Valentowitsch et al., 2024
Volume 12, pages 1 – 22

Journal of Competences, Strategy & Management | www.jcsm-journal.de

Doing Business in the Digital Age: Towards an Adjusted Resource-Based Model

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Abstract: *Digital transformation is changing the way companies do business and disrupting industries and workflows. The increasing use of digital technologies and data is altering value creation structures and business models. In this paper, we argue that digitalization is changing the context of the resource-based theory so dramatically that an adaptation of the theory itself is required. The literature-based discussion shows that the adoption of new IT technologies and the use of data are difficult to reconcile with the traditional conceptualization of the resource-based view. This paper therefore discusses ways to further develop the resource-based framework in the context of digital transformation. Therefore, we propose a revised modeling framework that no longer focuses on achieving a long-term, that is sustainable, competitive advantage, but on constantly adapting and changing the resource configuration to ensure a short-term competitive position. We argue that this profound reformulation of the resource-based explanatory model is necessary to better reflect the contemporary reality of the digital world.*

Keywords: digital transformation, resource-based view, value creation, digital ecosystems, complementary resource bundling, VRIO, theory reformulation

1. Introduction

The resource-based view is one of the most important theoretical schools of thought in strategic management today (Davis & DeWitt, 2021). Like any other theory, the resource-based view attempts to explain phenomena (explanandum) by referring to empirical regularities and initial conditions (explanans). Regarding the explanandum, the resource-based view aims to explain how competitive advantages are created by firms and how they can be sustained against competitors (Barney et al., 2021). Apart from this, the resource-based approach also aims to be a theory of the firm. As such, the resource-based framework must not only explain the scale and scope of a firm, but also answer the question of why firms exist (Holmstrom & Tirole, 1989). In this regard, the resource-based theory has primarily argued that companies create productive value by exploiting specific resources that can be used more productively within the company than outside the company (Conner, 1991). However, the changes in the business world resulting from digitalization call this conclusion and thus also the established conceptualization of the resource-based model into question for several reasons. This is because the use of digital technologies and the emergence of platform- and data-based business models challenges the conventional inside-out logic of the resource-based perspective (Helfat et al., 2023; Krakowski et al., 2023; Kohtamäki et al., 2019). For instance, what strategic advantage does the isolation of productive resources in the company offer if the business logic in the context of digitalization is increasingly based on the shareability of resources, data, skills, competencies and knowledge? Or is it worth keeping value-creating bundles of resources within the company in the long term when the corporate environment is changing rapidly in the course of digitalization?

With regard to the explanans, the resource-based theory proposes that companies must acquire and control valuable, rare, inimitable and well-organized (VRIO) resources (Barney, 1991; Wernerfelt, 1984). Furthermore, companies must possess appropriate organizational capabilities and competencies to productively use and exploit the VRIO resources (Amit & Schoemaker, 1993; Peteraf, 1993; Sanchez et al, 1996). The elegant argumentation of the resource-based theory impresses with its simplicity and immediate validity (Kraaijenbrink et al., 2009). Although the consistency of the reasoning has been questioned by many authors in the past, the basic framework of the theory has remained remarkably solid and has survived to this day (Barney et al., 2011). In the recent debate, however, the pillars of the theory are increasingly faltering. Against the backdrop

of the digital transformation, many authors criticize that the resource-based view has problems in understanding value creation and competitive success in the digital world (Kindermann et al., 2022; Gueler & Schneider, 2021; Kraus et al., 2021; Schymanietz, 2020; Vial, 2019). In this sense, digitalization is significantly changing the contextual setting of resource-based theory and thus also its explanans. This means that the theory structure must be fundamentally revised if the resource-based model should remain applicable in the digital business reality (Cooper et al., 2023; Helfat et al., 2023; Pereira & Bamel, 2021).

The emergence of digital technologies and the establishment of new, data-driven business models are changing the contexts for the resource-based theory. Digitalization has fundamentally transformed the way companies engage with customers and the value they create and deliver (Talmar et al., 2020; Bosch, 2019; Kohtamäki et al., 2019; Adner, 2017). Companies in the digital business environment have access to easy-to-scale resource bundles that enable both hyperspecialization and hyperscaling of their business (Giustiziero et al., 2023). This enables simple and rapid expansion, allowing companies to address a larger number of customers, serve broader markets and expand internationally with relative ease, for example. In addition, accelerated scaling primarily enables processes to be handled more quickly at lower costs. This is because with scalable business models, the IT infrastructure and processes grow in line with the company's requirements, while scaling effects reduce transaction costs and make a business model not only faster but also more agile. This in turn makes it easier for the company to meet increasing demand with decreasing transaction and marginal costs (Schreiner & Klostermann, 2018). Further, digital technologies such as AI, when used to support decision making, can also render human skills obsolete, although they have previously been considered a valuable source for building sustainable competitive advantages according to the resource-based logic (Krakowski et al., 2023). So digitalization is acting like a game changer in a variety of ways, and there are many reasons for this. On the one hand, digital transformation enables the use of new types of technologies and data that redefine the importance of existing resources and competencies in companies (Kinderman et al., 2022; Bosovic et al., 2019). On the other hand, new forms of competition have emerged, creating new potential for interaction and value creation (Cozzolino et al., 2020; Sedera et al., 2016). In particular, the rise of platform companies has turned many old practices on their head (Zeng et al., 2021). For instance, digital platforms are enabling smaller companies to enter global markets at a speed and scale that was unimaginable in the past. Traditionally, small businesses, limited by their resources and reputation, used the networks of larger companies for internationalization. With global platforms acting as digital intermediaries, providing companies with a level playing field, credibility, governance, cross-border networking, and direct access to market information, these formerly disadvantaged companies can now easily enter international markets (Singh et al., 2023). Platforms also enable companies to leverage a virtual field that is not constrained by space and time limitations to achieve rapid internationalization and value creation (Deng et al., 2022). So all in all, digitalization is having a profound impact on the way companies do business by creating new resources and ways of using resources, shifting competencies, making certain skills and resources less important while others become more relevant, opening up new scaling potentials, creating new business models and new forms of competition, changing market dynamics and increasing the importance of new forms of collaboration in inter-firm networks (Helfat et al., 2023). All this is reason enough to ask whether the old management implications of the resource-based theory, based on the identification of productive resources and their isolation from the competitive environment, are still valid in the digital business operating mode.

To address this new reality, as we will argue, the logic of the resource-based view needs to be fundamentally reconsidered (Gueler & Schneider, 2021; Huemer & Wang, 2021; Alexy et al., 2018). Against this background, this paper critically reviews the assumptions and core propositions of the resource-based perspective in terms of their applicability to explain digital business practices and value creation strategies. The literature-based discussion shows that the adoption of new IT technologies and the use of data are difficult to reconcile with the traditional conceptualization of the resource-based view. This paper therefore discusses ways to further develop the resource-based framework in the context of digital transformation.
From a methodological perspective, our work is conceptual in nature. We tie in with the theory-driven discussion that has taken place in the literature since the early days of the resource-based theory. Quite a few authors throughout

the history of the resource-based view have criticized its shortcomings in order to derive potentials for theory adaptations or further developments. Thus, the resource-based approach has undergone many theoretical advancements over time, such as the competency-based perspective (Freiling, 2004a), the dynamic capabilities approach (Teece et al., 1997), or the knowledge-based perspective (Grant, 1996), which at some point recognized that the theoretical explanations were inadequate to describe some real-world facets. Our work in this regard is guided by the belief that the resource-based view is once again at a crossroads where the theoretical foundation needs to be adjusted. As Barney et al. (2011) aptly put it, the resource-based theory will either take its place as an old-fashioned view in the ranks of mainstream management theories or it will find the power to evolve conceptually towards better capturing business practice in the context of digitalization within its framework. Our paper attempts to contribute in this direction. Taking a conceptual perspective, we will first highlight the shortcomings of the resource-based theory in the context of digital transformation and then suggest possible ways for its further development.

Our work contributes to the scholarly discourse in several ways. First, we address the ongoing controversy on the contemporary relevance of the resource-based view. While some authors see no need for theory adaptation (Straub et al., 2021; Touil Ait & Jabraoui, 2020; Zuiderwijk et al., 2015), others emphasize the limitations of the resource-based approach in the context of the digital economy and thus see an urgent need for a theory revision (Copr et al., 2023; Chaudhuri et al., 2022; Bär et al., 2022). The reflections in this paper are particularly supportive of those authors who argue for a fundamental refocusing of the resource-based model. Second, although many authors recognize that the resource-based view is not well suited to explain value creation and resource orchestration in the digital business paradigm, they do not provide substantive guidance on how the theory might be further developed (Barney et al., 2021). In contrast, by conducting a comprehensive review and reassessment of the existing literature, our paper not only highlights the problems of the resource-based theory, but also suggests possible lines of development for a conceptual reorientation. Third, the literature on resource-based theory is very fragmented (Pereira & Bamel, 2021). Our extensive review therefore makes a valuable contribution by summarizing the various arguments and structuring them in a coherent way. In doing so, we enrich the current literature on strategic management, which lacks theory building (Shepherd & Suddaby, 2017), with impulses for new theory formation. Finally, we highlight some new directions in which the core concepts of the resource-based theory can be applied to the challenges of the digital world, while also discussing which elements of the former theoretical framework need to be dropped.

2. Digital transformation: Changing context of the theory

In a recent special issue of the Strategic Management Journal, digital transformation is described as one of the most intriguing fields for new applications of the resource-based theory (Helfat et al., 2023). In general, the term digital transformation is used to describe the evolution of the organization through the use of technology (Vial, 2019). More specifically, digital transformation refers to the use of IT technology and data resources for radically improving the performance and reach of the company in terms of customer experience, operations, and business models (Westerman et al., 2014). Also of particular importance for digital transformation is the high scalability of digital offerings and the resulting negligible marginal costs combined with the global reach of digital markets and varying types of network effects associated with a large number of digital contexts (Helfat et al., 2023).

In this regard, digitalization can provide an impetus for hyperscaling as only a small number of firms dominate the market. For digital companies, the value derived from a particular resource bundle in a focal activity is much more scalable as the size of the bundle increases. The greater scalability of resource bundles in the digital context in turn impacts the opportunity cost of integration, which requires resources to be spread across multiple value-creating activities rather than used more intensively for growth within the focal activity (Giustiziero et al., 2023). In addition, the use of digital technologies can increasingly replace and complement humans in managerial roles and decision-making, which can impact sources of competitive advantage in the digital domain (Krasowski et al., 2023). The digital transformation thus poses major challenges for resource-based logic as a whole. The most important shifts and focal points that are particularly relevant in this context are outlined below. First, the highly dynamic and short-lived

nature of the deployment and use of digital technologies, data and IT assets. Second, the blurring line between cooperation and competition among companies interacting in digital ecosystems. And finally, the increasing convergence of industries in the digital environment. To start with, digital technologies are characterized by short development cycles and rapid market diffusion (Vial, 2019). For companies, this means not only a rapid need for development and renewal in the design of their offerings, but also an increased need to build digital competencies and dynamically adapt the resource base of the organization (Kinderman et al., 2022; Bosovic et al., 2019). However, in the digital age, changes in the industry environment sometimes happen very quickly, leaving no time for sustainable competence accumulation. The required IT skills and knowledge must therefore often be compensated for by collaboration with other players (Felser, 2022). At the same time, the complex value creation activities are blurring the boundaries between cooperation and competition (Zhu et al., 2020). While the increasing complexity of digital product design forces companies to collaborate by sharing resources and knowledge on the one hand, increasing networking can lead to an outflow of IT skills and knowledge on the other (Lin & Marupiung, 2022). Thus, cooperation partners can quickly become competitors (Cozzolino et al., 2020). The digital transformation is also characterized by far-reaching industry convergence, which is expressed in an alignment of value creation practices and cooperation patterns (Chen et al., 2022). Dominant value creation approaches are gaining acceptance across industries because certain principles of data and IT use are often universally applicable and easily adaptable (Bosler et al., 2020). One example in this context is the emergence of platform-based business models (Sedera et al., 2016). The trend toward the product-as-a-platform strategy is also striking, as the focus of value creation here is no longer on the sale of original products. Instead, the product is seen solely as a medium for digital value-added offerings and supplementary services (Kohltamäki et al., 2019). This paradigmatic change in direction requires more intensive and often cross-industry collaboration between companies, resulting overall in an extremely dynamic and complex value creation structure (Márton, 2022; Subramaniam, 2020).

The above-mentioned aspects have a significant implication for the resource base of organizations, which must be taken into account in the theory discussion. On the one hand, the volatility of digital technologies and data requires a dynamic adjustment of the resource configuration in the company (Linde et al., 2021; Bosler et al., 2020). This is because digital trends have a short lifespan and customers quickly realign their wants and needs in the digital business environment. At the same time, the increasing integration of digital assets leads to increasing heterogeneity and immateriality of the resource base in the company. This requires different management approaches and makes it difficult to identify and bundle valuable and productive assets (Huemer & Wang, 2021; Kraus et al., 2021; Gupta & George, 2016). Finally, the resource base of the company is increasingly being opened up to collaborative sharing in the ecosystem, which imposes other requirements on resources and their management (Giustiziero et al., 2023; Helfat et al, 2023). So, the overview so far shows that digitalization constitutes a genuine disruption in the way business is done. The digital economy has different success factors and concepts than traditional business (Helfat et al., 2023). Scalability and shareability of resources play a much greater role, as new business models are primarily based on the exploitation of network effects and rely on the complementarity of products and services (Giustiziero et al., 2023; Felser, 2022; Zeng et al., 2021).

3. Status Quo of the resource-based theory

Even though there is widespread agreement in the research literature on the contextual changes of the digital transformation, there is no uniform consensus on a continuing applicability of the resource-based theory as an explanatory approach for entrepreneurial performance differences in this era. The research literature is essentially characterized by three streams of thought: Agreement, advancement and rejection of the resource-based theory.

Authors who still accept the resource-based theory in its traditional form explain conceptually how internal IT resources must be deployed in order to generate strategic value for the organization (Wade & Hulland, 2004). Accordingly, internal IT resources and capabilities should be combined in order to be able to achieve sustainable competitive advantages and increase efficiency (Son et al, 2014; Schroeder & Kotlarsky, 2015; Bischof et al, 2016). Zuiderwijk et al. (2015) confirm the validity of the resource-based theory by identifying enterprise IT-related resources and capabilities as a critical success factor for the use of open data sets (Zuiderwijk et al., 2015). In the context of digital innovation

management, the existing resource and competence base of the core business is partly responsible for the emergence of digital innovations and thus determines markets, performance and innovation success of the company (Bosler et al., 2020).

However, there is also a large body of critical literature that points out the shortcomings of this approach and sees the potential of resource-based theory to adapt to the changing digital environment as limited (Cooper et al., 2023; Helfat et al., 2023; Pereira & Bamel, 2021, Mazzei & Noble, 2020; Braganza et al., 2016). In the following, we will briefly present the most salient viewpoints. To begin with, it should be noted that the critical assessment of the resource-based approach is not fundamentally new, regardless of the changing context of digitalization. Numerous authors have criticized the assumption framework of the theory (Nason & Wiklund, 2018; Hitt et al., 2016; Leiblein, 2011; Lockett et al, 2009; Dyer, 1996), its focus on achieving competitive advantages (Foss & Knudsen 2003; Powell, 2001), and the mechanisms the theory offers to explain how competitive advantages can be created and sustained (Krasowski et al., 2023; Sergeeva & Andreeva, 2016). One assumption that is particularly often at the center of discussion is the heterogeneity of resources (Lockett et al, 2009). This assumption is crucial to the logic of the resource-based approach because it necessarily implies limited mobility and imitability of value-creating assets (Peteraf, 1993; Barney, 1991). However, despite the crucial importance of this assumption, research on the resource-based model has so far failed to explain what the heterogeneous resource base of the firm actually results from (Sergeeva & Andreeva, 2016; Baron & Ensley, 2006).

To address this gap, Sirmon et al. (2007) proposed the theory of resource orchestration and constructed a framework defined as the complete process of structuring, aggregating, and utilizing firm resources. Sirmon et al. explicitly point out that the source of competitive advantage lies not only in the resource elements that the firm possesses, but also in the arrangement of resource assets. Their explanatory approach therefore focuses on the effective management and use of resources. Some critics have also addressed the explanatory patterns of the resource-based theory regarding the sources of sustainable competitive advantage. For example, Dyer and Singh (1998) challenged the assertion that the source of sustainable competitive advantage lies within the organization. They argued that an important unit of analysis for understanding competitive advantage lies in interorganizational relationships and identified four potential sources of interorganizational competitive advantage: (1) relation-specific assets, (2) knowledge sharing routines, (3) complementary resources/capabilities, and (4) effective governance. We will discuss the validity of sustainable competitive advantage in the context of digitalization in more detail in section 5.

Scholars, however, have discussed not only the sources of competitive advantage, but also how competitive advantage can be sustained in the long run under changing environmental conditions. While the original conception of the resource-based theory was rather static, later authors recognized that a firm's resource base must be adjusted as environmental conditions change to ensure that the source of competitive advantage is not lost (Teece et al., 1997, Sanchez et al., 1996). In this context, some authors have emphasized, for example, the importance of relationship capabilities, which enable firms to adapt their internal resources to changing requirements by incorporating external resources from collaborative partners into their networks (Helfat et al., 2007). Another widely noted approach comes from Teece (2007), who proposed a distinction between sensing, seizing, and reconfiguring capabilities. Teece argued that the adaptive competence of organizations depends on their abilities to understand the environment by identifying threats and opportunities (sensing), to select and invest in such opportunities (seizing), and to adapt organizational resources and capabilities to these new opportunities (reconfiguring). These adaptive capabilities are particularly important in the context of digitalization, because the digital business environment is characterized by short development cycles, the easy imitability of digital functions, the global availability of digital resources, and the intensive integration and exchange of partners, resulting in serious strategy and structural changes in companies (Bosler et al., 2020). Due to these high dynamics, most authors argue that at least an adaptation of the traditional view is needed to fully explain value creation in digital and data-driven firms (Bosler et al., 2020; Son et al., 2014; Cao et al., 2010; Sedera et al., 2016; Pereira & Bamel, 2021; Cooper et al., 2023; Bär et al., 2022; Chaudhuri et al., 2022). A prominent approach to theory adaptation is the extended resource-oriented perspective, which shifts the resource boundary of the firm outward (Son et al., 2014). In terms of defensible competitive advantage, proponents of this view emphasize the importance of

so-called network resources, which can be accessed through interorganizational relationships among multiple firms. Thus, external resources, e.g., externally provided IT services, can also generate strategic value with less risk and cost (Son et al., 2014; Bär et al., 2022). Moreover, the literature advocates a contingent resource-oriented view as a theory extension (Sedera et al., 2016; Cao et al., 2010). While resources are exogenously given or can be formed through specific activities within the firm, capabilities are formed by integrating and linking these resources (Sedera et al., 2016). Accordingly, the strategic value of enterprise IT depends on the interaction of a whole system that is influenced in parallel by numerous facilitators and mediators (Cao et al., 2010).

Over the course of time the resource-based view has also attracted some fundamental criticism that completely rejects the explanatory patterns of the theory. Apart from the well-documented and extensive tautology discussion (Lockett et al., 2009; Priem & Butler, 2001), the core elements of the theory, such as the VRIO scheme (Miller, 2003) or the argument that sustainable competitive advantage results from resource configurations that are difficult to replicate, have been at the center of critical annotations (Bromiley & Rao, 2016). Proponents of the resource-based theory often cite strong arguments such as causal ambiguity, historicity, or social complexity to justify why value-creating resources intended to underpin competitive advantage can be maintained over time (Barney et al., 2021; Peteraf, 1993; Barney, 1991). The resource-based approach thus builds on isolation mechanisms that require managers to not fully understand how they create their valuable resources in order to prevent managers from selling this knowledge to other companies or taking it with them when they move from one company to another (Mahoney & Pandian, 1992; Rumelt, 1984). On the one hand, this logic elegantly explains why resources cannot simply be imitated. But on the other hand, this conceptualization enormously limits the empirical testability of resource-based theory (Kaur, 2023; Baron & Ensley, 2006) and also reduces the value for management practice (Connor, 2002). Moreover, there is much empirical evidence that it is not the difficult to imitate resources of firms that create competitive advantage, but rather the elements that can be easily replicated (Bromiley & Rau, 2014). For example, some studies show that firms differ in their use of fairly simple and seemingly obvious practices, and that these differences lead to performance differences across firms (Bloom et al., 2013; Bloom & Van Reenen, 2006; Combs et al., 2006; Nohria et al., 2003). This observation is particularly relevant in the context of digitalization, as knowledge and practice sharing have increased significantly in the short-lived digital business landscape (Bosler et al., 2020). Some authors therefore consider the resource-based approach to be fundamentally inappropriate in the digital world. Braganza et al. (2016), for instance, consider the theory inappropriate in the context of Big Data initiatives, as the necessary resources are usually external to the organization and relationships with partners are more transient than they were in the analog era. Instead, they recommend using institutional theory, stakeholder theory, and other theories from the fields of strategy and leadership to illuminate this issue (Braganza et al., 2016). The digitalization of business models, accelerated in particular by Big Data technologies, represents a radical economic upheaval that poses a major challenge to management scholars. The role of Big Data in modern business worlds remains unclear, requiring new theoretical management constructs on the interplay of data, technology, and strategy (Mazzei & Noble, 2020).

4. Challenges to theory adaptation

The changed context resulting from digitalization is leading to a shift in the resource and competence base of companies. On the one hand, the volatility of digital technologies and data requires a dynamic adjustment of the resource configuration in the company (Linde et al., 2021; Bosler et al., 2020). This is because digital trends have a short lifespan and customers quickly realign their wants and needs in the digital business environment. At the same time, the increasing integration of digital assets leads to increasing heterogeneity and immateriality of the resource base in the company. This requires different management approaches and makes it difficult to identify and bundle valuable and productive assets (Huemer & Wang, 2021; Kraus et al., 2021; Gupta & George, 2016). Finally, the resource base of the company is increasingly being opened up to collaborative sharing in the ecosystem, which imposes other requirements on resources and their management (Giustiziero et al., 2023; Helfat et al, 2023).

The inherent short-lived nature of the digital business setting also calls into question whether companies can achieve sustainable competitive advantages and secure their competitive position in the long term as traditionally

assumed (Gueler & Schnieder, 2021). Due to the increased risk of competition and imitation in digital business, it is more likely that competitive advantages can only be built up in the short term (Bosler et al., 2020). Digitalization is thus changing the explandum of the resource-based theory. Furthermore, to maintain temporary competitive advantages in a challenging environment, a company must be capable of a balancing act. On the one hand, the organization must be able to withstand change by building resilience capacities (Li et al., 2023; Trieu et al. 2023; Hou et al., 2021). But at the same time, it must also be able to adapt when needed by building adaptive skills and competencies. In order to find and maintain the right balance, companies in the digital environment are increasingly reliant on networking and collaboration with other players in the digital ecosystem (Fleser; 2022; Cozzolino et al., 2020). So the changing logic of being successful in the digital age is also nagging at the explanans of resource-based theory. We have identified four main areas of the RBV that are particularly affected by digitalization, which we will describe in more detail below.

4.1. Conceptualization of strategic resources

To begin with, the digital transformation brings digital, i.e. IT-based, resources to the forefront of value creation. According to Wade and Hulland (2004), IT-based resources (IT resources for short) comprise both IT assets, which include hardware, software and data assets, and IT capabilities, i.e. IT management capabilities, IT enterprise relationships and technical IT capabilities of a company. The strategic importance of IT resources for building sustainable competitive advantages has been widely discussed in the literature since the emergence of the resource-based theory (Wade&Hulland, 2004; Cao et al., 2011). According to Barney, strategic resources must be valuable, rare, inimitable and well organized (Barney, 1991). Most authors agree that individual IT resources alone cannot fulfil all VRIO criteria. While IT capabilities are more often identified as strategic resources, the isolated contribution of IT assets for building a sustainable competitive advantage is still critically viewed today (Mata et al., 1995; Delmonte, 2003; Wade&Hulland, 2004; Beard & Sumner, 2004; Cao et al., 2011; Schroeder & Kotlarsky, 2015; Zuiderwijk et al., 2015; Braganza et al., 2016; Bischof et al., 2016). In the following, we therefore take a closer look at the problem regarding the strategic potential of the IT assets hardware, software and data assets.

Hardware elements, such as infrastructures, networks and computer components, and software elements, such as platforms and applications, are among those IT assets that are widely distributed in markets and used within firms and easily accessible in the digital age. Many authors therefore refer to them as standardised mass products (Braganza et al., 2016; Bischof et al., 2016; Beard & Sumner, 2004). Within the framework of the resource-based theory, they can therefore not be considered rare, as the criterion of relative unavailability to current and potential competitors is not met. Furthermore, resources are considered non-imitable if they are protected by imitation barriers or isolation mechanisms, which include, in addition to property rights, the criteria of historicity, causal ambiguity as well as social complexity (Nevo & Wade 2010). In most cases, both hardware and software components have no barriers to replication, so they are considered to be resources that can be imitated relatively easily and quickly by competitors (Wade&Hulland, 2004). For example, potential competitors can easily implement technical systems such as ERP, CRM, SCM or EDI due to enormous experience in these areas, which is why such resources do not have a significant impact on the generation of competitive advantage (Beard & Sumner, 2004; Bharadwaj, 2000).

A company's data assets can include its internal corporate database, open data sets, and product and service related data (Zuiderwijk et al., 2015). Although the collection, use and analysis of data has been identified by many authors as a critical strategy for success (Touil Ait & Jabraoui, 2020; Mazzei & Noble, 2020; Bischof et al., 2016), data assets alone also cannot fulfil all VRIO criteria (Touil Ait & Jabraoui, 2020; Zuiderwijk et al., 2015; Schroeder & Kotlarsky, 2015; Bischof et al., 2016). Thus, the criterion of rarity does not apply to an organisation's data assets, as they are accessible and usable (for a fee) by many more companies (Braganza et al., 2016). In a study on the strategic importance of open data sets in organisations, Zuiderwijk et al. (2015) concluded that data alone cannot lead to sustainable competitive advantages. In particular, the unlimited availability of open data was consistently criticised (Zuiderwijk et al., 2015). Data, being available and freely accessible to everyone, should be considered as a common resource with the character of a public good rather than a strategic resource (Davies & Bawa, 2012). In their analyses, Schroeder & Kotlarsky

(2015) and Touil Ait & Jabraoui (2020) question the value of data and argue that data alone cannot help to improve efficiency in organisations, exploit market opportunities or protect them from threats. Rather, data needs to be stored, processed and analysed over time (Schroeder & Kotlarsky, 2015; Touil Ait & Jabraoui, 2020). The criteria for imperfect imitability are also violated in the case of data sets, as long as there is no high diversity in the data sources, extremely long periods of data collection and use, or a combination with other IT resources. Only then a rich data source can be created that is sufficiently protected from imitation, as competitors would have to accept significant costs and time delays in imitation (Schroeder & Kotlarsky, 2015; Bischof et al., 2016).

Overall, it remains to be said that data stocks as well as hardware and software components in their conventional and purely physical form are neither rare nor imperfectly imitable, which is why the strategic potential of these resources must be doubted (Braganza et al., 2016; Bischof et al., 2016; Schroeder & Kotlarsky, 2015). However, many authors emphasise the strategic importance of resource combinations in the digital age (Bingham & Eisenhardt, 2008; Kohli & Grover, 2008; Nevo & Wade, 2010). In particular, the combinations of different IT resources with each other and with complementary organisational factors such as strategy, structure, process, culture, power and politics are discussed as a promising source for building sustainable competitive advantages (Schroeder & Kotlarsky, 2015; Cao et al., 2011).

4.2. Bundling of resources and the role of management

From the perspective of the resource-based theory, competitive advantages arise from the combined use of different resources in the firm (Grant, 2010; Bharadwaj, 2000). Earlier studies initially focused exclusively on the company's individual assets, capabilities and competencies (Winter, 1995; Peteraf, 1993; Barney, 1991; Wernerfelt, 1984). More recent approaches, however, have taken a more open view, emphasizing the role of external resources for the company (Hall, 2000; Sanchez & Heene, 1997). For example, Sanchez et al. (1996), advocate an open systems view and emphasize that companies interact with their external environment to close resource gaps and promote the development and use of competencies. To this end, collaboration with external actors is essential to gain access to these external resources. Furthermore, strategic management research has identified that not only ownership or access to resources is important for achieving competitive advantage, but also managerial actions to structure the organizational resource portfolio and bundle these resources into capabilities (Helfat et al., 2007; Sirmon et al., 2007). These so-called resource orchestration capabilities of management have gained enormous importance, especially in the context of digitalization and the emergence of digital business ecosystems (Kindermann et al., 2022; Linde et al., 2021; Zeng et al., 2021; Bosler et al., 2020). This line of research also places more emphasis on the bundling of productive resources, as the mere availability of resources actually only plays a minor role in value creation (Alexy et al., 2018). Much more important is the strategic fit of resources, their complementarity, and their ability to interact in a value-enhancing manner (Huemer & Wang, 2021). According to this logic, data resources alone, for instance, cannot establish a competitive advantage for a company. This is because the value-adding use of data requires a targeted bundling of all complementary resources in the company that are necessary for this purpose (Gupta & George, 2016). Thus, the strategic value of data can only be realized through effective and efficient orchestration within complex resource bundles. This also has far-reaching consequences for the routine and skills base of the organization. This is because the old processes, patterns and workflows in organizations are losing their competitive character in the light of increasing digitalization and must be fundamentally changed (Kraus et al., 2021). However, the associated organizational change not only requires a radical redesign of organizational structures and processes, but also implies a reassessment of organizational norms and values (Liu et al., 2011). The necessary transformation of organizational structures goes far beyond the mere use of data to increase the efficiency and effectiveness of business processes. Rather, a holistic use of digital technologies is required to fundamentally change the entire business operation, value creation, and new digital product offerings (Libert et al., 2016). This view is also supported by strategy-as-practice research, which has emerged in recent years as a distinct way of thinking about strategic management. By focusing on the micro-level social activities, processes, and practices that characterize business strategy, this view provides a more comprehensive, in-depth analysis of what is actually taking place in the organization (Golsorkhi et al., 2010). A central message of this perspective is that potential resources become valuable to the organization only when they are put into

practice, and what kind of value they deliver depends on how they are used (Feldman & Worline, 2011). This changes the perspective from simply owning the resources to human action, that is, productive and purposeful use of the resources (Feldman & Worline, 2016). In the digital age, the practical exploitation of resources plays a special role, as the opportunities for companies are almost unlimited thanks to the easy accessibility to IT assets and data. The decisive factor is therefore not the mere existence of these possibilities, but their concrete implementation in the company and in the company's products and services. And for this, companies need not only IT knowledge, but also management and operational skills, because digital resources must be meaningfully integrated into organizational structures and corporate strategy.

4.3. Implications for human behaviour and governance

Digitalization and the increasing use of IT technologies and data are changing the framework conditions for decision-makers in companies and for ordinary employees. On the one hand, digital technologies such as artificial intelligence (AI) enable the automation of complex tasks that require intelligent problem-solving skills and offer decision-makers in companies enormous support in reaching decisions (Cao et al., 2021). AI-based decision-making is considered to be more effective, accurate and flexible, enabling the analytical and problem-solving skills of employees in an organization to be improved and creativity to be enhanced (Metcalf et al., 2019; Wilson & Daugherty, 2018; Agrawal et al., 2017). From the perspective of resource-based theory, digital technologies such as AI can therefore not only help to unleash previously unknown resource potential in the company, but also optimize internal processes and expand existing organizational competencies. On the other hand, the increasing use of digital technologies is also viewed critically by many experts, as the rising implementation of digital processes also increases the complexity of operational IT systems, which can be monitored and controlled by only a few specialists (Yin et al., 2023). The one-sided distribution of information and knowledge to a small number of people opens up scope for opportunistic and fraudulent behavior, which appears to be confirmed by the latest empirical research findings (Giustiziero et al., 2022; Fung, 2019). In addition, digitalization increases organizational dependency on IT systems, which entails risks in terms of IT-supported bias in decision-making and makes organizations more susceptible to cyberattacks, data loss and other digital risks. The use of IT technology is therefore ambivalent in many respects. While on the one hand new resource potentials are accessed and human action is positively supported, on the other hand threats arise that can bias decisions and stimulate unintended behavior. This creates new governance requirements for companies (Keller et al., 2023; Flyverbom et al., 2019). Especially in inter-company collaborations characterized by data or IT sharing, digital systems need to be better monitored to characterize the threats posed by digitalization and to develop strategies and best practices to improve governance practices that have proven ineffective or inefficient against such threats (Linkov et al., 2018). How to design effective governance in the digital age is currently the subject of intense debate in the research community (Li et al., 2024; Keller et al., 2023; Wang & Han, 2023; Luo, 2022).

But digitalization also has an impact on the customer. To be more precise, customer expectations are changing in the digital context. Increased competition and the enormous availability of similar products and services are leading to an inflation of demand-side expectations. Companies, however, are often unable to meet these exaggerated expectations of their customers. Therefore, two consequences can result from this conflict. On the one hand, companies may have an incentive to behave fraudulently in order to seemingly fulfill customer expectations (Wang & Han, 2023). This can be done, for example, by simulating a false variety, quality or readability of products and services. On the other hand, there are stronger incentives to collaborate with other companies to meet the more complex needs of customers (Bosler et al., 2021; Cozzolino et al., 2020; Kohltamäki et al., 2019). For example, multiple value elements can be combined by a variety of companies in the ecosystem to offer an increasingly sophisticated range of products and services. At the same time, however, the individual company loses control over the various components of the bundle. The autonomy of the individual company is therefore lost to a certain extent and the companies involved in the value creation process become mutually dependent, which in turn means that new forms of governance are becoming increasingly important (Keller et al., 2023; Flyverbom et al., 2019).

4.4. Inter-firm value creation

The resource-based view is concerned with the internal analysis of the firm (Wernerfelt, 1984). The theory thus provides explanations of how scarce resources and capabilities can be used productively by companies to achieve sustainable competitive advantages (Barney, 1991). Firms thus position themselves in markets according to their own resources, capabilities, and competencies-and they do so in a way that makes their unique features difficult or impossible for other firms to imitate (Connor, 2002). However, the digital transformation of business practices is increasingly breaking through this old logic (Giustiziero et al., 2022; Talmar et al., 2020; Vial, 2019). Interconnectedness and shared value creation are creating deep interdependency structures between companies (Zeng et al., 2021; Subramaniam, 2020). Companies can therefore no longer be viewed as isolated entities, but must be seen as a part of a large digital ecosystem landscape (Márton, 2022). This also requires a fundamentally different view of companies' value creation practices and business models (Kohtamäki et al., 2019). While companies traditionally had a one-dimensional value chain, they now operate in multidimensional value networks (Adner, 2017). These offer them greater opportunities for monetization, as not only the original products, but also the data and the resulting value-added services can be used as a new source of revenue (Bosch, 2019). However, the new opportunities not only expand the scope of value creation, but also increase the competitive pressure on companies, as access to data is not exclusively limited and imitation is much easier in the digital context (Subramaniam, 2020).

However, this new ecosystem reality, in which companies learn from each other, share resources, engage customers, and compete with each other, is insufficiently captured by the traditional inside-out perspective of resource-based theory (Schymanietz, 2020). This is because the clear differentiability of companies, as classically assumed in the resource-based perspective, has noticeably eroded in the digital sphere (Giustiziero et al., 2022). Thus, the source of value creation no longer originates in the firm, but results from the mutual interactions of actors in multidimensional value networks (Márton, 2022; Zeng et al., 2021; Talmar et al., 2020; Jacobides et al., 2018; Adner, 2017). This requires a dynamic and open perspective on the processes of value creation, delivery, and market positioning (Gueler & Schneider, 2021; Zeng et al., 2021) along with a corresponding reformulation of the resource-based model. In particular, the shareability and scalability of resources is becoming increasingly important in the digital context due to the principle of interaction-based value creation (Helfat et al., 2023; Zeng et al., 2022). This is because companies derive advantages not only from simply owning digital resources, but from being the first to use them in a profitable way. To be first means in this context being able to leverage positive network effects, build a strong reputation, and create barriers to entry for competitors. The first-mover advantages can further be sustained by occupying marketplaces at an early stage and scaling quickly. Rapid scalability thus enables new business ideas to be used more effectively than competitors, at least in the short term (Giustiziero et al., 2023).

5. Towards a reformulated theory

Previous remarks have shown that the digital age entails significant contextual challenges for the resource-based theory (Kindermann et al., 2022; Gueler & Schneider, 2021; Kraus et al., 2021; Schymanietz, 2020; Vial, 2019). Together with other authors, we argue that a revision of the content structure of the theory (explanandum and explanans) is therefore also necessary (Cooper et al., 2023; Helfat et al., 2023; Pereira & Bamel, 2021). Before we continue with our considerations, we would first like to discuss a fundamental question. Does the core of the resource-based theory, the VRIO scheme, need to be only partially adapted or completely changed in the context of digitalization? We advocate a partial adjustment because we consider certain elements of the model to be robust and not obsolete in the context of digitalization. In our view, the following arguments speak in favor of maintaining the VRIO approach, even if only partially. On the one hand, the VRIO model is widely used in academia and empirical research has also provided a great deal of evidence for this approach over the years. On the other hand, the model is well-known and widely accepted in business practice because it derives management implications from a firm-centered perspective. We want to maintain this inside-out thinking in the following, because in spite of blurring boundaries between companies and a stronger focus on digital ecosystems, the individual firm is still at the center of all considerations. However, we recognize that the increasing use of digital technologies and data along with value creation through engagement with various players in the digital ecosystem is changing the focus on which resources and capabilities help companies to achieve competitive advantages in the digital context. Nevertheless, it is undisputed that the

resource configuration of some companies leads to better market performance than of others. This is essential to understand why certain digital companies develop into dominant players, while others struggle to differentiate themselves from the competition despite similar starting conditions and opportunities in the ecosystem. The basic argument of the resource-based approach therefore remains unchanged by digitalization. As in the classic interpretation according to Barney (et al. 2021; 1995; 1991), the value-creating feature in the company that leads to competitive advantage must be rooted in the resource configurations and the organizational ability to use these resources productively. What is fundamentally changing as a result of digitalization, however, are the VRIO criteria themselves, that is, the explanans of the resource-based model.

5.1. Adjustment of the resource-based model

The first thing to note in the context of digitalization is that digital resources such as data, digital technologies, software components or cloud-based infrastructures cannot be considered scarce per se (Braganza et al., 2016). Different companies – just like their competitors – can access identical digital resources from the same digital partners (Bosler et al., 2020; Bischof et al., 2016; Schroeder & Kotlarsky, 2015). Value creation processes are also increasingly shifting to value networks and interactive cooperation models are gaining importance (Márton, 2022; Zeng et al., 2021; Talmar et al., 2020; Jacobides et al., 2018; Adner, 2017). These developments imply a common pool of resources to which all actors in the digital ecosystem have access. Moreover, free access to many digital resources enables straightforward imitation. The fact that digital resources are difficult to protect reinforces this process (Giustiziero et al., 2022; Bosler et al., 2020). Overall, the criteria rare and inimitable of the VRIO model thus no longer represent a mandatory prerequisite for generating a competitive advantage in the digital age.

In contrast, we continue to recognise the criteria valuable and organised as robust. Even in the digital context, companies can gain competitive advantage by having valuable digital assets that are well integrated into the organizational stock of resources (Touil Ait & Jabraoui, 2020; Mazzei & Noble, 2020; Schroeder & Kotlarsky, 2015). For instance, the use of information technologies can generate huge amounts of data that can be strategically valuable to the business and provide a competitive advantage through intelligent use (Singh et al., 2023; Zeng et al., 2021; Bosler et al. 2020). It is important to note, however, that neither IT resources nor the resulting data provide competitive advantages per se. The benefits arise from a targeted analysis of the data, a thorough alignment with operational and strategic goals, and a good fit with the remaining resource and competence profile of the organization (Linde et al., 2021). However, even if companies can achieve a superior competitive position through the targeted deployment and use of IT and data resources (Barney, 1991), this may only be of a temporary nature due to the highly dynamic nature of the digital business environment (Vial, 2019). The easy imitability and global availability of digital resources, coupled with short development cycles, a high degree of uncertainty and the fast pace of digital business, means that competitive advantages can be achieved but not sustained over the long term (Kindermann et al., 2022; Bosler et al., 2020; Bosovic et al., 2019). This results in some important implications for model adaptation. To begin with, the criteria rare and inimitable of the VRIO framework no longer play a significant role in the digital age and can therefore be removed from the model. However, this has the consequence that companies in the digital context can only achieve temporary competitive advantages (TCA), as their competitive position is not secured in the long term. However, this contradicts the empirical evidence, as numerous examples of digital companies can be cited that are permanently better positioned than their competitors. Additional criteria for the resource-based model are therefore needed to explain why temporary competitive advantages can be maintained in the long term. In the search for possible explanations, it is worth taking a look at prominent spin-offs of the resource-based theory, because similar questions have already been discussed extensively in research. For example, one debate that is particularly helpful for our argumentation has been conducted in dynamic capabilities studies. The starting point of the discussion was the realization that companies in short-lived industries often have to reinvent themselves and adapt their business processes to changing conditions. The standard framework of the resource-based theory offered only a limited explanation of how companies manage to maintain competitive advantages despite changing environmental conditions. Therefore, an additional explanation had to be used. According to this explanation, firms need special adaptive capabilities to cope with unexpected changes in the environment. Teece (2007) concretizes this in his paper by providing three

elementary competencies of adaptive organizations: sensing, seizing, and reconfiguring. Particularly important to our argument is the notion that organizations must be able to constantly realign and restructure their resource base. However, while adaptability in the dynamic capabilities view originates in the changing business environment, the pressure to adapt in our argument arises from the accelerated competitive environment and the high risk of imitation in the digital domain. This is because the development processes in the digital economy are accelerating and companies are constantly facing changes and developments in new technologies (Bosler et al., 2021). This suggests that a sustainable competitive advantage (SCA) in the digital environment cannot be achieved in the long term and instead must be constantly re-created. Thus, the existence of valuable resources and the organizational exploitability of these resources are not sufficient to ensure a sustainable competitive position under the enormous threat of imitation in the digital context. The streaming services industry is a good example of this. While the success of the pioneer Netflix according to the classical resource-based view indicates a sustainable competitive advantage for the company, the proliferation of alternative providers in the streaming market, however, shows that the competitive position of the pioneer was far from being as well protected as the classical view would imply (Anindita, 2021; Subburayan, 2023). Thus, to be competitive in the long run, companies must engage in a constant process of finding new combinations of resources that are one step ahead of the competition. This principle of constant renewal and adaptation receives too little attention in the standard view of the resource-based theory. We therefore propose a revised and adapted resource-based model that better reflects the inherent need for adaptation in the firm (see Figure 1). However, the adaptive capability of companies alone is not enough to explain how they secure their competitive position in the digital business environment. Against this background, the conceptualization of strategic resources also needs to be reconsidered and the importance of resource bundles and inter-firm value creation needs to be brought into sharper focus (Kinderman et al., 2022; Bosovic et al., 2019). According to Barney competitive advantages result primarily from the use of a unique resource configuration that is either not available to competitors or can only be imitated at considerable expense (Barney, 1991). However, as we have repeatedly argued, in the case of digital resources, the traditional mechanisms for mitigating resource imitability and rarity are not present (Touil Ait & Jabraoui, 2020; Braganza et al.; 2016). Rather, in many cases, the value of IT and data resources comes from their sharing with other actors in the digital ecosystem. Hence, due to the dynamic nature of the digital age, competitive advantages are primarily anchored in speed advantages in the orchestration of internal and external resources (Bosler et al., 2020). To enable cross-company value creation, it must therefore be possible to share IT assets with other partners (Singh et al., 2023; Deng et al., 2022; Felser, 2022; Linde et al., 2021). What is shared, however, must be suitable for many interacting partners and different contexts. After all, rapid scalability is not only characteristic of digital business models, but also crucial to their competitive success (Giustiziero et al., 2023; Helfat et al., 2023; Zeng et al., 2022). So shareability and scalability must be present to characterize strategically relevant IT and data resources. Both, of course,

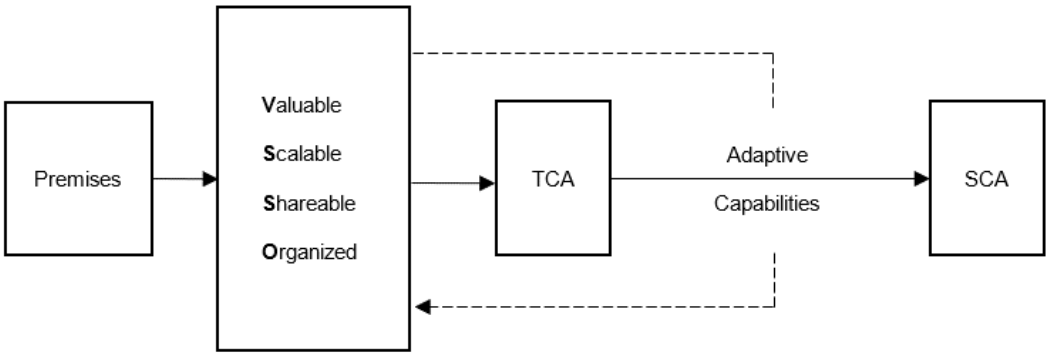

Figure 1: Reformulation of the resource-based model

come with enormous management and implementation challenges for the organization. This is because shared resources, with value created through interaction in complex networks, must be aligned with the rest of the organization's resource base (Bosler et al., 2020). At the same time, productive bundles of externally shared resources must be balanced against assets and capabilities that remain within the company. This is because, as we have already discussed, the digital competitive environment requires constant adjustment of the resource bundles in order to maintain competitive advantages (Hou et al., 2021). So, summing up, we consider the two principles of resource sharing and scalability as important core elements that need to be addressed in order to achieve a sequence of temporary competitive advantages leading to a sustainable competitive position in the digital context. Together with organizational adaptability, they form the new frame of reference in our adapted resource-based framework (see Figure 1).

5.2. Promising linkage points for the revised model

Changing the theoretical framework gives new impetus to the research discussion by making the resource-based approach suitable for the digital business environment. We integrate insights from current digitalization research, capabilities scholarship, and the relational view into the theory, helping to break down the static core of the traditional model and replace it with a more dynamic perspective. In this way, we also make the resource-based theory more interoperable with other research paradigms that have developed under the umbrella of resource-based theory but have never become part of its conceptual core. We will briefly discuss some promising points of linkage below.

To begin with, the research on ambidexterity offers a promising coupling point for the revised model (Raisch & Birkinshaw, 2008; Tushman & Smith, 2002; Duncan, 1976). According to the standard literature, the construct of ambidexterity is composed of the key dimensions of exploration and exploitation (March, 1991), both of which are indirectly represented in our modified model framework. Organizational exploitation capability is reflected in valuable resources and organizational alignment toward the productive use of those resources. As we have already discussed in detail, despite the volatile nature of the digital business environment, companies need to be resilient to some extent, otherwise they will not be able to generate profits from their superior but transient competitive position (Li et al, 2023; Trieu et al., 2023). In this respect, the accumulation of generative assets such as skills or knowledge is particularly important for companies as they need them to face the changing business environment driven by digitalization. These generative assets are particularly critical because, unlike other assets, they allow the company to create resources and competencies of strategic importance (Freiling, 2008). The ability to accumulate, organize and use these resources, even if only temporarily, to serve the interests of the company reflects the idea of exploitation. Exploratory capability, on the other hand, is reflected in the adaptability of the firm, that is, the ability to constantly adjust and change the sources of the short-term competitive advantage. It is important to emphasize at this point that adaptability explicitly refers not only to the internal resource base, but also to the digital assets, which must have a high degree of shareability and scalability. So the internal adaptation of the organization takes place in line with the digital ecosystem in which the organization is integrated through its IT and data resources. This shows that adapting the business requires extensive exploratory capacity, not only in terms of market intelligence, but also in terms of reaching out to partners in the collaborative value network. Exploration can also benefit from a higher degree of networking through digitalization, which enables better access to cooperation partners and communities of practice (Nicolini et al., 2022; Arndt et al., 2021). The accessibility and mobilization of innovation resources in the company's environment in the sense of open innovation can also be improved by digitalization, which enables a higher degree of interaction between the company and other innovation actors (Gobble, 2018; Chesbrough & Bogers, 2014). Also particularly important in this context is the trend towards the platformization of innovation activities. Platforms naturally entail a certain degree of openness and mutual dependencies. For example, platform operators provide boundary resources such as application programming interfaces (APIs), software development kits (SDKs) and other resources to enable complementary providers to build their offerings (Ghazawneh & Henfridsson, 2013). Often these resources go beyond the technical aspects to include legal protection and other related services. These low-cost resources can be used by entrepreneurs to gain access to the platform's markets so that they can build their businesses and develop further innovations (Nambisan et al., 2018).

Bridging the gap to ambidextrous research not only provides an important cross-connection, but also highlights the dynamic nature of the organizational processes of value generation and value appropriation by the firm. In research on ambidexterity, the coexistence of exploration and exploitation is an important factor describing the long-term existence and success of firms (Durisin & Todorova, 2012; Lubatkin et al., 2006). Following this explanatory logic, the interplay of exploitative resource use and exploratory adaptation in our model also provides the crucial explanation for why some companies can be more successful in the digital environment than others in the long run. But perhaps we need to think differently about exploitation and exploration in the digital economy. Today, companies achieve a high degree of exploitation through shareability and scalability. Exploration, on the other hand, is realized through new business models and new data-driven services. This is very different from what was understood by exploitation and exploration in the old business context, where the exploitation was achieved through rationalization and downsizing, while exploration was realized through long-term research and development.

Another important reference point for our revised model is the competence-based framework. The competence-based approach emphasizes the importance of a firm's skills and knowledge in creating customer value (Sanchez et al., 1996; Hamel & Heene, 1994). Compared to the traditional resource-based view, this approach has a different emphasis. From the competence-based perspective, competitive advantages do not automatically result from a given resource base, but are rather generated by the collective capabilities and activity patterns of the organization (Freiling 2004a). A common element of our model and the competence-based approach is the joint focus on the company's internal resources and competences as well as the external market and the environment (Freiling 2004b). The new model thus takes account of the need to integrate the increasing variability of market requirements in the course of digitalization more strongly into the conceptual approach (Freiling et al., 2008). Our revised model thus builds a bridge to competency-based research in strategic management, but without losing the foundation laid in the company's resources. Similarly, our new framework also builds a conceptual bridge to research on dynamic capabilities by recognizing the need for continuous adaptation of the resource base to changes in the market and competitive environment (Kindermann et al., 2022; Braganza et al., 2016; Helfat et al., 2007). Nevertheless, there is a significant difference between our framework and the competence-based and dynamic capabilities-oriented strand of research. This is because our approach aims to take a holistic view that considers both the resource base and the adaptability of the organization, thus contributing to a better understanding of the interplay between these two elements. In particular, our model shows that, in addition to valuable and organized resources, a competitive advantage in the digital context lies in resources that can be scaled, shared as well as continuously adapted.

6. Conclusions

In this paper, we have shown that digitalization both changes the context of resource-based theory and requires an adaptation of the theory itself. Based on our review and evaluation, we have proposed a revised modeling framework that no longer focuses on achieving long-term competitive advantage, but rather on constantly adapting and changing the resource configuration to maintain temporary competitive position. Our modeling approach makes it possible to integrate different research directions, which previously existed rather independently side by side, into the central explanatory logic of the resource-based theory. We believe that this radical reconstruction of the explanatory model is necessary to better address the contemporary business reality of the digital world. Against the background of the digital revolution, many authors argue that the traditional resource-based approach has reached an argumentative impasse. Our changed orientation of the resource-based model could therefore give new impetus to the theory discussion. The integrative approach also offers many opportunities to link to related strands of research and to formulate the model in a more contemporary way. For instance, effectuation research offers an interesting starting point for the revised resource-based model. Effectuation represents a paradigmatic shift in the understanding of entrepreneurship. This is because the introduction of fundamentally new products and services makes it impossible for the entrepreneur to find valid information in advance to optimize the innovations (Perry et al., 2012). There is not only a lack of benchmarks, but simply a lack of markets and customers who are aware of the innovations in order to carry out optimization prior to market launch. This is particularly relevant to our considerations because in the digital context, the introduction of radically new products and services is an essential part

of competition between companies. And the need to constantly change and adapt digital offerings adds to the pressure to innovate. So, given this situation, how can companies innovate successfully? Effectuation research suggests that interacting with potential partners, suppliers, customers, and other stakeholders can be helpful in reducing information uncertainty (Gregoire & Cherchem, 2020). This interaction-based openness to the ecosystem is also reflected in our adapted resource-based model. This is because the ability to adjust the resource base requires the company to be receptive to the market and competition. It thus needs basic perceptive capabilities to anticipate changes in demand and solutions from competitors at an early stage. At the same time, our consideration expands the set of criteria for strategic resources to include elements such as shareability and scalability, which are aimed at the interaction of resource bundles in the digital ecosystem. So our modeling allows for better integration of strands of theory and research that focus on interaction, sharing, and collaboration in value creation and making new offerings and solutions.

Finally, we would like to encourage strategic management scholars to rethink the old resource-based model in the context of digitalization. Our work has prompted a reformulation of the classic VRIO scheme that better reflects the digital business reality and emphasizes the transformative capabilities of firms by better accounting for the sharability and scalability of resources in an open value creation paradigm centered on digital ecosystems. Future research could take our study either as a starting point to further adapt the resource-based framework for the context of digitalization or as an impetus to investigate whether the resource-based theory is still suitable for contemporary settings and what new picture could perhaps be drawn instead of the old model.

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Acknowledgements

The authors would like to thank the anonymous reviewers for their many valuable comments, which contributed significantly to the improvement of the manuscript.