Int. Journal of Business Science and Applied Management, Volume 17, Issue 3, 2022

How to Transfer Operational Capabilities in Multinational Companies without Disclosure: Optimizing Decentralization and Information Richness in Times of Digitalization.

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Abstract
Multinational companies simultaneously try to facilitate the internal transfers of operational capabilities without disclosing them to external stakeholders. To mitigate this tension, the decentralization of the decision-making and information richness of communication mechanisms are balancing parameters that can be regulated appropriately. Since digitalization has changed the coordination and interaction in intra-firm transfers, both balancing parameters need to be optimized. The present study examines how to adjust decentralization and information richness in times of digitalization by drawing on an exploratory single-case study approach in a German industry company. This research identified six sub-parameters set differently within the company's digital collaboration platform and video conference technology network.

Keywords: operational capabilities, capability transfer, capability protection, decentralization, information richness, digitalization, digital collaboration platform, video conference technology

1. INTRODUCTION

Multinational companies (MNCs) generate competitive advantages (Argote & Fahrenkopf, 2016) if there are many intra-firm flows of capabilities (e.g. De Castro & Aquino, 2021; Gaur, Ma & Ge, 2019; Prompreing & Hu, 2021), or, more precisely, operational capabilities (Helfat & Winter, 2011; and similar Teece, 2014). These are firm-specific sets of skills, processes, and routines (Cepeda & Vera, 2007) based on valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). However, these capability transfers within MNCs are facing a "paradox" (Coff, Coff & Eastvold, 2006): on the one hand, the companies try to facilitate the transfers of operational capabilities within their organization (e.g. Burmeister, Lazarova, & Deller, 2016), but on the other hand, they are careful to avoid disclosure to external parties (Contractor, 2019; Ritala & Stefan, 2021), e.g. when underlying skills, routines and resources become transparent to rivals (Hurmelinna-Laukkanen, 2011; Ralston & Blackhurst, 2020).

To mitigate this tension, (I) the level of decentralization of decision-making (Sumelius & Sarala, 2008) and (II) the information richness of communication mechanisms (Daft & Lengel, 1986) are considered to be balancing parameters, whereby (I) describes the autonomy of the transfer participants in their actions (Molina, Lloréns-Montes & Ruiz-Moreno, 2007) and (II) refers to the ability of the media channel to transmit information and effectively change the understanding of the receivers (Shaw, Chen, Harris & Huang, 2009).

As digitalization reduces traditional physical boundaries and interdependencies between organizational units, and standardizes communication interfaces (Cano-Kollmann, Cantwell, Hannigan, Mudambi & Song., 2016; Culot, Orzes, Sartor & Nassimbeni, 2020), it enables more scope for interaction and coordination in the transfer of operational capabilities (Eisenman & Paruchuri, 2019; Hagiu & Wright, 2015). In doing so, digitalization also intensifies the paradox between simultaneously facilitating the transfer of operational capabilities and their protection from disclosure (Thalmann, Manhart, Ceravolo & Azzini, 2014), thus shifting the focus to the optimization of decentralization of decision-making and the information richness of communication mechanisms.

Some scholars have attempted to examine the advantages and disadvantages that come with leakages of capabilities to externals (Inkpen, Minbaeva and Tsang, 2018; Wadhwa, Freitas & Sarkar, 2017). Other studies investigated how the internal use of digital tools enhances or threatens the codifiability of knowledge and capabilities (Coff et al., 2006; Berraies, 2019; Chatterjee, Chaudhuri, Vrontis & Piccolo, 2021), or they focused on the paradox from the perspective of inter-organizational transfers (Contractor, 2019; Ritala & Stefan, 2021), and were anchored, for example, in open innovations research (e.g. Lauritzen & Karafyllia, 2014). However, these studies do not open the black box of the balance between facilitation and protection of intra-firm capability transfers, nor do they provide guidance on how digital transfer mechanisms need to be optimized. Therefore, current literature remains on a higher level of consideration in the context of the trade-off, which neglects the influencing factors of decentralization of decision-making and information richness in times of digitalization. This raises the following research question, both theoretically and practically.

RQ: How do MNCs optimize (I) decentralization of decision-making and (II) the information richness of communication mechanisms to simultaneously facilitate and protect transfers of operational capabilities in times of digitalization?

For this purpose, a German-headquartered multinational industrial product company, characterized by high rates of capability transfer flows between organizational units, was analyzed in a single-case study (Zhao & Anand, 2009).

The article is organized as follows. Section 2 presents a literature review of the transfer of operational capabilities, decentralization of decision-making, and the information richness of communication mechanisms. In addition, the influences of digitalization on intra-firm transfers of capabilities are discussed. Then, Section 3 explains the research framework applied to investigate the research question. Section 4 examines the research methodology used in this study. This is followed by a presentation of the findings in Section 5, and the subsequent discussion in Section 6. This article ends with a conclusion (Section 7) including theoretical and practical contributions as well as the limitations of the study.

2. LITERATURE REVIEW

2.1. Transfer of Operational Capabilities

In the literature, operational capabilities are seen as a subset of frequently used organizational capabilities and thus share a large overlap in attributes (Argyres, 2021; Sheehan & Foss, 2017). Operational capabilities, in consequence, represent "information-based tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm's

resources" (Amit & Schoemaker, 1993, p. 35). Ideally, operational capabilities can generate competitive advantages when they are based on valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991) such as knowledge (Papa, Dezi, Gregori, Mueller & Miglietta, 2018; Proff 2005).

Operational capabilities can be transferred between organizational units such as the headquarters and subsidiaries (Jankowska, Bartosik-Purgat, & Olejnik, 2020; Law & Kamoche, 2017) or peer subsidiaries of an MNC and have the "ability to globally leverage dispersed subsidiary specific advantages and to generate new knowledge through a global synthesis of dispersed knowledge" (Keupp, Palmié & Gassmann, 2011, p.214). The management is interested in facilitating these transfers, because, on the one hand, the operational capabilities are bound to complex routines and processes (Bloodgood, 2019; Inkpen, 2008), which means a separation and documentation ("codification", Simonin, 1999; Zander & Kogut, 1995) is difficult (Windsperger & Gorovaia, 2011), or the organizational structures are too centralized concerning the subsidiary's management transfer decisions (Nesheim & Gressgard, 2014). On the other hand, MNCs also try to avoid operational capabilities becoming transparent to external parties in the case of spreading the transfer to a large number of receivers (Ritala & Stefan, 2021). Hence, there is a tension between facilitating the transfer of operational capabilities within the company (e.g. Burmeister et al., 2016) and protecting them from disclosure to external stakeholders (Contractor, 2019), which is described as a "paradox" (Coff et al., 2006), and cannot be mitigated in favour of a clear decision for one of the two sides.

However, it can be seen from the literature that there are parameters, such as decentralization of transfer decisions and the information richness of communication mechanisms, which can be used to reduce the tensions of this trade-off (Molina et al., 2007; Shaw et al., 2009). These two parameters are presented below.

2.2. Decentralization and Information Richness

The level of (I) *decentralization of transfer decisions* and (II) *information richness of communication mechanisms* are parameters that influence (facilitate or hinder) the transfer of operational capabilities (Gaur et al., 2019; Molina & Llorens-Montes, 2006; Nisar, Prabhakar & Strakova, 2019):

Decision-making decentralization varies between full decentralization and full hierarchy, whereby decentralization refers to the level of freedom that an organizational member has in carrying out his or her activities (Grant, 1997; Molina et al., 2007). Decentralization, therefore, also influences commitment and cooperation in the transfer of operational capabilities (Nahapiet & Ghosal, 1998). According to Teece (2000), non-bureaucratic, decentralized, autocratic, and task owner-oriented transfer conditions are particularly necessary to facilitate the transfer of capabilities in MNCs (Molina & Llorens-Montes, 2006). That is, it is difficult to transfer operational capabilities that are more likely to flow from one organizational unit to another. In addition, too much decentralization can lead to a lack of clear rules on intellectual property and security (Luo, 2022), and the transfer processes become uncontrolled and dissipated in the organization (Ritala, Husted, Olander & Michailnova, 2018). Individual capability owners might also resist a transfer if their decision-making freedom is too high, for example, because they fear a loss of uniqueness within the organization (Cabrera, Collins & Salgado, 2006). The managerial challenge is to balance the two sides: a high level of decentralization of decision-making to empower the independent creation and dissemination of operational capabilities within the organization and a low level of decentralization to ensure the transfer of capabilities in an orderly and safe manner (Andersson, 2003).

According to the information richness theory (Daft & Lengel, 1986), the effective transfer of operational capabilities also requires a fit between the codifiability, that is, the level of documentability of the operational capabilities, and the "richness" of the communication media or mechanisms (Windsperger & Gorovaia, 2010). Appropriate information richness is shown in four attributes (Ishii, Lyons & Carr, 2019; Windsperger & Gorovaia, 2010): immediate feedback, availability of multiple cues (voice, body, gestures, and words), language variety, and personal focus (transfer of emotions and feelings). Mechanisms that fulfil these attributes facilitate the sharing of unconcealed tacit knowledge as the basis of operational capabilities (Szulanski, Ringov & Jensen, 2016) because they can transfer the context of information, resolve ambiguity, and support understandability (Peltokorpi, 2014). While text-based communication mechanisms, such as e-mails, have rather low information richness, feedback can be provided, and body language is shown particularly quickly in face-to-face conversations (Abbariki, Snell & Easterby-Smith, 2017). Here, the information richness can be described as very high (Dunaetz, Lisk & Shin, 2015). However, high information richness in communication mechanisms bears the risk of unraveling the VRIN characteristics of capabilities more easily (see section 2.1).

However, the two parameters of (I) decision-making decentralization and (II) information richness of communication mechanisms are not to be regarded as invariable. Rather, they need to be adapted to

organizational changes (Chatterjee et al., 2021; Contractor, 2019). One of these changes is triggered by digitalization, which will be explained in the next section.

2.3. Digitalization

Digitalization causes changes in organizations through the increasing use of digital technologies (Krasonikolakis, Tsarbopoulos & Eng, 2020; Sandkuhl, Shilov & Smirnov, 2020), which leads to far-reaching socio-technical phenomena and processes of use and adaption (cf. Gray & Rumpe, 2015; Legner et al., 2017). This wide application of new technologies has also influenced the transfer of operational capabilities within MNCs, as strictly sequential and interdependent communication and decision-making channels, for example, within the relationship between a subsidiary and the parent company, have been dissolved by the introduction of standardized communication tools (Peñarroja, Sánchez, Gamero, Orengo & Zornoza, 2019). Consequently, activities can be uncoupled, and decision-making units can make partial decisions independently (Weyer, Schmitt, Ohmer & Gorecky, 2015). Therefore, organizational units can be linked to modular systems (cf. Herbst, 2021; Koch & Windsperger, 2017) and thus form temporary, network-like structures such as connected production systems (Lu, Liu, Wang, Huang & Xu, 2020). This also applies to the transfer of operational capabilities within digital networks, which are implemented with the help of software tools, and thus can be made faster and more far-reaching (Paruchuri & Awate, 2016). Common communication mechanisms include blogs and wikis (Matos & Lourenço, 2013) or video conference technologies (Schneckenberg, Truong & Mazloomi, 2015). In the course of digitalization, platforms are also emerging, such as enterprise collaboration platforms, in which interactions for extensive two-way dialogue among employees are created, including private and social topics and issues (Lehmkuhl & Jung, 2013). Thus, network attendees create social ties (Valenzuela, Correa & de Zuniga, 2018) in multilateral relationships between organizational units (Murray & Peyrefitte, 2007) and consequently build intra-firm networks of employees (Razzaque, Eldabi & Jalal-Karim, 2013). The implementation of these digital networks creates more scope for interaction and coordination in the transfer of operational capabilities, which on the one hand allows faster and more frequent transfers with a high number of network participants and on the other hand also increases the danger of capabilities becoming transparent to external companies (Hurmelinna-Laukkanen, 2011), which amplifies the risk of the disclosure of operational capabilities (Krylova, Vera & Crossan, 2016).

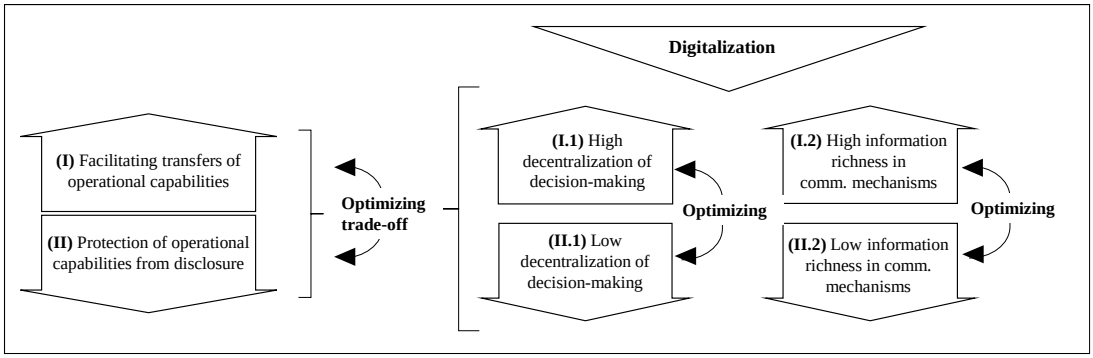
Thus, further research is needed on how to mitigate this trade-off, which gets intensified by advancing digitalization. An approach to this is presented in the next Section.

3. RESEARCH FRAMEWORK

In this study, a research framework (see Fig. 1) was applied to investigate the trade-off between the facilitation of the transfer of operational capabilities and their protection from disclosure in times of digitalization. This research framework was developed based on the theoretical foundations in Section 2. At this point, it could be shown that the tensions cannot be mitigated by a decision in favour of one of the conflicting goals. Instead, one proposition is to make the trade-off "more favourable" (Teece, 2019) by reducing (Mudambi, 2011) or more strongly narrowing down the conflict to the level of balancing parameters (Elahi & Yu, 2007; Winter, 1987), which need to be optimized. In the literature, the two parameters of (I) decentralization of decision-making and (II) the information richness of communication mechanisms are often discussed as having an impact on the transfer and protection of operational capabilities (see Section 2.2). That is, they can be seen as "third variables" (Ledgerwood & Shrout, 2011) and sub-parameters. However, the balancing of (I) and (II) can range from high to low and always needs to be adapted in consideration of organizational changes. As shown in Section 2.3, digitalization can be seen as a cause of organizational change, which has shifted the transfer of operational capabilities. This means especially the transformation from traditional bilateral communication (e.g. headquarters and subsidiaries) to multilateral communication based on software tools such as collaboration platforms that enable the coordination and interaction by means of multiple connections and transfer channels (see Section 2.3).

Therefore, based on the review of the literature in the respective sections the present research framework focuses on the optimization of the two sub-parameters (I) decentralization of decision-making and (II) information richness in communication mechanisms under digitalization. This research framework, therefore, builds the starting point for the in-depth case study approach and thus can shed light on the optimization of (I) and (II) from a qualitative perspective. The underlying methodology is explained in the next Section.

Figure 1: Research framework (Source: own compilation)



4. METHODOLOGY

4.1. Case Study Approach

Qualitative research was used that provides in-depth insights into the transfer of operational capabilities (Mees-Buss, Welch & Westney, 2019; Simons, 2013) by answering "how" and "why" questions (Yin, 2004). The case in the present research is a worldwide industrial company headquartered in Germany, generating more than 5 billion euros in sales with more than 20,000 employees (state of 2022) from over 100 locations. It has diversified its product portfolios for industrial products. Digital intra-firm networks for the transfer of operational capabilities have already been implemented.

4.2. Data Collection

The present study's data are based on 12 interviews with middle- and top-management employees who are highly involved in knowledge and capability-transferring activities. The interviews were conducted following a semi-structured approach with open questions (Wagstaff, Salvaj & Villanueva, 2020) concerning the decentralization of transfer decisions (for example, "How can participants decide to take part in capability transfers?" and "Who is responsible for the administration of these transfers?") and the information richness of communication mechanisms (e.g. "What kind of software do you use in the transfer of capabilities?" and "Which type of data were transferred?"). Video calls were used for each interview (Gray, Wong-Wylie, Rempel & Cook, 2020) with respondents from international company locations, and the interviews were recorded (see Table I).

Table 1: Conducted interviews

Respondent	Position at company	Located	Duration
A	Head of Corporate Business Excellence	Headquarters	84 min
B	Corporate Excellence Network Manager	Headquarters	60 min
C	Corporate IT Manager	Headquarters	58 min
D	Head of Corporate IT	Headquarters	58 min
E	Corporate Strategy Manager	Headquarters	50 min
F	Senior Manager Production Excellence	Subsidiary	63 min
G	Vice President	Subsidiary	53 min
H	Plant Manager	Subsidiary	53 min
I	Plant Manager	Subsidiary	54 min
J	CTO, COO Business Unit	Subsidiary	58 min
K	Technology Manager	Staff Unit	76 min
L	Technology Manager	Staff Unit	65 min

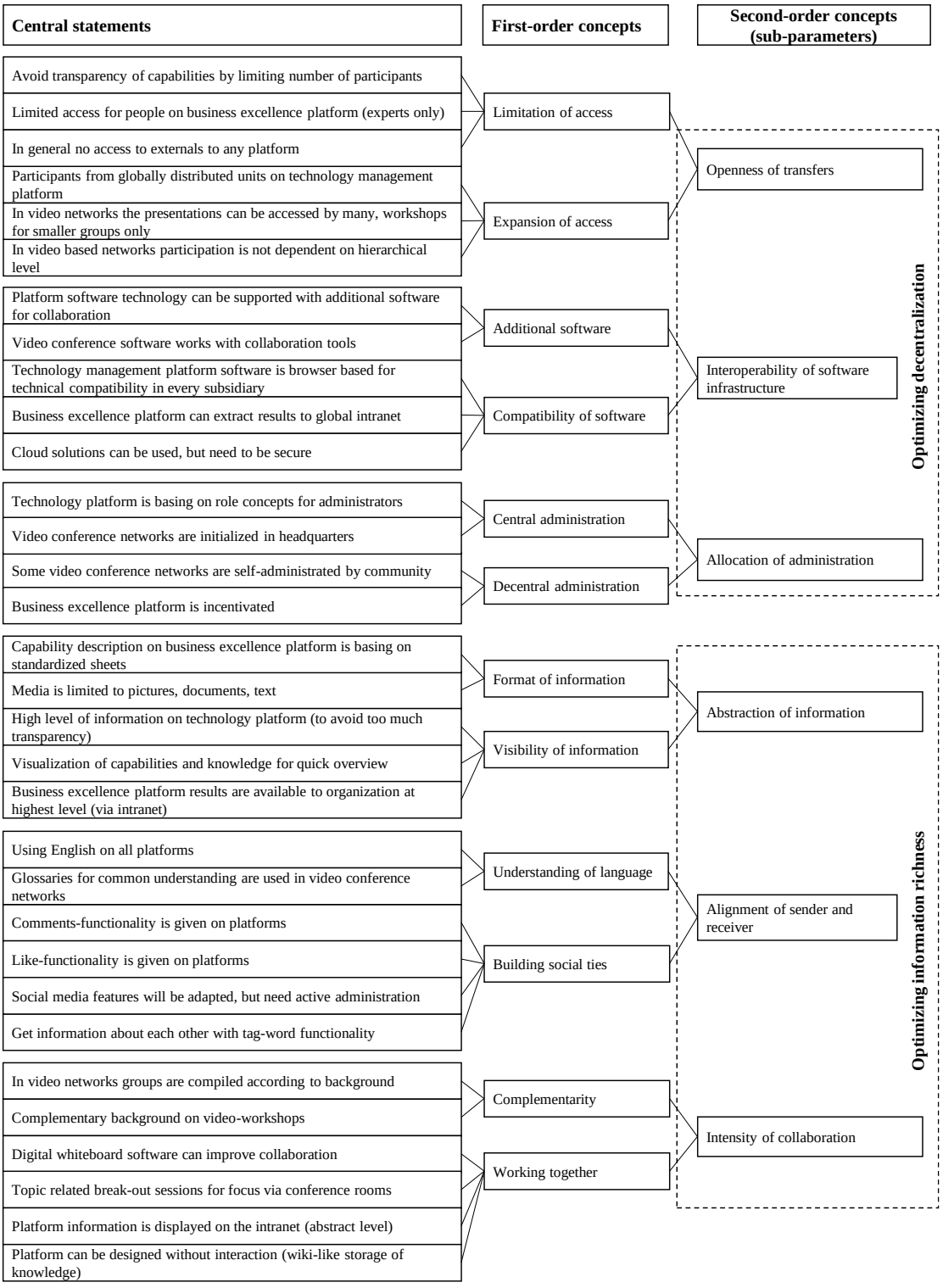
After 12 interviews with a deep focus on the research question, the point of saturation was reached, that is, no new information could be gained after this point (Glaser & Strauss, 1967). The recorded interviews were transcribed for data analysis (Meyer, 2001), resulting in 124 pages of transcription. For triangulation, additional digital artifacts were collected (Eisenhardt, 1989) in the form of software

manuals (991 pages) and documents (626 pages), both demonstrating the functionality and features of the networks. The research team was also allowed to attend live meetings on intra-firm capability transfers. A researcher with expertise in knowledge and capability transfer conducted pre-tests of the interviews with two employees from the organization (Ellram, 1996) before the actual interviews were conducted.

4.3. Data Analysis

The analysis was applied to all the available data (interview transcripts, documents, and software manuals, see Section 4.1) following the principles of inductive qualitative research (Gioia, Corley & Hamilton, 2013). Open coding was applied (Holton, 2007) and supported with software (MAXQDA; see Kuckartz & Rädiker, 2019) using the constant comparison method (Corbin & Strauss, 1990). By cycling between the coded data and theoretical constructs and vice versa, central statements and first-order concepts were generated from the data and finally grouped into sub-parameters ("second-order concepts", Langley, 1999; Strauss, 1987, see Fig. 2). The results indicate how to set these sub-parameters to optimize (I) the decentralization of decisions and (II) the information richness of communication mechanisms (see Section 3). For proof of reliability, research colleagues who performed the coding independently arrived at the same conclusion (Yan & Gray, 1994).

Figure 2: Central statements, first-order concepts, and aggregated sub-parameters for the optimization of decentralization and information richness (Source: own compilation)



5. FINDINGS

On the one hand, digital collaboration platforms are set up within the case study company in which participants contribute their best practices or technologies and transfer information to the community. These platforms are based on enterprise social media technology, where users can open, edit, and comment on best practices and participate in virtual groups (Gressgard, 2012; Sun, Fang & Zhang, 2021). On the other hand, networks based on video conferencing technology are built, in which participants

deliver presentations or participate in interactive workshops. Both network types differ in terms of (I) the decentralization of the MNC's decisions on transfers and (II) the information richness of the communication mechanisms, which can be seen in the three sub-parameters for both (I) and (II).

5.1. Optimizing the Decentralization of Decision-Making

5.1.1. Sub-Parameter A: Openness of Transfer

From the data, it can be seen that the company has defined accessibility to its transfer networks for the subsidiaries' and headquarters' employees to varying degrees. In the case of collaboration platforms, this parameter is set more restrictively such that only a fixed group of participants is admitted. Registration was not possible for all employees. For example, the worldwide business excellence platform for best practice transfers has limited access to business excellence experts. The company wants to keep the number of transfer participants manageable, thereby avoiding the circulation of capabilities in an uncontrolled manner.

Capability transfer networks based on video network technology extend beyond the usual one-to-one conversations in normal calls and act more like "communities of practice" (Roberts, 2006). Meetings normally take place with 10 to 15 participants and therefore have smaller characteristics. The openness of transfer is high and is based on a voluntary exchange of capabilities, so that participants benefit from free (i.e. intrinsically motivated) interaction and the formation of social relationships (Lave & Wenger, 1991). That is, network members from different subsidiaries are free to transfer their capabilities, as respondent B stated.

"[…] and by the foundation of these networks people from different company locations can meet on [video conference software] and can talk to each other and can share capabilities very well."

Participants' access is granted without restrictions concerning their hierarchical level or affiliation to a corporate division, and the interaction can occur in webinars and lectures, mainly in smaller groups, so that conversations are easy to manage.

5.1.2. Sub-Parameter B: Interoperability of Software Infrastructure

The company uses a standardized collaboration platform and video-conferencing technologies in which the central headquarters or leading subunits have decided to implement and meet the requirements specified by the top management. Both network types have the possibility of expansion. In collaboration platforms, software usage is browser- and cloud-based, because standard interfaces (see Section 2.2) can enable compatibility with a broad range of global IT systems, as can be seen from respondent L:

"The software is cloud-based software, which we deliberately chose. Because we need to have a cross-group tool, and because our group has different IT architectures, which then cannot always connect to one solution. Therefore, a cloud-based solution that is accessible through the browser."

However, independent use of additional software is not possible. Instead, only software extensions that work together with existing infrastructure (add-in tools) can be used. By doing so, the software variety is expanded to a predetermined pool of products, applications, and additional tools that have been proven to be secure. This ensures that the transferred capabilities remain within controllable environments and that the transfer processes are stable.

In transfer networks based on video call technology, standardized software can be expanded for functionality up to a certain level, for example, if more collaboration is needed. Additional software was used in parallel. Therefore, communities can individually decide whether an additional browser-based collaboration tool should be added, such as *Mural* (Mural Enterprise, 2021), which supports the joint creation and editing of content and information. This affords users more freedom than would be possible with proprietary solutions, leading to improvements in meeting their expectations and increasing their satisfaction (Wang & Li, 2012).

5.1.3. Sub-Parameter C: Allocation of Transfer Administration

Networks that transfer capabilities based on collaboration platform technology or video technology are implemented within the company from the headquarters or by leading subsidiaries, but administration differs according to the size and underlying technology of these networks. Big transfer networks based on platforms (e.g. best practice sharing in a narrowly defined subject area) are administered by a central subsidiary, which uses a reward system based on performance points to track and incentivize transfer activities, as respondent F explained:

"Sharing knowledge of best practice and lessons learned is part of our excellence system, and that is assessed in assessments, and if the factories don't do that […] then he [transfer contributing subsidiary] gets fewer points."

Incentivization often occurs when there are too few network participants to generate a steady flow of contributions or when they have little motivation to share information on their own (Friedrich, Becker, Kramer, Wirth & Schneider, 2020). Especially at the beginning of the formation of such platforms, incentivization is a solution to generate both secure and traceable transfer activities, as well as adequate engagement from the participants. Centralized administration with incentivization for transfer activities mediates these networks, creating an artificial impetus for transfers. On some platforms that have reached a certain size, the central units cannot handle the administration alone because the traceability of activities across the growing network requires too much capacity. Therefore, globally accessible platforms are based on role concepts, meaning that certain community members become administrators acting as moderators, who can still maintain connections to top-level administrators.

In contrast, video-technology-based transfer networks are implemented from the headquarters to staff offices, but can move from centrally administrated to self-administered governance (i.e. managed independently by the community). Respondent A stated:

"We see that the members of the network access the colleagues in the excellence network as a source of solutions for their daily business as if it were a matter of course. […] This means that beyond the formal events, independently developing networks emerge here."

In this case, people from different subsidiaries of the network are part of the transfer network and are also responsible for coordinating transfer processes and content.

5.2. Optimizing Information Richness in Communication Mechanisms

5.2.1. Sub-Parameter D: Abstraction of Information

The case study company's collaboration-platform-based transfers contain information with reduced details only. Even though more detailed information can be transferred, the storage of capabilities is based on superficial and standardized input options with a higher degree of abstraction so that sensitive data and information do not become too transparent in the organization. This kind of "anonymization" (Alamäki, Aunimo, Ketamo & Parvinen, 2019) of content decreases the information richness and is chosen in such a way that the stored capabilities still provide a basic understanding of the underlying principles and functionalities; more detailed information is deliberately transferred only if there is interest in a bilateral exchange, which is handled via other channels. Respondent L confirmed this as follows:

"However, technical documents or drawings are never exchanged on the platform. This is not done via the cloud, but is exchanged bilaterally between the experts using internal communication channels."

In comparison, networks based on video conference software enable the transfer of operational capabilities with greater language variety and a higher number of cues and channels (Daft & Lengel, 1986), which is typical in video face-to-face interactions. Thus, even capabilities in a highly complex context can be explained by these mechanisms. Because the group of participants in workshops, in particular, is small compared to the potential number of people in platform-based solutions, the risk of uncontrolled transfer of capabilities remains low.

5.2.2. Sub-Parameter E: Alignment of Sender and Receiver

On the company's collaboration platforms, participants can add keywords, ratings, comments, and linkages to information on capabilities, and the sender and receiver will automatically get in touch after a search inquiry. In particular, because the organization is increasingly based on the globally distributed expertise and knowledge of individuals (see also Caldwell, Palmer & Cuevas, 2008), the company's platforms can connect members if they have shared interests or complementary capabilities. According to Sheer (2011), even though these exchange channels offer limited opportunities for transmitting social information compared with face-to-face communication, their multiple features (e.g. commenting, rating, and sharing) make it easier to build relationships and build up social-emotional cues (Daft & Lengel, 1987). In the future, the company intends increasingly to rely on algorithms with artificial intelligence analyzing each documentation of capabilities to make accurate recommendations as to which capabilities need to be transferred to which persons. According to Respondent D,

"[This technology can] evaluate the information that I have and target it in the group or on an employee's intranet page who then says he is interested in the following points, and then he gets a tech

cloud, and there is the intelligence behind it. These are new ways to display relevant information. [...] New topics are suggested to me."

In comparison to collaboration platforms, the company's video-based networks offer the possibility of face-to-face interaction, which can enable rapid feedback related to information richness (Daft & Lengel, 1986). In these networks, wikis and glossaries as well as user profiles are created to improve participants' understanding of the topics issued in the network, where prior knowledge is required. As a result, not only are the participants always involved and they co-determine the content of the transfer networks, but also the alignment of participants to network goals is stronger than on digital platforms.

5.2.3. Sub-Parameter F: Intensity of Collaboration

The transfer of capabilities via the digital collaboration platform focuses on the unilateral sharing of information and is based only on delayed feedback because there is a time lag between members' contributions, which prevents instant answers and communication (Dennis & Kinney, 1998). Consequently, platform transfers are mainly utilized to document best practices and publish them within a circle of participants. Collaboration occurs at a low level through comments, supplementary entries, or shared documents edited by the community. On the one hand, this hinders the deeper co-creation of capabilities, but on the other hand, it can keep the collaboration documentable and thus prevent uncontrolled and overhasty dissemination of content.

For more intensive collaboration with multilateral interaction, video-technology-based networks enable the transfer of operational capabilities with greater language variety and a higher number of cues and channels (see Daft & Lengel, 1986). This allows people with different background knowledge to interact better with each other and exchange the character of a workshop in which content is developed jointly. Respondent C said:

"Because we do everything at [video-call software] and […] said we would take people from our network top-down to the technical basis so that we can work in a workshop format."

In the course of this communication, participants can not only document their already known capabilities but also, by bringing in complementary knowledge, co-create completely new capabilities ("value co-creation," Vargo & Lusch, 2008) outside their daily work. In this context, additional collaboration software is used in the case company, where people can live in different groups (e.g. on a blackboard or a mind map) and present the results together, giving immediate feedback.

6. DISCUSSION

The findings from the present study show six parameters: (I) decentralization of decision making and (II) the information richness of communication mechanisms, which optimize the facilitation of intra-firm transfers of operational capabilities and their protection from disclosure to externals in times of digitalization (see Fig. 3).

Figure. 3: Adjustment of sub-parameters for optimizing decentralization and information richness of capability transfers (Source: own compilation)

	Sub-Parameters	Digital collaboration platform	Video-technology network
Optimizing decentralization	A Openness of transfer	Restricted access to platforms, background related (i.e., experts only)	Open access, voluntary participation, interdisciplinary composition
	B Interoperability of software infrastructure	Cloud-based standardized platform software, supplementary add-in tools	Standardized video-conference software, supplementary stand-alone software
	C Allocation of administration	Initialized (incentivated) by central units, administration by de-central moderators and automated algorithms (for big networks)	Initialized in headquarters, self-administration by community
Optimizing information richness	D Abstraction of information	High level of abstraction (summarized information, text- and graphics-based interaction)	Low level of abstraction (detailed information, virtual face-to-face interaction)
	E Alignment of sender and receiver	Tag-words, linkages, ratings, comments and search functionality	Common understanding via glossaries, wikis, user profiles
	F Intensity of collaboration	Delayed feedback on platforms, limited co-creation of capabilities	Immediate co-creation of capabilities, enabling of workshop mode

Accordingly, decentralization of decision-making regarding the transfer of operational capabilities can be optimized by adjusting A) the accessibility of the transfer activities ("openness of transfer"), B) the level of autonomy to expand the software functionality or compatibility that is used in communication ("interoperability of software infrastructure") and C) the responsibility for the administration of the transfers ("allocation of administration"). The information richness of communication mechanisms in transfers of operational capabilities can be optimized by adjusting D) the depth of details of the transferred information ("abstraction of information"), E) the characteristics of the alignment between the sender and receiver of the capabilities ("alignment of sender and receiver"), and F) the intensity of collaboration, for example, when co-creating capabilities together.

The results provide initial indications of how the sub-parameters will be designed within the two basic technologies of collaboration platforms and video-conferencing for the transfer of operational capabilities. Companies can adjust (I) the decentralization of their decisions in the transfer of operational capabilities via collaboration platforms through limited access management for participants (A), a controlled extension of the software infrastructure without foreign additional tools (B), and a shift of administration to moderators in the case of larger numbers of participants on collaboration platforms (C). (II) Information richness in platform-based transfers can be optimized with abstract information sharing only (D), enabling the alignment of participants by (increasingly automated) matching of their common interests and improving personalization (E). Moreover, companies might accept delayed collaboration functionality (F), which minimizes the risk of the rapid spread of sensitive content that occurs when communication is left completely dynamic and in real time. For this reason, collaboration platform technology in the MNC is mainly used for the transfer of best practices to larger groups of participants (e.g. in the sharing of best practices in business excellence).

Furthermore, MNCs can optimize their (I) decentralization of decision-making in the transfer of operational capabilities via video conference software by providing open access for participants (A), allowing additional software for enhanced functionalities that can improve collaboration (B), and outsourcing the administration of transfers to the community (C). (II) Information richness of communication mechanisms is facilitated by allowing detailed information sharing (D), improving mutual understanding in smaller groups (e.g. by writing glossaries) (E), and enabling bilateral and live collaborations for strong co-creation of capabilities (F). That is, video conference technology-based networks facilitate the transfer of particularly complex operational capabilities and can create new capabilities in smaller groups of participants such that sensitive information is contained within a well-defined circle of involved participants.

7. CONCLUSIONS

7.1 Theoretical Contributions

This article has investigated the paradox between facilitating the intra-firm transfers and the protection of operational capabilities from becoming lost to externals in times of digitalization. So far, in the literature, this trade-off has been treated as a black box and has not been examined in detail by considering balancing factors for digital communication mechanisms (see Section 1). By narrowing down the trade-off with the introduction of "third variables" as balancing parameters (Elahi & Yu, 2007; Ledgerwood & Shrout, 2011), which includes optimizing the (I) decentralization of the MNC's decisions and (II) the information richness of communication mechanisms, this study could provide a theory-based approach to mitigate the paradox. In general, the findings have contributed to a better understanding of the theoretical constructs of decentralization and information richness under digital impact. In particular, six sub-parameters for the optimization of the balancing parameters were identified. Thus, the present case-study results extend the previously generically described understanding of decentralization of decision making (e.g. Grant, 1997) and information richness (Daft & Lengel, 1986) and apply it to the design of digital capability transfer networks, in which the balance between transfer and protection of operational capabilities is optimized. The identification of sub-parameters for (I) and (II) can thus also provide a fundamental basis for operationalizations in quantitative empirical research in the field of digital intra-firm knowledge or capability transfers.

7.2 Practical Contributions

The findings from the single-case study revealed six sub-parameters of (I) decentralization of decision making and (II) the information richness of communication mechanisms, which can help the management of MNCs to adjust their digital capability transfer networks. In particular, practical indications were provided, on how to design digital collaboration platforms and video conference networks that can improve the transfers, but without losing capabilities to externals (mitigation of the "paradox", Coff et al., 2006). The findings show that to transfer operational capabilities in networks with

many participants, but without uncontrolled content distribution, collaboration platform-based networks with a balancing parameter setting of lower decentralization and information richness would be appropriate. In contrast, for collaborative exchanges among participants and intensified interactions in smaller groups, video-based networks with parameters that lead to high autonomy and information richness could be the most suitable choice for MNCs. For both platform-based networks and video-based networks, the present research could provide concrete recommendations for implementation (see Section 6). Thus, the findings will not only contribute to the identification of design parameters for balancing the trade-off but can also be a preparation for the establishment of virtual organizations (Choi & Cho, 2019) in the medium term or for the transfer of knowledge and capabilities in increasingly discussed metaverse organizations (Choi, 2022) in the future.

7.3 Limitations

Despite the contributions of this study, several limitations should be considered in future research. Due to the non-representative nature of the sample, the data collection process might be subjective and cause research bias (e.g. when identifying interview partners and conducting the interviews). Hence, the findings should be considered with care (as initial indications that require further quantitative research), since they do not provide general validity. In addition, other sectors or industries may have different digitalization impacts and capability transfers than those in the present study. Future research could therefore also apply a quantitative research approach to include a larger number of participants and allow conclusions to be drawn about the generalization of the results.

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