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# Resource bundles and value creation: An analytical framework

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## **Highlights**

- Resources are bundled and need to be analyzed accordingly
- Rareness and inimitability matter for competitive advantage, not for value creation
- Resources are valuable when they match with and enhance other resources

## **Resource bundles and value creation: An analytical framework**

### **ABSTRACT**

All organizations intend to create some form of value. Yet, the most influential analytical frameworks focusing on resources emphasize competitive advantage, which is a concern for only some organizations. This study proposes a novel analytical framework focusing on value creation. Moreover, the framework returns to the emphasis on the bundled nature of resources stressed in earlier strategy theory. The concepts of resource interfaces, resource imprints and cogency effects, are combined to (i) highlight the bundled and interdependent nature of resources (ii) reinterpret the classical emphasis on rareness and inimitability and (iii) redefine the meaning of a strategic resource. With help of a longitudinal case study, the scope of value creation is broadened by reconsidering the meaning of the 'best resource' and the 'weakest link'; focusing on being 'better with...' rather than being 'better than...'.

**Keywords:** Resource bundle; value creation; analytical framework; resource interaction; cooperative strategy; case study

## 1.Introduction

Analytical frameworks are influential when they direct theoretical development and guide managerial decision-making. To illustrate, Porter's (1985) value chain framework, which informs on value creation and the coordination of sequential interdependencies (cf. Thompson, 1967), has influenced strategy and supply chain scholars and managers. The VRIN/O<sup>1</sup> frameworks of the resource-based view (RBV) are probably the most utilized tools for resource analyses. RBV's focus is on illustrating VRIN/O's importance for competitive advantage (e.g. Barney, 1991; Peteraf, 1993; Sirmon, Hitt, & Ireland, 2007). Only some organizations are concerned with gaining and sustaining a competitive advantage; however, all organizations intend to create some form of value. A resource-oriented analytical framework focusing on value creation would thereby have a broad application.

This study's basic claim is that there is a need for an analytical framework focusing on value creation from a resource perspective. Such a focus characterizes the 4R model<sup>2</sup> of the resource interaction approach (RIA) (e.g. Håkansson & Waluszewski, 2002; Håkansson & Snehota, 1995; Baraldi & Strömsten, 2006; Baraldi, Gressetvold, & Harrison, 2012). RIA and the 4R model build on systematic analyses of resource interdependencies (Freitag, Gadde, & Harrison, 2017). However, recent research emphasizes that the notion of value and the mechanisms for value generation need a more detailed discussion also in RIA (Bocconcelli, Carlborg, Harrison, Hasche, Hedvall, & Huang, 2020). This argument echoes the concern of Bowman and Ambrosini (2000) that the RBV does not explain what actually makes a resource valuable.

We suggest that the bundled nature of resources is a particular concern with respect to value creation. Resource bundles are relevant since "*the problem of not understanding the*

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<sup>1</sup> Valuable, rare, inimitable and non-substitutable (Barney, 1991); Valuable, rare, inimitable and organized (e.g. Barney, 2007).

<sup>2</sup> 4R emphasizes four resource categories; products, facilities, business units and business relationships (Håkansson & Waluszewski, 2002)

*relationships among bundled things and their importance to the utilization of those bundles are problems that practitioners address with each strategic decision they make.”* (Black and Boal, 1994, p.144). Neither VRIN/O nor the 4R model are bundle frameworks, however. Black and Boal (1994) argued that the RBV had a ‘bundling problem’ since it analyzed resources in isolation. We claim two ‘bundling problems’ remain in contemporary research; one in strategy and the other in RIA. Recent RBV research (e.g. Braganza, Brooks, Nepelski, Ali & Moro, 2017; Alexy, West, Klapper, & Reitzig, 2018; Saranga, George, Beine, & Arnold, 2018) returns to the early portrayal of firms as resource bundles. This line of research avoids treating (supposedly) individual resources as standalone entities with inherent value but transfers this assumption of independence to the bundle level of analysis; that is, bundles appear as standalone entities. From a RIA perspective, it is problematic to transfer the assumption of independence from single resources to a higher level of analysis; interdependencies persist also there. RIA resembles the early portrayal of firms as bundles of complementary resources (e.g., Penrose, 1959; Wernerfelt, 1984; Dierickx & Cool, 1989; Grant, 1991). To paraphrase Black and Boal (1994); the 4R model is designed to understand relationships among ‘things’ (e.g. resources), but bundles have not been emphasized. That is, the 4R’s ‘bundling problem’ is that the bundled nature of the aggregated and complex resources that the model centers on usually remain unnoticed; for instance, products and facilities are bundled resources. The objective of this research is therefore to construct a framework focusing on value creation from a resource bundle perspective. We accordingly ask: How do resources become valuable? How do resources create value? Will an acknowledgement of bundled resource interdependencies and a focus on value creation lead to a reinterpretation of the influential VRIN/O logic?

The study builds on findings from a longitudinal study of a logistics network where a start-up, a logistics service provider (LSP), bundled resources with external partners. Theoretically, the study combines RIA research with insights from cooperative strategy; a

domain within the strategy discipline which acknowledges interdependencies and value co-creation. We bridge insights from these literatures, as described in the following literature review. Presentation of the framework, methods and the case follow. Implications for RIA and cooperative strategy conclude the paper. We reinterpret the emphasis on resource rareness and inimitability, redefine the meaning of a strategic resource, and increase the managerial scope of resource utilization. The influence of the VRIN/O framework is acknowledged for comparative reasons without evaluative intentions.

## **2. Literature review**

### *2.1 Value creation and valuable resources*

Strategy, as represented by the RBV, claims that resources are valuable when they capitalize on opportunities and/or deal with threats. Of particular interest is the argument that the possession of valuable and rare resources is the basis for value creation (e.g. Sirmon et al., 2007). Moreover, value is created only when resources are evaluated, manipulated, and deployed appropriately within the firm's environmental context (Lippman & Rumelt, 2003). The influence of the VRIN/O logic is apparent in classical research; Black and Boal (1994: 146) emphasize how relationships contribute to the strategically important resource characteristics of rareness and inimitability. Similarly, the relational view of Dyer & Singh (1998) involves a request of relationships that are rare and difficult to imitate. More recent strategy research remains dedicated to the VRIN/O logic by transferring the requirements of VRIN/O from single resources to the bundle level of analysis (e.g. Braganza et al., 2017; Alexy et al., 2018; Saranga et al., 2018); single resources do not have to be VRIN/O as long as the bundle has these traits.

RIA scholars argue that actors interact to combine resources in various ways and for different purposes, especially in order to improve their value (e.g. Baraldi et al., 2012; Håkansson & Waluszewski, 2002). 4R embraces a subjective and interdependent



understanding of value (e.g. Cantù, Corsaro & Snehota, 2012; Ford & Mouzas, 2013) and an emphasis on how resource combinations influence value creation (e.g. Baraldi & Strömsten, 2006; Jahre et al., 2006; Baraldi et al., 2012; Mouzas & Ford, 2012). These arguments correspond with strategy research questioning the RBV for its homogenous and static view of resources (e.g. Priem & Butler, 2001) and with Lavie's (2006, p. 641) claim that RBV assumes away cooperative interactions. Value is often co-created and re-created among different actors (Ramirez, 1999). Actors may consequently perceive value differently (Cantù et al., 2012), including the assessment of the problem-specific value to themselves and to their counterparts (Ford & Mouzas 2013). Values created may be in the form of profits, but also knowledge, image, safety, health and a variety of environmental benefits. Strategy research similarly highlights multiple forms of value which can be created for or with various stakeholders (Post, Preston, & Sachs, 2002; Lepak, Smith, & Taylor, 2007).

RIA's view of value creation and resource value has certain similarities also with the service-dominant logic (e.g. Vargo & Lusch, 2004, 2011). Both approaches stress resource heterogeneity and the relational nature of value creation; resources are utilized across firm boundaries to create value (e.g., Cantù et al., 2012; Bocconcelli et al., 2020). However, compared with the RBV, the service-dominant logic has shifted the focus to the user side of resources. RIA studies, on the other hand, attribute equal analytical relevance to both the provision (supplier) and the using (customer) side of resources (Baraldi et al., 2012).

## *2.2 The bundled nature of resources*

The analytical framework builds on the assumption that resource bundles are the norm, not the exception. There is always a multitude of resources to conceptualize and manage; we therefore join the RIA notions of resource interfaces and resource imprints with the strategy domain's emphasis on cogency effects. This combination accounts for the claim that resources

and resource interfaces are concepts that warrant equal analytical relevance (Prenekert, Hasche, & Linton, 2019).

From a bundle perspective it is important to acknowledge that resources may or may not match with each other when utilized together; a notion captured by the expression *resource interfaces*. Interfaces are defined as interconnections at shared boundaries between at least two resources (Dubois & Araujo, 2006, p. 22). Interaction between resources form interfaces, which influence the value of a specific resource (Wedin, 2001) as well as value creation (e.g. Håkansson & Waluszewski, 2002; Baraldi & Strömsten, 2006; Jahre, et al., 2006; Baraldi et al., 2012; Mouzas & Ford 2012). To illustrate, consider Prenekert et al.,'s (2019) illustration of a railway track and a rail cargo wagon. If the width of a railway track does not fit with the wagon's design, their respective value diminishes.

Notably, RIA scholars stress that resource interfaces exist between *two or more resources* (Dubois & Araujo, 2006), and debate whether interfaces of two resources are, conceptually and managerially, different from ones with multiple resources (Hasche, Kask, Linton, & Prenekert, 2020). This debate raises a concern regarding the presence and boundaries of bundles, and it reveals what we earlier described as RIA's 'bundling problem'. To illustrate; how many resources are there in the cargo wagon-track example mentioned above? Two? But then again, a wagon's wheel is another critical resource, and a wheel typically consists of two main parts: the wheel itself, and the tire around the outside. A rail tire is usually made from steel (constituting another bundle). The track is another bundle, consisting of the rails, fasteners, railroad and ballast, in addition to the underlying subgrade. Notably, one manager's resource bundle is another's resource; consider, for instance, how resources are perceived to create value at different tiers of a supply chain.

Despite 4R's bundle ignorance, we also find the notion of *resource imprints* to be useful when describing the multiple boundaries of resource bundles. Resource interfaces are argued

to be both direct and indirect (Jahre et al., 2006) and connected (Dubois & Araujo, 2006). Such indirect or connected interfaces are important because they create resource imprints (Håkansson & Waluszewski, 2002). Resource imprints illustrate that resources are seldom utilized or developed in isolation (Baraldi et al., 2012; Håkansson & Waluszewski, 2002). Resource imprints are attributes of resource interfaces and the embeddedness characterizing bundles; for instance, two linked resources may receive pressures from connected interfaces (Baraldi et al., 2012, p. 268).

Building on strategy theory, we note that pressures from connected interfaces may involve *cogency effects*. Cogency effects imply that strategic resources that are components of a complex network can enhance or detract value (Black & Boal, 1994). The notion of cogency is based on work on cospecialized assets (Teece, 1986, p. 285-305), with incorporation of the notion that complementarity relationships (Amit & Schoemaker, 1993). This line of work thereby adds an interactive dimension regarding the value of a resource. By adding cogency to the bundle terminology, we emphasize the impact resources have on one another. The combination of resource interfaces and resource imprints, originating in RIA, and cogency effects from strategy, is developed in the following section where we present the analytical framework.

### **3. The resource bundle framework**

The core of the analytical framework is the novel combination of resource interfaces and cogency effects. To illustrate the complementarity between these two concepts, let us return to the railway example. Wheel–rail interaction is one of the most important research topics in railway engineering (Bian, Gu, & Murray, 2013). When the wheel fits the track, the resource interface matches. This is normally the case; however, mismatching interfaces do exist. Railway tracks all over the world have more than twenty different sizes (Bilogistik, 2016).

Train operators face disadvantages when they need to adapt to different standards. The framework accordingly highlights that resource interfaces can match or mismatch.

As to cogency, two effects are emphasized. A suppressing cogency relationship exists when the presence of one resource diminishes the value of another resource. An enhancing cogency relationship exists when the presence of one resource magnifies the value of another resource (c.f. Black & Boal, 1994). In other words, matching interfaces realize the inherent potential of resources, and cogency changes that potential.

To illustrate, both track and wagon can receive suppressing cogency effects in a variety of ways. Wheel–rail impact forces occur because of imperfections in the wheels or rails such as wheel flats, irregular wheel profiles and rail corrugations (Bian et al., 2013). Such suppressing cogency effects can lead to significant economic loss for track owners through damage to rails. An enhancing cogency example follows on the combination of high-speed trains and high-speed infrastructures; passengers save time. However, a set of suppressing cogency effects will result if high-speed trains are combined with traditional infrastructure resources. Building on this line of reasoning, the framework defines valuable resources in the following way:

- A resource increases in value when other resources provide (i) matching resource interfaces and (ii) enhancing cogency effects.
- A resource decreases in value when other resources provide (i) mismatching resource interfaces and (ii) suppressing cogency effects.

In other words, a resource becomes valuable (or not) from what it *receives* from other resources. The bundle framework defines value creation in the following way:

- A resource creates value when it provides (i) matching resource interfaces and (ii) enhancing cogency effects to other resources.

- A resource destroys value when it provides (i) mismatching resource interfaces and (ii) suppressing cogency effects to other resources.

Thus, a resource creates value (or not) from what it *remits* to other resources.

RIA has to date has focused on what we label *receiving imprints*; involving the pressure a resource receives from the external network. Less attention has been given to what we call *remitting imprints*; an expression that resembles a form of higher-level service value that may result from connections between a single relationship and others within a wider constellation of resources across a network (Ford & Mouzas, 2013). To illustrate, both rail and wheel may receive a negative (suppressing) imprint from overload caused by heavy goods; making them less valuable. As to remitting imprints, mismatching wheel-rail interaction may result in instabilities that damage fragile goods in the freight car; the higher-level service value will not result due to this (negative) suppressing imprint. The notion of resource imprints includes boundary-spanning resource interfaces and cogency effects of a positive and/or negative nature. Table 1 summarizes the framework.

[Insert Table 1 about here]

Whereas strategy scholars stress the importance of identifying relevant resources and thereafter assessing their fit (e.g. Lavie, 2012), the framework's emphasis flips this logic; suggesting that resource fit (what we denote as a matching resource interface) is a precondition for relevance. Increased value/value creation results from enhancing cogency effects. Resource imprints acknowledge the subjective nature of resource boundaries and is the term used to avoid treating bundles as standalone entities.

#### **4. Method**

Accenture originally used the fourth-party logistics service provider (4PL) designation to denote an information-based LSP that coordinates its resources and those of multiple asset-based LSPs to provide complex logistics services (Badem & Mueller, 1999). A 4PL's physical resource neutrality has been claimed to provide a value creation advantage in terms of objectivity and independence (Africk & Calkins, 1994). Our initial research focus followed this claim. As the study proceeded, we realized that interdependencies among bundled resources made the '4PL advantage' challenging to realize. Interdependencies reduced the 4PL provider's flexibility to "plug and play/unplug" (Fabbe-Costes, 2005) its various third party logistics (3PL) relationships. Moreover, we found that evaluations of the "best" available 3PL resources was challenging to assess. These initial empirical insights directed us toward the final research focus on the bundled nature of resources. We characterize this research as a longitudinal, comparative case study design; an approach found advantageous for explorative investigations of interactions over time (Pettigrew, 1990; Langley, 1999; Dubois & Gadde, 2002). This characterization is further explained below.

#### *4.1 Case setting*

The choice of a 4PL provider, Alpha, as the focal case firm was based on convenience, access and relevance. Convenience and access explained by the fact that we had an ongoing relationship to the founders of Alpha since 2001; relevance because the combination of internal resources with partners' external resources is inherent to the 4PL business model. Alpha operated in the Nordic countries, and this study's focus is on its Norwegian operations. The study of two bundles in the same geographical region was seen as advantageous. In particular, the Norwegian network experienced fluctuations in size, 3PL partners and resource interactions, whereas the operations in Finland and Sweden were stable.

Alpha focused on fast-moving consumer goods and beverage supply chains. These supply chains are demanding in terms of the requirements for accurate handling and timely

arrival. Alpha provided fully integrated supply-chain services, including administrative and physical logistics services. The firm handled administrative logistics services, such as demand and inventory management, purchase order processing, and customer service, internally, and outsourced physical logistics services, such as inbound and outbound transportation and warehousing, to 3PLs.

#### *4.2 Data collection and quality*

The study was conducted from 2008 to 2015; the longevity of the research made it possible for us to follow two bundle processes in real time. This report includes cross-case comparisons between Alpha-Beta and Alpha-Delta bundles as well as cross-phase comparisons of the Alpha-Beta bundle. One of the authors visited Alpha for two months during the summer of 2010 to observe and talk with employees and managers. In addition to numerous informal discussions, 26 formal interviews were conducted; they were recorded and transcribed verbatim. The informants from Alpha included its two partners, the country manager in Norway, the Nordic ICT manager and three employees. On the 3PL side, business development managers (one for Beta Warehouse, one for Beta Distribution and one from Delta) were interviewed. Structured and semi-structured interview data were triangulated (Pettigrew, 1990) with documents and observations, and the final case report was reviewed by key informants. Six feedback sessions were also arranged: one for Alpha Norway in 2009, another for Alpha's Nordic managers in 2012, and four sessions for two of the founders between 2014 and 2019. These meetings provided opportunities to discuss tentative ideas and findings. Finally, two of Alpha's founders have given annual guest lectures since 2009 for the executive MBA program at the school with which one of the authors is affiliated.

#### *4.3 Data analysis and the role of the case*

The combined analysis of 'what goes on in reality' (4PL-3PL interactions and the development of the logistics network), theory (RIA and strategy), emerging case descriptions

(from insights about the ‘4PL advantage’ to bundle processes) and analytical frameworks (considering VRIN/O, the 4R model and the construction of the bundle framework), is called abduction (Dubois & Gadde, 2002). Moving back and forth from one type of research activity to another and between empirical observations and theory enabled the development of the analytical framework. This systematic matching process is central to the abductive logic, as visualized in figure 1.

[Insert Figure 1 about here]

The development of the cases was imperative for the construction of the analytical framework. An explicit acknowledgement of resource interdependencies characterized the early stages of the analysis; based on RIA’s notions of resource interfaces and resource imprints. Gradual insights from the cases then directed us towards further literature studies of bundles and cogency effects. The cases inspired us to combine insights from RIA (interfaces and imprints) with strategy (cogency effects and explicit bundle awareness). The bundle framework is an *alternative* to RBV and the VRIN/O framework in terms of the unit of analysis (a resource bundle, rather than a single resource), the assumption of how resources are related (interdependence, rather than independence), and the outcomes of the analysis (value creation, rather than competitive advantage). The bundle framework is a *complement* to the 4R model by emphasizing bundles, combining resource interfaces and cogency affects, and in distinguishing between remitting and receiving resource imprints.

As to value creation, we acknowledged that the comprehensive resource bundle that a 4PL provider establishes enables the distinction of different forms of value creation; for instance, for the 4PL, 3PLs and the clients. We anchored the analysis in a defined measure of the final retail client’s value creation. The retailer evaluated “on time in full,” a measure of supply-chain delivery performance that focuses on the extent to which the customer receives



what they want at the time that they want it. Accordingly, value creation was translated into (i) delivery within a strict time window and (ii) delivery of the correct content, packaged and marked properly (i.e., the correct number of product units). Expressed in the terminology of the framework, we analyzed whether the focal bundles remitted positive or negative imprints in terms of the “on time in full” measure. We focused on this dimension because it was central to the establishment of Alpha’s business. This measure of value creation was also informative when delineating bundles and selecting their subcomponents. We considered different resources, and ended up with bundles consisting of Alpha’s client network (beverage importers) and the 3PL providers’ competencies<sup>3</sup>, according to figure 2.

[Insert Figure 2 about here]

The client network that a 4PL provider offers a 3PL provider is central to the 4PL provider’s attractiveness. The performance of logistics networks depends on their offering of products or services that exhibit network effects (Huemer, 2006; Afuah, 2013) which have been described as strategic assets (Shankar & Bayus, 2003). The second resource component, 3PL competencies, was core to Alpha’s evaluation of LSP partners. Knowledge-based resources have been studied from an interactive perspective (Mouzas & Ford, 2012); of particular interest to us was how the client network interacted with the 3PL providers’ competencies to achieve the chosen target of value creation.

## **5. The development of two resource bundles in a logistics network**

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<sup>3</sup> We considered either more complex or alternative bundles, including 4PL competence and 3PL infrastructures. We opted for simpler bundle constructions since the presence of 4PL competence and 3PL infrastructures did not fundamentally influence the results.

The development of the Alpha–Delta bundle is described in a single phase, whereas the more long-term Alpha–Beta bundle is analyzed in four phases.

### *5.1 The Alpha–Delta resource bundle*

Delta was one of Alpha’s preferred 3PL providers, based on its tender evaluation. Alpha thus contracted with Delta, a competent provider of beverage logistics services, in early 2009 for warehousing and distribution. The combination of the 4PL’s and the 3PL’s resources was successful in terms of value creation; the final retail client appreciated the consistently good performance. The LSPs’ fulfillment of the “on time in full” measure helped to improve on the retailer’s supply chain performance in terms of its resource utilization, planning, and inventory management. The Alpha-Delta relationship was, despite these results, terminated after only six months.

Explanations for this early termination were twofold. Firstly, Delta also provided services for 4PL competitors of Alpha. At the beginning of its relationship with Alpha, Delta used the same warehouse for all of the 4PL firms, but one of these competitors eventually opposed the sharing of the warehouse with Alpha. According to the manager of Alpha, *“They [Delta] managed to have us in the same warehouse at the start, but the pressure eventually was too high from ...[the direct competitor of Alpha], ..., so Delta moved us to another warehouse and thereby increased our price, we had no option but to look for another solution.”*

Secondly, on the distribution side, Delta’s distribution of beverages (heavy goods) was interdependent on distribution for clients in its fashion (light goods) supply chain. As the manager of Alpha mentioned, *“When they [Delta] lost their main fashion market in Norway, they decided to shut down the distribution. So we [Alpha] were kind of forced to look for alternative LSP cooperators”*. This development was the definitive setback for the Alpha–Delta bundle. Alpha contracted with Beta for warehousing and distribution services in the middle of 2009.

## 5.2 *The Alpha–Beta resource bundle*

Beta was a large Norwegian-based 3PL with experience from different supply chains. It scored well with regard to its strategic intention to engage in 4PL–3PL cooperation, and Beta expressed a desire to offer Alpha competitive warehousing and distribution prices.

### 5.2.1 *Phase 1: A resource mismatch between the client network and the 3PL's competence*

Beta was professional and knowledgeable, but inexperienced with beverage logistics. Given Beta's specific 3PL competence, Alpha's client network was challenging for the 3PL. As the manager of Beta mentioned, *"...it is almost our [Beta's] fault of course, we have new people with less experiences, inadequate routines, a lot of that, that was the problem."* As a result, the final retailer did not benefit from the combined 4PL–3PL services as expected. The value created, according to the "on time in full" measure, was unsatisfactory for the retailer.

### 5.2.2 *Phase 2: Enhancing the 3PL's competence to create resource match*

To address the mismatch between Beta's competence and the 4PL's requirements, Alpha committed to assist Beta. The 4PL's managers visited most of Beta's terminals and warehouses and advised Beta's personnel regarding customer contact and service. As the manager of Alpha explained, *"We [Alpha] visited the warehouse every month, we looked at routines, we had monthly meetings looking at operations, KPIs, telling them what to do. They [Beta] did not know what to do at all..."*

Alpha also invited its largest client to participate and to provide advice to the 3PL regarding service improvements. The client shared its logistics knowledge about beverage storage and distribution, which further helped Beta to build its beverage logistics competence.

In addition, the bundle benefitted from an incremental growth of the client network. The pace of growth matched Beta's successive competence development, at least during certain episodes. That is, value creation increased when Beta's competence developed in a manner compatible with the expansion of the client network. By the end of phase 2, the Alpha–Beta

bundle received the highest score for the “on time in full” measure among all of the retail client’s suppliers. This was a remarkable improvement in terms of value creation compared with phase 1.

### *5.2.3 Phase 3: Non-core growth*

The size of the client network and Beta’s competence matched in a way that was beneficial for the retail client, as illustrated in Phase 2. However, Alpha lost a number of clients and their market share declined from 10% to 5% during 2011. As a result, Beta became dissatisfied with the volumes that Alpha offered. The 3PL desired a larger client network to maintain its competitive prices. As the manager of Beta explained, *“We are not positive in a sense that we have to lower the price and lose money for a couple of years. If we have to pay clients to use our services, we cannot do that for a long time.”* Alpha on the other hand claimed that Beta was *“not that willing to take risks on strategic pricing”*.

By the end of 2011, Alpha initiated discussions with Gamma, a large client in electronics that required a tailored Nordic logistics solution. Alpha decided to offer its 4PL services, acknowledging that this client represented a new supply chain category. Beta reacted positively and offered Alpha a competitive price on its 3PL services. Alpha became more attractive to Beta by offering a larger client network; however, the 4PL *deliberately* avoided bundling Gamma into the focal beverage client network. The reason, according to the manager of Alpha, was that Gamma had *“no synergies at all [with the beverage network] ...it is a big difference if you enter a new segment, new solution, new warehouse setup, a new geographical coverage, everything is new...”* Gamma’s distribution and warehouse system was therefore designed differently than was that of the beverage network.

### *5.2.4 Phase 4: Core growth results in unexpected problems*

Alpha contracted with a major beverage client in early 2013, in line with the ambition to expand the client network. The 4PL thereby reached its highest market share ever in the

Norwegian market (12%). Alpha's managers consequently bundled new compatible clients into the network in phase 4, in contrast to their retention of Gamma outside of the bundle in phase 3.

Due to the matching characteristics of the new client, Alpha expected that Beta would be able to deal with the increased business volume. However, because the number of orders increased tenfold and stock-keeping units increased by a factor of four, a new mismatch between the client network and the 3PL provider's competence emerged. The impact on value creation was significant; the Alpha–Beta bundle received the lowest performance score among the retail client's suppliers in phase 4.

## **6. The framework's interpretation of the two resource bundles**

Table 2 summarizes the developments of the two bundles according to the analytical framework.

[Insert Table 2 about here]

The Alpha-Delta bundle is interesting in a number of ways. Delta's competence was valuable due to a matching interface with the client network of Alpha. The bundle created value; it had a positive remitting imprint on the final retail client. The analysis exposed no cogency effect between resources within the bundle; the characteristics of the client network did not change; network size did not increase or decrease, and the 3PL firm's competence persisted. However, the bundle experienced negative imprints (suppressing cogency effects) from a competitor of Alpha, and the performance of the bundle was interdependent on a positive receiving imprint (an enhancing cogency) from adjoined supply chains. These receiving imprints explain the termination of the relationship after only 6 months, and highlight the importance of not analyzing bundles as standalone entities.

The Alpha-Beta bundle illustrates a roller-coaster ride in terms of value creation. In phase 1, the value created, according to the “on time in full” measure, was unsatisfactory for the retailer. In other words, the remitted imprint on the retailers’ supply chain was negative. The reason for inadequate value creation was the mismatching resource interface between the client network and Beta’s competence. Phase 2 was the ‘best in class’ period of the Beta bundle in terms of value creation, and good performance continued in phase 3, whereas the bundle became ‘worst in class’ in phase 4; matching and mismatching resource interfaces corresponded accordingly.

The mismatching interface of phase 1 explains several of the developments occurring in phase 2, where Beta’s 3PL competence became more valuable via receiving positive imprints from both the 4PL and its largest client. The quality transformation of a specific resource, in this case the 3PL’s competence, is the essence of a cogency effect. Moreover, the incremental growth of the client network matched Beta’s successive competence development, enabling the bundle to create value by providing a positive remitting imprint on the retailer’s supply chain. We thereby see a positive interplay between cogency and interfaces in this phase.

The importance of cogency effects is present in a different way in phase 3, where Alpha’s managers kept Gamma outside of the focal network. Recalling that the value of a resource depends on what it receives from other resources, we note that Gamma would have reduced the value of the existing client network (a suppressing cogency). Phase 4 is similarly illustrative in terms of resource value since the client network experienced an enhancing cogency by the inclusion of a new *compatible* client. The network became more valuable as its size increased. However, the growing client network resulted in a mismatching interface with the 3PL’s competence. This development reduced the bundle’s value creation towards the retail client (a negative remitting imprint). In this phase, we observe a negative interplay between cogency and interfaces. In a relatively short time span, the Alpha–Beta bundle’s performance,

as measured by the final retail client, declined from “best in class” to “worst in class”; a development which cannot be understood by evaluating resources in isolation.

We suggest that a couple of key learning points emerge from these findings. As argued above, the Alpha-Delta bundle illustrates that neither resources (or what is perceived to be a single resource) nor resource bundles should be treated as standalone entities. Similarly, we need to account for events beyond the Alpha-Beta bundle when acknowledging that the 3PL was subject to positive receiving imprints (enhancing cogency effect) in phase 2, since the 4PL provider and the client used their competencies to change the inherent potential of Beta’s 3PL competence.

Moreover, phase 1 in the Beta bundle was characterized by a mismatching resource interface, as indicated above. Considering the 3PL’s inexperience, the conventional conclusion would be to stress its inferior competence. From an assumption of independence, that claim is plausible. Expressed in terms of the bundle framework, however, that statement is misrepresentative because it involves the “blaming” of a weak link; it is an evaluation done in isolation. Similarly, a RBV analysis would reveal that Delta’s competence would do better in a conventional VRIN/O analysis than Beta’s competence would. An assessment of the studied bundles from the VRIN/O perspectives would find the short-lived Delta bundle, and not the “best in class” Beta bundle, to be ‘superior’. The Discussion section that follows will develop these observations and highlight the framework’s main implications.

## **7. Discussion**

The use and perception of supposedly common resources and apparently superior resources need to be reevaluated when the objective is value creation. With regard to VRIN/O qualities, an observation is that individual resources in the Beta bundle, if viewed in isolation, did not stand out when the highest level of industry performance was acknowledged in phase 2. No rareness emerged at any level of this analysis; neither resources in the bundle nor the

bundle in itself would have scored well in a conventional RBV analysis. Value was nevertheless created; and in this particular case, it is plausible to claim that even a temporary competitive advantage resulted in phase 2 of the Alpha-Beta bundle. Notably, neither Alpha nor Beta would have reached the highest level of industry performance in isolation; but Alpha could have purchased equal or even better resources (3PL competence) in the market. The Alpha-Delta bundle reveals the opposite outcome, but adds to our basic argument; in this case seemingly superior resources did not create value.

Similarly, the growth of the client network in phase 4 of the Alpha–Beta bundle increased rareness (few comparative 4PL networks in term of size) and arguably made the network harder to imitate. As mentioned above, this seemingly positive development created a mismatching interface that ultimately had a negative remitting impact on the final retail client’s resource bundle. The decision to keep Gamma out of the focal client network in phase 3 provides for another interpretation of rareness. Logistics networks are characterized by pooled interdependencies, which are coordinated by standardization (Thompson, 1967). Gamma’s rareness (as in uniqueness) would have complicated standardization, increasing the need for mutual adjustment to coordinate (undesirable) reciprocal interdependencies. Value creation would accordingly have suffered.

## *7.1 Theoretical implications*

### *7.1.1 The resource interaction approach*

We suggest that the bundle framework’s combination of resource interfaces and cogency effects, and distinction between remitting and receiving imprints, enhances the 4R model’s interactive resource classification. In particular, the framework caters for the bundled nature of resources and is one way of addressing the claim that RIA needs a more detailed discussion regarding the notion of value and the mechanisms for value generation (Bocconcelli et al., 2020). Changing one resource alters both its value and how it relates to other resources



(c.f. Håkansson & Snehota, 1995). Furthermore, RIA is based on the proposition that all changes of a resource create tensions (e.g. Bocconcelli et al., 2020). Our cases suggest that tensions may arise, but the bundle framework helps us to nuance the implications of this statement. Specifically, the interplay between interfaces and cogency informs on why tensions may arise, and importantly, illustrates that resources tensions may be reduced or even removed. This occurs when a change in one resource (i.e. cogency) creates a matching resource interface with another resource, as illustrated in the Alpha-Beta bundle. Finally, RIA proposes that a resource changes and develops its characteristics over time. Although this is a likely development, the Alpha-Delta bundle demonstrated stability in the focal bundled resources. Resource interactions are characterized by both change and stability; the interplay between interfaces and cogency effects inform on how resources evolve or remain stable.

The bundle framework also addresses the comment that the formalization and refining of existing concepts should be done in a more ‘guided’ way in RIA (Bocconcelli et al., 2020). In particular, the 4R model is a ‘pure’ resource tool, in comparison with the more actor-centric view of value as an outcome of service dominant activities (Lusch & Vargo, 2014) and the O dimension of VRIN/O. Since the actual identification of potential new interfaces is a key source of value (e.g. Cantù et al., 2012; Harrison & Håkansson, 2006), the capability of combining interfaces and cogency effects become pertinent. Recalling that a capability is an ability “to perform a coordinated set of tasks utilizing organizational resources” (Helfat & Peteraf, 2003, p. 999), we define resource bundling capability as the ability to purposefully bundle and re-bundle resources to optimize interfaces, cogency effects, and imprints. Bundling capability centers on the systematic creation of value through resource organization, with acknowledgement that the potential of a resource to yield valuable services depends on interdependencies. Our reasoning thereby parallels critique of the mainstream isolationist view of dynamic capabilities (Bingham, Heimeriks, Schijven, & Gates, 2015).

### 7.1.2 Cooperative strategy

From a competitive strategy standpoint, resources need to be rare since the ability to purchase relevant resources in a secondary market would deter the emergence of advantages. Resource rareness is regarded as “the bottom-line question” for the understanding of firm advantage (see Hitt, Xu, & Carnes, 2016). Inimitability is the next step towards the ultimate goal: a sustainable competitive advantage. The bundle framework does not generate consideration of such a question; rather, it indicates that the conventional demand of rareness applies only when a bundled resource creates value independently of other resources. Rareness is ultimately an assumed precondition for competitive advantage, not a requirement for value creation. Consequently, a strategic resource does *not* need to be complex for the sake of inimitability, as argued by for instance Shankar & Bayus (2003). We define a strategic resource as one that provides matching interfaces and enhancing cogency effects in many relationships. A strategic resource creates value not because it is rare and inimitable, but because it matches with and has a positive impact on other resources. Building on the identified developments in the two logistics bundles, we accordingly claim that:

- Matching interfaces and enhancing cogency effects increase value creation, although resources without perceived VRIN/O qualities interact.
- Mismatching interfaces and suppressing cogency effects reduce value creation, although resources with perceived VRIN/O qualities interact.

The network effects we encountered add to the argument that resources do not have a fixed, given value. Another way of expressing this is to claim that the value of a product or service depends on the number of others using it (Katz & Shapiro, 1985). Notably, the traditional emphasis on network size has been developed to include compatibility, i.e. that only compatible clients add synergies to networks (c.f. Lavie, 2006). Moreover, there is a need for firms to attract members with distinctive capabilities (Afuah, 2013). To this line of reasoning,

we add the importance of inviting members with resources that match and provide enhancing cogency effects to existing participants. To the argument that resources *need not* be rare (e.g. Alexy et al., 2018; Saranga et al., 2018), we stress that in certain settings, bundled resources *should not* be rare (i.e., unique). Rareness can be detrimental to value creation when network effects are involved. We correspondingly emphasize that:

- Increasing the perceived VRIN/O quality of a bundled resource may decrease value creation due to resource mismatch and suppressing cogency.

RBV scholars transfer the requirement of resource rareness from what they perceive to be single resource components to the bundle level, and they remain loyal to the VRIN/O logic. In a similar vein, strategy researchers claim that common resources can be paired with capabilities in such a way that the resulting combinations in which they are exploited are rare (e.g., Dierickx & Cool, 1989; Newbert, 2008; Holcomb, Holmes, & Connelly, 2009). This line of work transfers the requirement of rareness from resources to resource–capability combinations; rareness is still required at some level or some constellation. The bundle framework does not require rareness. That is, it does not regard rareness as a must-be element in all situations for value creation. To sum up, this line of reasoning accentuates the importance of resource organization and bundling capability; it renders the organization of resources truly strategic, in comparison with the limited importance of O in VRIO that follows on resource independence.

## 7.2 Managerial implications

The bundle framework generates the following analytical process:

1. Identify the boundary of the focal resource bundle<sup>4</sup>
2. Identify target of value creation (i.e. the bundle's remitting imprint)

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<sup>4</sup> Managers used to Porter's (1980) Five Forces model will find a resemblance in the first step of the analysis; the identification of a *non-given boundary* (in Porter's case the industry).

3. Categorize resources within the bundle (in this study we used the client network and 3PL competence)
4. Evaluate resource interfaces and cogency effects
5. Evaluate receiving imprints
6. Conclude by assessing remitting impact on chosen target of value creation

This analytical process is unique in several ways. It provides managers with a flexible approach in defining bundle boundaries. The managers we followed in this study considered different domains of the supply chains that they managed or of which they were a part, occasionally including adjoined supply chains. Similarly, football coaches scale up and down in analyzing their teams, considering interdependencies between offense and defense, and links within the defensive line, the linebackers, and the defensive backfield. Bundles are constructed, yet useful demarcations, which make complex resource constellations more manageable.

Moreover, the emphasis on interfaces and cogency, rather than rareness and inimitability, broadens the scope of resources to be considered in terms of value creation. We accordingly reinterpret the advice to search for common (non-superior) resources as well as superior resources (Nag & Gioia, 2012). The presence of interdependencies complicates the labeling of resources as “superior” or “common,” with respect to their value-creation potential. The framework thereby guides managers to reevaluate their perceptions of ‘the weak link’ and ‘the best resource’. Blaming ‘the weak link’ and praising ‘the best resource’ are based on the assumption of independence. We suggest that managers embark on their value-oriented bundle analyses by assuming that (i) there is no “best” resource and (ii) the expression “weak link” does not imply a weak resource. In other words, the framework guides managers to relax their attention to rareness and inimitability (cf. Bromiley & Rau; 2016; Priem & Butler, 2001); instead focusing on whether resources match and if cogency effects are present.

### *7.3 Conclusion*

Whereas the RBV informs competitive strategy with its emphasis on ‘being better than...’, the bundle framework builds on and informs RIA and cooperative strategy with the idea of ‘being better with...’. The notion of ‘being better with...’ links to both value co-creation and the subjective experience of value. In our study, the final retail client valued ‘on time in full’, and this higher-level service value (cf. Ford & Mouzas, 2013) was co-created when the 4PL experienced value creation in terms of network growth, and when the 3PL increased its knowledge of beverage supply chains. Future research may use the bundle framework and its key concepts to study how different stakeholders perceive value, participate in value co-creation and eventually appropriate value for themselves. The emphasis on both receiving and remitting imprints are further suggested to aid in the study of how both positive and negative value develops for multiple actors, including those that appear only to be providers.

Future research may also apply the framework in various settings, including those of for-profit entities, public organizations, private–public partnerships, and network-based value creation. The evaluation of value creation can thereby be anchored in different dimensions. Resource interfaces may be classified more carefully, instead of our rather crude categorizations of either match or mismatch, and be nuanced for instance in terms of their heaviness and variety (c.f. Prencert et al., 2019). The bundled nature of the 4Rs aggregate resource categories can be studied in more detail. The framework’s bundle approach may also be of interest to the service dominant logic and the emphasis on resource integrators (e.g. Vargo & Lusch, 2011). The emphasis on resource interfaces and cogency effects may influence resource integration and the processes through which the resources for service provision are created and emerge.

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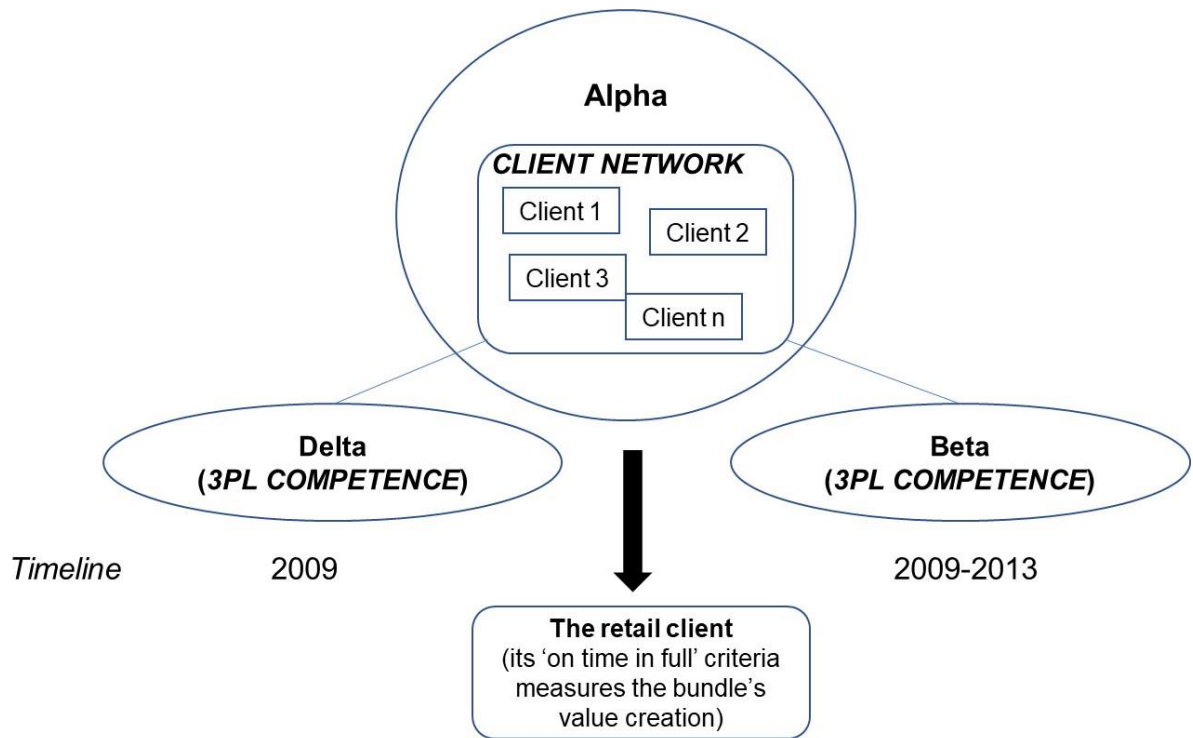


Figure 2. Components of the resource bundles and the chosen target of value creation.

Table 1. The bundle framework's key concepts

<b>Within a focal bundle</b>		<b>Beyond a focal bundle</b>	
<i>Resource interfaces</i>	<i>Cogency effects</i>	<i>Receiving imprints</i>	<i>Remitting imprints</i>
-Match	-Enhancing	-Positive (matching interfaces & enhancing cogency)	-Positive (matching interfaces & enhancing cogency)
-Mismatch	-Suppressing	-Negative (mismatching interfaces & suppressing cogency)	-Negative (mismatching interfaces & suppressing cogency)

Table 2. Findings according to the framework

<b>The focal resource bundle</b>	<b>Within the bundle</b>		<b>Beyond the bundle</b>	
	<i>Resource interface</i>	<i>Cogency effects</i>	<i>Receiving imprints</i>	<i>Remitting imprints (value creation)</i>
<b>The Alpha-Delta bundle</b> (Alpha's client network and Delta's 3PL competence)	Match	-----	Negative from one 4PL competitor. Termination of positive from other clients of the 3PL	Positive towards the final retail client
<b>The Alpha-Beta bundle</b> (Alpha's client network and Beta's 3PL competence)	Phase 1	Mismatch	-----	Negative towards final retail client
	Phase 2	Match	Enhancing on 3PL competence (incremental growth of the client network)	Positive (enhancing cogency) on 3PL competence from Alpha's and its largest client's competencies
	Phase 3	Match	See receiving imprints	Avoidance of negative receiving imprints
	Phase 4	Mismatch	-----	Negative towards final retail client (indicated by lowest score evaluation)