (2003) defined that with the introduction and use of new IT technology, strategic human resource work is necessary. Interestingly, this study shows that over the years, the role of the HR-professional has not shifted towards the strategic business partner role. This shift is still envisioned. So, in line with the findings of Lawler and Mohrman (2003) this study shows that 18 years later, still little change is found in the shift of HR-professionals to become strategic although increasingly more IT technology is used and the influence of algorithms on job design is showing in organizations. In all, this study adds to the fact that over the last 20 years, several researchers have identified the fact that HR-professionals are expected to shift to a strategic role (Bell et al., 2006; Ulrich et al., 2012) however, this study shows that this shift is still not occurring. At this moment, this shift for HR-professionals is still envisioned.

Besides the envisioned shift towards a strategic role of the HR-professional, there are more findings notable from this study. Especially, this study found that within most public sector organizations, the storage of data is not handled correctly. Particularly, the first step in this process is to digitalize processes to ensure that data is digitized and that the data is available to store. This study found that public sector organizations are all busy with the digitalization of processes in the organization, such as ensuring that all simple administrative tasks are digitalized, for example applying for employers' statements. Digitalization helps the organization to store specific data. However, the results show that currently, public sector organizations are at the start of using and working with data. For the most part, it is unknown which data should be stored, and which data is useful for algorithms and the creation of analyses. This development also demonstrates that the shift for HR-professionals towards the strategic role may be restrained by ignorance about the required data and the storage of that data which is necessary for the creation and use of algorithms. Additionally, digitalization has been an important project within the public sector over the last years. As more and more of the processes are digitalized, this development should also enhance the development of digitalizing the HR-processes, which normally decreases the time of executing administrative tasks as some tasks can already be executed by the employee itself or the line-manager can partly execute the administrative process. Consequently, it is expected that HR-professionals will have more time to focus on the use and analyses of data for better advising to line-managers and for example strategic personnel planning. This finding extends the findings of Isari et al. (2020) who also argue that digital transformation within organizations provides opportunities for HR-professionals to have more time to perform strategic tasks, due to increased efficiency of digitalization. In all, the results show that the shift of HR-professionals towards a strategic role is only envisioned, but this may partially be

restrained by not using data for long-term predictions and algorithms. As the HR-professionals do not have data to look for long-term consequences, it is hard to have a strategic role. This results in the fact that at this moment, there is room for improvement for HR-professionals to conduct their strategic business partner role, as the use of data within their tasks can ensure better long-term decisions and can help to create the strategy. Therefore, this study found that data increasingly becomes important and can create value for the organization as also tasks, competences, team composition and roles for HR are all including the use of data, however, HR-professionals currently not use the data to the fullest.

Furthermore, besides the fact that the influence of algorithms on job design is expected to indirectly affect the role of the HR-professional, the division in roles between the HR-professional and the line-manager is also envisioned to change. These changes in the division of roles is not only contributed to the use of algorithms, but also the HR devolution has an influence. The HR devolution development has already been frequently discussed, as it is known that line-managers are conducting more operational HR-tasks and have consequently more responsibilities with that (Bos-Nehles, 2010; Sujan et al., 2020), and therefore the role of the line-manager becomes increasingly important for the right implementation and execution of the HR-policy (Steijn et al., 2010). Moreover, this study found that line-managers are currently conducting the operational HR-tasks, whereas HR-professionals are expected to execute the tactical and strategic tasks. Besides the HR devolution development, the use of algorithms within the work of employees, which causes changes in the job design, is found to also change the role of the HR-professional, as HR-professionals are more seen as coordinator and only help the line-manager when necessary, this creates more distance between the employees and the HR-professional. Consequently, this study found that the envisioned shift in roles between the HR-professional and the line-manager creates differences in the tasks and responsibilities in the different levels within the organization. So, it is found that the line-manager conducts tasks on the individual- and team level, whereas the HR-professional increasingly focuses on the department- and organizational level. Especially, the execution of organization wide projects is seen as important value creation by the HR-department, relating to the findings of Ulrich et al. (2012).

In sum, this study shows that due to the influence of algorithmic decision-making on job design, it is expected that there will be a significant shift in the role of the HR-professional and consequently in the division of roles between the HR-professional and the line-manager. As a consequence, this influences the way that the HR-department stands in the organization and how the HR-professionals can create value for the organization.

5.1 Theoretical implications
This study makes three important contributions to the HRM literature. First, this study contributes to the HRM literature in the public sector in the way that it expands the knowledge on the HR-professionals and the HR-department within public sector organizations. As it is argued that within all HR-departments, there is a shift from the administrative role to the strategic role (De Bruyn & Roodt, 2009). We reject this claim, as in this study, the interviewees still talked about their envisioned changes which results in the fact that currently the shift towards the strategic role is not shifting significantly in the public sector. Additionally, this study suggests that within HR-departments in the public sector, the use of large data-sets is currently not occurring. According to Newell and Marabelli (2015) the use of large data-sets can ensure that the best strategic decisions are being made. However, currently the HR-professionals do not store data or use the data for advising or decisions that are being made. This results in the fact that the shift of HR of being administrative to strategic is made more difficult as data is not

used in the most effective way. Therefore, further research is necessary to see whether HR-professionals and consequently the HR-department can execute the strategic role without the use of data and how the use of data affects the shift towards the strategic role.

Second, this study adds to the HRM literature in the way that line-managers have been found to guide the employee in their changing job. So, when job design is affected by algorithms, this study particularly found that the line-manager executes the operational HR-tasks to guide the employee and to help them in the transition of their function. The line-manager therefore has an important role in the influences of algorithms on job design. Consequently, the HR-professional is found to execute more tasks towards the guidance of the line-manager and to set up more organization wide projects when there is a demand for it. This finding adds to the HRM literature in the way that there is more space between the line-manager and the HR-professional. Especially, the line-manager has the responsibility to deal with all the developments the employee experiences. Therefore, some new tasks for line-manager have been found. These new tasks are especially the guidance of employees and signaling developments in the department.

Third, this study adds to the HRM literature in the way that through the influence of algorithms on job design, both the HR-professional and the HR-department are expected to change. The changes in the role of the HR-professional and the HR-department do not stand alone, these are intertwined. This leads to the fact that this study expands the findings of Ulrich, Brockbank, Johnson, and Younger (2007) that when HR-professionals upgrade their competences and execute their new tasks and responsibilities well, the department can better meet the changing demands and consequently create value for the business. According to the findings in this study, the HR-department creates value for the organization with soft skills, organization wide projects and being a data expert.

5.2 Practical implications

As found in this study and argued by the interviewees, the role of the line-manager is becoming more important with the HR devolution and the envisioned change of HR to become more strategic. However, it is found that line-managers need other competences because within the organization, the departments are increasingly being seen as business units where the line-manager needs to control all parts of the business unit including finance and HR. Consequently, with the right training, line-managers can start to act more as coaches and can guide the employees better in their personnel developments. With the HR devolution development in most public sector organizations, the line-manager becomes partly responsible for the right fit between the employee with its competences and knowledge and the function. When the function changes due to the influence of algorithms, which results in changes in the function, there is the chance that a mismatch occurs. Such a mismatch can result in lower efficiency, effectiveness and lower satisfaction of employees. These aforementioned consequences lead to negative outcomes for the organization. Therefore, recruitment, selection and training of the current line-managers is important to ensure that employees are guided in the right way and that the fit between employees and their function exists. So, for organizations to remember is that not only employees are offered the right training to deal with the use of algorithms, but that also line-manager are trained to deal with the guidance and other tasks they need to execute in order to help the employee the best. The training of line-managers ensures that they can better take on advice from HR-professionals, and consequently will not resist occurring developments (Andreescu, 2004).

In addition, this study shows that currently, HR-professionals and HR-departments are not using their data optimally, meaning that currently organizations and

HR-departments are not mapping and storing their data or using the available data for analyses or the creation of algorithms. However, organizations are aware of the fact that digitalization is in advanced stages and that algorithms are the next step to take. Furthermore, some of the interviewees identified that the first step in using algorithms is to identify which data is necessary for analyses and how to store the collected data. However, as found in this study, most organizations have not thought about the collection and storage of data. For organizations and especially for the HR-department, the use of data becomes increasingly important. As mentioned by most interviewees, the goal for HR is to have a strategic role within the organization. However, as the HR-department is currently not using data, the shift into a strategic role becomes more difficult. So, for public sector organizations it is important to start using the data and start to advise with the data, this makes the shift for HR to a strategic role easier. So, organizations within the public sector need to become more aware of the importance of data and the value creation of the use of data. Therefore, organizations can create multidisciplinary teams that initiate the use of data within the organization and that try to boost it. Consequently, it is found within this study that an advisor based on data is necessary within the HR-team and that there must be someone who can help all HR-professionals with the use of data or analyzing the graphics created. Not all HR-professionals should be fully concerned with the use of data, but there must be one or two experts on data within the HR-department.

5.3 Limitations and suggestions for future research
This study provided new insights with regards to the use of algorithms within the organization, but also the envisioned changing role of HR-professionals, line-managers and the HR-department. However, during this research, several limitations were distinguished. First, the focus within the study is on algorithms and its influence, however, when conducting the interviews, the interviewees argued that especially line-managers are executing the operational HR-tasks and guide the employees. A program manager argued that within one of the projects, when using algorithms in certain departments, the HR-professional is not even included in the project or the changes that occur for employees. Therefore, it is argued that future research is necessary to put more emphasis on the role of the line-manager and the tasks that the line-manager executes with regards to the guidance of the changing function of the employee. As also within this research the HR devolution is found to be an important influence for all roles, the role of the line-manager should be further explored.

Second, to continue with the role of the line-manager, it is useful to conduct further research and to see how the line-manager sees the changes with regards to the use of algorithms in the organization. As for this study, only professionals that have knowledge about HR or work within the HR-department were interviewed, this results in the fact that the view of the line-manager on this question is not addressed. The trustworthiness of the study is lower as the opinions of the line-managers are not included in this study. So, further research is necessary to especially include the insights of the line-manager on the changing role of HR-professionals, but also on the new tasks and responsibilities that are necessary for the guidance of employees to ensure the process of the changing function will go smoothly.

Third, during the interviews, it became clear that for some of the interviewees and that within some of the public sector organizations, the implementation of algorithms and the use of algorithms is not discussed or thought about. Consequently, for those interviewees, it was hard to imagine how the role of the HR-professional changes accordingly. Therefore, the influences on the role of the HR-professional, line-manager and the HR-department cannot solely be contributed to the use of algorithms within the organization and its influence on job design of employees. For this reason, extensive

research is necessary to see what the solely influence of algorithms is within the public sector. The validation of the results is necessary to see what the solely influence of the use of algorithms is on job design and how the role of the HR-professional changes accordingly.

Lastly, in this study, the focus is on public sector organizations. However, as found within this study, organizations within the public sector are usually some years behind with regards to the private sector. This relates to the limitation that the role of the HR-professional within the public sector is currently unknown as especially algorithmic decision-making is not fully used. However, as argued within this study, the use of algorithms is increasing. Therefore, the same study within the private sector may come up with completely different results as it is expected that organizations in this sector are further with the use of algorithms and consequently algorithmic decision-making and therefore it is expected that the role of the HR-professional with regards to the changing job design of employees is more known.

5.4 Conclusion
Overall, we found that the shift in roles towards a strategic role for HR-professionals is still an envisioned change. It is expected that the role of the HR-professionals changes due to the use of algorithms within jobs. HR-professionals will increasingly conduct tasks and have more responsibilities with regards to changing function, personnel development and strategic tasks. Additionally, it is found that HR-professionals will need other competences in order to conduct the aforementioned tasks, therefore, HR-professionals need to become more businesslike, need more competences to deal with the use of data and creativity to deal with the challenges that will come up. To conclude, the role of the HR-professional is expected to change towards a more strategic role where data becomes increasingly important in order to create value for the organization.

Besides the fact that the role of the HR-professional changes significantly, we found that there is a significant change for the division in roles between the HR-professional and line-manager. Therefore, it is found that the line-manager executes more operational HR-tasks (relating to HR devolution), whereas HR-professionals are envisioned to conduct more tasks that are tactical or strategic. This shift consequently shows that more space is created between the employee and the HR-professional, whereas the line-manager will be more involved with the employee.

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Appendices

Appendix 1: Interview scheme

First of all, I want to thank you for your participation. My first question is: is it ok for you if I audiotape this interview? Regarding the confidentiality and anonymity, I will not use your name in this study. Additionally, I will use the audiotape for the transcription of this interview and after the transcription, I will delete this audiotape.

As aforementioned, I am doing research on what the role of the HR-professional is and how this role changes as algorithmic decision-making influences job design. Consequently, I will ask questions regarding the different roles that HR-professionals have within the organization and how this might be affected due to the influence of algorithmic decision-making on job design.

The interview will be around 30 to 45 minutes. Do you have any questions before we start?

Themes	Questions
Introduction	- For what organization do you work for? What is the size of the organization? - What is your function within the company and what are your main tasks? How long do you work in the same function or do you have experience as HR-professional? - How large is the HR-department within your company?
Algorithmic decision-making/digitalization	- Can you tell something about the use of algorithms within your company? Can you give an example? - Do you think digitalization is a condition for the use of algorithms? - Which purpose has digitalization according to you? Which follow-up steps do you see with digitalization?
Tasks and responsibilities HR-professional	- Which tasks are currently executed by HR-professionals with regards to job design? - Is the HR-professional responsible for keeping the function of the employee fitted? - Are there any changes with regards to the responsibilities between the HR-professional and the line-manager? - With the use of algorithms in the work of employees, do you see or do you expect any changes in the tasks or responsibilities?
Value creation	- Do you think that there are any changes in the value creation of HR(professionals)? - Do you notice that HR-professionals are becoming more strategic/tactical? - Do you notice that HR-professionals are focusing more on the long-term? - Is HR focusing on strategic personnel planning?
Competences	- Which competences do you think are necessary to keep ensuring that the jobs of employees fit them? - Do you think that consequently, team composition needs to change?

	o Do you think HR-professionals have an active or passive role in this change? o What do you think the role of the line-manager is with regards to the changes in the job design of employees?
Closing	o Do you have any questions? Is there any information you still want to share which is not discussed? o Information about the transcript o Do you have any feedback? o Thank you for your participation.