Maximizing team development for open innovation in digital product development: the role of collaborative HRM and relational leadership

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Abstract

Purpose – The purpose of the study was to maximize team members' collaboration and develop relationships in a newly formed team to engage with internal and external partners to achieve open innovation (OI) in product development. The authors examine the role of collaborative human resource management (HRM) and relational leadership (RL) in this process.

Design/methodology/approach – The study took a two-stage qualitative methodological approach to examine relational leadership as it emerges in a newly formed cross-functional team at a large German fashion house. In stage one, 10 interviews were conducted with members of the new project team over three months and in stage two six external knowledge exchange partners were interviewed.

Findings – Collaborative HRM promotes greater social exchange, trust and commitment of team members internal and external to the organization to support the emergence of RL, which is critical for OI. The authors found that collaborative HRM practices such as team-based recruitment, team-based training, team-based performance management with rewards systems and job design support the emergence of RL. Moreover, RL practices such as congruence and commitment towards team goals subsequently promoted the development of knowledge sourcing and sharing (KSS) to support OI.

Originality/value – The study is the first to demonstrate how collaborative HRM enables RL practices to help newly formed teams overcome challenges with achieving KSS to successfully engage with internal and external partners for OI. The authors contribute to HRM theory development of the relationship between HRM and OI by conceptualizing the OI process as a social construction through collaborative HRM and relational leadership.

Keywords Collaborative HRM, Open innovation, Relational leadership, Knowledge sourcing, Knowledge sharing

Paper type Research paper

Introduction

This study is about a large German fashion house with a strategic goal to maximize product digitization through means of open innovation (OI) using collaborative human resource management (HRM). OI is an approach to organizational innovation that emphasizes the use of knowledge within and across the boundary of an organization to leverage external sources of knowledge for the purpose of commercialized solutions (Chesbrough, 2006; Gassmann *et al.*, 2010). In today's competitive business environment, organizations, such as the German fashion house, increasingly rely on cross-functional project teams to solve complex business problems (Ehrhardt *et al.*, 2014). To understand business problems within cross-functional teams it is important for HRM professionals to examine the inflow and outflow of knowledge within and across the boundaries of an organization and establish HRM practices that

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facilitate such knowledge work (Chesbrough, 2006; Gassmann *et al.*, 2010). We use the concept of knowledge sourcing and sharing (KSS) as a key knowledge exchange process to enable OI (Nedon, 2015). KSS represents the mutual sharing and sourcing of knowledge at the employee level which translates into the inflow and outflow of knowledge at the organizational level, thereby influencing OI (Engelsberger *et al.*, 2023). Cross-functional teams are a collection of members of different departments and disciplines sharing responsibilities to make product development decisions (Ungureanu *et al.*, 2021).

However, there are often barriers within cross-functional teams associated with negative employee attitudes towards sharing knowledge and working with other team members from different functional and professional backgrounds (Burcharth *et al.*, 2014). One of the main barriers is employee resistance to organizational change (Dąbrowska *et al.*, 2019). It is challenging when cross-functional team members have different professional values, languages, customs and approaches which inhibit the capacity to develop productive relationships and share/utilize ideas (Ungureanu *et al.*, 2021). It is also challenging to build a culture conducive to maximizing innovative practices/products (De Brentani *et al.*, 2010). It has been argued that cross-functional teams create enormous opportunities to share, create and innovate given the diverse range of knowledge, skills and abilities of disparate professionals (Ehrhardt *et al.*, 2014). We argue that there is an important role for collaborative HRM in supporting cross-functional team members to collaborate and subsequently enhance KSS and OI.

We apply the process of relational leadership (RL) (Uhl-Bien, 2006) to explore how a newly formed cross-functional team works to engage in KSS for OI to overcome the barriers associated with cross-functional teamwork. RL is defined as "a social process through which emergent coordination (i.e. evolving social order) and change (i.e. new values, attitudes, approaches, behaviours, ideologies) are constructed and produced" (Uhl-Bien, 2006, p. 655). RL is a way to understand how cross-functional teams can overcome any internal challenges of diversity and leverage wider communications and networks. RL is important because it enables organizational actors to better understand how leadership emerges and is embedded to promote shared expertise and facilitate collaboration among group members to achieve organization and team objectives such as creating innovative products (Clarke, 2018). RL in the context of cross-functional teams provides insights into the importance of strong relationships to enable cooperation and subsequent sharing of specialist knowledge. The language, focus and processes of one functional area can be very different to another. For example, a design team member uses different linguistic terms, technology and skills to those of a fabric cutting team member. When relationships are collaborative and supportive this allows team members the confidence to ask questions and remove anxiety around asking obvious questions of someone who finds the information straightforward. We argue that collaborative HRM is important to establishing the conditions through which RL can emerge in cross-functional teams.

We have not found any study that examines the role of collaborative HRM and RL in a newly formed project team and how team members work to achieve OI. There is a dearth of research on the role of collaborative HRM and RL within an organization's boundaries and with external knowledge partners for OI. There is also a lack of research on German organizations operating internationally to pursue open innovation especially in Asian contexts such as Korea. Our research question is: How can collaborative HRM enhance the RL practices of team members to support the KSS of a new project team for OI and product digitization? We utilize a case study method that employs interviews undertaken across two stages and four time periods. In stage 1, we interview the 10-member innovation team (operating in Germany) across three time periods (one month apart). In stage 2, six months later, we interview four workers from the external exchange partner (operating in Korea) and re-interview 10 members of the original innovation team.

Our paper contributes to the HRM literature by examining the process through which collaborative HRM enables RL to support the KSS of a new project team within an organization. We unpack the theoretical process through which collaborative HRM establishes the conditions for RL to emerge and support OI. In doing so, we contribute to theory building on the role of collaborative HRM, leadership and organization of workers engaged in OI within and external to an organization (Stock *et al.*, 2017). We contribute to the growing body of research on collaborative HRM, KSS and OI (Engelsberger *et al.*, 2022, 2023). Furthermore, we contribute to HRM practice about how RL contributes to the achievement of strategic goals with external partners that drive innovative behaviours in a new digital product development (DPD) team.

The challenges of open innovation and the promise of collaborative HRM and relational leadership

It has been established that cross-functional teams often experience challenges when working together to innovate for product development (Ehrhardt *et al.*, 2014). Mangers tend to focus more on time and cost efficiency, whilst a designer's objective revolves around the functionality and style of a product. Due to competing personalities and approaches, communication barriers may arise and hence increasing coordination and negotiation time which eventually impact on costs and efficiencies (Ungureanu *et al.*, 2021). Communication barriers often occur because of assumptions and stereotyping regarding other disciplines and a lack of awareness and appreciation of co-operating with other disciplines, which can make it difficult to develop and build a cohesive team. Although some organizations benefit from establishing cross-functional teams, others struggle with implementation, ultimately leading to substantial project rework, increases in organizational costs and overall poor performance outcomes (Ehrhardt *et al.*, 2014).

To maximize OI and project outcomes, it is critical that team members' behaviours are aligned with the strategic goals of the organization (Becker and Huselid, 2006) and reinforced by strategically aligned HRM practices (Boxall *et al.*, 2011). To achieve coordinated efforts of team members, the team focus must be underpinned by the strategic goals of the organization and related HRM practices (i.e. collaborative HRM) (Bartram *et al.*, 2007; Engelsberger *et al.*, 2023), which reinforce and incentivize strategically valued attitudes and behaviours, as well as cultivate social order that is determined by expertise and experience (i.e. RL) (Clarke, 2018). In this paper, we use Hong *et al.*'s (2019) conceptualization of collaborative HRM which comprises of four HRM practices: (1) team-based recruitment, (2) training in teamwork skills, (3) team-based appraisals and rewards and (4) rotational job design. Hong *et al.* (2019, p. 44) suggest that collaborative HRM practices may reduce "organizational-capability-related barriers to OI while also enhancing employees' capabilities and motivation to participate in [. . .] open innovation".

We argue that critical to OI is the need for collaborative attitudes and behaviours among OI team members that facilitate KSS between internal and external organizational actors (Engelsberger *et al.*, 2022; Oparaocha, 2016). A recent survey of 367 certified innovative Portuguese small and medium enterprises by Muñoz-Pascual *et al.* (2019) reported that collaborative orientated HRM practices were a necessary pre-condition for knowledge sharing between organizations and business partners.

Collaborative HRM practices are critically important in the process of developing relational leadership and subsequent KSS (Engelsberger *et al.*, 2023). Collaborative HRM practices focus on developing trust, loyalty, mutual commitments and positive social exchanges among team members. Positive social exchanges through collaborative HRM facilitate internal and external knowledge exchange, which are critical components of OI. When collaborative HRM practices are used as a bundle of practices within an OI team,

they may reduce barriers to OI and facilitate relational situations to support the need for collaboration (Oparaocha, 2016) and in turn KSS (Engelsberger *et al.*, 2023). Collaborative HRM promotes internal knowledge flows that are critical for OI through developing stronger social exchanges between team members which create the conditions for relational leadership. Relational leadership is dependent on positive social exchanges which are underpinned by interdependence, enhanced trust and cooperation among OI team members. Collaborative HRM practices such as team-based recruitment, training in teamwork skills and team-based appraisals and rewards can create opportunities and the need for reciprocal exchanges (e.g. sharing expertise to solve challenging problems) given commonality of goals and greater team interdependency. Rotational job design may also enhance team members' knowledge and skills to foster positive social exchanges between OI team members and knowledge exchange partners (Cropanzano *et al.*, 2017). The process of RL may reduce the well documented challenges associated with cross-functional teams to support the capacity to enhance KSS and potentially OI (Hagel and Brown, 2008). RL allows organizational team members to improve KSS and leverage capabilities in OI (Ungureanu *et al.*, 2021). Team members can be highly creative by acting as resourceful strategists to harness the knowledge. They can create an environment conducive to support OI (Bogers *et al.*, 2019).

Theoretical framework

In this study, we examine the processes through which collaborative HRM enables RL through Drath *et al.*'s (2008) DAC framework. The DAC framework provides a means by which to consider individual and collective beliefs and practices that may enhance KSS and OI underpinned by collaborative HRM practices (Bogers *et al.*, 2019; Hong *et al.*, 2019). The DAC framework allows the researchers to examine leadership as a social process through which new coordination, goals, behaviours and change emerge (Uhl-Bien, 2006), and in this case it is important because in the organization the outcome is to promote OI. **Direction** concerns "the widespread agreement in a collective on overall goals, aims, and mission" (Drath *et al.*, 2008, p. 636). If there is a common agreement about direction in a collective, it means there is "shared work" and understanding the collective's mission or goals and how the members agree on the direction (Drath *et al.*, 2008). **Alignment** refers to "the organization and coordination of knowledge and work in a collective" (Drath *et al.*, p. 636), which is "often achieved through structure and ... management" (p. 647). In large organizations this can be planning, budgeting, performance management, and reward systems. If there is alignment in a collective, the work of individuals is generally coherent among other individuals (Drath *et al.*, 2008). **Commitment** refers to "the willingness of members of a collective to subsume their own interests and benefit within the collective interest and benefit" (Drath *et al.*, p. 636) and it is about "mutual commitment" (p. 647) of the members. If there is commitment produced within a collective, members allow other members of the collective to make demands on other member's time and energy (Drath *et al.*, 2008). Based on the DAC, we contribute to greater understanding of the process through which collaborative HRM and RL contributes to OI. This process is based on the assumption that leadership is an interactive negotiated social order that develops over time in response to emergent challenges facing a collective (Drath, 2001) and evolves from personal dominance to interpersonal influence and eventually to relational dialogue. Hence, the DAC assumes that leadership practices are shared collectively (Huffaker, 2017). Although DAC is an approach to RL (Hosking, 2007) through the clear focus on outcomes, this approach addresses the criticism and limitations of RL in regards to how long it takes to build a cohesive group. This study also addresses how the lines of responsibility and authority can

become blurred between those with decision-making powers and subordinates (Uhl-Bien and Ospina, 2012).

We argue that the development of KSS is dependent on the extent to which there is reciprocal connection to all three elements of DAC (Drath *et al.*, 2008) to achieve OI. DAC can be produced by an individual, a team, an organization, or inter-organization and society overall (Drath *et al.*, 2008). However, levels of reciprocal connection of team members are usually the result of trust and commitment (Peralta *et al.*, 2015) which we argue is underpinned by collaborative HRM practices. There are four key elements that underpin direction, alignment and commitment:

(1) *Leadership beliefs:* a confidence in behaviour, and an attitude of the leader or leaders that their leadership will produce the best outcomes for a team (Sveiby, 2011). The DAC framework assumes that individual leaders hold beliefs about how to produce conditions for DAC and when they work with others in a collective, they act based on their beliefs and expect that others will do the same. In line with Hong *et al.* (2019), we suggest that such beliefs are underpinned by collaborative HRM such as team-based training and team-based rewards. Beliefs about how to produce DAC become consequential and influence how DAC is produced (Hosking, 2007). The individual and collective beliefs about how to produce DAC comprise understandings of the knowledge for a specific project and how that knowledge will be shared. Leadership beliefs are seen as a shared resource (and influenced by collaborative HRM) for producing DAC and provide the basis of leadership (Drath *et al.*, 2008).

(2) *Leadership practices*: this is about a pattern of behaviours of a collective aimed at producing DAC (Sveiby, 2011). Practices are referred to as collective enactments such as conversations or routines that transcend individual behaviour. In general, specific to leadership practices, the DAC framework is relational (Hosking, 2007; Uhl-Bien, 2006) because the behaviours and actions of individual members are interpreted in consideration of their place and significance within a larger group or team. Collaborative HRM practices, through enhancing social exchange (i.e. team-based rewards) create the conditions for RL to take place in the OI teams. The ways in which knowledge is sourced and work is performed is sustained by the team members' beliefs and shared practices (Drath *et al.*, 2008).

(3) *Leadership culture:* this is about an established and stable pattern of collective approaches towards the production of DAC (Sveiby, 2011). This becomes a system of beliefs about how to produce knowledge and support the relational understandings of team members (Drath, 2001). The customs and norms within a team embrace individual and collective beliefs and shared practices (Hosking, 2007; Uhl-Bien, 2006). Such a leadership culture is underpinned by collaborative HRM that sets out to create a culture of collaboration, trust and commitment among OI team members (Hong *et al.*, 2019).

(4) *Leadership context:* this is about the larger system of beliefs (Sveiby, 2011), whereby context and leadership are seen as reciprocally interacting interdependent elements. Leadership beliefs and practices that substantiate those beliefs exist not in insolation from one another but in mutually supportive webs or networks which are informed by collaborative HRM. The production of DAC leadership is inextricably bound up in the ways in which individuals and a team build knowledge and the interconnected ways how knowledge is sourced and shared (Drath *et al.*, 2008).

In a project team with shared decision-making processes and flat-hierarchies, leadership roles are socially constructed between members that lead to an emergence of social order and

action (Uhl-Bien, 2006). Therefore, the inflow and outflow of knowledge across the boundaries of organizations to leverage external sources of knowledge support the development of new products/technology (i.e. DPD) (Chesbrough, 2006). We suggest that collaborative HRM creates the conditions which enable RL, KSS and subsequent engagement in open innovation.

Methodology

A qualitative methodological approach was designed to examine the complex phenomenon of RL as it emerges in a new project team (NPT) within a large German fashion house and the NPT and the knowledge exchange partners (KEPs). The German fashion house was selected as a research site because one of the researcher's had a contact in the organization which presented the researchers with gatekeeper access (Denzin and Lincoln, 2000). This fashion house was also selected because they were engaged in open innovation with KEPs in another national setting (i.e. Korea). When the researchers discussed the proposed project with the fashion house it was their preference that qualitative methods would best capture the views of the members of the newly formed team. It was agreed, a quantitative study would not be possible with such a small number of participants. The next phase was to ensure participants received participant information statements and informed consent forms to complete before data collection could commence (Fraenkel and Wallen, 1993). In this study, it was critical that all members of the NPT participated. Each of the participants read the information statements and signed the consent forms punctually as they were keen to have research conducted on how their newly formed team functioned. Each participant was informed they could withdraw from the study at any point in time without providing a reason. There would be no repercussions from the organization.

The researchers worked with the fashion house from the development and launch of a newly formed OI team. At the commencement of the project there were no HRM practices in place to directly support the NPT. Before the NPT was formed, the researchers put forward four collaborative HRM practices that could provide team members with the tools to enhance the OI process. These practices are selective team-based hiring, team-based training, team-based performance with reward systems, and rotational job design which can support building relationships among team members internally and externally to improve knowledge sharing and trust amongst team members and external collaborators (Hong *et al.*, 2019).

There are two stages to this study. Stage 1 involves the organization and the NPT and Stage 2 (to be discussed later) involved KEPs. The first stage was designed to inform the second-stage interviews in three ways. First, in the initial interviews with team members their enthusiasm and willingness to work collegially with other team members was evident. Second, in the first interviews, team members were meeting for the first time even though they may have worked for the company for several years the researchers wanted to know how their views were aligned. Third, the researchers set out to establish the level of understanding of KSS and commitment amongst the team members. It was important for the first stage interviews to be aligned before interviewing KEPs.

In Stage 1, there were three phases of data collection and each participant attended individual one-hour semi-structured interviews in English that gave the interviewer scope to gain rich data (Seidman, 2013). Data collection involved a series of 60-min face-to-face interviews, using a pre-developed interview guide which was adapted and further developed over the following interviews. The interviewer asked open-ended questions allowing the participant to convey their personal perceptions on the topic (Denzin and Lincoln, 2000). Across the course of the study a total of 30 interviews were conducted. Every four weeks (interviews were conducted in August 2019, September 2019 and October 2019) interviews

were carried out with each of the ten members of the new project team to make up the 30 interviews that provided rich data from this study. During data collection, we provided trustworthiness of the data (Lincoln and Guba, 1985) and increased reliability: first, we assured redundancy in our data by sequentially conducting interviews until all concepts are repeated multiple times without new concepts or themes emerging (saturation); second, we provided credibility by interviewing external partners. This way, we gained insights from multiple perspectives (inside and outside the company). Third, we ensured transferability by providing the list of participants (see Table 1). Last, we ensured confirmability by fully recording all 44 interviews, coding all transcripts in NVivo and documenting every step of data analysis to provide a rationale for the decisions made (Creswell and Creswell, 2017). When the themed analysis was carried out in NVivo we also carried out a manual process as verification. For example, in NVivo the theme of "direction of the team" was supported with terms such as "knowing the goals", and "understanding the mission". In the manual process was highlighted with narratives when participants articulated their understandings of the new team's purpose to "increase digital product development" and "the direction for the business was to go 3D" indicating they were aware of the course of the project.

Stage 2 knowledge sourcing and sharing between the new project team and knowledge exchange partners

Stage 2 took place six months after (interviews carried out in January 2020) the NPT was formed and follow-up interviews were conducted with 14 participants; eight interviews were carried out with internal project team members. Thirteen of the internal project team members were German and one was Mexican. One of the original members was on maternity leave and another left the company. Interviews were also carried out with six KEPs from one firm in Korea. Five of the KEPs were German and one was Korean. Therefore, across Stage 1 and Stage 2 a total of 44 interviews provided the rich data for this study. The findings at Stage 2 emerged out of data collected from one-hour interviews with 14 participants. Throughout the 14 interviews we were seeking preliminary views on how KSS is perceived and how it happens beyond the internal research team and with KEP. It was important for the second

Internal Participant Acronym – New Project Team	New Project Team Members Area of Expertise	Interview 1	Interview 2	Interview 3
NPT_P1	Ambassador – between the Product Developer, Technical Development and the Creative Team	1	1	1
NPT_P2	Brand Manager	1	1	1
NPT_P3	Pattern Designer and stimulates Trims; Turns 2D Sketch into 3D Piece	1	1	1
NPT_P4	Industrial Design, 3D Programs	1	1	1
NPT_P5	Technical Developer	1	1	1
NPT_P6	3D Development	1	1	1
NPT_P7	Technical Developer' Product Quality Control	1	1	1
NPT_P8	Strategic Project Management	1	1	1
NPT_P9	Background as Buyer now Project Management	1	1	1
NPT_P10	Pattern Designer	1	1	1
NPT	*Total Number of interviews 30*			

Source(s): Created by author

Table 1. Stage 1 interview over three months (participants of Stage 1 of the study, areas of expertise and number of interviews)

interviews to further explore the ways in which working with cross-functional team members worked together and if the level of initial enthusiasm was sustained and KSS was working well. The data highlights a cross-fertilization of views from the NPT and the members of a KEP team. The next two sections present a table of participants and a synthesis across both teams (see Table 2).

The analysis of the data commenced at the research site with the NPT and immediately following phone interviews with the KEPs with the purpose of identifying initial themes (Lofland and Lofland, 1984) support the practice of researchers focusing on recordings or note taking whilst commencing early analysis of the raw data. The researchers took notes and began the preliminary ordering of categories into memos. A category theme analysis was applied and there were conversations amongst the researchers about the categories (Strauss and Corbin, 1990). The writing up of initial ideas began and the researchers engaged in analysing the data and comparing notes to arrive at relevant categories.

The notes from the interviews were then transcribed and analysed through a second stage by using NVivo, following the steps of content analysis outlined by Weber (1990). This software assists researchers to analyse data into modules by importing, analysing and codifying the data to search for patterns in participants' responses (Yin, 2013). A deductive approach was utilized in accordance with the DAC framework (Drath *et al.*, 2008). The transcript of each interview was also coded independently by two coders, who are experts in

Table 2.
Stage 2 interview (participants of Stage 2 of the study, areas of expertise and number of interviews)

Internal Participant Acronym – New Project Team	New Project Team Members Area of Expertise	Number of Interviews Stage 2 × 1	External-Knowledge Exchange Partners Acronym	Knowledge Exchange Partners' Area of Expertise	Number of Interviews Stage 2 × 1
NPT_P1	Ambassador – between the Product Developer, Technical Development and the Creative Team	1	KEP1	Consultant and Software Trainer	1
NPT_P2	Brand Manager	1	KEP2	Consultant and Software Trainer	1
NPT_P3	Pattern Designer and stimulates Trims; Turns 2D Sketch into 3D Piece	Maternity Leave	KEP3	3D Design Lead 3D in Europe and Software Trainer	1
NPT_P4	Industrial Design, 3D Programs	Resigned	KEP4	3D Designer	1
NPT_P5	Technical Developer	1	KEP5	3D Software Trainer	1
NPT_P6	3D Development	1	KEP6	3D Software Trainer	1
NPT_P7	Technical Developer' Product Quality Control	1			
NPT_P8	Strategic Project Management	1			
NPT_P9	Background as Buyer now Project Management	1			
NPT_P10	Pattern Designer	1			
	Total Number of NPT and KEPs	*8*			*6*
	Total Number of Interviews 14				

Source(s): Created by author

OI, until saturation. The transcripts were read by each coder and inter-rater reliability was determined by the frequency of agreement between the first two raters (Yin, 2013). The two coders ensured the reliability of the coding framework. Where there was disagreement between the coders, a third rater, who researches in OI, was employed to finalize the coding. The results of NVivo and the thematic analysis of the two raters were combined to reach agreement on the main themes in the data. NVivo confirmed the themes identified in the manual analysis and identified additional themes as discussed at Stage 1 and Stage 2 of data collection in the next section.

Results

The direction of the new project team – first interview

Team members informed us that the recruitment and selection process across the entire organization was rigorous to ensure congruence with company goals and increase digitization by 80%. The data from the first interviews highlighted team members' understandings about the mission, vision and goals (Drath *et al.*, 2008) of the NPT to ensure each member of the collective understood how the direction of the project would unfold (Huffaker, 2017). There was immediate evidence of collaboration amongst team members in their attitudes and behaviours, and from a relational leadership perspective how they shared similar views on the strategic goals of the organization. The main goal of the NPT is to support the organization *"to go digital and to achieve the overall target of digitization"* by sharing and integrating knowledge, as well as developing innovation which facilitates digitization within the organization. Moreover, finding new ways of working is not only the goal regarding digitization but also when it comes to the management and structure of the NPT such as collective leadership and shared decision-making processes. Although the initial goal is quite broad, the participants seem to have a common understanding that the main goal is to:

> Achieve high-quality 3D simulation through all product groups . . .. an easy way of working . . ..they come to us and explain the current project . . ..so, that's why it's an open exchange and good collaboration [to help achieve the goal]. (NPT_P7)

Participants expressed their main assignment was to *"build on knowledge and skills"* through *"open innovation to increase digital product development"*. This was support through training and development activities undertaken by the HR department to deliver team member learning on the process of digitization, team building capabilities and communication skills. This was clearly in agreement with the organization's goal of product digitization by the NPT. The organization's vision was to capitalize on a *"green field"* approach with the autonomy to shift and change direction progressively, as new knowledge and skills were sourced and shared within the team, for ultimate outcomes. The participants described the project as a *"trial and error platform"* that would help them achieve digitization through new workflow systems. There was a sense of excitement amongst the team members as they were about to embark on a journey with team members they had not worked with before. One of the participants of the newly formed research team articulated what he saw as the direction of the team:

> We started [the initial direction of the team] . . ..with an exploration of a 3D technology tool . . . the direction for the business was to go 3D by 2021 . . .. they've got really high goals in terms of virtual sampling. The direction for the company is to really train everyone in the 3D technology, with the designer of pattern makers, because the goal is really to step by step become 100% digital. (NPT_P5)

One of the key elements that underpins DAC is leadership beliefs and, in this case, related to beliefs about decision-making within the team. Such beliefs become a valued shared resource for producing DAC (Drath *et al.*, 2008). When the NPT was formed the members were afforded

a high degree of autonomy and from their talk, they valued this level of authority around decision-making. The following narrative highlights how each of the participants is consulted and adds to the decision-making relative to their area of expertise:

> I studied industrial design at university and started to learn 3D programs . . . more for gaming . . . . both knowledges merged . . . so, when someone from Trims (a department) comes and says they want production information . . . I need the blueprints, there is no one that has that background . . . . (NPT_P4)

Through the participants responses we also identified some barriers due to a few dominant members of the team who sometimes influenced the collective decision-making. The stronger more dominant voices "*are difficult to shut down*" and were felt by the quiet and reserved team members who "*struggled to be heard some days"*. These types of challenges highlight how challenging it is to establish a culture within the team.

Alignment of the new project team – second interview

During the second interview, the researchers were interested in how the NPT was progressing and the ways members and the team came into alignment. The researchers were also interested to explore what was working well and what some of the challenges might be. The participants concurred that decisions are made collectively within the team. Comments were offered such as "*decisions are made based on our knowledge and expertise"*. It was evident through this series of interviews that participants with expertise were given the opportunity to lead on expert-related discussion. Every member was consulted and given the opportunity to offer their views before decisions were made. It was noted by one of the participants that alignment had been achieved beyond usual processes within one month of forming the NPT.

> . . . . we're not stuck in the typical processes, and we can think out of the box . . . . . it's driven by the processes which makes it happen . . . . makes it more flexible. In the meantime, the goal for me is to find a way to roll out the 3D processes. (NPT_P10)

Participants highlighted reflections on how the team formed, including the challenges, that helped them align and develop into a committed team. The team members agreed with each other on the future direction for the projects and the decisions to make regarding that because they share the same understanding of the overall goals and how to achieve them.

> There was a barrier between designers and 3D artists of software knowledge . . . they're starting to understand the 3D terms, so we can collaborate easier. (NPT_P4)

Commitment of the members of the new project team – third interview

The third interview revealed the level of trust that had been built within the NPT over the three months and how the level of commitment of every member of the new project team had developed. This was reinforced by the organization and their promotion of the NPT's high-level performance and progressive success with the digitization through monthly awards and organizational recognition.

Every member was conscious of building trust and recognizing that the team would not function well without trust. The communication between the team members appeared to be very open and direct. Team members expressed how passionate they were about the mission of their work within this research team.

> We try to work on transparency within the team . . . . . we're brain-storming a lot . . . exchanging ideas . . . . . relationships became really close . . . I have full trust in each and every team member here because we're all sitting in the same boat and we're really passionate about what we're doing . . . (NPT_P9)

The participants' responses demonstrated that they were all engaged with the project and demonstrated willingness for KSS. The participants indicated they could see the benefits in sharing knowledge with their team members which prompted them to continually source new knowledge and be productive for the team. Through the participants' narratives the researchers were able to identify that the team members appeared willing for KSS whenever they attended meetings.

> . . . we all understood that this project was very important for us . . . . . the building of a foundation of a common commitment. (NPT_P8)

The frequency and depth of the participant's commitment was found when they expressed how actively they create opportunities for KSS. They shared ideas about "*weekly kick-off meetings*" where they talk openly about the status of their most recent contributions to the team. The team members indicated they are conscious of transparency within the team and invest a lot of time in KSS.

Knowledge sourcing across the new project team and the knowledge exchange partners

The NPT was in harmony when team members talked about how they "*source ideas through open communications*" and how their commitment to the research project had developed through "*building relationships and trust*" and "*not being afraid to let anyone know*" when something needed fixing. They also expressed how the organizational hierarchy had praised their efforts which consolidated how they are open to sourcing ideas for future projects.

> It's (new project team) been rewarding for us . . . but it's also rewarding for the organization . . . we're really leading the way at the moment . . . . . people became motivated by others (in the new project team) . . . they started to understand the benefits from it (the research team). (NPT_P1)

In the interviews with the external KEPs it became evident that they provide critical software that the organization needs in production. It was important that the NPT and KEPs source knowledge from each other in relation to the software and eventually achieving DPD. One of the KEPs explained how the NPT source knowledge on the software and how each of the KEP team members provides analyses on the organization's processes and training on the software.

> I'm a 3D designer, so I was training different people at the organization . . . in our software. Now I'm more analysing their processes . . . . taking care of the licensing of our software, analysing how many licenses are in place and if there are more licenses needed for the software. And then of course, internally at our company I'm taking care of the scheduling of trainings on the job support. (KEP2)

Knowledge shared across the new project team and the knowledge exchange partners

At Stage 2 the researchers set out to establish the level of understanding of KSS amongst the team members and with exchange partners. During the fourth interview the researchers investigated the topic of the knowledge sharing with the NPT and KEPs about the research project and the organizational goal to achieve 80% product digitization by the end of 2021 or early 2022. The participants talked about how the program had been "*rolled out*" internally and how each member had taken on board the knowledge of the other team in accordance with the organizational goals to digitize production. In these interviews, the focus was on what the NPT and KEPs knew about the project and how they had engaged with team-based training and job rotation activities to be able to work collaboratively:

> . . . . . we're in a daily business here and have to take the (knowledge regarding) feedback of the customer and we have to adapt it to their software. So, I think both of us are giving . . . (knowledge) because it's more a cooperation . . . . . across functional training between say the design team and cutters (NPT_P7)

> . . . . . it was challenging at first but each of the team members enjoyed learning about their colleagues' area expertise . . . . . for example designers learned more about how to market products through digitization (NPT_P3)

The external team members shared their knowledge openly about how to achieve innovation for digital development. There was a determination in their narratives to find shared understandings:

> The new project team is the dedicated project group to train and work together . . . the 3D approach . . . . . the core team, the knowledge base, the strongest users, and we train also a lot outside of the new project team . . . . we have the strongest bond with people from Europe . . . . . this is really support by the organization (KEP3)

All of the NPT members expressed how they share knowledge within their team and beyond with the external KEPs. It was evident in their narratives that it was important for them to establish relationships beyond a business agreement.

> It's about being open to all new things, to discuss all these new things and then find out the best way . . . you have to source information from other companies such as our partners in Korea and share their knowledge and experiences. (NPT_P5)

Members of the NPT also identified points of contention in the process of working together to share new "*knowledge and solutions*" for DPD. They talked about "*pain points*" and how they worked together within the team and with the KEPs to resolve any issues. All participants mentioned the level of teamwork and the strong relationships they developed with each other and with vendors, suppliers and manufacturers. They talked about the mindset of the members and how they now share "*ideas openly*" and how a common purpose of change within the industry drove the way the members all came into alignment for the best outcomes of the research team.

> We sent over one of our team to Korea and we plan to visit them again in 2020. In a more informal way, more unstructured more based on personal relationships and getting to know each other and having informal talks about our targets. Therefore, it seems we're getting quite good at aligning (knowledge) in that way . . . on a personal level. (NPT_P8)

The KEP members expressed strong connections with the NPT and the organization in Germany. Collectively they noted how important it is to have a basis of respect and trust for knowledge sourcing and sharing to happen. One of the KEPs articulated what the other exchange partners were in agreement with:

> The key thing is transparency, and secondly communication. We respect each other as client and software provider. (KEP6)

Discussion

Overall, our findings demonstrate the importance of building relationships between OI team members (and external OI partners) to support digitization of product development. First, there is evidence of collaborative HRM practices namely team-based recruitment, team-based training and job rotational design (Hong *et al.*, 2019) supporting the development of RL in the OI team (Bogers *et al.*, 2019). This is an important finding because we have established that there is a clear process through which HRM practices can enable the conditions for RL to emerge which is especially important in OI.

Second, the direction of team members towards KSS and achieving the organizational and the team's main goal became the foundation for OI. During Stage 1, the NPT members explained how every member reached a point of being in congruence by the end of this stage to accomplish "*high-quality 3D simulation through all product groups*" (NPT_P7). The beliefs

regarding the direction of the project became the foundation for alignment and commitment to be achieved by the NPT (Hosking, 2007). Collaborative HRM practices were important in establishing alignment with strategic goals and congruent beliefs of team members regarding the importance of collaboration and OI.

Third, a key finding emerged when members of the NPT became aware they shared a strong alignment towards achieving the goal of OI for digital product development. Team members not only shared understandings of the team's goal, mission and vision but also agreed on the direction and value of the organizational goals for their project team (McCauley *et al.*, 2019). Collaborative HRM played an important role in this process through team-based recruitment and team-based training. Members talked about alignment and noted the team was "*building on a foundation of a common understanding* (about the 3D digitization)" (NPT_P8) and openly discussed and shared their expertise and opinions about the project. In decision-making when members of the team understood (through team-based training) they could contribute to the goal of innovation, with their own unique skills and knowledge, their values were basically stamped on the goal. Interestingly, we found no evidence in the data that there were cultural or communication barriers between the German and Korean OI partners. None of the participants raised any cultural challenges working with each other. This could be explained by the participants' excellent English skills and international experiences. Autonomy was critical to the emergence of RL (Biehl, 2019). Each member's commitment towards the strategic goals of the organization and the behaviours and actions of the NPT members supported RL practices through DAC of the strategic goals (Drath, 2001; Hosking, 2007; Uhl-Bien, 2006).

Fourth, RL practices developed as the NPT worked together to achieve maximum benefits for OI in digital product development and they also advanced a united commitment towards the project. After three months it was evident because each member was totally devoted to building relationships and recognized this was critical to RL (Biehl, 2019). Team members also recognized that commitment is strengthened by open communication and a level of cross-functional trust which is critical to the emergence of RL (Biehl, 2019). We argue that relationship building and supportive beliefs towards KSS are important to achieve DAC (i.e. RL) and enable OI within and across organizational boundaries.

Fifth, when we examined the relationships between the members of the NPT and the KEPs, from Stage 2 (the fourth interviews), we found key themes in the narratives that align with the DAC framework (Drath *et al.*, 2008). The two teams shared strong understandings of the German organization and how important it was for the coordination of KSS particularly in relation to the work of the NPT who each take on different roles and have different levels of expertise. It was important for both the NPT and KEPs to building strong relationships and mutual understandings through respectful and open communication. We suggest that DAC developed by the NRT-enhanced KSS across cultural, functional and organizational boundaries with the KEPs. When members of the two teams (NPT and KEPs) combined their work, it appeared to fit well together and was coherent (McCauley *et al.*, 2019). Collaborative HRM provided a culturally neutral basis for framing RL while allowing beliefs and practices to vary by expertise and culture (Drath *et al.*, 2008). There was a strong feeling of mutual responsibility across the NRT and the KEPs, towards collective goals, reducing negative attitudes towards KSS (McCauley *et al.*, 2019).

Theoretical and practical implications

Collaborative HRM is important for establishing the conditions for RL to take place, which is in turn critical for KSS (Hong *et al.*, 2019; Liao *et al.*, 2007; Uhl-Bien, 2006) and ultimately OI. This is paramount in OI project teams that bring together cross-functional experts within a NPT and established teams, and also across organizational boundaries with KEPs to achieve

an organization's strategic goals (Becker and Huselid, 2006). The DAC framework informs the processes through which collaborative HRM enables RL to emerge and support KSS to take place (Hosking, 2007), which underpins OI (Liao *et al.*, 2007). The conceptual framework (Figure 1) demonstrates the connections of a NPT underpinned by the strategic goals of the organization. Moreover, we also demonstrate the interconnections between collaborative HRM (Becker and Huselid, 2006; Hong *et al.*, 2019), RL (Biehl, 2019), DAC (Drath *et al.*, 2008) and KSS to achieve OI (Liao *et al.*, 2007).

Through the DAC framework (Drath *et al.*, 2008) a NPT can achieve direction when team members understand the strategic goals of the organization and the purpose of a project (Huffaker, 2017). Alignment occurs through structured and shared activities (Drath *et al.*, 2008) and effective coordination around a project which is underpinned by collaborative HRM practices such as team-based recruitment, team-based training and job rotational design (Huffaker, 2017; Hong *et al.*, 2019). Commitment emerges through the willingness of team members to consider the team's collective efforts and trusting other member's expertise and experience which is reinforced through team-based performance management with reward systems (McCauley *et al.*, 2019).

For OI to take place, organizations need to invest in collaborative HRM where RL can emerge (Uhl-Bien, 2006) through team-based recruitment, team-based training, team-based performance management and rewards and rotational job design that support social exchange, autonomy and collective responsibility (Liao *et al.*, 2007). OI requires significant investment in developing relationships within the team and across KEPs. It is necessary for HRM departments to understand that RL and OI are medium- to long-term initiatives. We recommend that HRM departments implement collaborative HRM practices that train, incentivize and afford new teams' autonomy to make decisions about product development. Managers need to select members who share the same values and attitudes and put in place a regular review process to evaluate how members are working together.

This paper is not without limitations. Our study was limited to a qualitative examination of one OI project in a German garment manufacturing organization and their Korean business partner. Furthermore, we did not conduct a survey of the organization on the use of OI nor examine other OI project teams. We encourage further research that examines, from both qualitative and quantitative approaches, OI projects across a range of industries and multi-national organizations from a diverse group of national, institutional and cultural contexts. We also encourage further research that examines specific human resource and business outcomes of OI projects.

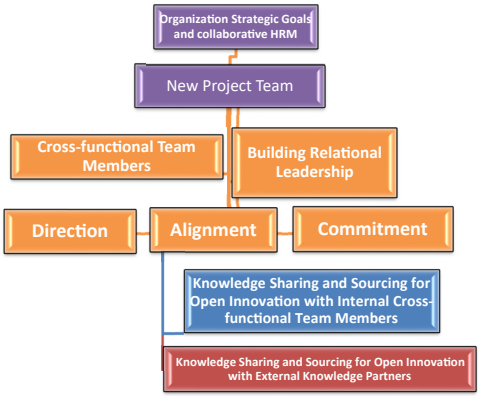

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Figure 1.
The process of open innovation through collaborative HRM and relational leadership

Conclusion

In sum, KSS and ultimately OI emerged when cross-functional teams are developed to achieve the strategic goals of the organization enabled by collaborative HRM to support the emergence of RL. There were three clear phases of development, from establishing a mutual direction, to reaching alignment and achieving a common commitment to DPD. We demonstrate the value of the DAC framework in the context of a NPT and the shared respect with the KEPs being a necessary condition for the effective sharing of work for OI. This paper contributes to the HRM literature on the human side of OI by developing a conceptual model to promote theoretical and practical understandings of how collaborative HRM can enable RL to support KSS and ultimately OI.

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