The Role of e-HRM in Technology Startups

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By

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Executive Summary

This thesis explores how electronic human resource management (e-HRM) enhances employee performance in technology startups. During their transition phase, technology startups face challenges, such as maintaining effective communication, sustaining organizational culture, and managing growth. These challenges reduce employee performance, threatening the survival and growth of startups. Despite the potential of e-HRM to address these issues, there is limited research on its specific impact within startups. Existing e-HRM studies focus on large corporations or only broadly discuss startups, leaving a significant gap in understanding its effect in the entrepreneurial context. This gap is important because startups, unlike established firms, face unique challenges such as rapid growth, limited resources, and high failure rates. To close this literature gap, the thesis employs a qualitative research design, using semi-structured interviews with HR managers from 32 EU-based technology startups. The selected startups, founded between 2016 and 2022, employ between 35 and 249 people.

This research shows that e-HRM practices in technology startups primarily focus on administrative tasks (used by 94% of companies) and performance management (84%). However, practices related to employee relations, safety, and strategic HR are not frequently adopted.

The findings show that HR managers have mixed opinions on the impact of e-HRM on employee performance. Some argue that e-HRM systems primarily save administrative time and do not directly affect core performance metrics such as sales or primary business outcomes. Conversely, other HR managers report that e-HRM systems can enhance employee performance through employee engagement and feedback/ education. These systems should be user-friendly and reduce complexity in HR processes, and target employee engagement through addressing motivation, offering benefits, minimizing disruptions, and reducing confusion. To improve employee performance, performance management practices like employee evaluations and feedback mechanisms are indicated to be most suitable. Task tracking tools, while potentially increasing performance, often do not enhance engagement and may reduce it, thus their use should be carefully considered.

The study also identifies challenges that startups encounter when implementing e-HRM tools. Predominantly, people-related issues include employee reluctance to use e-HRM, the time-consuming nature, manager hesitancy, incorrect or incomplete software usage, and managing an too many tools. Despite the expectation that these startups, with their technological and innovative focus, would face minimal technological challenges, issues like data integration, system reliability, and user interface problems were also frequently reported.

In conclusion, e-HRM systems can have a positive effect on technology startups if implemented with a focus on time savings, simplicity, and employee engagement. Successful e-HRM implementation requires strategic planning that considers the values of all stakeholders, including employees, HR, line managers, and the founder. Communicating the change in advance helps mitigate challenges and ensures a smoother transition. With these findings, entrepreneurs in the field of HRTech learn which e-HRM characteristics are most important to HR managers (time savings) and which are most relevant to enhancing employee performance (employee engagement and feedback/education). At the same time, founders of technology startups and HR managers of those startups get to know which e-HRM practices are most relevant to improving employee performance (Performance Management tools) and that they need to communicate an e-HRM tool implementation early, including company stakeholders and explaining how the new tool helps the different internal stakeholders in their daily work.
The findings guide the reader on how to effectively use technology to improve HRM, enhance employee performance, prepare a technology startup for scaling, and increase the probability of startup success.

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1 Introduction

As Harari (2014) notes in „Sapiens: A Brief History of Humankind", the expansion of human societies lead to more complex structures and bureaucracy, bringing not only efficiency gains but also challenges and struggles. One reason for that is the fact that the members of a group would not know, and therefore trust each other anymore after a certain threshold of people is reached. This mirrors the evolution of startups, where increasing team size demands the adoption of formalized HR processes and structures (DeSantola & Gulati, 2017).

As a small company or startup scales from a small, close, team to a larger workforce, it encounters unique challenges (Eisenmann & Wagonfeld, 2012) like maintaining effective communication, culture, and management practices (Giardino et al., 2014), and especially technology startups have to navigate uncertain environments (Okrah et al., 2018). 60% of startup failures can be attributed to human factors (Calderón et al., 2019). The literature indicates that HRM is a crucial success factor in startups (Van Lancker et al., 2022), as its goal is to ensure the availability of the right and motivated human resources and organizational structures necessary for success (Ma & Ye, 2015). In addition to that, the expectations of HRM have changed, expanding HR responsibilities beyond traditional tasks like shift planning and conflict management to include managers and team leads. This significantly complicates the HR landscape, particularly in startups. As more individuals become involved in HR-related activities, the risk of misaligned objectives and practices increases, underscoring the urgent need for coherent and effective HRM strategies that can adapt to the evolving demands of a growing organization.

The task of an entrepreneur is to make those strategic choices within environmental and resource constraints (Balodi & Prabhu, 2014). Despite or exactly because of the significance of strategic decision-making and robust organizational design, more than 80% of startups fail within their first year, and if they manage to survive this first year, 50% fail within the next four years (Hyder & Lussier, 2016; Statistics, 2016). In order to enhance survival chances, especially startups use innovations in their own processes (Ries, 2011) and are more open to adapting technology and AI in HRM (Rico et al., 2020), summarised in the term "e-HRM" (Harazneh & Sila, 2021). New technological advancements created a potential for automating HRM and using machine learning (Gandhi et al., 2023; Mohture, 2023), which can be a significant determinant of competitive advantage and success. One major factor is the influence of e-HRM on employee performance by enabling employees to perform their tasks faster or more easily (Nurlina et al., 2020; Wijayadne, 2021). Employee performance is an important factor for organizational success in knowledge-intensive firms like technology startups (Shepherd et al., 2019), where employee performance serves as a direct link to organizational performance (Nyathi & Kekwaletswe, 2023). Especially in technology startups, where measuring organizational performance is often complicated by external factors, the impact of e-HRM on employee performance provides a valuable indicator of HRM's effectiveness.

While the literature often agrees on the positive effect of e-HRM on employee performance, there is a notable gap in understanding how e-HRM practices should be implemented during the growth stage (Van Lancker et al., 2022) in technology startups to impact employee performance. The objective of this study is to address this black box by exploring the implementation of technological HRM practices in technology startups and their influence on employee performance during the transition stage. Using technology startups as context, technological challenges were expected to play a different role than in large corporations because of employees' IT knowledge or openness to IT. With the outcome of this study, future e-HRM tool developers and HR managers of startups will learn how to effectively use technology to improve HRM, to be ready for the scaling stage and increase the employee performance and therefore the probability of startup success.
The main research question of the study is the following:

Research Question
How can electronic human resource management (e-HRM) improve employee performance in technology startups during their transition phase?

1.1 Relevance to MSc Management of Technology

This research on e-HRM's role in enhancing employee performance in technology startups during their transition phase directly aligns with the MSc Management of Technology (MOT) program's goal of preparing students to analyse trends, implement solutions, and manage organizational changes. The program emphasizes leveraging technology to achieve strategic goals. The findings offer strategic insights into e-HRM implementation, essential for managing growth in technology-driven startups. This research contributes to understanding how technology can drive strategic objectives and competitive advantage.

The MOT program emphasizes integrating technology to maximize customer satisfaction, employee wellbeing and corporate efficiency. This thesis explores how e-HRM streamlines HR processes, improves engagement, and drives performance, aligning with courses like "Digital Business Process Management."

The focus on leadership in technology environments is reflected in this study of e-HRM adoption challenges and strategies. Courses like "Leadership and Technology Management" highlight the importance of leadership in implementing management policies. This research also provides answers for successful e-HRM adoption.

The program's emphasis on research methods and data analysis in the course "Research Methods" provided the skills to design interviews, analyse data, and draw meaningful conclusions, ensuring robust and reliable findings.

My specialization in "Technology Venture Development" equipped me with interview strategies and a customer needs perspective, aiming to define how an e-HRM tool should address urgent needs of HR-Managers. This mirrors the goal of developing market-driven products entrepreneurially.

2 Theoretical Background

This chapter explores the literature underlying the transition phase of startups, focusing on electronic human resource management during this period. First, the transition phase of startups is described, which is the phase where strategic decisions and organisational synchronization occur to support growth. This section shows how startups manage these transitions and the unique challenges compared to mature businesses.
After that, in Chapter 2.2, the discussion on HRM in technology startups illustrates the impact of HRM practices on success and failure and presenting studies on the importance of innovative HRM practices for reducing failure rates and enhancing success in startups. The next subsection, 2.3, categorizes various e-HRM tools and their applications. Then, in Chapter 2.4, the challenges of e-HRM implementation are discussed using the Technological, Organizational, and People (TOP) framework, with a focus on startup-specific challenges.
After that, in Chapter 2.5, the impact of e-HRM on employee performance is examined, reviewing different performance definitions and how e-HRM practices influence these metrics.
Finally, the literature gap and study focus are identified, highlighting the need for research on innovative HRM practices in startups during the transition phase. The research questions and propositions guiding the study are presented, detailing the expected contributions to the field of HRM in technology startups.

2.1 Transition Phase of Startups

In the landscape of startups, measuring and defining success goes way beyond the typical measurement of „performance" in the strategy literature. One reason for that is the big difference between startups and SMEs (small and medium-sized enterprises) in their high degree of innovation (for example in internal processes, technology, or business models), their ability to capture worldwide markets and various financing sources which influence growth rates of startups (Aulet & Murray, 2013). Success in the context of startups is a multi-dimensional construct, encompassing aspects like ability to raise money (Prohorovs et al., 2019), venture setup, firm survival and growth, entry performance measures like duration, satisfaction and first sale, financial and nonfinancial aspects of innovation and regional impacts like job creation, financial returns and GDP growth (Shepherd et al., 2019). Santisteban and Mauricio (2017) summarise various definitions of success in Table 1 below. This diverse understanding of success reflects the different dependent variables against which the growth and challenges of startups are analysed, especially during their different phases.

Table 1: Definitions of Success in Technology Startups, abbreviated Version.
Source: Santisteban and Mauricio (2017). Full table in Appendix A 5.1.

Definition	*Reference*
Success is defined by the number of jobs the company has generated.	(March-Chorda, 2004)
It is given by its share in the market and the size of the customers.	(Van Gelderen et al., 2005)
It is the achievement of the goals and objectives and […] good management.	(Anh et al., 2012; Thanh, 2015)
Success is creating something that truly contributes to improving the lives of others.	(Sulayman et al., 2014)
It is the good financial performance of the company.	(Spiegel et al., 2015)

Making strategic decisions and design choices to maximize success at every stage, entrepreneurial ventures face the challenge of being flexible in reacting to new opportunities as they arise, while also being efficient with the structures in executing existing operations (DeSantola & Gulati, 2017). Growth, particularly the potentially unstable and unpredictable growth of an entrepreneurial venture, can make achieving this balance more difficult (Gjerløv-Juel & Guenther, 2012), which is a unique challenge compared to mature businesses (Bhide, 2000). During growth, startups try to synchronize internal organizing with the pace of growth. This is often called "problem of scaling" (Eisenmann & Wagonfeld, 2012). If this synchronization fails, for example by growing the team too early, this can lead to startup failure (Giardino et al., 2014). This growth leads to different stages in startups. One definition, which combines many different approaches to structuring growth, is to divide the stages in "Seed", "Early, "Growth"/"Transition", "Expansion", and "Exit" (Santisteban, Inche, et al., 2021).

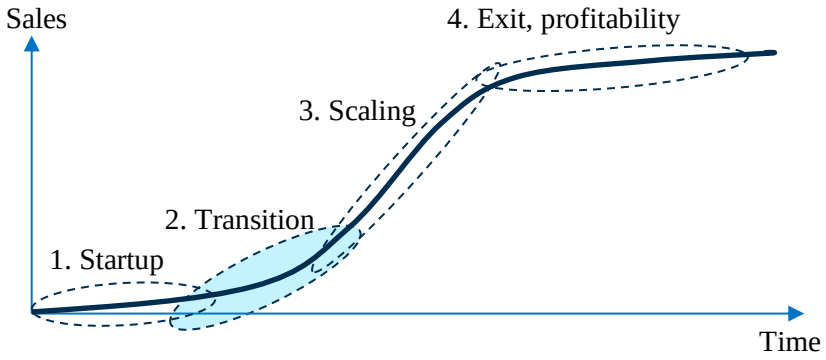

Figure 1: Four Stages in the Life Cycle of an Entrepreneurial Firm.
Highlight on the crucial „Transition phase". Figure adapted from Picken (2017).

For this work, the four-phase definition of Picken (2017), visible in Figure 1 above, is used. He describes the stages: Startup, Transition, and Scaling, after which the final Exit comes into play. Picken, among others, argues that the transition phase of a startup is the most important phase for later success, because the organisation sets all practices and routines before starting to scale in employees and sales. Table 2 below shows a summary of the main thoughts on the stage Startup, Transition and Scaling, whereas several different attributions of other authors are implemented. Santisteban, Mauricio, et al. (2021) suggest identifying the factors that promote growth and mitigate the risk of failure at specific stages of technology-based startups.

Table 2: Three Stages of Startups, with Focus on the Transition Phase.
Overview developed based on Picken (2017) and different sources (cited in table)

Criteria	*Startup Phase*	***Transition Phase***	*Scaling Phase*
Business Focus	Define/validate business concept: market opportunity, offering, business model, go-to-market strategy.	Lay foundation for growth, establish credibility, legitimacy, and acquire essential resources.	Add resources, leverage processes for growth. Aim for competitive scale, market leadership.
Organizational Structure	Informal, fluid.	Expanding management; implementing discipline, structure,	Structured, process-driven.
Management Challenges	-	Strategy, market positioning, building management team, culture molding.	Replace ad hoc decisions with formal processes and policies.
Employee Size	Small team, often founders and few employees.	Team growth; new functional specialists, management members.	Larger teams with functional specialization and defined roles.
Timeframe	Typically a few months to a couple of years.	Relatively brief, typically 18-36 months.	Longer-term, focused on sustaining growth.
Failure and Success Rate	80% fail within the first year (Hyder & Lussier, 2016).	High failure rate; success requires overcoming numerous challenges.	50% fail within the first five years (Statistics Bureau, 2016).
Scholarly Stage Names	Start-up (Mueller et al., 2012), Seed (Bocken, 2015), Incubation (Various Sources), Young (Bocken, 2015), Early (Ng et al., 2014),	Growing (Bocken, 2015), Growth (Pirollo & Presutti, 2010), Early growth (Yoon-Jun, 2010), Growth and Development (Mueller et al., 2012),	Expansion (Various Sources), Mature (Bocken 2015), Maturing

More than 80 percent of startups fail in their first year of existence (Hyder & Lussier, 2016). Identifying success factors in startups has been done in various ways, as outlined by Rauch (2020) through methodologies like meta-analyses, systematic literature reviews, bibliometric reviews, synthesis of qualitative research, and historiometric analysis. Studies have identified various reasons for startup failures, encompassing a range of

factors such as human capital factors, market-related challenges, financial constraints, organizational deficiencies, personal issues within the management team, and environmental factors (Calderón et al., 2019). Studies also show that human factors, in particular "lack of personnel selection, lack of training, disharmonies in the team and a team unmotivated" account for 60% of startup failures (Calderón et al., 2019). Other studies focussing more on the condition for success identified three key areas; innovation, leadership and cluster location (Abadía, 2021). Eisenmann (2020) found that early efforts to professionalize human resource management raise later startup valuations. Additionally, Sevilla-Bernardo et al. (2022) presents success factors of startups in research literature in Table 3 below. A full table with synonyms is available in Appendix A 1 on page 62. It is visible that many of those factors are connected to HRM.

Table 3: 16 Success Factors for Startups.
Source: (Sevilla-Bernardo et al., 2022). Marked in blue: Success factors connected to e-HRM and HR.

Timing	Funding	Culture/Values	Diversity
Team	CEO Decisions	Dynamic Adaptation	Advisors Board
Idea	Marketing	Satisfaction	Lean Startup
Business Model	Culture of Evaluation	Training & Development	Founders Experience

2.2 HRM in Technology Startups

The literature indicates that companies focusing on people, their Human Resources, are less likely to fail. This is not only shown by the case of Netflix (Nanda, 2022), but is also tested empirically through the comparison between "commitment" firms and "autocratic" ones (Baron & Hannan, 2002), and with different independent HRM-variables and dependent success-variables. For example, hiring an HR manager in startups is positively linked to post-IPO firm survival (Chadwick et al., 2016). A study in the silicon valley showed that innovative HRM practices (high commitment work systems) lead to a decreased chance of failure and increased chance of IPO in technology startups (Burton & O'Reilly, 2004). Many other studies state a positive effect between HRM in startups and their success (Jiang & Messersmith, 2017; Saridakis et al., 2017; Van Lancker et al., 2022). One often-cited theory in this context is the theory of the resource-based view, supporting the idea that successful use of internal resources leads to successful competition (Wernerfelt, 1984).
The following sections in this subchapter are descriptions of two cases, one with successful innovative HRM practices, and the other with no HRM strategy. After that, typical HRM practices in startups are presented.

HRM at Netflix – Successful Case
Netflix's transition from a DVD rental service to a global streaming leader shows the strategic impact of HRM on startup growth. The company's approach to HRM acts as an example for an impactful and successful adoption of innovative HRM practices to increase employee performance in technology startups.

In the early 2000s, particularly during the dot-com bubble burst, Netflix faced significant economic challenges that led to a pivotal decision in its HRM approach. The company laid off a third of its workforce, choosing to retain only those deemed as high performers. This decision set the stage for the company's future HR strategies. Hastings, a co-founder of Netflix, believes that the company's culture, focusing on values like freedom, responsibility, and high performance, was key to long-term success (Nanda, 2022; Slocum et al., 2014). This strategy of recruiting and retaining high performing individuals is used as strategic advantage since then.

Netflix's performance culture is characterized by the "keeper test," a method to ensure each role is filled by a top performer. The company's policy on freedom and responsibility highlights HRM's role in managing growth and complexity. By eliminating traditional leave policies, Netflix empowered employees, suggesting a flexible HRM approach to enhance innovation (Hastings & Meyer, 2020).

HRM at WeWork – Non-successful Case

WeWork's rapid rise and subsequent challenges offer a strong lesson in HRM for a fast-growing startup. Founded in 2010, WeWork expanded quickly, driven by a vision to revolutionize the traditional office environment through shared workspaces. By 2016, the company got a valuation of approximately $16 billion due to aggressive expansion and substantial venture capital investments.

Despite these early successes, significant HRM issues began to surface as the company scaled. WeWork's HRM could not adapt to its rapid growth. The hiring processes, meant to on-board large numbers of employees, were rushed, and lacked integration strategies. By 2018, the cultural and management shortcomings became increasingly visible. Reports of poor decision-making by CEO Adam Neumann began to undermine employee trust and engagement. The leadership's failure to establish consistent and clear communication channels contributed to a chaotic workplace environment that confused and demoralized staff. (Pendergraft, 2021)

The tipping point came in 2019 during WeWork's attempt at an initial public offering (IPO). The IPO documents revealed not only unsustainable growth practices but also raised serious concerns about Neumann's management and the overall viability of WeWork's business model. The public exposure of these issues led to a dramatic decline in company valuation and Neumann's resignation. (Brown & Farrell, 2021)

Typical HRM Practices at Startups

Bhattacharjee and Mukherjee (2020) describes in Table 4 below that common HRM practices and experiences in startups often involve ad-hoc and informal approaches due to limited resources and the lack of formal HR divisions. These practices include unstructured recruitment and compensation methods, practical and adaptive training and development, and performance management systems that utilize comprehensive evaluations. Organizational changes are challenging and can destabilize startups, while labour relations are influenced by union activities, prompting a need for managers to address employee issues proactively. Overall, the themes highlight the necessity for flexible, resource efficient HRM strategies to cope with the dynamic environment of startups.

Table 4: Human Resource Management Practices in Startups.
Own table, developed based on the literature review of Bhattacharjee and Mukherjee (2020).

HR Subject	*Description*	*References*
Recruitment and Staffing	Small organizations often lack formal HR divisions and face challenges in recruiting due to constraints like scarcity of qualified labourers and limited resources. They adopt ad-hoc recruitment procedures and rely on informal hiring practices.	Aldrich and Von Glinow, 1991; Mehta, 1996; Williamson, 2000; Heneman and Berkley, 1999; Arthur, 1995;
Compensation	Compensation practices in small firms can be ad-hoc and uncoordinated, impacting employee satisfaction and retention. A total rewards perspective, incorporating monetary and non-monetary rewards, is suggested for a more effective approach.	Graham et al., 2002
Training and Development	Small firms require training for skill acquisition and retention. Formal and informal training methods are used, including socialization processes for new employees. The emphasis is on practical learning and adapting to changes in responsibilities.	Bishop, 2003; Chandler and McEvoy, 2000; Chao, 1997; Rollag and Cardon, 2003
Performance Management	Performance management in small firms includes a 360-degree evaluation, focusing on various aspects like disciplinary procedures, performance appraisals, and incentives.	Jones et al., 1995
Organizational Change	Small firms face challenges in implementing HR changes due to their size, structure, and resources. Changes can destabilize the firms, affecting employee turnover and financial performance.	Chu and Sui, 2001; Baron and Hannan, 2002
Labour Relations	Union elections can lead to significant changes in HR practices, affecting aspects like compensation, promotions, and employee turnover. Union activities serve as a reminder for managers to address employee issues and invest in training and development.	Batt and Welbourne, 2002; Flanagan and Deshpande, 1996

2.3 E-HRM Practices

As technology becomes more advanced, companies are shifting HRM towards the digital age (Hmoud & Varallyai, 2023). The aim is to bring digital technology into HR practices to boost their effectiveness (Allal-Chérif et al., 2021), efficiency and service delivery (Parry & Tyson, 2011). Since the 1980s, computers have been used in HRM. The Internet revolution and various IT innovations have further helped digitalization in HR (Haidari & Chhibber, 2022). The most cited definitions state that e-HRM is since 1995 subject to academic literature defined as the use of web and information technology to implement HR strategies and support the interaction between stakeholders in executing HR activities (Ruël et al., 2004; Strohmeier, 2007).

In technological HR, various terms are used, such as "HRIS" (Human Resources Information Systems) (Kavanagh et al., 2011), "virtual HR" (Lepak & Snell, 1998), or "algorithms in HRM" (Cheng & Hackett, 2021). The distinction is made based on who uses the HR system (Zafar, 2013), which can be either the HR department (HRIS / virtual HR) or all employees (e-HRM). Algorithms in HRM are more focused on solving problems with data analysis. As analysing employee data is one part of e-HRM, it is counted as a subcategory of e-HRM in this study. While the shift to technology doesn't render traditional HR obsolete, it augments it, as shown in research from Arslan et al. (2021), pointing to a future where human and digital collaboration is key in HRM.

The diversity in definitions is also to be found in the content of e-HRM. As there is no uniform definition of e-HRM, also the components are not standardized. In order to develop an inclusive framework consisting of categories and subcategories of e-HRM, the work of five scholars have been analysed. Crucially was the mindset of not categorising tools, as Faraj and Azad (2013) pointed out, but practices, where one tool can include more than one category and e-HRM practice. The results of the analysis are visible in the Appendix A 3 on page 63-65. The results of the different groups of e-HRM practices include Table 15 on page 63 from Ziebell et al. (2018), a literature search based on Ziebell et al. (2019) in Table 16 on page 64, Table 1 on page 6 developed based on the literature review of Bhattacharjee and Mukherjee (2020), and Table 17 on page 64 widely used e-HRM functions, based on Fındıklı and Bayarçelik (2015), and Table 18 on page 65, showing „IT Applications in Implementation of HRM Activities" from Karoliny, M. & Poór, J. (2017). The definition of e-HRM for this work is summarised in Table 5 below, and is based on the common themes in the literature while being inclusive.

Table 5: E-HRM Processes Developed Based on Common Themes in the Literature.

Group	***e-HRM Practice***	***Description***
Administrative and Analysis	Database management	Efficient management of employee data records.
	Attendance tracking	Automated tracking of employee attendance and leaves.
	Payroll processing	Automated systems ensure payroll management.
Talent Acquisition and Management	Selection	Management of applications to facilitate selection process.
	Recruiting	Applicant Tracking Systems (ATS).
	Employer branding	Developing a positive image to attract talent.
	Talent relationship management	Maintaining relationships with potential applicants.
Learning and Development	E-learning programs	Online training programs for employee development.
	Career management	Support for career planning and progression.
	Knowledge Management	Sharing and management of knowledge.
Performance Management	Performance Evaluation	Documentation, analysis, and goal-setting for employees.
	Feedback mechanisms	Receiving feedback from employees.
	Compensation & Benefits	Designing compensation structures.
Strategic HR and Workforce Planning	Manpower requirements	Assessing staffing needs based on organizational goals.
	Competency management	Planning of employee skills for development.
	Succession planning	Planning for leadership and critical role continuity.
	Job Analysis	Analysing organizational structure and business needs.
Employee Relations and Safety	Employee relations	Managing interactions between employees positively.
	Safety/ security protocols	Implementing and monitoring safety protocols.
	Legal compliance	Ensure practices comply with laws and regulations.

The most common way to structure e-HRM is to separate the practices in three different kinds of e-HRM; „Operational e-HRM", which focusses on administrative tasks, „Relational e-HRM", which focuses on complex operations like recruiting, training, and performance review and „Transformational e-HRM", which focusses on strategic actions (Lepak & Snell, 1998). A detailed description of different ways of clustering, and an overview of the clustered e-HRM practices of the table above is visible in Appendix A 3.6 on page 66.

Marler and Parry (2015, p. 2250) found that e-HRM has "significant effects on the strategic role of HRM in organizations". This also enables e-HRM to develop transformational outcomes, affecting the company's strategy and developing the organisation in line with it. While technology performs certain functions, employees can also focus on more important activities, such as talent / knowledge management, as well as strategic planning, to increase the company's competitiveness (Nyathi & Kekwaletswe, 2023). This two sided connection between the strategic role of HR and the e-HRM effectiveness is discussed in detail in the Appendix A 2 Role of HRM in the Organisation on page 62.

2.3.1 E-HRM Practices in Startups

The research about e-HRM practices in startups suggests some differences, compared to large cooperations. Rico et al. (2020) found in his study that entrepreneurially oriented firms tend to use more AI and innovative practices in HRM. It is suggested that companies which are open to innovation and willing to take risks are adopting emerging technologies faster, which can be translated to a possible higher use of e-HRM in startups. At the same time, the study of Dey et al. (2023) found a strong correlation between the use of HRM practices in Indian unicorn startups and employee engagement. Another study found, that technology companies themselves, are more likely to adapt technology in internal processes (successfully) (Yüksel, 2022).

Specifically relevant to startups is a finding from a study on e-HRM in SMEs, which found that in unstable environments, e-HRM practices need to be flexible and respond to changing market conditions. Additionally, the strategic orientation of the firm (whether they are prospectors, defenders, or analysers) plays a critical role in determining the type of e-HRM capabilities that are most beneficial. For instance, firms with a defensive orientation might focus more on efficiency and cost control through their e-HRM practices, while prospectors might leverage e-HRM for innovation in HR practices and workforce agility (L'Écuyer & Raymond, 2020).

In conclusion, the literature indicates that while established corporations use more formalized HRM practices, innovative and entrepreneurially oriented firms often adopt more innovative HRM approaches. To develop strong sub-research questions and ensure study reproducibility, propositions are formulated. These propositions guide the reader through the document: starting with the literature review, moving to the propositions, leading to the sub-research questions, and concluding with the answers to each sub-research question and the main research question.

Based on the preceding literature review, it is suggested in proposition I that all six e-HRM practice-categories are used in technology startups.

Proposition I

Technology startups use the following six e-HRM categories: administrative and analytical tasks, talent acquisition and management, learning and development, performance management, strategic HR and workforce planning, employee relations and safety.

2.4 E-HRM Challenges

The digital transformation has brought significant changes in the field of HRM, introducing both opportunities and challenges. In this study, the definition of e-HRM adoption from Bondarouk, Parry, et al. (2017) and Ceric and Parton (2024) is used, which describes it as the strategic choice and transfer process between an old (or non-existent) and a new e-HRM system, and its user acceptance. As organizations adopt e-HRM, challenges in implementation and use arise. Critical are the challenges that arise within the technological (T), organizational (O), and people (P) contexts (Bondarouk, Parry, et al., 2017), visible in Figure 2. In the following paragraphs, e-HRM challenges are described using the TOP framework, and then compared to e-HRM challenges from startups in Figure 3 on page 10.

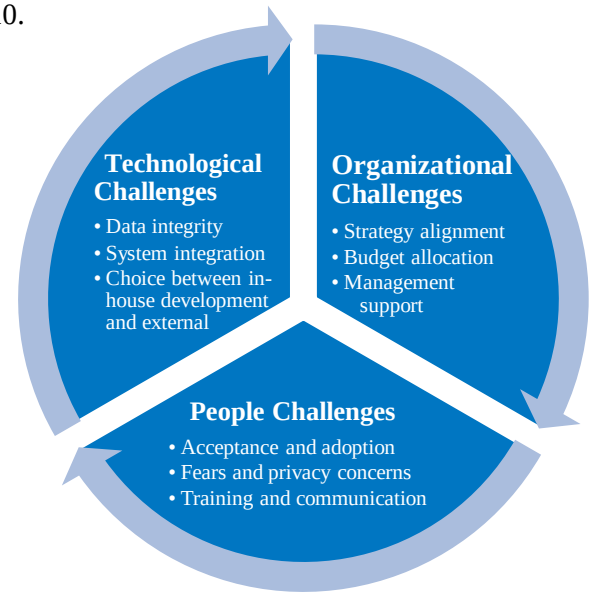

Figure 2: TOP Framework with Technological, People and Organisational Challenges.
Source: Own figure based on Bondarouk, Parry, et al. (2017).

Technological Challenges

Technology startups adopt technology in many internal processes for efficiency gains (Ries, 2011), which is one reason why less technological e-HRM implementation challenges are expected to be found in this context. The reasons come from employee's expected openness to new technologies and the actual knowledge about such systems. Using the Technology Acceptance Framework for e-HRM (Yusoff et al., 2010), it can be suggested that employees of technology startups see perceived ease of use and perceived usefulness higher, and therefore have a higher attitude towards using technology. They may still encounter hurdles in the technological context of e-HRM adoption. Data integrity, system integration, and the choice between in-house development and external HRIS software are named in the literature (Bondarouk, Parry, et al., 2017; Ceric & Parton, 2024).

Organisational Challenges

Organisational Challenges, such as top management support, budget allocations, and the alignment of e-HRM with organizational strategy play crucial roles. The size of the organization can significantly influence the availability of resources like IT infrastructure and technical support, which are essential for e-HRM adoption (Zhou et al., 2022). Challenges such as inadequate resources, resistance to adopting e-HRM systems, and poor data access can severely limit the potential benefits of e-HRM, impacting employee performance and organizational effectiveness (Bondarouk, Parry, et al., 2017). As startups do not have strict bureaucratic organizational structures, it could be expected to find only a few of those challenges in this study. In the study of Nyathi and Kekwaletswe (2023), only people challenges, discussed in the next subchapter, were found.

People Challenges

Perhaps the most critical, especially in the technology startup area, are the challenges within the people context. The acceptance and adoption of e-HRM systems are influenced by factors such as top management support, communication, and collaboration between IT and HRM departments, and the HR skills and expertise available

within the organization (Bondarouk, Parry, et al., 2017). Especially in startups, the team of individuals has a huge influence on the organization and entrepreneurial performance (Sevilla-Bernardo et al., 2022), indicating the big influence of individuals on decision making. Resistance to e-HRM can arise from fears related to job security, increased workload, or concerns about privacy and data security. Ensuring user acceptance and addressing these concerns through training and communication is important for realizing the benefits of e-HRM systems in improving employee performance and organizational efficiency (Ceric & Parton, 2024).

2.4.1 E-HRM Challenges of Startups

Studying e-HRM in an startups, Nyathi and Kekwaletswe (2023) found that challenges in startups differ from large companies. These challenges are communication, demotivation, power distribution, education, and sabotage. As all of them are related to the "People Context" from the TOP framework discussed above, this could indicate that people-related challenges are at the forefront in startups. Combining the findings of Nyathi and Kekwaletswe (2023) with informal expert interviews conducted in this study, an overview of e-HRM challenges in startups is shown in Figure 3 on page 10 below. For the development of this overview, four informal expert interviews were conducted, as described in Appendix A 4.1 on page 68.

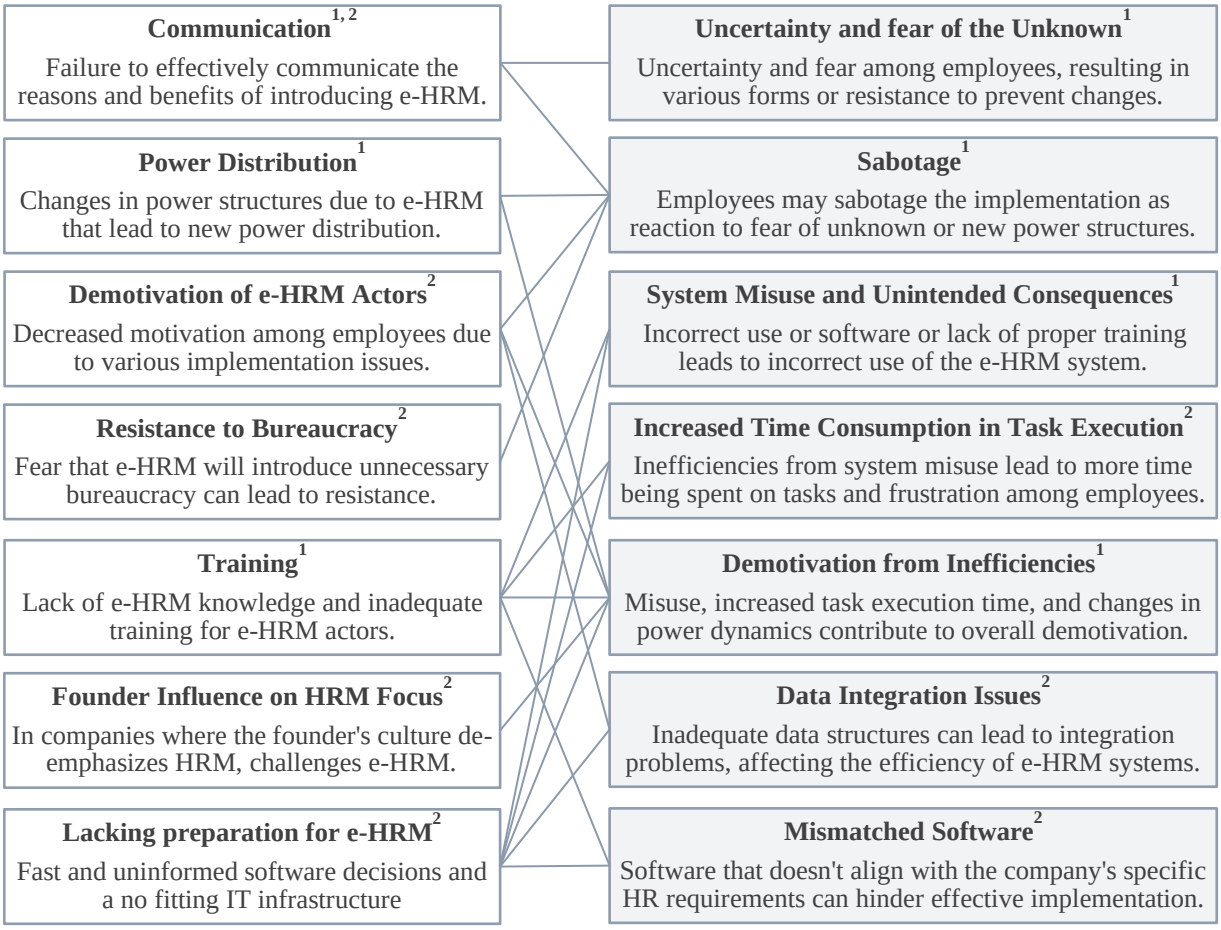

Figure 3: e-HRM Implementation Challenges based on Literature and Expert Interviews.
Source: [1]: Nyathi (2023), [2]: Interviews with e-HRM experts. The lines indicate connections between different challenges.

The effectiveness of e-HRM is influenced by challenges. These challenges range from technical integration issues to organizational readiness and user acceptance (Bondarouk, Harms, et al., 2017). It is suggested in the literature, as well as own preliminary expert interviews, that challenges in technology startups differ from corporate organisations. These considerations lead to the formulation of the following proposition:

Proposition II
The e-HRM challenges in technology startups are mainly people challenges and differ from the challenges in corporate organizations, as for example identified by Ceric and Parton (2024).

2.5 E-HRM Impact on Employee Performance

In order to understand the choice of the dependent variable „Employee Performance" in this study, it is crucial to understand there are various definitions of startup success in technology startups (Santisteban & Mauricio, 2017). Additionally, the difficulty in capturing IT-related productivity and performance changes and the inherent multidimensionality of productivity itself (DeLone & McLean, 2003) pose significant challenges, particularly when using dependent variables like startup success, which are further influenced by environmental factors.
Especially in knowledge-intensive startups like technology startups, employees are a big factor contributing to the organizational goals (Shepherd et al., 2019). At the same time, e-HRM is one important way of implementing HRM best practices aimed at enhancing organizational effectiveness through human resources (Bondarouk, Parry, et al., 2017). This study adopts an inclusive view on employee performance, considering it as a diverse construct that significantly influences organizational outcomes.

Given the substantial impact employees have on startup success (Shepherd et al., 2019), this study focuses on employee performance as the dependent variable. The literature about employees' impact is diverse, reflecting the complex ways in which employees contribute to organizational success. From servant leadership, which (Alikhani & Shahriari, 2022) found to be positively related to startup competitiveness, to broader influences such as access to paid family care leave and its impact on new venture performance (Bao, 2022), the scope of research of employees impact on organizations is big.

This study acknowledges the various dimensions which are preceding employee performance. Most prominently preceding is employee engagement, which is supported to be associated with employee task performance (Bailey et al., 2017). Scholars, like Alfes et al. (2012) found a positive link between perceptions of HRM practices and engagement. Other preceding variables of employee performance researched are Entrepreneurial Behaviour of Employees, Employee Productivity and Innovation and Adaptability.
First, Entrepreneurial Behaviour of Employees was examined by Hernandez (2019) through case study methodology, which showed that specific HR practices are instrumental in promoting entrepreneurial behaviour among employees, contributing significantly to the international success of new ventures.
Second, Employee Productivity can be measured by analysing direct and indirect effects of various factors. Azmy et al. (2023) applied Partial Least Square analysis in their study to discover how psychological contracts, employer branding, and job environment impact turnover intentions.
Lastly, Innovation and Adaptability are often assessed through qualitative approaches. Baldegger and Gast (2016) conducted interviews with founder-CEOs to explore the evolution of leadership from transformational to transactional as firms grow, indicating shifts in HR needs to sustain innovation and adaptability.

Many studies find a positive influence of e-HRM on firm performance, while at the same time pointing out the difficulty to specify the impact, speaking of a „Blackbox of (e-)HRM". SMEs are found to be positively influenced, as e-HRM leads to competitive advantages and better HR performance. This is especially true, when the company manages to choose the right e-HRM practices for the type of environment and the strategy they are pursuing (L'Écuyer & Raymond, 2020). Iqbal et al. (2019) found a significant correlation between the use of e-HRM and employee productivity, and similar research is done by many scholars. This type of quantitative research presumes a direction of influence of/on technology, and has therefore the potential for „ambiguous or weak explanations for inconclusive and complex results" (Dulebohn & Stone, 2018, p. 267).
Considering all these diverse understandings of performance variables influencing organizational success (visible in Table 6 below), Pradhan and Jena (2017), like many other scholars, developed an instrument to measure employee performance with 23 items.

As visible in Table 6, the different definitions are all related to different characteristics of HRM in companies. Pahos and Galanaki (2020) and De Alwis et al. (2022) included HR managers in their interviews to assess the influences of e-HRM. Similarly, Bondarouk et al. (2009) also pursued interviews to research the effectiveness of e-HRM. In order to assess the nuances of e-HRM, a qualitative and nuanced analysis is necessary (Strohmeier, 2007).

Table 6: Identification of Key Constructs on Employee Performance, abbreviated Version.
Source:Pradhan and Jena (2017). Full table in Appendix A 5.1.

Authors	*Aspects of Employee Performance*
Kennedy, Lassk, & Burns (2001)	Work role empowerment, Behavior toward customers, Teamwork
Johnson (2003)	Job performance, Contextual performance
Schepers (2011)	Work performance, Disciplined effort
Audrey, & Patrice (2012)	Creativity, Reactivity in face of difficulties, Interpersonal adaptableness, […]
Koopmans, Berhnaards, Hildebrandt, Vet, & Berk (2014)	Task performance, Contextual performance, Counterproductive work behavior

While the 23-item scale has been adopted by some scholars to measure different impacts on employee performance, for example the impact of leadership, political skills and organizational culture (Idris et al., 2022), HRM (Alabri et al., 2022), training and development (Arwab et al., 2021), and the impact of recruitment and organizational politics (Bibi et al., 2021), there is no consensus about the design of such a scale.

Many scholars provide different scales for measuring employee performance. The items for those scales are found in Appendix A 5, starting on page 68. Goodman and Svyantek (1999) split employee performance into three parts. Two are within contextual performance; Altruism and conscientiousness, and the third pillar is task performance (Appendix A 5 in Table 30 - Table 32 on page 71). Koopmans et al. (2014) built an „Individual Work Performance Questionnaire", consisting of task, contextual and counterproductive work behaviour (Table 33 - Table 35 on page 72). Andrade et al. (2020) developed a short version of self-assessment scale of job performance with only ten items, visible in Table 36 on page 73.

Acknowledging the diversity of performance measurement scales and items, the literature provides no consensus to the question how employee performance is influenced by e-HRM. Based on findings, that e-HRM has the potential to influence employee performance positively, but also the potential for negative influence (in case of challenges), the following model is proposed.

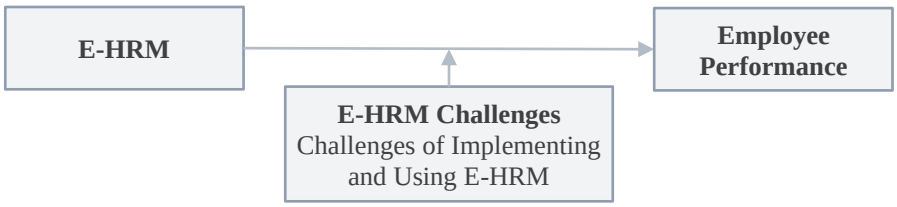

Figure 4: Effect of e-HRM on Employee Performance, weakened by e-HRM Challenges.

The conceptual model leads to the following proposition: suggesting a positive effect of e-HRM on employee performance, weakened by e-HRM challenges.

Proposition III
The e-HRM challenges weaken the effectiveness of e-HRM systems in enhancing employee performance within technology startups.

2.6 Literature Gap and Focus of the Study

The focus of this study and at the same time an often suggested research stream is HRM practices in specific organizational stages, because little is known about how HRM practices change over time and organizational development (Van Lancker et al., 2022). Steffensen et al. (2019) indicate that the best way to understand HRM is to study how it is implemented. One way of implementing HRM is through technology, which allows HR to scale its operations. This is called "e-HRM" by many scholars. E-HRM is the use of technology to tackle administrative HR tasks, complex operations like recruiting and even strategic HR actions (Gandhi et al., 2023), potentially utilising AI (Mohture, 2023). The call for future research in the field of e-HRM has been echoed by Dulebohn and Stone (2018, pp. 267-268) to open the "Black Box" of e-HRM, pointing to the importance of a nuanced understanding of the technology and its impact (Faraj & Azad, 2013).

The entrepreneurship literature recommends considering employee performance as a dependent variable. This is due to the practical significance of organizational performance, which, as a dependent variable, is subject to numerous environmental factors, making it less feasible for study. Employee performance is directly linked to organizational performance, even more so than other precedents such as innovative behaviour, well-being, and engagement. Particularly in growing and knowledge-intensive firms, it appears that employees are extremely important stakeholders, and their performance is a critical proximal outcome (Shepherd et al., 2019). Specific employee related variables like "self-efficacy" seem to be positively related with competitiveness of startups (Alikhani & Shahriari, 2022). Even other influences on employees, like access to paid family care leave, influence new venture performance (Bao, 2022). Many scholars indicate a relationship between the adoption of e-HRM and employee performance in firms (Nurlina et al., 2020; Wijayadne, 2021).

While entrepreneurially oriented firms tend to use more advanced technology in their HR processes (Rico et al., 2020), decisions of startups are especially impactful in their transition phase (Picken, 2017), and human related factors account for 60% of startup failures (Calderón et al., 2019), no study researches the impact of technological HRM (e-HRM) on the performance of technology startup employees. The literature gap, with definitions, propositions, and research questions, was described in detail in the this chapter (page 7-13).
Figure 5 is the overview of the context of this study, showing HRM as crucial factor between startup growth and startup success. The literature gap and focus of this study is the independent variable "Implementation of HRM", which describes how HRM is implemented in a firm (specifically: e-HRM), and the dependent variable "Outcome of HRM on an Individual Level" (specifically: employee performance).

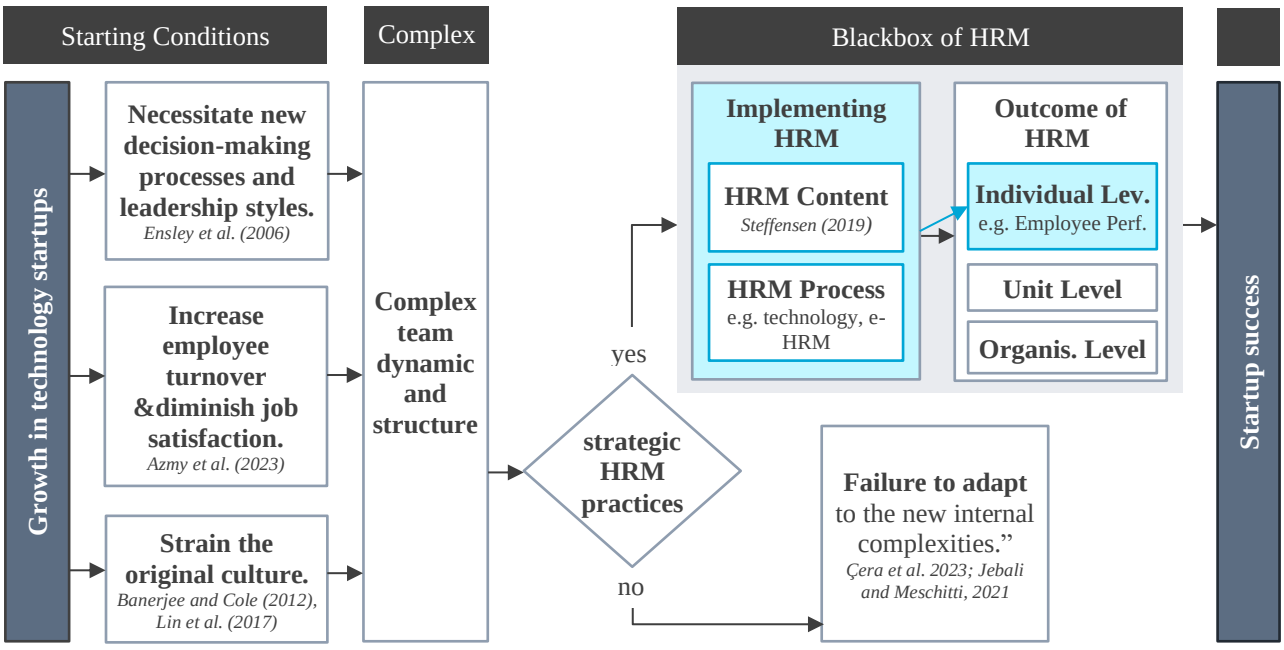

Figure 5: Startup Growth Influencing Startup Success with HRM. Blue Highlight: Focus of this Study.
Own figure, developed based on Ensley et al. (2006), Azmy et al. (2023), Banerjee and Cole (2012), Çera et al. (2023), Jebali and Meschitti (2021), Steffensen et al. (2019), Lin et al. (2017).

This research is based on the following four propositions visible in Figure 6. To answer the corresponding questions, the next chapter describes the research method in detail. Thereafter, the results for each research question are presented. The last sub-research question can be answered after compiling results from the first three research questions.

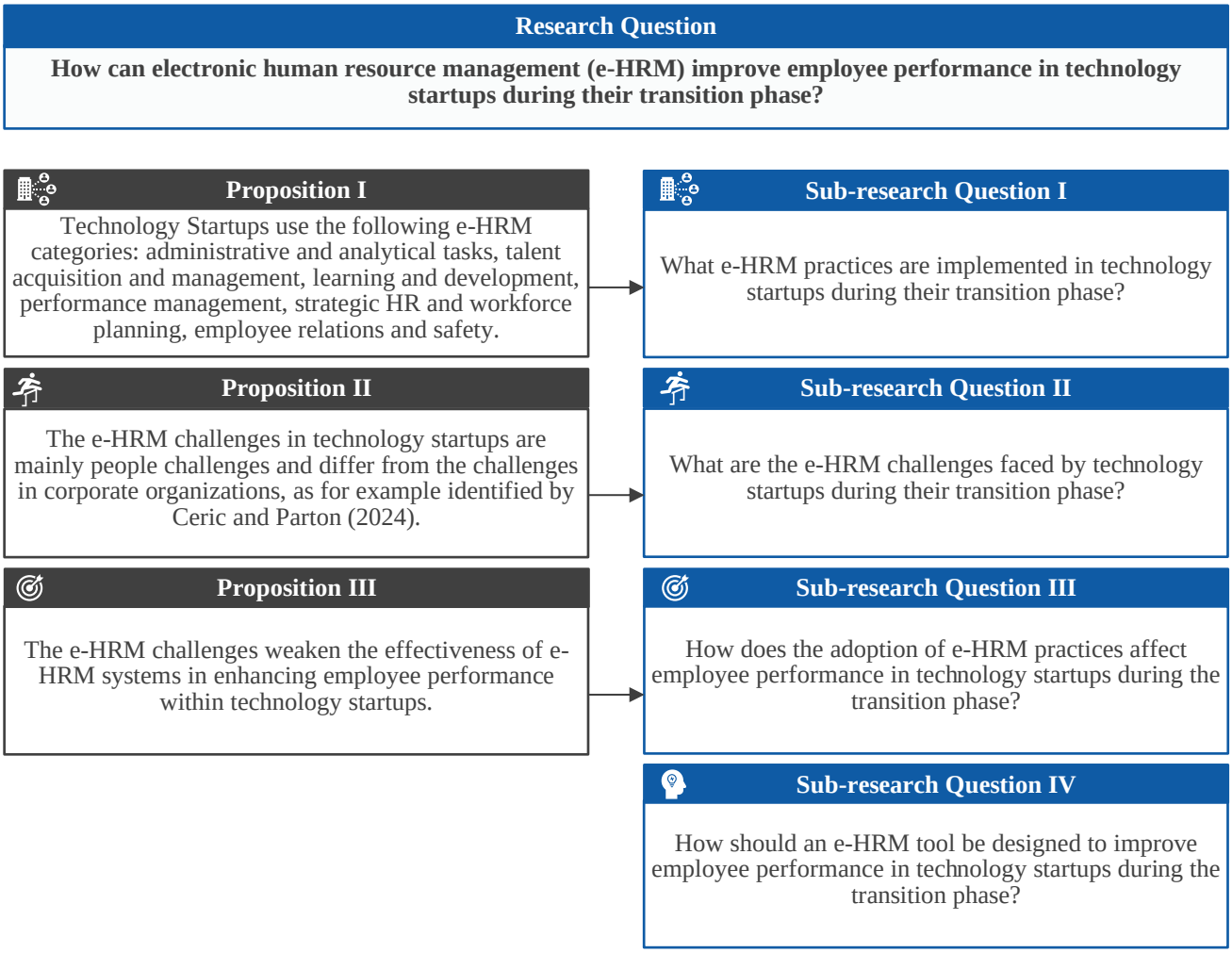

Figure 6: Summary of Propositions and Sub-research Questions.

3 Methodology

3.1 Research Design

This study adopts a qualitative research design to explore the implementation of e-HRM practices and their impact on employee performance in technology startups during their growth phase. The research uses semi-structured interviews to collect rich, descriptive data. The study involves 32 technology startups in the EU that are in the transition phase of their growth. Within each selected company, the HR Manager was interviewed.

3.1.1 Criteria for Selected Organizations

The six criteria are adopted from Ceric and Parton (2024), Balodi and Prabhu (2014) and Dahir and Kazeem (2018).

 Technology sector (IT / high-tech manufacturing)

 Use new technology in business model or operations

 Selling a product or service / or significantly funded

 Between 35 and 249 employees

 Founded after 01.01.2016

 HR-Manager available

Those criteria are rooted in the choice of technological startups in the transition phase, with an HR manager available to interview. The rationale behind the criteria is further explained in the following.

Technology Sector

The choice to focus on the technology sector, specifically companies involved in computer software, information technology, and high-tech manufacturing, comes from the anticipation that these industries are likely to be receptive to new technologies, as discussed in Chaper 2.3.1 on page 8. This selection is not restricted to SaaS (Software-as-a-Service) businesses alone but extends to a broader range of technology related activities. Companies in these fields are generally considered progressive and knowledgeable about technological advancements, making them ideal candidates for exploring the adoption and impacts of e-HRM. Another study found that technology companies are more likely to adapt technology in internal processes (successfully) (Yüksel, 2022), which would allow this study to observe successful implementations of e-HRM.

Uses new Technology in Business Model or Operations

The requirement for the organization to be a startup, characterized by an innovative technology-based business model or a strong reliance on new technologies for operations, ensures that the study focuses on entities that are typically resource-constrained yet open to employing automation and technologies to enhance efficiency.

Operational or Financial Maturity

The condition means that the organization must be actively selling its product/service or have received significant funding. This criterion focuses on companies that are likely striving towards or receiving profitability, either through active revenue generation or significant investor backing. Investments are particularly relevant in industries where substantial growth might occur without immediate revenue.

Employee Count

The restriction that organizations have between 35 to 250 employees aims to capture them during a critical growth phase where structured HR processes become necessary (the transition phase). Informal expert interviews suggest that beyond 30 employees, maintaining interpersonal connections without formal systems starts to become challenging, indicating a natural point where e-HRM systems can be beneficial. The upper limit of 250 employees aligns with the European definition of small and medium enterprises, ensuring the study

is relevant to a significant segment of the business population. In order to ensure possible comparability with future studies on SMEs and potential publication of this data form this thesis, the participants are sub grouped (35-49, 50-99, 100-149, 150-199, 200-249).

Age of the Organization
Limiting the organization's age to less than eight and a half years (founded after 1.1.2016) ensures the inclusion of new companies that are likely still in their expansive phases. This criterion helps exclude long-established (family) businesses which may not exhibit the characteristics typical of a rapidly evolving startup environment.

HR Manager Presence
Requiring the presence of an HR manager or a designated HR-responsible employee ensures that there is a dedicated person overseeing HR processes. This criterion is important as it indicates a level of organizational complexity where structured HR management is necessary. It also ensures that the interviewee will have understanding of the HR technologies in use for detailed interviews on e-HRM systems.

3.1.2 Development of the Interview Script

In order to ensure the right questions are asked in the right way, certain measures were taken. This included the literature review in Chapter 2, four preliminary expert interviews on the research concepts, and three trial interviews with the provisional interview script. The most important findings are described in the following.

The main findings of the preliminary expert interviews are that scaling HR operations is a major challenge for startups, particularly during rapid growth phases. One founder highlighted the difficulties faced when scaling from 30 to 50-60 employees, noting the complexity of managing fast employee growth and the need for effective support systems. Another key insight was the importance of system functionality and user satisfaction, as noted by an HR consultancy founder, who described e-HRM systems as essential to avoid user irritation. This highlighted the need for detailed preparation and planning in the pre-implementation phase to ensure success and acceptance within the organization. Further, differences in challenges faced by small versus large companies were underscored by a LinkedIn HR influencer, who pointed out that large companies struggle with slow decision-making and rigid established systems, while startups often struggle with the absence of these systems and issues of responsibility and resource allocation. This comparison highlighted the need to tailor e-HRM solutions to meet the diverse needs of different-sized companies. Additionally, an HR technology startup executive identified the problem of disconnected HR tools in small companies, resulting in significant manual work, stressing the value of integration in e-HRM systems.

After those preliminary expert interviews, an interview script was developed. This interview script was used in three trial interviews, which helped shape the questions to ensure respondents understand them. The main findings here were that it is necessary to use an icebreaker question at the beginning, asking respondents an easy question about their responsibilities. This helps to create a relaxed and open dialogue environment. Additionally, it became clear that questions should be framed in an open-ended manner. For example, asking interviewees whether they currently measure or have plans to measure employee performance within their organization. This approach helped to avoid discomfort or hesitation among HR managers, who often acknowledged their responsibility to assess performance but admitted to not having established metrics in place. Another key finding was that questions should focus on one selected software at a time. This method, learned from trial interviews, encouraged respondents to provide detailed answers about specific tools rather than broad categories. It showed that practitioners often think in terms of the tools they use daily rather than abstract categories. Finally, to understand the influence on performance, two questions were posed: one to identify elements where employee performance has increased, and another to discover areas where it may have decreased. This separation ensured that HR managers could focus specifically on each aspect without the cognitive load of considering both simultaneously, which often led to generalized or neutral responses in the trial interviews.

3.1.3 Sampling

A convenience sampling strategy was employed to select 32 startups in the EU, as visible in Figure 7. Potential startups were identified using LinkedIn and Crunchbase. Interview participants were recruited via LinkedIn and email. Various methods were used to approach startups, resulting in outreach to over 300 companies across the EU. Of these, approximately 50 responded, leading to 32 successful interviews. This low response rate leads to one limitation of this sampling method, discussed in detail in the next subchapter.

Figure 7: Location of the 32 Interview Participants.

An overview of the interviewed startups is visible in the following tables. Additionally, a table describing the interview participants with their respective industry is visible in Appendix B 1 on page 74.

Country	*#*
Germany	13
The Netherlands	5
Sweden	3
Poland	2
Spain	2
Austria	1
Denmark	1
Finland	1
France	1
Hungary	1
Romania	1
Portugal	1
SUM	*32*

Revenue	*#*
0	1
100K - 1M	5
1M - 10M	18
10 M - 100M	6
NA	2
SUM	*32*

Founded	*#*
2016	12
2017	6
2018	2
2019	5
2020	5
2021	2
SUM	*32*

Employees	*#*
35-49	7
50-99	18
100-149	4
150-249	3
SUM	*32*

Industry	*#*
Corporate IT Services	7
AI & VR	4
Energy & Transport	4
Industrial & Manufacturing	4
Media and Entertainment	4
Telecom & FinTech	4
Venture Tech Building	4
BioTech	1

Figure 8: Five ways to Cluster the 32 Interview Participants.

3.1.4 Limitations of this Research Method

The chosen research method comes with limitations, such as response bias and the challenge of generalizing findings from a specific subset of technology startups. The convenience sampling method might not provide a fully representative sample of the target population. This is especially true as only a small subset of the targeted companies agreed to an interview. The low response rate may lead to non-response bias, where the companies that chose to participate might systematically differ from those that did not, potentially skewing the results. It could be the case that only startups with HRM as a priority agreed to be interviewed. This bias could result in an overrepresentation of companies that are more advanced in their HR practices or those that have a more favourable view of e-HRM systems.

Additionally, the low response rate might exclude insights from startups that face significant challenges or failures in implementing e-HRM, thus presenting a skewed perspective that is overly optimistic. Furthermore, companies without a dedicated HR manager might not agree to participate, leading to a biased understanding of e-HRM practices as those companies could rely on founders or other team members to manage HR tasks. This exclusion is significant because such companies might use e-HRM tools differently or to a lesser extent. Moreover, very busy HR managers might have opted out of participating due to time constraints, leaving responses primarily from HR managers who are less burdened by their roles. This could imply that the participating HR managers are either less effective or not utilizing their HR resources to the fullest, which might not accurately represent the typical experience of more engaged and efficient HR managers.

The small sample size also reduces the statistical power of the study, making it difficult to rely on its quantitative findings or draw definitive conclusions. Future research should aim to employ strategies to increase participation rates, such as providing incentives for participation or using multiple recruitment channels to capture a broader and more diverse sample. This approach would help in obtaining a more comprehensive understanding of e-HRM implementation and its impact across different types of technology startups.

To mitigate the limitations discussed, strategies such as ensuring anonymity for interview respondents and selecting startups that represent a diverse range of contexts within the technology sector were employed. To clarify the concepts discussed in this study, four preliminary expert interviews were conducted. The interview guide was reviewed by HRM and startup experts to ensure validity. Additionally, three pilot interviews were carried out to refine the interview questions. Reliability was maintained through consistent data collection procedures and a detailed interview script.

The chosen research design has additional limitations, such as researcher bias, where qualitative data may be interpreted subjectively by the researcher. The reliance on self-reported data, especially concerning employee performance, can introduce bias and limit objectivity. Furthermore, variability in respondents' knowledge and ability to describe e-HRM systems can affect data quality. These limitations are further discussed in Chapter 5.3 - Limitations on page 52.

3.2 Data Collection

Data is collected through semi-structured interviews, allowing for flexibility in discussing complex and nuanced aspects of e-HRM practices and challenges (Adeoye-Olatunde & Olenik, 2021). Each interview was designed to last approximately 40 minutes, conducted remotely via video conferencing tool MS Teams because of the geographical spread of the startups. Interviews were held in German and English, based on the preference of the interviewee. The interview questions are aligned with the sub-research questions of the study, focusing on e-HRM practices, challenges, and the effects on employee performance.
The Interview Guide is to be found in Appendix B 2 on page 75. The German guide is developed through translating the English version to German and asking colleagues to translate it back to English. This ensured reliability of the interviews held in German and English. The following is a brief explanation of the five interview parts.

At the start, participants confirmed their agreement to record the session. An opening statement ensured transparency and obtained informed consent. Once consent was given, the recording began. To create a relaxed environment, interviews started with an icebreaker question about participants' responsibilities within their company.

Interviewees were asked if they measure or plan to measure employee performance, framed openly based on trial interview learnings. They then shared the software tools they use in HR processes, focusing on the impact

on employee performance. If specific tools were not mentioned, further probing using categories from the literature (see Table 5 on page 7).

Next, the application of selected e-HRM tools was discussed. Questions focused on one software at a time to gather detailed information, as learned in the trial interviews. Interviewees described the tasks the software was used for, its effectiveness, and whether it met, exceeded, or fell short of expectations. If expectations were not met, further probing identified shortcomings and implementation challenges.

The involvement of HR managers in the implementation of e-HRM software was the next topic. If the HR manager participated, they were questioned about their reasons for selecting the software and any challenges encountered during implementation. Probing questions based on the "TOP" framework (Technical, Organizational, People-related challenges) were used to find challenges.

Finally, questions about the impact of the e-HRM software on the organization and its stakeholders were asked. Questions targeted at effects on various stakeholders in the company. Probing questions guided towards concrete examples. The questions focused then on the effects on employees, specifically areas where performance had increased or decreased, using the "TOP" framework to analyse the impact.

3.2.1 Ethical Considerations and Data Management

The study has received ethical approval from the TU Delft Human Research Ethics Committee. All participants are informed about the study's scope and their rights, with consent obtained before conducting interviews. The Opening Statement (Informed Consent Form) can be found in Appendix B 3 on page 77. The pseudo anonymized transcripts are not part of the public Appendix, to ensure compliance with data protection.

3.3 Data Analysis

The method of analysis for this thesis involved a thematic analysis of 32 interview transcripts. Each transcript, resulting from interviews ranging between 35 to 50 minutes, was analysed using ATLAS.ti 24 Windows, a qualitative data analysis software provided by TU Delft.
The initial phase of coding segmented the data into quantitative and qualitative categories. Quantitative factors such as the number of employees, industry type, company founding year, and revenue brackets were first identified. These characteristics were subsequently coded and organised into „document groups" within ATLAS.ti. This organization facilitated the later analysis of data relevant to specific demographic contexts or company characteristics.

For the first sub-research question on e-HRM practices, a predefined set of categories was used. These categories were determined based on the quantitative aspects of the research, focusing on the frequency and types of e-HRM practices employed within the data set.

The approach shifted for the second and third sub-research questions, addressing challenges and the influence of e-HRM, respectively. Here, a grounded theory methodology guided the analysis. This began with a comprehensive review of the collected data, making annotations and marking quotations related to perceived challenges and influences of e-HRM. Following this review, the process of coding began, and relevant data were systematically coded.

Coding was conducted iteratively: initial codes were applied as interviews were being completed, allowing for continuous refinement of the coding scheme. This iterative process continued until a point of theoretical saturation was reached—approximately after 25 interviews—with no new codes emerging. This was confirmed by conducting an additional seven interviews, ensuring robustness in the data collection and analysis phases.

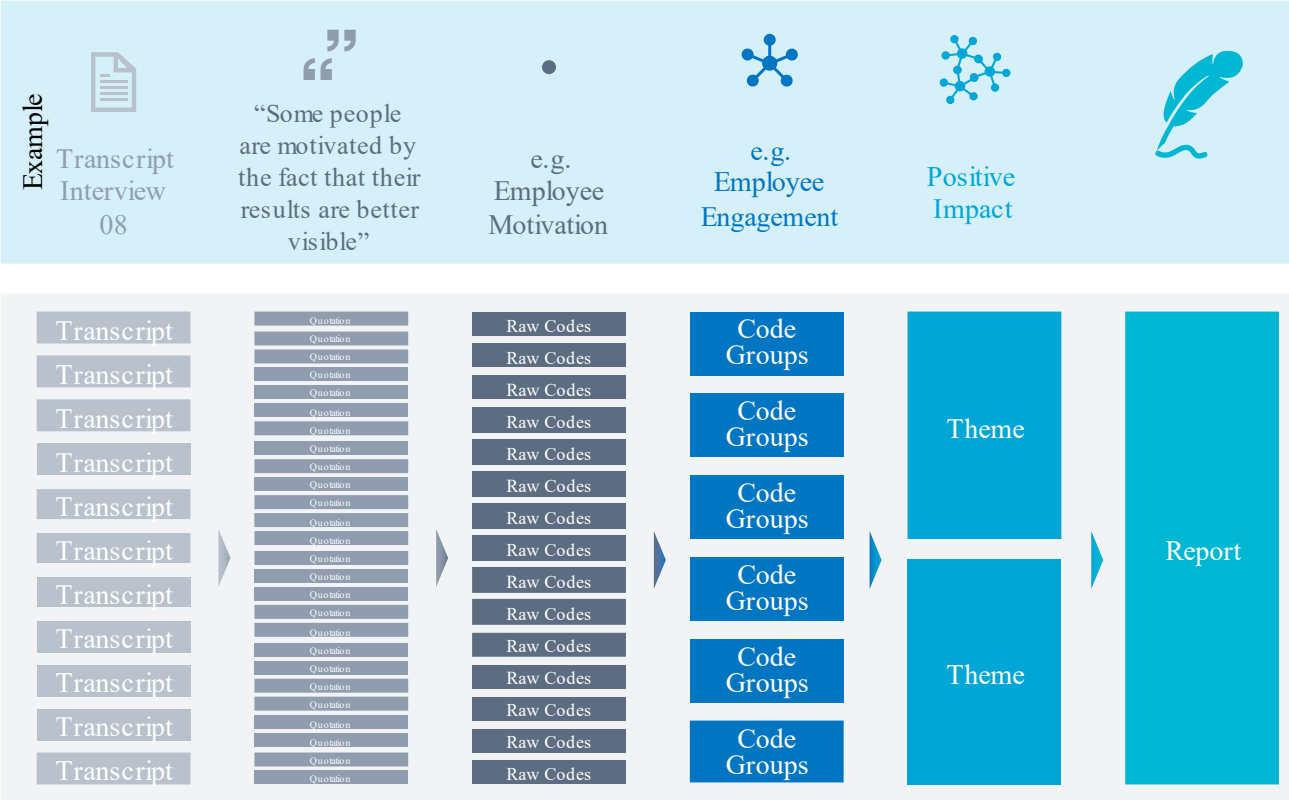

Figure 9: Detailed Example of the Coding Process.

Coding was performed with high granularity, visible in Figure 9. Each piece of data was first coded narrowly to capture details. For instance, challenges associated with e-HRM were coded distinctly when linked to different e-HRM practices or when the same challenge was discussed in varying contexts. Repetition within a single interview did not lead to multiple codings of the same text unless the context or association with the practice differed, thus preserving all details of qualitative data. After initial coding, code groups and themes were developed, grouping the results. Various visualizations were employed to aid in the analysis, including co-occurrence tables and bar charts, both with and without normalization. These visual tools helped in revealing patterns and trends in the data.

The coding for qualitative data was organised into folders corresponding to each research question. A detailed description of the different codes used, and the type of quotations coded with those codes, is visible for sub-research question two in Appendix B 4.1 on page 78, and for sub-research question three in Appendix B 4.2 on page 80. Post initial coding, closely related codes were grouped into categories, as visible in Figure 9 (single hierarchy), forming coherent themes that were reflective of the underlying data. Not all codes were merged, meaning that some codes stand next to the hierarchy, which is common practice in qualitative research. ATLAS.ti's functionality to restrict to a single layer of hierarchy of codes helps in maintaining analytical coherence and prevents the dilution of thematic significance that could occur with multiple overlapping hierarchies. The use of folder hierarchies, as well as coding groups, is not restricted to a number of hierarchies, and allows for additional fine-grained grouping and analysis. A detailed overview of the codebook is visible in Appendix B 5 on pages 82-84.

The subjective nature of qualitative coding presents inherent limitations, notably the potential for researcher bias in data interpretation. To mitigate this, iterative analysis was used. However, the subjective interpretation remains a noted limitation of qualitative research, and this is addressed in greater detail within the discussion section.

4 Results

The results in this section are divided in four parts, corresponding to their respective sub-research question. Together, the four sections answer the following research question:

Research Question
How can electronic human resource management (e-HRM) improve employee performance in technology startups during their transition phase?

4.1 E-HRM Practices

The following section provides an examination of the use of e-HRM tools and practices in technology startups. Specifically, this section addresses the first sub-research question:

Sub-research Question I
What e-HRM practices are implemented in technology startups during their transition phase?

4.1.1 E-HRM Tools

Before analysing the different practices, it is important to understand that the number of used practices is not the same as the number of used tools. One tool could cover many different e-HRM practices, as the following quotation shows:

> *"Yes, so this is actually our HR management software, this is e-HRM Tool X. So the employee has […] access to his own profile and can see in the organisation chart which other employees there are, for example, we can also use it for time recording, absences, absence requests for holidays, illness, other things, and exactly payroll accounting will then gradually come, we will then also use it." (HR manager 07, Quotation 91).*

The average number of tools used is 3.4. The variety of tools is zero to ten, while two was the most common (eight times). It is indicated that 75% of companies use five or fewer tools. The dataset reports a total of 61 different e-HRM tools, with many of these tools being unique to only one company; indicating a wide range of e-HRM tools being adopted.

4.1.2 E-HRM Practices

The analysis of e-HRM practices reveals selective adoption across various categories. Data, as shown in Figure 10, indicates that out of 32 companies, the majority implemented e-HRM practices in the first four categories: In contrast, the last two categories, were not widely used.

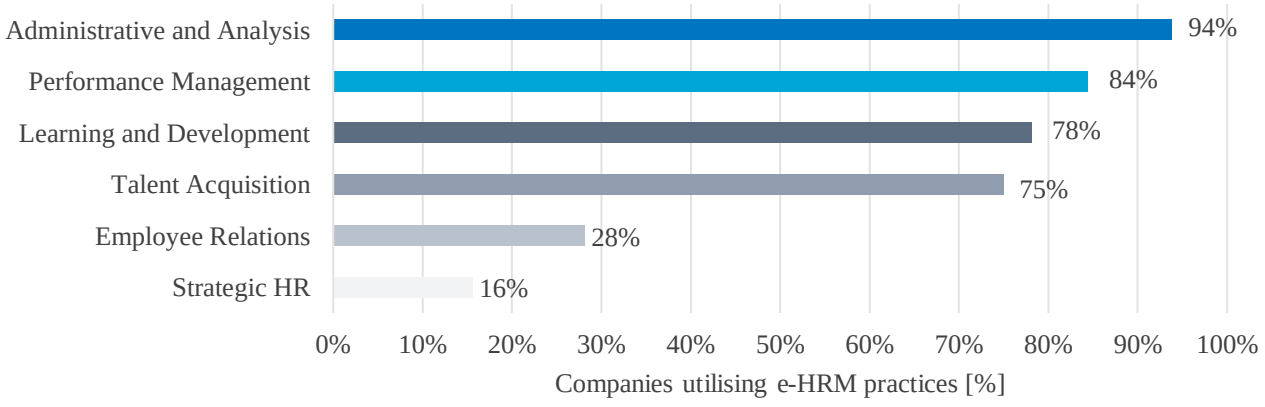

Figure 10: Percent of Companies Utilising Different e-HRM Practices.

This result indicates that technology startups do not use strategic e-HRM practices. When prompted about the usage of further e-HRM practices, an often mentioned answer was:

> *"So right now, we are actually exploring, we are going to implement this platform soon. So we don't have it at the moment, but we will implement it soon." (HR manager 05, Quotation 60)*

This indicates that further e-HRM tools are not the top priority, but planned for the future. Table 7 shows the groups of actual practices observed in the companies.

Table 7: Groups of e-HRM Practices based on the Results.

GROUPS OF E-HRM PRACTICES (RESULTS)
1. Administrative and Analysis
2. Talent Acquisition
3. Learning and Development
4. Performance Management

Further insights are provided by Figure 11, a box plot that details the distribution of tool-usage within the e-HRM categories. The box plot shows that in Administrative and Analysis, Learning and Development, and Performance Management, the first quartile (25th percentile) reaches one and the third quartile (75th percentile) at two. This distribution indicates that at least 50% of the companies use between one and two e-HRM practices in these categories. The x in the box plot indicates the average. The table providing the data for this figure is provided in Appendix C, Table 49 page 86.

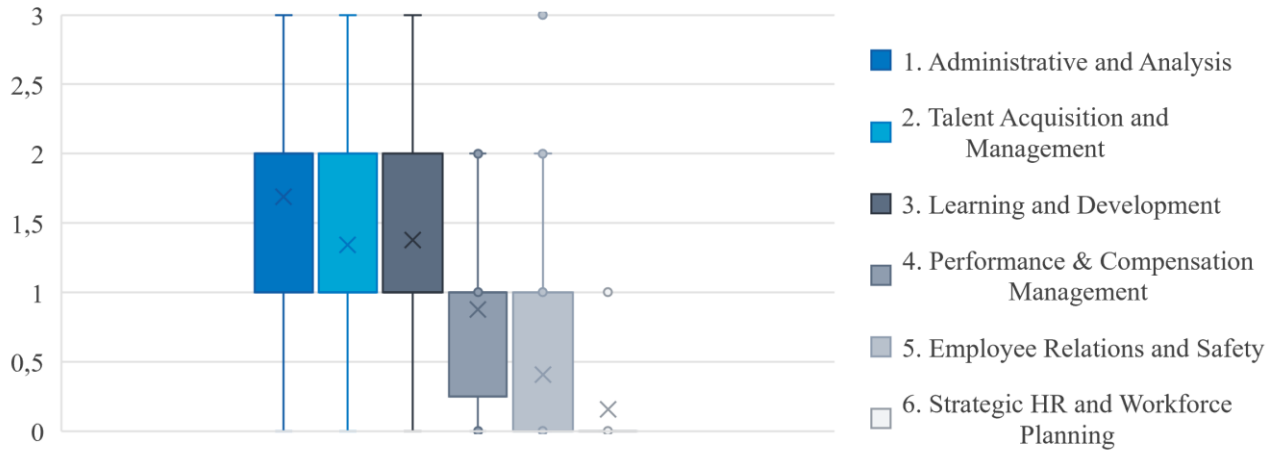

Figure 11: Boxplot on the Number of e-HRM Practices mentioned per Category.

Figure 12 below shows the list of e-HRM practices, based on the overview created from the literature in chapter 2.3.1 - E-HRM Practices in Startups on page 8, and their correlating usage. The subgroups, that were indicated in the literature, but not found in the results, are Career management, Manpower requirements, Competency management, Succession planning, Safety/ security protocols. It also visible that the two last groups are not used often, and therefore not relevant for all companies, as indicated in the previous subchapter. It is visible that subcategories in the six main categories are not utilized equally. This is most prevalent in the category „Talent Acquisition", where recruiting tools (like Applicant Tracking Systems) are mentioned more than five times as often as all the other three subcategories combined. The data in Figure 12 can be found in Table 50 in Appendix C 1.1 on page 86.

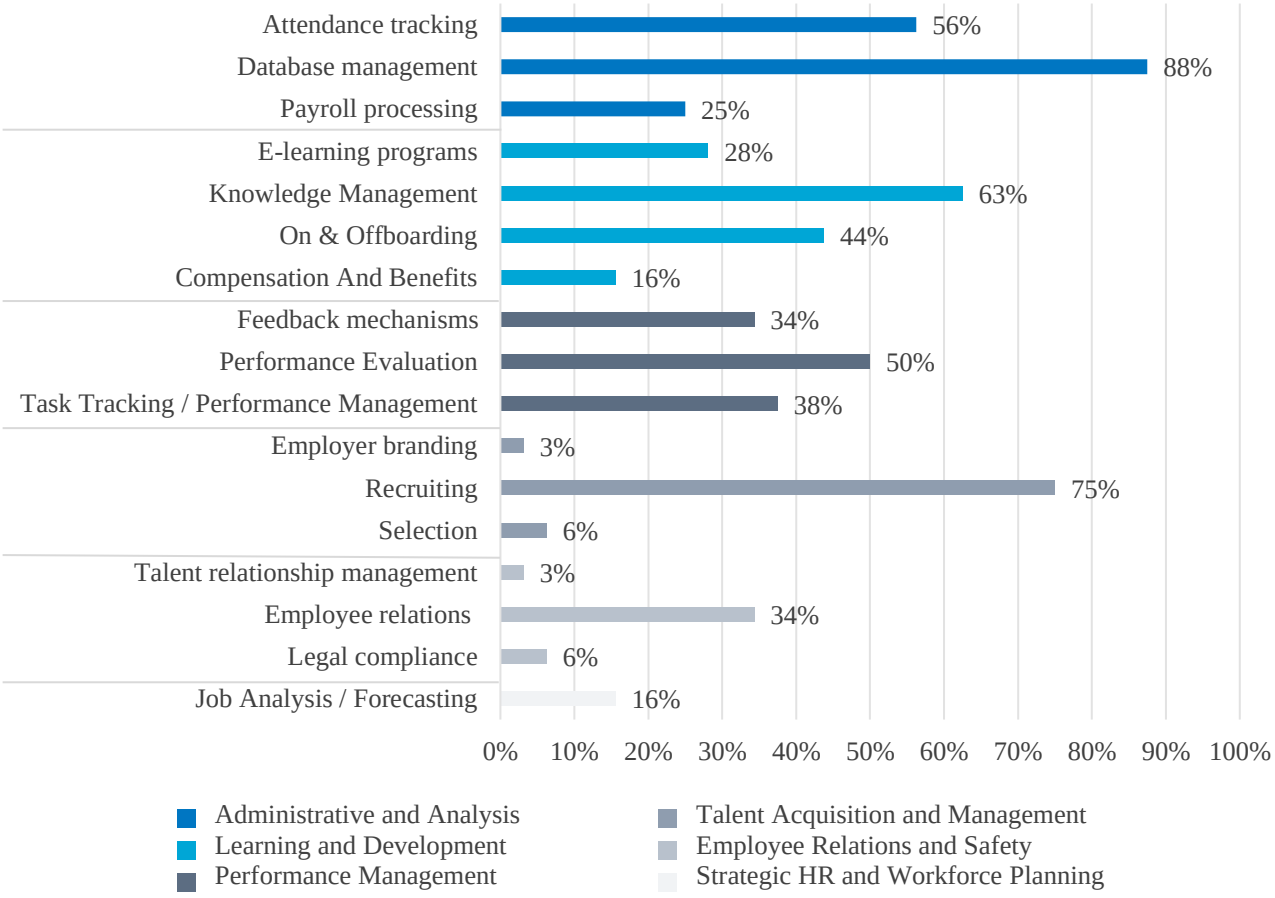

Figure 12: Usage of Different e-HRM Practices in Percent of the 32 Interviewed Companies.

4.1.1 Answering the first Sub-research Question

Sub-research Question I
What e-HRM practices are implemented in technology startups during their transition phase?

During their transition phase, technology startups primarily implement e-HRM practices in Administrative and Analysis, Learning and Development, Performance Management, and Talent Acquisition. The most common tools include database management, used by 88% of companies, and recruiting strategies, employed by 75% of companies. Other notable practices are knowledge management in Learning and Development, used by 63% of companies, and feedback mechanisms in Performance Management, used by 50%. Practices related to Employee Relations, Safety, and Strategic HR are less commonly adopted.

4.2 E-HRM Challenges

The analysis of challenges encountered by technology startups in implementing e-HRM tools reveals a diverse range of obstacles. While the literature suggests only people challenges in technology startups (Chapter 2.4.1 on page 10), this section presents the challenges in all categories of the TOP framework. By analysing these challenges, the second sub-research question is answered:

Sub-research Question II
What are the e-HRM challenges faced by technology startups during their transition phase?

The distribution of these challenges is depicted in a box plot (Figure 13), indicating that 50% of the interviews reported mentioned between 3 and 8 challenges, with an average of 5,4 challenges per company.

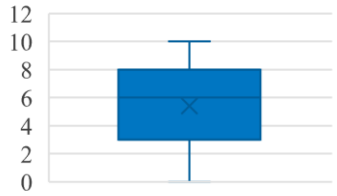

Figure 13: Boxplot on the Number of e-HRM Challenges per Company.

The different challenges are described in the following. Figure 15 below shows an overview of e-HRM challenges, while the sizes of the areas showcase the number of quotations per code.

4.2.1 People Challenges

People-related challenges formed the majority, accounting for more than half of all challenges faced, as highlighted in Figure 15 on the next page. These include, visualised in Figure 14, five types of challenges. A detailed table of the codes and quotations in this category is available in Appendix D 1.2 on page 89.

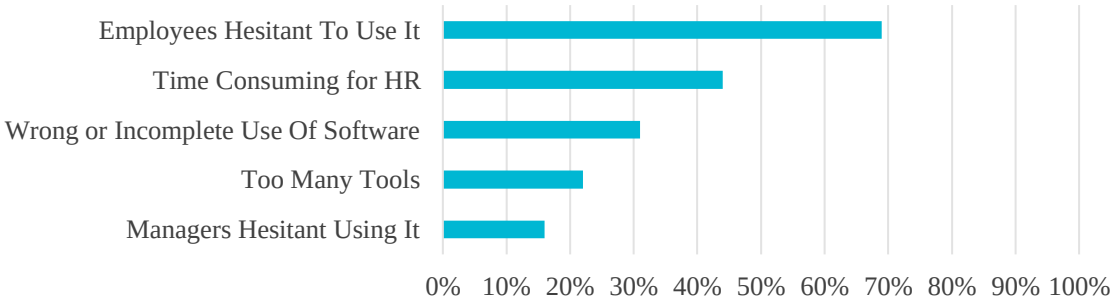

Figure 14: People Challenges mentioned in Percent of the 32 Companies.

Employees Hesitant to Use It

In implementing e-HRM tools, a key challenge identified across technology startups is employee hesitancy. This reluctance is primarily due to unfamiliarity with new technologies and disruptions to established routines. For instance, a simple update like adding fields in an HR tool prompted confusion about the tool itself:

> *„Like a month or two ago we had an announcement where I've added some fields in e-HRM Tool X so that people could put in their shoe/sock and T-shirt size. So for our next company event we can get cool like swag and we did have someone say: 'Wait, what's e-HRM Tool X?'„ (HR manager 12, Quotation 174).*

Employees often resist new systems, preferring traditional methods that they perceive as simpler and more within their control. This resistance can complicate the transition to automated systems, which while intended to streamline processes, end up adding complexity and administrative overhead. For example, switching from manual tracking in online sheets to an automated system requires new habits, and was met with reluctance:

„It was mostly engaging people in using it because before everything was reported like let's say basic Tool Y and it's like creating this habit of reporting in the system and like adding information to e-HRM Tool X, basically engagement." (HR manager 05, Quotation 158).

Moreover, the integration of e-HRM tools often leads to increased administrative tasks, especially when the tools are not intuitive, resulting in significant time spent on adjusting to the new system:

„So it's incredibly time-consuming. I'm sure many people are totally annoyed by it. But it's an insane amount of stress to push it through. You might spend two hours with e-HRM Tool Z and not be able to continue working on your normal tasks." (HR manager 08, Quotation 279).

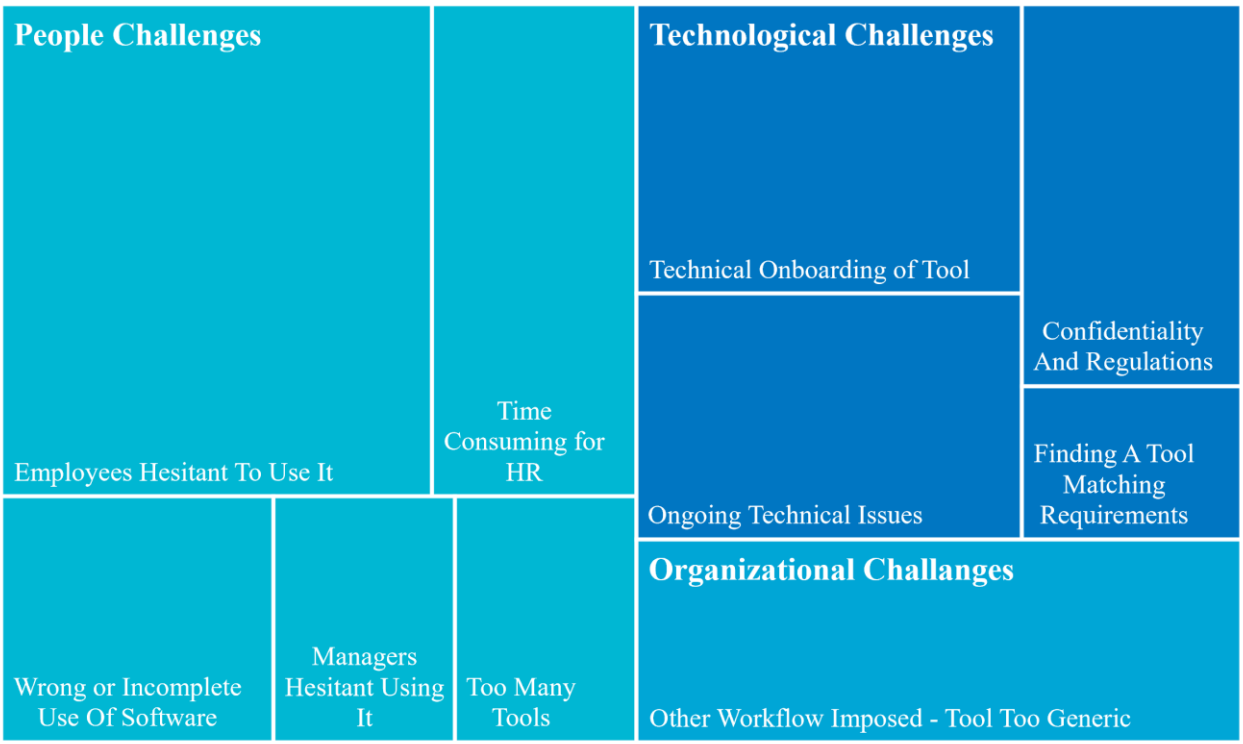

Figure 15: People Challenges, Technological Challenges and Organizational Challenges mentioned.

Time Consuming for HR

A significant challenge faced by HR is the time investment required, which often originates from system complexities and the need for frequent adjustments. These challenges are particularly pronounced in activities such as holiday management, time tracking, and the transition from manual to digital systems.

Employees often forget to use the new systems correctly, such as clocking in and out, which necessitates regular adjustments by HR. For example, one HR manager noted the recurring issue of having to make small, yet time-consuming corrections:

„When we had this clock-in system, and I don't know, some people forget to clock in in the morning or forget to clock in again after the break and that's such a small thing, but that really does add up, yes, in terms of time, when there are these ten to fifteen minutes every day that you have to make any adjustments." (HR manager 07, Quotation 223).

Additionally, navigating new systems can be confusing and inefficient, leading to frustration among HR staff. A common complaint is the cumbersome nature of these tools, as expressed by one user:

„Now I'm being led from one page to another and then I think to myself, why was I led to another page? Why couldn't I just stay on the same page?" (HR manager 04, Quotation 160).

The integration of new e-HRM tools often requires dual maintenance of digital and physical records, doubling the workload for HR departments:

„I only have double the work in the sense that I have a physical and digital personnel file, so if I receive documents in paper form, I still have to scan them so that they are also visible to the employee in the digital personnel file." (HR manager 22, Quotation 214).

Moreover, the frequent updates and changes within e-HRM systems can further complicate the user experience, making it difficult for HR staff to keep up with the adjustments needed:

> *„For example, there's just been an update and we've all been looking around a bit. Where did our competence matrix end up?" (HR manager 26, Quotation 169).*

Wrong or Incomplete Use of Software

Another common issue identified in the deployment of e-HRM tools is the wrong or incomplete usage of software functionalities by users within organizations. This often results from a lack of understanding or awareness of the full capabilities of the systems in place. For instance, one HR manager pointed out the underutilization of a comprehensive HR platform:

> *„We have quite a few hiring managers and they don't always use e-HRM Tool X the way it should be used. But I think if e-HRM Tool X is used the way you can, you know that you can write in your assessment, you can write in the comments. You can communicate with the recruiter." (HR manager 17, Quotation 210)*

This indicates a gap between the potential applications of the tool and its actual usage.

Moreover, another significant pattern emerges where features available within the software are left untapped, as employees are either unaware of them or unsure how to integrate them into their daily operations. This is exemplified by another comment from a user:

> *„I think it's actually something that has been implemented, but I haven't used it yet, only thing I can perhaps say is that there is another module that I haven't looked at myself yet." (HR manager 26, Quotation 158).*

Too Many Tools

The next issue in the area of people challenges is the dilemma of too many tools. Many companies find themselves juggling several platforms for different HR functions, which can be cumbersome and counterproductive. A representative sentiment from the interviews illustrates this problem:

> *„Yeah, it would be much easier to use 1 tool with all the functions, but unfortunately for a small organization it's quite hard to find that tool for like a reasonable budget as well." (HR manager 05, Quotation 82)*

This statement captures the dilemma of wanting to streamline processes through a single integrated system versus the reality of needing to navigate multiple specialized tools, often due to budget constraints or the specific needs that no single tool adequately addresses.

Managers Hesitant Using It

Managerial hesitancy to fully engage with e-HRM tools is the last challenge highlighted in the interviews. Managers often struggle with or resist using these systems effectively. This hesitancy can lead to inefficiencies and the need for frequent reminders and follow-ups. As one HR professional pointed out,

> *„If people aren't good at putting in their own sick leave, or managers aren't good at tracking sick leave. So that's one that we have to do a few reminders and follow-ups on." (HR manager 09, Quotation 247)*

This indicates a gap in using the systems as intended. Furthermore, the reluctance or inability of managers to utilize e-HRM tools for performance reviews and employee recognition is another issue. The effectiveness of these tools is often undermined by incomplete or incorrect usage by managers, which can lead to employee frustration and disengagement. For example, another interviewee expressed dissatisfaction with how managers handle performance reviews:

> *„Even for us to nudge people like, hey, did you have the performance review already? Because we have to do this job and it's a pain in the ass when it's like 12 times." (HR manager 19, Quotation 330).*

4.2.2 Technological Challenges

Technological challenges were noted in about 30% of the responses. Common issues included the technical onboarding of tools, concerns over confidentiality and compliance with regulations, ongoing technical difficulties, and the challenge of finding a tool that meets all HR requirements, summarised in Figure 16 below. A detailed table with quotations listed next to the categories is visible in Appendix D 1.3 on page 90.

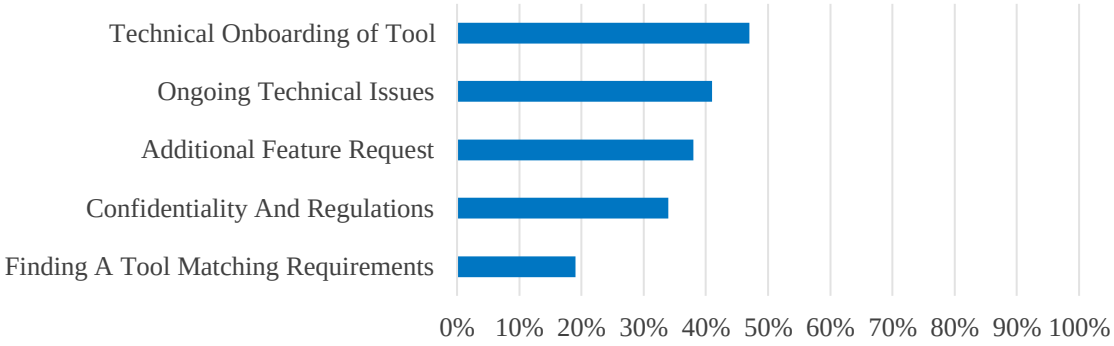

Figure 16: Technological Challenges mentioned in Percent of the 32 Companies.

Technical Onboarding of Tool

A specific example concerning the technical onboarding of tools involved issues with data integration:

> *„This was the pain point I think we did a CSV upload which had a bunch of errors and then we had to go manually fix all the errors. Then I had to update all of the contractor information one by one. I mean, if I was doing this with 300 employees, wow. Umm, but thankfully we were only 40 at the time" (HR manager 06, Quotation 228).*

Another common issue is the lack of direct support and guidance during the setup phase, which compounds the complexity of adopting new systems. As another participant described,

> *„No one ever got in touch with us and we then set it up or I tried to set it up a bit on my own with the manuals they had. Yes. And while I was doing that, we already wanted to launch the first 360-cycle, so the whole concept, the communication, how does it work? In other words, I had to deal with the new tool, with the technical things, with the introduction of the new process, with the communication. That was very difficult." (HR manager 08, Quotation 178).*

Ongoing Technical Issues

Ongoing technical issues with e-HRM tools frequently disrupt normal HR operations, as shown by problems with system integrations and unreliable functionalities. These issues often result in the need for redundant data entry and manual adjustments, which undermines the efficiency of automated systems. One significant problem pointed out by a user involved integration issues between an HR platform and a payroll system:

> *„Specifically, what wasn't working for us was the integration between e-HRM Tool X and our payroll system in Sweden was always broken, which means it didn't have any purpose. We were having to enter things in twice, so that was a big factor in why e-HRM Tool Y was really appealing because they did integrate with our payroll system." (HR manager 12, Quotation 128).*

Furthermore, users frequently encounter problems with basic functionalities such as notification systems and holiday calculations, which can lead to confusion and additional workload for HR staff. Another user detailed their frustration with the notification system:

> *„And before it was a bit separate, notifications, i.e., the tasks and notifications in the inbox. But then there were notifications in the inbox that I would actually have understood as a task." (HR manager 15, Quotation 223).*

Confidentiality And Regulations

Another challenge are confidentiality and compliance with regulations which are not the perfectly depicted in the technical functionality of one tool, particularly when adapting tools developed under one legal framework for use under another. A frequent issue is the loss of anonymity and breaches in confidentiality, which can undermine trust in the HR processes. For example, an HR professional highlighted a critical failure in maintaining anonymity during peer reviews:

> *„But the thing is we used e-HRM Tool X last year to do the peer reviews. Their tool was not that great, to be honest. It was that... we lost the anonymity. It was not anonymous. When you did that, the peer reviews and that was just not so good.“ (HR manager 13, Quotation 41).*

Additionally, the challenge of ensuring proper data privacy and access control within e-HRM systems is often compounded by the complexity of the tools and lack of customization to local needs. This is particularly problematic in the context of stringent data protection regulations like GDPR. As one user explained,

> *„We have ruled out e-HRM Tool X completely, simply because whoever is responsible for data storage in the USA and in Germany and it was important that the data remains here in Germany, of course.“ (HR manager 22, Quotation 293).*

Finding a Tool Matching Requirements

Finding an e-HRM tool that matches specific organizational needs remains a significant challenge for technology startups, particularly in balancing functionality, cost, and the potential to introduce unwanted complexity into the organizational structure. This difficulty is compounded by the diverse requirements and constraints faced by smaller companies. As one interviewee expressed, the main challenge lies in

> *„ensuring that the tool will match any requirement we had on the HR“ (HR manager 20, Quotation 140)*

This underscores the struggle to find a solution that meets all HR needs without excessive customization or cost. Furthermore, cost considerations often prevent startups from adopting comprehensive tools that offer extensive features for performance management and other HR functions. As mentioned in another discussion,

> *„We also explored other tools that are incredible for performance management. However, the costs are really high“ (HR manager 19, Quotation 98)*

The challenge extends to ensuring the tool does not enforce a hierarchical or overly structured environment that may not align with the flexible nature of startup culture. Concerns about the tool fostering

> *„too much of a hierarchical structure or like a checkbox exercise“ (HR manager 11, Quotation 231).*

were also noted.

Technological Challenges in Software vs. Non-software Startups

Proposition II suggested that technology startups encounter nearly no technological challenges. However, the results indicate this is not the case. Also, when comparing the software startups in the sample (21) with the non-software startups like hardware and robotics (11), no strong difference is visible (see Figure 17). While software startups encounter 1.7 technological challenges on average, non-software startups encounter only slightly more, namely 2.0. The data for this graph is visible in Appendix D 1.3 on page 90.

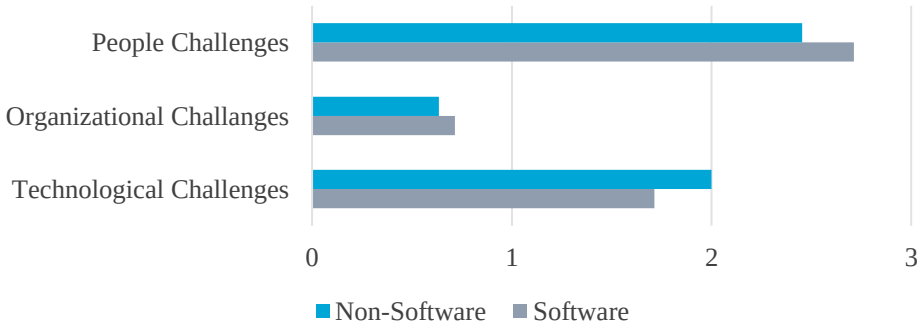

Figure 17: Average Number of Challenges in Software Startups vs. Non-software Startups.

4.2.3 Organizational Challenges

Organizational challenges were the least reported. The main challenges mentioned were overly generic tools that imposed specific workflows not suited to the company's needs, as visible in Table 8. The table with quotation is visible in Appendix D 1.4 on page 90. Notably, such challenges were not widespread, accounting for roughly 10% of all challenges, predominantly mentioned by the largest organizations surveyed. The limited reporting of organizational challenges aligns with initial expectations given the typically non-hierarchical and flexible structures of startups.

Table 8: Organizational Challenges mentioned in Percent of the 32 Companies.

Challenge	*%*
Other Workflow Imposed - Tool Too Generic	34%

A prevalent challenge with e-HRM tools is their inability to offer the necessary customization for specific organizational needs, leading to issues with imposed generic workflows that do not align with the unique processes of different companies. Many tools come with preset functions and features that are too basic and can not be adapted for more complex, tailored needs. For example, an HR professional highlighted the limitations of a system designed for simple reciprocal reviews that fails to accommodate more nuanced performance review processes:

> *„It's in a way very simple, so it doesn't let you make it a bit more complex. For example, if you do a yearly review, there is no way to customise it for separate people. For example, I want to review you, Raphael, then another person also reviews you. It's like something more complex... It lets you just review: OK, you review me, I review you, that's it. So it's in a way a very simple system and it doesn't let us adjust to needs." (HR manager 05, Quotation 213).*

Additionally, the rigidity of these systems often fails to support the detailed organizational structures and varied operational nuances of different teams within a company. Another HR manager expressed frustration with the lack of flexibility in administrative permissions, which does not support their organizational hierarchy or variable compensation structures:

> *„The administrative permissions were not super flexible in e-HRM Tool X. e-HRM Tool X isn't really set up for having multiple currency types and multiple pay cycle types. So all of their financial reports, we would only include people who had their salary type as monthly because that's how it was set up. So then no one in Portugal was being included in our any of the analytics related to finance." (HR manager 12, Quotation 131).*

4.2.4 E-HRM Challenges Linked to High Utilization of e-HRM Practices

In examining the various challenges associated with the e-HRM practices, it becomes visible that the frequency and type of challenges reported are closely correlated with the extent to which these practices are utilized. Particularly, the more extensively a practice is used, the more challenges are reported. This pattern is especially visible for administrative tools and performance management practices, with challenges mentioned in 25 and 17 interviews respectively. This distribution of challenges is also quantitatively represented in Figure 18 below, which shows the percentage of companies reporting at least one challenge with a specific e-HRM practice.

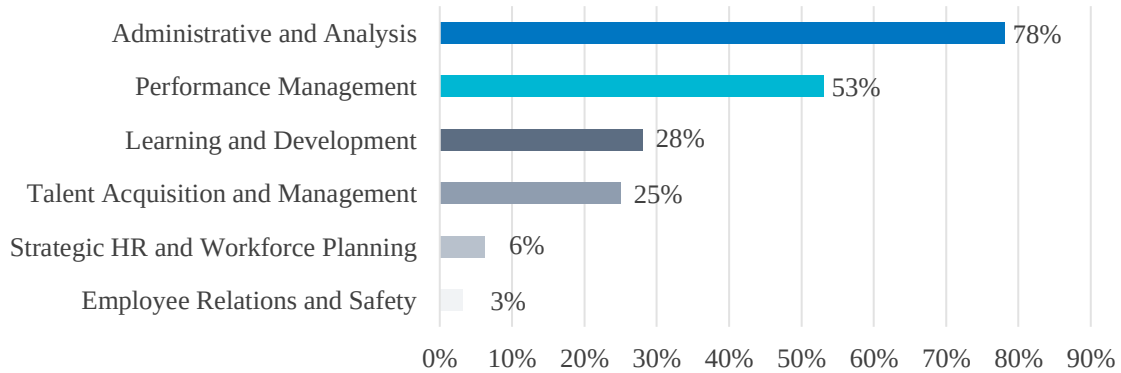

Figure 18: Companies Mentioning at least One e-HRM Challenge per e-HRM Practice Category.

Conversely, the last two categories - Strategic HR and Employee Relations and Safety - exhibited far fewer challenges, with only two challenges reported for Strategic HR practices and a single challenge for Employee Relations and Safety practices. Due to the limited number of challenges associated with these two categories, no significant result can be presented for them.

To better understand the different types of challenges associated with the corresponding practices, some representative quotations for the two most prominent practices, namely Administrative and Performance Management, are described in the following. Further challenges to different e-HRM practices are described in Appendix D 1.1 on page 89.

Administrative e-HRM Tools

In the category of Administrative and Analysis, common patterns of challenges include issues with system reliability, integration complexities, and the inflexibility of tools to adapt to specific organizational needs. These challenges impact the effective management of timekeeping, payroll, and general administrative tasks.

System Reliability Issues: Many HR manager report persistent problems with e-HRM tools, for example after updates, leading to inaccuracies in essential timekeeping data. For instance, one HR manager mentioned,

> *„Yes, the tool just goes crazy, I don't know, I've run several updates and the times were no longer correct." (HR manager 01, Quotation 144).*

Integration Complexities: Integrating e-HRM tools with other systems, especially payroll, often does not meet the organizational requirements, leading to redundant work. A typical challenge is expressed by a HR manager who faced ongoing issues with payroll integration:

> *„Specifically, what wasn't working for us was the integration between e-HRM Tool X and our payroll system in Sweden was always broken, which means it didn't have any purpose. We were having to enter things in twice." (HR manager 12, Quotation 128).*

Tool Inflexibility: The inability of e-HRM tools to be customized for specific organizational needs is a recurring theme. Tools often do not support variations in employment contracts or local legal requirements, such as differing public holiday laws or complex leave policies. An example of this issue is highlighted by a HR manager who struggled with the tool's lack of support for local needs:

> *„We have flexitime, flexitime accounts, so you can take hours with you and then there's an overtime allowance and so on and it's all a bit difficult for them to understand." (HR manager 01, Quotation 146).*

Performance Management e-HRM Tools

Performance and compensation management within e-HRM tools often faces significant challenges, primarily around system inflexibility, lack of intuitive use, and inadequate customization options that hinder effective employee evaluations and compensation management.

Difficulty in Managing Performance Reviews: Managing performance reviews often becomes cumbersome due to the generic setup of the tools, which do not align with the specific operational practices of the organization. This is exemplified by the following experience:

> *„The performance reviews cycles is still something that it's not entirely reflecting our ways of working... these tools usually are made for the standard processes... However, in our company, we do it whenever someone is doing their anniversary in the company." (HR manager 19, Quotation 190)*

Inadequate Feedback Mechanisms: The tools frequently lack sophisticated mechanisms to capture detailed and actionable feedback during performance reviews. This limitation is evident in user feedback, such as,

> *„The tool is not super intuitive either, so it was not easy to really get it across to the employees and motivate them to get to grips with it." (HR manager 08, Quotation 200)*

Furthermore, another HR manager highlighted,

> *„And it was just we just figured that doing the peer reviews in text, it took a lot of time from everyone." (HR manager 13, Quotation 43)*

4.2.1 Answering the Second Sub-research Question

Sub-research Question II
What are the e-HRM challenges faced by technology startups during their transition phase?

In addressing the sub-research question about the challenges faced by technology startups during the implementation phase of e-HRM, these challenges are nearly equally split between technological and people-related issues. This is also visible in Figure 19.

From a technological perspective, startups frequently encounter difficulties with system integration and data management. Technical onboarding proves particularly challenging, with startups dealing with errors in data uploads and integration with existing systems which often aren't seamless or intuitive. These technical barriers significantly disrupt the normal HR operations and increase the workload due to the need for frequent manual corrections and double entries.

Figure 19: Proposition of Technological and People Challenges in Technology Startups.

At the same time, people challenges are very prominent. Interviews showed that employees often show hesitancy towards adopting new tools, preferring familiar manual processes over new automated systems. This resistance is visible through a lack of familiarity with the new systems, leading to underutilization and incorrect usage. Managers also demonstrate hesitancy in fully utilizing these systems for tasks such as performance reviews, further hindering the effectiveness of e-HRM tools.

4.3 E-HRM Impact

This chapter answers the third research question:

Sub-research Question III
How does the adoption of e-HRM practices affect employee performance in technology startups during the transition phase?

Initially, specific effects of e-HRM practices are described, which are more frequently linked to transparency and employee engagement, so indirect contributors to employee performance. These effects are discussed first, based on their frequency of mention in the interviews, with insights supported by direct quotes.

The latter part of this chapter narrows the focus to the implications of e-HRM practices on employee performance. The different sentiments of answers regarding employee performance are analysed through quotations to show how e-HRM practices influence performance within the context of technology startups.

4.3.1 Influence of e-HRM on Various Variables

The specific e-HRM categories with their sentiments of impact (positive/negative) are presented in Figure 20. The impact mentioned in this subchapter is not only regarding direct influence on employee performance, but also indirect related and not related variables like transparency, employee engagement and time saving. It is visible in Figure 20 below, that the first two e-HRM categories, which are also the two most used categories, have been named most often, with a majority of positive influences:

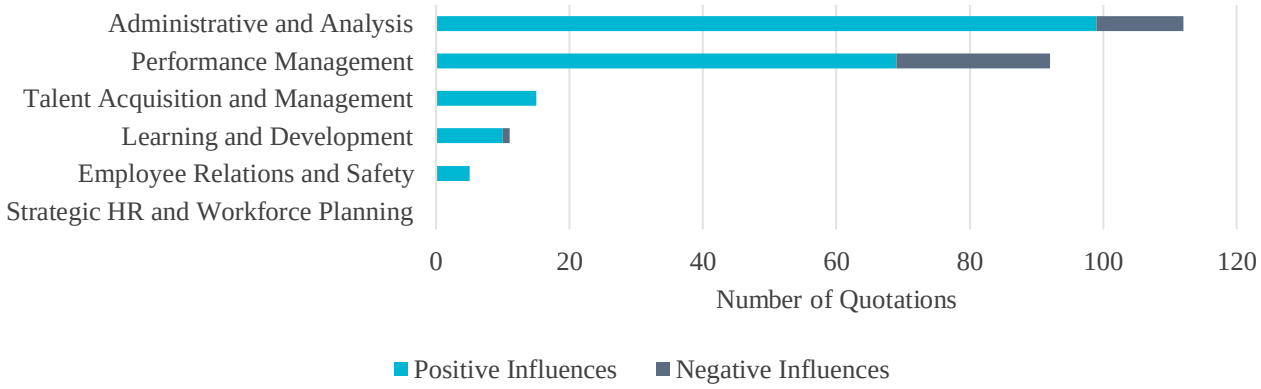

Figure 20: Influential e-HRM Practice Categories, Positive and Negative.

The specific influences of e-HRM are visible in Figure 21 below. In the following, the influences are described, using quotations from the interviews, in the same order visible in the figure. The top four influences, namely Transparency, Employee Engagement, Time Savings and Simplicity, are explained directly in this chapter. The descriptions on Informed Decisions, Speed, Feedback/Education, Structure, Data Security and Non Value Added activities is described in Appendix E 2 on page 93 - 96.

Enhanced Transparency

Enhanced transparency and improved access to information are frequently highlighted as significant benefits of e-HRM systems in technology startups. For instance, one HR professional noted the system's impact on managing vacation days:

> *„You can easily check if people have vacation days... It predominantly helped big time to make that process much more transparent and easily executable." (HR manager 03, Quotation 157)*

This enhanced transparency extends to various HR processes, providing both employees and managers with a clearer and more accessible view of essential data. Another example shows the system's role in improving operational transparency:

„So if the tech is enabling transparency, that improves performance.“ (HR manager 06, Quotation 328).

Additionally, these systems facilitate better planning and scheduling, which is crucial for organizational efficiency. The ability to view team availabilities and plan accordingly was emphasized:

„They can click on a button and they can see for their entire team who will be on holiday when so it helps them with planning.“ (HR manager 11, Quotation 287).

This functionality not only aids in immediate scheduling needs but also contributes to long-term resource planning, making it an indispensable tool for managers.

However, despite these advantages, some negative impact is also mentioned. Some employees may fully utilize the system as intended, but interact less with their peers, leading to gaps in communication. As highlighted in one interview:

„I do think, though, on the flip side, maybe people are slightly less communicative about it... So that’s maybe a like a weakening from having a system.“ (HR manager 12, Quotation 204).

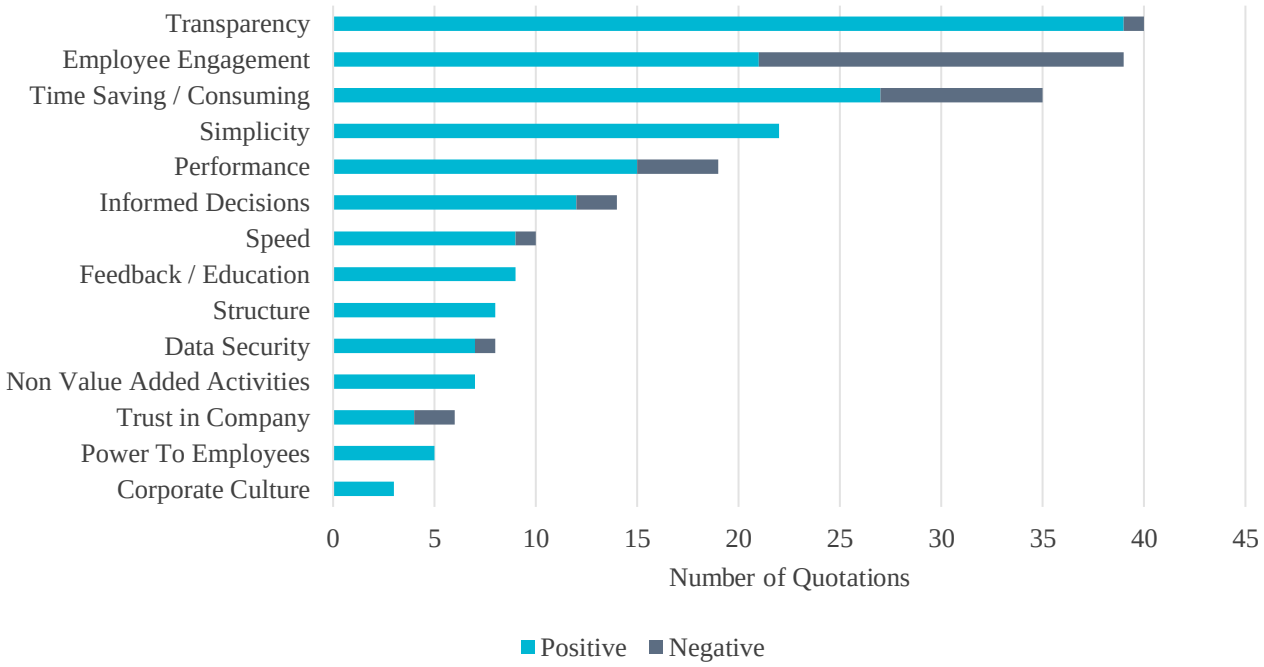

Figure 21: Mentions of Different Impact Factors of e-HRM, Positive and Negative.

Employee Engagement

Employee engagement has a multifaceted impact on employees. In Table 9 is visible, how HR managers described the influence. Firstly, employee experience within organizations has notably improved with the integration of e-HRM systems. These systems not only automate reminders for personal events like birthdays and anniversaries but also ensure these important dates are not overlooked, thus contributing to a supportive work culture. As one HR manager shared,

„We also use it for anniversaries and birthdays, so that we are reminded of them, which is also very nice, so you don’t forget that with the employees“ (HR manager 25, Quotation 161).

Table 9: Positive Influences on Employee Engagement.

Positive Influences on Employee Engagement	*# of quotations*
+ *Feel Cared About*	7
+ *Hygiene Factor*	6
+ *Motivated Employees*	6
+ *Employee Experience*	2

Furthermore, the transparency and direct feedback mechanisms these systems provide are helpful for facilitating open discussions about performance and well-being, enhancing the overall work environment. An example of this impact was described by an HR professional who noted,

> *„Sometimes they choose to reveal the feedback, not anonymously, so we can see... Ohh yeah, Alfonso is not happy about this and that let's talk about it" (HR manager 06, Quotation 492).*

The systems also foster a sense of being cared for among employees. This is especially significant in remote work settings where maintaining personal connections can be challenging. Regular surveys and feedback mechanisms assure employees that their opinions are valued and acted upon. One HR manager explained,

> *„It's good that they are happy that we care about them. We make these surveys and then we have an update for the whole company that what we have investigated and so on" (HR manager 02, Quotation 244)*

E-HRM systems also serve as essential tools for organizational hygiene, streamlining productivity by simplifying routine tasks. This was said by another interviewee:

> *„One role is to look at productivity and making life easier for the non-value added activities... It definitely is a hygiene factor to make things run as smoothly as possible" (HR manager 03, Quotation 174).*

However, the deployment of e-HRM systems is not without its challenges, as visible in Table 10. Some employees express frustration and annoyance, especially when the systems do not function correctly or are perceived as cumbersome. For instance, errors in calculating time off can lead to significant discontent, as one HR manager mentioned,

> *„Even if you can't apply for time off in e-HRM Tool X because it's not calculated correctly... of course, that frustrates you and leads to anger" (HR manager 01, Quotation 157)*

Additionally, the complexity and sometimes non-intuitive nature of these systems can confuse employees, as highlighted by another professional:

> *„Sometimes the holidays are a bit confusing, I have to say. Okay. But I think that's also because... We don't just have the legal holiday days, but also some extra holiday days and then sometimes the calculation doesn't add up" (HR manager 21, Quotation 341).*

Table 10: Negative Influences on Employee Engagement.

Negative Influences on Employee Engagement	*# of quotations*
- Anger & Annoyance	7
- Confusion	7
- Micromanagement	4

Moreover, there is a delicate balance between monitoring for efficiency and micromanaging. Excessive tracking can undermine autonomy and demotivate staff, as one HR manager pointed out:

> *„Yes, I think that for people who have already worked very efficiently before... having to do it all at once has probably made them a bit slower" (HR manager 27, Quotation 335).*

Time Management

The impact of e-HRM systems on time management within organizational contexts has been noted for both its efficiency gains and potential time-consuming aspects.

On the positive side, many organizations have experienced significant time savings due to the automation of manual tasks. For instance, one HR professional noted,

> *„It also reduced a lot of the manual tasks, basically" (HR manager 09, Quotation 291)*

This sentiment was echoed in another interview where the HR manager highlighted the reduced administrative workload,

> *„Well, it simply takes an incredible amount of admin work and labour out of the HR team in particular. So, that's just our, yes, time saving, a lot. Yes" (HR manager 08, Quotation 361).*

However, the integration of e-HRM systems is not without its challenges. Some processes associated with these systems can be unexpectedly time-consuming. For example, one individual described the extensive time required for performance reviews:

> *„So the only thing I can think of is that processes like this are very time-consuming. So you have to write your self-assessment, which can take an hour, and then you have to write assessments for peers, depending on how many you have" (HR manager 08, Quotation 277).*

Another negative aspect was highlighted in terms of usability issues that lead to additional work:

> *„E-HRM Tool Z calculates them [the vacation days]as well as the law, so if someone starts on the second of a month, for example, e-HRM Tool Z says there is no holiday for that month and we say yes, of course there is holiday for one month exactly, so we always have to make sure that we adjust it manually, which always means an extra step of work and is not optimal" (HR manager 26, Quotation 254).*

Simplicity

While simplicity sometimes goes hand in hand with time savings, it is mostly focussed on the intuitive nature of a task. This intuitive design enables HR managers and employees to complete tasks efficiently and without much cognitive load or frustration. A key benefit repeatedly highlighted is the centralization of data, which provides a single, easy-to-access location for all information, significantly simplifying administrative tasks for both employees and management. As one professional noted,

> *„There is a positive change because there is some centralized place with all the data, all the information where people can look" (HR manager 05, Quotation 227).*

Additionally, the integration of various HR functions into one platform has made it easier for employees to perform a wide range of tasks such as time reporting, vacation requests, and accessing team structures. This consolidation reduces the need to navigate through multiple systems, leading to a more streamlined workflow, as explained by another HR manager:

> *„It's a bit simpler for them to report time, request vacation. See their team structure. Fill out surveys, have development discussions, because everything is in one place, not in separate Sheets" (HR manager 05, Quotation 235).*

Feedback from users also underscores the intuitive nature of these systems, particularly with features like time recording and visibility of workplace presence, which enhance user experience and satisfaction.

> *„People across the board actually find the e-HRM Tool X time recording system much more intuitive, much easier and yes, they just like the fact that you can see who else is in the office" (HR manager 07, Quotation 272).*

The further influences (Informed Decisions, Speed, Feedback/Education, Structure, Data Security and Non Value Added) are described in Appendix E 2.

4.3.2 The Influence on Different Stakeholders

In exploring the influence of e-HRM on various stakeholders in the companies, this chapter examines the specific impacts on employees, HR managers, line managers, and the company as a whole. Figure 22 visualizes the different influences on different stakeholder groups. For **employees**, e-HRM systems centralize access to information, enhancing transparency and potentially boosting engagement by simplifying administrative processes. **HR managers** benefit from the automation of routine tasks, which improves efficiency. **Line managers** utilize e-HRM tools for better team management and performance tracking, aiding in more informed decision-making. At the **organizational level**, e-HRM contributes to improved compliance and data management, aligning HR functions with broader company goals while also presenting challenges such as integration with existing processes.

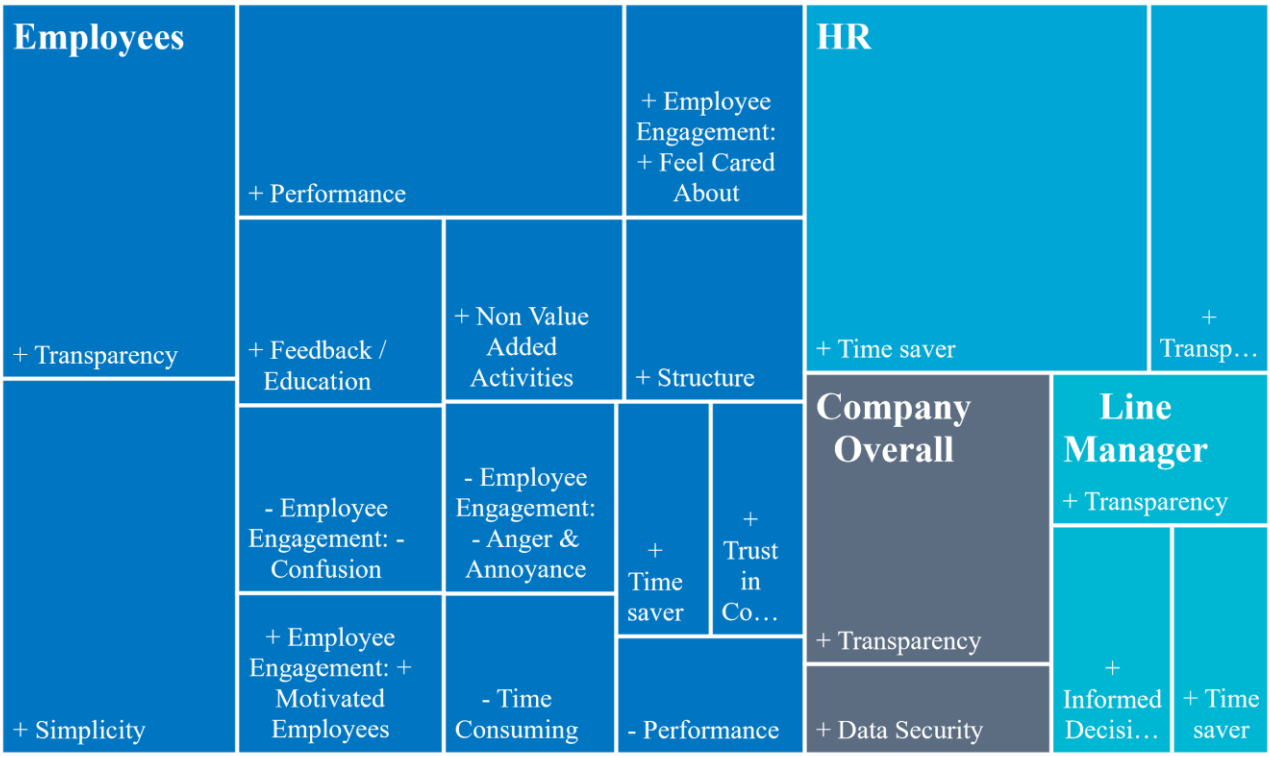

Figure 22: Influenced Stakeholder by e-HRM; Employees, HR Manager, Line Manager, Company.

e-HRM Influence on Employees

The impact of e-HRM systems on employees can be significant, offering both benefits and potential downsides depending on the implementation and system fit. A positive aspect frequently highlighted is the system's ability to centralize and simplify access to necessary information and administrative tasks. For instance, employees appreciate the system for enhancing accessibility and reducing confusion,

> *„It's good that they are happy that we care about them. We make these surveys and then we have an update for the whole company that what we have investigated and so on. So they have been very positive" (HR manager 02, Quotation 244)*

This sentiment underscores the role of e-HRM in fostering a more engaged and well-informed workforce, enhancing transparency and the ability to act on feedback efficiently.

However, not all impacts are positive. The integration of e-HRM can also introduce challenges, particularly if the system's design does not align well with the existing processes or the specific needs of the company. As noted in one feedback,

> *„So you could see the people that reviewed you, although it was supposed to be anonymous. […] And so it also affected that we believe that the feedback might not have been, as truthful as it would have been" (HR manager 13, Quotation 232)*

This comment points to potential issues with anonymity and privacy that can undermine trust in the feedback process, potentially negatively impacting the employee's perception of the process.

e-HRM Influence on HR manager

The integration of e-HRM systems has a positive impact on HR manager, streamlining administrative tasks. For instance, some HR manager highlighted the benefits of automation within their team. This sentiment was echoed in a statement that underscored the system's ability to enhance transparency and simplicity:

> *„You can relatively easily check it if people have older vacation days. If we can check what's going on. So I think it predominantly helped big time to make that process much more transparent and easily executable." (HR manager 03, Quotation 157)*

Some HR managers noted that while the system generally improved efficiency, there were occasions where the software did not align with the organizational practices, leading to additional manual adjustments. One example of this was the handling of pro-rata holiday entitlements, where the system's calculation did not match the company policy, necessitating manual corrections:

> *„And e-HRM Tool X calculates them as well as the law, so if someone starts on the second of a month, for example, e-HRM Tool X says there is no holiday for that month and we say yes, of course there is holiday for one month exactly, so we always have to make sure that we adjust it manually, which always means an extra step of work and is not optimal" (HR manager 26, Quotation 254)*

This highlights the occasional disconnect between e-HRM systems and company-specific needs, thereby having a negative influence on HR managers day-to-day job.

e-HRM Influence on Line Manager

The implementation of e-HRM has largely been positive for line managers, enhancing their management capabilities and operational efficiency. The benefit of the system for monitoring team dynamics is showed here:

> *„It gives immediate insights. It also gives immediate insights to team managers and alike. So I think it's extremely valuable" (HR manager 03, Quotation 276).*

Additionally, the ability to access and analyse team data efficiently is highlighted by another interview, mentioning the report function:

> *„For managers and for executive level, they also have access to the reporting function. So for them that's very useful" (HR manager 10, Quotation 216).*

However, not all impacts of e-HRM systems are viewed positively. Some interviewees express concerns about the potential for the system to encourage a rigid, hierarchical structure perceived as a „checkbox exercise,":

> *„The only thing that they [the upper management] were a little bit hesitant about was whether it would not become too much of a hierarchical structure or like an checkbox exercise" (HR manager 11, Quotation 231)*

This criticism points to potential issues expected with a software imposing a structure, while the upper management is pursuing flexible leadership.

e-HRM Influence on the Company

The general impact of e-HRM on the company in general has been predominantly positive, enhancing organizational efficiency and compliance. One notable positive influence is the improvement in transparency and efficiency in handling internal processes and financial forecasting, as highlighted in a quotation from an interview:

> *„Well, the company as a whole has overview of the employees which I think is one big benefit that we never had which of course.. we talk about budgeting and forecasting and P and Ls is just really useful" (HR manager 09, Quotation 288).*

Another positive outcome is the effect on compliance and data management, particularly with regard to GDPR, which is a critical aspect in today's data-driven environments.

However, there are challenges noted in the integration of e-HRM systems within companies. One negative aspect is the potential for a malfunctioning system to complicate certain administrative processes, particularly in accounting and time management. For example,

> *„The accounting department is also affected [by a tool malfunction]. Because we have to make provisions at the end of the year for holidays and overtime... And if I don't have any reliable figures now? That is bad, because they need that for the annual accounts" (HR manager 01, Quotation 179).*

4.3.3 Influence on Employee Performance

While there have been many comments about the general influence on employees, the statements regarding employee performance have not been straightforward. Around half of the quotations out of 32 interviews state no direct effect, while the other half states a positive effect of e-HRM on employee performance. While the frequency of positive and no effect statements is quite balanced, the nature of these statements differs.

Quotations indicating a positive effect often use logical reasoning and provide concrete, detailed examples of how e-HRM tools enhance performance. For instance, one interviewee explained,

> *"I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire. It is faster for us to contact candidates,…" (HR manager 09, Quotation 317).*

These statements often highlight direct impacts such as improved feedback mechanisms, increased transparency, enhanced engagement, and time savings.
In contrast, quotations stating no effect on employee performance describe the beliefs of the HR manager rather than logical reasoning or giving proof. Respondents typically emphasize the administrative nature of e-HRM systems without providing detailed explanations or examples. For instance, one HR manager stated,

> *"No. If you mean that if the HR system improves the performance, so no, it has nothing to do with how much we sell and so on. This is this is more admin, and you know for people so that they know when they are on holiday…" (HR manager 02, Quotation 250).*

These statements focus on the perception that e-HRM tools are primarily designed for HR and administrative functions rather than directly influencing employee performance.

The following three subparts in this subchapter describe first the mentioned reasons for no direct effect on employee performance, then the quotations on positively affecting employee performance, then the few quotations on negatively affecting employee performance.

No Influence on Employee Performance

Limited Relevance to Sales or Core Business Metrics

Several HR managers pointed out that e-HRM systems are predominantly administrative tools that don't directly influence the core performance metrics of employees. For example, one HR manager stated,

> *„When it comes to like work performance, since it's completely not work-related... I haven't seen it impacting performance in any way" (HR manager 05, Quotation 251)*

Some respondents indicated that e-HRM systems do not have a direct relationship with the critical performance indicators such as sales. One interviewee explicitly mentioned,

> *„No. If you mean that if the HR system improves the performance, so no, it has nothing to do with how much we sell and so on" (HR manager 02, Quotation 250–251)*

Equivalence with Previous Systems

Several managers observed that while e-HRM systems might centralize functions or streamline processes, they do not fundamentally change the nature of the tasks being performed. As noted in one statement,

> *„Honestly, no, I think that the process that we had before worked well... This is true that now we have centralized everything with bamboo because we have this platform... but at the end the content and the way to do it was super similar" (HR manager 14, Quotation 201)*

Specificity to HR and Administrative Functions

It was often mentioned that e-HRM systems are specific to HR and administrative functions and do not intersect directly with the daily responsibilities of most employees. One manager explained,

> *„Not really, so the tool doesn't influence their way of working or their area of responsibility, so it doesn't actually have any points of contact with employees or superiors, so the work performance is completely detached from the system" (HR manager 22, Quotation 232).*

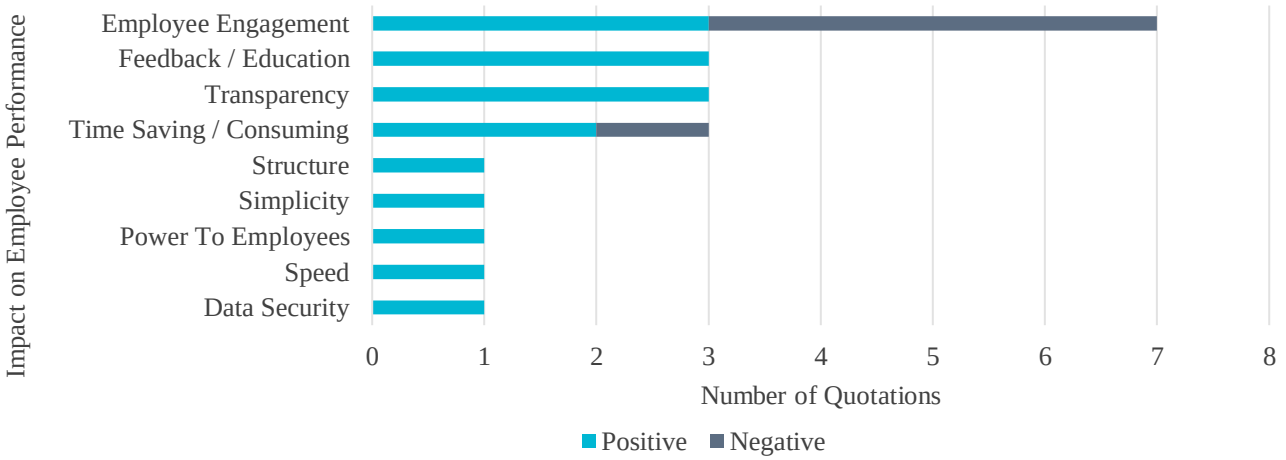

Figure 23: How e-HRM Influences Employee Performance.

Positive Effect on Employee Performance

The positive effect on employee performance has been documented through aspects such as speed, transparency, employee engagement, and feedback/education as visible in Figure 23 above and Table 11 below. A full table with all influences and a representative quotation is visible in Appendix E 3 on page 96.

Time saving

E-HRM systems have facilitated faster operational processes, particularly highlighted in recruitment practices where automation and streamlined tasks have directly increased the efficiency of hiring processes. For example, an interviewee mentioned,

> *„I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire" (HR manager 09, Quotation 317).*

Table 11: Positive Influences on Employee Performance.

Positive Influences	#	*Positive Influences*	#
+ *Transparency*	3	+ *Data Security*	1
+ *Employee Engagement*	3	+ *Speed*	1
+ *Feedback / Education*	3	+ *Power To Employees*	1
+ *Time saver*	2	+ *Simplicity*	1

Transparency

The systems are credited with increasing transparency within the workplace, making ongoing projects and tasks visible to all relevant personnel, which in turn speeds up processes. An instance of this effect is captured in the statement,

> *„And that's different with e-HRM Tool X, everyone has access to it, everyone sees it and everyone always sees a little bit. What is the other person working on right now?" (HR manager 27, Quotation 329).*

Employee Engagement

Enhanced employee engagement through e-HRM tools is noted to have a direct impact on performance. These tools help in revealing feedback, including dissatisfaction, allowing for immediate remediation and discussion, as mentioned in one of the interviews:

> *„Sometimes they choose to reveal the feedback, not anonymously, so we can see... Ohh yeah, Alfonso is not happy about this and that let's talk about it" (HR manager 06, Quotation 492).*

Feedback / Education

The ability to provide timely and structured feedback through e-HRM systems supports employee development and performance improvement. This is illustrated by the feedback on an employee's ability to structure work better, directly affecting their performance positively:

> *„If I notice, like the one employee I just mentioned, that he manages to structure himself a little better and thereby improve his work performance" (HR manager 22, Quotation 334)..*

Negative Influence on Employee Performance

The introduction of e-HRM systems, while largely beneficial, has also presented challenges that negatively impact employee performance in some contexts. These negative impacts are generally categorised under employee engagement and the time-consuming nature of some e-HRM processes, as visible in in Figure 23 above and Table 12 below. A table with quotations is visible in E 3 on page 96.

Negative Influences	#
- Employee Engagement	4
- Time Consuming	1

Table 12: Negative Influences on Employee Performance.

Employee Engagement

A key concern expressed is that e-HRM systems can sometimes foster frustration and disengagement among employees. This is particularly noted when managers do not accurately or effectively use the systems to set and review objectives, leading to a perceived lack of accurate reflection and restitution of discussions. One HR manager explained the frustration that can arise, stating,

> *„it could definitely be something that could create frustration and disengagement and in the future lack of performance because definitely the manager is setting up your objectives, they review like that (not accurate), and do not take the time to restitute the discussion correctly" (HR manager 20, Quotation 246)*

This misalignment can lead to dissatisfaction and disengagement, potentially impacting long-term performance and commitment.

Time Consuming

E-HRM systems are also criticized for being time-consuming in certain scenarios, especially where the software requires detailed and frequent input. An example of this is observed in time-tracking for multiple projects, where the system's design may not clearly support efficient logging. An interviewee mentioned,

> *„OK, there are cases where people do multiple projects at once, and they're kind of confused how they should... Basically, track their time in e-HRM Tool X and it takes some time, takes some consideration how you should actually report that in e-HRM Tool X" (HR manager 24, Quotation 175)*

This complexity can slow down productivity and complicate what should be straightforward tasks. Furthermore, some highly efficient and self-organised employees find that the necessity to continuously interact with e-HRM systems for tracking and documentation purposes may actually reduce their usual pace of work. As stated,

> *„Yes, I think that for people who have already worked very efficiently before, i.e., who are very self-organised, having to do it all at once has probably made them a bit slower, because you have to track it, because you have to fill in things that you might otherwise have just done" (HR manager 27, Quotation 335).*

4.3.3.1 Influence of Different e-HRM Categories

This subchapter explores the different influences of e-HRM categories on employee performance. The codes and quotes are also listed in the Appendix E in Table 63 and Table 64 on page 97.

Performance Management Tools

Performance management within e-HRM systems shows both sides on influence on employee performance. Positively, it allows for direct feedback which can be revealing and actionable, as one interviewee noted,

> *„Sometimes they choose to reveal the feedback, not anonymously, so we can see... Ohh yeah, Alfonso is not happy about this and that let's talk about it" (HR manager 06, Quotation 492)*

On the negative side, the same category can lead to stress due to its rigorous tracking demands,

> *„Some are demotivated by the fact that they have to track everything" (HR manager 25, Quotation 313).*

Administrative and Analysis Tools

In the administrative and analysis functions, e-HRM systems are seen positively for their efficiency gains. They reduce manual workload, allowing employees to focus more on critical tasks, enhancing compliance and work quality, as highlighted by,

> *„And in this case, if they have much more manual work. Then first, the compliancy cannot be good. The quality should become and also they can spend less time on the projects, right, so" (HR manager 32, Quotation 256)*

Learning and Development Tools

E-HRM tools that facilitate learning and development are linked to positive impacts on employee performance. These tools enable structured personal and professional growth, improving job performance. For instance, one interviewee explained,

> *„[…] the one employee I just mentioned [he used the e-learning tool], that he perhaps manages to structure himself a little better and thereby improve his work performance, then that's an improvement both for him and for us" (HR manager 22, Quotation 334)*

Talent Acquisition and Management Tools

The category Talent Acquisition and Management impacts positively, particularly through the automation and efficiency it brings to the recruitment process, directly benefiting organizational performance. An interviewee described,

> *„I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire" (HR manager 09, Quotation 317).*

Employee relations and Safety Tools

Support for employee relations and safety through e-HRM tools is mentioned for maintaining performance, especially under high stress or in remote settings. These systems provide essential support, as one HR manager outlined,

> *„But from my feeling, also from the feedback we get, it [the Employee relations tool] does have an influence, yes. Especially because we are remote or the workload is very high. And especially people who are really top performers with us, but can feel burnt out relatively quickly" (HR manager 08, Quotation 122).*

4.3.4 Answering the Third Sub-research Question

Sub-research Question III
How does the adoption of e-HRM practices affect employee performance in tech startups during the transition phase?

The adoption of e-HRM practices in technology startups during the transition phase affects employee performance in many ways. The analysis of interviews reveals that e-HRM systems are primarily viewed as administrative tools without direct influence on core work performance or essential business metrics like sales. They do not fundamentally alter the tasks but may enhance process efficiency by centralizing functions.

In some cases, e-HRM systems are credited with improving employee performance through increased operational speed, particularly in recruitment, enhanced transparency in workflows, and better employee engagement by facilitating open feedback mechanisms, contributing positively to employee performance.

The adoption of e-HRM can also negatively impact employee performance due to potential increases in frustration and disengagement when poorly implemented. Furthermore, the time-consuming nature of some e-HRM processes, especially detailed tracking requirements, may hinder performance, particularly for highly efficient and self-organised employees.

4.4 E-HRM Tool to Improve Employee Performance

This chapter answers the following sub-research question, with the design of the e-HRM tool in Figure 24;

Sub-research Question IV
How should an e-HRM tool be designed to improve employee performance in technology startups during the transition phase?

Inspired by Simon Sinek's "Why - How - What" approach (Sinek, 2009), this framework is targeted at designers of e-HRM tools. The first step (Stakeholder Values) addresses the "Why," focusing on the core values of primary stakeholders. The second step (e-HRM Impact) corresponds to the "How," identifying the key impact factors that can enhance employee performance. The third step is the "What" – the specific e-HRM tools and practices. By placing the tools in the third step, the framework ensures that these practices are informed by the stakeholder values and impact factors, providing a targeted approach to developing e-HRM solutions.

The framework targeted at developing a tool begins by identifying and aligning with the core values of primary stakeholders - HR, employees, line managers, and the company. This initial step ensures that the e-HRM system is tailored to address specific values of stakeholders, like time savings for HR, engagement and simplicity for employees, informed decision-making for managers, and data security and transparency for the organization.

The second step shows the different kinds of impact. While ten impact factors are listed, the framework suggests focusing on one only four of them. This is in line with the results of the previous section, indicating a direct impact on performance for only those four factors. These include timesaving, transparency, employee engagement, and continuous feedback and education. By addressing these factors, the framework aims to tackle potential challenges that could arise with tool usage early, leading to a positive effect on performance.

Finally, the framework highlights specific e-HRM practices that influence employee performance in the third step. It shows the option of building tools for talent acquisition, administrative and analysis functions, or performance management. These tools are chosen because of their indicated impact on performance in this study, aligning with the previously established values and impact factors to maximize their effectiveness.

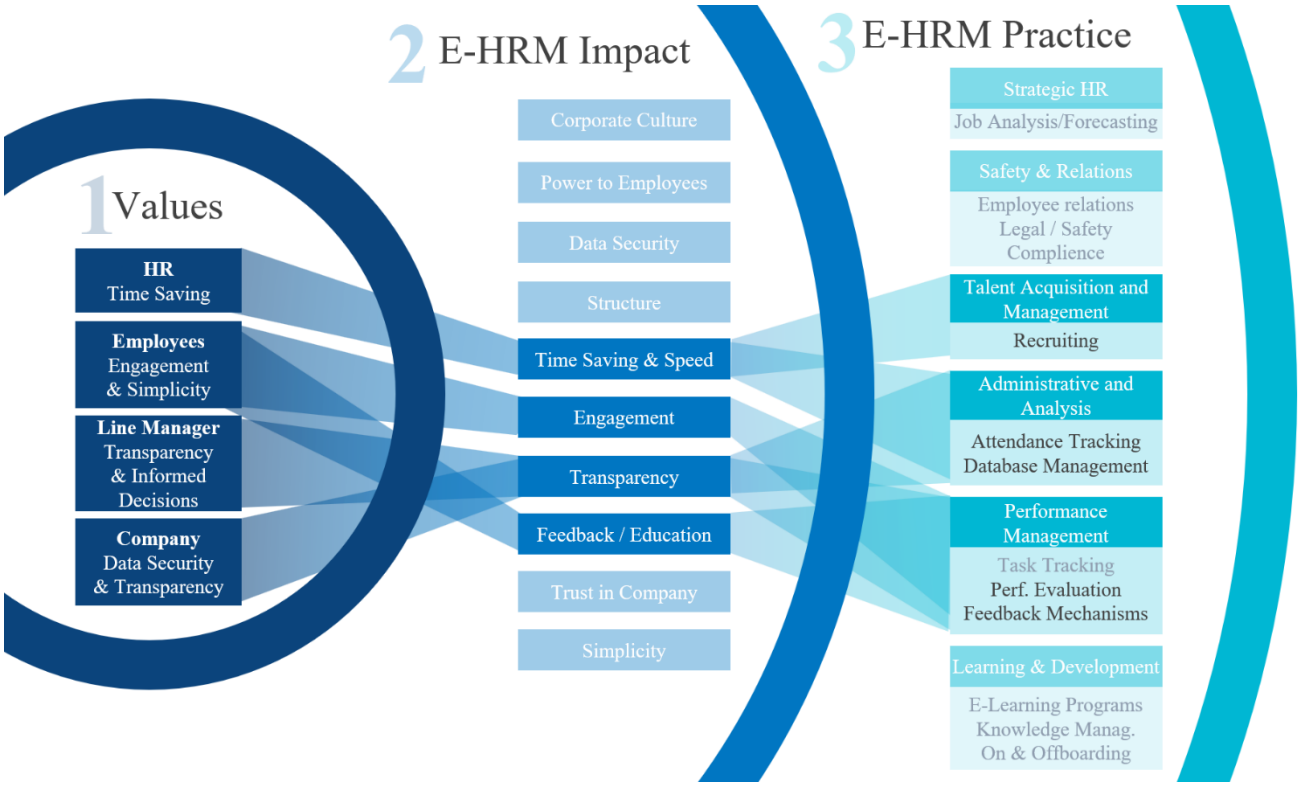

Figure 24: Overview of e-HRM Framework.

4.4.1 Framework Step I: Stakeholder Values

The first part of the framework, Stakeholder Values in Figure 25, underscores the importance of aligning the e-HRM system with the needs and expectations of four primary stakeholders: HR, employees, line managers, and the company in general.

HR Values

For HR professionals, the main value from an e-HRM system is time saving. The system should streamline administrative tasks, such as attendance tracking and payroll processing, to reduce manual work and free up HR to focus on strategic initiatives.

Employee Values

Employees value engagement and simplicity in e-HRM systems. They seek platforms that are straightforward and facilitate easy access to personal and professional information. Systems that enhance transparency, provide immediate feedback, and simplify daily tasks can significantly boost employee satisfaction and performance.

Line Manager Values

Line managers look for transparency and the ability to make informed decisions from e-HRM systems. Tools that offer real-time data and comprehensive reporting enable line managers to oversee and support their teams.

Company Values

At the organizational level, values centre around data security and overall transparency. The e-HRM system must ensure compliance with legal standards like GDPR and safeguard sensitive information. Furthermore, it should enhance organizational efficiency by providing accessible reports on key HR metrics.

As first step in this framework, the tool developer should assess which stakeholder values are most critical to their specific context and choose one or two primary stakeholders to focus on positively impacting. This choice guides the subsequent steps in the framework, ensuring that the e-HRM system is tailored to the most impactful areas, supporting improvement in employee performance throughout the company's transition phase.

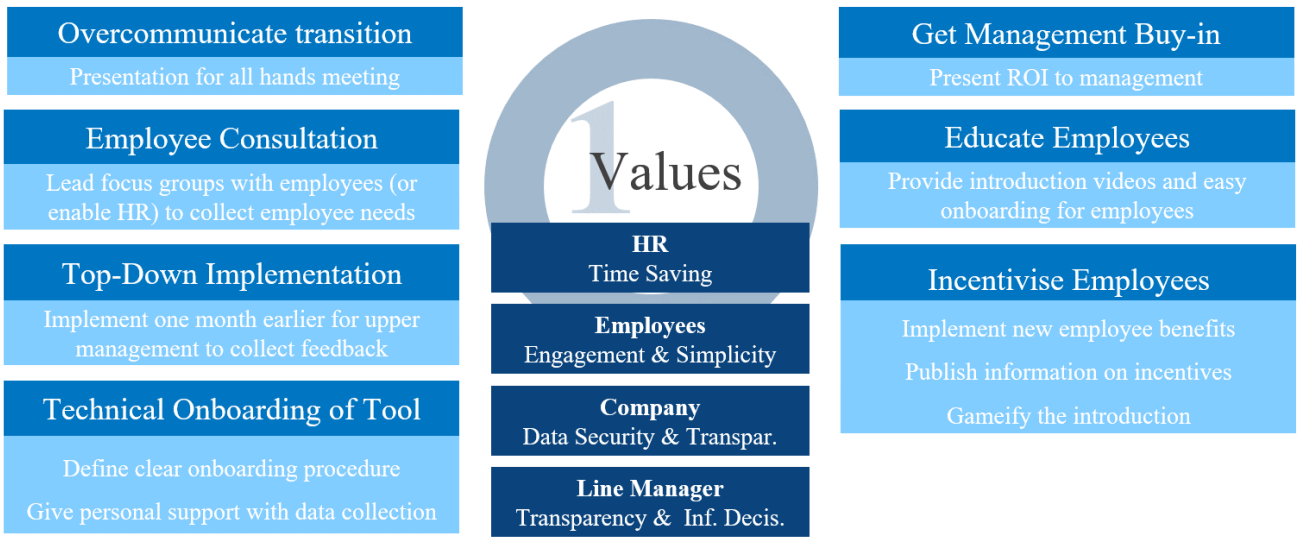

Figure 25: e-HRM Framework Step I: Stakeholder Values.

Those values are not only crucial when thinking about the potential features of the tool – they start at the start of the customer journey. This is pre-implementation and includes getting all relevant stakeholders on board. The strategies outlined in Figure 25 are described in detail in Appendix F 1.1 on page 98. All of them aim at mitigating challenges which occur even before the tool is implemented.

4.4.2 Framework Step II: E-HRM Impact

The second part of the e-HRM framework in Figure 26 focuses on fostering impact factors that are crucial to enhance employee performance. These impact factors are deeply connected with the values of the stakeholders. The four critical impact factors are:

Time Saving

Speed and efficiency are important in e-HRM systems. The design should prioritize automating and streamlining processes to significantly reduce the time spent on these activities. This not only speeds up operations but also frees up employee and management time for more strategic tasks.

Transparency

Ensuring that e-HRM systems provide clear visibility into projects, tasks, and performance metrics across all levels of the organization is vital. This transparency helps in speeding up processes and enhancing accountability, allowing everyone to understand their roles and the status of their contributions.

Engagement

Employee engagement is directly linked to how interactive and responsive the e-HRM system is. Tools that facilitate open feedback channels and allow for immediate responses or adjustments can greatly enhance employee satisfaction and involvement. Engagement is also fostered when employees see that their feedback is valued and acted upon, which in turn can improve their performance and commitment.

Feedback/Education

Providing structured, timely feedback supports learning and performance improvement. Systems should be designed to help employees structure their work more effectively and offer developmental feedback that aligns with their personal and professional growth objectives.

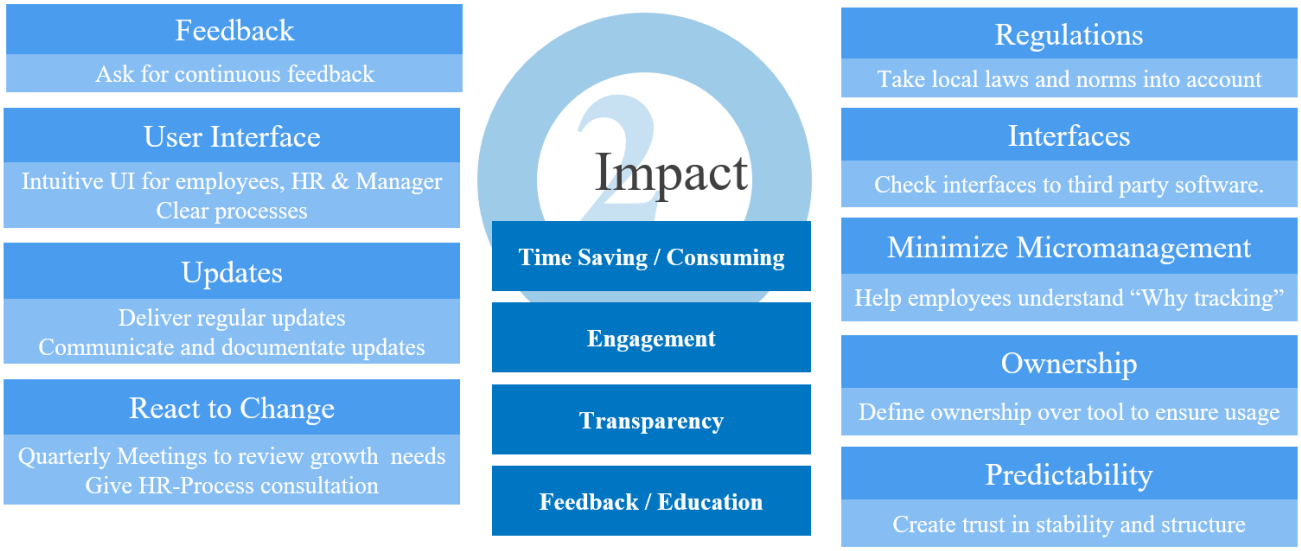

Figure 26: e-HRM Framework Step II: Impact Factors.

In order to prevent challenges while the e-HRM tool is actually used, it is again useful to focus on the impact factors that align with the values of the chosen stakeholder in step one of this framework. All strategies suggested in this framework are described in detail in Appendix F 1.2 on page 99.

4.4.3 Framework Step III: E-HRM Practices

In the third part of the e-HRM framework in Figure 27, focusing on specific practices is the last step to increase employee performance. Here are the three most impactful e-HRM tool types:

Talent Acquisition and Management

These tools automate many aspects of the hiring process, from sorting applications to scheduling interviews. By streamlining these tasks, the tools not only save time but also improve the quality of hires by allowing managers to focus more on the candidates' qualifications and fit rather than on administrative aspects.

Administrative and Analysis Tools

Tools focused on attendance tracking and database management reduce the manual workload on HR departments. This shift improves compliance with regulations and enhances the overall quality of work within the HR department.

Performance Management Tools

This category includes tools for task tracking, performance evaluation, and feedback mechanisms. These tools facilitate direct and actionable feedback, which can help employees at development and improvement. By making performance reviews and feedback more structured and frequent, these tools help employees understand their strengths and areas for improvement, which can motivate them and improve their performance. However, it's important to balance the rigour of tracking and evaluation to avoid employee stress or demotivation from constant monitoring.

Figure 27: e-HRM Framework Step III: e-HRM Practices and Features.

Specific features and functionalities to enhance employee performance visible in Figure 27 are explained in detail in Appendix F 1.3 on page 100.

4.5 Answering the Main Research Question

Research Question
How can electronic human resource management (e-HRM) improve employee performance in technology startups during their transition phase?

Electronic human resource management (e-HRM) can improve employee performance in technology startups during their transition phase through an approach that integrates e-HRM practices, addresses e-HRM challenges, and enhances important impact factors.

By adopting the right e-HRM practices such as administrative and analysis practices, performance management systems, and talent acquisition processes, technology startups can automate and minimize administrative tasks and data management. This not only frees up time for more valuable activities but also provides employees with the necessary environment to increase their productivity. Performance tracking and feedback mechanisms further motivate and guide employees, while automated recruitment processes help attract and hire the best talent efficiently.

Managing the challenges associated with e-HRM is essential for its successful implementation. This concerns the time before the implementation (decision making, stakeholder involvement) and after implementation (usage). Technological challenges, such as system integration, data privacy, and user-friendly interfaces, must be handled to allow HR managers and employees to use the system. People challenges, including employee and manager resistance, need to be overcome through communication, involvement and training, which, when successful, also helps reduce the administrative workload of HR managers.

Enhancing key impact factors is another aspect of improving employee performance with e-HRM. Time-saving is achieved through the automation of repetitive tasks, and centralized databases. Transparency is improved through clear visibility of tasks and performance metrics, enhancing accountability, and allowing for informed decision-making. Engagement is boosted by using open feedback channels and intuitive tools, and well-planned introduction of the tools. Additionally, offering structured feedback and development opportunities supports continuous improvement. The results of this study indicate that targeting these four impact factors leads to an increased employee performance.

5 Discussion

This study addresses the research question, "How can e-HRM improve employee performance in technology startups during the transition phase?" The results show mixed impacts of e-HRM on employee performance, with HR managers reporting both positive effects and no influence. These findings, which are consistent with existing literature, may be attributed to several factors. Limited use of strategic e-HRM in startups could come from budget constraints and a lack of prioritization, while the perceived lack of impact on employee performance may be due to interviewees not viewing time savings as performance gains. In the subsequent discussion, the reasons behind these findings will be explored from various perspectives uncovered in this research.

Indirect Relationship Between e-HRM and Employee Performance

HR managers often mentioned choosing tools based on previous experiences or the need to save time in the HR department, rather than focusing on strategic benefits. This indicates a pragmatic approach to tool selection, prioritizing immediate operational needs over long-term strategic goals. This is also supported by literature echoing the term of “e-HRM Blackbox”, indicating that the (potential) effects of e-HRM are hard to measure, and therefore underestimated by practitioners (De Alwis et al., 2022). Despite E-HRM's ability to shift HR roles from administrative to strategic, practitioners tend to focus on immediate administrative efficiency. This study found, in line with the literature, that the indirect effects on performance are transparency (Emueje & Tochi, 2020), time savings, engagement (Vogelgesang et al., 2013) and education. While reporting that e-HRM strongly improves transparency, this study also finds that this enhanced transparency does not directly lead to improved employee performance, which is in contrast to some studies like Berggren and Bernshteyn (2007).

Another reason for the low mention of e-HRM's impact on employee performance could be attributed to the nature of startups themselves. In these environments, early employees are typically highly motivated and the focus on performance management is not as critical as it might be in larger organizations. This is due to the lack of information asymmetry; in small companies, everyone is aware of each other's contributions, whereas in larger corporations, individual contributions are less visible, necessitating performance management measures. Consequently, HR managers in startups might not prioritize e-HRM for performance impact, as it is not a primary focus at this stage of the company.

e-HRM Challenges

Both, the literature and interview participants, agree that resistance to (new) e-HRM is a significant barrier, which comes into play long before a potential impact on employee performance. The results show that in technology startups, resistance typically originates from a fear of bureaucracy and a preference for familiar, simpler systems. For example, moving from a well-understood basic platform to a more complex e-HRM system can meet substantial employee resistance, complicating the transition. Interestingly, other studies are suggesting a positive correlation between e-HRM use and job satisfaction (Nyathi & Kekwaletswe, 2023; Sethuraman et al., 2023). This indicates that there is potential to enhance job satisfaction through well-implemented e-HRM systems that simplify rather than complicate the user experience.

The results show, when compared to the literature on mature organizations, that the challenges of implementing e-HRM systems are differ significantly. Startups often encounter specific, operational hurdles such as technical onboarding of tools, system reliability issues, and integrating multiple tools within a constrained budget. These problems, highlighted in the results, underscore the need for e-HRM solutions that are both agile and adaptable to environmental changes and limited resources.

Educational Barriers to Effective e-HRM

The results also show that technical and people challenges often appear simultaneously. For example, when HR-Managers are not adequately trained, they might use the software incorrectly, leading to technical issues and further frustration. This intertwining of technical and human factors complicates root cause analysis for challenges. Similarly, Nyathi and Kekwaletswe (2023) point out that challenges have two orders –root cause and effect. When pushing to an extreme, this could mean that employees' lack of familiarity with new systems can result in improper use, which then manifests as technical problems, creating a cycle of resistance and difficulty. The most significant e-HRM challenges affecting employees include annoyance, confusion, and perceptions of micromanagement, which all make employees hesitant to adopt these systems.

This hesitance is echoed in various studies, yet the implications are complex. The mentioned challenge could either indicate that the overall impact on employees is negative, or that the effect is overall positive, but smaller than its full potential. While the literature shows no consensus in this question (Marler & Parry, 2015; Panos & Bellou, 2016; Parry & Tyson, 2011; Zhou et al., 2022), the results of this study found mostly positive effects of e-HRM on employees, pointing to the latter theory indicating an overall positive effect. The literature and the interviewees give recommendations about solving the issue of negatively impacting employee engagement. One strategy mentioned often is training and communication. While Nyathi and Kekwaletswe (2023) point out that failures in communication and training can lead to resistance and underutilization of e-HRM systems, also interviewees shared their strategies of „overcommunicating everything" or admitting that the challenges about employee confusion would have been minimized by sending an educating video about the tool.

The Impact of Supplier Power Imbalances on e-HRM in Startups

While not expecting many technical challenges in technology startups, as they were believed to be technologically literate and open to innovation, the challenges were significant. It takes a lot of time for HR managers during technical onboarding to fix errors and manually update profiles, and during daily use, they are dependent on the tool providers environment and updates. Based on the interviews, one reason for this finding could be the limited purchasing power of startups and the high cost of HRM tools, leading to a power imbalance with HRM tool suppliers. Interviewees also noted that e-HRM customer service is often unresponsive, leaving them to handle issues on their own, but they still do not plan to switch to the more expensive e-HRM competitor. This would mean that the customer, in this case the technology startup, must accept generic and imperfect tools, because the switching costs are too high and suitable e-HRM competitors too expensive. Also other studies mention the challenge of HRM to be tailored to the specific startup needs to support the growth the positive impact on employees (Jafari Sadeghi et al., 2022). Large cooperations, on the other hand, face broader systemic technical challenges. Legacy systems, lack of integration, and the need for extensive strategic e-HRM planning are predominant (Ceric & Parton, 2024). This hypothesis of different power structures developed in this paragraph is further developed in Chapter F 3 - Outlook on page 106.

Strategic Potential of e-HRM is Untapped by Startups

One major finding was the infrequent mentioning of specific impact on employee performance of e-HRM. This is also a finding of Nascimento (2017), mirroring the findings of the preference of in-person feedback mechanisms over technical solutions in performance management, as well as seeing HR as administrative function in startups, not a strategic partner. At the same time, studies indicate that advanced HRM and performance management practices influence startup success positively (Frare & Akroyd, 2023; Keir, 2019). The reason for the low use of performance enhancing e-HRM in startups could be that they prioritize finding tools that are robust and simple enough, rather than focusing on the long-term impact on employees. In startups, the strategic value of e-HRM does not seem to be a predominant reason for purchasing, visible in the comments of HR managers, stating they chose this tool solely because their previous employer used it, or because they want to save time in the HR-department. The infrequent mentioning of employee performance aligns with phrases like "for us, this low type of e-HRM is enough," and the low use of strategic e-HRM practices, indicating a fit of the e-HRM practices used right now. This was shown also through many quotations indicating not using all functionalities the tool is capable of (and paying for those unused functionalities), which again stresses the

need for research on the actual used technology and its impact, not just the tools implemented (Dulebohn & Stone, 2018; Faraj & Azad, 2013). This purposeful low use of e-HRM could again indicate no further perceived need for strategic e-HRM or bigger impact on performance management at the current stage. Some scholars agree that startups often see little value in formalized HR practices, like performance management or strategic HRM, because of their size (Eisenmann & Wagonfeld, 2012). This could also be a reason why HR managers mentioned impact on employee performance not often. In contrast, in large firms, one goal is leveraging e-HRM to transform HR into a strategic partner within the organization, enabling HR to influence performance (Ceric & Parton, 2024). Another suggestion is made by L'Écuyer and Raymond (2020), finding that unstable environments and strategic direction of companies strongly influence the type of e-HRM and the benefit of e-HRM on the organization. Unstable environments, like those in startups, would lead to a low use of e-HRM. As the strategic direction of the company was not part of the research, this hypothesis can not be answered with the data collected. Often mentioned in the interviews was the fact of a current economic downturn, leading to the need of cutting expenses. This would indicate a strategic position of a "defender", which focuses more on efficiency and cost control through their e-HRM practices, as was observed in the interviews, while "prospectors" would leverage e-HRM for innovation in HR practices and workforce agility (L'Écuyer & Raymond, 2020). A "prospector" would, compared to the defender, likely implement innovative HRM to drive long term strategic initiatives and enhance competitive.

When prompted to speak about the benefits and functions of their e-HRM system, no HR manager spoke about enhancing the strategic role of HR in the organisation. In the literature, one often cited main benefit of e-HRM is improving the strategic role of HR in organizations (De Alwis et al., 2022). Also in startups, this benefit is echoed by many scholars (Bendickson et al., 2017), while acknowledging the common underuse of e-HRM possibilities. Even a study from MIT showed that innovative HRM practices in startups, which are usually practiced mostly by big cooperations (Keir, 2019), lead to a decreased chance of failure and increased chance of IPO in technology startups (Burton & O'Reilly, 2004). This could indicate that the purposeful underuse is driven by an underestimated value of innovative HRM practices in startups.

e-HRM's Role in the Transition Phase of a Startup

Given the mixed results on the impact of e-HRM on employee performance, this study indicates that technology startups should still consider implementing e-HRM systems for several reasons. Primarily, e-HRM tools showed to offer significant time-saving benefits by automating and streamlining HR processes, which can directly influence performance by freeing up HR resources. Given that time-saving is a primary benefit of e-HRM influencing performance, HR Managers' reasoning that they lack the time to implement these tools could hinder them from using the full e-HRM potential in their company.

Additionally, enhancing transparency through e-HRM tools is indicated to be important for creating a culture of accountability and engagement, especially important in the growing company. This transparency allows employees to have a clear understanding of their roles and contributions, which, as interviewees mentioned, can lead to higher satisfaction and better performance outcomes. Moreover, enhancing employee engagement through these tools helps to ensure that employees actively use and benefit from them. By aligning internal processes with the functionalities and best practices suggested by e-HRM tools, startups can make these tools more intuitive and helpful, thus maximizing their potential to save time and improve efficiency.

Taking into account the common responses from HR managers about the plan of implementing certain e-HRM practices within the "near future," it appears that the low priority of long-term thinking in HR in tech startups could be reconsidered. The benefits of e-HRM systems in terms of time-saving and transparency make them a valuable investment. By thoughtfully integrating these tools, communicating the changes, involving stakeholders, and adapting processes accordingly, startups can effectively leverage e-HRM to support their growth and performance objectives, especially when anticipating rapid expansion.

5.1 Practical Implications

The results of this study are highly relevant for practitioners in the field of Management of Technology, especially when implementing or developing systems to improve employee performance in young technology companies. After outlining the general practical implications of this research, this subchapter explains how different groups of practitioners can use the findings. Prioritizing the two main values of employees found in this study, employee engagement and simplicity, is essential. Such systems must be user-friendly and intuitive, reducing process complexity. Enhanced engagement can be achieved by automating reminders and providing clear, accessible information, thereby improving the employee work experience. Those values should be kept in mind throughout the whole e-HRM lifecycle. This is step one in Figure 28.

Figure 28: E-HRM Framework Focused on Employees as Stakeholder.

Continuing to step two, targeting specific impact factors that influence employee performance in important. This requires targeting engagement through motivation, benefits and reducing confusion. Feedback and education is also important, ensuring the system supports continuous learning and easy feedback mechanisms to support employee development and performance development.

The third step is about choosing the right tool. Performance management tools for evaluations and feedback mechanisms are particularly effective. Task tracking tools, while potentially increasing performance, often do not enhance engagement and may reduce it. Therefore, their use should be carefully considered.

In summary, focusing on engagement and simplicity, enhancing performance through targeted engagement and feedback, and choosing the right tools are essential for successful e-HRM implementation. While these findings are straightforward, the practical implications vary for different groups of practitioners. In the following, suggestions for different practitioners are defined, in order to demonstrate the potential use cases of this master thesis.

Entrepreneurs and Product Managers developing e-HRM

The most obvious group of practitioners potentially benefiting from this thesis are future and current HRtech entrepreneurs and Product Managers. The framework developed in the fourth sub-research question (page 42-46) is specifically targeted at e-HRM tool development. Entrepreneurs and Product Managers can use this framework to decide which stakeholders in companies they want to develop a solution for, and how this solution should look.

Technology Startup Founders

The second group of practitioners who can benefit from this research are founders of technology startups, as the adoption of e-HRM offers substantial strategic advantages. The research shows that founders who prioritize HR through investments in e-HRM effectively address the unique challenges of rapid growth, such as maintaining organizational culture and enhancing communication. By using e-HRM, founders can minimize administrative tasks, thus freeing up valuable time. Moreover, the enhanced transparency and efficiency provided by e-HRM systems can improve employee engagement and performance, essential factors for scaling the business successfully. The data indicates that companies utilizing e-HRM see an improvement in recruitment efficiency and employee satisfaction, suggesting that founders can benefit from a more motivated and productive workforce. This increases the likelihood of achieving long-term success and sustainability in a competitive market.

Human Resource Managers in Technology Startups

Human Resource Managers in tech startups can gain considerably from the implementation of e-HRM systems. The findings highlight that e-HRM tools allow HR managers to save a significant amount of time when implemented correctly. When leading a team of HR professionals, the HR manager can use the results of this thesis to understand the values of different stakeholders in their HR department and the company. This understanding helps them effectively decide on the right strategy and technology for managing people in the company. By keeping the different fears and values of stakeholders in mind, they can prevent future challenges when using the implemented people management technology.

Venture Capitalists

Venture capitalists (VCs) evaluating tech startups should consider the presence and effectiveness of e-HRM systems as a key investment criterion. The research suggests that startups with robust e-HRM practices may be better positioned to manage the complexities of scaling, which directly impacts their potential for growth and survival. Additionally, VCs can use insights provided by e-HRM analytics to assess the health of a startup's workforce, including engagement levels, turnover rates, and overall performance. Without such a system, obtaining this information is very difficult and requires many hours from the HR department to collect the needed data. Furthermore, startups that effectively use e-HRM tools demonstrate a commitment to using technology for operational efficiency, a trait highly valued in the tech industry. This could indicate a long-term perspective, which is a favourable trait.

Startup Incubators

Startup incubators play a crucial role in nurturing early-stage tech companies, and the integration of e-HRM systems can significantly enhance this support. The research underscores that incubators equipped with e-HRM knowledge can offer their startups guidance on e-HRM implementation, from recruitment and onboarding to performance management and employee development. By providing access to these advanced HR technologies, incubators can help startups overcome common growth challenges such as high employee turnover and scaling workforce management. Additionally, incubators can support mitigating both technical and people e-HRM challenges. Moreover, incubators can use e-HRM data to monitor the progress and health of their resident startups, allowing for more tailored and effective support. This proactive approach not only aids in the development of individual startups but also strengthens the overall startup ecosystem, which is a typical target of startup incubators.

5.2 Personal Reflection

I am personally very happy with the subject of my thesis and remain extremely interested in it. The insights gained have deepened my understanding of e-HRM and its impact on employee performance, as well as a valuable network in the field of HR. I am excited to apply these insights in building, using and improving e-HRM tools to enhance employee performance and contribute to the success of technology startups. I am happy that I did a deep literature analysis and conducted interviews with experts to identify e-HRM challenges in startups even before the main data collection phase. This helped a lot in finalising the interview script.

It was challenging in some interviews to decide which e-HRM tools to focus on, especially with companies that used many of such tools. Balancing the depth and breadth of the discussion on each tool was difficult to ensure coverage of relevant practices while still staying within time boundaries. Additionally, while Microsoft Teams' transcription software generally performed well, it occasionally struggled with participants who had strong accents. This required time consuming review and correction of the transcripts. Moreover, I initially included and interviewed two companies that, upon further analysis, did not meet the sample criteria, leading to their exclusion from the final sample.
Using Atlas.TI for the coding process was a very good choice. It facilitated the organization and analysis of a large amount of interview data, making the process more efficient and structured.

5.3 Limitations and Future Research

One limitation of this study is the selection criterion requiring that only startups with an HR manager be interviewed. This criterion may exclude startups that do not have a dedicated HR manager, potentially leading to a biased understanding of e-HRM practices. Startups without HR manager might use e-HRM tools differently or to a lesser extent, as these startups may rely on founders or other team members to handle HR tasks. To address this limitation, future research should include startups without HR managers to provide a better view of e-HRM implementation across different organizational structures, and to give additional context for the results.

The findings of this study may not be generalizable beyond the sample of technology startups in the EU during the transition phase due to the specific focus and convenience sampling, even though theoretical saturation was reached. With interviews conducted in 32 companies, the sample may not fully capture the diversity of experiences and practices in of startups in different areas or larger cooperations. Future research could include startups from different regions and stages of development to enhance the generalizability of the findings and learn more about how the e-HRM practices change over time.

The interview-based approach may be subject to social desirability bias, where respondents present themselves or their companies in a more favourable light, especially when asked about potential issues such as implementation challenges. Also, the sensitive nature of HR data or HR challenges and potential privacy concerns might restrict respondents' openness, and concerns about confidentiality and data security could limit the willingness of participants to share candid insights. Recency bias might also skew the results, as interviewees may emphasize recent experiences over past ones, and especially in the unstable world of startups, recent experiences can have a significant impact on perception. Conducting interviews in multiple languages can lead to information being lost in translation, and cultural differences in interpreting questions and responses could also affect data. To mitigate these biases, future studies could incorporate anonymous surveys and longitudinal designs to capture changes over time and reduce the impact of recent events. This would help to further answer the question of the impact of e-HRM, and test the theories developed in this study. When studied quantitively, it could be explored how innovative HRM practices in startups impact company success. For example, studying the adoption of advanced HRM practices in startups and their correlation with long-term success metrics, such as IPO rates and survival rates, could provide valuable insights for both practitioners and researchers.

The reliance on self-reporting, especially when prompted about employee performance, can introduce bias and limit the objectivity of the data. The knowledge and ability of interviewees to describe e-HRM systems' use and impact could vary, affecting data quality, especially the quantitative results of e-HRM impact. Differences in this technological expertise might also lead to varying reporting on e-HRM challenges. Future research could employ mixed-method approaches, combining qualitative interviews with quantitative performance metrics, to provide a more balanced and objective assessment of e-HRM impact and challenges. This would also allow for more generalizable results, depending on the chosen way of measuring employee performance.

The qualitative nature of the study can lead to a bias introduced through the researcher during the interviews, the coding process, and the code interpretation. Steps to mitigate this limitation in this study were data triangulation between qualitative and quantitative data, as well as iterative coding and interpretation. However, researcher bias can never be completely eliminated. Future research could involve multiple researchers in the coding process to cross-verify findings and reduce individual biases.

Another limitation is the study's focus on technology startups in the EU, which may not address all potential moderator variables, such as external economic conditions, that could influence the effectiveness of e-HRM systems. Factors like market dynamics, regulatory changes, and industry-specific challenges were not explored. At the same time, the transition phase itself could imply additional impact factors, like funding strategies as well as strategic choices regarding employee relations and employer branding. This could lead to moderators in e-HRM use, challenges and effect. Future research should consider these external variables and characteristics of the transition phase when exploring e-HRM adoption and effectiveness.

The study might have missed insights from startups that declined to participate, potentially skewing the results. The reasons for this non-participation were not explored, which could have helped to interpret the results. Future studies should investigate reasons behind declining an interview request, which is very difficult, or use a different sampling method which does not allow for non-participation of selected participants.

Startups established during the COVID-19 pandemic might have specific experiences not generalizable to other contexts. Future research should compare e-HRM adoption and usage between startups established before, during, and after the pandemic to identify any unique patterns or challenges, or in order to eliminate the effect of the pandemic on research findings.

To explore how e-HRM tools can be designed to fit and enhance the strategic direction of technology startups, future research should investigate the alignment between e-HRM systems and startup goals. Understanding this alignment can help optimizing e-HRM implementation and contributing to the startup's strategy. Additionally, research should focus on identifying strategies to translate findings on the impact of HRM on startup success into practical applications for HR Managers. This includes understanding the decision-making process of successful e-HRM tool adoption and translating research findings into actionable insights for practitioners.

Given the high number of technological e-HRM challenges in technology startups, future research should conduct field experiments to assess the reason for this surprising result. One reason could be the impact of power structures, which could be mitigated through using subcontractors as procurement providers for e-HRM systems. This research could determine if technological challenges originate from power imbalances between suppliers and startups.

Another important research direction is to investigate the low strategic use of e-HRM and its impact on performance. L'Écuyer and Raymond (2020) found that unstable environments and strategic direction significantly influence the type of e-HRM used. Future studies should examine whether large corporations in unstable environments exhibit similar patterns and identify ways to increase the strategic use of e-HRM in startups.
Four of the suggested research streams are detailed in F 3 on page 106 with potential research questions methods.

6 Conclusion

This thesis explored the role of electronic Human Resource Management (e-HRM) in technology startups, focusing on how these practices affect employee performance during the transition phase. The main research question is:

Research Question
How can electronic human resource management (e-HRM) improve employee performance in technology startups during their transition phase?

While the literature frames HRM as a "Black Box" because the effects are hard to measure, this study found four influential factors through which e-HRM influences performance. These four factors are transparency, employee engagement, time savings, and education. The following paragraphs describe the main contribution of this study to the literature.

Technology startups primarily implement e-HRM practices in administrative tasks and performance management. Among these two e-HRM practices, especially the latter is influential on employee performance. It affects employee performance through employee engagement and feedback/education. HR managers' performance is particularly influenced through time savings, and line managers are mostly influenced through the transparency a new e-HRM system brings.

e-HRM systems can influence employee performance positively, especially when potential e-HRM challenges, like low usage by employees and technical difficulties, are mitigated already during implementation. This can be done through a proactive implementation process, taking the values of the various stakeholders in companies into account, and therefore increasing employee acceptance and performance.

The knowledge of implementation strategies and the four impact factors (transparency, employee engagement, time savings, and education) helps practitioners select a specific e-HRM system, successfully guide its implementation, and enhance employee performance in technology startups. For academics, this research provides new theories to test and allows for a deeper investigation into how e-HRM impacts different stakeholder, growth stages, company ages, and employee sizes.

7 References

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Appendix A Literature

A 1 Success Factors

Table 13: Success Factors for Startups and their Associated Synonyms based on 60 Analysed Articles. Source: (Sevilla-Bernardo et al., 2022). Marked in blue: success factors connected to e-HRM and HR.

Factor of Study	*Synonyms or Variables Found in the Articles Analysed*
Timing	Startup Stages, Time, Moment, Opportunity
Team	Collaboration, Cohesion, Teamwork, Cohesity
Idea	Innovation, Value, Product
Business Model	Profit, Economic Model, Control, Business Plan
Funding	Financing, Financial Variables, Finance, Money, Funding, Funds
Ceo Decisions	Leadership, Ambiguity, Decision Making, Power, Management
Marketing	Communication, Business Intelligence, Advertisement, Social Networks, Publicity
Culture of Evaluation	Evaluation, KPI, Constant Evaluation, Monitoring, Continuous Monitoring
Culture/Values	Cultural alignment, Values Alignment, Communication Strategy
Dynamic Adaptation	Stress, Speed, Dynamic capabilities, Reinvent, Vanguard
Satisfaction	Satisfaction, Fun, Optimism, Wellbeing
Training And Development	Training, Mentoring
Diversity	Mentality, Heterogeneity, Horizontal system
Advisors Board	Advisors, Steering Committee
Lean Startup	Going lean, Prototype, Split testing, Continuous deployment
Founders Experience	Founder, Founders

A 2 Role of HRM in the Organisation

The role of Human Resource Management (HRM) within organizations has evolved significantly over the years, transitioning from primarily administrative functions to becoming a strategic partner integral to organizational success. This is also visible in academic terms in Figure 29 (below), showing a steady increase of the term „strategic human resource management" since 1980 in the database of Scopus. Traditionally, HRM focused (only) on administrative tasks such as payroll, compliance, and employee records management. However, contemporary literature emphasizes the strategic dimension of HRM, advocating for its involvement in planning and executing organizational strategies, particularly in areas related to talent management, organizational culture, and employee engagement (Ulrich, 1997).

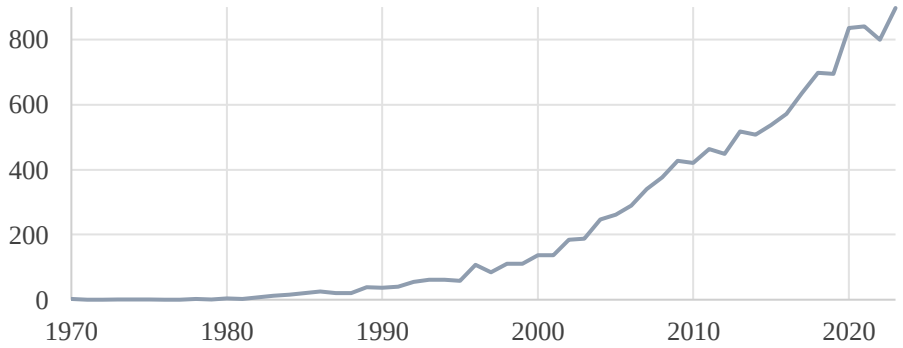

Figure 29: Number of Papers Including the Term of 'Strategic Human Resource Management'. from 1970 to 2023 per Year. Source: Scopus, 1970–2023.

Strategic HRM aligns human resource policies and practices with the overall strategic objectives of the organization, ensuring that the management of human capital contributes directly to the achievement of business

goals. This strategic partnership is characterized by HR practices that are not only reactive and functionally focused but are also proactive and aligned with long-term organizational strategy (Wright & McMahan, 1992). It involves HRM playing a critical role in areas such as strategic planning, change management, and innovation, thereby contributing to organizational agility and competitive advantage.

In the context of electronic Human Resource Management (e-HRM), the strategic role of HR becomes even more pronounced. e-HRM offers opportunities for HR to contribute more effectively to organizational goals (Strohmeier, 2007). The literature suggests that the strategic involvement of HRM enhances the impact of e-HRM on employee performance, because the implementation of e-HRM is more likely to be aligned with the organization's strategic objectives, leading to more effective use of e-HRM tools and practices in improving employee performance (Marler & Parry, 2015).

A 3 E-HRM Practices

A 3.1 List of all e-HRM Practices. Source: Naveed Iqbal (2018)

Table 14: List of all Categories of e-HRM Practices. Source: Iqbal et al. (2018)

e-HRM Practice
Performance Management
Performance Appraisal
Benefit Management
Recruitment
Selection
Training and Development
Grievance Management
Talent Management
Knowledge Management

A 3.2 HR Process World. Source: Ziebell et al. (2018)

Table 15: HR Process World. Table adapted from Graphic. Source: Ziebell et al. (2018)

Main Group	*Subgroup*	*Process*
Talent Management	External	Employer Branding
		Talent Relationship
	Internal	Goal Management
		Learning
		Development
		Performance Review
	Workforce Planning	Succession Planning
		Recruiting
		Analytics
Operative HR Core Processes	-	Compensation and Benefits
		Payroll
		Personal and Organizational Management
		Time and Attendance

Ziebell et al. (2019) adopted the approach of Nagendra and Deshpande (2014), which states that processes digitized in e-HRM are generally divided into two categories based on their complexity; „unsophisticated" for administrative core processes, and „sophisticated" for areas such as talent management and workforce planning.

The results of their literature research is summarised in Table 16 on page 64. The findings are similar to the summary of HR process world, visible in Table 15 on page 63.

A 3.3 Digitized HRM Processes Source: Ziebell et al. (2019)

Table 16: Digitized HRM processes, own table based on literature search of Ziebell et al. (2019)

Main Group	***Process***	***References***	***Description***
Talent Management & Workforce Planning	Performance Management	Herington et al., 2013; Nura and Osman, 2013; Tornack et al., 2014; Pilarski et al., 2016; Bohlouli et al., 2017	Focus on human capital management and the general value of e-HRM in talent management.
	e-Learning	Nichols, 2003; Clark et al., 2003; Pocatilu et al., 2010; Stone et al., 2015; Fındıklı and Bayarçelik, 2015; Colchester et al., 2017	Research on making e-Learning more efficient and its expedience in digitization.
	Employee Relationship Management	Strohmeier, 2013	
	Competency Management	Echavarren, 2011; Bohlouli et al., 2017	Mentioned as unbalanced in eHRM applications, with suggestions for evaluating competencies through mathematical models.
	Recruiting	Pin et al., 2001; Furtmueller et al., 2011; Dhamija, 2012; Girard et al., 2013; Maier et al., 2013; Laumer et al., 2014	Dominant research topic in workforce planning, examining new web technologies' influence on recruitment practices.
	Succession Planning	Brad Neary, 2002; Nagendra and Deshpande, 2014; Pilarski et al., 2016	Less digitized compared to competence management, with digitization helping to promote and retain internal talents and acquire external talent.
Administrative Core Processes	Payroll	Harris and Spencer, 2018; Dulebohn and Marler, 2005; American Payroll Institute, 2010; Dery et al., 2013	High adoption rate in companies, focusing on automation, accuracy, and error reduction in payroll processes.
	Compensation and Benefits Administration	Dulebohn and Marler, 2005; Fay and Nardoni, 2009	Use of e-HRM to design and administrate the compensation system, with benefits including increased accuracy and an overview of the pay structure.

A 3.4 Most widely used e-HRM Functions

Table 17: Most widely used e-HRM functions. Own table based on Fındıklı and Bayarçelik (2015)

e-HRM Function	***Description***
HR Planning	Strategic planning of human resource needs and allocations.
HR Recruitment and Selection	Identifying, attracting, and choosing suitable candidates.
HR Development	Training and career management for employee growth.
HR Awards	Performance evaluation and compensation management.
HR Protection	Ensuring security, safety, and adherence to legal issues or managing employee relations.

A 3.5 : IT Applications in Implementation of Human Resources Management Activities. Source: Karoliny, M. & Poór, J. (2017)

Table 18: IT Applications in Implementation of Human Resources Management Activities.

Source: Karoliny, M. & Poór, J. (2017). Emberi erőforrás kézikönyv– Rendszerek és alkalmazások. Budapest: Wolters Kluwer.

HRM Activities	***HRM Tasks***	***E-HRM Support***
Administrative Support	Recording of Employee primary data (attendance, absence, salary)	Database management, attendance recording system, attendance registration with network.
Recruitment	Process planning, documentation and implementation of recruitment	Creating online job advertisements, registration, and management of application data from online advertisements, online application forms, implementation of online selection tests, and use of social media networks for candidate analysis.
Training and development	Reviewing the education and development needed by employees, planning training programs, organizing training, storing learning materials.	Online questionnaire of employee competency needs, analysis of employee development trends, data management of learning materials, and implementation of e-learning programs.
Individual Performance Management	Performance measurement	Documentation, analysis and feedback on employee performance via the intranet.
Compensation	Making salary structure, salary modelling, compensation level analysis	Analysis and calculation based on internal and external information.
HR Planning	Manpower requirements planning, employee fluctuation statistical analysis	Trend Analysis, model simulation.
Job Analysis	Data management description and specification of business processes, organizational structure analysis	Documentation of job analysis results, visualization of the current and planned organizational structure.

A 3.6 Clustering e-HRM Practices

There are, next to the diverse findings on e-HRM practices, also different ways of clustering the e-HRM groups. Ziebell et al. (2018) suggests one way of clustering in combination with the different e-HRM practices, visible in the Appendix in Table 15 on page 63. One often cited way of clustering e-HRM outcomes based on Lepak and Snell (1998) is visible in Table 19 on page 66 below, namely clustering in operational, relational and transformational outcomes.

Table 19: Three Levels of Outcomes of e-HRM.

Own Table based on Lepak and Snell (1998), Ruel et al., 2004 and Barber et al., 2018.

Level	***Description***
Operational	Focuses on data administration efficiency related to employee payroll and personal data. e-HRM facilitates HR operations, making them easier, time-efficient, and cost-efficient by allowing employees to update their personal data, thus reducing HR staff workload and excess staff.
Relational	Involves the use of IT to enhance HRM processes with stakeholders through activities like recruitment, training, and performance management. e-HRM enables job advertising on websites, online applications, spreading training needs questionnaires, and online training materials.
Transformational	Aims to support strategic HRM activities like knowledge management and employee development in alignment with the company's strategic goals. e-HRM supports virtual teams, facilitates the exchange of strategic employee information, and assists in strategy formulation and implementation.

Table 20 on page 66 below is based on Strohmeier (2007), suggesting two categories for utilizing technology in e-HRM. These categories are also outcome oriented but focus more on the specific software/tool. It distinguishes between connecting e-HRM, which brings new possibilities compared to traditional methods, and automating e-HRM, simply providing efficiency gains.

Table 20: Two Ways of Utilizing of Technology in e-HRM. Own Table based on Strohmeier (2007)

Utilization Method	***Description***	***Examples***
Connection and Integration	Technology is used to bridge spatial gaps between employees, enabling virtual meetings and interactions. It acts as a medium to enhance connectivity and foster integration among team members who might be located in different geographical locations.	Video conferencing tools for meetings; messaging and collaboration platforms for continuous communication.
Automation and Task Replacement	Technology assists or fully takes over certain HR tasks, acting as a tool for work tasks. This includes automating repetitive or routine HR processes, thereby reducing the need for manual intervention and allowing HR professionals to focus on more strategic tasks.	Automated payroll systems; self-service portals for personal data updates; AI-driven recruitment and screening tools.

Table 21 below describes how the main practices of the e-HRM framework for this study could be categorised using the two approaches form above.

Table 21: Categorising of the e-HRM Groups based on Lepak and Snell (1998) and Strohmeier (2007).

Group	***Function***	***Utilization Method***
Administrative and Analysis	Operational	Automation & Task Replacement
Talent Acquisition and Management	Relational	Connection & Integration
Learning and Development	Relational	Connection & Integration
Performance Management	Transformational	Connection & Integration
Strategic HR and Workforce Planning	Transformational	Automation & Task Replacement
Employee Relations and Safety	Operational/Relational	Automation & Task Replacement / Connection & Integration

A 3.7 Measuring Quantity and Quality of e-HRM. Source: Naveed Iqbal (2018)

Table 22: Description of Likert Scale. Source: Iqbal et al. (2018)

Scale	*Description*
1	Habitually used
2	Quite frequently used
3	Slightly frequently used
4	Neither frequently nor infrequently used
5	Slightly infrequently used
6	Infrequently used
7	Not used

Use of e-HRM Practices

Table 23: Items to Measure the Use of e-HRM practices. Source: Iqbal et al. (2018)

Item	***Description***
EHRMP1	Our organisation uses e-HRM for managing employee benefits
EHRMP2	We use e-HRM for recruitment and selection processes
EHRMP3	We use e-HRM for formal grievances and complaints
EHRMP4	We use e-HRM for work scheduling
EHRMP5	We use e-HRM for online testing and learning
EHRMP6	e-HRM is used to appraise branch employees in our organisation
EHRMP7	e-HRM is used to review the performance of the branch employee
EHRMP8	e-HRM is used for internal hiring and transfer
EHRMP9	In my organisation, e-HRM is used for talent management

Quality HR Services

Table 24: Items to Measure the Quality of HR services. Source: Iqbal et al. (2018)

Item	***Description***
QHRS1	e-HRM provides quality HR services to its internal customers (managers, employees)
QHRS2	Our e-HRM system guarantees errorless administration
QHRS3	Ever since the introduction of e-HRM, HR services have been performed correctly and in appropriate way
QHRS4	e-HRM improves the quality of HR services
QHRS5	e-HRM enables managers to accomplish tasks quickly
QHRS6	HR services have been streamlined and standardized in our organisation

A 4 Challenges

A 4.1 Overview of Experts Interviewed for Preliminary Research Framework

In preparation for this research, preliminary expert interviews were conducted to gain a deeper understanding of the challenges faced by technology startups in implementing e-HRM systems. These informal interviews provided insights that shaped the focus of this study.

Founder of a Technology Startup in Real Estate Technology
One interview was conducted with the founder of a technology startup in the real estate sector. He highlighted difficulties encountered when scaling the company from 30 to 50-60 employees. He noted that this scaling process was particularly challenging and supported by coaches who also emphasized the expected difficulties. The founder's experience underscores the complexities of managing fast employee growth.

Founder of an HR Consultancy
Another interview was with the founder of an HR consultancy. She discussed the annoyance factor associated with e-HRM systems, describing it as a hygiene factor—critical to avoid irritation if not functioning correctly. Her consultancy advises on various e-HRM solutions, emphasizing the importance of the pre-implementation phase. According to her, detailed preparation and planning before implementing an e-HRM system are important to its success and acceptance within the organization.

LinkedIn HR Influencer
A LinkedIn HR influencer provided insights, comparing the struggles of small and large companies. She pointed out that large companies face slow decision-making processes and already have established systems which are hard to change, whereas young companies often lack these systems and face issues of responsibility and resource allocation for HR. This difference highlights the different challenges startups face in establishing efficient HR processes from the ground up.

HR Technology Startup Business Development Executive
The final interview was with a business development executive from an HR technology startup. He shared their approach to integrating various HR functions into a single system to address the issue of disconnected tools. This is a issue that their hear often from their (potential) customers. Especially in small companies, having multiple, unconnected tools results in significant manual work. Their solution aims to connect HR processes by providing integration, reducing the manual workload and enhancing efficiency.

A 5 Outcome Measurement

A 5.1 Definition of Success

Table 25: Definitions of Success. Source: Santisteban and Mauricio (2017).

Definition	*Reference*
Success is defined by the number of jobs the company has generated.	(March-Chorda, 2004)
It is given by its share in the market and the size of the customers.	(Van Gelderen et al., 2005)
It is the growth of sales and profitability, which has to be similar or higher than the industry average.	(Wing-Ki et al., 2005; Hormiga et al., 2010)
Success in the entrepreneurial ecosystem is that they buy or get you to go public.	(Colombo & Grilli, 2010; Krejci et al., 2015; Hyder & Lussier, 2016)
It is having a business that allows you to live the way you want. Some employers want to avoid working for someone else.	(Chirjevskis & Dvortsova, 2012)
It is the achievement of the goals and objectives of the company and also as a measure of good management.	(Anh et al., 2012; Thanh, 2015)
Success is in creating something that truly contributes to improving the lives of others.	(Sulayman et al., 2014)
It is the good financial performance of the company.	(Spiegel et al., 2015)

Table 26: Identification of Key Constructs on Employee Performance.
Source:Pradhan and Jena (2017).

Authors	*Aspects of Employee Performance*
Kennedy, Lassk, & Burns (2001)	Work role empowerment, Behavior toward customers, Teamwork
Borman et al. (2001)	Conscientious initiative, Personal and organizational support
McCook (2002)	Perceived effort, Satisfaction with coworkers, Opportunity for reward
Johnson (2003)	Job performance, Contextual performance
Parker, Williams, & Turner (2006)	Proactive work behavior, Problem-solving, Idea implementation
Griffin et al. (2007)	Individual task proficiency, Individual task adaptivity, Individual task proactivity, Team member task proficiency, Team member task adaptivity, Team member task proactivity, Organizational task proficiency, Organizational task adaptivity, Organizational task proactivity
Schepers (2011)	Work performance, Disciplined effort
Audrey, & Patrice (2012)	Creativity, Reactivity in the face of difficulties, Interpersonal adaptableness, Training efforts, Handling work-related stress
Koopmans, Berhnaards, Hildebrandt, Vet, & Berk (2014)	Task performance, Contextual performance, Counterproductive work behavior

A 5.2 Items to Measure Employee Performance. Source: Pradhan and Jena (2017)

The items are described in this subchapter. The items are split in three dimensions: Task Performance (Table 27, page 70) is the level of how high an employee maintains work standards; Adaptive Performance (Table 28, page 70) is updating skills and knowledge that can adapt to job changes; Contextual Performance (Table 29, 70) is helping new colleagues with work. The scale developed by Pradhan and Jena (2017) for measuring employee performance is based on qualitative and quantitative work, starting with interviews and a literature review to grasp the various facets of performance. A 42-item instrument emerged from these insights, designed to capture different dimensions of employee performance. The Content Validity Ratio (CVR) was then employed to ensure the instrument's validity, leading to the refinement of the scale to 38 items based on expert feedback, with items requiring a CVR of 0.49 or higher for retention. A field survey involving 361 executives from Indian firms provided empirical validation. Exploratory Factor Analysis (EFA) revealed three key dimensions of performance: task, adaptive, and contextual, known collectively as TAC. A total of 23 relevant items resulted from this process. The reliability of the scale and its subscales was confirmed through a reliability study, with Cronbach's alpha indicating strong internal consistency ($\alpha = 0.80$ for the total scale, with subscales ranging from 0.80 to 0.91). The scale is intended to use a 5-step Likert scale.

Table 27: 6 Items measuring Task Performance. Source: Pradhan and Jena (2017)

Item	***Description***
TP9	I use to maintain a high standard of work.
TP14	I am capable of handling my assignments without much supervision.
TP11	I am very passionate about my work.
TP10	I know I can handle multiple assignments for achieving organizational goals.
TP8	I use to complete my assignments on time.
TP12	My colleagues believe I am a high performer in my organization.

Table 28: 7 Items measuring Adaptive Performance. Source: Pradhan and Jena (2017)

Item	***Description***
AP11	I use to perform well to mobilize collective intelligence for effective teamwork.
AP3	I could manage change in my job very well whenever the situation demands.
AP9	I can handle effectively my work team in the face of change.
AP6	I always believe that mutual understanding can lead to a viable solution in organization.
AP8	I use to lose my temper when faced with criticism from my team members. (R)
AP2	I am very comfortable with job flexibility.
AP12	I use to cope well with organizational changes from time to time.

Table 29: 10 Items measuring Contextual Performance. Source: Pradhan and Jena (2017)

Item	***Description***
CP5	I used to extend help to my co-workers when asked or needed.
CP1	I love to handle extra responsibilities.
CP8	I extend my sympathy and empathy to my co-workers when they are in trouble.
CP4	I actively participate in group discussions and work meetings.
CP7	I use to praise my co-workers for their good work.
CP2	I derive a lot of satisfaction nurturing others in the organization.
CP3	I use to share knowledge and ideas among my team members.
CP6	I use to maintain good coordination among fellow workers.
CP10	I use to guide new colleagues beyond my job purview.
CP11	I communicate effectively with my colleagues for problem solving and decision making.

A 5.3 Items to Measure Employee performance Source: Goodman and Svyantek (1999)

Contextual Performance: Altruism

Table 30: Items to measure Contextual Performance: Altruism. Source: Goodman and Svyantek (1999)

No.	*Items*
1	"Helps other employees with their work when they have been absent."
2	"Volunteers to do things not formally required by the job."
3	"Takes initiative to orient new employees to the department even though not part of his/her job description."
4	"Helps others when their work load increases (assists others until they get over the hurdles)"
5	"Assists me with my duties."
6	"Makes innovative suggestions to improve the overall quality of the department."
7	"Willingly attends functions not required by the organization, but helps in its overall image."

Contextual Performance: Conscientiousness

Table 31: Items to measure Contextual Performance: Conscientiousness. Source: Goodman and Svyantek (1999)

No.	*Items*
1	"Exhibits punctuality arriving at work on time in the morning and after lunch breaks."
2	"Takes underserved work breaks."
3	"Exhibits attendance at work beyond the norm, for example, takes fewer days off than most individuals or fewer than allowed."
4	"Coasts toward the end of the day."
5	"Gives advance notice if unable to come to work."
6	"Spends a great deal of time in personal telephone conversations."
7	"Does not take unnecessary time off work."
8	"Does not take extra breaks."
9	"Does not spend a great deal of time in idle conversation."

Task Performance

Table 32: Items to measure Task Performance. Source: Goodman and Svyantek (1999)

NO.	**ITEMS**
1	"Achieves the objectives of the job."
2	"Meets criteria for performance."
3	"Demonstrates expertise in all job-related tasks."
4	"Fulfills all the requirements of the job."
5	"Could manage more responsibility than typically assigned."
6	"Appears suitable for a higher level role."
7	"Is competent in all areas of the job, handles tasks with proficiency."
8	"Performs well in the overall job by carrying out tasks as expected."
9	"Plans and organizes to achieve objectives of the job and meet deadlines."

A 5.4 Construct Validity of Performance Questionnaire. Source: Koopmans et al. (2014)

The IWPQ is designed to examine construct validity, which means it aims to measure what it claims to measure - individual work performance. The methodology involved testing the questionnaire among 1424 Dutch workers from various sectors (blue, pink, and white-collar). The study validated the IWPQ in two ways: convergent validity and discriminative validity. For convergent, the scores from the IWPQ were correlated with related constructs, such as absolute and relative presenteeism, and work engagement, to ensure that the IWPQ aligns with similar measures of work performance. For discriminative validity, the questionnaire's ability to distinguish between groups known to have differences was assessed by looking at differences in IWPQ scores among workers with different levels of job satisfaction and health status.

The results showed that the correlations for convergent validity were weak to moderate, which is typical for measures of complex behaviours such as work performance. For discriminative validity, significant differences in IWPQ scores were successfully detected among groups with known differences, such as varying job satisfaction levels and health conditions. In conclusion, the IWPQ was found to have acceptable construct validity. The tool provides researchers with a reliable and valid instrument for comprehensively and generically measuring individual work performance. It is applicable among workers from different occupational sectors and accommodates those with and without health problems.

The IWPQ can be utilized in research across a diverse workforce to measure work performance. It is a versatile tool that can be applied regardless of the worker's health status, making it useful for studies that may involve workers with health issues or disabilities. Researchers planning to use the IWPQ should consider its ability to provide nuanced insights into work performance related to health and job satisfaction.

Task performance (TP) scale

In the past 3 months…

Table 33: Items to measure Task performance (TP). Source: Koopmans et al. (2014)

Item	*Description*	*Mean*	*SD*
TP1	I managed to plan my work so that it was done on time.	2.80	0.95
TP2	My planning was optimal.	2.47	0.98
TP3	I kept in mind the results that I had to achieve in my work.	3.11	0.81
TP4	I was able to separate main issues from side issues at work.	2.83	0.82
TP5	I was able to perform my work well with minimal time and effort.	2.32	1.00

Contextual performance (CP) scale

In the past 3 months…

Table 34: Items to measure Contextual performance (CP). Source: Koopmans et al. (2014)

Item	*Description*	*Mean*	*SD*
CP1	I took on extra responsibilities.	2.24	1.09
CP2	I started new tasks myself, when my old ones were finished.	2.57	1.13
CP3	I took on challenging work tasks, when available.	2.32	1.08
CP4	I worked at keeping my job knowledge up-to-date.	2.28	1.15
CP5	I worked at keeping my job skills up-to-date.	2.42	1.02
CP6	I came up with creative solutions to new problems.	2.31	0.98
CP7	I kept looking for new challenges in my job.	2.12	1.10
CP8	I actively participated in work meetings.	2.25	1.20

Counterproductive work behaviour (CWB) scale

In the past 3 months…

Table 35: Items to measure Counterproductive Work Behaviour. Source: Koopmans et al. (2014)

Item	*Description*	*Mean*	*SD*
CWB1	I complained about unimportant matters at work.	0.97	0.85
CWB2	I made problems greater than they were at work.	0.71	0.76
CWB3	I focused on the negative aspects of a work situation, instead of on the positive aspects.	1.10	0.86
CWB4	I spoke with colleagues about the negative aspects of my work.	1.56	1.02
CWB5	I spoke with people from outside the organization about the negative aspects of my work.	1.21	1.05

A 5.5 Short Version of the Self-Assessment Scale of Job Performance. Source: Andrade et al. (2020)

Table 36: Short Version of Self-Assessment Scale of Job Performance. Source: Andrade et al. (2020)

Items	*Description*
Item 1	"I perform hard tasks properly."
Item 2	"I try to update my technical knowledge to do my job."
Item 3	"I do my job according to what the organization expects from me."
Item 4	"I plan the execution of my job by defining actions, deadlines and priorities."
Item 5	"I plan actions according to my tasks and organizational routines."
Item 6	"I take initiatives to improve my results at work."
Item 7	"I seek new solutions for problems that may come up in my job."
Item 8	"I work hard to do the tasks designated to me."
Item 9	"I execute my tasks foreseeing their results."
Item 10	"I seize opportunities that can improve my results at work."

A 5.6 Measuring Employee Performance. Source: Iqbal et al. (2018)

Labour Productivity

Table 37: Items to measure the Labour Productivity. Source: Iqbal et al. (2018)

Item	*Description*
LP1	We believe that the productivity of our employee is better than that of our competitors
LP2	Since the implementation of e-HRM average absentee rate are reduced
LP3	Using e-HRM, our average effective hour loss is lower
LP4	e-HRM makes our job much easier
LP5	e-HRM has increased the focus of managers and employees on their core duties

Appendix B Methods

B 1 Overview Interviews Companies

In all companies, the HR manager was interviewed. In order to maintain the anonymity of participants, only the respective industry of participants is shared in the following table.

Table 38: List of all 32 Participants and Their Corresponding Industry

Nr	*Industry*
HR manager 01	Telecom & FinTech
HR manager 02	Venture Tech Building
HR manager 03	BioTech
HR manager 04	Industrial & Manufacturing
HR manager 05	Media and Entertainment
HR manager 06	Corporate IT Services
HR manager 07	AI & VR
HR manager 08	Corporate IT Services
HR manager 09	Telecom & FinTech
HR manager 10	Media and Entertainment
HR manager 11	Energy & Transport
HR manager 12	Media and Entertainment
HR manager 13	Venture Tech Building
HR manager 14	Energy & Transport
HR manager 15	Energy & Transport
HR manager 16	Telecom & FinTech
HR manager 17	Venture Tech Building
HR manager 18	AI & VR
HR manager 19	AI & VR
HR manager 20	Industrial & Manufacturing
HR manager 21	Corporate IT Services
HR manager 22	Telecom & FinTech
HR manager 23	Industrial & Manufacturing
HR manager 24	AI & VR
HR manager 25	Media and Entertainment
HR manager 26	Corporate IT Services
HR manager 27	Energy & Transport
HR manager 28	Corporate IT Services
HR manager 29	Venture Tech Building
HR manager 30	Corporate IT Services
HR manager 31	Industrial & Manufacturing
HR manager 32	Corporate IT Services

B 2 Interview Script

0. Introduction

Thank you for your time. We will talk about digital HR tools in your company. The goal of the research is to find out how HR-Software is used and how it influences the company. But before we start the recording: I send you the privacy statement. Do you have any questions regarding that? Can I ask you to sign that?

Recording Start. Now I start the recording. **[START]** The recording started now - Can you again indicate whether you agree to the informed consent form and to the recording?

If yes: Can you introduce your responsibilities at xxx, and explain how many people take on HR tasks? *How many employees are currently working at xxx?*

1. Employee Performance & Overview of e-HRM practices

Do you measure or plan to measure employee performance in the company in some way?*If Yes:*
How do you measure employee performance?
If No:
What would you like to measure to measure employee performance?
We are now discussing the effect of HRM-Software on employees. So we can first talk about the software you use, and after that go in detail for them.

Which software or tools do you use for Human Resource Management practices?
Are there more tools in general, which are used by employees and HR?

Internal comment: Watch out for e-HRM software (accessed by HR manager and employees). If e-HRM Software is mentioned, go for each individually (e-HRM software X, Y, Z,..) in detail with the questions on the next page.

The e-HRM categories (Table 1) are for internal use, to check (prompt) all areas of e-HRM.

Table 39: Six Groups of e-HRM Tools

HRM-tool Group	*Description for Interview*	*Examples*
1. Learning and Development	E-learning or other employee development	E-learning programs, Career management, Knowledge Management
2. Strategic HR and Workforce	Workforce forecasting or strategic HR tool	Manpower requirements, Competency management, Succession planning, Job Analysis
3. Performance Management	Tracking and managing employee performance	Performance Evaluation, Feedback mechanisms, Benefits administration, Compensation structure
4. Administrative and Analysis	Everyday administrative HR tasks	Database management, Attendance tracking, Attendance tracking, Payroll
5. Employee Relations and	Employee relations and ensuring workplace safety	Employee relations, Safety/ security protocols, Legal compliance
6. Talent Acquisition and Management	Hiring or Employer Branding	Selection, Recruiting, Employer branding, Talent relationship management

Internal Comment: Ask question 2., 3. & 4. on this page for one selected e-HRM software (X) before moving on to the next (Y, Z,..)

2. Usage

For which tasks do you use [HRM Software X/Y/..] in the company?
Can you describe the problems/tasks that you were trying to solve with that software?
Are those problem solved/ expectations met?
If expectations are not/partly met: Why are the expectations not/ only partly met?
If problems are mentioned: Did you try to solve those problems? What (else) did you try?

3. Implementation Challenges

Have you been part of the implementation of [e-HRM Software X/Y/..]?
If yes: Do you remember why you decided for this software, and not a different one? Probe: why?
If yes: Did you see any challenges with implementing? Probe: Technical / People / Organizational Challenges
Where were the issues? How did you try to solve them?
Are there any challenges with the software right now? *Probe:* Technical / People / Organizational Challenges
If yes: Do you try to solve them? *If yes:* How are you trying to solve them?

Probes (will be asked if not mentioned yet):

- Did the standing of HR in the company help during the implementation process, or hinder?
- Did employees influence the implementation? Probes: Why where they pro/con? Strategies to foster acceptance?
- How has top management/Founder support (or lack thereof) influenced the adoption of [specific tool]?

***4.* Impact**

How is the company is affected by [specific tool]? Probe: In what ways? How is this visible? How do you know that?
How are employees affected by [specific tool]? Probe: In what ways? How is this visible? How do you know that?
Do you see elements where employee performance increases / decreases through this technology?
If yes: how does it increase / decrease the employee performance?

Probes (will be asked if not mentioned yet): Technical / People / Organizational Challenges. If Decreases: Ask what they tried to solve

5. Conclusion

Thank you for sharing your insights and experiences with the digital HR tools! Last question, to assign the interview to the correct category: How would you call the type of industry you are in? And in which revenue bracket to you fall? Is it under 100K, 1M, 10M, 100M?
Is there anything else you would like to add before we conclude? **[RECORDING STOP]** Thank you again and have a great day!

B 3 Informed Consent Form

You are being invited to participate in a research study titled „Enhancing Employee Performance in Technology Startups: The Role of Electronic Human Resource Management.“ This study is being conducted by Raphael Krebs from the TU Delft, as part of a Master's thesis project.

The purpose of this research study is to explore the implementation challenges of Electronic Human Resource Management (e-HRM) in technological startups and its influence on employee performance. The findings aim to equip human resource managers in startups with insights on utilizing e-HRM to increase employee performance. The interview will take a maximum of one hour to complete. Your participation involves answering questions about the use and challenges of e-HRM in your organization.

As with any online activity, the risk of a breach is always possible. However, to ensure the confidentiality of your responses, the data collected will be securely stored in the TU Delft database. The interviews will be recorded solely for the purpose of this research; recordings will not be published or made publicly available, and they will be deleted after the project is completed (July 2024). No personal questions which allow for identification will be asked during the interview. The personal data (Interview transcript and this signed informed consent form) will be preserved at TUD for up to 2 years after the completion of the study. The data will be used for scientific and educational work in the domain of „electronic Human Resource Management". Quotes from the Interview may be used in publications. The information published in such work will not be traceable to you. Should we want to use the data for any other purpose or share it with third parties, we will reach out to you and ask for your written permission.

Your participation in this study is entirely voluntary. You have the right to withdraw at any time or omit any questions you prefer not to answer. If you have COVID-related considerations, the interview can be conducted with a distance of 2.5 meters, and FFP2 masks can be worn. Anonymized data will only be used for the purpose of research and teaching purposes.

If you have any questions about the study or your rights as a participant, please feel free to contact Raphael Krebs If you have any concerns or complaints, you can also reach out to Dr. Aleksandar Giga , who is overseeing this research project.

By agreeing to participate, you acknowledge that you have read this opening statement and understand the terms of your participation in this study.

Signatures

_____	_____	_____
Name of participant	Signature	Date

I, as researcher, have handed out the information sheet to the potential participant and, to the best of my ability, ensured that the participant understands to what they are freely consenting.

Raphael Krebs	_____	_____
Researcher name	Signature	Date

Study contact details for further information: R.Krebs@student.tudelft.nl

B 4 Coding Rules

B 4.1 E-HRM Challenges

The following is a description of the quotes coded by the coding scheme for the e-HRM challenges.

Quotations in the „Additional Feature Request" category typically express a desire for improvements or additions to existing e-HRM tools. They specifically identify lacking features, integration deficits with other systems (like payroll or e-mail platforms), and the need for enhanced functionalities that support more automated and seamless HR processes, such as onboarding, offboarding, performance reviews, and daily operations.

Quotations in the „Confidentiality And Regulations" category highlight concerns and challenges related to data privacy, legal compliance, and the secure handling of sensitive information within e-HRM systems. These quotations often discuss issues like the inability of HR systems to ensure anonymity in feedback processes, the complexity of aligning software capabilities with varying international laws (e.g., GDPR compliance), and difficulties in managing user permissions and data access within the organization. This category also captures user frustrations with HR software that does not accommodate the specific legal and cultural requirements of different countries, leading to potential breaches of confidentiality and legal non-compliance.

Quotations coded under „Employees Hesitant To Use It" reflect reluctance, resistance, or slow adoption of new e-HRM systems by employees. This category includes statements that describe employees' discomfort with changing from familiar manual processes to automated systems, challenges in adapting to new software features, or frustrations with the complexity and non-intuitiveness of the tools. The quotations often mention employees' preferences for previous methods (like Excel), the effort required to learn new systems, and the additional workload perceived due to the introduction of new HR technologies. These quotations typically highlight the human factors affecting technology uptake, such as resistance to change, lack of engagement, or simply the inconvenience felt by employees having to adjust to new ways of performing their routine tasks.

Quotations in the „Finding A Tool Matching Requirements" category express difficulties encountered when trying to select e-HRM software that aligns with the specific needs of the organization while also fitting budget constraints. These quotations often discuss the challenges of balancing cost with functionality, ensuring that the chosen tool can provide the necessary features without introducing unwanted complexity or hierarchy. They also highlight concerns about whether advanced tools are necessary for small companies and the process of defining what functionalities are essential for the organization's HR tasks.

Quotations in the „Managers Hesitant Using It" category specifically address reluctance or inefficiency among managers to fully use e-HRM tools as intended. These quotations often discuss managers' difficulties in adapting to new systems for tasks like tracking sick leave, managing holidays, conducting performance reviews, and providing employee feedback. They highlight issues such as managers not engaging with the system effectively, failing to perform required tasks within the tools, and the additional efforts needed to remind and train managers to use the system properly.

Quotations in the „Ongoing Technical Issues" category describe persistent problems with e-HRM systems that impact their functionality and user satisfaction. These issues include software bugs, integration failures with other systems like payroll, confusing interfaces, inaccurate calculations (such as leave days or sick leave tracking), and unreliable notifications or task management within the system. This category captures specific technical shortcomings that hinder the efficient use of the HR tool, requiring frequent manual interventions or corrections, and leading to inefficiencies and user frustration. These quotations often mention the need for

repeated support calls, updates that fail to resolve issues, and the complexity of performing simple tasks due to system limitations or design flaws.

Quotations in the „Other Workflow Imposed - Tool Too Generic" category reflect the challenges encountered when using e-HRM systems that lack the necessary customization options to meet specific organizational needs. These quotations discuss the limitations of software that is too simplistic or rigid for diverse and complex workflows, including issues with adjusting settings for unique departmental needs, customizing access levels for different roles, and tailoring performance review processes or holiday policies to specific organizational practices. They highlight difficulties in setting up features like multi-currency and multi-pay cycle support, adapting systems to comply with local labor laws across various geographies, and personalizing interfaces to accommodate unique company structures or employee management styles.

Quotations in the „Technical Onboarding of Tool" category detail the challenges encountered during the initial setup and integration of e-HRM systems into the company's existing processes. These quotations often reflect issues such as complex data migrations, difficulties in formatting data correctly for uploads, problems with system interfaces, and the need for extensive manual intervention when automated processes fail. This category captures experiences of insufficient guidance from the tool providers, the labor-intensive nature of manually correcting errors post-migration, and the steep learning curve associated with mastering new HR software. Furthermore, it includes descriptions of the time-consuming nature of setting up configurations and customizations necessary to align the tool with specific organizational needs and the frustrations of dealing with technical support during these processes.

Quotations in the „Time Consuming for HR" category reflect issues and challenges related to the excessive time and effort required to manage and operate e-HRM systems. These quotations often discuss the inefficiencies and frustrations encountered by HR personnel due to cumbersome processes, such as manual data entry corrections, frequent system navigation issues, complex configurations, and the need for repeated adjustments to accommodate organizational changes or correct user errors. This category captures descriptions of labor-intensive tasks that arise from suboptimal system design, such as unclear user interfaces, slow performance, and the necessity of maintaining parallel digital and physical records. It also includes mentions of difficulties in training users, ensuring data accuracy, and dealing with constant system updates that complicate routine tasks, ultimately leading to significant time investment by HR staff.

Quotations in the „Too Many Tools" category highlight the challenges and inefficiencies caused by using multiple e-HRM systems instead of a single integrated solution. This category includes mentions of difficulties in coordinating activities across different software, such as managing recruiting, performance reviews, and leave requests, which often leads to confusion and dissatisfaction among employees.

Quotations in the „Wrong or Incomplete Use Of Software" category reflect issues where the e-HRM systems are either not fully utilized or are used incorrectly. These quotations typically involve situations where users are unaware of all the features available, use only a fraction of the system's capabilities, or apply the tool in ways that do not align with its intended functions. This category includes mentions of HR managers not engaging with the system's full potential, such as neglecting to use assessment and communication tools within the software, or failing to update and maintain the software's data accurately. It also captures instances where the system's functionalities are not fully integrated into the daily workflows of the organization, leading to inefficiencies and underutilization of the technology.

B 4.2 E-HRM Impact

Quotations in the „+ Corporate Culture" category discuss how e-HRM practices influence and enhance the corporate culture. These quotations often highlight how the adoption of e-HRM tools facilitates open communication, encourages the sharing of feedback, and fosters a culture of personal and professional development. This category includes instances where e-HRM tools help bring team members closer together, even across different locations, and contribute to creating a more appreciative and supportive work environment. It captures the positive impact of e-HRM on reinforcing company values, improving interpersonal connections, and promoting a culture that drives both individual growth and overall company success.

Quotations in the „+ Data Security" category emphasize how the adoption of e-HRM practices enhances data security and compliance with privacy regulations such as GDPR. These quotations typically discuss the benefits of having a centralized and secure digital system for managing sensitive employee information, reducing the risk of data breaches, and ensuring that personal data is not mishandled or exposed. This category includes mentions of improved control over who can access specific data within the organization, the automatic deletion of data in compliance with legal standards (for example CVs in recruiting).

Quotations in the „+ Employee Engagement" category highlight how the adoption of e-HRM practices enhances employee engagement. These quotations often discuss how e-HRM tools facilitate the expression of feedback, enable regular communication about company updates, and foster a culture where employee well-being and motivation are prioritized. This category includes mentions of how e-HRM systems support the implementation of employee surveys, performance reviews, and recognition programs, all of which contribute to a more engaged workforce. It captures how these tools help employees feel valued and heard, ultimately improving their motivation.

Quotations in the „+ Feedback / Education" category emphasize the role of e-HRM practices in enhancing feedback mechanisms and educational opportunities. This category includes discussions on how e-HRM tools facilitate structured feedback and performance management processes that are integral to personal and professional development. It captures quotations about the importance of (continuous) learning enabled by e-HRM platforms, which help in organizing feedback sessions, self-reviews, and training programs.

Quotations in the „+ Informed Decisions" category illustrate how e-HRM tools empower technology startups to make better strategic choices by providing insights. Quotations describe how they enhance decision-making processes by centralizing data, streamlining communication, and offering detailed reporting functionalities.

Quotations categorised under „+ Non Value Added Activities" reflect how e-HRM systems minimize or eliminate tasks that do not directly contribute to a startup's productivity or performance. These quotations emphasize the role of e-HRM tools in simplifying administrative processes like holiday management, document storage, and personnel updates, which do not influence direct business outcomes such as sales.

Quotations categorised under „+ Power To Employees" highlight how e-HRM systems empower employees by providing them with tools to manage their own information, voice opinions, and participate in organizational processes securely and privately. These systems facilitate a greater sense of ownership and accountability, enabling employees to directly influence their work environment and career development. This empowerment is reached through functionalities that allow employees to provide feedback, manage personal details, and actively engage in their professional growth.

Quotations categorised under „+ Simplicity" reflect the benefits of e-HRM systems in making administrative tasks straightforward, consolidating functions into a single platform, and enhancing accessibility of information.

This category captures how e-HRM solutions simplify daily tasks such as time reporting, vacation requests, and access to organizational policies, reducing the need for multiple tools and manual data management.

Quotations in the „+ Speed" category reflect how e-HRM systems enhance the speed and efficiency of operations. This category includes reflections on how integrating all HR functions into one system reduces the time needed for both routine and complex processes, from recruitment to daily task management. There are statements highlighting faster access to information, streamlined communication, and quicker resolution of administrative tasks.

Quotations coded under „+ Structure" in the context of e-HRM impacts on technology startups during transition phases are those that describe how e-HRM systems introduce or enhance organizational structure, process clarity, and workflow organization. This category captures how tools and practices streamline and standardize operations, making processes like performance management, holiday requests, and task prioritization more structured and transparent.

Quotations in the „+ Time saver" category illustrate how e-HRM systems reduce the time spent on routine, manual, and administrative tasks, enabling HR teams and managers to focus more on strategic activities and less on manual operations. This category captures quotations which state significant reductions in time spent on processes such as holiday requests, payroll management, employee onboarding, and performance reviews due to automation and centralization of data. These quotations emphasize the efficiency gains from using HR technology.

Quotations categorised under „+ Transparency" focus on the clarity and openness e-HRM tools provide to both employees and management. This category involves expressions where contributors discuss how e-HRM systems make organizational procedures, such as vacation tracking, performance evaluations, and resource allocation, more visible and understandable to all stakeholders. These tools are highlighted for their ability to present comprehensive and easily accessible data on various HR processes, which ensures that everyone is informed and can see the factual basis of decisions and policies.

Quotations under the category „+ Trust in Company" typically address how e-HRM practices enhance employee confidence in their organization's management and operations. This category involves statements where individuals highlight how transparent HR policies, data security, and employee input mechanisms foster a sense of safety and respect within the company. Quotations describe the benefits of systems that allow employees to manage their personal information securely and voice their opinions or concerns, contributing to a workplace where they feel valued and heard.

B 5 Codebook

B 5.1 Sub-research Question One: e-HRM Practices

Table 40: Codebook e-HRM Practices

e-HRM Category	*e-HRM Practice*	*e-HRM Category*	*e-HRM Practice*
Admin	Attendance tracking	Recruit.	Employer branding
	Database management		Recruiting
	Payroll processing		Selection
L&D	Career management		Talent relationship management
	E-learning programs	Safety	Employee relations
	Knowledge Management		Legal compliance
	On & Offboarding		Safety/ security protocols
Perf.	Compensation And Benefits	Strategic HR	Competency management
	Feedback mechanisms		Job Analysis/ Forecasting
	Performance Evaluation		Manpower requirements
	Task Tracking / Project Management		Succession planning

B 5.2 Sub-research Question Two: e-HRM Challenges

Table 41: Codebook e-HRM Challenges

Codes
Additional Feature Request
Additional Feature Request: Allow For Qualitative Input
Additional Feature Request: Automatic Suggestion Based on Survey Results
Additional Feature Request: Automation
Additional Feature Request: Better Smartphone App
Additional Feature Request: Data Interface Export
Additional Feature Request: Diary / Note Taking
Additional Feature Request: Email Integration
Additional Feature Request: More Data And Information
Additional Feature Request: Notification And Reminder Automation
Additional Feature Request: Personal Development Paths
Confidentiality And Regulations
Confidentiality And Regulations: Access And Confidentiality Breaches
Confidentiality And Regulations: Data should stay in EU / Home Country
Confidentiality And Regulations: Different Regulations In Country Than Tool Provider
Employees Hesitant To Use It
Employees Hesitant To Use It: Complaints Over Reduced Power / Access
Employees Hesitant To Use It: Complicated User Interface Employees
Employees Hesitant To Use It: Employees Did / Do Not See Why It Is Needed
Employees Hesitant To Use It: Hard to Engage Using For Employees
Employees Hesitant To Use It: Time Consuming For Users
Managers Hesitant Using It
Managers Hesitant Using It: Complicated User Interface Manager
Managers Hesitant Using It: Hard to Engage Using For Managers

Ongoing Technical Issues
Ongoing Technical Issues: Interface Broken
Ongoing Technical Issues: No Or Wrong Tasks And Person Tagging Possible
Ongoing Technical Issues: Reports Should Work Better
Ongoing Technical Issues: Technical Issues -> Incorrect Data In Software
Technical Onboarding of Tool
Technical Onboarding of Tool: Difficult Data Collection
Technical Onboarding of Tool: Difficult Data Formatting
Technical Onboarding of Tool: Onboarding - More Guidance Wanted
Technical Onboarding of Tool: Technical Onboarding Did Not Work Initially
Technical Onboarding of Tool: Time Consuming Setup For HR
Time Consuming for HR
Time Consuming for HR: Access And Roles Not Correct
Time Consuming for HR: Additional Manual Work in Tool
Time Consuming for HR: Bad Communication To Employees - Leads To They Ask Questions
Time Consuming for HR: Complicated User Interface HR manager
Time Consuming for HR: Difficult Communication With Customer Support -Time Delay
Time Consuming for HR: Employees Forgetting To Use - Leads To Change Requests
Time Consuming for HR: Fear Of Losing Data - Two Sources Of Truth
Time Consuming for HR: Tool Is Slow
Wrong or Incomplete Use Of Software
Wrong or Incomplete Use Of Software: No Ownership Over Tool
Wrong or Incomplete Use Of Software: Not Using All Features
Wrong or Incomplete Use Of Software: Wrong Use ->Incorrect Data In Software
Too Many Tools
Other Workflow Imposed - Tool Too Generic
Finding A Tool Matching Requirements

Table 42: Codebook e-HRM Challenges and Their Corresponding Practice

challenges per e-HRM practices
challenges per e-HRM practices: Admin
challenges per e-HRM practices: L&D
challenges per e-HRM practices: Perf.
challenges per e-HRM practices: Recruit.
challenges per e-HRM practices: Safety
challenges per e-HRM practices: Strategy HR

B 5.3 Sub-research Question Three: e-HRM Impact

Table 43: Codebook e-HRM Impact, Negative

Negative Influences	
	- Data Security
	- Informed Decisions
	- Performance
	- Speed
	- Time Consuming
	- Transparency
	- Trust in Company
- Employee Engagement	
	- Employee Engagement: - Anger & Annoyance
	- Employee Engagement: - Confusion
	- Employee Engagement: - Micromanagement

Table 44: Codebook e-HRM Impact, Positive

Positive Influences	
	+ Data Security
	+ Informed Decisions
	+ Performance
	+ Speed
	+ Time saver
	+ Transparency
	+ Trust in Company
+ Employee Engagement	
	+ Employee Engagement: + Employee Experience
	+ Employee Engagement: + Feel Cared About
	+ Employee Engagement: + Hygiene Factor
	+ Employee Engagement: + Motivated Employees
+ Power To Employees	
	+ Power To Employees: + Accountability
	+ Power To Employees: + Employees To Share Opinion
	+ Power To Employees: + Empower
	+ Corporate Culture
	+ Feedback / Education
	+ Non Value Added Activities
	+ Simplicity
	+ Structure

Table 45: Codebook e-HRM Impact, Stakeholder

Stakeholder	*Impact*
Company (indirect to employees)	
	Company (indirect to employees): - Negative
	Company (indirect to employees): ? No Effect
	Company (indirect to employees): + Positive
Employee Performance	
	Employee Performance: - Negative
	Employee Performance: ? No Effect
	Employee Performance: + Positive
Employees - not Performance	
	Employees - not Performance: - Negative
	Employees - not Performance: ? No Effect
	Employees - not Performance: + Positive
HR manager (indirect to employees)	
	HR manager (indirect to employees): - Negative
	HR manager (indirect to employees): ? No Effect
	HR manager (indirect to employees): + Positive
Line-Manager	
	Line-Manager: - Negative
	Line-Manager: ? No Effect
	Line-Manager: + Positive

Table 46: Codebook e-HRM Impact, Practices

e-HRM Categories of Impact
influences per e-HRM practices: Admin
influences per e-HRM practices: L&D
influences per e-HRM practices: Perf.
influences per e-HRM practices: Recruit
influences per e-HRM practices: Safety
influences per e-HRM practices: Strategy HR

Appendix C Results e-HRM Practices

C 1 Tools

Table 47: Number of e-HRM tools

Number of Tools	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
Count	*1*	4	8	7	3	4	3	1	0	0	1

C 1.1 E-HRM Practice Groups

Table 48: Usage of e-HRM Practice Groups

Practice	***Total***	***Total***
Administrative and Analysis	30	94%
Learning and Development	25	78%
Performance Management	27	84%
Talent Acquisition and Management	24	75%
Employee Relations and Safety	9	28%
Strategic HR and Workforce Planning	5	16%

Table 49: Statistical usage of e-HRM Practice Groups

	Administrative	*Learning*	*Performance*	*Talent*	*Employee*	*Strategic HR*
Average	1,7	1,3	1,4	0,9	0,4	0,2
Min	0,0	0,0	0,0	0,0	0,0	0,0
1. Quart	1,0	1,0	1,0	0,8	0,0	0,0
Median	2,0	1,0	1,0	1,0	0,0	0,0
2. Quart	2,0	2,0	2,0	1,0	1,0	0,0
Max	3,0	3,0	4,0	2,0	3,0	1,0

C 1.2 E-HRM Practices

Table 50: e-HRM Categories and Practices mentioned in the Interviews.

e-HRM practice	*Subgroup*	*Number*	*Percent*
e-HRM - Admin	e-HRM - Admin: Attendance tracking	18	56%
	e-HRM - Admin: Database management	28	88%
	e-HRM - Admin: Payroll processing	8	25%
e-HRM - L&D	~~e-HRM - L&D: Career management~~	0	0%
	e-HRM - L&D: E-learning programs	9	28%
	e-HRM - L&D: Knowledge Management	20	63%
	e-HRM - L&D: On & Offboarding	12	44%
e-HRM - Perf.	e-HRM - Perf.: Compensation And Benefits	5	34%
	e-HRM - Perf.: Feedback mechanisms	11	50%
	HRM - L&D: Task Tracking / Projekt Management	12	16%
	e-HRM - Perf.: Performance Evaluation	15	38%
e-HRM - Recruit.	e-HRM - Recruit.: Employer branding	1	3%
	e-HRM - Recruit.: Recruiting	24	75%
	e-HRM - Recruit.: Selection	2	6%
	e-HRM - Recruit.: Talent relationship management	1	3%
e-HRM - Safety	e-HRM - Safety: Employee relations	9	34%
	e-HRM - Safety: Legal compliance	2	6%
	~~e-HRM - Safety: Safety/ security protocols~~	0	0%
e-HRM - Strategic HR	e-HRM - Strategic HR: Competency management	0	0%
	e-HRM - Strategic HR: Job Analysis/ Forcasting	4	16%
	~~e-HRM - Strategic HR: Manpower requirements~~	0	0%
	~~e-HRM - Strategic HR: Succession planning~~	0	0%

Appendix D Results e-HRM Challenges

Table 51: Data for Boxplot – Data of total Challenges Mentioned per Company

Average	5,4
Min	0
1. Quart	3
Median	6
2. Quart	8
Max	10

Table 52: Number and type of Challenges Mentioned.

Type of Challenge	*Number*
Additional Feature Request	18
Additional Feature Request: Allow For Qualitative Input	1
Additional Feature Request: Automatic Suggestion Based on Survey Results	2
Additional Feature Request: Automation	3
Additional Feature Request: Better Smartphone App	1
Additional Feature Request: Data Interface Export	4
Additional Feature Request: Diary / Note Taking	1
Additional Feature Request: Email Integration	1
Additional Feature Request: More Data And Information	1
Additional Feature Request: Notification And Reminder Automation	3
Additional Feature Request: Personal Development Paths	1
Confidentiality And Regulations	15
Confidentiality And Regulations: Access And Confidentiality Breaches	9
Confidentiality And Regulations: Data should stay in EU / Home Country	2
Confidentiality And Regulations: Different Regulations In Country Than Tool Provider	4
Employees Hesitant To Use It	38
Employees Hesitant To Use It: Complaints Over Reduced Power / Access	1
Employees Hesitant To Use It: Complicated User Interface Employees	7
Employees Hesitant To Use It: Employees Did / Do Not See Why It Is Needed	6
Employees Hesitant To Use It: Hard to Engage Using For Employees	15
Employees Hesitant To Use It: Time Consuming For Users	9
Managers Hesitant Using It	8
Managers Hesitant Using It: Complicated User Interface Manager	2
Managers Hesitant Using It: Hard to Engage Using For Managers	6
Ongoing Technical Issues	17
Ongoing Technical Issues: Interface Broken	4
Ongoing Technical Issues: No Or Wrong Tasks And Person Tagging Possible	5
Ongoing Technical Issues: Reports Should Work Better	2
Ongoing Technical Issues: Technical Issues -> Incorrect Data In Software	6

Technical Onboarding of Tool	20
Technical Onboarding of Tool: Difficult Data Collection	3
Technical Onboarding of Tool: Difficult Data Formatting	4
Technical Onboarding of Tool: Onboarding - More Guidance Wanted	2
Technical Onboarding of Tool: Technical Onboarding Did Not Work Initially	4
Technical Onboarding of Tool: Time Consuming Setup For HR	7
Time Consuming for HR	18
Time Consuming for HR: Access And Roles Not Correct	2
Time Consuming for HR: Additional Manual Work in Tool	1
Time Consuming for HR: Bad Communication To Employees - Leads To They Ask Questions	2
Time Consuming for HR: Complicated User Interface HR manager	6
Time Consuming for HR: Difficult Communication With Customer Support -Time Delay	1
Time Consuming for HR: Employees Forgetting To Use - Leads To Change Requests	2
Time Consuming for HR: Fear Of Losing Data - Two Sources Of Truth	2
Time Consuming for HR: Tool Is Slow	2
Wrong or Incomplete Use Of Software	12
Wrong or Incomplete Use Of Software: No Ownership Over Tool	1
Wrong or Incomplete Use Of Software: Not Using All Features	8
Wrong or Incomplete Use Of Software: Wrong Use ->Incorrect Data In Software	3
Too Many Tools	8
Other Workflow Imposed - Tool Too Generic	22
Finding A Tool Matching Requirements	6
Sum	182

Table 53: Challenges per e-HRM Practice Group.

Practice, At least one challenge in this category		
challenges per e-HRM practices: Admin	25	78%
challenges per e-HRM practices: L&D	9	28%
challenges per e-HRM practices: Perf.	17	53%
challenges per e-HRM practices: Recruit.	8	25%
challenges per e-HRM practices: Safety	1	3%
challenges per e-HRM practices: Strategy HR	2	6%

D 1 Quotations TOP Framework

D 1.1 E-HRM Practice Specific Challenges

Talent Acquisition e-HRM Tools

In the area of Talent Acquisition and Management, the challenges primarily revolve around the limitations in system functionality and flexibility, affecting the efficiency and effectiveness of recruitment processes. Common patterns include issues with user interface design and the ability to customize features to better suit organizational recruitment strategies.

User Interface and Navigation Issues: Many users experience frustration with the navigation and user interface of e-HRM tools, which can be cumbersome and unintuitive. This is highlighted by one user's experience:

> *„Now I'm being led from one page to another and then I think to myself, why was I led to another page? Why couldn't I just stay on the same page? For example, when you're in a place and then you go to Applications, then a new window opens and you have to jump from left to right all the time. I find that a bit tiring." (HR manager 04, Quotation 160)*

This kind of interface design can significantly hinder the recruitment process by slowing down tasks and complicating simple actions.

Lack of Customization for Recruitment Activities: The inability to tailor e-HRM tools to specific recruitment needs is another significant challenge. For instance, users find it difficult to adapt scoring systems for candidate evaluations within the tools, as explained by one user:

> *„So the thing is that we would like to each of the panel members to insert a score to the applications of each candidate that has applied, you know, and this is not possible, just one score can be introduced the system." (HR manager 14, Quotation 108)*

D 1.2 People Challenges

Table 54: Quotations of People Challenges Mentioned.

Challenge	*%*	*Quotation*	*Source*
Managers Hesitant Using It	16%	[...], we of course reminded people again and again about it. So there was a bit of, you know, reminding, et cetera, but we put most of the effort and time into the managers. So like hey, have you done this in the system, did you do that, et cetera, et cetera	HR manager 09, Quotation 223
Wrong or Incomplete Use Of Software	31%	We have quite a few hiring managers and they don't always use e-HRM tool X the way it should be used. But I think if e-HRM tool X is used the way you can, you know that you can write in your assessment, you can write in the comments.	HR manager 17, Quotation 210
Time Consuming for HR	44%	where I still get requests for adjustments, because when we had this clock-in system, so to speak, and I don't know, some people forget to clock in in the morning or forget to clock in again after the break and that's such a small thing, but that really does add up, yes, in terms of time, when there are these ten to fifteen minutes every day that you have to make any adjustments. And it's always the same people, so it's a bit...	HR manager 07, Quotation 223
Employees Hesitant To Use It	69%	Like a month or two ago we had an announcement where I've added some fields in e-HRM tool X so that people could put it in their shoe/ sock and T-shirt size. So for our next company event we can get cool like swag and we did have someone say: „Wait, what's e-HRM tool X?", so...	HR manager 12, Quotation 174
Too Many Tools	22%	Yeah, it's would be much easier to use 1 tool with all the functions, but unfortunately for a small organisation it's quite hard to find that tool for like a reasonable budget as well.	HR manager 05, Quotation 82

D 1.3 Technological Challenges

Table 55: Quotations of Technological Challenges Mentioned.

Challenge	*%*	*Quotation*	*Source*
Technical Onboarding of Tool	47%	This was the pain point I think we did a CSV upload which had a bunch of errors and then we had to go manually fix all the errors. Then I had to update all of the contractor information one by one. I mean, if I was doing this with 300 employees, wow. Umm, but thankfully we were only 40 at the time.	HR manager 06, Quotation 228
Ongoing Technical Issues	41%	Yes, the tool just goes crazy, I don't know, I've run several updates and the times [in the time tracking system] were no longer correct.	HR manager 01, Quotation 144
Additional Feature Request	38%	For example, in the onboarding process, we can't send an e-mail directly from the platform. So if I want to send you as a new hire a welcome e-mail, I need to kind of copy the template that I've stored in e-HRM tool X, go to e-mail provider Y and manually write you this e-mail.	HR manager 10, Quotation 155
Confidentiality And Regulations	34%	But the thing is we used e-HRM tool X last year to do the peer reviews. Their tool was not that great, to be honest. It was that... we lost the anonymity. It was not anonymous.	HR manager 13, Quotation 41
Finding A Tool Matching Requirements	19%	The main challenges were to ensure that the tool will match any requirement we had on the HR, but also ensuring that there is enough ergonomy into the tool to encourage people going into e-HRM tool X.	HR manager 20, Quotation 140

Table 56: Average Number of Challenges, Software vs. Non-software.

	Software	*Non-Software*
Technological Challenges	1,71	2,00
Organizational Challenges	0,71	0,64
People Challenges	2,71	2,45

D 1.4 Organizational Challenges

Table 57: Quotation of Organizational Challenges Mentioned.

Challenge	*%*	*Quotation*	*Source*
Other Workflow Imposed - Tool Too Generic	34%	I mentioned that it doesn't let you customise things that needs to be customised for you. [For example] it's in a way very simple, so it doesn't let you make it a bit more complex. For example, if you do a yearly review, there is no way to customise it for separate people. For example, I want to review you, Raphael, then another person also reviews you. It's like something more complex... It lets you just review: OK, you review me, I review you, that's it. So it's in a way a very simple system and it doesn't let us adjust to needs.	HR manager 05, Quotation 213

Appendix E Results e-HRM Impact

E 1 General Impact of e-HRM: Negative and Positive

Table 58: General Impact of e-HRM: Negative

	#	*Quotation*	*Interview*
Employee Engagement	18	Even if you can't apply for time off in e-HRM tool X because it's not calculated correctly, so it's not calculated correctly and then the outcome isn't right and instead of having, I don't know, 4 days plus you have 4 days minus I mean of course that frustrates you and leads to anger.	HR manager 01, Quotation 157
Time Saving / Consuming	8	[...] processes like this are very time-consuming. So you have to write your self-assessment, which can take an hour, and then you have to write assessments for peers, depending on how many you have. If you're a manager, you sometimes have to write assessments for ten people and more.	HR manager 08, Quotation 277
Performance	4	Yes, I think that for people who have already worked very efficiently before, i.e. who are very self-organised, having to do it [project management documentation] all at once has probably made them a bit slower, because you have to track it, because you have to fill in things that you might otherwise have just done.	HR manager 27, Quotation 335
Informed Decisions	2	The accounting department is also affected. Because we have to make provisions at the end of the year. For holidays and overtime. Exactly, and because that's an expense. Holiday is paid working time. And it arises in a certain period and if you don't take it in this period and I mean, there are also legal regulations, but you actually take it and in accounting terms you have to delimit it and say no? The holiday was taken this year and? Yes, and if I don't have any reliable figures now? Is that bad, because they they need that for the annual accounts.	HR manager 01, Quotation 179
Trust in Company	2	There's a big risk in it if employees take the time and the energy to fill in the survey, but the key takeaways are but then don't see, follow up or true change happening accordingly. Yeah. Then then it only widens the gap between management and employees.	HR manager 03, Quotation 294
Transparency	1	I do think, though, on the flip side, maybe people are slightly less commutative about it. Ideally I would love if people would put it in e-HRM tool X and update their online status, but [...] there's a good chunk of people who only put it in e-HRM tool X for example. So that's maybe a like a weakening from having a system.	HR manager 12, Quotation 204
Speed	1	No, just my response time Influences the employees and the employees only realise what's going on in the background if it's not working somehow.	HR manager 01, Quotation 310
Data Security	1	So you could see the people that reviewed you, although it was supposed to be anonymous. So that had a direct effect as well, that everyone knew who they were getting feedback from. And so it also affected that we believe that the feedback might not have been, as truthful as it would have been, as I think we would have..	HR manager 13, Quotation 232

Table 59: General Impact of e-HRM: Positive

	#	Quotation	Interview
Transparency	39	[...] from an operations perspective we will [notice] because we have access to information way easier. We have access to reports that we didn't have before because e-HRM tool X also allows us to collect data very easily and already has all these reports created for turnover, for the salaries reports, and you know all this distribution of the company, the demography of the company, it has this without us having to go through the five Excel files.	HR manager 19, Quotation 249
Time Saving / Consuming Simplicity	27	I would say that we have become a bit more efficient. Yeah. And to be honest. Having this HR tool is more of a development for leads and for HR […]	HR manager 11, Quotation 273
	22	I would say that it has had a positive effect, or at least that's the feedback I get. People across the board actually find the e-HRM tool X time recording system much more intuitive, much easier and yes, they just like the fact that you can see who else is in the office.	HR manager 07, Quotation 272
Employee Engagement	21	It's good that they are happy that we care about them. We make these surveys and then we have an update for the whole company that what we have investigated and so on. So they have been very positive.	HR manager 02, Quotation 244
Performance	15	If the tech is enabling continuous iteration, that improves performance, because if you are able to make a performance management better then eventually that automatically seeks 12 months later, has an impact on better performance because you're more targeted in your performance management.	HR manager 06, Quotation 329
Informed Decisions	12	The biggest influence is the survey function, so our people survey here is one of the most important tools we have in the whole company, because it simply gives us incredibly important data. What does the company look like now?	HR manager 26, Quotation 202
Speed	9	I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire. It is faster for us to contact candidates,	HR manager 09, Quotation 317
Feedback / Education	9	We hope that it can help people to go and improve themselves and to keep on learning, so to also see the options. Let's say if you are only a C++ developer that maybe it's interesting to develop into rust or something like that.	HR manager 28, Quotation 273
Structure	8	the feedback so far has been very positive because, yes, people are really longing for a bit of structure here. They are really happy that they have something they can rely on.	HR manager 04, Quotation 240
Data Security	7	So yeah, and then we are sure that we are compliant with all the privacy policies and rules. So this is a positive change	HR manager 05, Quotation 228
Non Value Added Activities	7	One role is to look at productivity and making life easier for the non value added activities. You could argue there is impact but I cannot say we achieved these milestones because we have this tool. But it definitely is a hygiene factor to make things run as smoothly as possible for these sorts of activities.	HR manager 03, Quotation 175
Power To Employees	5	This means that a lot of work has been taken off their hands, and at the same time we have also been able to strengthen the employees, i.e. strengthen the management and the employees by enabling them to manage their own data.	HR manager 27, Quotation 205
Trust in Company	4	Simply that the security is there, that they have e-HRM tool X to sort things out, so I can enter my address there if I've moved. I have new bank details, that doesn't go down, because I can change it myself. It gives you a bit of security. Above all, you know where your data is stored.	HR manager 25, Quotation 231
Corporate Culture	3	So it has a simple effect on our corporate culture, in any case. It means that everyone can communicate openly with each other, give each other critical feedback, even if it's unpleasant, and that simply, yes, high level, simply drives the company's success and performance forward and […] I get feedback, I reflect on myself, then I know where I stand and then I can work on whatever my next steps are	HR manager 08, Quotation 255

E 2 Description of Impact of e-HRM

This description continues the list of impact factors in the table below, while the first have been discussed in the main part.

Table 60: Impact Factors of e-HRM

Impact Factors	*Positive*	*Impact Factors*	*Positive*
Transparency	39	**Informed Decisions**	**12**
Time Saving / Consuming	27	**Speed**	**9**
Simplicity	22	**Feedback / Education**	**9**
Employee Engagement	21	**Structure**	**8**
Performance	15	**Data Security**	**7**
		Non Value Added Activities	**7**

Informed Decisions

The integration of e-HRM systems has significantly enhanced the ability of organizations to make informed decisions. These systems provide centralized access to critical data, allowing HR professionals, management, and employees to access and analyse information efficiently. For example, an HR manager described the benefits of immediate access to information, stating,

> *„And yeah, also being able to get some information from the system is also nice for me" (HR manager 11, Quotation 266).*

But not only HR is affected, also line managers seem to benefit. It can provide immediate insights, which is particularly valued by team managers. The systems supply real-time data that can influence decisions on organizational development and team effectiveness, as noted:

> *„It gives immediate insights to team managers and alike. So I think it's extremely valuable" (HR manager 03, Quotation 276).*

Centralized communication through these platforms also ensures that all employees, regardless of their role, receive consistent and updated information regarding onboarding, offboarding, and other HR processes. One benefit is described as,

> *„All the tasks when it comes to onboarding and offboarding are assigned through the system, so they know where to find it" (HR manager 05, Quotation 236)*

Additionally, e-HRM systems enhance strategic planning at the executive level through robust reporting functions. Managers and executives can access detailed reports that aid in performance analysis and resource planning. For example,

> *„For managers and for executive level, they also have access to the reporting function. So for them that's very useful" (HR manager 10, Quotation 216).*

While e-HRM systems provide significant advantages for informed decision-making, one HR manager raised concerns that they should not be the sole basis for critical decisions affecting employee careers. It's important to consider the broader context, including personal circumstances that may impact an employee's performance, as noted by one interviewee:

> *„You shouldn't just base the employee's development or the employee's promotion opportunities purely on some electronic tool" (HR manager 07, Quotation 314)*

This caution suggests the need for a balanced approach that combines data insights with human judgment to ensure fair and comprehensive decision-making.

Speed

E-HRM systems operation significantly enhances the speed for stakeholders. These systems enable quicker access to information, streamline processes, and reduce the need for manual interventions, which collectively boost productivity and user satisfaction. For instance, e-HRM systems allow employees to independently access

information whenever needed, without waiting for HR to respond to individual queries. This self-service capability is greatly appreciated, as one HR manager pointed out:

> *„So I think this helps us because we don't have to answer individual questions so they can go directly to the system and then see all the information for themselves or for their team more easily" (HR manager 14, Quotation 172)*

By reducing the dependency on HR for information, these systems empower employees and managers alike to make faster decisions and manage their tasks more effectively.

Automation of routine tasks is another area where e-HRM systems bring speed and efficiency. The systems automate various administrative tasks such as document handling and data entries, which previously consumed significant time. As one HR manager explained,

> *„And some things also work automatically, no longer have to be done yourself and you don't have to scroll through so many sheets and documents in the drive until you can do something. That's a good thing" (HR manager 04, Quotation 248)*

This automation not only speeds up processes but also reduces the potential for human error.

In the context of recruitment, the speed improvements are particularly noteworthy. E-HRM systems streamline the recruitment process by maintaining a comprehensive candidate database, automating communications, and tracking each step of the recruitment cycle. This functionality significantly expedites the process, as highlighted by a user:

> *„It fasten a bit it speeds up a bit the processes" (HR manager 16, Quotation 245)*

This quicker process ensures that vacancies are filled more rapidly, improving the organization's ability to respond to its recruiting needs.

However, it's important to note that the efficiency of these systems heavily relies on their performance. If there are issues with the system's functionality, it can negatively affect the perception of its speed and effectiveness. An HR manager expressed concern about response times, noting,

> *„No, just my response time influences the employees and the employees only realize what's going on in the background if it's not working somehow" (HR manager 01, Quotation 310)*

This comment highlights that the benefits of speed are dependent on the functioning of the e-HRM systems.

Feedback / Education

E-HRM systems significantly enhance the feedback and education processes within organizations, promoting a culture of continuous improvement and learning. For instance, an HR professional highlighted the system's role in facilitating effective feedback sessions or review programs, which are integral to personal and professional development:

> *„So it's just, yes, like a training session, which we all have to do from time to time, that's just part of it and it has a bigger effect afterwards or at the end, yes, and that's why I wouldn't say that it has a negative effect" (HR manager 08, Quotation 279).*

Moreover, the systems play a crucial role in reinforcing the organizational culture through regular feedback and performance management processes. As another HR manager described, the comprehensive approach to feedback and performance management embedded in e-HRM systems enhances employee retention and engagement:

> *„So the more we deal with this whole topic, the more processes and tools we have, which I have just described, the more you naturally bind employees to such a company and we call that stickiness" (HR manager 08, Quotation 255)*

This indicates that e-HRM systems not only support individual development but also strengthen organizational ties by creating an environment that values continuous feedback and growth.

Structure

E-HRM systems significantly contribute to creating structure within organizations by ensuring that all relevant stakeholders are efficiently coordinated and processes are transparently managed. An example comes from an interview where it was noted,

> *„Interesting. I would say that e-HRM Tool X brings together virtually all the relevant stakeholders who need to be involved in a task or topic, creates one hundred percent transparency and creates structure and prioritization" (HR manager 08, Quotation 327)*

This statement highlights the role of e-HRM systems in not only improving organizational efficiency but also in enhancing strategic management and operational clarity. By integrating various functions and departments within a single tool, these systems facilitate a more organised, streamlined approach to managing work, directly impacting productivity and the effectiveness of team collaborations.

Data Security

E-HRM systems are also mentioned for improving data security, especially in alignment with stringent regulations like GDPR. A representative positive quote illustrates this advantage:

> *„Because on the one hand, it is also GDPR-compliant that we don't see all the data... In recruiting, for example, only the applicants who are really relevant are seen by the hiring manager. Applicants are deleted after 6 months. This is also compliant with the GDPR" (HR manager 25, Quotation 152)*

This functionality ensures that access to sensitive information is appropriately managed, and that data is deleted in compliance with legal standards.

However, there has been a negative mention regarding the system's handling of anonymity in feedback processes. Specifically, the system inadvertently disclosed the identities of those giving feedback, which was meant to be anonymous:

> *„So you could see the people that reviewed you, although it was supposed to be anonymous" (HR manager 13, Quotation 232)*

This means that when challenges occur, the effects can even be negative – worse than before.

Non Value Added Activities

E-HRM systems are instrumental in simplifying and speeding up non-value-added activities, which traditionally consume significant administrative time and effort. An illustrative comment from an HR professional highlights this improvement:

> *„One role is to look at productivity and making life easier for the non-value added activities. So there you could argue there is impact but I cannot say we achieved these milestones because we have this tool. But it definitely is a hygiene factor to make things run as smoothly as possible for these sorts of activities" (HR manager 03, Quotation 174)*

This statement points out that while e-HRM systems may not directly influence performance metrics in opinion of this HR manager, they streamline processes like holiday planning and document management, thereby reducing the manual effort required and allowing employees to focus more on core responsibilities. This reduction in manual tasks is a clear indication of the system's ability to enhance operational efficiency by simplifying routine administrative tasks.

E 3 Impact on Employee Performance

Table 61: Positive Influences on Employee Performance

Positive Influences	#	*Quotation*	*Interview*
+ *Speed*	3	I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire. It is faster for us to contact candidates,	HR manager 09, Quotation 317
+ *Transparency*	3	And that's different with E HRM Tool X, everyone has access to it, everyone sees it and everyone always sees a little bit. What is the other person working on right now? And you notice that I get lost in some topic a lot more, which means that things tend to be processed more quickly.	HR manager 27, Quotation 329
+ *Employee Engagement*	3	Sometimes they choose to reveal the feedback, not anonymously, so we can see.. Ohh yeah, Alfonso is not happy about this and that let's talk about it. So that has a direct impact on performance. You wanna do something about improving performance, you need to have a tool that helps you with engagement. Because engagement drives performance is one of the factors.	HR manager 06, Quotation 492
+ *Feedback / Education*	2	They have more of an eye for it and, of course, if I notice, like the one employee I just mentioned, that he perhaps manages to structure himself a little better and thereby improve his work performance, then that's an improvement both for him and for us and, of course, if an employee from purchasing says he wants to develop further, that also helps us because he simply expands his knowledge and perhaps can then take on a different position with more responsibility.	HR manager 22, Quotation 334
+ *Data Security*	1	And in this case, if they have much more manual work. Then first, the compliancy cannot be good. The quality should come and also they can spend less time on the projects, right, so.	HR manager 32, Quotation 256
+ *Time saver*	1	And in this case, if they have much more manual work. Then first, the compliancy cannot be good. The quality should come and also they can spend less time on the projects, right, so.	HR manager 32, Quotation 256
+ *Power To Employees*	1	You have this accountability, because it has your name on it, it has your own name on it and at that moment you know, oh, that's mine, then I have to do it now.	HR manager 27, Quotation 284
+ *Simplicity*	1	I would also argue that if you have clarity around what are the benefits on how things work, that could increase performance, but theoretically you could also do it without the HR system I suppose.	HR manager 09, Quotation 308
+ *Structure*	1	I would say that E HRM Tool X brings together virtually all the relevant stakeholders who need to be involved in a task or topic, creates one hundred per cent transparency and creates structure and prioritisation. Yes.	HR manager 08, Quotation 327

Table 62: Negative Influences on Employee Performance

Negative Influences	#	*Quotation*	*Interview*
- Employee Engagement	4	[...] it could definitely be something that could create frustration and disengagement and in the future lack of performance because definitely the manager is setting up your objectives, they review like that (not accurate), and do not take the time to restitute the discussion correctly.	HR manager 20, Quotation 246
- Time Consuming	1	OK, there are cases where people do multiple projects at once, and they're kind of confused how they should.. Basically, track their time in e HRM Tool X and it takes some time, takes some consideration how you should actually report that in e HRM Tool X so well this just somewhat time consuming if there is a... If the case for tracking the time is not obvious then they have to take time to actually you know think how they should track their task. So this is a case where it could actually somewhat impact the performance negatively, I would say, but this was the only case I can think of.	HR manager 24, Quotation 175

Table 63: e-HRM Practice Categories influencing Employee Performance positively.

e-HRM Practice	#	*Quotation*	*Interview*
Performance Management	9	Sometimes they choose to reveal the feedback, not anonymously, so we can see.. Ohh yeah, Alfonso is not happy about this and that let's talk about it. So that has a direct impact on performance. You wanna do something about improving performance, you need to have a tool that helps you with engagement. Because engagement drives performance is one of the factors.	HR manager 06, Quotation 492
Administrative and Analysis	2	And in this case, if they have much more manual work. Then first, the compliancy cannot be good. The quality should become and also they can spend less time on the projects, right, so.	HR manager 32, Quotation 256
Learning and Development	2	[…] the one employee I just mentioned [he used the e-learning tool], that he perhaps manages to structure himself a little better and thereby improve his work performance, then that's an improvement both for him and for us and, of course][…]	HR manager 22, Quotation 334
Talent Acquisition and Management	1	I have seen managers be able... so because it streamlines our hiring efforts a lot more, there's a lot of automated tasks. I could see there that it has had an increase in performance purely because it is easier for the manager to hire. It is faster for us to contact candidates,[...].	HR manager 09, Quotation 317
Employee Relations and Safety	1	But from my feeling, also from the feedback we get, it [the Employee relations tool] does have an influence, yes. Especially because we are remote or the workload is very high. And especially people who are really top performers with us, but can feel burnt out relatively quickly. There's always a risk and even when you're remote and because we often have a lot of pressure, it's super important that we have this offer and that they can use it to take care of themselves a bit and get support.	HR manager 08, Quotation 122

Table 64: e-HRM Practice Categories influencing Employee Performance negatively.

	#	*Quotation*	*Interview*
Performance Management	4	Some are demotivated by the fact that they have to track everything.	HR manager 25, Quotation 313

Appendix F Design of e-HRM Tool

F 1 Framework for e-HRM Tool Development

F 1.1 Step I: Values

The following strategies can be chosen in the first step of the framework to mitigate challenges.

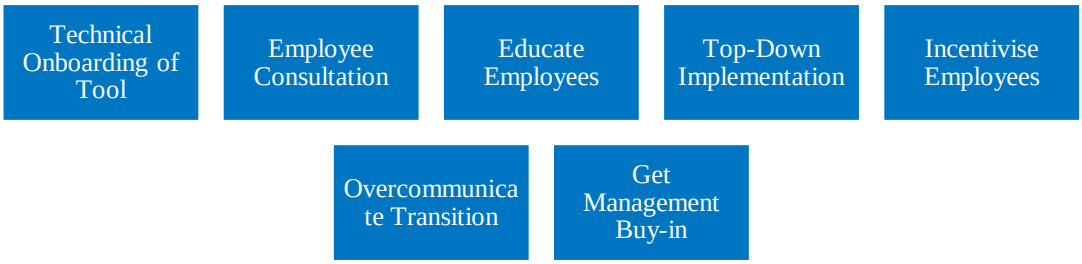

Figure 30: Mitigation Strategies for Challenges in Step I

Technical Onboarding
Design an onboarding process for HR teams that includes enough support and initial data setup. This ensures HR can effectively manage and later use the tool, aligning with their value of time-saving by simplifying the administrative burden from the start.

Employee Consultation
Enable HR to lead focus groups or, alternatively, your startup should conduct these sessions to gather employee feedback and requirements. This ensures the tool aligns with employee engagement and simplicity, crucial for widespread adoption and effective use.

Educate Employees
Provide concise, informative videos and straightforward onboarding for all users. This educates employees efficiently, supporting their engagement and simplifying their interaction with the new system.

Top-Down Implementation
Initiate implementation with upper management first to collect early feedback. This aligns with the values of transparency and informed decision-making, ensuring the tool meets strategic needs before company-wide rollout.

Incentivize Employees
Introduce new benefits alongside the tool, publicize these incentives on the platform, and incorporate gamification. This boosts employee engagement by making the adoption process interactive and rewarding.

Overcommunicate Transition
Offer clear guidelines for presentations during all-hands meetings to ensure transparency and thorough understanding across the organization.

Get Management Buy-in
Demonstrate the tool's ROI and urgency to secure executive support. This not only garners the necessary resources for implementation but also aligns the tool with the company's strategic objectives.

F 1.2 Step II: Impact

The following strategies can be chosen in the second step of the framework to mitigate challenges.

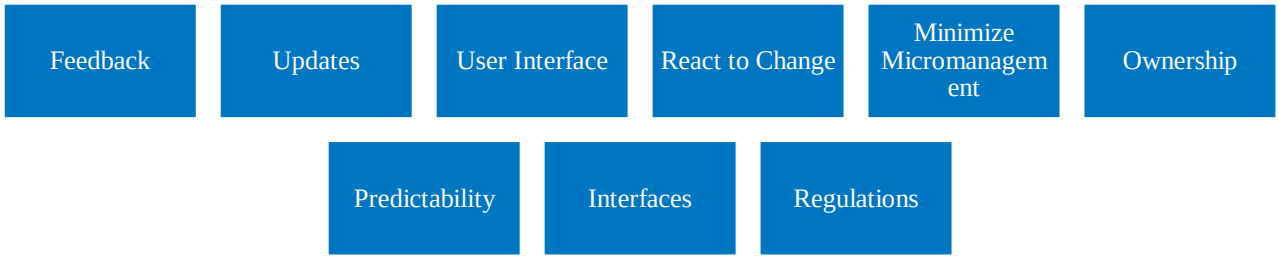

Figure 31: Mitigation Strategies for Challenges in Step II

Feedback

Implement mechanisms to solicit continuous feedback from all users (employees, HR, and line managers). This allows for ongoing refinement and ensures the tool remains responsive to user needs and organizational changes.

User Interface (UI)

Design an intuitive UI that simplifies processes for all users. Clear, streamlined interfaces reduce training time and facilitate quicker adoption, enhancing user experience across the board.

Updates

Commit to delivering regular updates to improve functionality and address any emerging issues. Equally important is the communication about these updates, ensuring all users are aware of changes and enhancements.

React to Change

Schedule quarterly meetings to assess the organization's evolving needs and the tool's alignment with these changes. Offer HR-process consultations to ensure the e-HRM system integrates seamlessly with existing workflows and supports organizational growth.

Regulations

Ensure the system complies with local laws and respects cultural norms. This is crucial for maintaining legal compliance and fostering a respectful workplace environment.

Interfaces

Regularly check and update the interfaces with third-party software to ensure smooth data flow and system interoperability. This prevents disruptions and maintains the integrity of the e-HRM system.

Minimize Micromanagement

Educate users on the benefits of tracking and documentation provided by the e-HRM system to alleviate concerns over micromanagement. Clear communication about the purpose and advantages of these features can enhance acceptance.

Ownership

Clearly define who owns the tool or specific features within the organization. This ensures responsibility for its maintenance and effectiveness, promoting sustained engagement and proper management.

Predictability

Establish and maintain a reliable and stable system. Consistency in system performance and functionality builds trust among users, crucial for long-term adoption and satisfaction.

F 1.3 Step III: e-HRM Practices and Features

Specific features and functionalities to enhance employee performance in the third step include:

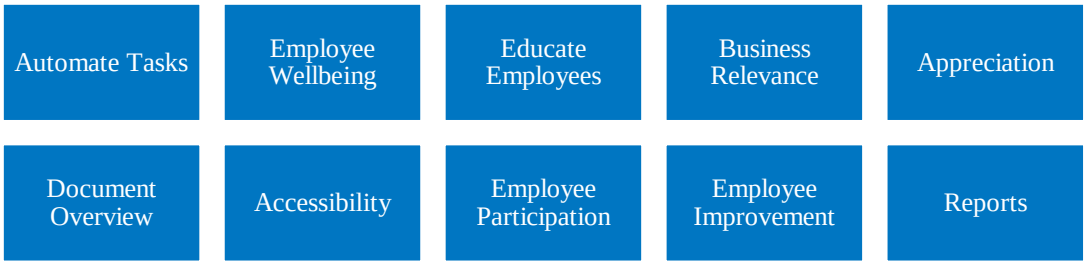

Figure 32: Beneficial Features of e-HRM tools to improve Performance

Automate Tasks

Automation of approval processes and employee requests can be integrated into Administrative and Analysis Tools to streamline HR operations, reducing time and effort in managing routine tasks.

Appreciation

Enable public „claps" or „appreciations" for employee visibility, ideally suited for Performance Management Tools to enhance engagement and provide positive reinforcement directly linked to performance metrics.

Business Relevance

Utilizing data in business-relevant contexts, such as customer/supplier integration and strategic decision support, can be incorporated into all tools, when they also have interfaces accessible by third parties.

Employee Wellbeing

Increasing wellbeing through benefits focused on physical or mental health should be part of Performance Management Tools, where personal growth and health are directly correlated with performance outcomes.

Educate Employees

A support chatbot or an intuitive database for procedural queries can enhance Administrative Tools by providing continuous support, mitigating challenges while saving time for HR.

Document Overview

Ensuring a clear document structure and establishing a single source of truth are critical for Administrative and Analysis Tools, improving data integrity and accessibility, which are essential for effective management and compliance.

Accessibility

Restricting access to confidential information and setting clear, flexible roles for users can be integrated into all three tools, ensuring security and appropriate access across different levels of the organization.

Reports

Providing data overviews for managers fits well within Administrative and Analysis Tools, but also for employee insights in Performance Management tools, supporting management's need for data-driven decision-making and strategic oversight.

Employee Improvement

Features that measure and support employee performance improvement should be part of Performance Management Tools, facilitating direct feedback and promoting personal and professional growth.

Employee Participation

Implementing regular surveys and feedback requests and acting on improvement suggestions are best suited for Performance Management Tools, directly engaging employees in their development and ensuring their voices are heard in the organizational growth context.

F 1.4 Data Behind the e-HRM Framework: e-HRM Categories

In order to be able to follow the development of the framework, the following pages show the data used for the development. This chapter outlines the influences of different e-HRM practice groups.

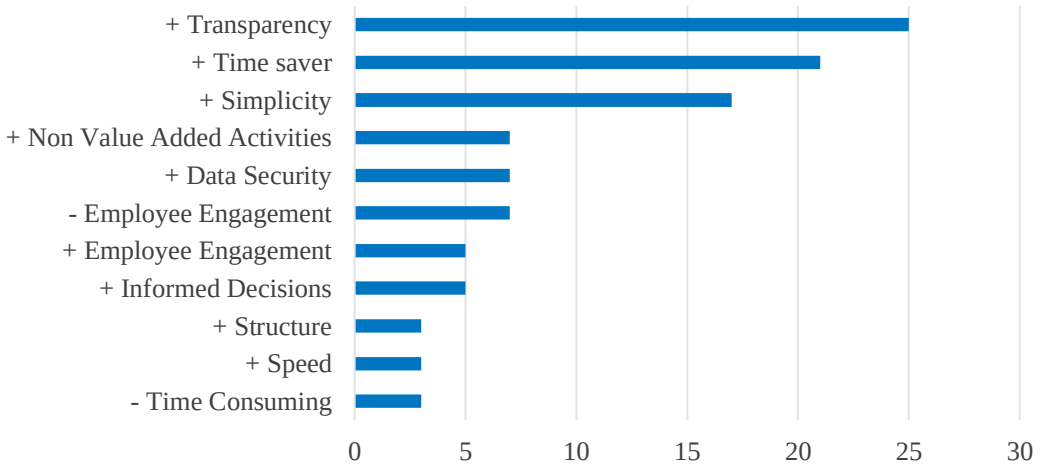

Figure 33: Influences per e-HRM practices: Admin, mentioned at least 3 Times

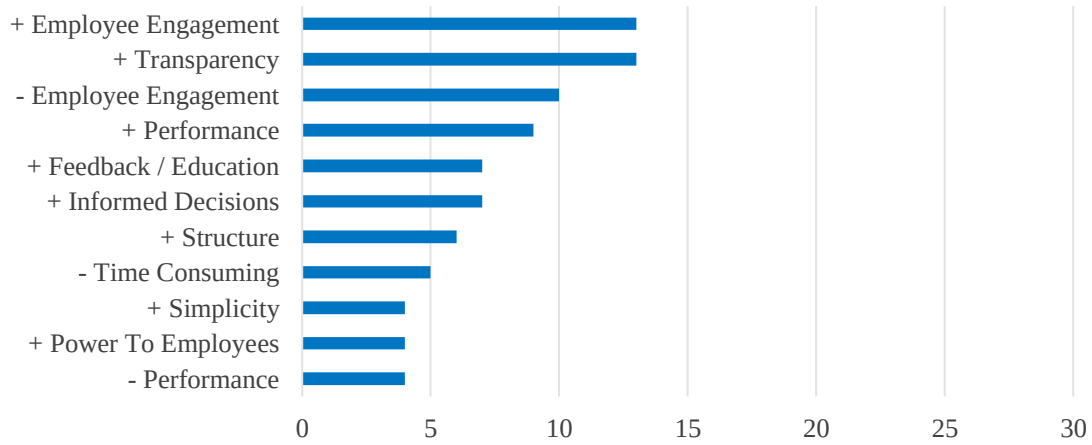

Figure 34: Influences per e-HRM practices: Performance Management, mentioned at least 3 Times

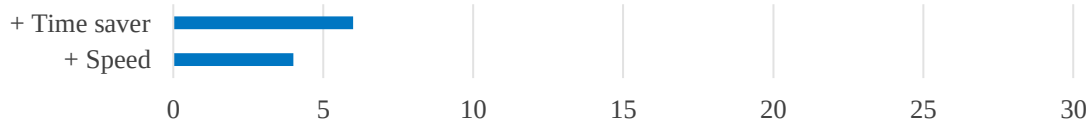

Figure 35: Influences per e-HRM practices: Recruiting, mentioned at least 3 Times

F 1.5 Data Behind the e-HRM Framework: e-HRM Impact Factors on Performance

In order to be able to follow the development of the framework, the following pages show the data used for the development. This chapter outlines the influences on specifically employee performance.

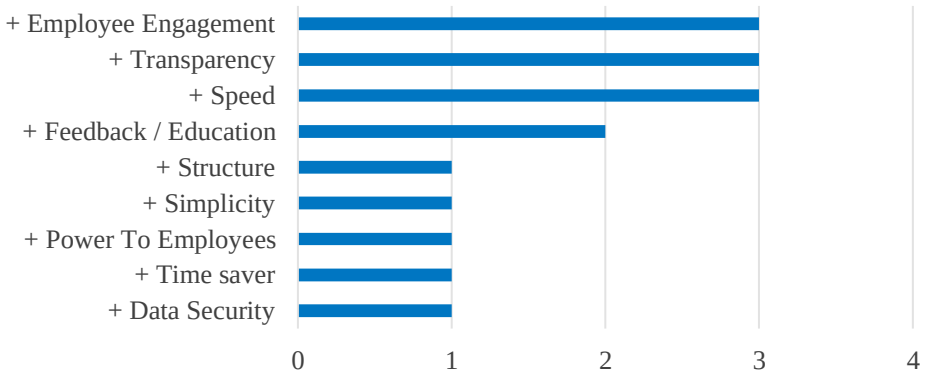

Figure 36: Positive Influences on Performance

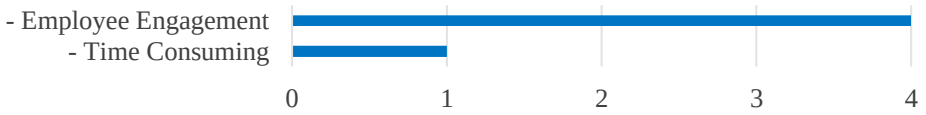

Figure 37: Negative Influences on Performance

F 1.6 Data behind the e-HRM Framework: e-HRM Impact Factors on Stakeholders

Employees

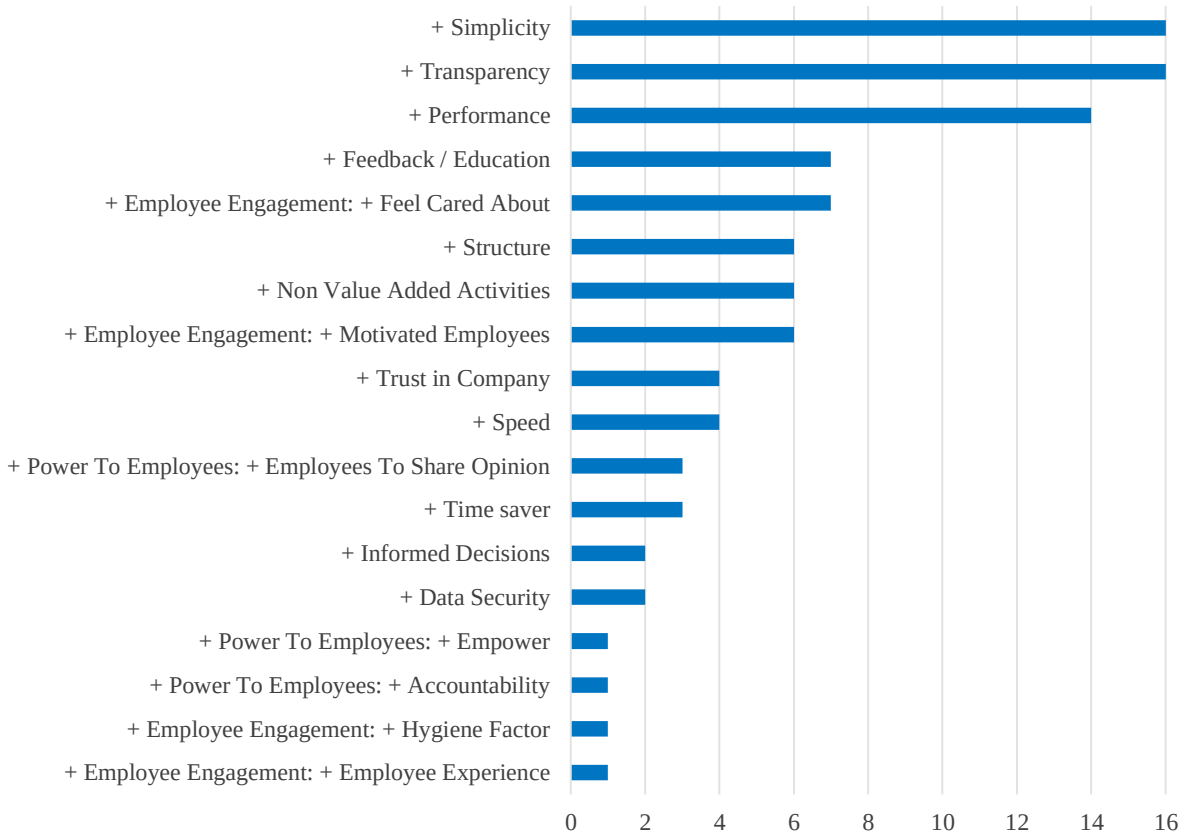

Figure 38: Positive Influences on Employees

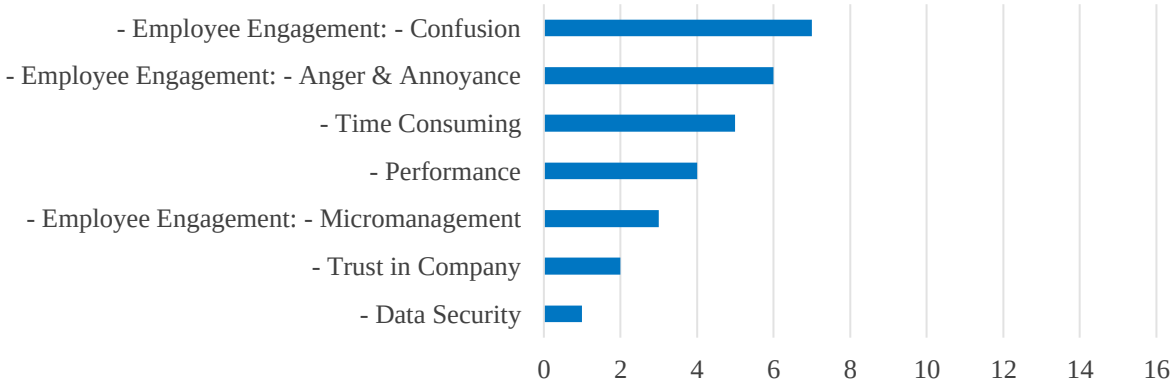

Figure 39: Negative Influences on Employees

HR manager

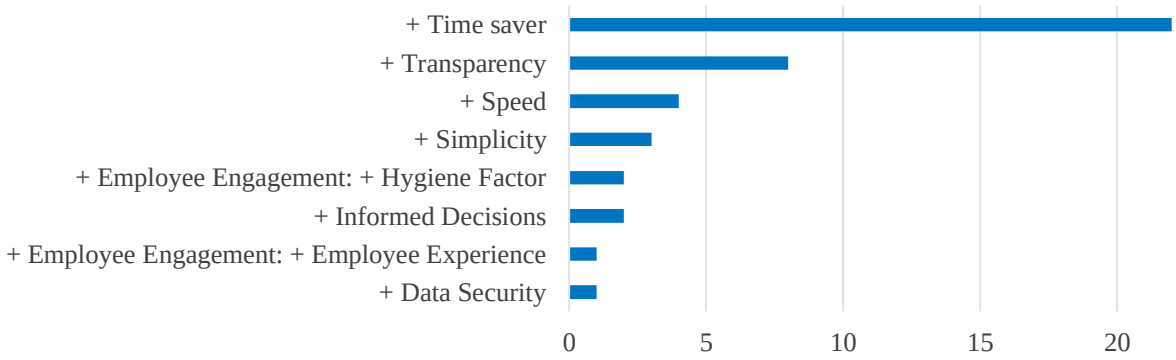

Figure 40: Positive Influences on HR

Figure 41: Positive Influences on HR

Line-Manager

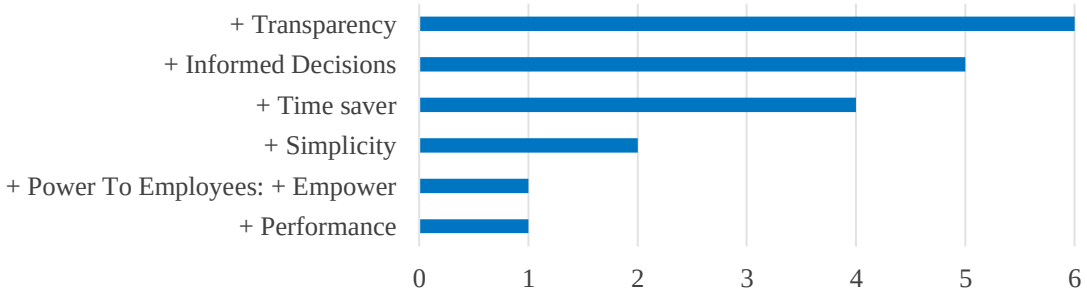

Figure 42: Positive Influences on Line Manager

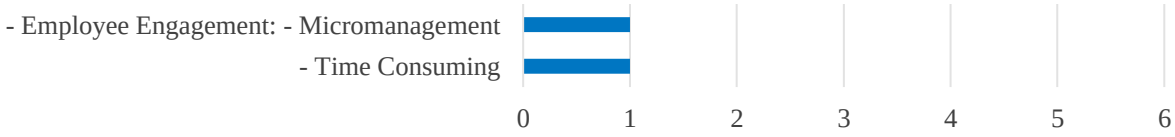

Figure 43: Negative Influences on Line Manager

Company overall

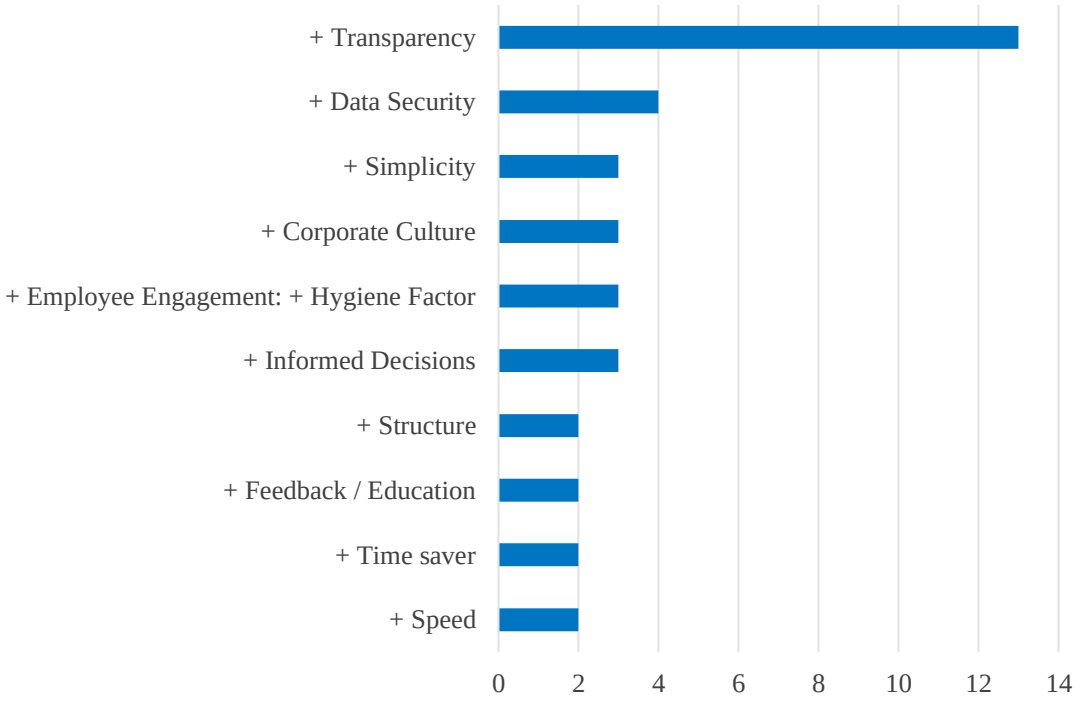

Figure 44: Positive Influences on the Company

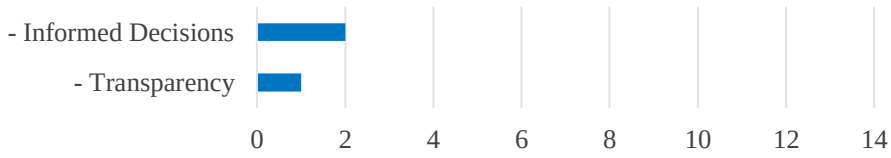

Figure 45: Negative Influences on the Company

F 2 Framework for HR Managers

The following framework is based on the same results like the main framework in chapter 4.4, but is targeted to HR manager in technology startups.

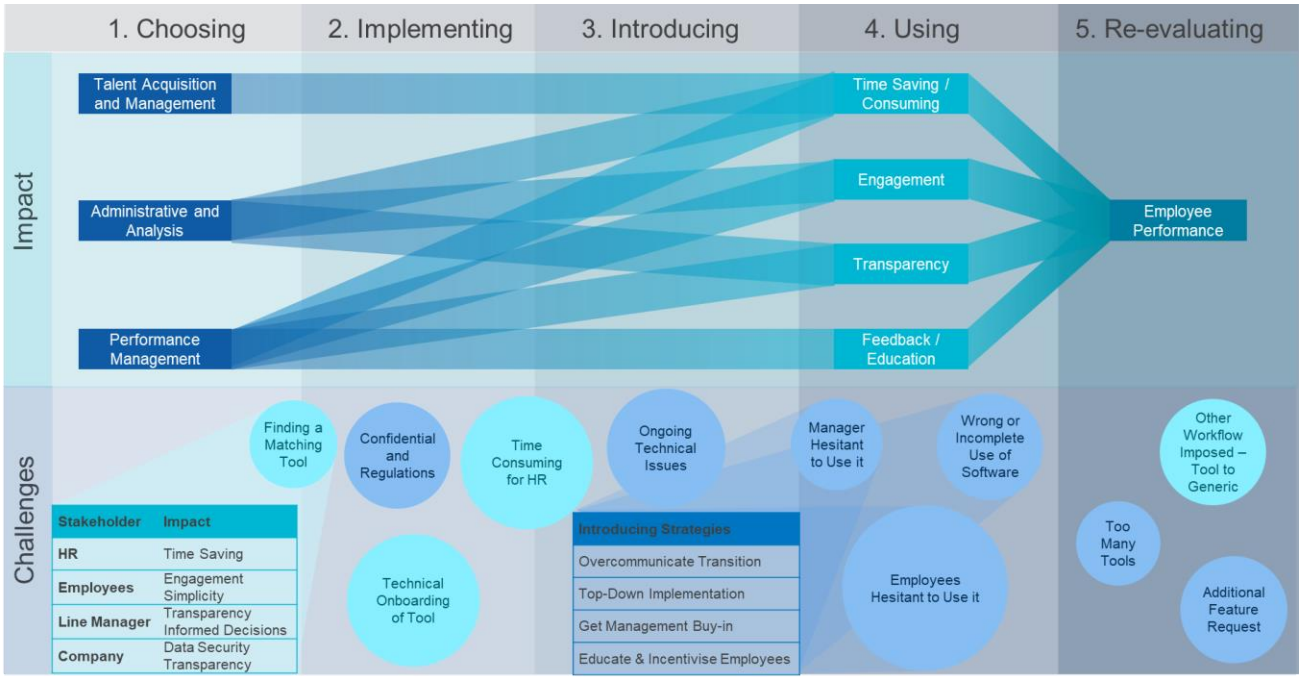

Figure 46: Alternative e-HRM Framework for HR Manager

F 3 Outlook

This chapter describes the four suggested future research streams in more detail.

Designing Strategic e-HRM Tools for Technology Startups (Mixed Methods)

> *"How can e-HRM tools be designed to align with and enhance the strategic direction of technology startups?"*

This research should employ a mixed methods approach, combining qualitative and quantitative data collection. Initially, qualitative interviews with HR managers in technology startups will be conducted to understand their strategic goals and how e-HRM tools currently align with these goals. This will be followed by a quantitative survey to gather broader data on e-HRM alignment across a larger sample of startups. Finally, a comparative analysis will be conducted to identify gaps and propose design improvements for e-HRM tools.

Translating HRM Research into Practical Applications for Startups (Action Research)

> *How can research findings on the impact of HRM be translated into practical applications to improve e-HRM tool adoption and startup success?*

Action research involves a participatory approach (Avison et al., 1999) where researchers work closely with HR managers in technology startups to implement and test new e-HRM tools based on existing research findings. This iterative process includes the identification of key decision-making factors, the development of practical tools and strategies, and continuous feedback loops to refine and adapt the tools in real-time.

Assessing the Impact of Eliminating Power Structures on e-HRM Challenges (Field Experiment)

> *Does the elimination of traditional power structures between buyer and supplier reduce technological challenges of e-HRM systems in technology startups?*

This research should conduct field experiments in technology startups where traditional power structures are changed. For example, using subcontractors as procurement providers for e-HRM systems will be tested against the traditional direct procurement model. The experiments will measure the impact on technological challenges faced during e-HRM implementation and assess whether the altered power dynamics mitigate these challenges.

Strategic Use of e-HRM in Unstable Environments (Case Study)

> *How does an unstable environment influence the strategic use and performance impact of e-HRM in both technology startups and large corporations?*

This research will use a case study approach to investigate large corporations operating in unstable environments, comparing their use of e-HRM with technology startups. The study will involve analysis of company documents, interviews with HR managers, and observation of e-HRM practices. By identifying common patterns and differences, the research will explore how instability affects the strategic use of e-HRM.