Disruptive Technology's Transfer Between Organizational Units: The Role of Corporate Headquarters

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Abstract This qualitative study examines how the increasing adoption of artificial intelligence (AI) influences organizational design, particularly within corporate headquarters (HQs) during digital transformations. The primary thesis is that AI adoption reshapes HQs by enhancing their dual roles in integration—coordinating and guiding business units—and entrepreneurship—identifying and leveraging new business opportunities. This exploration reveals key challenges in transferring knowledge between HQs and business units and provides actionable recommendations to mitigate negative externalities. Overall, the study clarifies the contextual and structural impacts of AI on modern organizations, making these complex changes more understandable and manageable.

Keywords Business/IT alignment · Organizational reconfiguration · Disruptive technologies · Corporate headquarters

1 Introduction

The mainstream discourse on the adoption of ICT (Information and Communication Technology) across various industries has traditionally been associated with the need to respond to environmental pressures, including the uncertainty and dynamism of markets [1–3]. In this sense, ICT has long been regarded as indispensable tools to

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survive, improve performance, sustain operations, and gain competitive advantages [4].

In parallel, the organizational relevance of ICT, with reference to its ability to generate dramatic changes at the firm level, has been investigated by numerous disciplines, including Information Systems, Organizational studies and Management studies. Specifically, the structural contingency school was the dominant paradigm [5, 6] both for conceptually analyzing technological reconfiguration and for offering practical guidance to decision makers until the late 1970s [7, p. 38].

One of the watchwords of this approach in its various meanings and operational translations is certainly the topic of "fit" (or alignment) between technological and organizational choices [8–10]. The theory states that the more dynamic the environment, the more differentiation is required between the organizational units, and consequently greater intra-organizational integration [11]. Hence organizational configurations are largely shaped by external and internal attributes [2]. Related to the matter of structural change is the issue of how staff functions are integrated into the overall design of the organization [6, 12].

According to contingency thinking, delayering, the expansion of top management teams (TMTs), and the shrinking of a firm's boundaries [6] are among the reasons why corporate headquarters (meant as "staff functions and executive management which is tasked with providing services to the company at large" [6, p. 9] and that "in conjunction with top management orchestrate major change initiatives" [6, p. 8]) are in a constant state of flux. The emergence of disruptive technologies—including artificial intelligence (AI)—that promise to profoundly transform business models and organizational processes [13–15] has made it increasingly critical for the upper echelons (i.e., decision makers who are responsible for leading firm operations [16]) to establish appropriate guidelines. *Vertically*, it is necessary to identify the locus of responsibility for innovation processes related to digital transformation [17]. *Horizontally*, it is a matter of defining cross-unit coordination mechanisms to enable voluntary knowledge exchange and collaboration [18]. However, literature on organizational design pays little attention to corporate headquarters [6, p. 9]. Incomplete knowledge on whether disruptive technologies shape headquarters' operations means that any understanding of so-called "degrees of freedom" [2, p. 591] that we may have in the organizational design is incomplete.

This "gap-filling" paper intends to explore the transformations underway in order to develop broad design implications for successfully implementing AI. The assumption is that headquarters (HQs) are called to reposition themselves and reconsider their role in two typical functions: that of integration (focused on establishing synergies and providing guidance to organizational units) and entrepreneurship (aimed at discovering and exploring new opportunities, helping units to cope with transformations). Thus, our overarching question is: *How are the relationships between the business units and the corporate headquarters configured when the latter is both agent of change and recipient of part of the AI-related investments?*

We will try to answer this question using personal argumentation supported by a selective literature review. Overall, the paper argues that AI investments bring about a qualitatively different role of HQs, with particular reference to IT governance,

intra-firm knowledge allocation and skills transfer. Interestingly, AI-based solutions are not simply part of response strategies attempting to cope with changing environmental conditions. Rather, new systems are as much a part of the problem as they are of the solution.

The contribution of the study is twofold: it adds to the scholarly discourse on organizational design implications of AI, with particular reference to the choices of structural differentiation and knowledge exchange; and it also indicates the challenges that accompany the technology transfer processes between HQs and business units.

In the next section we present our research approach before offering a selective overview of the relevant literature. The subsequent discussion examines the design implications of AI's adoption and use. Finally, the paper closes with the limitations of this study and future research development paths.

2 Theoretical Underpinnings and Method

Exploring AI impacts on corporate headquarters ultimately means questioning the relationship between technological choices and structural choices. To address this "classic problem of organizing," here we integrate notions from two well-established theoretical perspectives that still influence the strategies [4] and concrete practices of today's organizations, i.e., the contingency theory and the resource- and capabilities-based view (RBV) of the firm. The former (contingency theory) is centrally concerned with the key environmental determinants that shape a firm's organizational design. In this view, ICT is an exogenous factor that the organization must adapt to on pain of inefficiency. The latter theory (RBV), on the other hand, conceptualizes firms as bundles of tangible and intangible assets or resources [4, 19] that are the basis for its performance [16]. Accordingly, digitization capabilities are meant as an important precondition for companies to gain a sustained competitive advantage [20, 21]. A firm's IT capability is defined here as its ability to mobilize and deploy IT-based resources in combination or co-present with other resources and capabilities [22]. Among the latter, the knowledge of the actors—especially of the tacit type—occupies a central place. In fact, tacit knowledge is difficult to emulate by other companies. However, it is also difficult to reproduce *within* the organizations it is developed in.

In essence, the strategic focus on *internal* organization makes RBV a complement to the emphasis on *environmental* characteristics at the center of the contingency theory. Here we assume that useful insights about the intersection of AI's adoption and use and structural design can be learned from their combined strengths.

Given the relatively novel topic and the question addressed (of the *how* variety), the paper adopts a qualitative, explorative research stance [23]. We, in other words, designed a qualitative second- and third-hand evidence study [23, p. 160], where evidence is to be found in the qualitative, quantitative and conceptual papers selected to support our argumentations and listed in the references.

The start-up phase sketches the main traits of AI's nature and influence on organizational practices using a selective literature review as evidence, whose primary aim—using Yin's [23, pp. 72–3] words—is to sharpen the "preliminary considerations" regarding our "topic of study, method, and data source." In doing so, we assume that recent academic work from information systems, organizational studies, and management studies is an effective proxy for the processes of AI deployment and adoption in contemporary firms [15]. Once the *niche* for the study [ibidem] has been defined, and drawing on a concept-centric approach [24], the paper discusses the structural consequences of AI-related investments on the role and operation of corporate headquarters.

3 Related Work

As observed by Flyverbom, et al. [16, p. 5], in the past "we used to think of digital technologies as tools that corporations and other organizations would pick up and use for particular activities. But increasingly, they are the backbone of most organizational processes and much of what we know about people, organizations, and societies involves digital sources and activities." This general trend is reflected in AI applications that are now ubiquitous [15]. AI is now recognized as a primary competitive factor [15, 25, 26]. We focus here on several key aspects to understand the main impacts on organizational practices: (1) its disruptive nature; (2) its consequences on the processes of information sharing and organizational learning; (3) the impacts on organizational relationships; and finally (4) *sunny* and *dark* sides of AI-led digital transformation.

3.1 AI as a Disruptive Technology

AI integrates technologies such as machine learning, deep learning, natural language processing, and computer vision to create high-intelligence algorithms that approximate human cognitive functions to search, analyze, and make decisions based on large-scale data [13]. AI, machine learning (ML), and associated new technologies "embody the characteristics of general purpose technologies" [27]. As such, they are pervasive, able to be improved over time, and able to spawn complementary innovations.

AI is disruptive [28, 29], and machine learning represents a fundamental change from the first wave of computerization [27, p. 24]. However, as observed by Brynjolfsson, et al. [23], realizing the benefits of AI is far from automatic. Indeed, it requires adaptability at the individual and organizational levels to undertake related restructuring. Effective initiatives include developing new data sets, building firm-specific human capital, and implementing new business processes [27, 30, 31].

Thus, it is easy to predict that in the future companies will be forced to reconfigure their structure, from top management to middle management (i.e., the users and co-designers of AI) as well as, of course, the chief information officer (CIO) and the board of directors (BoD) [29]. For example, an empirical study carried out in Australia by Alsheibani et al. [32] reveals that the two primary factors that encourage and inhibit the adoption of AI by companies are the skills to evaluate, build, and deploy AI solutions and top management support based on solid business cases. Based on the analysis of some Chinese companies, Li et al. [13] believe it is crucial for the CIO to be able to convey a clear vision of AI impacts to top management, in order to promote both awareness of the choices to be made and the consensus necessary to implement the projects. However, whether or not the role of the CIO should be supported by a dedicated organizational structure equipped with critical skills to evaluate, build, and deploy AI solutions [32] is unclear. Design issues will be taken up again in the Discussion.

As regards the role of the BoD vis-à-vis AI initiatives, Li et al. [13] observe a discontinuity with respect to the prior episodes of digitization characterized by a low involvement of executive levels [33]. As Jewer and McKay [34] underline, the role of the BoD in the AI field is actually crucial for establishing strong relationships with the CIO [13] and for fostering creative thinking among people (board members) with different backgrounds and expertise. In this sense, previous experience in R&D can be of great help in evaluating the opportunities and potential risks of AI.

The new issues that AI raises require major transformation programs. As Berente et al. [26, p. 1433] highlight in the introduction to a recent special issue of *MIS Quarterly*, managing AI "marks the dawn of a new age of information technology management." Managing AI "involves communicating, leading, coordinating, and controlling an ever-evolving frontier of computational advancements that...push the frontiers of performance and scope of AI" [26, p. 1433].

3.2 Information Sharing and Organizational Learning

Knowledge "in all its forms and dimensions stands out among the factors gaining importance" [2, p. 593] in contemporary organizations. As observed by Hage [35], Lawrence and Lorsch were the ones who provided an evolutionary theory of increasing knowledge and its impact on these choices, suggesting that movement toward the organic organizational form took place as product development, applied research, and then basic research departments were being added to the structure of the organization.

These general ideas can be applied and extended to one of the most crucial issues of AI, namely the interaction between machine learning (ML) systems and people. The first observation is that with the rise of machine learning, individuals "are no longer the only ones capable of learning and contributing to an organization's stock of knowledge" [36]. It therefore becomes necessary to coordinate people's knowledge—especially experiential knowledge, which is essential for dealing with

environmental turbulence—with that of ML systems. Sturm et al. [36] point out that while human-based organizational learning is a process of a social nature that provides for a coordinated interaction between learners, ML is based primarily on data processing. Taking a cue from March's approach [37] and developing a series of agent-based simulations, Sturm and colleagues document the link between organizational learning, human learning, and ML. Hence the general recommendation for firms to allocate resources selectively, i.e., to those practices and structures that are most significant for the purposes of organizational learning processes.

Sturm and colleagues also highlight three crucial issues. First, herding the diverse beliefs of the organization's members towards homogeneity requires a balance between exploration (the search for new ideas far from current capabilities, which lead to non-immediate outcomes and maintain the diversity of beliefs) and exploitation (which favors belief homogeneity because it is based on the current agenda). Organizations choosing the first option are bound to run into difficulties because they neglect to build a common knowledge base. Conversely, organizations that underestimate new opportunities risk becoming trapped in stagnation.

Second, the quality of internal skills that contribute to the setup of ML systems is essential. Addressing a real-world problem [36, p. 1584] by developing a brand-new system (e.g., an AI-based system) requires the input of people who select the scope, who prepare the data, and who fine tune the learning algorithm. Therefore, from the outset it is necessary to involve those who know the problem to be solved and who have the necessary theoretical and practical knowledge. In this manner a progressive convergence of intentions is created between the business units and the central structures. Furthermore, and interestingly, organizational members can learn from the ML model they have helped to generate. Simply put, ML systems become central elements of the organizational memory.

Third and lastly, Sturm and colleagues observe that the evolution and refining of knowledge driven by data and learning fuel an ongoing cycle of reconfiguration and adaptation of the system, thus altering its characteristics and properties [36]. The development of local knowledge and experiences accumulated within the company in turn feeds into learning processes starting from the units that use the ML-based solution. However, the question becomes how learning can be managed, both for the substantial costs of reconfiguration [36, p. 1586] and, we add, for the subsequent decision on *who* has to bear those costs, i.e., HQs or subunits? This issue is discussed in Sect. 5 below.

In sum, recent findings [13, 36] underscore the need to establish systematic information flows at the apex (i.e., top management and BoD), facilitated by the CIO, and among the various functions (central and peripheral) and the business units. The higher echelons and the relevant structures, i.e., the HQs, define the corporate innovation policy and set the AI plans. At the center is the organizational action that unfolds through a network of multilevel relationships that focuses on a firm organization capable of continuous learning, enhanced by AI-related capabilities. Indeed, coordinating humans and ML systems remains "a challenging management issue" [36, p. 1596].

Ultimately, distinctive skills are context-specific and embedded within organizations [38]. As Hage [35, p. 612] put it, "the way in which knowledge is channeled" becomes a key component of firms' innovation processes.

3.3 Impacts on Organizational Relationships

The development of a renewed and ongoing link between the inside and outside of the organization stands out among the factors gaining traction in the debate on digital transformation, meant as "a source of continuous change and disruption in a firm's competitive environment" [3, p. 133]. However, as observed by Nell, et al. [39], understanding how the form of HQs can evolve under conditions of permanent change is not easy.

In the extant academic debate, the HQ is mostly seen as a mere provider of support services—including corporate ICT, external communications, marketing, and human resources—operating under the direction of top management [6]. In reality, the corporate headquarters performs crucial functions, namely the *entrepreneurial* function which includes the discovery of new opportunities, the acquisition of resources, and the implementation of corporate strategies, and the *integration* function which instead ensures cross-unit coordination and cooperation. Another function of HQs—particularly relevant for the purposes of this paper—is so-called *knowledge direction*, a term coined by Foss to denote the activities of using, blending, and directing knowledge. Foss notes that HQs perform "a crucial parenting function through deciding on which new business to support, which inter-divisional information sharing groups to establish, which businesses to acquire or divest, how to build a shared context, etc." [12, p. 324]. As observed by Menz and colleagues [40, p. 638], the term "parenting" suggests that the HQ "somehow oversees and improves the performance of its 'children,'" i.e., the individual organizational units. The latter are in turn viewed as benefiting from their membership in the "corporate portfolio."

Recently, research has provided novel insights on the configuration of headquarters from a systems perspective. For example, the term "headquarters system" used by Nell et al. [39, p. 1124] labels not only the presence of multiple activities performed at a corporate level, but also the relevance of the interactions between the organizational units tasked with central staff activities, and between units and the external environment. To what extent—the authors ask [39, p. 1127]—"do environmental changes affect the disaggregation and dispersion of headquarters, and how effective are changes in the configuration in preserving environmental fit?"

However, research inspired by RBV studies has shown that the development and upgrading of capabilities is "location-dependent" [39, p. 1133]. As a result, knowledge and capabilities of headquarters' managers are shaped by the local operating context. Studies also emphasize the role of HQs in "orchestrating the dispersion of resources and facilitating reverse or lateral knowledge and resource flows across borders" [39, p. 1133].

Of close interest to this paper is the metaphor that compares HQs to a "corporate brain" [6] placed at the apex of an organization, which distills the information coming from the various corporate units, allowing the TMT and the Board of Directors itself to make informed decisions. As we will see later (Sect. 4.2), and in keeping with a contingent view, in turbulent environments the "corporate brain" must be able to count on the presence of *liaisons*, i.e., dedicated interfaces capable of directing (funneling) and regulating (gatekeeping) the ongoing digital transformation initiatives.

3.4 *Digital Transformation, AI and HQs:* Sunny *vs.* Dark *Side*

Digital transformation "is when organizations redesign underlying systems and processes to align with today's data and digital technology, including artificial intelligence, machine learning, and the internet of things" [41, p. 195]. Based on a survey and interviews with senior HQ managers, a recent contribution [42] contrasts the optimism of the mainstream debate on digital transformation with the (negative) conclusions of a field study conducted in a variety of industries. According to the narrative associated with the sunny side of the story, digitization leads to an increase in the amount of available information destined for HQs, and therefore helps to strengthen their decision-making capacities. It has also been assumed that this improved capacity results in a higher relative weight of the impacted structures.

According to Schmitt and colleagues, such an unqualified optimism is to be rejected for at least three reasons (or potential problems). First, assuming that digitization can translate directly into better-informed decisions by HQs is illusory. For example, the extensive data collection efforts under digitization may not be rigorous enough. Or the data analytics tools and algorithms may not be appropriately developed. Furthermore, it is not obvious that the firm has adequate organizational capabilities to interpret the data. Second, when the HQs lack the tacit and contextualized knowledge of the subunits, the actual weight of the HQs remains modest even if they have more information. And third, it is not obvious that decision-making centralization is sustainable: on the contrary, it could exacerbate competition between subunits to ensure the attention of HQs in the resource allocation process, with the result of reducing the level of intra-organizational collaboration. Other conflicting situations include the negative reactions of subunit managers in response to initiatives deemed inappropriate by the HQs, less trust in the decisions of the HQs, and the renunciation of entrepreneurial behavior by the subunits, not to mention open resistance.

Recent insights (e.g., [7]) strongly support the idea that in terms of AI, the "sunny side" should be pursued by leveraging, on the one hand, the CIO who leads the digital transformation initiatives, and on the other the joint contribution of the TMT and the HQs. The latter, considered as seats of collective leadership [43], perform an

entrepreneurial function with respect to the BoD by identifying, in concert with the relevant subunits, the emerging business opportunities that can justify new AI investments. Notably, and in contrast with past technologies, decisions relating to AI projects result in greater board involvement.

Therefore, the risks of a weakening of the role of the HQs, or conversely a greater centralization of decision-making accompanied by an exacerbation of the competition between subunits feared by Schmitt, et al. [39], would be moderated by both the CIO and the BoD, provided they develop the two capabilities indicated in the well-known study by Lichtenthaler and Lichtenthaler [44] on open innovation. These are the absorptive capacity (a firm's ability to acquire and utilize external knowledge and to assimilate it in its knowledge base) and the desorptive capacity (a firm's outward knowledge transfer capability).

For example, the desorptive capacity needs to be developed when the CIO and the corporate ICT function must identify the knowledge in the HQs and subunits that could be exploited thanks to the use of AI. Consequently, they will have to transfer the technical knowledge necessary for the use of AI to the subunits. Conversely, (in a logic of absorption) the HQs and subunits will have to develop the ability to integrate the know-how developed in the field of AI by the ICT department into their knowledge base. For the purposes of the effectiveness of knowledge transfer processes (both inbound and outbound), professional roles with skills in both data management methods and specific business problems are essential. These are the "light quants" mentioned by Schmitt, et al. [39] and which we identify here as interface roles (see Sect. 4.2 below). Interestingly, such roles can help mitigate the risk of creating a divide between the HQ and the subunits, i.e., one of the potential side effects of AI-driven transformation processes.

4 Discussion

The above review suggests that AI deployment can have a profound influence on a firm's internal organization. However, we do not have many certainties as to exactly where the ongoing developments will lead.

The disruptive nature of AI surely shifts the role of HQs to center stage, as organizational structures appointed to provide the upper echelons and the board of directors with the expertise necessary for investment-related decision making at a corporate level. Notably, AI is a cross-cutting but not immediately usable technology. Therefore, the substantial (and risky) investments necessary for the implementation of digital transformation must be adequately justified and monitored at a corporate level.

The HQ also plays an intermediary role between the internal and external stakeholders, including business units, startups, vendors, partners, and system integrators. Managing these relationships in the context of AI projects is critical for value creation in the overall organization. Following a transaction cost logic, each firm will determine which activities should be performed inside or outside the

organization, affecting, for example, the outsourcing of functions. The exploration of different contingencies affects the decision to perform specific HQ roles. In particular, the way in which "knowledge is channeled" [35, p. 612] is a crucial component of firms' innovation processes.

The concept of "parenting" through knowledge direction highlights the HQ's value-adding roles [12, 40]. In parallel, the presence of an HQ that "supervises" firms' subordinate units entails potential intra-organizational problems. At the moment, however, there are no clear signals on which design options (e.g. top-down or network forms) will prevail among the firms embarking on AI projects.

More broadly, a better understanding of the factors that can impede AI-led digital transformation is required. The three subsections below sketch how to mitigate the negative externalities (i.e., the dark sides identified by Schmitt, et al. [39]). The fourth and final subsection tentatively outlines and discusses the main responsibilities of a hypothetical organizational unit tasked with exploring AI-related developments on behalf of the company at large.

4.1 Dark Side 1: Little Information Available to HQs

This risk is intrinsically linked to factors beyond the direct control of the HQs, such as the lack of technical skills (e.g. data scientist, system architect, business analyst) and the complexity of the IT ecosystem (e.g., vendor lock-in, system integrator lock-in, legacy systems), as highlighted in particular by Li et al. [13] in Sect. 3.1 above. Resource allocation can be the indirect tool through which HQs can counter negative externalities. Examples include financing the acquisition of the required talent and simplifying and modernizing the IT ecosystem. All of this assumes that corporate ICT is directly involved in budget planning via the CIO, informing the BoD of the potential risks of the various options.

4.2 Dark Side 2: Lack of Matching Between Information and HQ Empowerment

According to Schmitt, et al. [42] this risk occurs when HQs lack the right knowledge and skill set to interpret and contextualize information. A possible solution—following [41]—consists in the development of absorptive and desorptive capacities. Appropriate interface roles, i.e., placed between HQ and individual subunits, could on the one hand collect and synthesize local business knowledge, i.e., specific to each subunit, in order to make it available to HQs (in a logic of absorptive capacity), and on the other hand identify within the HQs and relevant local operating units the

technical capabilities necessary for the effective evaluation and implementation of new solutions (i.e., desorptive capacity).

4.3 Dark Side 3: Weak Role of HQs

This risk—which can arise when the subunits possess the relevant knowledge and directly control their own resources, i.e., independently from the HQs—can be mitigated by tasking the HQs with the responsibilities for allocating resources destined for digital transformation programs. This way each initiative or project will inevitably have to align with the strategies and priorities defined at a corporate level. It is very important that governance is exercised without penalizing the proactive role of the subunits.

Furthermore, increasing authority at the center would facilitate knowledge exchange and other collaborative activities across units, also reducing redundancy. In this context, therefore, centralization takes the form of "funneling and gatekeeping" the company-wide collection of ICT projects for which approval by the relevant central decision makers is required. This is an important activity due to the need to also manage the expensive reconfigurations in the ML environment. Such reconfigurations are significant for the development of dynamic capabilities of the firm, as noted in Sect. 3.2 (see: [36]).

4.4 Establishing a Competence Center to Mitigate the Challenges of AI-Enabled Transformation

Both the observations of Nell, et al. [39] on the unplanned development of the "headquarters system" and the remarks by Foss [6] on the unclear definition of its traits warn of the dangers deriving from the HQs' loss of their *entrepreneurial function* and demand the adoption of an organizational design perspective [ibidem]. Here we offer preliminary ideas on how externalities can be counterbalanced, leveraging the "parenting function" of the headquarters [12] executed through knowledge direction.

Specifically, the hypothesis is to create a specialized unit within the HQs tasked with key responsibilities, including:

- Centralization of AI skills and expertise;
- Investment management and risk containment by directly financing the projects in order to protect the subunits from potential failures related to the experimentation of AI ventures;
- Collection of business needs, i.e. the identification of potential use cases of AI within the subunits;

– Scouting and technological development, i.e. the exploration of the market in search of solutions (buy) or developing them in house (make);
– Increasing internal communications, i.e. promoting the objectives, capabilities, and outcomes of this specialized unit across the organization.

It is important to observe how the above exemplary responsibilities fit particularly well with the versatility of AI and with its many forms. Indeed, AI applications can analyze, synthesize, and generate various types of data, including numbers (e.g., predictive analytics), text (e.g., natural language processing), and images (e.g., computer vision). Furthermore, they are able to interface with physical systems, including connected devices (e.g., edge AI) and robots (e.g., embedded AI), to enhance their capabilities.

This new specialized unit is called a "competence center" (CC) within the parent department (i.e., corporate IT). Put simply, this design assumes a top-down contribution from HQ to the business. The centralized design delivers reasonably better performance compared to a decentralized option, i.e., consisting of the introduction of AI specialists in each subunit. Indeed, a decentralized design would not be as efficient, and moreover could hinder the sharing of experiences and knowledge in other contexts. It should also be noted that a CC like the one hypothesized here could turn out to be dysfunctional if it were applied to special-purpose technologies or intended for a single subunit. In fact, in both cases the CC would be too "distant" from the local knowledge without allowing the reuse of the digital solutions by other subunits.

The CC takes charge of the investments related to the experiments in the AI field. This responsibility involves both the supervision of all relevant projects and de-risking. In other words, the costs of the AI-based services provided to the subunits cannot fall on the latter as long as it is not possible to objectively quantify the added value in terms of business.

The CC must be provided with the tools—such as, for example, digital platforms that enable asynchronous, spontaneous, and less structured communication (social network-like)—necessary to be able to meet the needs of the subunits (e.g., process efficiency, reduction of operational errors, creation of new business lines or products), and to allow all employees to propose and discuss ideas that in turn could translate into functional requirements to be submitted to the relevant units. Therefore, it is essential that the subunits find a competent and available partner in the CC.

To respond to the diverse needs of the subunits, the CC is endowed with the resources necessary for "sensing opportunities or acquiring information" [39, p. 1130]. This task implies the creation—beyond the boundary of the firm—of an open innovation ecosystem made up of different actors including startups, partners, vendors, suppliers, and system integrators. In other words, when HQs are faced with the *make or buy* dilemma relating to a specific AI platform or system, the CC must be able to support the relevant decision makers, for example by comparing the solutions available on the market (i.e. scouting) with alternative ICT sourcing options.

Finally, the CC would have the responsibility (shared with other subunits) to disseminate information on initiatives involving newer technologies within teams

and across the hierarchy. Communication channels include webinars, meetings with internal or external experts, workshops and seminars. Collectively, these initiatives further integrate the various representations people have of ongoing AI projects. The assignment of responsibility for communications to the CC underscores the importance of using a shared language in terms of AI artifacts and digital innovation both inside and outside of the organization.

To conclude, and using the words of Schmitt et al., we note that "computational capabilities are in no way a substitute for good management and social capital in organizations" [42, p. 6]. It is therefore necessary to establish participatory processes, empower people, and cultivate trust in intra-organizational relationships. In our opinion, Schmitt and colleagues recall the usefulness of adopting a socio-technical view in organizational design (see, e.g.,: [45]) to simultaneously address ICT-driven processes and organizational learning.

5 Final Remarks and Conclusions

The aim of this paper has been to reflect on a set of AI issues that appear not to have been satisfactorily addressed by organizational design research. Specifically, we focused on the evolving role of HQs, assuming that implementing AI in the context of digital transformation brings about significant changes in firms' configurations.

In response to our research question, we believe that AI investments entail a qualitatively different role and operation of HQs, with particular reference to explorative tasks (e.g., identifying potential areas for experimentation of emerging digital technologies, starting from the needs of the organizational units). As an *agent of change*, the HQ sets the organizational rules of the game that provide a system for governing the relationships among business units. As a *recipient* of part of the AI-related investments, the HQ orchestrates change initiatives from which it will be able to benefit. Finally, we have offered preliminary guidance on how to approach learning and knowledge management processes in the context of AI-led transformation.

Figure 1 summarizes the research path followed by the authors of this work.

The study adds to the scholarly discourse on the organizational design implications of AI. The combination of contingency theory and RBV as a guiding analytical lens broadens the focus of enquiry from that of organizational impacts of technology (i.e., AI) to the use of organizational design as a resource of firms' distinctive advantage.

The study also highlights the challenges that characterize knowledge transfer processes between HQs and business units. Overall, we believe that the article makes the referential context and structural effects of AI more comprehensible and realistic. At a practical level, the paper offers potential support to identify actionable HQ design prescriptions within an open innovation ecosystem.

Admittedly, this exploratory paper comes with important limitations that we plan to address in future studies. First, we acknowledge that our reading experience of

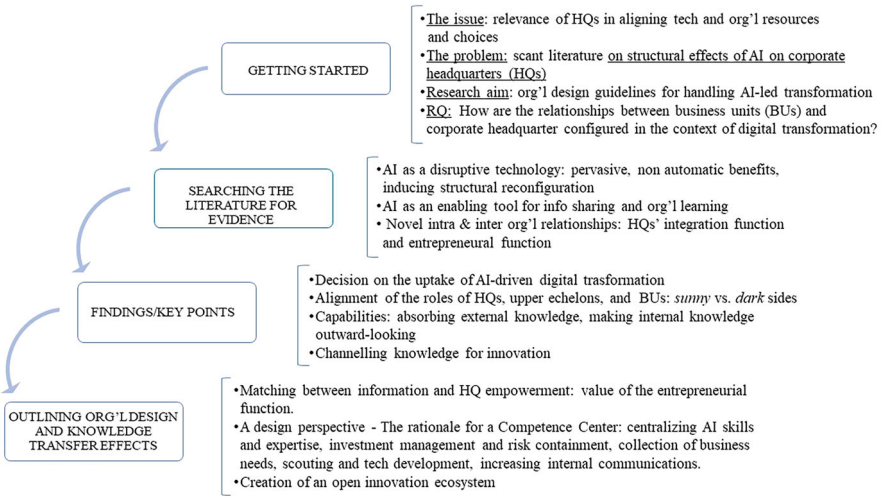

Fig. 1 The research path followed by the present article

selected issues could have biased the analysis. In fact, due to space constraints we included academic work based on our reading that reflects our own viewpoint and expertise. To provide a solid picture of extant research, a systematic literature review supported by a solid analytical frame must be performed in future research endeavors. Second, we recognize that the preliminary findings of this study are unlikely to form a sufficient basis for taking any design action. In fact, the competence center outlined in Sect. 4.4 is only summarily described, and the potential benefits from its establishment are synergistic with the realization of the *sunny* side of digital transformation. Also, we acknowledge that there are potential disadvantages of the CC as a specialized unit. For example, a centralized design (consistent with the parenting role of HQs) may slow the adoption of AI technologies due to a bottleneck effect, i.e., the inability to distribute and parallelize development within subunits. Thus, evaluating the benefits and drawbacks of diverse CC forms, including bottom-up and network designs, should be the first priority of a future and challenging research agenda.

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