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HRM work and open innovation: evidence from a case study

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ABSTRACT

This paper proposes a framework for firm use of HRM when engaging in open innovation. Whereas open innovation has gained wide recognition in the innovation management field, as firms open their boundaries to knowledge inflow and outflow to advance innovation, very few empirical papers link the HRM literature to this phenomenon. We base our analysis on an exploratory qualitative study of the pharmaceutical corporation AstraZeneca and its implementation of an open innovation initiative called BioVentureHub. We identify three main areas of HRM work: inbound, outbound, and coupled HRM work. Furthermore, we illustrate how these HRM activities relate to the development of the open innovation initiative and to current HRM and open innovation literature. The framework identifies HRM activities that target not only internal employees, but also external human resources engaged in the open innovation initiative. This HRM work is mainly conducted through informal means, separate from the host corporation's business as usual. Our empirical study contributes to the limited and mainly conceptual research connecting open innovation with HRM, increasing our knowledge of how corporations use HRM work to manage open innovation initiatives in practice.

KEYWORDS

Innovation; open innovation; case study; informality; pharmaceutical industry

Introduction

A company's ability to develop and launch new products, services, and work methods is inextricably linked to its management of human resources (Laursen & Foss, 2003, Diaz-Fernandez et al., 2017). The innovation process involves highly knowledge-intensive activities driven by collaboration, creativity, and individual commitment (Hayton, 2005), and studies have connected HRM and innovation in both conceptual (e.g. Bos-Nehles et al., 2017, Lin & Sanders, 2017, Seeck & Diehl, 2017)

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and empirical (e.g. Laursen & Foss, 2003, Beugelsdijk, 2008, Haneda & Ito, 2018, Bos-Nehles & Veenendaal, 2019, Zhou et al., 2019, Lin et al., 2020) scholarly work. However, despite this progress, there are still several under-theorized areas meriting further exploration (Lin & Sanders, 2017, Seeck & Diehl, 2017).

A specific challenge when linking HRM to the constantly evolving field of innovation management is that the innovation process increasingly tends to cross organizational boundaries. Chesbrough (2003) called this phenomenon ‘open innovation,’ suggesting that firms can and should purposely open their organizational boundaries to the inflow and outflow of knowledge to advance innovation and generate new income streams. As the co-founder of Sun Microsystems Bill Joy stated, ‘No matter who you are, most of the smartest people work for someone else.’ When the innovation process blurs firm boundaries in open innovation, it naturally has implications for the division of labor and for coordinating mechanisms between internal and external actors (Felin & Zenger, 2014). Open innovation furthermore may require a different set of organizational capabilities (Teece, 2020) and a different corporate culture from that of closed innovation (Kratzer et al., 2017).

It has recently been conceptually argued that HRM activities can play a critical role in addressing and overcoming cognitive and organizational barriers during the open innovation journey (Hong et al., 2019). Empirical studies of HRM and innovation, however, have so far mostly focused on innovations developed inside single firms, with HRM activities solely targeting their own employees. As Hong et al. (2019, p. 2) put it, ‘Because of the implicit assumption that innovation processes normally take place within the boundaries of one particular firm, the role of HRM in supporting *open* innovation ... has been largely overlooked.’ Given that open innovation is an increasingly applied innovation practice (Huizingh, 2011, Chesbrough et al., 2014, West & Bogers, 2014, Randhawa et al., 2016, Bogers et al., 2017) and that this approach involves new ways of managing human resources, it is unfortunate that research connecting open innovation and HRM is still very limited.

The implementation of open innovation will arguably have important implications for conventional HRM in terms of evaluating, attracting, developing, and rewarding people throughout the innovation process, because not all the involved human resources are employed by a single firm. For instance, since value creation and value capture processes are shared among several different actors, the open innovation perspective complicates the mainstream view of HRM as oriented toward getting the most out of the firm’s own human resources in relation to its strategic, often profit-oriented, goals (Boxall, 1996, Boxall & Purcell, 2016). Overall, there is a need for further research on open innovation and

HRM to extend our knowledge of how to support and facilitate internal as well as external human resources in this increasingly common, but also challenging, way of organizing innovation work (Hong et al., 2019).

To address this research gap, this paper asks ‘What forms of HRM work do corporations engage in to manage human resources in open innovation initiatives?’ In this study, the two fields of HRM and open innovation are linked in an exploratory study of the British–Swedish pharmaceutical corporation AstraZeneca and its implementation of the BioVentureHub (BVH). This open innovation initiative is intended to connect the large incumbent firm with small entrepreneurial life science firms.

Our study makes several major contributions to theoretical knowledge of HRM and innovation. *First*, the paper responds to recent calls to explore the promising, yet under-investigated, intersection between the fields of HRM and open innovation (e.g. Shipton et al., 2017, Hong et al., 2019, Lin et al., 2020). With an in-depth empirical analysis of BVH, we contribute to the scant and mainly conceptual research on how HRM may enable open innovation by introducing a novel framework of open innovation HRM work consisting of three areas of HRM activities. *Second*, we highlight not only inbound HRM work targeting the firm’s own employees, but also outbound work targeting external human resources and the coupled work of facilitating interactions between internal and external human resources. As such, we add to the emerging literature on how HRM empowers firms to engage with external actors (Lepak & Snell, 2002, Zhou et al., 2013) and obtain external knowledge (Lin et al., 2020). *Third*, we discuss how the three areas, or bundles, of HRM activities (Seeck & Diehl, 2017) may relate to one another. More specifically, we highlight four proposed relationships among the HRM activities in our framework that we argue reinforce one another. *Fourth*, we analyze an open innovation initiative governed neither by hierarchical control nor through contractual arrangements. Such HRM work needs governance forms different from those of more traditional collaborative structures (Demil & Lecocq, 2006, Wikhamn & Styhre, 2019), such as strategic alliances or joint ventures, and represents a rather neglected but promising future area of HRM research (Zhou et al., 2013). *Fifth*, we learn that open innovation initiatives involve informal HRM work mainly carried out by the open innovation team, and not integrated in the corporation’s ordinary HRM processes. This finding supplements and challenges findings of the strategic HRM literature that refer to formality, routines, and efficiency, rather than to exploration and adaptivity (see e.g. Shipton et al., 2017, Biron et al., 2021). *Lastly*, based on the study’s conclusions, we identify suggested managerial implications and avenues for future research.

Literature overview

The emerging field of open innovation

In the innovation management literature, open innovation has attracted considerable attention in recent decades (Chesbrough et al., 2006, Huizingh, 2011, Chesbrough et al., 2014, Randhawa et al., 2016, Bogers et al., 2017, Dahlander et al., 2021), becoming a central research domain and an increasingly common industrial practice. Open innovation is referred to as ‘a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organization’s business model’ (Chesbrough & Bogers, 2014, p. 27). This definition highlights not only the monetary rewards of open innovation work, but also the non-pecuniary emphasis on freely sharing and sourcing knowledge with and from other actors (Dahlander & Gann, 2010, Suhada et al., 2021). Furthermore, the definition points to knowledge *flows* rather than single transactions, highlighting a process view of open innovation, often characterized as comprising *outside-in/inbound* processes, *inside-out/outbound* processes, and *coupled* processes (Gassmann & Enkel, 2004, Gassmann, 2006).

Nevertheless, treating open innovation as a collaborative process that crosses organizational boundaries inevitably blurs the boundaries between internal and external actors, leading to novel governance mechanisms (Demil & Lecocq, 2006, Wikhamn & Styhre, 2019). The fact that open innovation targets external actors complicates its implementation for two interrelated reasons. First, these actors may have motives and strategies for engaging in open innovation that diverge from those of the incumbent firm itself (Cheng & Huizingh, 2014). Second, these actors are not under the hierarchical control of the incumbent firm (Demil & Lecocq, 2006), so their activities must be aligned with the external actors’ demands and expectations while not conflicting with the overall purpose of the open innovation initiative. Hence, these outbound activities must be regularly iterated and negotiated between all parties, which involves both the encouragement of interaction and limitations on such interaction. The open innovation process exposes paradoxical tensions (Lauritzen & Karafyllia, 2019) between, for example, collective value creation and private value capture (Chesbrough et al., 2018) and challenges incumbent firms’ existing cultures, processes, and business models (Teece, 2018, Bez & Chesbrough, 2019, Sund et al., 2021).

Whereas the open innovation domain has expanded significantly in recent years, many areas of it merit further inquiry. For example, although open innovation research has predominantly addressed the organizational level of analysis (Bogers et al., 2017)—i.e. analyzing how

a firm or business unit establishes or engages in the open innovation model (see Di Minin et al., 2010, Chiaroni et al., 2011, Mortara & Minshall, 2011)—knowledge of how open innovation is handled in practice remains limited (Mortara & Minshall, 2014, Wikhamn & Styhre, 2020). One reason for this is that the open innovation concept is very broad, and therefore involves many different forms and agendas (Randhawa et al., 2016, Stanko et al., 2017). Hence, there is no ‘one-size-fits-all’ model of open innovation (Chesbrough, 2020), and both the designs of open innovation initiatives and their aims may differ from case to case.

Here, we specifically consider an open innovation initiative in the life science industry, where the focal firm (AstraZeneca) has established a separate organizing unit (i.e. BVH) with the aim of facilitating interactions with small entrepreneurial firms and the surrounding regional life science ecosystem. This form of open innovation is similar to what have been called ‘corporate incubators’ (Pauwels et al., 2016), ‘corporate accelerators’ (Richter et al., 2018), and ‘corporate innovation hubs’ (Wikhamn & Styhre, 2019, Amann et al., 2022), which often result from an incumbent’s need for transformation and rejuvenation. Open innovation has been suggested to be a promising innovation model for the life science industry (Gassmann & Reepmeyer, 2005, Hunter & Stephens, 2010), but few empirical studies consider how it can be implemented in practice.

HRM and innovation

Previous research has convincingly linked HRM with *organizational* performance (Delaney & Huselid, 1996, Guest, 2011, Jiang et al., 2012), giving HRM activities, such as staffing, training and development, rewards, and work design, strategic roles in firms (Lengnick-Hall et al., 2009). Studies have shown that HRM can align employee behaviors with strategic organizational goals (Jackson et al., 1989) and/or develop employees’ skills, knowledge, and abilities (Becker & Huselid, 1998) to drive the firm’s operational and financial performance. As creativity and innovation have become essential capabilities that firms use to stay competitive in an increasingly dynamic environment, HRM has also been extensively linked to *innovation* performance (e.g. Laursen & Foss, 2003, Jimenez-Jimenez & Sanz-Valle, 2008, Aagaard, 2017, Diaz-Fernandez et al., 2017, Lin & Sanders, 2017, Shipton et al., 2017). HR practices have been proposed to facilitate product innovation (e.g. Shipton et al., 2006, Chen & Huang, 2009, Sanz-Valle & Jiménez-Jiménez, 2018), process innovation (e.g. De Saa-Perez & Díaz-Díaz, 2010, Haneda & Ito, 2018), and organizational innovation (e.g. Chen & Huang, 2009).

Furthermore, Seeck and Diehl (2017) suggested, based on a literature review, that simultaneously implementing a bundle of HR practices increases the probability of high innovation output, as empirically confirmed by Haneda and Ito (2018) in a study of Japanese R&D units.

Shipton et al. (2017) claimed that a formal HRM system can be configured differently depending on how it is intended to influence employees' innovative behavior, and they identified two distinct HRM systems: *control-oriented* and *entrepreneurial* HRM. The former focuses on aligning employees' innovative behavior with the firm's strategic goals and with broader institutional expectations. This is strongly related to the more traditional HRM literature on high-performance work systems (Becker & Huselid, 1998, Boxall & Macky, 2009), in which bundles of HR practices are claimed to enhance employees' loyalty, learning, and intrinsic motivation to strengthen their capabilities to fulfill organizational goals. Entrepreneurial HRM, in contrast, emphasizes questioning employees' taken-for-granted beliefs and promoting critical reflection, challenging how the organization operates and performs.

Moreover, Zhou et al. (2013) distinguished two innovation-enhancing HRM architectures: *commitment-oriented* and *collaboration-oriented* HRM systems. The former refers to a configuration of HR practices that emphasizes employees' high commitment to the internal organization and is grounded in the more traditional configuration of HRM activities. Collaboration-oriented HRM systems instead emphasize reaching out to, and building relationships with, external stakeholders, and was originally formulated by Lepak and Snell (2002) in a conceptual paper addressing alliances and partnerships. Its outward-oriented perspective involves developing HRM activities such as shared training programs or long-term personnel alliances with external actors such as business partners, consultants, and academic institutions. Both entrepreneurial and collaboration-oriented HRM bring new perspectives to the conventional view of HRM. At the same time, Aagaard (2017) asserted that innovation work can look rather different in different industries, implying that the design of innovation-supportive bundles of HR practices may need to be tailored to each case.

HRM and open innovation

Whereas the traditional HRM view is that HRM activities should prepare and facilitate *internal* employees' performance in line with the firm's strategic goals (Delaney & Huselid, 1996, Guest, 2011, Jiang et al., 2012), open innovation complicates this perspective since it engages human resources from both inside and outside firm boundaries (Chesbrough, 2003, Chesbrough & Bogers, 2014). A challenge with this is that the

external individuals do not fall under the hierarchical control of the firm, and therefore often cannot be managed through existing governance mechanisms (Demil & Lecocq, 2006, Wikhamn & Styhre, 2019). However, the limited HRM/open innovation research has so far mainly emphasized how HRM can support the internal organization in its effort to open its boundaries for collaboration (see Petroni et al., 2012, Bogers et al., 2018, Hong et al., 2019). The HRM literature touching on open innovation has therefore predominantly been influenced by knowledge management and change management theories, including how to promote and support knowledge sharing (Lepak & Snell, 2002), addressing the 'Not-Invented-Here Syndrome' (e.g. de Araújo Burcharth et al., 2014), improving dynamic capabilities (Teece, 2020), and developing the organization's absorptive capacity to internalize external knowledge. This is also what Hong et al. (2019) emphasized when specifically linking HRM and open innovation in a literature review, highlighting three internal organizational barriers to be addressed: cognitive processes, psychological biases, and capability-related factors.

Although Zhou et al. (2013) did not refer to open innovation as such when they described collaboration-oriented HRM systems, these systems seem, at least from the outset, well-suited for supporting open innovation, as they take 'an outreaching approach and emphasize developing connections and quality relationships with external stakeholders and partners' (Zhou et al., 2013, p. 267). This is similar to what Swart and Kinnie (2014) described as networking HRM models, specifically targeting the emerging networked work environment by engaging with suppliers, partners, clients, and customers in inter-organizational project teams. Swart and Kinnie (2014) claimed: 'We can no longer assume that one firm has legal control over its employees. This means that the HRM practices are also no longer the property of a single firm, but they become the strategic imperative for a network of organizations' (p. 293). Also, the entrepreneurial HRM system concept has reasonable connections to open innovation, and Shipton et al. (2017) have stated that it helps employees experience new opportunities for growth. As such, HRM may enable corporate renewal and organizational change by transforming employees' mental models and thus building the organization's innovation capabilities (Hailey, 2001) and absorptive capacity (Chang et al., 2013). Often, this is accomplished through bottom-up processes whereby employees are encouraged to take their own initiatives with little centralized control (Shipton et al., 2017).

Research connecting HRM and open innovation is still in its infancy (Hong et al., 2019), and the few published studies touching on open innovation and HRM have mainly approached open innovation conceptually (Shipton et al., 2017, Hong et al., 2019) or with a broad focus

on how to prepare the focal firm for external collaboration (Petroni et al., 2012, Bogers et al., 2018). However, since open innovation can take many different forms (Stanko et al., 2017), it is challenging to generalize how HRM activities may facilitate its realization. Instead, it is arguably important to align the HRM system with contextual and firm-specific conditions (Aagaard, 2017), and with the open innovation initiative at hand. Overall, how firms manage the open innovation process through HRM work is still under-theorized, so our study contributes to the HRM/innovation literature by exploring and analyzing how a large pharmaceutical corporation manages human resources located inside and outside firm boundaries when establishing an open innovation initiative in practice.

Method

To analyze the intersection between HRM work and open innovation, we conduct a qualitative case study (Ragin & Becker, 1992, Flyvbjerg, 2006) of AstraZeneca's open innovation initiative BVH. Whereas a single-case study is bound to its contextual specifics, it is a well-established method with which to develop in-depth illustrations and theoretical insights on exploratory phenomena (Yin, 1994, Flyvbjerg, 2006), such as the emerging field of open innovation.

The study started in fall 2013, when the research team first met with the manager who two months later became the CEO of BVH. Access was granted to follow the development of BVH through recurring interviews with the CEO, and eventually also with the appointed COO, and through interviews with other informants related to the initiative. The research project was originally framed as an open innovation study, and the emphasis on HRM issues emerged from analyzing the empirical data. Whereas BVH did not have its own formal HRM function, the hub team evidently put much effort into managing human resources, even though these human resources were not within the organizational mandate of the hub—some of them were even outside AstraZeneca's hierarchical control. Such HRM work can thus be seen as informal, to some degree overlapping with more general management work and displaying many similarities to HRM in small firms (see Lai et al., 2017, Harney & Alkhalaf, 2021). 'Informality' is described by Lai et al. (2017, p. 472) as 'governed by informal rules, unwritten customs and tacit understandings'.

Data collection

The empirical material comprises interviews conducted between 2013 and 2021 with relevant stakeholders of BVH, such as the hub team (including the CEO and COO) that runs BVH, the site management of

AstraZeneca, the small hub firms, and regional innovation system actors. We developed interview guides to structure the interviews based on general themes (e.g. current status, important decisions made or planned, and perceived challenges and opportunities). Within the boundaries of the interview guide, the interviewees were allowed to speak rather freely about their thoughts and experiences, covering both strategic and operational areas. We also had several workshops and seminars with the hub team, and continuously collected documents (e.g. internal presentations, website texts, and press releases) and news articles concerning the case.

In this paper, we mainly analyze the interviews with the hub team, including BVH's CEO and COOs (COO 1 was appointed in 2015, and was replaced by COO 2 in 2019) and managers and employees of the AstraZeneca R&D center. The empirical material comprises 30 interviews with 11 individuals (see [Table 1](#)), all digitally recorded and transcribed by a professional transcription bureau. The interviews lasted between

Table 1. Interviews.

Interviewee, position	Date	Length
BioVentureHub Team (22 interviews)		
CEO (13 interviews)	05/11/2013	90 min
	22/04/2014	120 min
	04/09/2014	60 min
	12/12/2014	45 min
	25/05/2015	30 min
	28/10/2015	60 min
	01/04/2016	60 min
	22/09/2016	60 min
	22/11/2016	60 min
	27/04/2017	60 min
	29/09/2017	50 min
	13/05/2019	90 min
	07/12/2020	60 min
COO 1 (6 interviews)	25/05/2015	45 min
	07/10/2015	60 min
	01/04/2016	60 min
	22/09/2016	60 min
	07/04/2017	60 min
	06/10/2017	60 min
COO 2 (1 interview)	06/02/2020	90 min
CEO & COO 2 (2 interviews)	19/03/2020	60 min
	26/08/2020	60 min
AstraZeneca corporation (8 interviews)		
Open Innovation expert	08/09/2014	60 min
Spin-out responsible	31/01/2017	60 min
Science and Innovation director	10/09/2020	60 min
Principal scientist	21/09/2020	60 min
Site Director	05/10/2020	60 min
Digital Transformation Lead	08/10/2020	60 min
Head of diagnostics science	15/10/2020	60 min
SVP Late-Stage development	26/10/2020	50 min

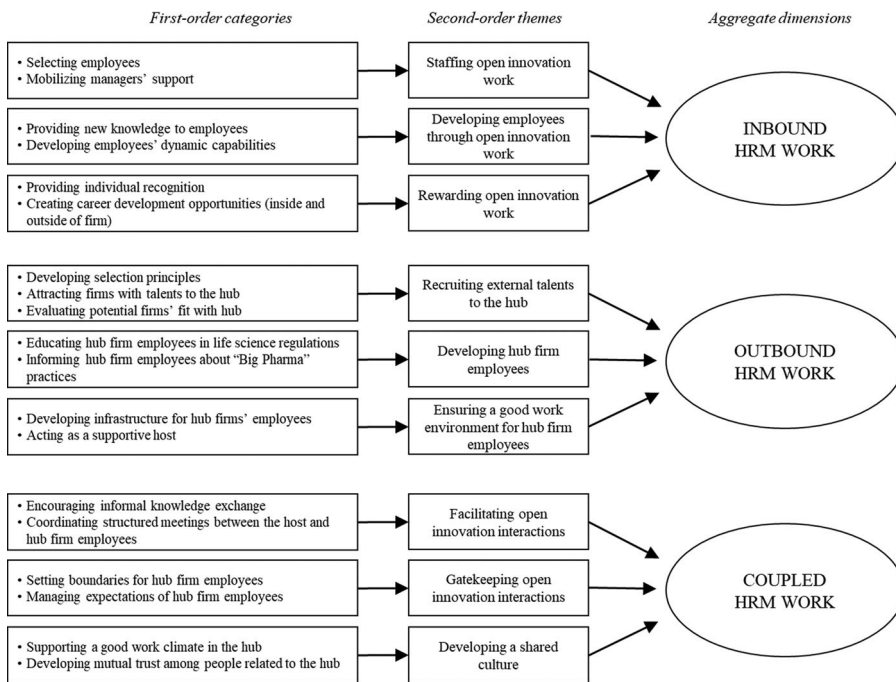


Figure 1. Final data structure.

30 minutes and two hours, but most lasted around one hour. Up to 2020, the interviews were with few exceptions held in the interviewees' offices. In the spring of 2020, the COVID-19 pandemic hit the world, which led to heavy restrictions on movement and physical meetings, and as a direct consequence all the remaining interactions in the study had to be held online, via Zoom or Teams. While the recurring interviews with the hub team (between 2013 and 2020) emphasized ongoing work on both establishing and running the hub, the interviews with the AstraZeneca staff mainly focused on how BVH was perceived by AstraZeneca employees and how it was linked to the corporation's strategic goals. Hence, the interviewees from AstraZeneca were selected based on their roles and engagement in BVH from the host corporation's side.

Data analysis

The empirical material was coded in NVivo by the main author, following general coding practices in inductive qualitative research (Miles & Huberman, 1984). First, when reading and rereading the transcripts, sections of texts were marked, labeled, and sorted into initial concepts, in what is often called open coding (Strauss & Corbin, 1990). These initial concepts included 'culture', 'top management support', 'trust', 'value', 'intellectual property', 'coordination', and 'internal transformation'.

For this paper, the data analysis was inspired by the ‘Gioia method’ (Langley & Abdallah, 2011, Gioia et al., 2013). The initial quotations and concepts related to HRM work (e.g. recruitment, staffing, development, education, rewards, and work design) were grouped and relabeled into first-order categories (Van Maanen, 1979). Second-order themes were then formed in relation to both the inductively generated empirical codes and previous research on open innovation and HRM. This was an iterative process in which all the authors of the paper participated. We were particularly inspired by the three core process archetypes of open innovation (Gassmann & Enkel, 2004), which helped us structure the second-order themes into aggregated dimensions that made sense to all co-authors. The data structure presented in Figure 1 graphically represents how the analytical process emerged, and Table 2 in the empirical section presents selected evidence from the empirical data analysis. In the last step, we developed a theoretical model by linking the themes and attributes to one another based on the empirical analysis, supported by logical reasoning and connections to ongoing conversations in the open innovation and HRM literatures.

Findings: the HRM-related work in BVH

AstraZeneca launched the open innovation initiative called BioVentureHub (BVH) in 2014 at the Mölndal research site in Sweden. Briefly, BVH is a physical place inside the R&D center, where carefully selected external life science firms are invited to rent offices and lab facilities, so that their employees can tap into the large corporation’s infrastructure, knowledge, and network. AstraZeneca did not demand any ownership rights or business contracts in return for sharing its knowledge and facilities, and the external firms kept both their intellectual property rights and strategic decision power. The main driver from the pharmaceutical corporation was instead to strengthen the surrounding life science ecosystem, and to build trusting relationships with small innovative firms. These interactions could eventually lead to shared projects or business contracts, but only based on mutual consent. By sharing in-house resources, AstraZeneca could guide and influence these potential future collaborators, but it also gained insights into the small firms’ potentials and, not least, learned from them. In 2021, 30 companies and one academic group were located in BVH.

From the analysis of the empirical data, we have structured the HRM activities specifically related to the open innovation initiative into three major areas: (1) *inbound open innovation HRM work*, (2) *outbound open innovation HRM work*, and (3) *coupled open innovation HRM work*. We collectively describe these areas as *open innovation HRM work* (see Table 2).

Table 2. Selected evidence from empirical data analysis.

INBOUND OPEN INNOVATION HRM WORK		
Second-order themes	First-ordercodes	Illustrative quotations
Staffing open innovation work	Selecting employees	<ul style="list-style-type: none"> • [The COO] is our contact person when the [hub firms] need help from AstraZeneca. If their requests are reasonable, we try to find the right experts for them. (CEO, BioVentureHub) • There are no formal barriers from top management, but the challenge is to break through “the noise” and to convince the employees that they should take the chance to get involved. (AZ Manager)
	Mobilizing managers’ support	<ul style="list-style-type: none"> • I report to our Swedish CEO, and my office is located very close to his. I have a lot of freedom, and have a lot of support in how we develop this initiative. (CEO, BioVentureHub) • I always speak to the manager first, to make sure that the employee is available for engagement [in the hub]. (COO, BioVentureHub)
Developing employees through open innovation work	Providing new knowledge to employees	<ul style="list-style-type: none"> • In informal talks [with the hub firms] our employees constantly develop new ideas. It is very difficult to quantify the value of that, but they learn a lot in these interactions. (CEO, BioVentureHub) • The innovation work in [AstraZeneca] is normally very planned and controlled, seldom driven by serendipity. Here, we have set up an environment that is open to such possibilities [for our employees]. (CEO, BioVentureHub) • [AstraZeneca] can of course learn entrepreneurial culture from these firms, but our employees can also learn new agile methods for approaching science. (AZ Manager)
	Developing employees’ dynamic capabilities	<ul style="list-style-type: none"> • The hub helps employees to embrace [AstraZeneca’s] cultural transition toward openness. Our staff can interact with these external actors even before we know that there are collaborative opportunities. (AZ Manager) • The hub can help us become more curious as an organization. Everyone has the opportunity to drive change. (AZ Manager) • I have to say that my colleagues have become much more extroverted, and able to see things from the small firms’ perspective. (COO, BioVentureHub)
Rewarding open innovation work	Providing individual recognition	<ul style="list-style-type: none"> • One of our employees helped a hub company with a very concrete issue, and he came back to us afterwards and said, “These are things that I do every day in our internal projects, but I have never received so much appreciation as I did today.” (CEO, BioVentureHub) • Our employees work on projects that are 10 to 15 years long. By engaging in the hub, they can see something new for an hour or so, feel very valuable, and they do not need to take any responsibility for implementation. (COO, BioVentureHub)
	Creating career development opportunities (inside and outside of firm)	<ul style="list-style-type: none"> • I do not think [our employees] will support this hub because of monetary incentives. We instead need to give them enough freedom to engage in activities that they see as meaningful and valuable for reaching their own professional goals. (AZ Manager) • There is personal interest among the [AstraZeneca] employees to develop their external contacts, in order to increase future opportunities. It would be great if several small growing firms in the neighborhood think that you are a competent person. (COO, BioVentureHub) • [AstraZeneca] employees are not slaves. They are allowed to move to another employer, or to start their own company. If we show that we are generous and open toward them, they will enjoy their work, and we also may attract new talents. (COO, BioVentureHub)

(Continued)

Table 2. (Continued)

OUTBOUND OPEN INNOVATION HRM WORK		
Second-order themes	First-order codes	Illustrative quotations
Recruiting external talents to the hub	Developing selection principles	<ul style="list-style-type: none"> • [The hub] has turned down many potential firms because their main reason for sitting here was low rent, or because they for various reasons did not fit the criteria that the hub has set. (CEO, BioVentureHub) • The selection criteria involve that [the hub firms] need to be funded, and that their employees will benefit from sitting here. We need to believe in what they are working on, and their employees' presence should also make the hub itself more attractive. (CEO, BioVentureHub) • We have to be clear on what type of competences that [AstraZeneca] strategically wants to attract to this environment. (AZ Manager)
	Attracting firms with talents to the hub	<ul style="list-style-type: none"> • It is a balance. I do not want to go out and sell the hub—I want it to sell itself—but we need to at least communicate that we exist. (CEO, BioVentureHub) • In the long run, we want to increase the attractiveness of the life science cluster in Sweden, and the attractiveness of Gothenburg, and of the AstraZeneca site. (AZ Manager)
	Evaluating potential firms' fit with hub	<ul style="list-style-type: none"> • We [at the hub] have been very clear about that none of us does this for short-term gains, and that all external employees of the hub firms need to accept the shared philosophy. (CEO, BioVentureHub) • The lead time from initial contact to a signed rental agreement is often more than six months. We need to make sure that the collaboration is good for both parties. (COO, BioVentureHub)
Developing hub firm employees	Educating hub firm employees in life science regulations	<ul style="list-style-type: none"> • We need to determine who is responsible for the activities performed in [AstraZeneca's] facilities. We need to sort out liabilities and indemnifications. [The hub firm employees] are at least to some extent under our responsibility. (CEO, BioVentureHub) • All the official ethical requirements need to be fulfilled, but as a global corporation we put the bar even higher. Just because you are ethically allowed to do something, [AstraZeneca] might not approve of such activities in our facilities. (COO, BioVentureHub)
	Informing hub firm employees about "Big Pharma" practices	<ul style="list-style-type: none"> • The biggest value is that their employees can get advice from a "Big Pharma" firm. There are few places in the world where you have such access to all pharmaceutical development stages. (COO, BioVentureHub) • Sharing our knowledge [with hub firm employees] takes us just a few hours now and then, and it does not cost us anything, while it will increase [the hub firms'] value enormously. (AZ Manager) • [The AstraZeneca experts] bring value to the hub firms because they are impartial. We do not have commercial interests in these projects, and we do not sell consultancy services. Therefore, we can give our honest expert advice. (COO, BioVentureHub)
Ensuring a good work environment for hub firm employees	Developing infrastructure for hub firms' employees	<ul style="list-style-type: none"> • It is important to build the infrastructure. We need to make sure that the IT system works, and that we have financial routines in place. We need to set up many processes. (COO, BioVentureHub) • We [in the hub] have created a service catalogue that presents all the offerings to the hub firms. It includes information about AstraZeneca's suppliers, how to book meeting rooms, to how to access chemicals and special cleaning services. (COO, BioVentureHub)

(Continued)

Table 2. (Continued)

COUPLED OPEN INNOVATION HRM WORK		
Second-order themes	First-order codes	Illustrative quotations
	Acting as a supportive host	<ul style="list-style-type: none"> I am so proud when I hear the hub firm employees say that they feel that we are doing our best to help them get settled and to meet their requirements. We might not be able to solve everything, but there is a genuine will to try. (COO, BioVentureHub) Much of my everyday job is to take care of the existing hub firms and their staff. This is our core business. We need to meet their needs and be a good host. (COO, BioVentureHub)
Facilitating open innovation interactions	Encouraging informal knowledge exchange	<ul style="list-style-type: none"> [The hub] has workshops, we have awareness-building lunches and many events where hub firms can present themselves and what they are working on. (COO, BioVentureHub) Physical proximity helps us learn about each others' competences and work practices. ... What I find most interesting are the unplanned interactions. (AZ Manager) The positive effect of the hub is that people meet without preconceived agendas. We sit and drink coffee, and suddenly common areas for future collaborations have been identified. (CEO, BioVentureHub)
	Coordinating structured meetings between the host and hub firm employees	<ul style="list-style-type: none"> [The hub's] facilitation role is important, and very much appreciated [by the hub firms]. It is a way to set common goals and to formulate conclusions from the meetings. (COO, BioVentureHub) I often chair these formal meetings [between host and hub firm employees], and I make sure that we all follow the good principles of the hub. The meetings are always conducted in a good spirit. People like to participate in them. (COO, BioVentureHub)
Gatekeeping open innovation interactions	Setting boundaries for hub firm employees	<ul style="list-style-type: none"> Some hub firm employees want to push the limits of what resources and knowledge they can obtain from us, and I have an important role to make sure that they keep themselves within the boundaries of what AstraZeneca has agreed to. (COO, BioVentureHub) Everything related to these knowledge sharing sessions is on AstraZeneca's terms. If our employees need to spend time on their own projects, than that is what is prioritized. (COO, BioVentureHub)
	Managing expectations of hub firm employees	<ul style="list-style-type: none"> The rental agreement is now much more detailed. Before it had some ambiguities, leading to a lot of wheeling and dealing about what was included in the contract. (CEO, BioVentureHub) I often clarify for [the hub firm employees] that the meeting with AstraZeneca experts is on our terms. It is contingent on the expert having time, he or she wanting to do it, and it not disrupting his or her own projects. (COO, BioVentureHub)
Developing a shared culture	Supporting a good work climate in the hub	<ul style="list-style-type: none"> When a new tenant arrives, we give their employees an introduction program. We inform them of many things, provide basic training, and, perhaps most importantly, try to make them feel at home. (COO, BioVentureHub) Innovation cannot be ordered. We can just try to create the best conditions for it to happen. (CEO, BioVentureHub) This hub concept is based on our having created a dynamic environment, and physical presence is thus important. (COO, BioVentureHub)
	Developing mutual trust among people related to the hub	<ul style="list-style-type: none"> A great accomplishment is that we have managed to develop a culture where people trust each other. People talk to each other. (COO, BioVentureHub) It is crucial that [AstraZeneca and the hub] not jeopardize the goodwill that we have created, and that we not do anything foolish against the hub firms. (CEO, BioVentureHub)

Inbound open innovation HRM work

By ‘inbound open innovation HRM work’, we mean activities directed specifically toward the host corporation’s own employees involved in the open innovation initiative, to enable and support their interactions with external parties, effectively and sustainably. Three areas are highlighted based on the study of BVH: (1) *staffing open innovation work*, (2) *developing employees through open innovation work*, and (3) *rewarding open innovation work*.

In terms of staffing, the hub team assumed the role of finding AstraZeneca experts in the global organization that matched the specific demands of the small entrepreneurial firms and, furthermore, of convincing them to meet with hub firm employees. To facilitate this staffing work, BVH gradually developed a network of AstraZeneca experts willing to engage with the small firms. The hub team also needed to mobilize support from line managers as well as top management, since they did not have a formal organizational mandate over these employees. There was, however, a generally positive attitude toward BVH throughout the R&D site, and convincing managers to allow their employees to engage with the hub for a few hours now and then was often not that difficult.

An important consequence for employees of participating in BVH was that it helped develop their knowledge and capabilities. This could involve very concrete scientific knowledge, in terms of new methods and techniques, but also knowledge of how to work in smarter or more agile ways. Simply put, by engaging with the small firms, the employees learned new things, as they had to translate their knowledge into new contexts, and in doing so, they also reflected on how to improve their own ways of working. BVH emphasized non-pecuniary rather than pecuniary rewards for the AstraZeneca employees. ‘It is based on voluntarism—we can never force anyone to participate if they do not want to’, the CEO of BVH proclaimed. Besides personal development, aspects such as personal recognition and networking opportunities were highlighted. Put differently, being selected by BVH as an expert, and interacting with valuable contacts in the small entrepreneurial firms, was often perceived by the employees as a reward in itself.

Outbound open innovation HRM work

In ‘outbound open innovation HRM work’, the emphasis is on activities directed toward strengthening the human resources external to the firm. Here too, three areas are highlighted based on the empirical analysis of BVH: (1) *recruiting external talents to the hub*, (2) *developing hub firm employees*, and (3) *ensuring a good work environment for hub firm employees*.

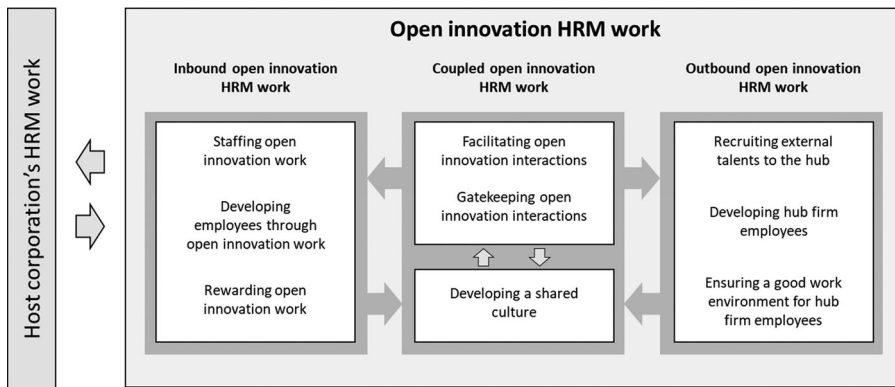


Figure 2. Theoretical model of open innovation HRM work.

The hub team put much effort into recruiting the ‘right’ external firms to BVH. The overall principle was to bring in firms with interesting science and innovations. ‘Competence attracts new competence’, as the CEO of BVH explained. It was also seen as important that potential new external firms understand the open innovation concept and be willing to engage their employees in the initiative in a collaborative and trustful spirit.

The hub team also developed new policies and educational programs to ensure that the external people acted within the ethical and safety constraints that AstraZeneca had set. This was seen as more complicated than instructing its own staff, because of the shared and somewhat blurry lines between ‘host’ and ‘tenant’ responsibilities. Furthermore, BVH assumed the role of educating the hub firms and their employees about ‘Big Pharma’ practices, including how to set up regulatory studies or design projects so that they better meet the standards of large corporations.

The third outward-oriented HRM area that BVH emphasized was to ensure that the external firms and their employees had a supportive and well-functioning work environment inside the hub. This involved, for example, refurbishing offices and lab facilities in line with the external firms’ needs and opening up some of the corporate IT infrastructure. The hub firm employees had the same access to the whole R&D site as did the AstraZeneca staff, and could use facilities such as restaurants, dry cleaning, and meeting rooms. Gradually, more and more processes and routines were developed, to make it easier for the external small companies to drive their own innovation work and to collaborate with other actors within the hub. For example, several onboarding activities were established for new firms arriving at BVH, including an introduction program and handling practicalities such as access to facilities and systems. Hence, to be a good host, the hub team developed a solution-oriented mindset.

Coupled open innovation HRM work

While the inbound HRM work targets AstraZeneca's own employees (i.e. staffing, developing, and rewarding them), and outbound HRM work targets external human resources (i.e. recruiting external talents, and developing and supporting them), other HRM work emphasized the actual interactions between internal and external human resources. We call this 'coupled open innovation HRM work' and, based on the empirical analysis, we highlight three such activities: (1) *facilitating open innovation interactions*, (2) *gatekeeping open innovation interactions*, and (3) *developing a shared culture*.

First, BVH actively facilitated the interactions between the hub firm and AstraZeneca employees in terms of hosting structured meetings and promoting informal contact. This meant that the hub team often approached the small firms and the internal employees of AstraZeneca to engage them in seminars and workshops or just share coffee. One advantage of BVH, often mentioned by the interviewees, was that it made room for interactions without first deciding on contractual arrangements and strategic goals.

However, BVH also had a gatekeeping role in relation to the interactions, for example, ensuring confidentiality and documenting more formal meetings. The hub team felt the need to manage hub firm expectations (and to some extent those of AstraZeneca employees) so that they would not use more AstraZeneca resources than agreed upon. This was especially important in relationships to former AstraZeneca employees hired by external hub firms, because they still had personal relations with former colleagues and had also good knowledge of the resources and services that AstraZeneca could offer.

The third HRM-related area that BVH focused on in relation to the coupled interactions between AstraZeneca and hub firm employees was developing a shared culture that promoted creativity and knowledge sharing. 'A collaborative culture, and not an extreme emphasis on patents', as the COO of BVH put it. This emphasis was in line with the general cultural shift that had started within AstraZeneca, and especially at the Mölndal R&D site, where openness and external collaboration were encouraged throughout the organization.

A theoretical model of open innovation HRM work

The analysis of BVH shows that HRM is a vital element of the enactment of open innovation, in line with the conceptual claims of Hong et al. (2019). As our findings show, one bundle of inbound HRM activities targeted AstraZeneca employees, preparing and rewarding them for engaging in open innovation work. A second bundle of outbound HRM

activities targeted external employees in the hub firms, creating favorable conditions for them to undertake open innovation work. Finally, a third bundle of coupled HRM activities developed the interface between AstraZeneca and hub firm employees to be as supportive as possible of open innovation work. From the empirical analysis, a theoretical model has been developed to illustrate how BVH handled these HRM activities to manage people in the open innovation initiative (see [Figure 2](#)).

The empirical analysis suggests, in line with previous research (e.g. Jiang et al., 2012, Seeck & Diehl, 2017, Haneda & Ito, 2018), that the simultaneous introduction of several bundles of HR practices furthered the implementation of the open innovation initiative, since the practices not only facilitated the open innovation work, but also reinforced one another. In other words, HRM activities were not applied piecemeal, but were configured into an integrated framework. Our theoretical model identifies reinforcing relationships among the three main components of open innovation HRM work (i.e. inbound, outbound, and coupled HRM work). We will here address four such connections, which can all be seen as propositions for future research.

First, we argue that inbound HRM activities can support the innovation hub in developing a shared culture based on openness and collaboration. Such a culture has the potential to then act as a strong governance mechanism for the collaborative activities inside the innovation hub (see also Aagaard, 2017), which is of great importance since open innovation initiatives generally need governance forms other than traditional hierarchical control (Demil & Lecocq, 2006, Wikhamn & Styhre, 2019). The COO of BVH explained: '[In BVH], a kind of social contract has been established, where people interact and share knowledge based on the fact that they trust each other, although no formal contracts have been signed'. We suggest that there is a link between how the host corporation approaches the staffing, developing, and rewarding of its own employees engaged in the innovation hub, and how these employees in turn interact with the external hub firms. In other words, the inbound HRM activities have the potential to support the development of trust and relational identification among the hub firm employees, and can thus help to reduce the perceived asymmetric power relationships that otherwise could hinder the generative output of collaborative work (Feng et al., 2019). As the CEO of BVH put it, 'A crucial aspect of why this works is that we have been able to build an environment where people dare to talk to each other. Trust is the single most important success factor'.

Second, we propose that outbound HRM activities can also assist in developing a constructive shared culture. As explained earlier in the empirical analysis of outbound open innovation HRM work, the

recruitment of external talents to the hub emphasized attracting not only the right knowledge, but also the right attitudes and motivations for contributing to collaborative work. Such reasoning recalls conventional HRM research suggesting that it is not just a matter of getting people on board, but rather of getting the *right* people on board (Collins, 2007). This is moreover in line with the person–environment (P–E) fit perspective (Cable & Edwards, 2004, van Vianen, 2018), proposing that people tend to seek out environments that match their own characteristics, but that these individuals also influence the environment they come to work in. Put differently, when the innovation hub engages talents with a collaborative mindset, they in turn make the innovation hub more attractive for other talents with a collaborative mindset. Echoing this, the CEO stated: ‘We want to attract new competences [to the hub] because we believe that when these talents interact, new ideas will emerge. We therefore need to build an environment where creative people think that this seems like a good place to work’.

Third, we propose that the coupled interactions not only facilitate knowledge sharing and the development of trust between the involved parties, but also may enhance the capabilities of all actors to better cooperate in future coupled encounters (see also Wikhamn & Styhre, 2017). The COO explained: ‘When I talk [to the AstraZeneca employees] after the meeting sessions, they say that it was really inspiring, but also that they learned a lot since they had to discuss the issues from a different perspective’. When interacting with the hub firms, the host corporation’s employees must translate their knowledge into the small hub firms’ settings, which have fewer resources but also less bureaucracy and more agile work processes. This opens up new possibilities for them to apply their valuable knowledge, while simultaneously educating them in new ways of approaching external actors. Hence, through these encounters, the employees are given opportunities to develop their dynamic, open innovation capabilities (Teece, 2020), and the firms can continuously refine their processes of staffing, developing, and rewarding for open innovation.

Finally, we also suggest that the informal HRM work in the innovation hub may influence or even challenge the formalized HRM work inside the host corporation (e.g. how to recruit talents, provide development opportunities, and give rewards). For instance, interviewees claimed that the open innovation initiative had improved the employer brand of AstraZeneca, helping the corporation in attracting new employees to the site. Furthermore, AstraZeneca let some of its employees temporarily work in the small firms to learn new things, and some hub firms were allowed to recruit employees from AstraZeneca, providing altogether new career paths for the staff. Hence, by interacting with

external firms through open innovation, the host corporation has the potential to increase its entrepreneurial capabilities (Shipton et al., 2017) and develop more agile and responsive HRM processes (Biron et al., 2021).

Discussion

Since its introduction by Chesbrough (2003), open innovation has moved from the periphery to the center of attention among scholars, practitioners, and policy-makers in the last decade (Chesbrough & Bogers, 2014, Randhawa et al., 2016, Bogers et al., 2017, Chesbrough, 2020). The concept has shown its potential to advance the innovation process in many ways, but has also raised difficult challenges when being implemented in practice. Because open innovation not only blurs organizational boundaries, but also challenges traditional views of innovation management and business strategy (Chesbrough & Appleyard, 2007, Hautz et al., 2017), it opens up new interesting avenues for HRM research (Hong et al., 2019).

We started this paper by seeking to answer the question ‘What forms of HRM work do corporations engage in to manage human resources in open innovation initiatives?’ Based on an in-depth analysis of AstraZeneca’s implementation of BVH, we have illustrated how HRM played a critical role in making open innovation work in practice. First, an important characteristic of the HRM work in our case is its informal approach. BVH did not formally assign an HR person or HRM function to conduct the HRM-related work, which was mainly done by the CEO and COO of the initiative (BVH was organized as a separate company, but the CEO of BVH reported to the head of the R&D site). This is similar to how many small firms address HRM, using fewer HR professionals and more informal work methods (Ram et al., 2001, Harney & Alkhalaf, 2021). Although these HR practices tend to be less sophisticated than in large firms (Harney & Dundon, 2006), they nonetheless play a significant role in small firms’ performance and development (Lai et al., 2017). In the SME context, overly formal and rigid HR practices have been convincingly argued to threaten employee participation (Saridakis et al., 2013) and job satisfaction (Lai et al., 2017). BVH displayed many similarities to a young startup, with a hub team that behaved very dynamically and entrepreneurially. At the same time, the hub team could benefit from the host corporation’s vast resources and strong legitimacy, so they did not experience the liability of newness and smallness that often characterize small, resource-constrained firms (Cardon & Stevens, 2004).

The empirical analysis has identified three broad and interconnected areas of HRM work—inbound, outbound, and coupled HRM work—that

together capture how people are managed specifically in open innovation initiatives. We integrated our empirical findings in a theoretical model and explained how the three bundled areas relate to the enactment of open innovation, and how they reinforce one another. The framework highlights that HRM activities supporting open innovation must target not only the internal human resources of the firm but also external human resources—a rather neglected area in the HRM/innovation literature. Two emerging perspectives that have recently emphasized outward and cross-boundary HRM activities are collaboration-oriented HRM (Lepak & Snell, 2002, Zhou et al., 2013) and networked HRM (Swart & Kinnie, 2014). Superficially, these perspectives resemble our view of outbound open innovation HRM, but despite some clear overlaps, there are also important differences. Notably, Zhou et al. (2013) and Swart and Kinnie (2014) have addressed cross-boundary organizing in terms of more traditional collaborative structures based on either formal contracts (as in partnerships and subcontracting) or strong interdependencies (as in customer interactions). These forms of innovation surely fall under the wide umbrella of open innovation (Stanko et al., 2017), but are based on a rather limited and control-based view of open innovation, and arguably may even be better addressed through the rigorous literature on strategic alliances or supply chain management (see also Van de Vrande & de Man, 2011). The open innovation initiative in our study is clearly not a strategic alliance, and we believe that it is better described as what Weiblen and Chesbrough (2015) have called ‘lightweight open innovation’, in which governance is based on influence, relationships, and trust, rather than on transactional control (Chesbrough, 2020).

Our findings also challenge mainstream theories of strategic HRM (Huselid et al., 1997) and high-performance work systems (Becker & Huselid, 1998, Boxall & Macky, 2009) in that BVH did not emphasize aligning its HRM activities with the strategic, profit-oriented goals of the host corporation. In fact, the overall purpose of BVH was to help develop innovations for external firms in which AstraZeneca had no direct financial stakes and, moreover, to improve the surrounding life science ecosystem. It was seen as an advantage by the hub team not to connect itself too much to the strategic goals of the host corporation, as this allowed them to tailor the HRM activities to open innovation without being restricted by business as usual. Rather than focusing on gaining new short-term income streams, AstraZeneca targeted softer values such as creating a great place to work and building trustful relationships with potential future partners in the wider ecosystem. AstraZeneca employees’ engagement was voluntary and promoted through non-pecuniary rewards: organizational recognition for being selected by BVH as a corporate expert with valuable knowledge. However, although

many activities were emergent and bottom-up oriented, support from line management was critical, as managers had to grant employees' time for open innovation work despite high workloads in their regular internal projects. Furthermore, and recalling Aagard's (2017) findings regarding radical front-end innovation in pharmaceutical and biotech firms, the facilitation of what she called a 'blame-free, more risk-averse innovation culture' (p. 443) was instrumental for employee engagement at AstraZeneca.

Our study furthermore suggests that part of the HRM framework for BVH closely resembles what Shipton et al. (2017) have described as an entrepreneurial HRM system, which focuses on creating opportunities for exploratory learning and critical reflection, rather than solely emphasizing commitment to top management's strategic goals and the organizational performance of, in this case, AstraZeneca. Hence, unlike the more traditional views of strategic HRM, entrepreneurial HRM—as well as open innovation HRM in this case—is intended to foster employee discretion, autonomy, and participation in relation to how the firm may alter its paths forward. Specifically, BVH's inbound and coupled HRM activities were designed to help employees gain new perspectives and challenge their taken-for-granted beliefs about how to develop pharmaceutical innovations. As Spithoven et al. (2010) noted, an organization's absorptive capacity to internalize external knowledge can be seen as both a precondition for open innovation and something that can be gradually improved due to employee engagement with external actors.

On an organizational level, AstraZeneca's HRM activities in BVH were separated from the host corporation's strategic HRM processes since they specifically targeted new work areas derived from the open innovation initiative. In other words, the open innovation HRM activities did not *replace* the established HRM practices in AstraZeneca but developed parallel to them. This division arguably created opportunities for *organizational ambidexterity* (O'Reilly & Tushman, 2013, Patel et al., 2013) by which the informal and explorative processes in BVH could indirectly inspire and influence the host corporation's exploitation processes. This is also in line with Biron et al. (2021) proposition that organizations could benefit from adopting a 'skunk works' approach to HRM. They define this concept as a group of employees released from bureaucratic impediments, enabling them to come up with more novel and rapid responses to non-routine HRM challenges than are possible using the 'normal' forms of decision-making based on routine and efficiency. Given that corporations operate in increasingly complex environments, the need to develop HRM functions that are flexible and responsive has increased (Shipton et al., 2017), and engaging in open innovation can serve as a well-suited platform for such an HRM skunk works approach.

Table 3. Distinction between traditional HRM and HRM in BVH.

	Traditional HRM	Open innovation HRM in BVH
Degree of formality	High	Low
Targeted human resources	Internal human resources	Internal and external human resources
Main governance mechanisms	Hierarchy and contracts	Culture and trust
Degree of alignment with firm strategy	High	Low
Main purpose	Efficiency and stability	Learning and change
Main emphasis	Output/value capture	Process/value creation
Examples of related literature	Becker and Huselid (1998), Boxall and Macky (2009), and Patel et al. (2013)	Shipton et al. (2017), Zhou et al. (2013), and Hong et al. (2019)

To summarize, [Table 3](#) identifies the HRM activities in BVH versus what is described in more traditional HRM literature, suggesting that HRM work related to open innovation needs to be approached in ways differing from what the mainstream HRM literature claims.

Conclusion

The open innovation literature is still in need of more in-depth empirical research (Mortara & Minshall, 2014, Wikhamn & Styhre, 2020). Calls have specifically been made to extend our knowledge of how open innovation can be implemented in the life science industry (Gassmann & Reepmeyer, 2005, Hunter & Stephens, 2010), otherwise often portrayed as governed by a tight appropriability regime (Teece, 1986) based on competition and closeness. This paper illuminates what is undoubtedly among the most important aspects of open innovation in practice, namely, the management of human resources. We identify five main contributions to theoretical knowledge of how corporations use HRM work to manage human resources in such open innovation initiatives.

First, the paper adds to the scant research into the intersection between HRM and the burgeoning field of open innovation, highlighting the great potential of HRM research to advance our understanding of this new phenomenon. We build on the conceptual arguments raised by Hong et al. (2019) and extend them using an in-depth empirical study. We highlight the three areas—inbound, outbound, and coupled open innovation HRM work—and combine them into an integrated and dynamic framework that is both theoretically aligned and empirically supported. While we concur with scholars such as Stanko et al. (2017) that the open innovation concept is very broad and inclusive, and that each case is therefore contextually bound, we believe that the framework involves HRM areas that are important aspects of most open innovation initiatives, and are thus generalizable to other contexts.

Second, unlike most HRM-innovation research that focuses on managing internal employees to foster creativity, knowledge sharing, and innovative behavior (e.g. Collins & Smith, 2006, Lopez-Cabrales et al., 2009), we extend this strand of research by noting the importance of also directing HRM activities toward external human resources in open innovation initiatives. The external orientation of HRM is an emerging research area (see e.g. Lepak & Snell, 2002, Zhou et al., 2013, Lin et al., 2020), and while our study adds to this HRM literature, the area is still under-theorized and merits further research attention.

Third, we not only explain how bundles of HRM activities individually facilitate open innovation work, but also discuss how they interrelate with, and strengthen, one another. This is in line with the bundle approach to HRM (e.g. Jiang et al., 2012, Seeck & Diehl, 2017, Haneda & Ito, 2018), suggesting that individual practices should fit together and be implemented in combination, in order to reinforce one another. Our theoretical framework introduces such HRM bundles (inbound, outbound, and coupled) and furthermore proposes four specific relationships among these bundles.

Fourth, we discuss our framework in relation to previous HRM/innovation literature, particularly concerning entrepreneurial HRM (Shipton et al., 2017) and collaboration-oriented HRM systems (Lepak & Snell, 2002, Zhou et al., 2013). While some of these studies have already connected open innovation and HRM, existing research is largely conceptual and/or mainly approaches openness in terms of more conventional innovation practices and control-based forms of open innovation, such as alliances and partnerships (e.g. Lepak & Snell, 2002, Petroni et al., 2012, Hong et al., 2019). We extend these conceptual approaches by applying and translating them to specifically target the study of HRM in more novel open innovation forms. The paper represents one of a very few studies that provides empirical evidence of how HRM work is used in more unconventional, and less control-oriented, collaborative innovation settings, and as such it presents a new area on which both open innovation and HRM scholars can build.

Fifth, the study extends our understanding of how organizations facilitate open innovation by introducing the notion of ‘informality’ to the HRM/open innovation domain. Indeed, as our case shows, the BVH initiative lacks a formal HR function and the HRM-related work has instead been carried out mainly by the hub team, similar to HRM work in small firms (Ram et al., 2001, Harney & Alkhalaf, 2021). We explain how this informal approach to HRM helped the organization become responsive to the specific needs of the open innovation initiative. We also propose that this exploratory approach to HRM can have an

entrepreneurial influence on the formal HRM processes of the host corporation over time.

Managerial implications

Paradoxical questions arise when opening organizational boundaries to the inflow and outflow of knowledge, such as how to motivate and organize internal as well as 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 limiting its potential (Demil & Lecocq, 2006). Our study illustrates how open innovation can be enacted in practice, and presents concrete HRM activities required for managing the open innovation initiative. We hope that the BVH case can inspire and guide practitioners to explore the possibilities of openness and how to support it with HRM.

Furthermore, the study agrees with Seeck and Diehl (2017) that open innovation HRM work should be implemented within a framework and not as separate activities, as the different bundles of HR practices could reinforce one another. Put differently, engaging in a single HRM activity is insufficient for managing people in open innovation. Our findings also show that leading open innovation initiatives requires not only technical knowledge and organizational legitimacy, but also people skills that go beyond hierarchical mandates and organizational power. As such, open innovation leaders should be prepared to fill two intertwined roles: a general manager role and an informal HRM role. We also call on managers to carefully reflect on how open innovation HRM activities relate to established HRM systems, since they may be based on two opposing logics (Shipton et al., 2017) and therefore be difficult to align.

Finally, while our framework can be a starting point for analyzing how to set up an HRM system for open innovation, we advise first considering the main purpose of the initiative at hand. Bundles of HRM activities then need to be developed to support the mission, and these activities need to target both the internal and external human resources involved in the innovation work.

Limitations and future research

Although we have presented a general framework for open innovation HRM work that we believe is generalizable to other contexts, we are aware of the general drawbacks of theorizing from a single-case study (Flyvbjerg, 2006) and the contextual contingencies such an approach may entail (Busse et al., 2017). We agree with Aagard's (2017) claim that HRM systems must be tailored to each specific case, so we call for

more empirical qualitative and quantitative research exploring the HRM–open innovation relationship in various contexts. Such studies could verify and/or develop the theoretical model we propose by adding or replacing HRM bundles and further analyzing their possible interrelations. Also, while the interviews we conducted provided valuable insights from the hub team of BVH and from AstraZeneca’s managers, future research is encouraged to study how such HRM work is perceived by employees of the host corporation and, not least, of the hub firms.

When analyzing our material, we were intrigued by the fact that open innovation engagement can lead to increased engagement among the involved employees, enhancing *employee wellbeing*—or what Grant et al. (2007, p. 52) defined as ‘the overall quality of an employee’s experience and functioning at work’. As Guest (2017) claimed, there is a strong case for promoting employee wellbeing in its own right, to keep organizations sustainable and their employees healthy, but it can also yield benefits in terms of a positive employment relationship and improved individual and organizational performance. We call for future research to investigate how engagement in open innovation might increase such awareness in incumbent firms. It would be particularly interesting to know how open innovation relates to employee and organizational wellbeing and how organizations can assess the success and failure of such efforts.

Moreover, engaging in open innovation can enhance the *employer branding* of the corporation—what Backhaus and Tikoo (2004) regard as a long-term strategy to manage current and potential employees’ perception of the organization as a good place to work. A recent study by Tumasjan et al. (2020) highlighted that the employer branding orientation indirectly influences firm performance, doing so mainly through the existing employees’ positive affective climate, and not so much through recruitment efficiency. Encouraging open innovation through HRM activities likely contributes in that way, and we believe that this would be an interesting avenue for future research.

To conclude, the previous open innovation literature has demonstrated that innovation initiatives can be designed in many different ways (Randhawa et al., 2016, Stanko et al., 2017), and that engaging in open innovation may problematize the more conventional view of human resource management. It is our conviction, however, that as the open innovation field matures, it has much to learn from the knowledge generated within the HRM domain.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author, [BRW]. The data are not publicly available due to privacy concerns that could compromise the privacy of research participants.

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