

Article

The Role of Human Resources Practices in Open innovation

Hassan Obaidi

University of Middlesex, United Arab Emirates, Dubai, obaidi1973@gmail.com

Abstract: This study proposes a structure for companies to use when implementing human resource practices in open innovation. Despite the fact that open innovation has received a lot of attention in the innovation management field as companies open their doors to information exchange in an effort to spur creative thinking, there are very few empirical articles that connect this trend to the human resource management literature. Our findings are the result of an extensive qualitative investigation into Julphar Gulf Pharmaceutical Industries Manufacturers in the United Arab Emirates (UAE) and its open innovation program. Internal, external, and combined are the three primary pillars of human resource management. We also demonstrate how the evolution of the open innovation initiative is linked to the state of the art in HRM and open innovation literature. The framework identifies HRM practices for both internal and external participants in the open innovation effort. Much of this HRM is done off the books, in a setting separate from the host company. By providing actual evidence of how firms use HRM to manage open innovation projects, our research adds to the scant and mostly theoretical literature linking open innovation and HRM.

Keywords: *open innovation; HRM; sustainability, UAE; inbound HR; outbound HR; technology.*

1. Introduction

Effective human resource management is critical to an organization's ability to develop new products, services, and working methods (de Zubielqui et al., 2019). HRM and

innovation have been linked in both theoretical and empirical research (e.g., Podmetina et al., 2013; Vanhaverbeke et al., 2014). (e.g., Carayannis & Meissner, 2017). Despite these advancements, there are still a number of unexplored areas that would benefit from theoretical investigation (Podmetina et al., 2018). When attempting to combine HRM with the rapidly developing discipline of innovation management, the innovation process increasingly tends to cross organizational boundaries, posing a unique problem. To describe these phenomena, Chesbrough and Brunswicker (2013) coined the term "open innovation," which proposes that businesses can and should knowingly allow knowledge to flow freely in and out of their systems in order to spur innovation and create new revenue streams. According to Tesla co-founder Martin Eberhard, "most of the brightest people work for someone else." The approach of open innovation in fuzzing out previously sharp lines of demarcation has obvious implications for how tasks are divided and how internal and external actors collaborate (Shipton et al., 2017). Furthermore, when compared to closed innovation, open innovation may necessitate a distinct set of organizational capabilities (Papa et al., 2018) and a distinct business culture (West et al., 2014). Human resource management practices have been proposed as a tool for addressing and overcoming cognitive and organizational constraints encountered during the open innovation journey (Bogers et al., 2018). However, the inventions studied in empirical research on HRM and innovation were those created within a single organization, with HRM activities primarily directed at the firm's own personnel. According to Burcharth et al. (2017), the role of HRM in promoting open innovation has been largely ignored due to the implicit belief that innovation processes typically occur within the confines of a single organization. Despite the fact that open innovation is becoming more popular as a method for developing new products and services (Yun et al., 2020), there has been little research into the relationship between open innovation and HRM. Because not all engaged human resources work for a single organization, implementing open innovation is likely to have significant implications

for traditional HRM in terms of evaluating, attracting, developing, and rewarding employees throughout the innovation process. The open innovation viewpoint, for example, contradicts conventional wisdom about human resource management, which sees its primary role as aligning the firm's human resources with its strategic, usually financial, objectives (Eltweri, Faccia, & Khassawneh, 2021; Huggins & Thompson, 2017). Overall, more research into open innovation and human resource management is required to better understand how to assist and enable both internal and external human resources in an increasingly common but difficult method of organizing innovation work (de Arajo Burcharth et al., 2014). This research aims to fill a gap in the literature by investigating the HRM activities that firms engage in to manage human resources in open innovation initiatives. The purpose of this paper is to conduct an exploratory case study of Julphar and its use of the open innovation initiative to bridge the gap between human resource management and open innovation. The goal of this open innovation initiative is to facilitate collaboration between large incumbents and more agile, start-up life science companies. Our research advances the state of the art in HRM and innovation theory in numerous ways. To begin, the purpose of this research is to respond to the growing interest in the under-researched but potentially fruitful intersection of HRM and open innovation (e.g. Singh et al., 2021; Khassawneh, 201). Following a thorough empirical investigation of open innovation, we present a novel framework of open innovation HRM practices comprised of three categories of HRM activities, thus contributing to the limited and largely conceptual research on how HRM may enable open innovation. Second, we emphasize the importance of emphasizing outbound HRM practices aimed at external HR, as well as the concomitant task of promoting contacts between internal and external HR, in addition to inbound HRM practices aimed at the firm's own personnel. In doing so, we contribute to the growing body of research on how HRM enables businesses to interact with outside parties and thus acquire new types of information (Khassawneh & Abaker, 2022; Bigliardi et al.,

2020). Third, we consider possible links between the three HRM domains or sets of tasks (Wang & Xu, 2018). In our framework, we focus on four potential links between HRM practices and argue that they strengthen one another. As a fourth step, we examine an open innovation project that is not governed by a strict hierarchy or formal contracts. Like HRM practices, such as strategic alliances or joint ventures, require governance mechanisms distinct from more conventional types of collaboration, such as strategic alliances or joint ventures (Naqshbandi et al., 2018), and thus represents an underexplored but potentially fruitful future topic of HRM study (Sivam et al., 2019). The literature on strategic human resource management frequently emphasizes formality, protocols, and efficiency over exploration and adaptability; this discovery complements and contradicts these themes (Hameed et al., 2021). Finally, based on the study's findings, we propose management implications and areas for future research.

2. Overview of the Literature

2.1 The evolving field of open innovation

Open innovation has emerged as a key topic in the study of innovation management over the last several decades (Prasetyo et al.; 2021). According to the Open Innovation Alliance, open innovation is a distributed innovation process based on meticulous knowledge flows across organizational boundaries, employing both financial and non-financial processes in accordance with each organization's economic model (Khassawneh & Mohammad, 2022a; Wynarczy et al, 2013). This definition emphasizes not only the financial benefits of open innovation work, but also the non-monetary benefits, such as the ability to openly share and source knowledge with and from other actors (Alawamleh et al., 2018). The definition also emphasizes a process-oriented approach to open innovation, distinguishing between inbound, outbound, and connected processes rather than focusing on individual transactions (Bertello et al., 2022; Khassawneh & Mohammad, 2022b). When open innovation is viewed as a cross-organizational collaborative process, however, the lines between internal and external

actors tend to blur, resulting in new forms of governance (Naqshbandi & Kaur, 2013). Implementing open innovation presents two interconnected challenges: the fact that it is directed toward external players and the nature of the innovation itself. First, these parties may approach open innovation with different goals and methods than the dominant corporation (Cavallo et al., 2022). Second, unlike the incumbent firm, these actors do not report to a higher authority; as a result, the incumbent must ensure that the goals of the open innovation initiative are compatible with the demands of the external actors. As a result, it is critical for all parties involved to iterate and negotiate both the extent to which these outside behaviors are encouraged and the extent to which they are restricted on a regular basis. The open innovation process, for example, may challenge incumbent enterprises' pre-existing cultures, procedures, and business models, revealing paradoxical contradictions between, say, collective value creation and private value capture (Davoudi et al., 2018). Despite the fact that the field of open innovation has grown significantly in recent years, there are still many unanswered questions. Because most open innovation research has focused on the organizational level of analysis, knowledge of how open innovation is handled in practice is limited (Lazzarotti, et al., 2013). One explanation for this is that there are so many different types of open innovation, each with its own set of goals and objectives (Huggins & Thompson, 2017). Because the designs and goals of open innovation projects vary from one to the next, there is no "one-size-fits-all" open innovation model (Khassawneh, Mohammad, & Ben-Abdallah, 2022; Bogers et al., 2018). We focus on an open innovation initiative in the life sciences in which the central company (Julphar) has established a separate organizing unit to facilitate interactions with small entrepreneurial firms and the surrounding regional life science ecosystem for the purposes of this study. This approach to open innovation is similar to what have been variously referred to as "company incubators," "corporate accelerators," and "corporate innovation centers" (Papa et al., 2018). Despite the fact that open innovation has been

proposed as a potential innovation paradigm for the life science business, few empirical studies have been conducted to investigate how it can be implemented in practice (Carayannis & Meissner, 2017).

2.2 Human resource management practices and innovation

Because previous research has linked HRM with organizational performance, HRM practices such as staffing, training and development, rewards, and job design have strategic significance in organizations (Scuotto et al., 2020). HRM has been shown to help employees better align their actions with the organization's long-term goals in order to improve the company's operational and financial performance (Verbano et al., 2015). Because creativity and innovation are essential characteristics for organizations to remain competitive in an increasingly dynamic market, HRM has been widely linked to innovation performance (e.g. Mohammad & Khassawneh, 2022; Crema et al., 2014). Furthermore, a study of European R&D units by Papa et al. (2020) provides empirical support for Ferraris et al. (2018)'s claim based on a literature review that implementing a bundle of HR practices concurrently increases the probability of high innovation output. According to Donate et al. (2016), there are two types of HRM systems: control-oriented HRM and entrepreneurial HRM, and their configuration is determined by the HR department's goal in terms of employees' innovative behavior. The former aims to get employees to align their innovative actions with the company's long-term goals and wider institutional norms. This is related to the more traditional HRM literature on high-performance work systems (Peris-Ortiz et al., 2018), in which packages of HR practices are claimed to improve employees' loyalty, learning, and intrinsic motivation, allowing the organization to achieve its goals more effectively. Entrepreneurial human resource management, on the other hand, emphasizes disrupting the status quo by encouraging employees to question their assumptions and engage in self-reflection. Grimaldi et al. (2017) distinguished two types of HRM architectures that promote innovation: commitment-oriented HRM systems and collaboration-oriented HRM

systems. In the first case, we are discussing the more traditional arrangement of HRM activities, which places a premium on employees' strong allegiance to the internal workings of the company. Instead, Malik et al. (2002) laid the groundwork for collaboration-oriented human resource management systems that place a premium on communicating with and developing connections with external stakeholders in their conceptual paper on alliances and partnerships. Outward-facing HRM entails developing shared training programs or long-term personnel alliances with external actors such as corporate partners, consultants, and educational institutions. The traditional view of HRM is expanded by the inclusion of both entrepreneurial HRM and collaborative HRM. Waheed et al. (2019), on the other hand, argued that innovation work may take on noticeably different forms across sectors, implying that industry-specific design of innovation-supportive bundles of HR practices may be required.

2.3 Human resource management practices and open innovation

Open innovation involves both internal and external human resources, complicating the traditional HRM view that HRM activities should prepare and facilitate internal employees' performance in line with the firm's strategic goals (Singh et al., 2020). The issue is that these outsiders are not part of the company's management structure and thus cannot be dealt with using traditional corporate governance methods (Mohammad et al., 2021; Kianto et al., 2017). However, the few studies on the topic of human resource management and open innovation have mostly focused on how HRM can help an organization's internal efforts to broaden its horizons in terms of collaboration (see Lazzarotti et al., 2017, Rondi et al., 2022). As a result, knowledge management and change management theories have had a significant impact on the HR literature concerning open innovation, such as how to promote and support knowledge sharing (Afiouni et al., 2014), how to deal with the "Not-Invented-Here Syndrome" (e.g. Huang & Kim, 2013), how to enhance dynamic capabilities (Malik et al., 2019), and how to increase an organization's absorptive capacity to internalize external knowledge This is

precisely the point made by Zhang et al. (2016) in their literature review connecting HRM and open innovation; they identified three internal organizational hurdles that must be addressed (cognitive processes, psychological biases, and capability-related issues). According to Zehir et al., collaboration-oriented HRM systems appear to be well-suited for promoting open innovation because they use an outreaching strategy and emphasize creating connections and quality relationships with external stakeholders and partners (2016). This is similar to the networking HRM models described by Lee et al. (2019), which seek to capitalize on the new networked workplace by forming inter-organizational project teams comprised of suppliers, partners, clients, and customers. According to Amarakoon et al. (2018), it is no longer assumed that one firm has legal authority over its employees. As a result, HRM practices can no longer be claimed by a single company, but must instead serve as a strategic need for a group of companies. Furthermore, Prasanna et al. (2019) assert that the concept of an entrepreneurial HRM system assists employees in experiencing new opportunities for growth, and there are plausible links between this idea and open innovation. As a result, HRM has the potential to facilitate corporate renewal and organizational change by cultivating creative and absorbent abilities in employees (Gloet & Samson, 2013). Bottom-up methods are frequently used to achieve this goal, in which workers are pushed to solve problems on their own with little direction from above (Chang et al., 2013). The literature on HRM and open innovation is still in its early stages (Zhou et al., 2019), and the few studies that have been published thus far have primarily approached open innovation conceptually or with a broad focus on how to prepare the focal firm for external collaboration (Audretsch et al., 2020). Because open innovation can take several forms, it is difficult to generalize how HRM activities can aid in its realization (Park et al., 2019). Rather, it is argued that it is critical to link the HRM system to contextual and firm-specific conditions, as well as the ongoing open innovation effort (Malik et al., 2019). Our study contributes to the HRM/innovation literature by investigating and

evaluating the management of internal and external human resources at a major pharmaceutical company during the launch of an open innovation project.

3. Method

We investigate the relationship between HRM practices and open innovation in a qualitative case study (Bell et al., 2022) of the Julphar open innovation project. While it is true that a single case study can only provide information relevant to that specific situation, this strategy has been successfully used to shed light on novel phenomena such as open innovation (Brodny & Tutak, 2022; Wu et al., 2022). After meeting with the managers/leaders involved in the open innovation project, the research project began in the fall of 2021. To track the progress of open innovation initiatives, the CEO and other informants were interviewed on multiple occasions. The study began as an open innovation investigation, with the focus on HRM issues emerging as a result of data analysis. Despite the fact that HR management was not part of the hub's purpose and, in some cases, was not even within Julphar's hierarchical authority, the hub team appears to have worked hard on it. As a result, such HRM activity may be viewed as informal, sharing many characteristics with HRM in small businesses and even overlapping with more general management tasks to some extent. Informality is governed by unwritten rules, customs, and tacit understandings.

4. Data collection

In-depth interviews with key open innovation players, such as the hub team (including the CEO and COO) that manages open innovation, Julphar site management, small hub enterprises, and regional actors in the innovation system, were conducted between 2021 and 2022. We were able to give the interviews a coherent framework by developing interview guides based on overarching themes (e.g. current status, important decisions made or planned, and perceived challenges and opportunities). As long as they stayed within the parameters of the interview guide, respondents were given a lot of freedom to share their ideas and experiences on a wide range of topics, from strategy to day-to-

day operations. Furthermore, we held a number of workshops and seminars with the hub team, and we have been collecting materials (such as internal presentations, website texts, press releases, and news stories) related to the case at all times. The information is made up of 27 digitally recorded interviews with ten different people. A competent transcription service transcribed the interviews. The majority of the interviews lasted about an hour, but some lasted up to two hours. Interactions in the study were conducted entirely through video conferencing software such as Zoom or Teams. The Julphar staff interviews focused on how Julphar employees viewed the open innovation program and how it was linked to the corporation's strategic goals, whereas the hub team interviews focused on continuing work on developing and administering the hub between 2013 and 2020. As a result, Julphar's respondents were chosen based on their importance to the host company and their involvement in open innovation.

5. Data analysis

The primary author coded everything in NVivo, following standard coding procedures in inductive qualitative research. The transcripts were initially read and reread using open coding, in which passages are noted, categorized, and sorted according to original notions. Culture, top-level management buy-in, trust, value, intellectual property (IP), coordination, and internal transformation were among the first concepts considered. The data analysis in this study was inspired by the 'Gioia approach.' First-order categories were created by grouping and renaming the first HRM-related quotes and concepts (such as recruitment, staffing, development, education, rewards, and work design). The empirical codes derived inductively and the prior literature on open innovation and HRM were then used to develop second-order themes. This iterative process was participated in by all of the study's authors. With the help of the three basic process archetypes of open innovation, the second-order concepts were organized into aggregated dimensions that made sense to all co-authors. Based on the findings of the

empirical study, we developed a theoretical model by establishing causal relationships between the themes and qualities, and we backed it up with rationale and references to ongoing discussions in the open innovation and HRM literatures.

6. Findings

6.1 HRM practices for inbound open innovation

Open innovation from within Human resource management practices refer to the efforts made on behalf of the host company's internal open innovation initiative participants to facilitate and sustain their communications with external parties. The case study OPEN INNOVATION focuses on two key aspects: (1) open innovation work training; (2) open innovation practice reward . The HR department is in charge of delivering open innovation training sessions. The company conducts ongoing research on new issues related to open innovation and ensures that these new issues are delivered through special workshops and sessions. Furthermore, open innovation training is included in the company's strategic plan. Julphar also focuses on rewards and incentives as an inbound open innovation HRM practice. The company offers appealing incentives to researchers (staff) who participate in open innovation activities.

6.2 HRM practices for outbound open innovation

Open innovation from the outside Human resource management practices are centered on expanding the company's talent pool by leveraging the expertise of people both inside and outside the company. The empirical analysis of OPEN INNOVATION, once again, focuses on two key aspects: (1) attracting top talent to the hub; and (2) making the hub a pleasant place to work for its employees. The hub team actively sought out and recruited 'appropriate' external enterprises for OPEN INNOVATION. The basic idea was to find companies that were doing exciting new things in science and technology. "Competence draws fresh competence," said the CEO of OPEN INNOVATION. It was also deemed critical that any prospective new external enterprises understand the concept of open innovation and be enthusiastic about

involving their employees in the overall effort. The hub team also created new policies and instructional initiatives to ensure that those working outside of the hub adhered to Julphar's ethical and safety standards. Given the shared and sometimes ambiguous distinctions between 'host' and 'tenant' responsibilities, this was deemed more difficult than educating its own employees. Furthermore, OPEN INNOVATION was tasked with teaching hub companies and their employees about "Big Pharma" methods, such as how to organize regulatory studies or design projects to meet the standards of large organizations. OPEN INNOVATION addressed the third externally focused HRM issue by creating a welcoming and productive workplace for companies and their employees from outside the hub. To make this possible, the company had to make changes to its physical and digital spaces to meet the needs of the outside companies. The hub company's personnel had access to all R&D facilities, including cafeterias, dry cleaners, and conference rooms, just as Julphar's did. Over time, the hub established more and more routines and procedures to facilitate external small business innovation activity and collaboration among those actors. An orientation program and a method for dealing with day-to-day tasks such as gaining access to the building and network have been put in place to assist new businesses in integrating into OPEN INNOVATION. As a result, the hub group shifted their focus to providing solutions in order to be good hosts.

6.3 HRM practices for coupled open innovation

Julphar's human resource management (HRM) focuses on both internal (staffing, development, and reward of current employees) and external (recruitment of new talent and their subsequent training and support) factors, with a subset of HRM focusing on the interactions between the two. Based on our empirical findings, we identify three examples of "connected open innovation HRM work": Facilitation of open innovation interactions, gatekeeping of open innovation interactions, and culture building. To begin, OPEN INNOVATION was critical in fostering and facilitating communication

between the hub company and Julphar employees by organizing formal meetings and encouraging less formal connections. As a result, the hub team frequently contacted local businesses and Julphar employees for events such as lectures, workshops, and even casual coffee chats. Several interviewees cited the framework's ability to facilitate conversations before settling on formal contracts and overarching objectives as a major benefit. In addition to facilitating these exchanges, OPEN INNOVATION served as a gatekeeper, keeping records of more formal meetings and ensuring that they were kept strictly confidential. The hub team believed that it was necessary to regulate hub firm expectations in order to prevent excessive use of Julphar resources (and, to a lesser extent, those of Julphar workers). This was especially helpful when dealing with former Julphar employees hired by external hub firms, as these individuals maintained personal contacts with their former coworkers and had a solid understanding of the resources and services that Julphar could provide. The third HRM-related topic that OPEN INNOVATION prioritized in light of the linked interactions between Julphar and hub business employees was the development of a shared culture that encouraged creativity and knowledge sharing. "A culture of collaboration, rather than an over-reliance on patents," according to the HR manager. This emphasis was consistent with a larger cultural shift taking place within Julphar, particularly in the R&D unit, where internal and external communication and cooperation were actively encouraged.

6.4 An open innovation HRM theoretical model at work

The examination of OPEN INNOVATION demonstrates that HRM is a critical component in the implementation of open innovation. According to our findings, Julphar implemented a set of inbound HRM activities aimed at motivating and incentivizing their employees to participate in open innovation projects. A second set of outward HRM initiatives aimed at hub organization external employees paved the way for them to participate in open innovation projects. Finally, a third set of intertwined human resource management actions made Julphar and hub firm employees more

comfortable with open innovation. Based on empirical research, a theoretical model has been developed to demonstrate how OPEN INNOVATION used HRM to manage its people in the open innovation program. In line with previous research (e.g., Haneda & Ito, 2018), the empirical analysis suggests that implementing multiple HR practice bundles at the same time aided in the rollout of the open innovation initiative, as these measures not only made open innovation work easier, but also bolstered one another. This means that HRM was not implemented in silos, but rather as part of a comprehensive strategy. All three primary components of open innovation HRM are positively interconnected, as we theorize in our model (i.e. inbound, outbound, and coupled HRM work). In this article, we'll look at four such links that can be interpreted as research questions. To begin, we propose that the innovation center benefit from inbound human resource management initiatives that promote a culture of transparency and cooperation. Importantly, given that open innovation projects typically necessitate governance structures other than hierarchical control, such a culture has the potential to serve as a strong governance mechanism for the collaborative activities that take place within the innovation hub. A kind of social contract has been built in OPEN INNOVATION, the company's chief operating officer (COO) explained, "where people engage and share knowledge based on the fact that they trust one another. We propose that how the host company recruits, trains, and rewards its own employees who work in the innovation hub influences how those employees interact with the external hub companies. In other words, inbound HRM activities have the potential to foster the development of trust and relational identification among the employees of the hub firm, thereby reducing perceived asymmetric power connections that might otherwise limit the generative output of collaborative work (Feng et al., 2019). A significant component of why this works is that we have been able to create an environment where people dare to talk to each other," said the CEO of OPEN INNOVATION. Simply put, trust is the most important factor in

achieving any goal. Second, we contend that HRM initiatives directed outside the organization can help to foster the development of a positive team culture. As mentioned earlier in the empirical analysis of outbound open innovation HRM work, recruitment of external talents to the hub focused on attracting not only the relevant knowledge, but also the correct attitudes and motivations for contributing to collaborative work. Traditional human resource management (HRM) insights reveal that simply recruiting more workers isn't enough; you also need to recruit the right workers (Collins, 2007). According to the person-environment (P-E) fit perspective (Cable & Edwards, 2004, van Vianen, 2018), people seek out settings that are a good fit for them, but they also have an impact on the places they choose to work. When the innovation center recruits other talents with a collaborative mindset, it becomes more appealing to those talents. "We want to attract new competences to the hub because we believe that when these talents combine, new ideas will emerge," said the CEO. As a result, it is critical that we create conditions that encourage creative thinkers to consider our company as a potential employer. Third, we contend that coupled contacts not only promote information exchange and mutual trust, but also have the potential to strengthen all actors' capacities for cooperative behavior in future linked encounters (see also Wikhamn & Styhre, 2017). "When I talk to [Julphar employees] after the meetings, they say it was incredibly inspiring, but they also learned a lot because they had to address the issues from a different perspective," the COO said. Workers at the host company must adapt their knowledge to the context of the hub companies, which are smaller but more agile because of less bureaucracy and streamlined operations. This not only gives them new opportunities to apply their knowledge, but it also teaches them new ways to interact with the outside world. As a result of these interactions, individuals are given opportunities to hone their dynamic, open innovation skills, and businesses are able to fine-tune their methods of hiring, training, and rewarding employees for open innovation over time. Finally, we argue that informal HRM

activities at the innovation hub have the potential to influence or even challenge formal HRM activities within the host company (e.g. how to recruit talents, provide development opportunities, and give rewards). Respondents to an internal survey, for example, stated that the open innovation effort had benefited Julphar's employer brand. Furthermore, Julphar allowed some of its employees to work temporarily in small firms to gain exposure to new areas of expertise, while some hub firms were allowed to hire people from Julphar, opening up new avenues of professional development. As a result, by collaborating with external firms through open innovation, the host organization can improve its entrepreneurial capabilities and create more adaptable and responsive HRM procedures (Biron et al., 2021).

7. Discussion

Since its introduction by Chesbrough (2003), open innovation has progressed from a minor concern to the forefront of researchers', practitioners', and policymakers' minds (Chesbrough, 2020). The concept has been shown to have the potential to improve the innovation process in a variety of ways, but it has also raised difficult issues when put into practice. HRM scholars can investigate novel topics because open innovation not only breaks down organizational silos but also challenges long-held assumptions about how to handle innovation and build a successful firm (Hautz et al., 2017). Beginning with the research question "What types of HRM work do corporations engage in to manage human resources in open innovation initiatives?" this article will discuss the various HRM activities that businesses engage in during open innovation projects. We have demonstrated the significant contribution of HRM to the successful implementation of open innovation through an in-depth examination of Julphar's OPEN INNOVATION implementation. First and foremost, the informal nature of our HRM work is an important feature. Because OPEN INNOVATION did not appoint a dedicated HR person or HRM department for this purpose, the initiative's CEO and COO handled the majority of the HRM duties (OPEN INNOVATION was organized as

a separate company, but the CEO of OPEN INNOVATION reported to the head of the R&D site). This reflects the approach taken by many small businesses to HRM; they employ fewer HR specialists and instead rely on more casual approaches (Ram et al., 2001, Harney & Alkhalaf, 2021). Despite the fact that small business HR practices are typically less advanced than those of large corporations (Harney & Dundon, 2006), they are critical to the success and growth of their respective industries (Lai et al., 2017). Employee involvement and job satisfaction in the SME environment have been effectively argued to be jeopardized by overly formal and restrictive HR methods (Saridakis et al., 2013). Lai et al. (2017) The hub team of OPEN INNOVATION exhibited characteristics akin to those of a young, innovative company, such as a high level of energy and an entrepreneurial spirit. Despite being very young and small, the hub team was able to leverage the host company's extensive resources and established credibility to avoid the pitfalls that frequently plague startups and businesses with limited resources (Cardon & Stevens, 2004). The empirical research has revealed three distinct but interconnected types of HRM work: inbound HRM work, outbound HRM work, and linked HRM work. These three types of HRM work encompass the distinct aspects of people management in open innovation initiatives. Our empirical findings were incorporated into a theoretical model, and we detailed the interaction of the three components and their impact on the actualization and mutual reinforcement of open innovation. The paradigm emphasizes the importance of external human resources in HRM activities that support open innovation, which has received little attention in the HRM/innovation literature. Collaboration-oriented HRM (Zhou et al., 2013) and networked HRM have recently emerged as approaches that emphasize HRM's outward and cross-boundary activities (Swart & Kinnie, 2014). Although there are obvious parallels between these and our own position on outward open innovation HRM, there are also significant differences. Zhou et al. (2013) have also discussed cross-border organizing, but in terms of more traditional contractual arrangements (such as

partnerships and subcontracting) or extensive interdependence across organizations (as in customer interactions). Although these innovations fall under the umbrella of open innovation (Stanko et al., 2017), they are based on a limited, control-oriented understanding of open innovation and may be better addressed by the rigorous literature on strategic alliances or supply chain management (see also Van de Vrande & de Man, 2011). The open innovation program in our study, in our opinion, fits the description of what Weiblen and Chesbrough (2015) refer to as "lightweight open innovation," in which governance is based on influence, relationships, and trust rather than transactional control (Chesbrough, 2020). Because OPEN INNOVATION did not place a premium on aligning its HRM activities with the host corporation's strategic, profit-oriented goals, our findings also call into question mainstream theories of strategic HRM (Huselid et al., 1997) and high-performance work systems (Becker & Huselid, 1998, Boxall & Macky, 2009). Indeed, OPEN INNOVATION was created to improve the local life science ecosystem by fostering the development of technologies for external companies in which Julphar had no financial stake. As the hub team saw it, not being overly tied to the host company's strategic goals was advantageous because it freed them to adapt HRM initiatives to open innovation without being constrained by business as usual. Julphar valued intangibles such as creating a fantastic workplace and cultivating trusting relationships with potential future partners in the larger ecosystem over securing new short-term revenue streams. Julphar employees' participation was entirely voluntary, and it was encouraged through non-monetary incentives such as internal acclaim for being selected as a company expert with unique insights by OPEN INNOVATION. Managers had to make time for employees to participate in open innovation initiatives despite their heavy workloads in their regular internal projects, so line management support was critical, even though many activities were emergent and bottom-up in nature. Recalling Aagard's (2017) research on radical front-end innovation in the pharmaceutical and biotech industries, I can say that encouraging a "blame-free,

more risk-averse innovation culture" (p. 443) was critical for employee involvement at Julphar. Furthermore, our research indicates that a significant portion of OPEN INNOVATION's HRM framework is strikingly similar to what Shipton et al. (2017) have described as an entrepreneurial HRM system, which places a greater emphasis on encouraging employees to commit to their employer's strategic goals and organizational performance, in this case Julphar, and less on providing them with opportunities for self-directed learning and critical reflection. As a result, unlike traditional conceptions of strategic HRM, open innovation HRM seeks to encourage employees' discretion, autonomy, and participation in shaping the company's future. The goal of OPEN INNOVATION's inbound and linked HRM efforts was to encourage employees to question their assumptions and assumptions about how to create pharmaceutical advances. Employee involvement with external actors, according to Spithoven et al. (2010), can be viewed as both a requirement for open innovation and a means of gradually improving an organization's absorptive capacity to assimilate external knowledge. Julphar's OPEN INNOVATION human resource management (HRM) efforts were separated from the host corporation's strategic HRM processes because they were tailored to the novel areas of work generated by the open innovation project. Simply put, Julphar's open innovation HRM initiatives grew alongside, rather than in place of, the company's existing HRM procedures. It has been argued that this separation provided opportunities for organizational ambidexterity (O'Reilly & Tushman, 2013; Patel et al., 2013), allowing OPEN INNOVATION's informal and exploratory processes to indirectly inspire and influence the exploitative processes of the host corporation. As such, it agrees with Biron et al (2021) .'s argument that a "skunk works" approach to human resource management can be beneficial to businesses. They define this concept as a group of workers who, free of bureaucratic constraints, can respond to novel HRM challenges more quickly and creatively than more traditional, efficiency-focused decision-making methods. As companies navigate more complex

contexts, there is a growing need for adaptable human resource management (HRM) activities (Shipton et al., 2017), and open innovation can provide a useful foundation for this HRM skunk works strategy.

8. Conclusion

More extensive empirical studies in the open innovation literature are required.

Although the life science industry is commonly portrayed as being governed by a strict appropriability regime based on competition and closeness, there have been calls to improve our understanding of how open innovation can be implemented in the sector. This study sheds light on human resource management, which is without a doubt one of the most important aspects of open innovation in practice. Five major contributions to theorizing about how businesses use HRM work to manage human resources in open innovation projects are highlighted. To begin, the paper adds to the limited literature on the intersection of human resource management and the rapidly developing subject of open innovation, demonstrating the immense potential of HRM research in furthering our understanding of this novel phenomenon. By drawing on a large-scale empirical study, we extend the conceptual arguments made by Hong et al. (2019). We emphasize inbound, outbound, and coupled open innovation HRM work and combine it into an integrated and dynamic paradigm that is both theoretically aligned and empirically supported. We agree with scholars such as Stanko et al. (2017) that the open innovation concept is broad and inclusive, and that each case is thus contextually bound; however, we believe the framework includes HRM areas that are important aspects of most open innovation initiatives, and that it can be applied to other contexts.

Second, we extend this line of research by emphasizing the importance of directing HRM activities toward external human resources in open innovation initiatives, in contrast to the majority of HRM-innovation research, which focuses on managing internal employees to foster creativity, knowledge sharing, and innovative behavior. Although our study adds to the HRM literature, the external orientation of HRM is

currently under-theorized and warrants further investigation. Third, we discuss how the various HRM activities that enable open innovation work are interconnected and mutually supportive. This is consistent with the bundle approach to human resource management, which contends that HRM activities should be applied collaboratively to support one another. We introduce four new links between the incoming, outgoing, and connected HRM bundles in our theoretical framework. Finally, we contrast our paradigm with existing HRM/innovation literature, focusing on entrepreneurial HRM and HRM systems that emphasize cooperation. Although some of these studies have established a link between open innovation and human resource management, the majority of the literature is conceptual and/or approaches openness through more traditional innovation methods and control-based forms of open innovation, such as alliances and partnerships. We broaden these conceptual frameworks by applying them to HRM research in cutting-edge open innovation examples. The report, as one of the few papers that provides empirical evidence of how HRM work is used in less traditional, control-oriented, collaborative innovation contexts, opens up new territory for research in the fields of open innovation and HRM. Fifth, the research broadens our understanding of how companies enable open innovation by introducing the concept of "informality" into the HRM/open innovation domain. We discovered that the OPEN INNOVATION initiative, like many other small businesses, lacked a dedicated human resources department, leaving the hub team in charge of most HRM-related tasks. We describe how this more flexible HR strategy helped the company adapt to the needs of the open innovation project. We also contend that this type of HRM experimentation can have an innovative impact on the host organization's established HRM practices.

8.1 Implications for management

How to motivate and organize internal and external human resources (Frey et al., 2011); how to balance value creation and value capture among participants (Chesbrough et al., 2018); and how to govern the process without suffocating its potential are all

paradoxical questions that arise when organizational boundaries are opened to the inflow and outflow of knowledge (Demil & Lecocq, 2006). Our research demonstrates how open innovation can be implemented in the real world and details the HRM tasks required to manage such an endeavor. We believe the OPEN INNOVATION case can help practitioners learn more about openness and how to foster it through human resource management. Furthermore, the study agrees with Seeck and Diehl (2017) that open innovation HRM work should be done within a framework rather than as independent operations because different bundles of HR practices may reinforce one another. To summarize, managing people in open innovation necessitates more than one HRM practice. Furthermore, our findings show that managing open innovation efforts requires not only technical expertise and organizational legitimacy, but also human abilities that transcend hierarchical mandates and organizational power. As a result, open innovation leaders must be comfortable in two intertwined roles: general manager and informal human resource manager. Because open innovation HRM initiatives and traditional HRM systems may be based on opposing logics (Shipton et al., 2017), we encourage managers to carefully consider how they relate to one another. To summarize, while our framework can be used as a starting point for analyzing how to set up an HRM system for open innovation, we recommend first considering the main purpose of the initiative in question, and then developing bundles of HRM activities to support the mission, with the activities targeting both internal and external human resources involved in the innovation work.

8.2 Future research and limitations

We acknowledge the limitations of theorizing from a single case study as well as the contextual variables that may emerge when applying our proposed paradigm for open innovation HRM work to other contexts. We support additional empirical qualitative and quantitative research into the HRM-open innovation connection because we agree with Aagard's (2017) assertion that HRM systems should be tailored to each unique

situation. This type of research could help confirm or expand the theoretical model we propose by adding to or removing HRM bundles and further investigating their potential interrelationships. While our interviews with OPEN INNOVATION's hub team and Julphar's management provided useful information, more research is required to determine how employees at both the host and hub companies perceive this type of human resource management. We discovered that employees who actively participate in open innovation projects report higher levels of well-being, which is defined as the total quality of an employee's experience and functioning at work (Grant et al., 2007). According to Guest (2017), fostering a healthy work environment is critical for businesses' long-term viability and the well-being of their employees. An approach like this can also improve working relationships and increase productivity. More research is needed to determine whether open innovation activity can raise this level of awareness in already-established businesses. Understanding the relationship between open innovation and the well-being of both employees and the company as a whole, as well as how businesses can assess the success or failure of their own initiatives, would be very interesting. Furthermore, open innovation can benefit a company's employer brand, which Backhaus and Tikoo (2004) define as "a long-term strategy to manage the perception of the organization as a good place to work by current and potential employees." According to Tumasjan et al. (2020), employer branding orientation has an indirect effect on business performance, primarily through a positive affective climate among current employees and less so through recruitment efficiency. We believe that encouraging open innovation through human resource management operations is a promising area for further research. Finally, the open innovation literature has demonstrated that there are numerous approaches to designing innovation efforts (Randhawa et al., 2016; Stanko et al., 2017), and that this approach to innovation may pose some challenges to the traditional approach to HRM. However, we believe that as

the field of open innovation evolves, there will be a lot to learn from studying HRM's body of knowledge.

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