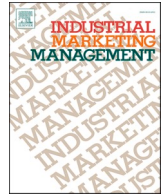




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Handling resource deficiencies through resource interaction in business networks

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ABSTRACT

This paper conceptualizes how to handle resource deficiencies due to disruption and turbulence in supply chains from an Industrial Marketing and Purchasing (IMP) perspective. A conceptual framework explores how three resource deficiencies, *resource scarcity*, *resource quality*, and *lack of availability*, impacts upon, and is mitigated via, resource interaction. There is a need for reconfiguring resources to cope with both temporary and permanent disruptions in handling resource deficiencies in complex, turbulent contexts. The three deficiencies can occur within a business network both separately and in combination. The paper outlines a dynamic capabilities perspective on resource deficiencies in business networks by linking resource interaction and capabilities. The reality of resource deficiencies requires a sense of urgency; they are disruptive and most likely unplanned. This challenges mainstream IMP understanding about the dynamics of resource development.

1. Introduction

Increasing complexity due to shortages and scarcity of raw materials, products and natural resources is currently challenging multiple literatures within the B2B domain. Examples abound in daily news reports regarding the combined financial after-effects of the pandemic (inflation), natural resource scarcity (Bell, Autry, Mollenkopf, & Thornton, 2012; Kalaitzi, Matopoulos, Bourlakis, & Tate, 2018), and resource shortages in raw materials, energy, and components. These have significant disruptive impacts on business sectors and societies as a whole, exacerbated by political instability and the climate emergency. Taken together, ultimately this is a pervasive sustainability issue.

The disruptive impact on the stability of global supply chains of such resource shortages is highlighted in supply chain resilience (Kumar & Kumar Singh, 2022; Tukamuhabwa, Stevenson, Busby, & Zorzini, 2015), resource scarcity (Spieske, Gebhardt, Kopyto, & Birkel, 2022), supply chain vulnerability (Christopher, 2016), and supply chain risk management (Manhart, Summers, & Blackhurst, 2020; Wagner & Bode, 2008) literatures. That is, “supply chain turbulence...is an increasing concern...defined as changes in the business environment beyond the company’s control, including shifts in customer demand, geopolitical disruptions, natural disasters, and pandemics” (Blessley & Mudambi, 2022: 58). This

leads to a need to understand “how resource reconfigurations occur during high impact disruptions” (Ibid.).

Various resource theories have been utilised in assessing buffering and bridging strategies for handling scarcity, such as Resource Dependency Theory (Kalaitzi et al., 2018), Resource Based Theory (Kumar & Kumar Singh, 2022; Spieske et al., 2022), and Resource Advantage Theory (Bell, Mollenkopf, & Stolze, 2013; Esper & Crook, 2014). In parallel, in the S-DL stream, “... resource quantity and resource quality are core considerations, yet questions remain regarding the effect of resource deficiencies and how these deficiencies might be overcome...[in] the resource integration literature” (Vafeas & Hughes, 2020: 597). There are tensions involved when resources are not available in suitable quantities and/or qualities.

The point of departure in this paper is to consider the resource deficiencies from the resource interaction literature within the Industrial Marketing and Purchasing (IMP) perspective. Taking an IMP lens to resources enables a multi-layered, multi-actor discussion towards resource deficiencies. This is important because such challenges – alongside other sustainability challenges - cannot be solved at the individual company level (Antolin-Lopez & Montiel, 2018; Ferraro, Etzion, & Gehman, 2015; Jarzabkowski, Dowell, & Berchicci, 2021).

IMP argues how the features of interactive, heterogeneous resources

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are a source of value cocreation and enabler of relationship development within business networks (Baraldi, Gressetvold, & Harrison, 2012a, 2012b; Håkansson & Snehota, 1995; Prenkert et al., 2022). Resource heterogeneity, here referring to the notion that resources have the potential to be further developed and re-used at a given point in time, along with both direct and indirect relationships as sources of resource access, are among the central assumptions (see Section 2.2). Furthermore, efforts in achieving innovation and resource development are emergent, and as such, are impacted by frictions, tensions and stickiness in resource combinations and interfaces (Bocconcelli et al., 2020; Håkansson & Waluszewski, 2002b). Challenges can occur in linking and changing resources in terms of underutilization, or ineffective combining processes regarding the potential of a resource combination (Baraldi et al., 2012b; Håkansson & Snehota, 1995; Prenkert, Hasche, & Linton, 2019).

In this paper, we take resource interaction literature within IMP as the starting point to explore the deficiencies under discussion in parallel literatures. We aim to explore how *resource scarcity*, *resource quality*, and *lack of availability*, impacts upon, and is mitigated via, resource interaction. Both the possibilities for resource re-use and resource access via direct and indirect relationships are likely to be impacted by disruptive, complex contexts. It creates a need for (rapid) resource reconfigurations to handle temporary disruption (and perhaps permanent) as resources are reconfigured to handle resource deficiencies in complex, turbulent contexts.

To the best knowledge of the authors, Bygballe, Dubois, and Jahre (2023) is the only paper outlining a resource interaction, IMP-centred discussion of managing supply chain disruptions. We agree with Bygballe et al. in terms of resources being underspecified and interdependent relationships are central. We aim to provide additional theoretical insight in expanding the scope of the debate to include the three resource deficiencies and the dynamic capabilities needed to cope with these. We ask two research questions. The first is *‘how can resource deficiencies be conceptualised from the perspective of resource interaction?’*. We answer this question by proposing a three-part conceptual framework that starts from an idea of resource deficiencies at a point in time.

We conceptualise resource deficiencies as *‘resource scarcity’*, *‘resource quality’* and *‘lack of resource availability’*, respectively. *Resource scarcity* occurs when the resource is insufficient compared with demand. *Resource quality* relates to the deficiencies in the intrinsic properties of the resource. *Lack of resource availability* refers to when there is limited or no access to a resource for actors within the network. When these three deficiencies occur - both separately and combined - we can observe a dark side (Grandinetti, 2017) of resource interaction within a business network. As such, the three resource deficiencies can only be managed by changing the interdependencies involved in the network, within both existing and/or new business relationships.

While capabilities are understudied with resource interaction (one exception is Huemer & Wang, 2021), and there are few ‘interactive views on dynamic capabilities’ (see Qiu, Holmen, Havenvid, De Boer, & Hermundsdottir, 2022 as an exception), we argue that coping with the three resource deficiencies necessitates dynamic capabilities for reorganizing resource interfaces. This is in particular when one or more of the deficiencies arise from disruptions to tangible resources. In other words, the reality of resource deficiencies requires a sense of urgency; they are disruptive and most likely unplanned, and in that way challenge the mainstream IMP understanding that the dynamics of embedding and disembedding resources are incremental (Håkansson & Waluszewski, 2002a, 2002b).

Within the Resource-Based View (RBV)-centred capabilities literature, operational capabilities are said to be underpinned by the existing intra-organisational resource base, and dynamic capabilities, the ability to change – or reconfigure - that resource base (Teece, Pisano, & Shuen, 1997). From an IMP perspective, capabilities must be based on existing inter-organisational resource combinations across the network. That is, they are interdependent and distributed (Bingham, Heimeriks, Schijven,

& Gates, 2015; Huemer & Wang, 2021; Qiu et al., 2022). One or more resource deficiencies challenges the possibilities to (re)combining existing resources, or change current resource interfaces, across organisational boundaries. Hence, our second research question asks, *‘What is the interplay between resource deficiencies and the capabilities to handle these?’*

The paper proceeds as follows. In Section 2 we outline the key themes within the literature about the dark side of business relationships, and discuss the limited research directly related to resource deficiencies in Section 2.2. In Section 2.3 we outline the three-part framework. Section 3 addresses how to cope with the resource deficiencies through dynamic capabilities, by linking to the limited existing literature on dynamic capabilities in business relationships and networks (e.g., Forkmann, Henneberg, & Mitrega, 2018; Mitrega, Forkmann, Ramos, & Henneberg, 2012; Qiu et al., 2022; Schepis, Ellis, & Purchase, 2018). We propose four resource deficiency scenarios, based on the timing and repeatability of a deficiency, and discuss how to cope with these in terms of capabilities. The final section addresses the main contribution of the paper along with limitations and future research directions.

The contribution of the paper is twofold. First, we discuss how to handle multiple resource deficiencies from an IMP perspective, a hitherto overlooked theme. Second, we link capabilities to resource interaction by arguing how the urgency created by resource deficiencies in the business network requires actors to utilise dynamic capabilities. We conclude with some managerial implications and suggestions for further research.

2. Literature background

2.1. The dark side of business relationships

Within IMP literature it is widely acknowledged that developing inter-organisational relationships is a matter of interactive processes across the organisations involved, which are embedded in complex business networks (Håkansson & Snehota, 1995). This dynamic process is characterized by continuous interactions. As such, it represents both an opportunity and a burden for a specific path of development of the relationship(s) (Ford, 1980; Håkansson, Ford, Gadde, Snehota, & Waluszewski, 2009; Håkansson & Snehota, 1998).

The dark side of business relationships has gained increasing attention over time among scholars. Some research has emphasized how *‘close relationships are not always synonymous with good relationships’* (Anderson & Jap, 2005: 1) and that *‘often business relationships are neither bright nor dark, but rather represent a combination of the two’* (Abosag, Yen, & Barnes, 2016: 6). Abosag et al.’s editorial (2016) summarises how the ‘dark side’ is related to attitudes to conflicts, opportunism, and deterioration of trust. For example, Ford and Havila (2003) distinguish three types of relational problems including unclear responsibilities, poor activity coordination, and underperforming resource investments.

Relationships can thus be analyzed as containing dualities of light and dark sides, or *‘the coexistence of cooperation and opportunism’* (Grandinetti, 2017: 327). There has been an overweight of attention towards the ‘light’ sides, and the benefits that the parties involved gain from interactive business relationships (Ibid.). This is even when the burden of relationships, due to the interacted interdependencies that can create problems and costs, has been long recognized (Håkansson & Snehota, 1998). Specifically, *‘... a relationship can be a burden in quite different situations: when it is broken, when it has to continue, or when it cannot be developed’* (Ibid.: 89).

We can simplify current research into two main groups. The first addresses the ‘negative consequences’ stemming from a single business relationship, measured using dimensions such as lack of trust. The dark sides of dyadic collaboration have been studied in the context of innovation processes and joint R&D initiatives (Mitrega & Zolkiewski, 2012;

Noordhoff et al., 2011; Villena, Choi, & Revilla, 2021; Yang, Song, Zhang, & Wang, 2020). Other studies centre on the multifaceted meaning of ‘dark side’. Asymmetric relationships in terms of power and dependence are said to influence relational conflict, with the resulting instability and uncertainty (Abosag et al., 2016; Johnsen & Lacoste, 2016; Oliveira & Lumineau, 2019).

The second grouping encompasses the overall tensions emerging within business networks. Specifically, the light and dark sides involved in processes of networked value creation (Chowdhury, Gruber, & Zolkiewski, 2016; Tóth, Peters, Pressey, & Johnston, 2018). Network tensions emerge as key drivers hindering processes of value creation (Öberg, Dahlin, & Pesämaa, 2020; Tura, Keränen, & Patala, 2019), in pushing changes in networks (Bayne, Purchase, & Soutar, 2021), or leading to network ‘failure’ (Tunisini & Marchiori, 2020). The dark side has also been explored as shaping service ecosystems dynamics (Mele et al., 2018).

We argue that the majority of these studies adopt an actor-centred perspective, focused on the behaviour of the parties involved. But if one considers that business relationships involve activities and resources at different levels and the resulting relational substance is complex, the interpretation of the dark side of business relationship only anchored to the actor level is not sufficient to catch the complexity of the three layers of substance involved. We aim to contribute to the discussion about the dark side of business relationships by taking a resource perspective. In other words, we want to underline that business relationships can show a “dark side” because of the presence of certain conditions at the resource level. Specifically, we claim that the dark side of resource interaction is when three deficiencies of scarcity, quality, and lack of availability occur both separately and in combination in a business network.

2.2. Resource interaction

In the management and marketing literature multiple perspectives on resources take as a starting point that no one organisation has all the resources (both tangible and intangible) needed internally. In the traditional transaction view of the market, resource scarcity is considered as the basis for the activation of price mechanisms that affects and regulates business transactions. This is also referred to by the RBV and its antecedents (Barney, 1991; Salancik & Pfeffer, 1978): distinctive and unique resources generate value and ‘give power’.

In IMP studies, the substance of a relationship can be divided into three dimensions – resource ties, actor bonds and activity links, which are linked across time and space (Håkansson et al., 2009). The main assumption about the resources layer is *resource heterogeneity*, that determines that the value of a resource is dependent on which other resources it is combined with (Håkansson et al., 2009). This is also dependent on the features of the resources and on the interfaces between them: technical interfaces between products and facilities, organisational interfaces between business units and business relationships, and mixed interfaces between technical and organisational resources (Dubois & Araujo, 2006).

Heaviness and variety are also two important dimensions to consider, which impact on the possibilities for change and development in business networks. Specifically, heaviness relates to difficulties in breaking apart resource interfaces and changing established resource combinations, while variety relates to the many possibilities of combining resources in new ways (Håkansson & Waluszewski, 2002b). As a consequence of this line of reasoning, no single resource is considered to have a value in itself, but that the value of a resource lies in its use potential (Håkansson & Snehota, 1995). A resource potential can be positively expressed when the resource spontaneously fits with other resources or, more commonly, when it is related and combined with other resources (Holmen & Pedersen, 2012).

Resource Interaction within IMP thus stresses that the processes of resource in interaction are central rather than the resources per se and

that the actual value of a resource only emerges on the use side in specific use contexts. In other words, as already underlined, the value of a resource always depends on which other resources it is combined with. The resource layer has been elaborated since the early 2000s, leading to complex understanding of resource interaction (Baraldi et al., 2012a, 2012b; Bocconcelli et al., 2020; Prenkert et al., 2022) which impacts on the variety of possibilities for actors to combine their resource collections (Abrahamsen & Håkansson, 2015).

The assumption of resource heterogeneity means that resources have no given features. Instead, their features emerge, and actors combine and mobilize them as a result of interaction with other resources in relationships. This is particularly evident in case of new product development and technological development as well as in logistics (Håkansson & Waluszewski, 2002a). The interactive and networked nature of resources can thus enable change, innovation processes and create value (or not) because of their heterogeneous nature.

As such, the IMP literature highlights how business relationships are the means by which actors get access to the resources of others and exploit the potential value of their resources. An organisation therefore needs to consider both how it can use available resources and how it can be used as a provider of resources, creating value through effective resource combination.

Such a view makes it possible to overcome some problems that can stem from actors’ resource scarcity or missing ownership of needed resources. In fact, by assuming interdependence in embedded business networks, a lack of control over a particular resource can be solved through interaction in business relationships. In a supply chain context, for example, value creation processes stem from resource interaction processes through the supply chain actors by their interconnections. In supply chain contexts resources’ adaptability can also let actors to face unexpected events and prevent disruptive processes (Bygalle et al., 2023). The leveraging on others’ resources is however related to the risk of one actor’s dependency on others’ resources and this demands capabilities to intercept which resources are critical, to leverage on multiple suppliers (relationships), to monitor mutual adaptation processes. However, there is little explicit discussion on how capabilities are linked to specific types of resources or combinations, and especially to cope with problems dictated by resource deficiencies (Ibid.).

In fact, notwithstanding the prominent role of resources in the IMP literature, the positive role of resources in interaction is the primary object of attention. Very few studies take a different angle of analysis. Chowdhury et al. (2016) consider value co-destruction in interaction when resources are misused. Grandinetti (2017) underlines ‘power imbalance’ as a problem in relationships, which is connected to the control of critical resources. Tensions can also be created within and across resource interfaces when friction occurs due to resistance to change, heavy resource combinations, and difficulties in recombining resources at a particular point in time (Håkansson & Waluszewski, 2002b). Moreover, current research within S-DL debates how an actor’s deliberate attempts to influence a service ecosystem to achieve self-interested benefits leads to ecosystems vying for the same set of resources (Mele et al., 2018).

In this respect, we can observe how the focus on the consequences of the deficiencies of resources on the business relationships is to a large extent missing, especially in the current economic and business condition of supply chain disruptions where companies suffer shortage of energy, components, and raw materials. While access to and control of resources is acknowledged in both dyadic relationships and at the network level, there remains a lack of conceptual knowledge about the role played by disruptive resource deficiencies on the dark side of business relationships. One consequence is that knowledge about the capabilities needed to overcome these, is missing.

In the next section, we analyze three resource deficiencies - resource scarcity, resource quality, and resource availability - and we discuss them from a Resource Interaction perspective along with their impact on business relationships.

2.3. Three resource deficiencies in business relationships

2.3.1. Resource scarcity

In a transactional perspective, resource scarcity impacts the price level of a resource. In other words, resource scarcity relates to limited quantities *vis a vis* demand. The RBV suggests that competitive advantage arises to the actor controlling the scarce resource (Barney, 1991; Nason & Wiklund, 2018). There is therefore a single actor perspective and a generally positive approach to scarcity. The focus is how to gain the most from the control of scarce resources, while scant attention is given to how to cope with their scarcity (beyond paying higher prices), or how it actually impacts on the processes of value creation.

This narrow approach has been partially reviewed by RBV scholars that have emphasized how - in the light of the recognition of the current “networked” nature of business - there is a need to include a stakeholder perspective into RBV (Barney, 2018). Notably, Barney et al. (2021a: 1940) elaborate more on the concept of “co-specialized resource bundles” where the focus shifts from the bundle of resources of a single organisation to the “relations” between bundles of resources (other organisations/stakeholders): “*Co-specialization is the way that, according to resource-based theory, resources and capabilities in a bundle are related to each other in a way that creates economic value*”. In this definition we can also recognize a review of the “outcome” of a resource bundle(s) in the context of the value creation framework, that goes beyond the original “competitive advantage” outcome. Notwithstanding these advancements in the RBV, we can still recognize a firm-centric perspective, as well as a concept of value that is merely economic in nature. It is important to note that generally it is suggested that - even in the case of co-specialized resources (i.e., community, networks, ecosystems) - scarcity is considered key for the firm to appropriate the most economic value possible.

Salancik and Pfeffer (1978) Resource Dependence Theory (RDT), adopting a single company perspective, posits that organisations are not self-sufficient. It is argued how an organisation’s embeddedness in a network of relationships is a response to the uncertainty created due to ‘missing’ resources. This generates resource dependence (Pfeffer & Salancik, 2003). The degree of dependency stems from three contingent factors: (i) the importance of the resource, such as the degree to which a purchased resource is critical to manufacture other end-products, (ii) supplier substitutability, and the relevant switching costs, and (iii) the discretion over the resource, which can be determined by the ownership of the resource. When an organisation needs a resource and has no control over it and a few sources exist, there is a situation of scarcity. This impacts on its market position and generates a situation of dependency.

Even in the RDT scholars argued that more research should be addressed to recognizing that dependencies exist with multiple environmental contingencies, or the “multiplexity” of these relationships (Hillman, Withers, & Collins, 2009: 1419). Broadly considering the network of relationships in order for the firm to handle the increasing complexity of the environment has been acknowledged as key (Wry, Cobb, & Aldrich, 2013). However, the focus still remains at the company level and at the means the company can use to reduce external dependency from others’ resources. Recently, RDT has been challenged in the light of the increasing consumption of natural resources: resource depletion becomes a concern especially if organisational survival is associated with the availability of scarce resources. Natural Resource Dependence Theory (NRDT) calls for new research efforts beyond the strategic management field, especially in the context of SCM in the current economic scenario (Alkhuzaim, Kouhizadeh, & Sarkis, 2022).

Scarcity has been thus recognized as a multidimensional concept and, as such, not only a “source” of competitive advantage for a single company, nor a constraint to be overcome by a single company by reducing external dependence by others’ resources.

Within IMP, resource ties are one of the elements characterizing the substance of business relationships, with interactive resources

combining the key source of value creation. Moreover, networking and relationship processes enable companies to overcome limits in the control of resources (Baraldi et al., 2012b; Bocconcelli et al., 2020; Håkansson & Snehota, 1998). It is therefore argued that resource scarcity can be handled by leveraging the power of networking.

Scarcity of a resource is thus “non existing” in a resource interaction perspective, since the resources in interaction within the business relationships can compensate for each other, by the multiplication of resource interfaces (with the same or different resources), or the changing/elimination of interfaces with the resource scarce and the creation of new interfaces with new resources. These processes however are not easy and can encounter “resistance” in the resource network structure due to its heaviness or to imprints in resources that make a new combining and recombining process problematic (Håkansson & Waluszewski, 2002a).

In the current economic landscape of supply chain disruption, scarcity, at a certain point in time, triggers unexpected processes that cannot be easily faced by the “power of networking”. IMP researchers have recently pointed out the limitations of re-use and re-combination of resources in interaction (Prenekert et al., 2019), but have not explicitly faced the problem of these limitations in the situation of a resource that suddenly becomes scarce both in the relationships, and in the whole network.

Several questions thus still remain open from a resource interaction perspective in a situation of disruptive resource deficiency, such as ‘what are the consequences of resource scarcity in interaction’, ‘how can companies face resource scarcity by leveraging within their network’, and specifically, ‘which kind of capabilities are needed to overcome the difficulties related to resource scarcity’? We address these questions in Section 3.

2.3.2. Resource quality

The second deficiency is resource quality. In a management context it is problematic to trace clear boundaries around the definition of the quality level of a resource. Even in the case of tangible resources the quality level (high or low/poor) depends on the use of the resource. When we consider intangible resources, the same considerations can also be made.

In the strategic management literature, an implicit reference to the quality of resources is in distinguishing between strategic and non-strategic resources. For example, “... *not all aspects of a firm’s physical capital, human capital, and organizational capital are strategically relevant resources*” (Barney, 1991: 102). In the RBV, three features characterize resource quality: valuable, rare, and imperfectly imitable. In this respect, RBV assumes that resources have intrinsic properties that define their value. Such features are an important source of competitive advantage and the more strategic the resource, the more economic value can be gained. This is also throughout the specific co-specialized bundle of resource actors decide to invest in “*where they anticipate they will be able to appropriate the most economic value from doing so*” (Barney et al., 2021a: 1940).

However, and even in the enlarged view of RBV including stakeholder perspective (Barney, 2018), a positive view of strategic resource is assumed, as well as a firm centric perspective on the property of the resource. However, Barney and colleagues point out the opportunities to expand the strategic resource concept. Debating on strategic resources in a new way could “*offer important caveats on traditional thinking wherein more strategic resources are viewed as unconditionally positive*” (Barney, Ketchen Jr, & Wright, 2021b: 1681). This new perspective opens for a broader and “contaminated” view on resources in the network where other theories can “*help us understand where heterogeneous resources and capabilities come from, while the resource-based view can help us understand how these resources can be a source of competitive advantage*” (Ibid: 1681).

The quality level of a resource at a point in time is an acknowledged concept within contexts dealing with natural/primary resources, such as poor water quality or low quality of raw materials. The

interdependencies with other resources and with other organisations are deemed central in dealing with quality issues. In the RDT the issue of ‘critical’ resources is central.

The extension of RDT in the NRDT offers interesting insights about the changing meaning of ‘critical’ resource that goes beyond the notion of scarcity. This is especially in the context of SCM dealing with recent challenges of an extremely fast changing environment. This is apparent in the agriculture or food and seafood processing industry where the impoverishment (or contamination) of resources implies a complete re-assessment of the resources involved in the production and the need for new resources to ensure monitoring and control of the intrinsic properties of the resources, for example, blockchain technologies (Alkhuzaim et al., 2022).

By adopting an IMP perspective, the resource quality is not per se and it is defined by the use made in combination with other resources. Quality emerges progressively in the interaction as the result of resource heterogeneity. We can assume that this process can be facilitated and enhanced by actors’ interaction in the business relationship, and, at the same time, it will impact on the substance and the results of the business relationship. Resource features change and adapt by a continuous combining and recombining process throughout adjustments of resource interfaces.

As per the other deficiencies, these adjustments are not easy and even not possible to predict or easily to “mitigate” by actors in the network of relationships due to heaviness and variety of a resource structure (Prenekert et al., 2019). Huemer and Wang (2021) argued that tensions occurring in connected resources when changing an individual resource can be mitigated by changing the resource so that it creates a matching interface with the other resources. This allows firms to re-combine resources to optimize interfaces, cogency effects, and imprints (Huemer & Wang, 2021).

However, in the current conditions of the economic landscape we observe a situation that challenges even more the resource interaction perspective for two reasons. First, resource interaction has not explicitly treated the situation of intrinsic “bad/low quality” of a resource; second - and even in case of an “undesirable resource property” - resource interaction perspective takes a stance of incremental and long (even if difficult) process of adjustments in the resource base.

But what happens if an intrinsic bad/low quality resource appears in the network? And what if this occurs suddenly and the company/network’s survival is dependent on an immediate response? Specifically, “what capabilities can companies leverage to overcome the problems related to an ‘undesirable’ quality of resources?”. We return to these questions in Section 3 (below).

2.3.3. Lack of resource availability

The third deficiency of resources is that of issues in terms of their availability within the network. In mainstream management literature taking the perspective of the single firm, limitations with the *control/ownership of resource use* are a governance issue. When a resource is not accessible within the firm, that is, it is not owned and controlled by that particular firm, it becomes necessary to accept the “*rules of the game*” set by the owners of that resource (Pfeffer & Salancik, 2003). A lack of control and ownership over a resource is therefore a burden to resource independence, with implications for both value creation potential and power dynamics (Chowdhury & Khanna, 2014).

Moreover, high uncertainty in turbulent environments emphasizes the importance of ownership and control, because the exact circumstances of resource deployment cannot be known in advance (Foss, Klein, Lien, Zellweger, & Zenger, 2021). Foss et al. (2021) argue how it is central that the ‘right’ organisation exercises resource ownership in order to maximize value creation potential. The notion of ‘right’ refers to the extent of ownership competence held by organisation to deploy a resource. In turn, ownership competence is said to have three dimensions: *matching competence*, *governance competence*, and *timing competence*, respectively. The successful exercise of ownership

competence requires all three of these dimensions in order to generate value.

From an IMP perspective, it is not necessary to directly control all the resources needed; non-ownership is not inherently negative. Instead, access to resources is achieved by overlapping agendas and initiatives at the relationship/network level. This is in line with other streams of literature such as Global Value Chains (GVC), which have recently argued that coordination mechanisms versus control/ownership mechanisms generate higher flexibility in the resource use especially in the case of disruptive contexts (Choksy, Ayaz, Al-Tabbaa, & Parast, 2022).

However, we can observe how by leveraging on the relationships, imprints are generated that create stronger ties than direct ownership over a resource. Thus, the network can result also into a heavier structure leading to less innovation and effectiveness. That is, as pointed out by Prenekert et al. (2019), high resource variety might create low variety and subsequent heaviness in resource interfaces. This is another effect of resources in interaction that should be considered when control is in the spotlight.

We suggest that much of the IMP literature ‘starts in the middle’, in other words, investigating relationships when an existing business network structure is in place (the few exceptions to this involve startups). Resources are available and embedded in networked resource structures. However, ‘what happens if and when an organisation cannot access a resource and/or the potential of a resource’, ‘how can companies leverage on interaction to get access to a resource, and which capabilities are needed’, and ‘which capabilities are needed to cope with changes in the availability of a resource at the network level?’ We consider such questions in Section 3 below.

2.3.4. Summary

In sum, the three resource deficiencies outlined above can act both separately and concurrently in business networks in different ways. This is particularly evident when physical resources are in play and when priority has to be addressed to disruptive events and not to incremental change and development processes. Despite the insights provided in the studies on resource interaction within IMP, we believe, in line with Bocconcelli et al. (2020), that further development of the resource interaction approach can be fruitfully enhanced by such contemporary contexts.

The scarcity of resources is increasingly not a ‘meta problem’ at the macroeconomic level, but an issue that directly and unpredictably impacts organisations, independent of their size (Clark, 2021). For example, the problem of microchip shortage affects a wide variety of industries globally. This scarcity situation is apparently linked also to the issue of access to resources as many companies react by trying to stipulate new contracts or activating new business relationships.

There are also numerous examples concerning the resource quality deficiency, such as traceability and quality in the agri-food sector. Blockchain technology is considered as an effective tool to cope with this issue (Annosi, Brunetta, Bimbo, & Kostoula, 2021; Tsolakakis, Niedenzu, Simonetto, Dora, & Kumar, 2021).

In a similar vein, limitations in the access to resources impacts business relationships between Small and Medium-sized Enterprises (SMEs) and larger firms in many sectors at the global/local level. For example, GVC studies are increasingly concerned about the role of networks and relationships in resource control and access by leading firms and smaller actors in the GVC (Kano, 2018).

Thus far, we have addressed the first research question. We now turn our attention to the second, ‘*what is the interplay between resource deficiencies and the capabilities to handle these?*’. In Section 3, we link capabilities to resource interaction. This is in order to outline the dynamic capabilities needed to cope with resource deficiencies. As already pointed out, the IMP literature would argue that resource combining, and recombining are incremental and take time. We argue that dynamic capabilities are needed because resource deficiencies are disruptive. We therefore need to link capabilities to resource interaction.

3. Handling the three resource deficiencies through dynamic capabilities

In brief, within the business relationships and networks literatures, relational and network capabilities (Äyväri & Möller, 2008; Forkmann et al., 2018; Paswan & Panda, 2020), networking capabilities (Arasti, Mokhtarzadeh, & Jafarpanah, 2021), alliance capabilities (Kohtamäki, Rabetino, & Möller, 2018), and inter-organisational dynamic capabilities (Qiu et al., 2022; Sandberg & Hultberg, 2021; Schepis et al., 2018) are in focus.

Studies focused on relational capabilities emphasize the dimensions of relational capability for SME marketing (McGrath, 2008), key account management (Ivens, Leischnig, Pardo, & Niersbach, 2018), and international sourcing activities (Pagano, 2009). The development of network capability concerns how an organisation uses a network, and network management in general (Parida, Patel, Wincent, & Kohtamäki, 2016; Ritter, 2021). For example, different types of organisations, such as entrepreneurial firms (McGrath & O’Toole, 2013, 2014), new ventures (O’Toole & McGrath, 2018), start-ups (McGrath, Medlin, & O’Toole, 2019), university spin-offs (Walter, Auer, & Ritter, 2006), network orchestrators (Hurmelinna-Laukkanen & Nätti, 2018), and themes including managing relationship ending (Zaefarian, Forkmann, Mitrega, & Henneberg, 2017) and how to manage a supply network (Forkmann, Henneberg, Naudé, & Mitrega, 2016) are in focus. A more micro-take, focused on the individual manager, places emphasis on *networking* capability (Arasti et al., 2021; Maghsoudi-Ganjeh, Khani, & Alem-Tabriz, 2021; Mitrega et al., 2012). Overall, there is a strong focus on capability development as a part of relationship or network management.

3.1. Inter-organisational dynamic capabilities and resource interaction

We can further our understanding of capability development by heeding Forkmann et al. (2018) call for B2B scholars to make better use of the ‘source literature’ on capabilities and dynamic capabilities. There is an emerging stream of literature in B2B about dynamic capabilities, for example, encompassing resource bundling capabilities (Huemer & Wang, 2021), dynamic capabilities for net formation and management (Schepis et al., 2018), an interactive view on dynamic capabilities (Qiu et al., 2022).

We argue that coping with the three resource deficiencies necessitates dynamic capabilities for reorganizing or reconfiguring resource interfaces. In this paper, we adopt the well-recognized definition of dynamic capabilities (Leemann & Kanbach, 2022) from Helfat et al. (2007: 4): “a dynamic capability is the capability of an organization to purposefully create, extend or modify its resource base”. It is an ability to change – or reconfigure – the resource base (in RBV terms) when rapid changes in the environment require this for the maintenance or renewal of competitive advantage (Teece et al., 1997: 516) although some authors argue that “all capabilities have the potential to accommodate change” (Helfat & Peteraf, 2003: 999). The implication is that capabilities are processes (activities, routines) rather than higher-level resources. Although there is a lack of common understanding (Leemann & Kanbach, 2022), Teece (2007, 2018) distinction of three central dynamic capabilities, those of sensing, seizing, and transforming (reconfiguration) are commonly cited.

Our understanding of dynamic capabilities needs adjustment because of several important contrasts between the RBV and IMP/Resource Interaction. These centre on the differing assumptions about resources in the RBV and IMP perspectives. The ‘existing resource base’ of interest is not that of a single organisation, but instead interdependencies at the dyadic and net/network level (Huemer & Wang, 2021; Qiu et al., 2022), which require the ‘team level’ in which a capability resides (Helfat & Peteraf, 2003: 1000) to be inter-organisational.

If capabilities are dependent on existing inter-organisational

resource combinations (Eisenhardt & Martin, 2000; Mitrega, Henneberg, & Forkmann, 2018), within IMP, dynamic capabilities refer to the processes involved in changing and/or reconfiguring the current inter-organisational resources and resource interfaces across multiple connected relationships in the business network. In other words, “how resource reconfigurations occur” (Blessley & Mudambi, 2022: 58). The trigger for change could be due to external changes, such as legislation or unexpected events, leading to resource scarcity, resource quality, and/or resource availability.

The impact of one or more of the three resource deficiencies is that the bundle of interacting resources changes in nature, and as a result, needs changing: there are deficiencies in one or more of the resources within the inter-organisational resource constellation or network. Moreover, as resource interfaces are distributed across multiple organisations, it is not an issue of a single company’s dynamic capability in managing their individual resource base. Dynamic capabilities can thereby be considered as the distributed ability across actors within a network to cope with one or more resource deficiencies by making changes to the existing resource network. We now discuss each resource deficiency in turn in terms of dynamic capabilities.

Resource scarcity can be faced by actors interacting to handle the lack of a resource within the inter-organisational resource bundle. For example, actors could invest in improving and maximizing the exploitation of the available scarce resources. In other words, once a situation of resource scarcity is understood and accepted, the goal becomes to get the most from the existing resources and to maximize the combination of the scarce resources available to the interacting actors. The dynamic capabilities involved are for jointly working through how to handle a deficiency and how to solve it on a short-term basis. This is different from ongoing, incremental resource combining by actors or from planned innovation processes (Håkansson & Waluszewski, 2002a). It requires the companies to shift their perspective to maximizing the exploitation of existing resource interfaces. In this way, resource scarcity can perhaps be handled by an increased focus on resource interface quality.

Dynamic capabilities could also be activated to face resource scarcity in terms of a focal organisation or focal relationship attempting to gain control over the scarce resources that are available. These capabilities are supported by the companies’ power position in the network context as well as to the power of their interdependencies. These are capabilities for controlling the use of scarce resources. Considering the search for a greater control over the resources, networking can increase the power of the actor(s) and let them to exploit the scarce resources more efficiently as well as negotiating with counterparts.

The second resource deficiency is that of *resource quality*. The issue here is when the resources that are to be combined through resource interfaces are of poor quality. It can be argued that a poor-quality resource in a certain point of time and in a specific interaction context could be coped with in different ways. Companies could compensate for the poor quality of certain resources by using dynamic capabilities to explore new paths of development. This might be done by sharing the investments to improve the quality of the poor resources – improving the quality dimensions of the inter-organisational resource bundle – or by searching to combine the poorer quality resources with other inter-connected resources that are of superior quality.

Moreover, actors could replace the poor-quality resource with a substitute, or even aim to eliminate these resources. These alternatives can also demand that companies change counterparts within the business network. In sum, dynamic capabilities involving the exploration, replacement, or elimination of resources, could result in the reconfiguration of the structure and dynamics of the network contexts as the current inter-organisational resource interfaces are changed.

The *lack of resource availability* is the third resource deficiency. We suggest it is uncommon within IMP to question the network impact of a resource not being available at x point in time. In other words, that no one actor in the relevant relationship or network owns/controls and can

provide access to a particular resource within their resource collection at time x . This means that resource interfaces cannot be created. In other words, the lack of the availability of a resource implies a need to leverage on the existing resources, and/or to create new resources.

In terms of dynamic capabilities, handling this third resource deficiency suggests the need for monitoring and new interaction opportunities within and outside the existing network. Whether a short or longer-term issue, the non-availability of a resource implies the need for sharing, using substitutes, workarounds and improvisation. If a ‘missing/unavailable’ resource is outside of the direct influence of a focal network, it needs to be given features and developed by others, say in an adjacent or parallel network. The generation and access to new resources also demand the companies’ abilities to re-design their current inter-organisational resource interfaces to participate in new interaction contexts in which the resources needed are available.

3.2. Four resource deficiency scenarios

The impact of the three resource deficiencies is likely to vary according to different types of resources and network contexts. We propose four resource deficiency scenarios that differ in terms of the severity of the impact generated, and therefore the extent to which dynamic capabilities need to be activated. The scenarios are (i) ‘one-off deficiencies’, (ii) ‘time limited recurrent deficiencies’, (iii) ‘durable and specific resource deficiencies’, and (iv) ‘structural resource deficiencies’ respectively.

As Table 1 below illustrates, the four scenarios vary along two features, *timing*, and *repeatability*. We can consider situations in which the resource deficiencies occur in the short-term, or which become a structural problem in the longer term. This will have consequences for how path dependent the actions undertaken by actors are and indeed the types of actions that can be undertaken (Araujo & Harrison, 2002; Håkansson & Waluszewski, 2002b). In terms of repeatability, we depict

Table 1
Four resource deficiency scenarios.

4 resource deficiency scenarios	Scenario features	Purpose of the dynamic capabilities (for sensing, seizing, and reconfiguring, following Teece, 2018)	Examples of actions
1. One-off deficiencies	Short term and one-off	Exploiting the existing network and interactions	<ul style="list-style-type: none"> ○ Understanding resource setting ○ Maximizing resource use ○ Optimising resource combinations
2. Time-limited recurrent deficiencies	Short term and recurrent	Exploring new options within the existing network	<ul style="list-style-type: none"> ○ Monitoring resource options ○ enacting alternative or parallel resource re-combinations
3. Durable and specific resource deficiencies	Medium term and one-off	Reorienting the network through incremental structural network changes	<ul style="list-style-type: none"> ○ Generating new resources and interactions ○ Accessing new resources and interactions ○ Exploiting new paths of resource interaction
4. Structural resource deficiencies	Medium term and recurrent	Transforming the network through radical structural network changes	<ul style="list-style-type: none"> ○ Re-thinking the structure of the resource network ○ Re-configuring the resource network ○ Linking to adjacent resource networks

situations in which the resource deficiencies are within a specific episode and situations in which the deficiency occurs on a repeated basis.

The first scenario, *one-off deficiencies*, is when resource quality, scarcity and availability occur either separately or in some combination in the short term (timing) as a one-off (repeatability). This could be a mega event/shock, such as the implications arising from the COVID pandemic, or what Blessley and Mudambi (2022) refer to as a ‘high impact disruption’.

This means that the first scenario is not necessarily trivial. The implications might be temporary problem solving (Williamson & Winter, 1993), but also coping actions due to the setback or major shock. In this context, companies utilise dynamic capabilities that lead them to better understand the issue, estimate the potential of the existing resources in the existing interaction context and maximize the exploitation of the scarce and poor-quality resources they have at hand or the resources they can have access to.

There could be temporary changes made to existing resource interfaces, perhaps the addition of temporary substitute resources, to attempt to handle the short-term/one-off resource deficiency. Alternatively, it could lead to current resource interfaces being ‘blocked’, with various organisations unable to utilise parts of the activities within the network. Changes to the inter-organisational resource bundles would perhaps become permanent, depending on the scale and scope of the short-term/one-off deficiency. The way the situation is coped with by the relevant actors could later become the new way of organizing. In sum, the efforts to exploit the existing network is the basis of changes being attempted through dynamic capabilities.

In the second scenario, *time limited recurrent deficiencies*, the three deficiencies could arise either separately or combined in the short term (timing) but recurrently (repeatability). For example, a poor-quality resource at x point in time can give rise to changes in the quality of other, related resources, replacement with a substitute, the elimination of the poor-quality resource (with implications for existing resource interfaces), or efforts to increase the quality of the resource.

A dynamic capability needs to be activated across multiple actors to be able to handle repeated resource deficiencies. The actors need to improve the control and/or quality of resources by attempting efficiency improvements with the available resources, strengthening resource interfaces, and to make temporary use of substitute resources within existing resource interfaces. This implies that the organisations involved in the resource combinations develop capabilities of monitoring potentials for resource deficiencies.

Depending on the industry sector, the extents of friction, variety, and heaviness (Håkansson & Waluszewski, 2002a; Prenkert et al., 2019) of the relevant resources will impact on whether it is possible to alter resource combinations back and forth. In other words, to use substitutes recurrently to handle a short-term resource deficiency. In sum, exploration of the possible options and alternatives in the existing network context are the basis of the dynamic capabilities to be activated by the companies.

The third scenario, *durable and specific resource deficiencies*, is when scarcity, quality, and availability occur in the medium term (timing) and as a one-off (repeatability). For example, if a resource is not going to be available at x point in time for a (substantial) time-period. That is, no actor in the network owns a particular resource at time x . If this scenario occurs in the medium term, there is a duration involved in the resource deficiency, which means that innovation efforts could come into play.

That is, the lack of availability of a resource implies the need to create new/different resources. It presupposes the mobilisation of new/different relationships, agility in coping with various interfaces, and capacity to promote the involvement of new actors to generate innovation to solve the resource deficiency. An alternative is to seek to access the unavailable resource, or a close substitute, in an adjacent network. The deficiency in availability may also be managed by companies’ using capabilities to make more efficient and effective use of the resources that

are available, and/or to exploit and enact interactions involving substitutes. In sum, incremental structural network changes are necessary. Capabilities to generate a gradual re-orientation of the interactions and business relationships also generating an incremental change in the network structure appear important.

Lastly, the fourth scenario, *structural resource deficiencies*, is when quality, quantity and availability deficiencies occur in the medium term (timing) and recurrently (repeatability). In this situation, companies need to rethink their interactions and network relationships and re-configure the network structures and dynamics. By pursuing these goals, capabilities are to be activated to be able to exit from current relationships and in forming new ones. More it can be that the interacting companies in the existing network context jointly act to relate, share, and merge with other networks. In sum, radical structural network changes are necessary, and relational dynamic capabilities to disrupt the network and transform the interactions and business relationships appear important.

4. Conclusions

The aim of the paper was to conceptualise how to handle resource deficiencies – an important challenge in contemporary supply chains – from a resource interaction perspective within IMP. Three resource deficiencies, those of scarcity, quality, and availability respectively, have been identified and discussed. Resource deficiencies are disruptive, and as such, they challenge current understandings of resource interaction processes as incremental and stable (Håkansson & Waluszewski, 2002a). To solve the impacts of such disruptions at a point in time requires existing and new relationships, and the use of dynamic capabilities (Helfat & Peteraf, 2009) on the part of the actors involved. The paper has linked capabilities and resource interaction, further adding to our understanding of the role of the actor in resource interaction (Bocconcelli et al., 2020; Cantù, Corsaro, & Snehota, 2012; Gadde & Håkansson, 2008).

We have addressed two research questions. The first, ‘How can resource deficiencies be conceptualised within a resource interaction perspective?’, has been answered by our proposed three resource deficiencies of resource scarcity, resource quality, and resource availability. The second question asked, ‘What is the interplay between resource deficiencies and the capabilities to handle these?’. We have argued how the existence of such deficiencies is likely to require some changes in the current inter-organisational processes of resource combining, and place limitations on the possible ways in which resources can be combined. Moreover, the resource deficiencies can make interactions and networking inefficient and ineffective, at least on a temporary basis.

In order to face the challenges related to the three resource deficiencies we have stressed that dynamic capabilities are necessary. It is important to note that the impact of the three resource deficiencies on interaction and networking is not always the same. It varies according to different situations and types of resources. As a consequence – depending on the various situations – different dynamic capabilities may be relevant.

Overall, the paper makes two contributions. First, we have considered how to handle resource deficiencies from an IMP perspective. This is both an overlooked theme, and a topical one in parallel literatures such as SCM (Bygballe et al., 2023). Second, we have added to existing understandings of the role of the actor in resource interaction, by linking dynamic capabilities and resource interaction. We have argued how the urgency to act due to resource deficiencies requires actors to engage dynamic capabilities. Interacting and networking is central to handling resource deficiencies, therefore.

The paper also has a managerial contribution, even if it is conceptual in nature. That is, it can be helpful for organisations to reflect and develop a line of reasoning and decision-making processes on how to cope with resource deficiencies. This is particularly relevant nowadays when such a condition of resource deficiencies is going to characterize

business context in the long-term, demanding that organisations and supply chain are resilient. The conceptual dimension enables organisations in different industries to contextualize our four resource deficiency scenarios in their respective business contexts.

There are several limitations of our paper which we acknowledge here. First, we have focused on conceptualizing the dark side of resource interaction in terms of three resource deficiencies, while other deficiencies could be identified further developing both literature and empirical analysis. The lack of empirical material can also be considered an important limitation of the paper. Exploratory empirical analysis could be helpful to develop a fine-grained analysis of resource deficiencies, to identify how different business contexts can be characterized by different types of resource deficiencies, how and which dynamic capabilities are activated to cope with resource deficiencies, how supply network structures and dynamics are affected by the coping with resource deficiencies over time.

In terms of suggestions for further research, we can thus call for studies that ‘test out’ our three resource deficiencies and the four scenarios of how to handle these. Multiple case study research designs could be used for theory generation regarding how the resource deficiencies play out in different business settings in different B2B markets. Longitudinal studies could generate process understandings of the impact of various dynamic capabilities over time. Moreover, further empirical studies or conceptualisations could expand the categories of resource deficiencies within resource interaction beyond the three types proposed here.

Lastly, it is managers that have to face the reality of resource scarcity, poor quality and resource availability. The main managerial implication is to provide managers with a conceptualization of how resource deficiencies could potentially be handled within the network by the use of dynamic capabilities. The actions necessary to handle the deficiencies depends on which of 4 possible scenarios are in play.

Data availability

No data was used for the research described in the article.

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