

How AI can Affect Work Design of HR Professionals for Better or Worse

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Artificial Intelligence (AI) has moved from being a science fiction concept in the 1940's, to beating the world champion of the Chinese game GO in 2015, to nowadays being quite common in the forms of facial recognition software, virtual personal assistants, and the first self-driving cars (Haenlein & Kaplan, 2019). Despite the concept having existed for roughly 80 years, it still has a variety of definitions, most of which referencing human intelligence. In the reproduction of their research proposal from 1955, McCarthy et al. (2006) describe AI as a machine capable of mimicking human intelligence. The Cambridge Dictionary defines AI as: “The study of how to make computers that have some of the qualities of the human mind, for example the ability to understand language, recognize pictures, solve problems, and learn.” Although these definitions give an intuitive idea of what AI should be able to do, they are perhaps a bit too vague to draw a line between programs that are AI and programs that merely look like AI. Kaplan and Haenlein (2019) provide a more specific definition which I will adopt for this thesis: “a system’s ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation” (p. 17).

One of the many fields where AI technologies can be useful is Human Resource Management (HRM). From the 1970’s onwards, there has been an increase in the use of electronic HRM technologies by organisations attempting to gain administrative and strategic benefits (Bondarouk et al., 2016), creating a steppingstone for the use of AI technologies in HRM. Starting with roughly a single article published per year in the late 80’s and 90’s, the subject started to gain some momentum in the early 2000’s and has grown exponentially since then (Kaushal et al., 2021). Malik et al. (2020) for example, show that the use of chatbots in various HR functions can improve employee experience and satisfaction, while Ore and Sposato (2021) have found that AI technologies can effectively automate routine tasks and improve recruitment strategies. Although the application of AI technologies in HRM is still in a nascent stage, the previous examples, among other research, show promising results with benefits for different groups of stakeholders (Vrontis et al., 2021).

Despite all the benefits AI could bring HRM, there are still many complications and risks associated with it. Tambe et al. (2019) discern four broad challenges, relating to the complexity of HR phenomena, practical issues regarding data, ethical and legal issues, and potential resistance from employees. Privacy and data ownership are often considered under the umbrella of ethical and legal issues, though Bhave et al. (2019) discuss privacy in the

workplace as a distinct issue in detail. Another common concern relates to how AI technologies may affect work in general, often relating to changing tasks or to human unemployment (Frey & Osborne, 2017; Vrontis et al., 2021). Biases in AI programs are also of great concern, and due to the way in which AI works, inescapable (Haenlein & Kaplan, 2019).

With science fiction stories of AI-caused apocalypses and stories of real-life issues in AI projects such as the gender bias in Amazon's AI recruitment system (Meyer, 2018), not everyone will be equally excited at the prospect of AI in their work. Park et al. (2021) investigated workers' opinions on the use of AI for performance evaluation and describe six types of burdens that employees can feel in such situations, to explain why people might resist it. Tambe et al. (2019) point out that to avoid replicating the dissension and conflict between workers and management that followed Scientific Management, careful attention should be paid to workers' reactions to the introduction of AI technologies in HRM. Some attention to employees' opinions on AI (M. K. Lee, 2018; Malik et al., 2020; Park et al., 2021) and experiences working with and being managed by AI (Parent-Rocheleau & Parker, 2021; Parker & Grote, 2020) has been paid, but research in this area is still in its preliminary stages. Especially when the focus is on HR professionals (meaning people in any HR related functions) collaborating with AI technologies (Ore & Sposato, 2021), and even more so when the HR professionals have not actually worked with AI technologies yet (Nankervis et al., 2019; Niehueser & Boak, 2020; Ore & Sposato, 2021). More research in this area is needed, and the goal of this research is therefore to develop a deeper understanding of how HR professionals view AI and more importantly, how they expect their work will be affected by using AI technologies in their work. This leads to the main research question: *In what ways do HR professionals expect the use of AI technologies in their work to affect their work?*

Because the implementation of new technologies can significantly affect work outcomes—for better or worse—considering the work design perspective can help steer those outcomes (Parker & Grote, 2020). Parker and Grote (2020) point out that so far, in discussing the implementation of new technologies, the focus has mainly been on how humans and their ways of working need to adapt to the new technology. They argue that more beneficial results are achieved when more emphasis is put on how technology can be designed to best suit the needs of humans. In line with this, I will focus on the influence of AI technologies on work design, taking work design to mean “the content and organisation of one's work tasks, activities, relationships, and responsibilities” as phrased by Parker et al. (2017). The

suggestions for AI design that result from this work will reflect the stance that technology should adapt to humans, not the other way around.

Through answering the research question, this thesis provides a more detailed insight into the ways HR professionals expect the use of AI technologies in their work to affect their own work design. To create a model of these effects, I built on existing research on effects of technology design and algorithmic management on work design (Parent-Rocheleau & Parker, 2021; Parker & Grote, 2020), specifying how the use of AI technologies may affect the work design of HR professionals, and improve and elaborate the model through empirical research. This research contributes to the literature on HRM and AI by explaining how the work design of HR professionals may be affected by the use of AI technologies in HRM, emphasising that such effects are not deterministic, and identifying the main factors that shape the effects of AI technologies on the work design of HR professionals (Ore & Sposato, 2021; Parent-Rocheleau & Parker, 2021; Park et al., 2021; Parker & Grote, 2020). I contribute to practice by providing advice for designing AI and work in a way that is beneficial for employees, HR professionals, and the organisation, by considering how AI technologies can affect work design.

In the following section, I explain what AI is, how it works, and mention some issues with AI. I briefly describe HR work in general, followed by the current state of research on AI in HRM. I also consider the effects of AI on the different aspects of work design. This theoretical background finishes with a description of the research model and is followed by an explanation of the research method and analysis of the results. After that, a discussion of the findings and limitations of this study, future research suggestions, and some concluding words on the practical use of the findings follow.

Theoretical Background

What is Artificial Intelligence?

As mentioned in the previous section, Artificial Intelligence (AI) is “a system’s ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation” (Kaplan & Haenlein, 2019, p. 17). Kaplan and Haenlein (2019) also offer two different ways of classifying AI types, either by evolutionary stage or by type of intelligence. Both classifications consist of three classes of AI. For evolutionary stage the first class is Artificial Narrow Intelligence (ANI), which are AI technologies capable of doing tasks in specific areas. Examples of ANI are virtual assistants, search engines and self-driving cars. Artificial General Intelligence (AGI) is the next step, technologies capable of teaching themselves how to solve problems from new areas,

performing tasks in several areas. The final step in AI evolution is Artificial Super Intelligence (ASI), which are technologies that can solve problems in any area, faster and more accurately than a human could. ASI is the type of intelligence most often referred to in science fiction, where humanity is taken over by self-aware computers or robots.

The classification by intelligence type as explained by Kaplan & Haenlein (2019), considers which of the following types of intelligence a technology exhibits: cognitive, emotional, and social. AI technologies that only show cognitive intelligence are classified as Analytical AI and are currently the most common type of AI. When a technology shows emotional intelligence in addition to cognitive intelligence, it is classified as Human-Inspired AI. These technologies can recognise human emotions and adapt their responses accordingly. Humanised AI is the last class, exhibiting all three types of intelligence. True Humanised AI does not exist yet, however, Sophia offers a good example of what it could look like. Sophia is a combination of Human-Inspired AI and robotics and has, among other things, participated in the “Loving AI” project, which found that social robots can be used to help people access self-transcendent states (Mossbridge et al., 2018).

Before moving on to the next section where I will explain in more detail how AI functions, I want to explain why I specifically chose the definition of AI provided by Kaplan and Haenlein (2019). Their definition makes a specific distinction that many other definitions fail to make: “... to *use those learnings* [emphasis added] to achieve specific goals and tasks through *flexible adaptation* [emphasis added]” (p. 17). In other words, AI possesses the ability to adapt itself through what it learns. This distinction becomes relevant when discussing expert systems: Rule-based systems containing the knowledge of experts in the form of if-then logical statements (Kaplan & Haenlein, 2019). Deep Blue, the first computer program to beat the world chess champion first in a game and later in a match, is a famous example of an expert system. Although these expert systems were the first programs to mimic human intelligence, they should not be considered ‘real AI’ in our definition as they do not have the capacity to adapt through learning. Improving an expert system is done by a human changing the code of the program. Still, despite not being real AI, these systems have been valuable in AI research and demonstrate an impressive feat of computer science.

How Does AI Work?

The terms AI and Machine Learning (ML) are often used interchangeably, but ML is actually a subdomain of AI (Colonna, 2013). The subject of ML is the creation of techniques and algorithms that allow a computer program to improve itself by “learning” from experience. This can be done through several types of learning, the most common ones being

supervised learning, unsupervised learning, and reinforcement learning, each of which having a range of methods based on it. These methods are used to train an algorithm using a set of “training data.” In supervised learning, a training data set consists of n observations of sets of features X_1, X_2, X_m , and their corresponding response variable Y (James et al., 2021). The algorithm can then learn what combinations of feature values lead to what value in Y , so that it can make predictions of Y when presented with unlabelled data. An example of such training would be using employee data and their corresponding performance scores to teach the algorithm to predict which job applicants will turn out to be high performers.

Unsupervised learning uses unlabelled sets of data to learn from, aiming to find patterns or commonalities in the data (Colonna, 2013; James et al., 2021). An example of this would be using sales data to identify purchasing patterns which can be used to enhance store layouts. In reinforcement learning, the algorithm learns to decide on which actions to take to optimize rewards over time (de Bruyn et al., 2020). This could be used in marketing to predict which actions to take to maximise long-term profitability of a customer, based on currently available information on the customer and the market.

Two other terms that are often mentioned are neural networks and deep learning. Neural networks are a subdomain of machine learning, with the goal of using algorithms to mimic the way human thinking works. Deep learning can be considered a subdomain of neural networks, as it is a more elaborate version thereof. The technical explanations regarding different AI techniques are outside the scope of this research, but for further explanations I refer the reader to an article from IBM (Kavlakoglu, 2020).

Like humans, AI requires data to learn from. The kind of data will depend on the task(s) for which the AI is created. For HR applications this will usually be information already contained in HRIS systems, though when available, data from other parts of the organisation can also prove valuable (Angrave et al., 2016). Big Data is also a popular topic because it is a major driver of AI (I. Lee, 2017). Big Data is most commonly characterised by the three V's: volume, velocity and variety, though different people advocate for additional characteristics (I. Lee, 2017). In short, volume refers to the amount of data, velocity to the increasing speed of data generation, and variety to the number of different types of data. Social media is one of the main contributors to Big Data, providing large amounts of highly varied data, growing at increasing rates. The Internet of Things (IoT) also contributes to Big Data and AI and is suspected to surpass social media in this regard (I. Lee, 2017). IoT is the concept of individually identifiable devices that are interconnected, collaborating, and sharing data without the need for human intervention. Think smartphones, smartwatches, smart home

devices, but also medical devices. The use of such data can improve our lives, for example by personalising services and recommendations, or by automating all manner of small tasks. There are however many potential issues with the collection and use of these data.

One of the main issues relates to privacy. Privacy is a complicated concept, and privacy in the workplace is discussed in great detail by Bhave et al. (2019). The form of privacy most relevant to AI is information privacy, defined by Bhave et al. as “(perceptions of) control over the acquisition, storage, use, dissemination, and dispersal of employees’ data” (2019, p.132). AI requires a lot of data and makes it less and less difficult to collect all manner of data without the person whose data is collected being any the wiser. These data can be used anonymously to study populations, but AI is making it ever easier to target and manipulate individuals. Additionally, any collection and storage of data entails a security risk, for example from hackers leaking personal data to obtain a ransom from the organisation that owns the data. The ownership of data is another issue. When discussed on an individual level, the concerns are mostly regarding privacy. On the level of organisations and governments, data ownership becomes an issue of unfair advantages, as the ownership of high quality and quantity of data can create such a strong spiral of growth that it leaves competitors no chance of catching up (Kaplan & Haenlein, 2019). There are many more issues that can arise with AI, but the final one to mention here is the problem of bias. Because AI needs training data and is in essence, as Kaplan and Haenlein eloquently put it: “a fancy curve-fitting machine”, any biases present in the training data are maintained and usually exacerbated (Haenlein & Kaplan, 2019).

AI in HRM

HR Work

Human resource management has been proven to be a valuable tool for improving business performance, yet many organisations are overlooking its potential (Ralević et al., 2015). With the growing possibilities in analytical HR, the potential strategic value of HR is only increasing (Angrave et al., 2016). Some of the reasons why this value often goes unrealised are the insufficient analytical skill in existing HR personnel, and the disinterest or even distrust of other managers in the strategic value of HR, often viewing HRM as costs to be reduced as much as possible (Angrave et al., 2016). Ulrich (2016) argues that due to all the changes going on in the business world, HR has the opportunity to take on a larger role and prove its value to business. AI could be a useful tool to aid the HR profession in taking on the opportunity and realising its potential, but even without AI, the way HR work is designed will likely be affected.

The core functions of HRM, which encompass the entire employee life cycle, can be found in any organisation. These core functions are recruitment and selection, performance appraisal, compensation, training and development (Meijerink & Bondarouk, 2021; Piwowski-Sulej, 2021), and workforce planning (Meijerink & Bondarouk, 2021). Although the functions of HR are similar for all organisations, the way in which the work is organised can vary significantly. In very small businesses for example, there is usually no need for a dedicated HR employee as other managers divide the tasks among them (Ulrich et al., 2008). When the business grows, so does the amount of HR work, eventually necessitating dedicated HR employees. The larger the business, the more HR employees are hired. These HR employees are often more focussed on creating and implementing HR policies, leaving tasks including more employee engagement to the line managers. Ulrich et al. (2008) argue that the way HR is organised should reflect the way the rest of the business is organised in order to perform best. They describe three HR organisations—functional, shared services, and dedicated—and describe the five roles and responsibilities in which HR work can be divided in the structure that best fits the most common business structure, the allied/diversified business. For more detailed explanations the reader is referred to (Ulrich et al., 2008). The main point to be made here is that HR work is complex and takes on different forms, depending on the level, and often sees overlapping responsibilities and tasks. Even with the same job title, roles and responsibilities and subsequently work design can vary significantly between jobs.

Employee Experiences with AI in HRM

Although research into the experiences of employees with the use of AI in HRM is still in the early stages, some interesting works have been published fairly recently (M. K. Lee, 2018; Malik et al., 2020; Nankervis et al., 2019; Niehueser & Boak, 2020; Ore & Sposato, 2021; Park et al., 2021). This literature appears to be divided into two streams, one covering the experiences and opinions of the people who are managed (in part) by AI, the other covering the experiences and opinions of HR employees who use AI in their function. The former will be discussed in this section, the latter in the next.

Research on experiences being managed by AI is made more complicated by the ambivalence of employee perceptions of AI (M. K. Lee, 2018). As (M. K. Lee, 2018) explains, employee opinions of AI are much more dependent on context compared to their opinions on human managers. She has tested how employees' judgements of fairness and trust, and emotion differ for decisions made by AI or by a human manager. She has shown that this partly depends on the kind of decision task: if the task is more mechanical, the human

manager and AI are judged roughly equal. If the task is considered to require human skills like intuition and emotional capabilities, AI is considered inferior to a human manager.

When employees are subject to HR decisions made by AI, they are expected to experience six types of burdens (Park et al., 2021). The first type is emotional, describing both unpleasant sensations and emotions resulting from the uncanny valley, and emotions relating to the perceived inhumanity of the AI (when it is considered too objective and harsh) (Park et al., 2021). The second type is mental, referring to the increased cognitive effort required to understand and predict how the AI system makes decisions (Park et al., 2021). The third and fourth kinds of burden are bias and manipulation, both resulting in harm to employees, through unintended system biases or intentional manipulation of the system respectively (Ore & Sposato, 2021; Park et al., 2021). Privacy is the fifth type of burden, concerning the involuntary use of personal information (Ore & Sposato, 2021; Park et al., 2021). The sixth type of burden is social, referring to the way AI can disrupt social relationships in the workplace (Ore & Sposato, 2021; Park et al., 2021). Although employees are usually expected to suffer from and therefore resist the use of AI in HRM (Kellogg et al., 2020; Nankervis et al., 2019; Park et al., 2021), there is some evidence that the use of AI in HRM can be beneficial to employees (Malik et al., 2020). In their case study of a multinational enterprise (MNE) that creates AI applications for all aspects of business and that uses AI technologies in their HR function, Malik et al. (2020) found that the employees who used the technologies had nothing but praise for it. Employees of the MNE experienced a better person-organisation fit and increased satisfaction, they felt more commitment at work and had lower intention to quit. As Malik et al. noted, because the MNE is an early adopter whose core business is the development of AI technologies for business applications, their employees' opinions are likely skewed in favour of AI. So, although such positive attitudes might not be encountered everywhere, they are encouraging.

HR Employee Experiences with AI in HRM

The experiences of HR employees with using AI in their work have so far received a bit less attention from researchers. This could be partly due to the relative novelty of AI in HRM but could perhaps also stem from a view that there are already whole streams of research that focus on human-AI interaction in general and on human-AI cooperation. Yet, due to the nature of the HR function, the use of AI technologies may affect HR work in different and/or additional ways.

HR employees who have been using AI technologies in recruitment and selection functions are generally positive about the experience (Niehueser & Boak, 2020; Ore &

Sposato, 2021). These HR employees tend to emphasise the significantly faster processing speeds of AI over humans as the main benefit. Because the AI system is faster, the candidate experience can be improved by either speeding up the entire process, or by using the time saved to improve the process for a better candidate experience (Ore & Sposato, 2021). Alternatively, the faster processing speeds allow the processing of larger volumes of data which can lead to higher quality candidates (Niehueser & Boak, 2020). Although those who have used the system tend to be confident in its quality (Niehueser & Boak, 2020; Ore & Sposato, 2021), they still recognise some potential risks. There are always risks and uncertainties regarding the reliability and accuracy of such systems (Ore & Sposato, 2021). Additionally, since part of the functioning of the system depends on the honesty of the candidates, there is the risk that they could fool the system and thus lower the accuracy thereof (Niehueser & Boak, 2020). There is also some fear of the potential for discrimination and concerns regarding privacy (Ore & Sposato, 2021). Although some HR employees fear the loss of human touch when introducing AI (Ore & Sposato, 2021), most are confident that human interaction will always be needed in HRM (Niehueser & Boak, 2020; Ore & Sposato, 2021).

HR employees who have not used AI before tend to be less convinced of the benefits of its use and show more divergence in intentions of future use (Nankervis et al., 2019; Niehueser & Boak, 2020). Niehueser and Boak (2020), like Malik et al. (2020), note that the positive attitudes they found may be partly due to a more technophilic culture in the company and therefore might show a slightly skewed picture. However, the high quality of the technology and the carefully planned introduction of the system—planning the pilot with a client, involving the team leader of the pilot early on in the process, and providing ample training—have likely provided a larger contribution to the success of implementation. The importance of how the system is introduced is also stressed by others (Nankervis et al., 2019; Ore & Sposato, 2021).

Work Design

The way in which work is organised has substantial effects on organisational outcomes and the health of employees (Parker et al., 2017). Parker and Grote (2020) offer a great explanation of the impact of technology on different aspects of work and how this affects work outcomes. Parent-Rocheleau and Parker (2021) offer a similar work, focussing on the more specific effects brought about by algorithmic management on the workers subject to it. In this section, the model from Parker and Grote (2020) will serve as a guide to discuss how the use of AI in HRM can affect the work design of the HR employees who will use it, as

their model offers a valuable integration of models of job characteristics (Hackman & Oldham, 1976), and resources and demands (Demerouti et al., 2001). The model consists of five categories of job characteristics. Four of them are considered job resources: those aspects of work that help the employee deal with job demands. Job demands, the remaining category, are any aspects of work that require physical, cognitive, or emotional efforts, and therefore come at a physical or psychological cost. The four categories of job resources are job autonomy and control, skill variety and use, job feedback and related work characteristics, and social and relational aspects.

Before discussing how the characteristics of each of these categories can be affected by the use of AI technologies, the topic of automation (where a machine takes over a human task) versus augmentation (where a machine supports a human with a task) should be discussed, as it serves as an important moderator of how AI technologies affect work design (Leyer & Schneider, 2021). When considering this topic, it is important not to fall into an either-or mindset. As Raisch and Krakowski (2021) explain using the paradox perspective, automation and augmentation are distinct activities when considering a single task at a single point in time, but from a higher level of analysis (considering multiple tasks in a process over time) it becomes clear that the two are not only contradictory but also inextricably linked. They warn that prioritising one approach over the other most likely results in a vicious cycle. The main point here is that although discussing the differences between their effects on work design can make one approach seem superior to the other, it is important to remember to consider the issue from different levels of analysis, taking a more systemic perspective.

Job Autonomy and Control

The category of job autonomy and control is split into two types: decision-making over work processes and boundary control (Parker & Grote, 2020). The first type contains any decisions relating to the work itself, the second refers to decisions regarding when and where to work. The impact of AI on these two types of characteristics is highly dependent on the design and implementation of the system, and on the design of work prior to implementation.

First considering autonomy related to work processes. When automation is the goal, the role of the human becomes mostly supervisory. This kind of work is mentally exhausting, decreases situational awareness and deteriorates skill, making it harder to respond appropriately to problems (Parker & Grote, 2020). Both automation and augmentation can make use of more opaque systems, which decrease interpretability and in turn decrease the control the user has over the situation. For a person to be considered in control of—and therefore accountable for—a process, they need to be able to understand, predict and

influence the process; all three aspects are difficult to maintain with increasing automation. Even with augmentation this can be a challenge, specifically when the augmenting system is used for HR analytics, a subject which HR professionals tend to struggle with already (Angrave et al., 2016). Although the HR professional would still be the one making the decision, they might not understand each of the analyses and subsequent suggestions made by the system. Automation of a task may decrease the autonomy for that task, but the employee might experience more autonomy if they can decide what to spend the saved time on.

In terms of boundary control, AI will not likely have strong direct effects on HR professionals, as it seems unlikely that their work schedule will be regulated by AI. They could however be impacted indirectly. If an AI scheduling system is used for general employees of the company, they could potentially experience the negative effects associated with its use such as decreased motivation, well-being, and performance (Parent-Rocheleau & Parker, 2021). This could grow into problems with productivity or absenteeism, which HR would then be asked to solve. Their autonomy would not be affected, but their job demands would increase because the autonomy of others is affected.

Skill Variety and Use

Skill variety and use refers to a whole range of characteristics involving variety, complexity, and meaning (Parker & Grote, 2020). The automation of boring or physically demanding tasks can lead to desirable effects (e.g., by freeing up time for more interesting tasks), which will for HR professionals mostly mean automating administrative tasks. However, it can also happen that too many tasks are automated, resulting in lower task variety. The user is then also often left with mostly supervisory roles, which can lower task significance (i.e., how meaningful the task is perceived to be), is exhausting and demotivating due to the constant vigilance required, and deteriorates skill due to underuse. When an augmentation approach is used, design is essential. If the technology is designed more transparently, it could support or expand the user's analytical capabilities, allowing them to tackle larger, more complex—and perhaps more meaningful—problems. A common assumption is that AI will increasingly lead to more high-skill and complex jobs and fewer lower-skill jobs, but researchers are increasingly pointing out that even high-skill and complex jobs will likely be subject to change (Haenlein & Kaplan, 2019; Parker & Grote, 2020; Vrontis et al., 2021). Regardless of which types of jobs will change most significantly, HR will likely experience challenges due to shifting demands for new personnel to be hired, and increased demands for training of both new and existing personnel, including HR personnel.

Job Feedback and Related Work Characteristics

The category of job feedback and related work characteristics is somewhat related to the category of skill variety and use in the sense that feedback plays a big role in learning. A lack of feedback due to an opaque AI technology design can make it difficult—if not impossible—for the user to understand how it “thinks”, especially considering how AI keeps adapting by itself (Haenlein & Kaplan, 2019; Parker & Grote, 2020). A lack of feedback can also impair the users’ situational awareness, decreasing their ability to intervene in case of trouble (Parker & Grote, 2020). In HR, the biggest threat would be the technology developing a new bias or strengthening a pre-existing one. With insufficient feedback from the technology, the responsible HR professional will be unable to detect such a development in time, bringing to question whether they can be held responsible for the outcomes. The use of AI in performance management can have both positive and negative effects on those who are managed by it (Parent-Rocheleau & Parker, 2021; Parker & Grote, 2020; Tambe et al., 2019). An increase in the amount of feedback—especially when better aligned to the actual performance of the employee—and the use of clear and appropriate metrics can result in improved understanding of expectations, resulting in improved role clarity (Parent-Rocheleau & Parker, 2021). When the use of AI in performance management is not done well, employees may perceive the feedback as unfair, unclear, and resulting from irrelevant metrics, resulting in distress and frustration (Parent-Rocheleau & Parker, 2021; Parker & Grote, 2020). When the effects on workers are mostly negative, the resulting outcomes such as increased complaints, absenteeism and turn-over, and reduced productivity can lead to increases in workload for HR professionals.

Social and Relational Aspects

The effects of the use of AI in HRM on social and relational aspects are somewhat straightforward. When more HR tasks are automated, the number of opportunities for interacting with employees is reduced, directly affecting HR professionals. On the other hand, the automation frees up time which can be spent on the remaining interactions, which could be beneficial. When a lot of HR interactions that employees have are with AI, they might feel dehumanized and undervalued (Park et al., 2021), but they might also feel less lost in a large organisation (Malik et al., 2020). It seems reasonable to assume that those workers who feel negatively about their interactions with the AI technology would feel some resentment towards those who oversee it, further harming social relations of those HR professionals. Although some research has shown how social interactions with AI can be beneficial for mental health (Mossbridge et al., 2018), when a decision has a negative impact on an

employee, they will most of the time feel worse if the decision is made by AI as opposed to a human (Tambe et al., 2019). People also fear losing the social aspects of work if AI would be implemented in the HR department (Ore & Sposato, 2021; Park et al., 2021). Clearly, the social aspects of work need to be considered with great care when an AI system is designed for HR, as poor design can seriously harm the social health of employees, in turn harming affective work outcomes. As with the other categories of work characteristics, using AI in HRM can indirectly affect HR professionals through the negative effects it can have on other employees.

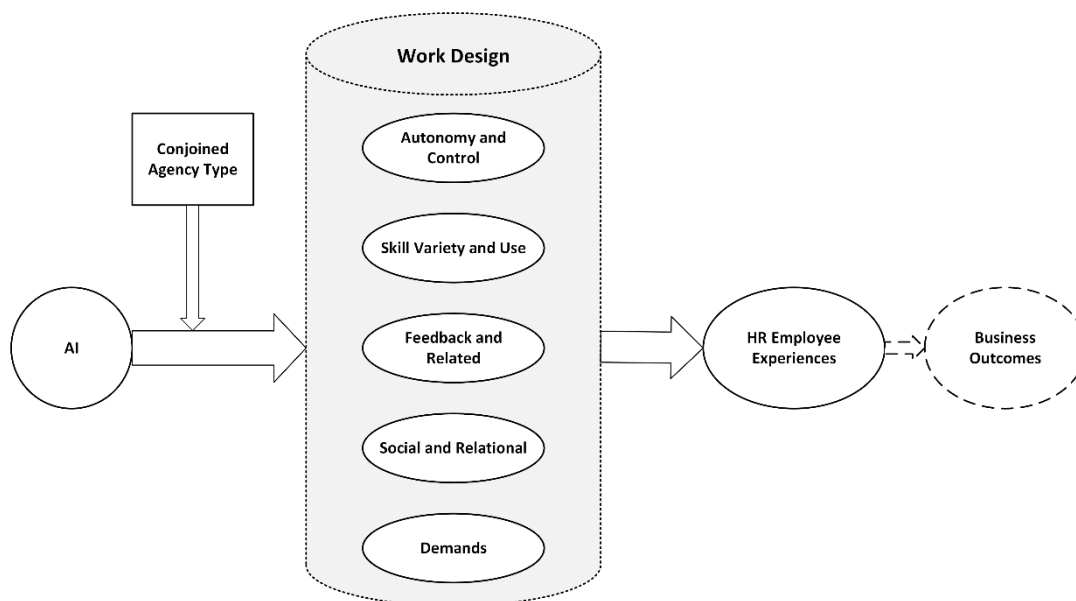
Job Demands

The effects of AI on job demands for HR professionals have mostly already been discussed in the previous paragraphs. Due to poor system design, work can become less stimulating and more fatiguing (Parker & Grote, 2020). The indirect effects discussed above can lead to higher workloads. What HR should guard against when implementing an AI system to take over administrative tasks is the possibility of mostly just shifting the administrative burden to other employees, accidentally increasing their workloads.

Research Model

Figure 1 shows the research model for this thesis. The model shows how the use of AI in HR work can influence the experiences of HR professionals through its effects on their work design. It also indicates that the ways in which AI can affect work design can differ depending on the type of conjoined agency. The type of conjoined agency in the model refers to whether the AI technology is designed to automate or augment the HR professional. The model differentiates between the five characteristics of work design, as these can be affected differently depending on the design of the AI system. Although there is a relation between HR employee experiences and business outcomes, the dashed lines indicate that this relation will not be discussed further in this work.

Figure 1 Research Model: How AI is Expected to Affect HR Work Design



Method

Research Design

Since the goal of this research was to develop a deeper understanding of the thoughts and experiences of a group of people, a qualitative design was considered most fitting. Because the topic has not received much attention yet, a more explorative design was deemed appropriate. Due to the similarities in design, an approach similar to that of Park et al. (2021) was used. Interviews were constructed in a semi-structured format and included vignettes in the second half. A thematic analysis approach was used to analyse the data. More specifically, I drew strong inspiration from template analysis as described by King and Brooks (2018). I share the view of Gioia et al. (2012) that flexibility is not the opposite but rather a vehicle to achieving scientific rigor. Therefore, keeping an open mind and willingness to adapt throughout the process should be beneficial.

Data Collection and Sample

In order to answer the research question posed in the introduction, I conducted fifteen semi-structured interviews with HR professionals. These interviews consisted of two parts. The first part focussed on their current knowledge of and experiences with AI in general and their thoughts and expectations regarding its (potential) uses in their field of work. The second part made use of vignettes and focussed on their ideas of what collaboration with AI in their field should look like. The vignettes were used to help consider different scenarios of using AI in HRM in more detail, and to gain a clearer insight into the ways in which HR professionals believe AI will affect different aspects of their work. This method of using

interviews and vignettes was inspired by the scenario-based interview method used by Park et al. (2021). The interviews were held in Dutch; both translations of the interview protocol are included in Appendix A. Both translations of the vignettes are included in Appendix B.

The participants were chosen to fit the following criteria: they were at the time employed in any HR related function; they are employed at an organisation whose main purpose/product is not related to AI; alternatively, they are (self-)employed as a HR consultant. Care was taken to select participants from a variety of different types of organisations to ensure a variety of different backgrounds. The reason for excluding organisations whose main purpose or product is related to AI was to prevent the gathering of a large proportion of technophiles. While a little familiarity with the concept of AI should aid in considering its uses in HR work, a technophile is more likely to view the topic through rose tinted glasses. As others have noted (Malik et al., 2020; Niehueser & Boak, 2020), this could lead to insights that may not be representative of HR professionals in general. The invitations sent to the potential participants also explicitly stated that prior knowledge about AI was not necessary to participate. This was done to prevent people from rejecting the invitation in the believe that they would not be able to contribute to the study due to their lack of knowledge about AI. To find suitable participants, members of a local HR association were contacted via email and asked whether they would participate or knew someone who might be willing to participate. Similar emails were sent to local HR consultancy firms. Where possible, multiple HR professionals at the same organisation but in different HR functions were asked. Three participants were approached through personal contacts. In total, 15 participants were interviewed, 13 of them in a face-to-face setting, the remaining two by means of a video-call. Details can be found in Appendix C.

In line with the method used by Park et al. (2021), a semi-structured interview approach was used, the protocol for which can be found in Appendix A. Questions were created beforehand to serve as a guideline for the interview but did not need to be adhered to strictly. The questions were adapted, and additional questions were asked whenever deemed necessary. As much as possible, the terms used by the participants were adopted, attempting to really understand their meanings and experiences. Careful attention was paid to avoid leading-the-witness questions. All interviews were recorded, resulting in a total of 16:37:26 hours of recordings. Four of the interviews were transcribed verbatim by hand. The other eleven were transcribed verbatim using the Amberscript AI software, and then checked by hand for transcription errors (some of which were rather comical). This resulted in a total of 394 pages of data to analyse.

Each interview started with questions about the participant and their work. It then moved to general knowledge about AI, which was used both to gauge their understanding of the subject and where needed to explain certain concepts that were relevant later in the interview. After that, questions regarding the use of AI in their organisation and the use of AI in HRM were asked. These questions were used to gain some insight into their current experiences with AI and their expectations for the future. This was followed by the part of the interview that used vignettes. The vignettes were constructed as short situational sketches of the use of AI technologies for different functions of HRM. They were mostly based on descriptions of real AI systems where possible and based on descriptions of potential uses of AI systems when no real AI system existed yet. The first and shortest covered recruitment and selection. The second was longer and covered performance appraisal, compensation management, and training and development. Together they covered most of the core HRM functions. Both vignettes described a heavily automated technology. The reason for this being the assumption that this type of system was expected to result in more negative effects on work design and would therefore make it easier for the participant to consider what they would prefer be changed about the system. Both translations of the vignettes are included in Appendix B. The participant was asked to carefully read through both vignettes and to think out loud when reacting to them. The first few questions in this part focussed mainly on the participant's initial thoughts and feelings about the described systems and if and how they would like to change the design of the system. After this, a more structured set of questions followed, focussing on the expected effects of the systems on the different characteristics of work design. These were structured to first ask how the participant feels the characteristic will be affected in the scenario, followed by how this might differ if the systems were changed according to their suggestions. Some suggestions for changes to the systems were prepared beforehand, in case a participant would require some help with considering design changes. These suggestions are included with the vignettes in Appendix B, but were not included in vignettes handed out to the participants. The final question regarding the vignettes asked which version (if any) the participant would prefer to use.

Data Analysis

As mentioned before, the method of analysis used was strongly inspired by template analysis as described by King and Brooks (2018). Their method uses hierarchical coding without a predetermined number of levels. A coding template is created from a subset of the data and then iteratively improved by applying to further data and revising, to create a final template to be applied to all data in the dataset. The final template can then be used for the

final interpretation of the data. I mostly followed the steps they describe, starting with the familiarisation with the data by transcribing four interviews by hand and correcting the AI generated transcripts. The four manual transcripts formed the first subset, and the correcting of AI generated transcripts was done per subsequent subset. The preliminary coding consisted of open coding in addition to the a priori themes I defined from the theoretical background, namely: 'autonomy and control', 'skill variety and use', 'feedback and related', 'social and relational', 'demands', 'automation' and 'augmentation'. Each new code was written on a sticky note and stuck to the wall, making the next step, clustering, easier, as I could physically group the codes together. In clustering the relations among the themes, both within and between clusters, were considered. From there an initial template was produced, focusing on both hierarchical and lateral relations between themes. I used several sheets of A3 paper on which I could stick the notes and then draw the relations between the themes. Once I was satisfied with the template, I copied it so I could use the (not so) sticky notes for later revisions. Scans of this initial template are included in Appendix D. This process was then repeated with a fresh subset of four interviews, analysing, coding data as it fit the template and adding new codes where needed. Because it felt like the template did not add any benefit during coding over just using a list of codes, I disregarded the template until all interviews were coded. Despite not updating the template, I continued working in subsets and evaluating the code list between subsets, renaming codes, and merging overly similar codes. After the final evaluation of the code list, I went through all interviews again to ensure everything fit. Throughout the process, the code list grew from the seven a priori codes to 123 codes, to later shrink back down to sixty-one codes.

After finishing all coding, the final template was created to help interpret the data. Because the initial template was created with highly inductive reasoning, I got distracted by data that, albeit interesting, was not relevant to my specific research question, and consequently lost sight of said question. Once this became clear, I changed my analysis strategy and switched to more abductive reasoning. For each of the five work design characteristics, I created individual templates for each participant's responses, mapping out all potential effects described by the participant. These participant level templates were then combined into work design characteristic templates, which were critically evaluated and compared to the literature. An example of both the participant level templates and the design characteristic templates is included in Appendix E. During this stage, the integrative themes and their roles were identified as well. This final interpretation of the data was then used to update the research model shown in Figure 1.

Results

This section will first discuss how the participants conceptualise AI. This is followed by the effects AI is expected to have on their work design, closing with a description of the overall role of AI in HRM work design.

What is AI?

The amount of HR professionals' pre-existing knowledge on AI varies, resulting in a variety of conceptions. People often associate AI with digital systems and/or robots, and most strongly with automation. Although most interviewees expressed uncertainty about their descriptions of AI, their attempts were generally close to the definition used in this study. Interestingly, several participants described the concept in terms of its uses, but not the concept itself. Nevertheless, most of the participants struggled to recognise AI in day-to-day life, partly due to a lack of interest in the subject, but also because many applications can be done both with and without AI, most notably chatbots. Discussing some examples and the vignettes helped the participants consider the topic in more depth and imagine potential uses in their work, resulting in ideas ranging from ways to improve onboarding processes, to using a robot (or a conversation assistance tool) for absenteeism interviews. The vignettes also helped the participants consider more deeply and thoroughly how their work design might be affected by AI. So, while their knowledge on the topic is generally limited, with a little help they can aid in considering the human side of AI and work, especially regarding more sensitive HR issues.

"I think I associate it with, I don't know, a computer or a robot which learns by itself, which actually learns from things without everything being programmed." -4

"You see, you are mentioning a couple of things that make me think: oh yeah, yes, no, that makes sense, right, or it sounds very obvious, but it is not really a theme I think about a lot. It is just there, and without you really being aware of what it is exactly." -12

Influence on Work Design

In this section, the expected effects of AI on each of the five work design characteristics will be discussed separately. However, first, it is important to note that technology refers purely to the technology itself, the tool to be used by a human, whereas a system is taken to mean the technology and the user together, as a combined entity. This distinction is necessary for discussing the expected effects on work design, as some effects depend specifically on technology design, while other effects will depend on the design of the system as a whole. For the sake of brevity, supporting quotes illustrating the influence of AI on work design are included in Appendix F.

Autonomy and Control

This research suggests that the autonomy of HR professionals will be affected by the use of AI technologies. To understand the role of AI in shaping these effects, three types of autonomy were found to be of importance: boundary control, method autonomy and decision autonomy. For all three types, it appears that the expected effects are mainly influenced by how the AI technologies are deployed by the organisation, and to some extent by the system design. Figure 2 provides an overview of the expected effects of the use of AI technologies on the autonomy of HR professionals.

Boundary control, or decisions regarding when and where to work, is expected to be reduced if the technology is used to track performance data. Constant monitoring can create the expectation that every second of the designated work hours should be productive, so taking small extra breaks—taking a few minutes to clear the mind between tasks, or when stuck on a difficult problem—would reflect poorly on performance and could therefore result in receiving fewer rewards. Whether boundary control is affected therefore depends on the goal or function of the technology, which is determined by the organisation—or rather, people in the organisation with higher authority than the user of the technology (i.e., HR professional). Whether *method autonomy* is affected also depends on the “higher management” within the organisation, as they determine whether the user is free to choose if and when to use the technology. Method autonomy is unaffected with voluntary use, while it is reduced with mandatory use. The severity of the reduction in method autonomy can be lessened by including the prospective user in the *design of the technology* and the *processes* it will be used for.

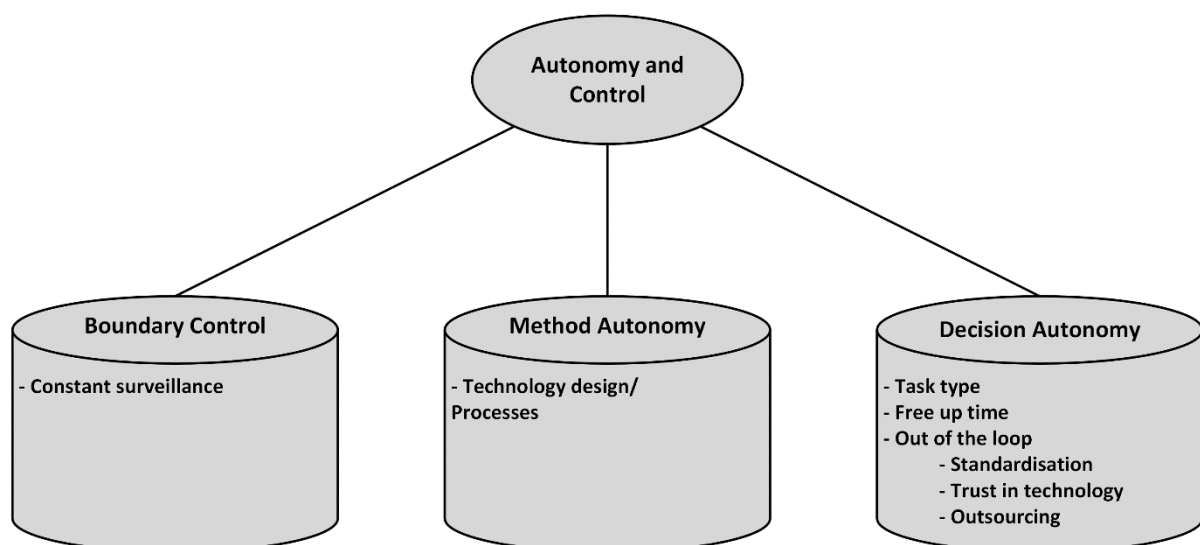
The expected effects on *decision autonomy* can be divided into three topics, as indicated in Figure 2. First, effects included in the topic *task type* stem from the fact that different tasks require different amounts of decision autonomy. Since the adoption of new technology can cause shifts in the task collection—meaning the sum of the specific tasks that make up a job—of the user, it can consequently increase or decrease decision autonomy. Additionally, technology can change the amount of decision autonomy required for a task by changing how that task is done. In both cases, how the decision autonomy would change depends on higher management and on system design. The second topic includes the effects that depend on the technology *freeing up time*, either by increasing efficiency or by taking over certain tasks. How decision autonomy would be affected again depends on higher management. If the user is free to decide how to spend this freed-up time, decision autonomy can increase. If higher management decides how the freed-up time should be spend, decision

autonomy can be affected in different ways. For example, if the extra time can be spent on the initial tasks, the extra “room” to think and improve performance can increase decision autonomy. Autonomy can also be increased by adding new tasks requiring more autonomy. However, if the time is freed up by handing high autonomy tasks to the technology and that time is then spent on lower autonomy tasks, then decision autonomy will decrease.

The third topic, *out of the loop*, represents the effects that can occur if the user is either less involved in, or has less influence on the HR processes, which decreases their decision autonomy. This can happen for several reasons. *Standardisation* generally reduces the amount of autonomy in “normal” cases, reduces the frequency of “exception” cases, and can also reduce the amount of autonomy the user has in those exceptional cases. *Trust in technology* can lead the user to voluntarily surrender some of their autonomy because they trust that the technology provides a correct answer, leaving them to feel less need to consider other options. When *outsourcing* a task, autonomy will decrease by the amount corresponding to that task. For example, when technology is used to enable more employee self-service, HR is outsourcing certain tasks, reducing their autonomy. However, time is freed up by outsourcing, which has the potential to increase autonomy, as discussed previously.

Overall, the amount of autonomy the user will have comes down to how their task collection is restructured. Although technology can influence this, its role is mostly facilitating. Moreover, it appears most, if not all, of these effects can occur regardless of whether the technology in question has AI or not. How the user’s autonomy is affected is predominantly determined by decisions made by higher management and system design.

Figure 2: Expected effects of the use of AI technologies on autonomy and control

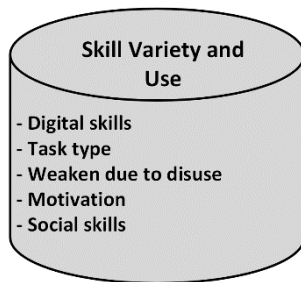


Skill Variety and Use

The effects the use of AI technologies is expected to have on skill variety and use are summarised in five topics, as indicated in Figure 3. Like with autonomy, technology plays a mostly facilitating role, and both technologies with and without AI can achieve the same effects. The effects are mostly shaped by the task division aspect of system design—meaning the division of tasks between the user and the technology, which can be affected by higher management.

Since the user needs to be able to work with the technology, they may need to improve their *digital skills*. The necessity of improvement will largely depend on the user friendliness of the technology's design and the current level of digital skill of the user. The second topic includes effects related to *task types*. The introduction of a new technology can be accompanied by changes in task composition by taking over certain tasks or changing how a task is done. Both cases may require the user to improve current skills or learn new ones. The third topic is complementary to the second, considering how the skills the user no longer needs—because they no longer perform any tasks that require those skills—will *weaken due to disuse*. An example of this from participants is becoming much slower at scanning through large numbers of résumés when the technology takes over that task. The fourth topic consists of effects related to *motivation*. If the technology performs well, the user may feel a lack of need to maintain the relevant skills. The motivation for problem-solving may also be reduced if the user assumes that if the technology indicates a problem cannot be solved, it cannot be solved and it is therefore useless to try a different solution. The final topic is one that the participants considered to be essential in HR work, namely, *social skills*. Several reasons were given for why social skills may become more important and/or valued with the adoption of AI technologies. One being that humans are expected to be better (or cheaper/more cost-effective) at it than technology would be. Strong social skills may also be needed to smoothen the implementation process and to handle the potential negative emotions of employees towards the new technology. Lastly, the technology may be used to identify problems, but with HR-related problems the underlying cause may often only be identifiable using social skills.

Figure 3: Expected effects of the use of AI technologies on skill variety and use



Feedback and Related

The use of AI technologies is expected to affect two types of feedback that have been studied in the literature: situational awareness and feedback on performance. As with the previous characteristic, system design appears to be the main factor in shaping the effects on feedback and related aspects. It also appears to be irrelevant whether the technology used has AI or not.

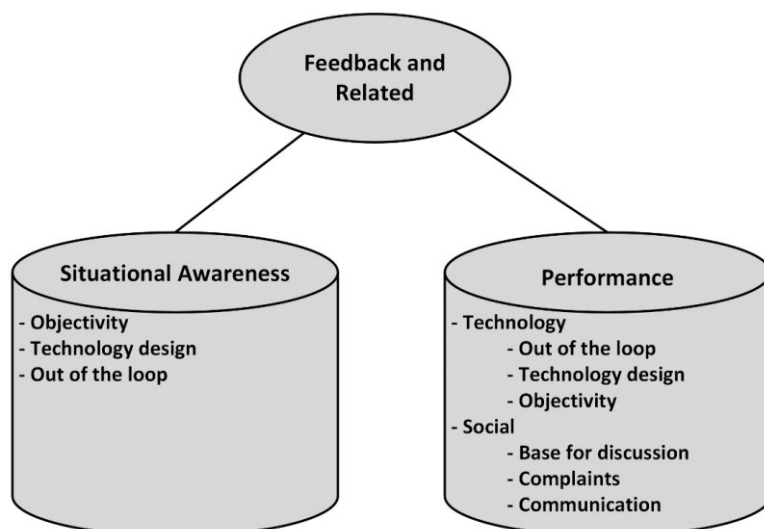
As shown in Figure 4, three topics were mentioned regarding *situational awareness*. Firstly, the technology can provide the user with *objective* data on past events, which is expected to increase situational awareness by providing the user with more extensive (for example, data on events in which the user had no role but that are relevant in the current situation) and less disputable (because the memory of a technology is considered more reliable than human memory) knowledge on the situation at hand. Secondly, the *design of the technology* can affect both the quantity and quality of feedback. Too little feedback is undesirable, but too much data can cause information overload. If the technology is designed well, it can increase the quantity of feedback while simultaneously increasing the quality thereof by presenting it in easy to interpret formats, including the right details, and perhaps running certain (preliminary) data analyses. Lastly, the design of the system may (inadvertently) result in the user being taken *out of the loop*. This could result in certain observations being missed, primarily those pertaining to more human aspects and context from outside the work environment. For example, the technology might detect that the performance of an employee is decreasing, but it would fail to determine that this employee recently became a parent and is consequently not getting enough sleep. If the user is less involved in the process, they may also fail to “measure” this fact.

Feedback on performance can come from *the technology* or from *social sources*. Three topics are important regarding the consequences of AI for the level of feedback and technology for HR professionals. The first topic, *out of the loop*, covers how the user may feel less responsibility for the outcomes of a process they are responsible for when technology

takes over certain tasks within that process. As the technology takes over part of the process, the outcomes less strongly reflect the user's performance because they partly reflect the performance of the technology. The second topic refers to how both the quantity and quality of feedback received from the *technology* will depend on its *design*. Although the increase in quantity should be easy, increasing the quality may be difficult as it may not be possible to meaningfully measure performance on HR work. The third topic relates to this in the sense that technology will provide *objective* feedback, although the accuracy and meaningfulness of that feedback is debatable.

Feedback from *social sources* also brought up three topics. The first reflecting on how the quality of social feedback can be improved if the feedback from the system is used as a *base for discussion*, assuming that the feedback of the system is of good quality. Using such data can help broaden and deepen the discussion of performance and aid in identifying issues or struggles that need to be resolved. The second topic covers how increases in *complaints* and absenteeism rates, and drops in performance of employees can, to some extent, be viewed as feedback on the performance of the user. Although not very direct and reliable, it may be an indication of poor performance of either the user or the technology. The third topic is *communication*, which most participants considered to be the most important source of feedback. Sufficient social interaction is necessary to maintain quality of this type of feedback. This should be considered in the design of the technology and system, though some argued that the user could also take initiative in maintaining sufficient communication by asking their peers for feedback whenever feedback is desired.

Figure 4: Expected effects of the use of AI technologies on feedback and related



Social and Relational

The social and relational aspects of HR professionals' work are expected to be affected by the use of AI technologies in several ways, as summarised in Figure 5. The use of these technologies can affect both the quantity and quality of both individual interactions and of relationships between the HR professional and other employees. Again, the technology appears to facilitate change, but system design and higher management shape the effects. Whether the technology has AI or not again appears to be irrelevant for all but the final topic listed in Figure 5.

Out of the loop refers to how reduced involvement in a process can result in fewer interaction opportunities related to said process. The topic *efficiency* regards the expected effect that people will limit their interactions when there is a high (perceived) pressure to be efficient. They will engage in fewer interactions and rush the interactions in which they do engage. Such pressure would mostly stem from higher management but can also result from system design if the system is used to monitor the workers and measure their performance. The next topic represents a contrasting effect to the previous. If using the technology *frees up time*—and the user is free to decide what to spend that time on—the user can have more frequent interaction opportunities or improve the quality of interactions by spending more time on them, allowing for more in depth or more social interactions.

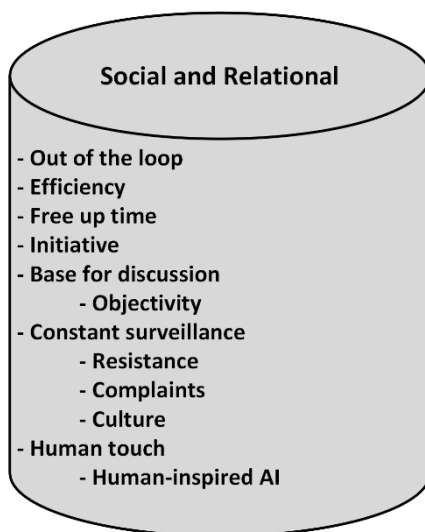
The user can also take the *initiative* to engage in more social interactions, even if the technology reduces the number of work-related interactions. The topic *base for discussion* refers to how the results of tasks or processes usually need to be shared with others, forming the input for discussion on further action. So, although technology may aid in or take over certain tasks and consequently take over certain interactions, it may also give rise to new interaction opportunities. Additionally, the quality of discussions can be improved by the system providing *objective* data. This can prevent disagreements on what is considered fact, saving both frustrations and time that can be spent on other aspects of the discussion, which can improve the quality of relational aspects.

Three effects were mentioned under the topic of *constant surveillance*. The first, *resistance*, is the expectation that people who (feel like they) are under constant surveillance will try to resist such control, harming the relationship between them and the user of the system. In case of the second effect, the user may not be viewed as responsible for the surveillance, but being HR, they will need to process the *complaints* and worries that stem from the surveillance, increasing the number of unpleasant interactions they face. The third, *culture*, would result from some employees starting to “game the system” for their own profit,

often at the expense of others. This can result in reduced trust between people in the same and in different hierarchical layers, and in increased individualism. Over time this can shift the organisational culture to one with lower-quality social and relational aspects.

The topic *human touch* sees two broad expected effects and some related effects regarding *human-inspired AI*. Participants expect that if the technology is considered to always be correct and superior to human decisions, the “human” side of the organisation will diminish, resulting in a cold and anti-social organisation. However, they also believe that if technology is employed in a more complementary way that allows humans to focus more on the “human things,” the quality of social and relational aspects can improve. When it comes to *human-inspired AI*, there is the possibility of the technology (partly) replacing the human HR professional and in doing so reducing their social and relational aspects in quality and quantity. It could however also be that the HR professional mostly interacts with the technology, not the other employees. In that case, a very “human” AI might not be bad, but the resulting reduction in interactions with fellow employees is likely unhealthy, making the overall situation undesirable.

Figure 5: Expected effects of the use of AI technologies on social and relational



Demands

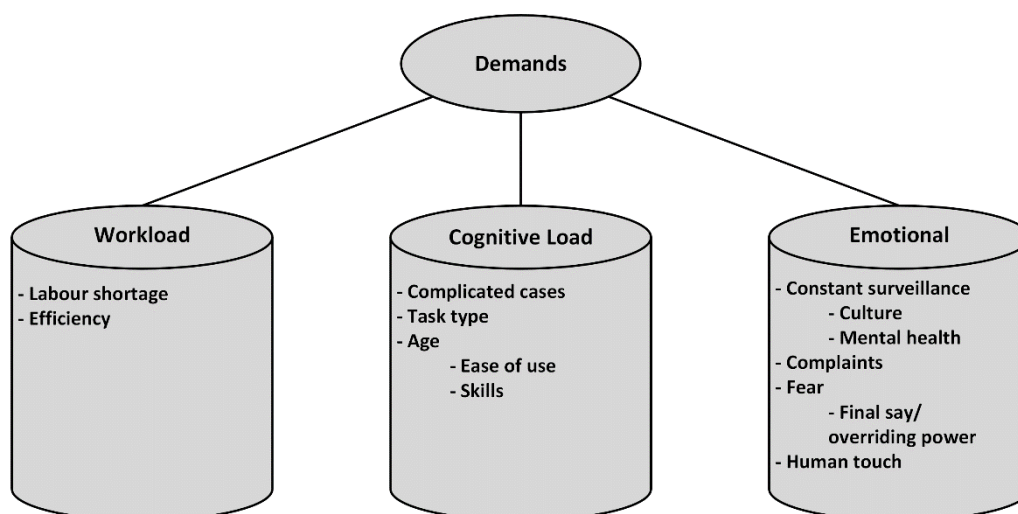
To understand how the work demands of HR professionals are expected to change when using AI technologies, three types of demands were considered: workload, cognitive load, and emotional demands. How these will be affected strongly depends on why and how the technology is used, meaning higher management and system design are the main determinants in shaping the effects on demands. As with the previous characteristics, these effects are expected to happen regardless of whether the technology has AI.

The first type of demand is *workload*, for which the expected effects fall under two topics. *Labour shortage* refers to the effects related to the labour market. It takes more work and effort to find new employees when there is a labour shortage. Shortages can also increase the mobility in the labour market, which increases the frequency of new vacancies. Both increase the workload for recruitment, whereas good technology can help reduce it, allowing recruitment to keep up with the increased workload. How the increased *efficiency* resulting from technology is expected to affect workload depends largely on higher management. If the volume of work stays the same, the workload reduces because the same work can be done with less effort. However, if increased efficiency is interpreted as ‘more work can be done by the same person,’ the workload can stay the same or increase.

The second type of demand is *cognitive load*, where three main topics of effects have been identified. The first of these is *complicated cases*, representing the effects related to changes in difficulty of a task. When a technology is first implemented, it usually takes over the simpler and more standardised cases, leaving the more complicated exception cases for the user to solve. If higher management decides that the use of the technology means that the same number of cases can now be solved with fewer employees, the user(s) of the system will receive additional difficult cases and consequently, a higher cognitive load. Alternatively, if higher management decides to keep the number of difficult cases per user the same, the technology will free up more time and cognitive capacity for the user to spend on those cases by taking over the simpler ones. This would reduce the cognitive load for the user. The cognitive load can also be reduced by using a more augmented system design where the technology assists the user in solving the complicated cases. The topic *task type* involves effects resulting from shifts in task collection, since different types of tasks have different cognitive loads. If the system is designed with the user in an operator role, the cognitive load would be reduced in a most likely undesirable way. The cognitive load could also be increased in a potentially desirable manner if the system design allows the user to take on more interesting, higher-level tasks. The final topic, *age*, revolves around the assumptions that older people will generally struggle more with the use of technology, meaning the use of the technology will increase their cognitive loads. If the technology is designed for *ease of use*, cognitive load should not be increased much, if at all, for users of any age. There is also the expectation that users from older generations will struggle more to obtain new *skills* required with the changes in work. Their cognitive loads would therefore be increased more than those of their younger counterparts.

The third type of demand is *emotional*. The expected effects on emotional demands can be divided into four topics, the first being *constant surveillance*. As mentioned before, the *culture* in an organisation can change in undesirable ways due to constant surveillance. Such changes in culture can increase emotional demands. *Mental health* is also expected to be affected by constant surveillance. Such intense monitoring can be interpreted as a lack of trust in the employees, which they will likely reciprocate. It can create feelings of being judged and incite fear of poor consequences. All of these can be emotionally draining. The reduced boundary control and social interaction that can result from constant surveillance can also harm mental health. The second topic, *complaints*, refers to how an increased number of complaints from other employees can be emotionally demanding, as the user, being an HR professional, will need to show the correct emotional responses to the negative emotions from the employees. The third topic is *fear*. The introduction of new things, or change in general, can arouse some tension or fear, which is emotionally draining. With the introduction of certain technologies, especially those with AI, there is often fear of losing control over a process and being unable to intervene in a timely and effective manner. Therefore, most participants believed that the user should always have the *final say* or *overriding power*, not the technology. The final topic, *human touch*, regards the common concern that the use of technology will result in a cold and harsh organisation. If the technology is designed to standardise and/or optimise everything, there will be no room left for human variety. Such organisations tend to induce feelings of dehumanisation, creating an environment that is very emotionally demanding to work in.

Figure 6: Expected effects of the use of AI technologies on demands



Role of AI in Work Design

Overall, it appears that the role of AI technologies in the work design of HR professionals is facilitating. Moreover, in most cases it seems irrelevant whether the technology in question has AI. What matters is what the technology can do—not how it does it—and how and why it is deployed. AI can expand the technological possibilities, allowing technology with AI to initiate more substantial changes than technology without AI. These changes are then mostly shaped by either or both *higher management* and *system design*. Higher management refers to the influence of people within the organisation with higher authority than the user of the technology (i.e., the HR professional). This means managers, supervisors, the organisational board; anyone higher up in the line of command. For example, for a local HR manager, the head of HR can be considered higher management, but for an HR assistant it could also mean the HR professional they assist.

System design, as mentioned before, refers to the design of the human and technology together, as a unit. There are three main aspects of system design that are relevant in determining how the use of the system will affect the work design of the user. The first, *conjoined design*, refers to the automation/augmentation aspect of design. It considers the overall role of the technology in the technology-human system, essentially asking the question whether the system is supporting or replacing the HR professional. The second aspect, *task division*, is closely tied to the first and regards the division of individual tasks between the user and the technology. The third aspect is *technology design*, which, as mentioned before, concerns the design of the tool itself. This includes considerations such as the *what* and *how* of information sharing between the user and the technology, and the methods with which the technology performs its tasks.

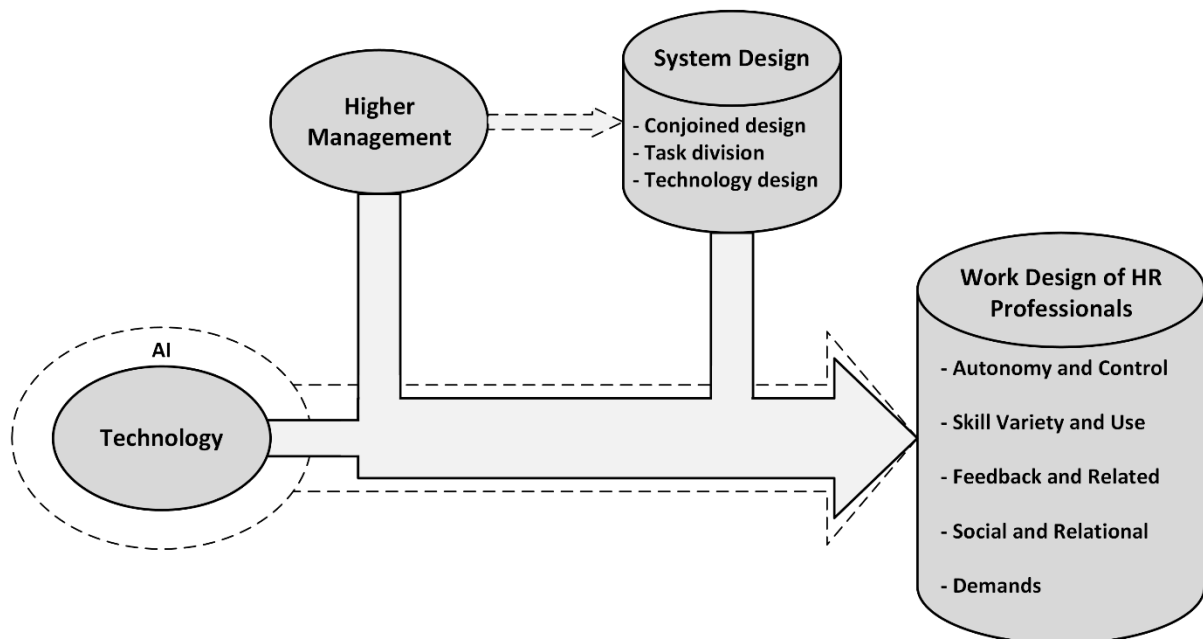
The role of system design may be illustrated best by the participants' responses to the two systems described in the vignettes (which can be found in Appendix B). The first system describes an AI technology to be used in recruitment. The technology takes care of the job posting, scanning the applicants' résumés, scheduling interviews with the applicants that it selects, and creates offer letters to be sent to the candidates that are selected by the HR professional following the interviews. The second system describes an AI technology that essentially takes over performance appraisal, compensation management and training and development, with the HR professional mostly monitoring the technology, receiving monthly reports of the information gathered and decisions made by the technology. The technology makes use of location trackers, camera footage, and personnel files to perform its tasks.

Most participants had the same initial reactions to the systems: they considered the first system interesting and potentially valuable; the second mostly received responses like: “George Orwell”, “Nineteen Eighty-Four”, “Big Brother is watching you” and once even “Soylent Green”, in addition to nearly every participant mentioning the European privacy laws. With the first system, most participants wanted to see the same changes, namely, they wanted the technology to show them which participants it would and would not select and why, giving them the option to modify the selection before letting the system invite the candidates. With the second system, even when assuming that performance can be measured accurately and meaningfully by the technology—which participants considered to rarely be the case—most participants would only want separate pieces of the system. Everyone would remove the cameras, considering their described use an infringement of privacy. The only purpose for which the location trackers were considered acceptable would be to monitor who accessed sensitive data at what time, so purely as a safety precaution. Most other features of the system—monitoring productivity, identifying competency gaps, suggesting courses and training, determining where changes in compensation are due—were considered beneficial, but only if the information is given to the HR professional as suggestions and input for discussions, not if the technology would use it to automatically make decisions. In terms of automation and augmentation, the participants shared the same overall sentiment for both systems. The technology should automate administrative tasks, objective measurements, and objective tasks (for example, answering straightforward, unambiguous questions, such as: “how many vacation days do I have left?”), but when it comes to the more “human” and complicated tasks, technology should only take on an augmenting role, providing the user with information and suggestions for decisions, but never autonomously making decisions. In terms of technology design, there was a bit more variety in how much information participants wanted from the systems, but overall, they agreed that with proper design, technology could provide them with more information without causing information overload. Taking an example from one of the participants, there is no need to be aware of every little instance an employee might be unproductive, but it could be helpful to receive a notification when that employee is frequently spending large amounts of time being unproductive, as it may be beneficial to have a conversation with them about it.

The research model has been updated to reflect these findings and is shown in Figure 7. Technology can facilitate changes in the work design of HR professionals. Although AI may increase the magnitude of change, its overall role in the change process is very limited and perhaps best compared to the role of a doorman in moving furniture into a draughty

house: something needs to keep the door open, and while a doorstop will do the trick, so will a brick, a heavy shoe, or a spare friend. So, technology, with or without AI, takes on a facilitating role, while higher management and system design shape how work design will be affected. Higher management can—but does not necessarily always—also influence system design, affecting the work design of HR professionals both directly and indirectly.

Figure 7: Conceptual model of the role of AI in the work design of HR professionals



To illustrate how work design might be affected differently in different circumstances, Table 1 shows a comparison of the work design of the HR professional in two different scenarios. The first scenario is based on system 2 as described in the vignettes and describes a situation none of the participants would want to work in. The second is based on a version of system 2 that has been improved using the changes proposed by the participants and describes a more desirable scenario.

Table 1: Comparing work design in two scenarios

Scenario 1	Scenario 2
<p>The system works as described in vignette 2, where the technology takes care of performance appraisal, training and development, and compensation management, while the user (i.e., the HR professional) monitors the technology. The user has no influence over the technology, they only passively receive information from it in the form of reports. If something goes wrong with or changes need to be made in the technology, the user must</p>	<p>The system consists of separate but linked technologies which assist the HR professionals with performance appraisal, training and development, and compensation management. Rather than completely automating everything, the technology gathers information and makes suggestions to the user based on that information. Decisions are then made by the user, after which the technology takes care of the administration. Interactions between the user</p>

contact the IT department of the organisation.

Management implemented the new system to reduce HR headcount. To do so, the remaining HR tasks (the ones not taken over by the system) were divided over as few people as possible, and the “redundant” HR professionals were either transferred to other departments or laid off.

and the technology were designed to mimic human interaction.

Instead of using cameras, other methods are used to detect productive and idle time, and rather than the user constantly monitoring this, they are alerted when an employee’s behaviour persistently deviates from their personal baseline.

Management implemented the new system to improve the quality of the HR processes. Using the system frees up time which allowed some HR professionals to focus more on strategy—making use of the data provided by the technology—while others could take more time to help employees.

Autonomy

- Boundary control: implicitly reduced due to constant surveillance
- Method autonomy: reduced
- Decision autonomy: shifts to other tasks

- Boundary control: may slightly reduce
- Method autonomy: must use technology but some freedom in how to use it
- Decision autonomy: increased

Skill variety and use

- Skills specific to tasks taken over by technology will weaken due to disuse
- May need new skills for new tasks
- May improve skills from increase in familiar tasks.
- Technology unlikely to require increased digital skills

- Maintain skills required for decisions
- Administrative skills may decrease but only slightly due to relevance in other areas of work and life
- May hone pre-existing or learn new skills (e.g., social, analytical, strategizing) depending on chosen tasks
- Digital skills likely only need improvement if pursuing strategy tasks

Feedback and related

- Situational awareness: increase quantity
- Performance: increase quantity through technology, decrease quantity through social
- Quality: more objective, according to management also meaningful, so increase

- Situational awareness: increase quantity
- Performance: increase quantity through technology, same quantity through social
- Quality: more objective, likely base for discussion rather than singular truth, increased

Social and relational

- Fewer and more rushed social interactions with colleagues
- Less interaction through HR processes
- Constant surveillance harms relations
- Loss of human touch

- Can take more time for social interactions
- Use of data from system creates more interactions, objectivity of data can improve quality of discussions
- System allows more focus on human touch

Demands

- Workload: increase through desire efficiency
- Cognitive load: reduced on tasks taken over by technology, can shift to other tasks

- Workload: decreases
- Cognitive load: decreases through technology assisting in tasks
- Emotional demands: may slightly increase due to constant surveillance and employee

- Emotional demands: increase due to constant surveillance, lack of human touch, employee complaints, fear of powerlessness	complaints, may slightly decrease due to increased human touch
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Discussion

This study aimed to better understand how HR professionals expect the use of AI technologies to affect their work. By adopting a work design perspective, this research has shown that different aspects of the work of HR professionals can be affected by AI technologies in a variety of nondeterministic ways. The effects it enables take shape through an interplay of several factors throughout the implementation (Parker & Grote, 2020) and use (Boudreau & Robey, 2005) of the technology. This study found that the effects HR professionals expect AI technologies to have on their work design are mainly determined by higher management and system design. Although more factors are at play, which will be discussed in the limitations section below, these two factors appear to have the strongest and most tangible influence on how HR professionals think the use of AI technologies will affect their work design. They will likely form the main pathways in steering the changes brought about by AI technologies towards positive outcomes, as they are the more simple and effective ones to influence. The Job Demands-Resources model (Demerouti et al., 2001) stresses the importance of decreasing job demands and increasing job resources to prevent exhaustion from and improve engagement in work, preventing burnout. This underlines the importance of considering work design throughout the designing and implementation processes, as the use of AI technologies can decrease demands and increase resources when designed well—such as in Table 1, scenario 2—but can also do the opposite when designed poorly—as is the case in Table 1, scenario 1.

Theoretical Implications

The findings of this study have several implications for theory. By applying the work design framework (Parker & Grote, 2020) in the context of HR work, this study showed that the work design of HR professionals will mostly be affected in the same ways as described in Parker and Grote's model, but with the addition of some effects that are more specific to HR work. These additional effects, as predicted in the theoretical section, are the indirect effects on the HR professional that result from the effects that algorithmic management can have on employees, and mainly affect the social and relational aspects and the emotional demands of the HR professional's work but may also require greater social skills of them. It also confirmed that all characteristics described by the work design framework are relevant and together form a comprehensive description of the work design of HR professionals, with the

only note that method autonomy should preferably be considered as a type of autonomy in its own right, rather than as a part of decision autonomy. The findings also support the notion that the use of technology can affect multiple characteristics together. Which (combinations of) characteristics are affected most depends mainly on the function of the technology.

The results provide an addition to the literature on the effects of algorithmic management on work design (M. K. Lee, 2018; Parent-Rochelleau & Parker, 2021; Park et al., 2021), which so far mostly considered the effects on those who are managed by AI, by considering those who would use AI to manage others. This should serve as a first step towards future research that considers both sides of this ‘equation’ together. Considering both sides may give a much deeper understanding of how AI technologies may affect both sides, especially when keeping the findings of Einola and Khoreva (2023) in mind that different groups within an organisation will make sense of AI and see their job roles change because of AI usage in different ways.

This study also found that in the context of HR work design, it rarely matters for HR professionals whether technology is based on AI or not. What matters is what the technology can do, not so much how it does it—in the sense that when the same function can be performed using AI, an expert system, or even underpaid workers pretending to be AI, all will result in the same experiences for the HR professional. Keeping in mind that the term AI has become quite polarising through hype-and-fear narratives and that its meaning has been muddled through misuse in the media (Willcocks, 2020), it appears that the term is more effective to use for attracting readers’ attention than as a factor in explaining how work design might change with the introduction of new technologies. Therefore, it seems more useful to shift the focus of research more in the direction of how certain functionalities of a system—rather than features of the technology in that system—can affect work design. This sentiment is not new, others have made similar calls in the past about IT. Boudreau and Robey (2005), for example, demonstrated how outcomes were enacted through the use of a technology, rather than being embedded in the technology’s features. Orlikowski and Iacono (2001) conclude in their article (with the noteworthy title: “Desperately seeking the “IT” in IT research—a call to theorizing the IT artifact”) that to understand the implications IT can have for individuals, groups, organisations and society “we must theorize about the meanings, capabilities, and uses of IT artifacts, their multiple, emergent, and dynamic properties, as well as the recursive transformations occurring in the various social worlds in which they are embedded.” (p. 133).

So, knowing that any implications of using technology are not determined by the technology's features, why would technology with AI (a feature of that technology) be expected to be different from other technologies? Perhaps science fiction stories about machines taking over the world are subconsciously influencing how AI is perceived. Or, more likely, the expectation stems from the fact that AI could autonomously make decisions and even replace human workers (Frey & Osborne, 2017; Murray et al., 2021). Yet just because it is possible to let the technology make decisions autonomously does not mean it has to be used that way. In this way AI technologies are no different from, for example, a hammer: just because it can bend nails does not mean that nails will definitely and always bend when a hammer is used—they will only bend if the hammer is used in specific ways. That said, the features of a technology can affect how it will be used (Berkers et al., 2022), and regardless of whether this is explained using mediation (Verbeek, 2006) or affordances (Leonardi, 2013), design decisions throughout the entire process from the initial idea to the implementation of the finished product can have far-reaching consequences (Bailey & Barley, 2020). Good design not only results in higher quality jobs, but it can also bring other benefits to the organisation (Sithambaram & Tajudeen, 2022).

Regarding the knowledge of HR professionals on the topic of AI, this study found that most of the participants, despite being able to give fairly accurate descriptions of what AI is, still struggled to conceptualise it and recognise it in practice. One explanation for this discrepancy may be the "AI effect," which describes the phenomenon where AI is no longer recognised as such when it reaches mainstream adoption because people no longer consider it real intelligence (Haenlein & Kaplan, 2019). This sentiment was conveyed by some of the participants noting that AI seemed like such a big, elusive, and special thing, whereas the virtual assistants on their phones had become so normal they never even considered them as potentially using AI. Other participants, when reflecting on their own knowledge (or rather, lack thereof) on the subject, attributed their struggles to a lack of interest in the subject that meant they never really spared a thought for it, as they believed it to be irrelevant to their work and lives. Another explanation may be the fact that some of the more contemporary examples of AI applications, most notably the chatbot, can also be achieved without the use of AI technologies. Most likely, these and other explanations all play a role in creating the discrepancy between being able to describe AI but struggling with conceptualising and recognising it in practice. Regardless, when given a little help to get started, the participants were able to provide clear insights on how they expect the use of certain technologies to affect various aspects of their work design and how it may affect other employees. This is crucial

considering the importance of including HR professionals in the design and implementation processes of technological solutions for work (Berkers et al., 2022; Einola & Khoreva, 2023; van den Broek et al., 2021). Finally, this study found that the expectations the participants had of what AI technologies could offer them were in line with what others have found (Niehueser & Boak, 2020; Ore & Sposato, 2021).

Practical Implications

The findings of this study naturally also have implications for practice. This study identified two main factors that can shape the effects the use of AI technologies can have on the work design of HR professionals and how they may do so, which should aid in designing work and technology in ways that improve (or at least not harm) the work design of HR professionals. The findings also give rise to the recommendation to include the prospective users (i.e., HR professionals) in the design processes of the technology, as they can provide insight into the human aspects of the system. For HR professionals, this study provides descriptions of potential ways the use of AI technologies can affect their work, helping them prepare for their role in the design, adoption, and implementation of AI technologies in their work. For HR technology designers, the results of this study should provide some insight in the effects their design choices can have on the users of their technology. Lastly, this study can give managers insight into how their decisions and strategies can affect how a technology is received by their employees.

Limitations and Future Research

As with every study, this research is not without limitations. One limitation is that its results are based on expectations rather than real-life experiences. However, since the results regarding the effects on work design fall in line with the literature, this does not appear to be much of an issue. Still, investigating real-life experiences with AI in HRM could uncover additional and different effects. Such research might also be better able to consider how the influences of government and law on the development and use of (AI) technologies (Bailey & Barley, 2020; Haenlein & Kaplan, 2019; Parker & Grote, 2020; Willcocks, 2020) may affect the work design of the user.

Although the work design model (Parker & Grote, 2020) used here provides a helpful guide for considering different aspects of work and can really help take work design into account during the development and implementation of new technologies, the separation of the characteristics fails to capture the intertwined nature of them. Parker and Grote (2020) did mention that further research should also consider interactions between the different characteristics, which is an improvement, yet it still approaches the subject with the

assumption that the characteristics are separate. Perhaps a deeper understanding can be achieved if the notion of separation is abandoned, allowing the researcher to consider the constitutive entanglements of the characteristics. Similarly, while the assumption that human, technology, and organisation are separate, interacting entities makes for a more straightforward and communicable analysis, it cannot capture the complexity of reality, as the separation of the social and the material is purely analytical (Orlikowski & Scott, 2008). In future research it may be beneficial to approach the subject of AI technologies and HR work from a sociomaterial perspective—as explained by Orlikowski and Scott (2008)—which works with the view that the social and the material are inherently inseparable and frames analyses in terms of practices rather than networks of relationships. Especially when, as mentioned earlier, both “sides” of HR work (the HR professionals and the employees they manage/serve) are included in the scope of the research. Still better would be, as others have also called for (Bailey & Barley, 2020; Parker & Grote, 2020), to cooperate with researchers from a variety of disciplines to expand the scope of the research to include a much wider range of stakeholders, encompassing the entire process from the initial idea for a technology all the way through the designing and implementation thereof to the societal changes accompanying the (widespread) use of the technology.

Conclusion

This study attempted to gain a deeper understanding of how HR professionals expect the use of AI technologies in their work to affect their work design. By using the work design model proposed by Parker and Grote (2020) and applying it in the context of HR work, this study has shown that HR professionals are expected to mostly experience the same effects on the autonomy, skill variety and use, feedback and related aspects, social and relational aspects, and the demands of their work from using AI technologies in their work as described in Parker and Grote’s model. Due to the nature of HR work, they are additionally expected to experience some indirect effects that result from the ways other employees are affected by HR using AI technologies. These indirect effects mainly affect the social and relational aspects and the emotional demands of the work of the HR professional but may also result in a need to increase social skills. The results also showed that the role of the technology is nondeterministic and that the effects on work design are mainly shaped by higher management and system design. Furthermore, it was found that it is irrelevant whether the technology has AI. Still, the use of (AI) technologies can affect the work design of HR professionals in a variety of ways, into which this research offers some insight.

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Appendix A

Interview Protocol; English

Interview agenda:

1. General Information and Procedures
2. Introduction of Participant & Organisation
3. AI in General
4. AI in Organisation
5. AI in HRM
6. Vignettes
7. Wrapping up

1. General Information and Procedures

Introduce self; Explain goal of research; Explain goal of interview and usage of findings; Interview process, so type of questions, length of session etc.; Informed consent form; Any questions or concerns prior to interview?; Feel free to ask any questions that arise throughout the interview.

2. Introduction of Participant & Organisation

- Please tell me something about your job?
 - Tasks/responsibilities
 - Position in organisation
 - Tenure

3. AI in General

* This section is for getting a rough idea of what the participant knows about the concept of AI and where needed, to explain certain concepts that are relevant later on in the interview.

- How would you explain/describe AI?
- Could you please describe any examples of things that AI can/could do?
- When humans and AI work together, we often differentiate between automation and augmentation. How would you describe these two concepts?
 - Automation: AI takes over/replaces human/can perform task without human/etc.
 - Augmentation: AI supports/improves/supplements/compliments human

4. AI in Organisation

- Can you tell me if your organisation is using AI for anything? If yes, what for?
- Is your organisation planning to use AI for anything (else) in the future?
- To what extent do you think people in the organisation enjoy/are looking forward to working with AI?
- If the implementation of AI would be resisted by the employees, what would you think their reasons are?
- To what extent do you think AI is/will be beneficial to the organisation?

5. AI in HRM

- Have you ever used AI in your work? If so, please describe your experiences.
- What have you heard about any other cases where AI is used in HRM? (not limited to your own organisation)
- To what extent do you think using AI in HRM is useful or maybe even necessary?
- Can you explain any potential downsides you see with using AI in HRM?
 - Standard problems with AI?
 - Problems that specifically arise for HR?
 - Ethical issues?
- In what ways do you think AI will change the way HR work is done?
 - Autonomy and control?
 - Skills?
 - Feedback?
 - Social and relational?
 - Demands?
- Are you seeing any changes due to AI in your own work?
 - Own work changing due to technology?
 - Own work changing because work of other employees is changing?
- Are you seeing any changes due to AI in HRM work in general?
 - Maybe reading about it in articles?
 - Stories from co-workers?
 - Stories from HR employees in other organisations?
- Do you/would you like to work with AI in your job? Why?
- Do you think you will at some point be able to/have to work with AI for your job?

6. Vignettes

Show participant both vignettes and instruct them to carefully read them. Then ask the following questions, prompting them to think out loud. “This system” always refers to the system as described in the vignette.

- How would you feel about using this system?
 - Positive and negative aspects

- In what ways would you change the system(s)?
- How do you think this system would affect your autonomy?
 - Would you still feel in control of the process?
 - And with the changes?
 - What additional aspects would you change?
- Would working with this system affect your skills?
 - Needing different ones?
 - Losing skills due to lack of use?
 - Needing fewer skills?
 - Boring work?
 - And with the changes?
 - What additional aspects would you change?
- With the way the system is described, would you feel like you still get enough feedback?
 - Enough information for decisions?
 - Need to be more involved to understand situation and make proper decisions?
 - And with the changes?
 - What additional aspects would you change?
- How do you think this system might affect the social aspects of your work?
 - Less interaction?
 - Different kinds of interaction?
 - Should you be more in charge to maintain valuable social relations?
 - And with the changes?
 - What additional aspects would you change?
- Do you think the system as described would make your work easier and better, or would it make your job more difficult, boring, or less satisfying?
 - What about the system with the changes we discussed?
- Would you prefer to use this system as described, with the changes we discussed, or not at all? Why?

7. Wrapping up

- Do you have any questions about or comments on the interview?
- Would you like to receive information about the results of the research?
- Can I contact you if I have additional questions?
- If you have any questions or comments about the interview later, feel free to contact me.
- Thank you for participating.

Interview Protocol; Nederlands

Interview agenda:

1. Algemene Informatie en Procedures
2. Introductie van Deelnemer & Organisatie
3. KI in het Algemeen
4. KI in de Organisatie
5. KI in Personeelszaken
6. Vignetten
7. Afronding

1. Algemene Informatie en Procedures

Introduceer zelf; Leg het doel van het onderzoek uit; Leg het doel van het interview en het gebruik van de bevindingen uit; Interview proces, dus het type vragen, duur van de sessie etc.; Geïnformeerde toestemming formulier; Nog vragen of opmerkingen voor het interview?; Stel gerust vragen die in je opkomen tijdens het interview.

2. Introductie van Deelnemer & Organisatie

- Vertel me alstublieft iets over uw functie?
 - Taken/verantwoordelijkheden
 - Positie in de organisatie
 - Dienstverband

3. KI in het Algemeen

* Dit deel helpt met een ruwe inschatting van de kennis van de Deelnemer van het concept AI en om, waar nodig, bepaalde concepten uit te leggen die relevant zijn voor later in het interview.

- Hoe zou u KI uitleggen/beschrijven?
- Zou u enkele voorbeelden kunnen geven van dingen die KI kan/zou kunnen doen?
- Wanneer mensen en KI samenwerken, differentiëren we vaak tussen automatisering en augmentatie. Hoe zou u deze twee concepten beschrijven?
 - Automatisering: KI neemt taken over/vervangt de mens/voert taken uit zonder de mens/etc.
 - Augmentatie: KI ondersteunt/verbetert/voeg toe aan/complimenteert de mens

4. KI in de Organisatie

- Zou u mij kunnen vertellen of uw organisatie KI ergens voor gebruikt? Zo ja, waarvoor?
- Is uw organisatie van plan om KI in de toekomst ergens (anders) voor te gebruiken? Zo ja, waarvoor?
- In hoeverre denkt u dat mensen in uw organisatie het fijn (zouden) vinden om met KI te werken?
- Als medewerkers weerstand zouden bieden aan de implementatie van KI, wat zouden volgens u hun redenen zijn?
- In hoeverre denkt u dat KI bevorderlijk is/zou zijn voor uw organisatie?

5. KI in Personeelszaken

- Heeft u ooit KI gebruikt in uw werk? Zo ja, wat waren uw ervaringen daarmee?
- Wat kan u mij nog vertellen over andere gevallen waar men KI gebruikt in personeelszaken? (Hoeft niet per sé in uw organisatie te zijn)
- In hoeverre denkt u dat het gebruik van KI in personeelszaken nuttig of misschien zelfs noodzakelijk is?
- Welke mogelijke nadelen kleven er volgens u aan het gebruik van KI in personeelszaken?
 - Standaard problemen van KI?
 - Problemen die specifiek voorkomen bij personeelszaken?
 - Ethische problemen?
- Op welke manieren denkt u dat KI de manier waarop werk in personeelszaken wordt gedaan veranderd?
 - Autonomie en controle?

- Vaardigheden?
- Feedback?
- Sociaal en relationeel?
- Eisen?
- Ziet u al veranderingen in uw eigen werk dankzij KI? Zo ja, welke?
 - Eigen werk veranderd door technologie?
 - Eigen werk veranderd doordat het werk van anderen veranderd?
- Ziet u veranderingen in het algemeen door het gebruik van KI in personeelszaken?
 - Misschien dingen erover gelezen in artikelen?
 - Verhalen van collega's?
 - Verhalen van collega's in andere organisaties?
- Vindt u het leuk/zou u het leuk vinden om KI in uw werk te gebruiken? Waarom?
- Denkt u dat u op een gegeven moment KI in uw werk gaat mogen/moeten gebruiken?

6. Vignetten

Laat de deelnemer beide vignetten zien en instrueer die ze zorgvuldig te lezen. Vraag vervolgens de vragen hieronder en spoor hen aan tot hardop denken. "Dit systeem" refereert altijd naar het systeem zoals beschreven in het vignet.

- Wat zou je ervan vinden om dit systeem te gebruiken?
 - Positieve en negatieve aspecten
 - Op wat voor manieren zou u het systeem/de systemen aanpassen?
- Op welke manier denkt u dat dit systeem uw autonomie zou veranderen?
 - Zou u nog steeds het gevoel hebben dat u het proces onder controle hebt?
 - En met de aanpassingen?
 - Welke andere aspecten zou u nog veranderen?
- Zou het gebruik van dit systeem invloed hebben op uw vaardigheden?
 - Andere vaardigheden nodig?
 - Vaardigheden kwijt raken door ongebruik?
 - Minder vaardigheden nodig?
 - Saai werk?
 - En met de aanpassingen?
 - Welke andere aspecten zou u nog veranderen?
- Met de manier waarop het systeem is beschreven, zou u nog het gevoel hebben dat u voldoende feedback krijgt?
 - Voldoende informatie voor beslissingen?
 - Meer betrokkenheid nodig om de situatie te begrijpen en passende beslissingen te maken?
 - En met de aanpassingen?
 - Welke andere aspecten zou u nog veranderen?
- Op welke manieren denkt u dat dit systeem de sociale aspecten van uw werk zou beïnvloeden?
 - Minder interactie?
 - Andere soorten interactie?
 - Zou u meer zeggenschap moeten hebben om waardevolle sociale relaties te kunnen onderhouden?
 - En met de aanpassingen?
 - Welke andere aspecten zou u nog veranderen?

- Zou het beschreven systeem uw werk makkelijker en beter maken, of zou het uw werk moeilijker, saaier, of minder bevredigend maken?
 - En met alle aanpassingen die we hebben besproken?
- Geeft u de voorkeur aan gebruik van het systeem zoals het is beschreven, met de besproken aanpassingen, of in zijn geheel niet? Waarom?

7. Afronding

- Heeft u nog vragen of opmerkingen over het interview?
- Zou u nog informatie over de resultaten van dit onderzoek willen ontvangen?
- Zou ik contact met u mogen opnemen als ik nog aanvullende vragen heb?
- Als u later nog vragen of opmerkingen over het interview hebt mag u gerust contact met me opnemen.
- Bedankt voor uw deelname.

Appendix B

Vignettes; English

Topic	Vignette
<p>1: Recruitment and selection</p> <p>based on (Niehueser & Boak, 2020)</p>	<p>Your company has implemented a new AI system for use in HR, more specifically in recruitment and selection. When a position needs to be filled, you provide the system with the details of the position and the candidate profile. The system then takes care of the job posting, résumé screening and scheduling the interviews. After the interview the system constructs an offer letter and asks you whether it should send the letter to the candidate.</p> <p>Changes to augmentation:</p> <ul style="list-style-type: none"> - The system writes a suggested job posting, but you get to read and edit it before it is posted. - The system screens the résumé's and selects applicants to invite for an interview, but you need to approve first before the system can schedule the interviews.
<p>2: Performance appraisal, compensation management and training and development</p> <p>Based on (Malik et al., 2020; Park et al., 2021; Tambe et al., 2019)</p>	<p>Your company has implemented a new AI system for use in HR. The system takes care of performance appraisal, training and development, and compensation management. To allow the system to do so, every member of the organisation received a new key card equipped with a technology which monitors their whereabouts within company grounds and compares this with their schedules. Camera footage is also analysed to determine when the employee is working and when they are idle. The system combines this information with several other measures of productivity—relevant to the specific work of the employee—and uses this to calculate a productivity score. Qualitative measures of performance provided by the manager responsible for the employee are analysed by the system and combined with the productivity score to form an overall performance score. The system uses these performance scores, the educational data of the employees, and information about future projects to identify any competency gaps. Based on these competency gaps, the system recommends courses or trainings to individual employees to improve their skills and prompts them when there is an opportunity to apply. Whenever an employee decides to join, the system takes care of the administrative work. Aside from being used to identify competency gaps, the performance scores are also used by the system to determine if an employee should receive a pay-rise or other monetary reward and the appropriate amount thereof. The system takes care of all necessary administration automatically. You receive monthly reports from the system about its functioning. These reports include overviews of performance scores in different parts of the company; lists that identify systematic underachievers; overviews of competency gaps and the trainings/courses that employees decided to join; and overviews of changes made regarding compensation.</p> <p>Changes to augmentation:</p> <ul style="list-style-type: none"> - Instead of just receiving performance scores you can also view all measures separately and have the option to calculate

	<p>different performance scores based on measurement sets of your choosing.</p> <ul style="list-style-type: none"> - Instead of doing everything automatically, the system first runs any suggestions by you. You then decide whether you accept or decline (parts of) the suggestions offered by the system, or accept the suggestions after changing them as you see fit.
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Vignettes; Nederlands

Onderwerp	Vignet
<p>1: Werving en selectie</p> <p>based on (Niehueser & Boak, 2020)</p>	<p>Uw bedrijf heeft een nieuw KI systeem geïmplementeerd voor gebruik in personeelszaken, specifiek voor werving en selectie. Wanneer er een functie moet worden ingevuld, voorziet u het systeem van de details over de positie en het kandidaat profiel. Het systeem zorgt voor de vacature, het scannen van de Cv's en het inplannen van de interviews. Na elk interview maakt het systeem een aanbiedingsbrief en vraagt het u of het de brief naar de kandidaat moet sturen.</p> <p>Aanpassingen voor augmentatie:</p> <ul style="list-style-type: none"> - Het systeem schrijft een voorstel voor een vacature, maar u kan het lezen en bewerken voordat het wordt geplaatst. - Het systeem scant de Cv's en selecteert kandidaten om uit te nodigen voor een interview, maar u moet eerst toestemming geven voordat het systeem de interviews kan inplannen.
<p>2: Prestatiebeoordeling, compensatie management en training en ontwikkeling</p> <p>Based on (Malik et al., 2020; Park et al., 2021; Tamba et al., 2019)</p>	<p>Uw bedrijf heeft een nieuw systeem geïmplementeerd voor gebruik in personeelszaken. Het systeem regelt prestatiebeoordeling, training en development, en compensatie. Om te zorgen dat het systeem dit kan doen, heeft ieder lid van de organisatie heeft een nieuwe sleutelkaart ontvangen waar een technologie in is verwerkt welke bijhoudt waar op het bedrijfsterrein die zich bevindt en vergelijkt dit met diens agenda. Camerabeelden worden ook geanalyseerd om te bepalen wanneer de werknemer aan het werk is en wanneer niet. Het systeem combineert deze informatie met meerdere andere criteria van productiviteit—die relevant zijn voor het specifieke werk van de werknemer—en gebruikt dit om een productiviteitsscore te berekenen. Kwalitatieve prestatiecriteria die worden geleverd door de manager die verantwoordelijk is voor de werknemer worden geanalyseerd door het systeem en gecombineerd met de productiviteitsscore om zo een algehele prestatiescore te vormen. Het systeem gebruikt deze prestatiescores, opleidingsdata van de werknemers en informatie over toekomstige projecten om hiaten in competenties te identificeren. Aan de hand van deze hiaten beveelt het systeem cursussen of trainingen aan individuele werknemers aan om hun vaardigheden te vergroten, en spoort het aan wanneer er een mogelijkheid om in te schrijven is. Wanneer een werknemer besluit om zich in te schrijven regelt het systeem de administratie. Het systeem gebruikt de prestatiescores niet alleen om hiaten in competenties te identificeren, maar ook om te bepalen of een werknemer een opslag of andere monetaire beloning verdient en het gepaste bedrag daarvan. Het systeem regelt alle benodigde administratie automatisch. U ontvangt maandelijkse rapporten van het</p>

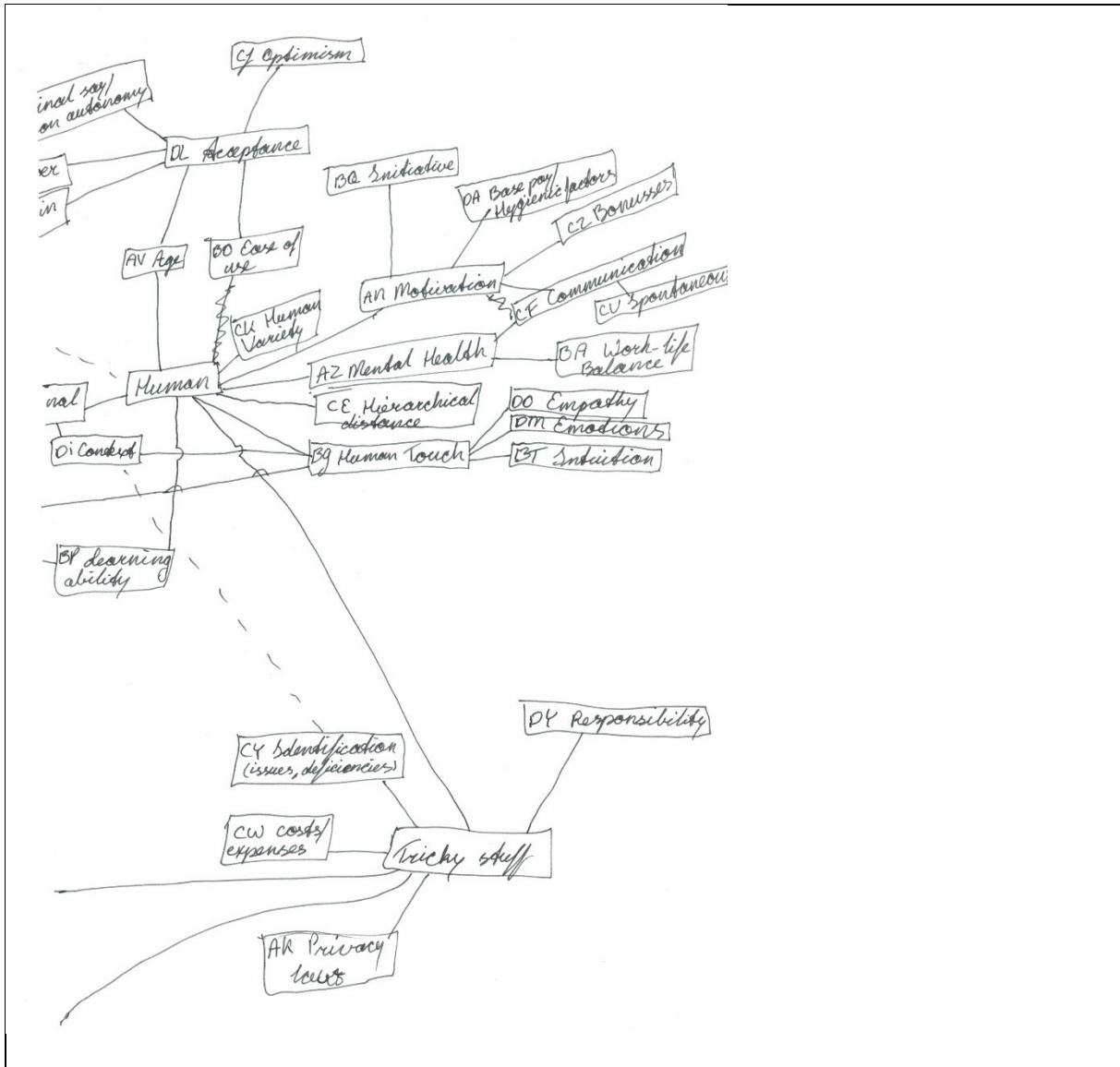
	<p>systeem over het functioneren ervan. Deze rapporten bevatten overzichten van de prestatiescores in verschillende delen van het bedrijf; lijsten die de systematische onderpresteerders identificeren; overzichten van de competentie hiaten en de trainingen/cursussen waar werknemers zich voor hebben ingeschreven; en overzichten van alle veranderingen die zijn gemaakt met betrekking tot compensatie.</p>
	<p>Aanpassingen voor augmentatie:</p> <ul style="list-style-type: none"> - In plaats van dat u alleen de prestatiescores krijgt, kan u ook de scores op alle criteria apart bekijken en heeft u de optie om verschillende prestatiescores te berekenen aan de hand van door u gekozen sets criteria. - Het systeem stuurt alle suggesties eerst via u in plaats van alles automatisch te doen. U beslist of u (delen van) de suggesties accepteert of afwijst, of dat u suggesties accepteert nadat u ze naar wens heeft aangepast.

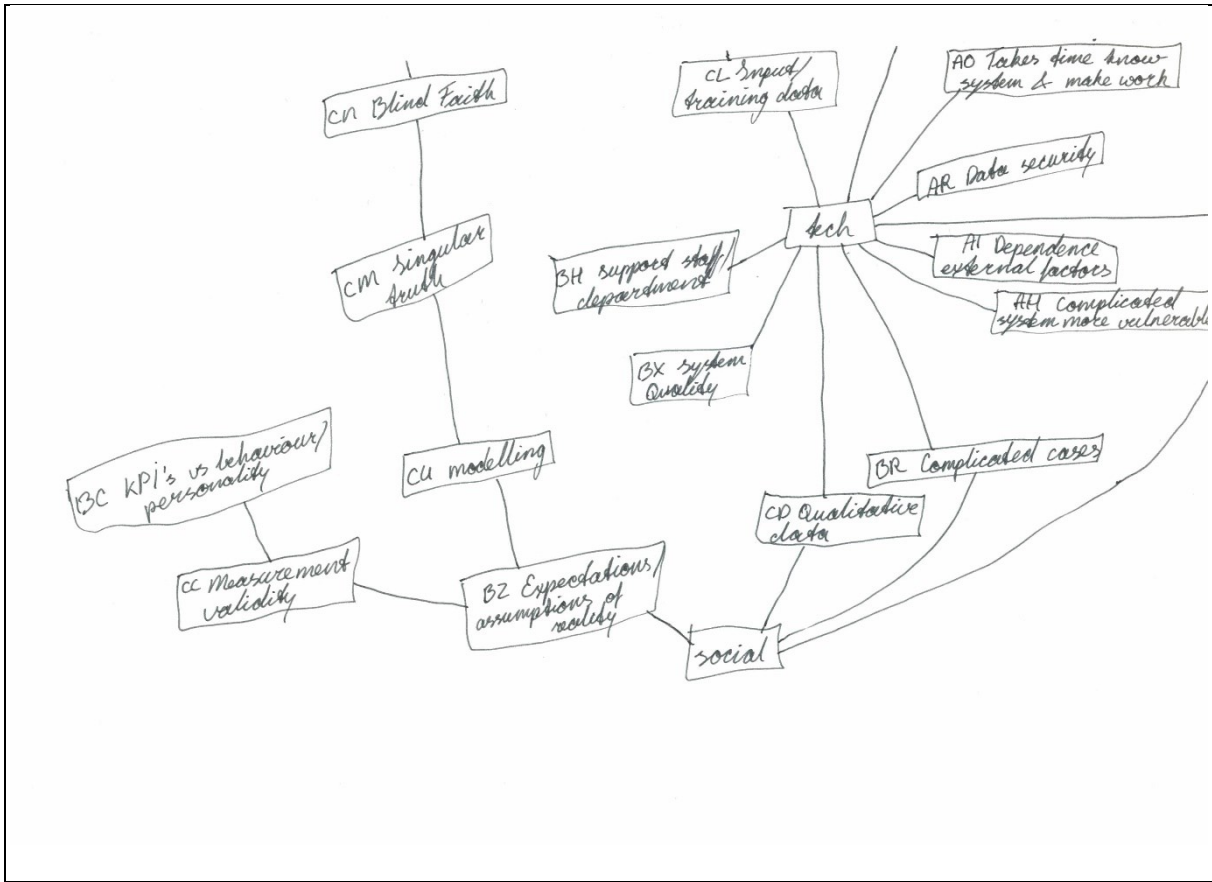
Appendix C

P# ¹	Gender	Function	Industry	Interview time (h)
1	M	Office supervisors	Telecom Services	00:57:56
2	W	Management and organisation analysts	HR consultancy	01:27:02
3	W	Personnel and careers professionals	Education	01:04:10
4 *	M	Human resources managers	Education	01:14:21
5	M	Human resources managers	Healthcare	01:26:18
6	M	Personnel and careers professionals	Contracting	01:15:19
7 **	W	Management and organisation analysts	HR consultancy	01:43:39
8 **	W	Management and organisation analysts	HR consultancy	²
9 *	W	Personnel and careers professionals	Education	00:45:13
10	W	Personnel and careers professionals	Automotive	01:04:12
11	M	Human resources managers	Healthcare	01:25:01
12 ***	W	Personnel and careers professionals	Public sector	01:00:34
13	W	Personnel and careers professionals	Engineering contracting	01:12:20
14	M	Human resources managers	Government	01:07:26
15 ***	W	Policy administration professionals	Public sector	00:53:55

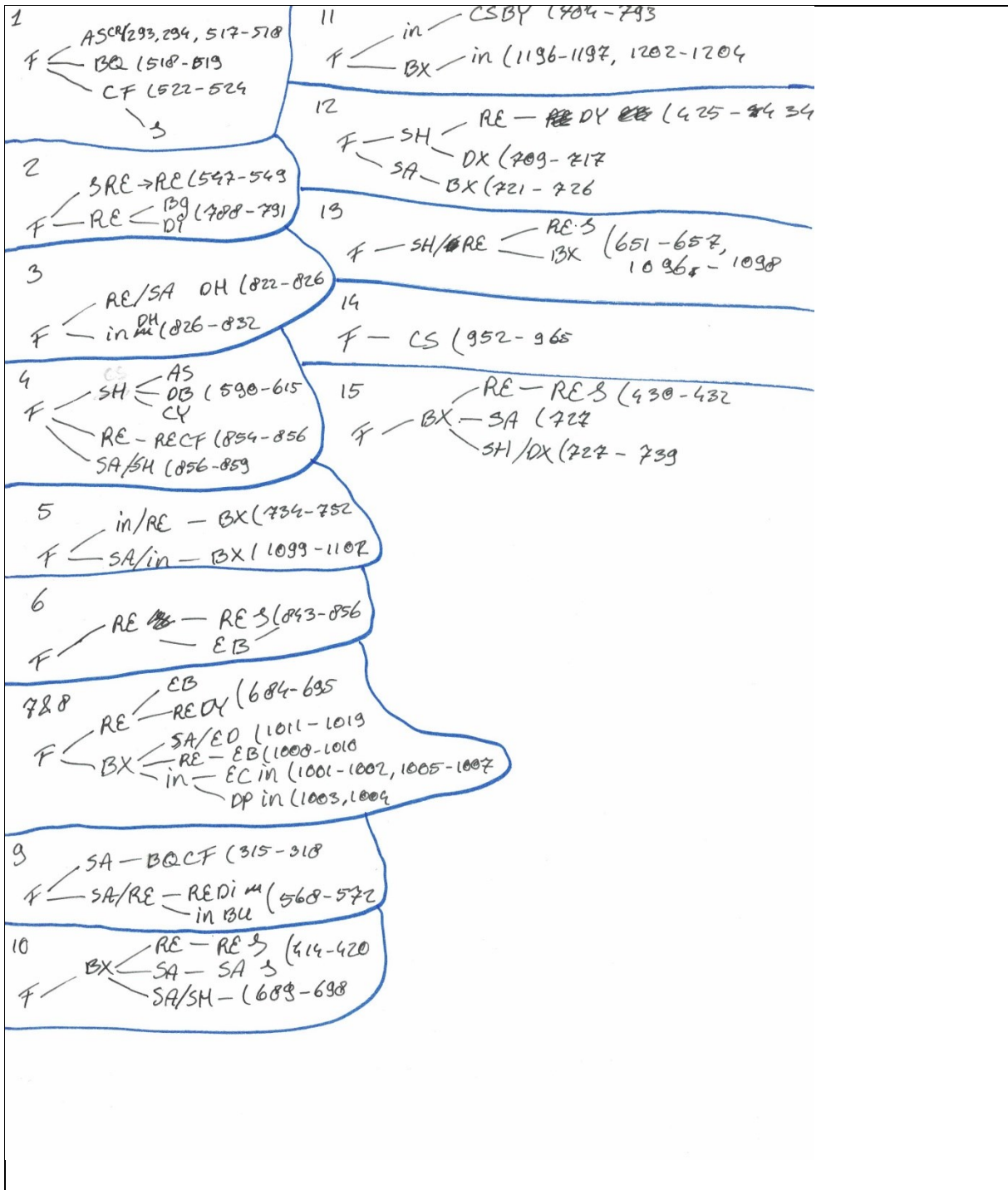
¹ Same number of * indicates participants are from the same organisation

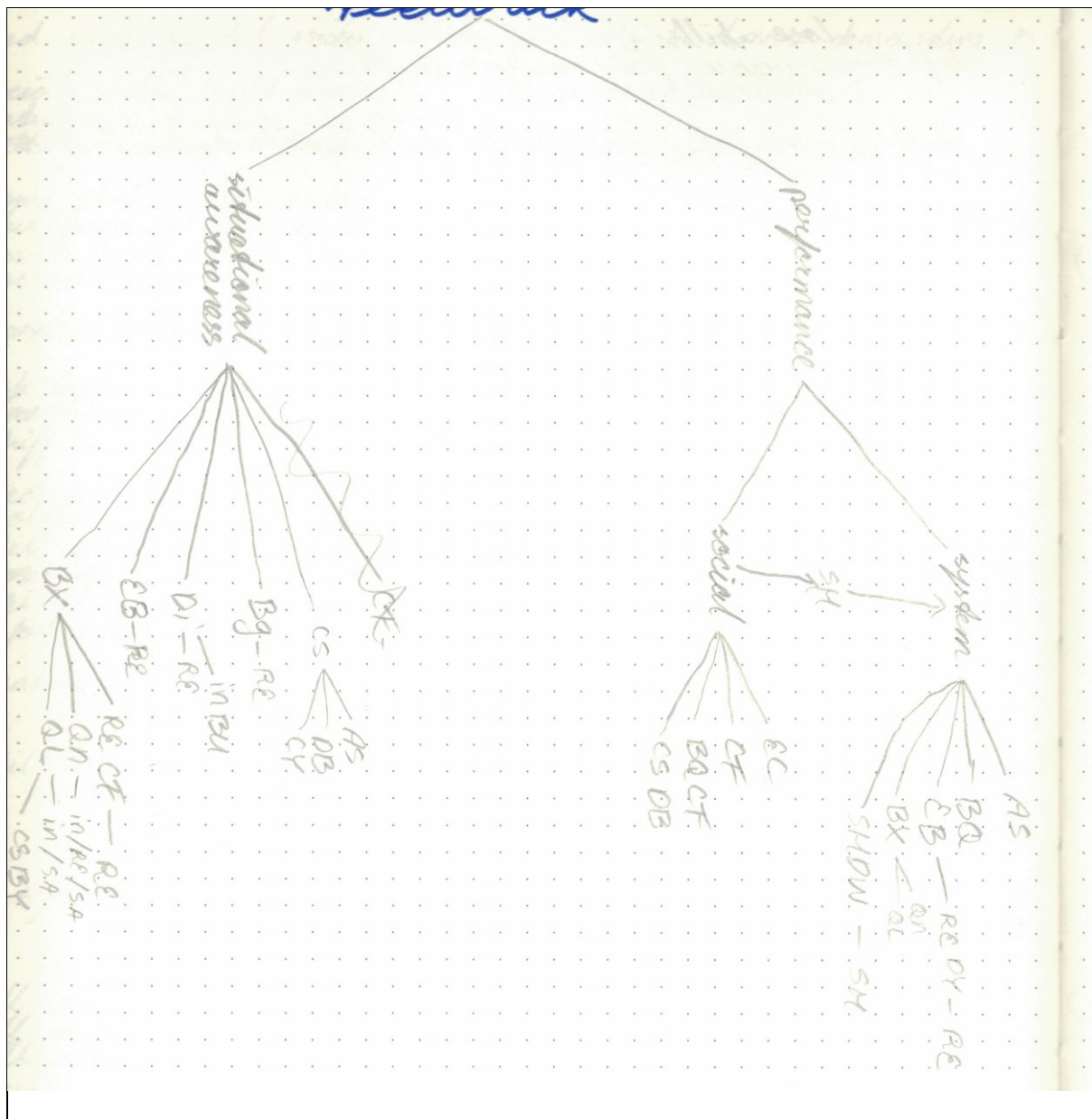
² Participants 7 and 8 were interviewed together





Appendix E





Appendix F

Autonomy	
Boundary control	[P13]: I understand it, but I, something like this, you are almost turning people into robots, sort of, you know? That they are intensely monitored, right, that they hardly dare to drink a cup of coffee, or you need to adjust for that like, you may drink your coffee then, or you may take this much time to drink coffee. Oh dear...
Constant surveillance	

Method autonomy	[P11]: I think the point is, an important question is: do you have a choice whether or not to apply it, let it happen? And the moment, if it's the latter, if you no longer have that choice, yes, then we have, well, then it is over, then we will be ruled by the machines.		
	Technology design/processes	[P8]: Autonomy is also about, at least for me, a bit the influence, and yes, this entire process, that, well, I would not actually want a voice in that, you know, that... [P7]: I would not even want to be a part of it. [P8]: No, exactly. That's it. You are being pushed in some direction that you don't actually support. So eh, no... [P7]: That would completely, your autonomy, because then you are doing all these things that you don't want to do in that way...	
Decision autonomy	Task type	[P5]: It reduces on those work processes. But I must say, spotting lateral connections, and specifically lateral connections based on your administration, well, I don't think that the software is going to take that over completely. But even then, there will be new work, because then there will be the revelations. What do I see? What does that mean? What are we going to do about it? Do we have to do anything about it? Well, and that is new, that is new. We currently barely do that. (...) So I believe that more work will arise, different work, higher quality work.	
	Free up time	[P4]: It does not harm your autonomy. It might actually help extend your autonomy sort off, because when you can finish things faster and a bit easier, you can also start doing other things, maybe even projects that lie close to your heart. Maybe you will just have a little more time to choose it, what you want. It does not necessarily have to be, if it is just, if it is only used because you can do things faster, therefore you can just do more work. Yeah, in that case the manager just shoves more work into an hour, yes, that just harms your autonomy. So it can go any which way, indeed. It purely depends on the situation, I think.	
	Out of the loop	[P2]: And also, you don't have any control over the process anymore. Because really, you are actually not doing anything at all anymore. You have some details, about the position and candidate profile, but the system does everything else.	
		Standardisation	[P14]: Standardisation always takes away some customisation. If you standardise 100% you are left without customisation, so you will have little autonomy left.
	Trust in technology	[P11]: I think there certainly are systems to which you will gladly leave it [decision autonomy]. (...) that has to do with, do you trust the technical, the technology?	

		Outsourcing	[P7]: Systems are of course being deployed more effectively, so that supervisors also get more responsibility and employees also get more responsibilities. And, right, that in the past, or a few years ago for example, everything was run through HR, the employee came to HR, HR had to include or add or type in, and employees can now do all of that themselves. Responsibility is placed more with the employee. Supervisors can do more autonomously. In that sense there has already been a downsizing in HR, because, there used to be an HR employee for that, who tied the two ends together.
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Skill variety and use		
Digital skills		[P6]: I mean, very simply put: I am currently user of a system and I hope as HR professional to remain that (...) I am a user of *** and I don't want the digital skills of the *** consultant or the system administrator who has to set the system up.
Task type		[P13]: It depends on where the emphasis will be. If the emphasis will increasingly be on the having attention for the support of managers and employees and less on the generating of information, for example, then I think you can develop yourself in those skills, because you will have more time and opportunity to do so. And that you will mainly develop, in those skills that, yes, it will depend on what such an AI, I think, will take over from you or support you with.
Weaken due to disuse		[P3]: I think certain skills might even decrease because you are no longer doing it. For example, selecting résumés, now you just quickly scan résumés so at some point you become very fast at that. As in, you know, what am I selecting for? And so that will decrease.
Motivation		[P11]: It's also easy, that is what I believe, think: yes, you know, the system says I can't do it, so I can't do it. Hello! Go, Pipi Longstockings: never done that before, think I can do it. It's also, what is your attitude? (...) If you are always in the 'yes, but'-setting, it is yes, but it's actually no, I think. What if it does work? What do we need to make it work? Yes, and what can we do instead? What, this we may not be able to do yet, but are we able to do this? Well, and, it is kind of in here [system 2] that you actually shut off all those mechanisms. It was determined that.
Social skills		[P9]: You'd miss the nuance, because someone may not have achieved their KPI's, but there may be a reason for that. And now I know, because I have the conversations, so it will demand more skill from the HR employee to still have that conversation and to make sure that you find another way to get that information.

Feedback and related		
Situational awareness	objectivity	[P1]: The system doesn't lie. So it can flawlessly roll out data that, where I think, yes, there you have it. That is the biggest advantage, the system is airtight.

	Technology design	[P5]: With exception reports it's, how should I say, it depends on how you design it. If you only get, it says, it is enough to say: I found an anomaly. Yes, then you have to go looking for it. If you then also develop something in the algorithm like, what do you see, tell me. Well, then you can search with better focus. And so it partially depends on how complicated the process is that you are monitoring, and partly also: how well did you think it through?	
	Out of the loop	[P2]: It takes away the circumstances. As I mentioned before, if you have two children for example, and you have been awake the entire night, you will be less productive, that's just how it is. And in that system [system 2], it takes away that context. So I think that it, yes, it kind of removes the entire human aspect.	
Feedback on performance	Technology	Out of the loop	[P7]: Yes, it's a bit beyond your control. When I notice I did something wrong, or I get feedback, and that I take quite personal. And then you want to do whatever it takes to make it right again. But if there is something in the middle there, that replaces my work, or takes it over, and that doesn't work correctly, then I think, yeah, that is a disadvantage of the system. Then it doesn't affect me personally.
		Technology design	[P13]: System 2 will give me feedback on my performance as well, so that should tell us something. Productivity score to me seems a bit more complicated with HR.
		objectivity	[P14]: Look, if you design a system as it is described here, you will get a more objective substantiation of for example performance criteria and why you would receive an extra reward, because I think that is a good thing. That can have positive effects. So there are more objective, yes, but what even is objective? Because somewhere you'll need to put those criteria in writing, so you will have to consider it extensively up front, what criteria you will use to measure performance, then you will have discussions at some point beforehand.
	Social	Base for discussion	[P5]: So with those information flows and depending on how it is designed and what value it has, I think that it can make the work of supervisors a bit easier by, if you can say this is information, tell me what your views on it are. And, yes, it is already information which, if everything is correct, you cannot argue with. So it does, it should contribute to a good discussion, I think.
		Complaints	[P7]: With system 2 I think you will get a whole lot of feedback, but it will mostly be from, from the dissatisfaction, from frustration. I think you will get a lot of feedback. [P8]: Yes, I think high absenteeism as well. Yes, I think so too.

		Communication	[P13]: The less you are in contact with other people, the more difficult it will be to get feedback, of course, or you'll need to get the feedback from the systems on how you did something. But yes, in my experience, feedback is still something you receive? How another person looks at your performance, or how you act, or what you have done, and the less contact you have with other people, the less feedback you will receive.
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Social and relational		
Out of the loop		[P6]: That personal contact, you may be taking some of that out with this [system 2], because also about certain questions, when they spoke with a supervisor about something or other or had a performance review, or they based it on that [the output from the system]. Yes, then in that, you will be less needed, so they will also be less likely to approach you, so that contact will become less.
Efficiency		[P2]: So that is, I think that is one of the, well, dangers that the social and relational parts are reduced again and again, because optimisation is increased.
Free up time		[P1]: You should actually have more time for the social aspects, that system is very supportive.
Initiative		[P4]: Well, I'm not actually sure, yes, I think somewhere, but that is purely a gut-feeling, that people are not going to withdraw into themselves when technology gains the upper hand. They may just start to visit each other more, because people are, well, people, and they love people.
Base for discussion		[P4]: The social side, to me, is the cooperating with other people and being sharp to each other. And sharing ideas, because who says one person is right and not the other? So it is, it is never that black and white. So if it is handled well by organisations, I believe the social context might actually be strengthened by it, because you are having better discussions with each other.
	objectivity	[P5]: It will be the case, you will have plenty to talk about. You have business-related talking points, plenty, irrefutable conversation material. That is worth a lot as well.
Constant surveillance	Resistance	[P3]: And system 2, yes, I think that you will, some sociality, that personnel will feel very monitored and that you will get some authoritarian behaviour of for personnel, in terms of feeling that you are removing some sociality. "Why are we being monitored? We are doing or jobs, right?" because how big is the group who slacks off compared to the group that does do their work? You know, you are then often talking about 2-3% of your total personnel. Do the good have to suffer because of the slackers? So I think you will receive a lot of resistance from your personnel. Well, and that is not going to help the social aspects.

	Complaints	[P7]: So that social element is just not in there [system 2] for me, yes, I think it's in the conversations with the people who come to your desk [to complain]. That is not necessarily positive.
	Culture	[P3]: Well, you cannot compare one case to another, with one case you busy for 3 hours, with the other you are done in half an hour. Well, I can already tell you what will happen. The difficult cases stay on the piles, everyone grabs the easy cases from them. (...) you will have some people who work smart, so to say, who get high performance reviews and who get rewarded, as opposed to perhaps the people who are more introverted and do what needs to be done, and they will grab the difficult cases and they are the ones whom the system fails. That is what I think of system 2.
Human touch		[P13]: Initially I would say that those [social and relational aspects] would become increasingly important, because I still believe that is something humans do best. So then I think that if everything is done that can be made smarter by a system or a robot or something, and you keep the truly interhuman side and let that be done by humans, then I think it will only increase in importance.
	Human-inspired AI	[P13]: On the other hand, what we were discussing before, yes, if a robot can also sense and can read how someone is feeling, yes, then it might even be able to take over that part. Yes, I that if that is the case, then the social aspects, those will decrease. That does not seem like a healthy development for the people themselves.

Demands		
Workload	Labour shortage	[P2]: But I do think it can make your work easier. And now in this, in this labour market it is, I mean, yes, you honestly hardly get any applications for a job anymore, so you really have to go look for those people yourself. So I do think that it can then, if you design it properly, that you more quickly contact the right people, for example.
	Efficiency	[P4]: Sometimes in meeting you have some person that, with all due respect, starts talking gibberish or goes off on a tangent, and then you think please stop, but that is what I mean with more efficient discussions (...) So if you, if you can filter it, and if you can make sure that the correct agenda is being discussed and then also provided with certain valuable information, yes, then it will be, I think that only improves it.
Cognitive load	Complicated cases	[P12]: You have to work less hard yourself, in your head, or to find things out, or whatever, because it already helps pre-sort where you, if you give some boundary conditions, it then helps make your job easier because you don't have to do it.
	Task type	[P6]: I assume that if you've implemented system 2, then you also don't need, then you will also have a properly automated personnel system and all questions about law and rules, and the like, you will have done, so then I assume that as HR you will get a different task description and that will likely be more on policy and tactical levels.

	Age	Ease of use	[P3]: the systems do need to be user-friendly. Because, you know, systems become, get more extensive capabilities. But then you also see a lot of systems become increasingly complicated in use. You will have to do more and more things and especially regarding the older employees I think that can be an issue, because they also need to be able to work with it.
		Skills	[P3]: Eventually you will benefit from it, but that initial period and the, getting to know the system again, getting to know new systems potentially. You also have older employees, can those employees also get the hang of the new systems?
Emotional	Constant surveillance	Culture	[P3]: I think it will be more difficult because you get a very different culture in an organisation. You get a monitoring culture. You are essentially assuming the worst of people, I believe. You are assuming that they will not do their work (...) You'll get surveillances, you'll be a cop.
		Mental health	[P15]: But that combination of all things [system 2] makes me think ooh... I think you will have the feeling that you'll be on edge the entire day. As human, when you enter, check, I'm here and I have to perform, because you know, I wonder whether that affects, you know, your mental and physical health, whether that will be okay.
	Complaints	[P6]: To me it is just usually an added value, but you do notice that not everyone sees it like that. So you do see that people, who, oh what do I need to do with that, oh and another app, and another and this and that, is it all necessary? Can't I just send an e-mail? So for me, yes, I have to convince those people again, and thankfully I can because I myself am convinced of it. But yes, you do need to convince those other people to join who feel like they need to learn to use a new system ten times a year.	
	Fear		[P5]: Terrifying, yes, working for a company like that [system 2]. For everyone. Even the manager, is being monitored...
		Final say/overriding power	[P10]: I would somewhere still be in control. I don't want that if you put in some information, that there is than no way back. It should be adaptive to the situation, the surroundings, to changing circumstances. It should mostly be in your service. I would probably find it quite scary if it is a system that completely thinks by itself.
Human touch		[P5]: I wouldn't want to work there [system 2]. This is a solution with a view of humanity, yes, everything is regulated between these lines and if you don't perform enough between these lines, then there's the exit.	