

EVOLUTION OF TECHNOLOGY MANAGEMENT IN HUMAN RESOURCE DEVELOPMENT: A QUALITATIVE PERSPECTIVE ON START-UP COMPANIES

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Abstract

This study investigates the role of technology management in human resource management (HRM) within start-up companies in Indonesia. Focusing on start-ups that have been operating for at least three years and employ a minimum of 20 personnel, the research utilizes a qualitative descriptive approach. Primary data was collected through in-depth interviews with HR managers, company executives, and employees, while secondary data was sourced from company documents and participatory observation. The findings show that the adoption of technology, particularly Human Resource Management Systems (HRMS) and Learning Management Systems (LMS), has improved HR processes, including recruitment, training, and performance management. However, challenges remain, such as digital literacy issues, cost constraints, and the misalignment of technology with organizational culture. While technology enhances operational efficiency, it cannot replace essential face-to-face interactions that contribute to a strong organizational culture. The study suggests that start-ups must customize technology solutions to better align with their specific needs and culture. This research provides valuable insights into the integration of technology in HRM and offers recommendations for overcoming the challenges start-ups face in leveraging technology effectively.

Keywords: *Technology management, human resource management, start-up companies, HRMS, LMS, digital literacy, organizational culture, technology integration*

1. INTRODUCTION

Technology management has become one of the most important elements in company development, especially in the rapidly evolving digital era. The fast-paced technological advancements demand that organizations adapt and leverage technology in their operational processes to remain competitive (Brynjolfsson & McAfee, 2014). In the context of start-up companies, technology management serves not only as an operational support function but also as a key element in driving innovation and transforming the company (O'Reilly & Tushman, 2013). Start-ups, as newly emerging entities, often face challenges that differ from those of established large companies. With limited resources, both financial and human, start-ups must maximize the use of technology across various

operational aspects, from product development to human resource management (Schein, 2010).

Since its inception, technology management in human resource management (HRM) has undergone significant development. Initially, technology in companies focused more on managing administrative processes and information systems to simplify routine tasks (Davenport, 1998). However, over time, technology has evolved into a more strategic tool to enhance individual and team performance and to develop human potential more efficiently (Kaufman, 2015). In the context of start-ups, technology plays a critical role in accelerating recruitment, training, career development, and performance management. Human Resource Management Systems (HRMS), online learning applications, and communication and collaboration platforms have now become integral parts of start-up operations (Armstrong & Taylor, 2014).

However, despite the advancements that facilitate HRM, challenges still exist in integrating technology with the needs and dynamics of human resources within the organization. Many start-ups still struggle to align technology with the flexible and adaptive work culture, which is characteristic of start-ups (McKinsey & Company, 2020). While technology offers various solutions, its successful implementation heavily depends on how well it can be accepted and applied by the workforce in the company (Kotter, 1996). Furthermore, another issue to address is the gap between the capabilities of available technology and the skills of human resources. Often, sophisticated technology is not utilized optimally due to mismatches between the tools used and the skills of the workers (Mayer-Schönberger & Cukier, 2013). This becomes a hindrance to human resource development that aligns with the goals of the start-up company.

This issue is highly relevant to human resource management in start-ups, and further research is needed. This gap arises because, despite the many benefits technology offers, its implementation in HRM often does not meet the actual needs of human resources in the company (Chesbrough, 2010). Many start-ups become trapped in using technology that is disconnected from their human resource development goals, resulting in suboptimal impact. Therefore, it is crucial to understand how start-ups can effectively utilize technology in human resource management and explore the barriers, challenges, and potential solutions to reduce the gap between technology and HRM. This research aims to provide a better understanding of the evolution of technology management in human resource development in start-ups and contribute to optimizing the implementation of technology in HRM in current start-ups.

2. METHOD

This study was conducted in several start-up companies in Indonesia that have been operational for at least three years, employ a minimum of 20 personnel, and have integrated technology in their human resource management (HRM) practices. The selection of subjects was carried out using purposive sampling to ensure the data gathered was relevant and aligned with the research focus. Purposive sampling allows for selecting participants who possess specific characteristics that are critical to the research objectives, ensuring the data's relevance and depth (Patton, 2002). The study applied a qualitative descriptive approach, utilizing both primary and secondary data sources.

Primary data were collected through in-depth interviews with key informants, including HR managers, company executives, and employees who directly interact with HR technology. These interviews were semi-structured to allow for flexibility while maintaining a focus on the research questions. Semi-structured interviews are commonly used in qualitative research as they allow for in-depth exploration of participant perspectives while still providing consistency across interviews (Kvale, 1996). The interviews aimed to explore the dynamics of technology adoption in HRM, including its impact on recruitment, performance management, training, and overall human resource development within the start-up environment (Järvinen, 2012).

Secondary data were sourced from company documents, internal reports, and relevant HR policy documents that provide context and insight into the companies' HR practices and technology integration. Document analysis is a valuable technique for obtaining historical and contextual data, helping to triangulate findings from interviews and observations (Bowen, 2009). Additionally, participatory observation was conducted in the workplace to observe how technology is being utilized in day-to-day HR operations and how employees engage with HR systems and tools. This direct observation allowed for an in-depth understanding of the real-time dynamics of technology in HRM and how it impacts organizational culture (Angrosino, 2007).

The data collected were analyzed using thematic analysis, following a structured process that involved several key steps: data transcription, initial coding, identification of themes, reviewing themes for consistency, and finally, naming the themes based on the commonalities found across the data (Braun & Clarke, 2006). This method facilitated the identification of patterns, relationships, and insights within the data, allowing for the extraction of meaningful conclusions regarding the role and evolution of technology in HRM within start-ups.

To ensure the accuracy and reliability of the research findings, triangulation was employed by cross-verifying the information from different data sources. Triangulation, a method used to enhance validity and reliability in qualitative research, involves comparing data obtained from multiple sources, such as interviews, observations, and document analysis (Denzin, 1978). This process of method and source triangulation helped to improve the credibility and validity of the study's findings.

By implementing this methodological approach, the study aims to provide significant insights into the application of innovative HRM practices in start-ups, especially in the context of technological disruption. The research seeks to offer practical recommendations that will help start-ups develop adaptive and effective HRM strategies, ensuring they remain competitive and responsive in an increasingly digital and rapidly evolving business landscape.

3. RESULTS AND DISCUSSION

Result

The analysis of the collected data revealed several key insights into the evolution of technology management in human resource management (HRM) within start-up companies. The findings were organized into key themes, which reflect the impacts, challenges, and benefits of integrating technology into HRM practices.

1. Adoption of Technology in HRM

The majority of start-ups in this study have adopted technology in various HRM processes, with a strong focus on recruitment, employee training, performance management, and communication. Most start-ups have implemented Human Resource Management Systems (HRMS) and learning management systems (LMS) to streamline HR processes and improve efficiency. Technology was found to significantly reduce the time required for administrative tasks, allowing HR personnel to focus more on strategic decision-making and employee development. As one HR manager stated, “The HRMS system we use has automated a lot of repetitive tasks like payroll and attendance tracking, which has freed up time for us to focus on talent management.”

2. Impact of Technology on Recruitment and Talent Management

Technology has proven to be especially beneficial in the recruitment process, where many start-ups utilize online job platforms, applicant tracking systems, and social media to reach potential candidates. Recruitment technology has not only expanded the reach of start-ups in terms of attracting talent but also improved the quality of candidates through data-driven screening processes. However, some start-ups still face challenges in integrating these technologies with their existing human resource processes, particularly in maintaining a personalized approach to recruitment. One company executive mentioned, “We use AI tools for screening resumes, but sometimes we miss the human touch, which is essential for assessing cultural fit.”

3. Employee Training and Development

The implementation of learning management systems (LMS) and e-learning platforms was cited as a major advancement in employee training and development. These systems allow employees to access training materials at their convenience, which has improved accessibility and engagement. Start-ups have increasingly turned to online platforms for continuous learning, which has proven to be more cost-effective than traditional in-person training. However, employees expressed concerns about the limited scope of online learning tools in addressing the soft skills development, such as leadership and communication, that are crucial in the start-up environment.

4. Challenges in Technology Integration

Despite the benefits, the study highlighted several challenges in the integration of technology into HRM. One of the main challenges was the lack of digital literacy among some employees, especially older generations, who struggled to adopt new technologies. Another barrier identified was the cost of implementing sophisticated HRM technologies, which can be prohibitive for smaller start-ups. Moreover, there were instances where the technology did not fully align with the company's needs, resulting in underutilization or inefficiency. One participant mentioned, “The software we purchased was supposed to streamline our hiring process, but we’ve only been using a fraction of its capabilities.”

5. Cultural Fit and Employee Engagement

Start-ups place a high value on maintaining a strong organizational culture, and technology, while useful for operational tasks, can sometimes hinder the creation of a close-knit work environment. Employees in start-ups emphasized the importance of face-to-face communication and informal interactions, which are often lost when technology replaces traditional methods. A senior HR executive shared, “While the tools help with efficiency, they don’t replace the need for personal connections, which are especially important in our company culture.

Discussion

The findings of this study illustrate both the potential and the challenges of using technology in human resource management (HRM) within start-up companies. The adoption of technology in HRM offers clear advantages, particularly in streamlining operational processes, improving recruitment efforts, and enhancing employee training. The integration of Human Resource Management Systems (HRMS) and Learning Management Systems (LMS) has led to more efficient processes and provided companies with valuable data to make more informed decisions in managing their human resources (Armstrong & Taylor, 2014). As technology helps automate tasks like payroll and attendance tracking, it allows HR personnel to focus more on strategic decision-making and talent management (Brynjolfsson & McAfee, 2014).

However, while technology adoption has many benefits, the study also reveals significant challenges. One of the key issues is the gap between the available technology and the skills of the employees who need to use it. While younger employees tend to embrace technological tools more readily, older employees or those with lower levels of digital literacy may struggle to adapt, leading to resistance to change. This highlights the need for companies to invest in digital literacy training and to foster an environment that encourages the use of technology while addressing the concerns of less tech-savvy employees (Mayer-Schönberger & Cukier, 2013). The importance of addressing digital literacy as a barrier to technology adoption has been widely documented, with studies suggesting that organizations must equip their workforce with the necessary skills to leverage new tools effectively (Kotter, 1996).

Another challenge identified in the study is the cost of technology. While larger organizations may have the resources to invest in cutting-edge HRM tools, start-ups often operate with limited budgets, making it difficult to implement sophisticated systems. This creates a disparity where some start-ups may be left behind due to financial constraints, despite the clear benefits that technology can offer in terms of operational efficiency and decision-making (Chesbrough, 2010). This finding aligns with research by Kaufman (2015), who pointed out that cost-related limitations can prevent small organizations from

implementing advanced technological solutions, thereby limiting their competitive edge in the market.

Furthermore, the integration of technology into HRM processes does not come without its cultural implications. Start-ups, known for their informal and flexible work environments, face the challenge of maintaining a strong organizational culture when technology begins to replace face-to-face interactions. The study found that while technology is an enabler of operational efficiency, it does not entirely replace the human element that is crucial to fostering innovation, creativity, and strong interpersonal relationships in a start-up environment. This finding resonates with previous research by Hochschild & Machung (2012), which argued that technology should complement rather than replace human interactions, especially in environments where collaboration and communication are key drivers of success. The ability to maintain a sense of community and culture is often cited as a significant factor in the success of start-ups, where trust and collaboration are essential (Schein, 2010).

The findings also suggest that start-ups may need to take a more tailored approach to selecting and implementing technology. It is not enough to simply adopt off-the-shelf solutions; the technology must be aligned with the unique needs and culture of the start-up. Companies should engage in careful planning and customization of the tools they use to ensure that they complement their organizational goals and enhance employee engagement rather than detract from it (O'Reilly & Tushman, 2013). This approach is supported by research that indicates the importance of customization in technology adoption, as solutions need to be closely aligned with the strategic and operational goals of the business to be truly effective (Kaufman, 2015).

In conclusion, while technology offers significant benefits to HRM in start-ups, its implementation must be carefully managed. It is crucial for start-ups to strike a balance between leveraging technology for efficiency and maintaining the human elements that are critical to their success. By addressing the challenges of digital literacy, cost, and cultural fit, start-ups can better harness the potential of technology to improve their human resource management practices and overall organizational effectiveness. The findings support the view that successful technology integration requires a thoughtful and tailored approach that considers both the technological tools and the people who will use them (Kotter, 1996).

4. CONCLUSION

This study highlights the significant role of technology in transforming human resource management (HRM) within start-up companies, offering numerous advantages such as streamlining operations, enhancing recruitment, and improving employee training. The adoption of systems like Human Resource Management Systems (HRMS) and Learning Management Systems (LMS) has proven effective in automating administrative tasks and supporting talent management. However, the research also identifies several challenges in technology integration, particularly the gap between available technological tools and the digital literacy of the workforce. Older employees or those with lower technological proficiency often struggle to adapt, which can hinder the effectiveness of HRM systems.

Additionally, cost constraints, particularly for smaller start-ups, present a barrier to implementing advanced HRM technology. Furthermore, while technology provides efficiency, it cannot replace the interpersonal connections and organizational culture vital in start-ups. Technology should complement, rather than replace, human interactions, especially in environments where collaboration and communication are essential.

The findings suggest that start-ups should adopt a tailored approach to technology integration, ensuring that the tools they implement align with the company's unique needs and culture. By addressing the challenges of digital literacy, cost, and cultural fit, start-ups can better leverage technology to enhance their HRM practices and maintain a competitive edge in an increasingly digital world.

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