Value co-creation and co-destruction in the digital transformation of highly traditional companies

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Abstract
Purpose – The purpose of this paper is to investigate how digital transformation changes highly traditional business processes and how it impacts value co-creation and co-destruction. More specifically, the aim is to examine, using the resource interaction approach, how the friction between non-digital and digital resources affects the co-creation and co-destruction of value in a network during digital transformation. Based on this, the authors provide managerial implications on how to handle simultaneous digital and traditional business processes to co-create value during digital transformation.

Design/methodology/approach – A case study is conducted of a digital platform provider and of three traditional confectioneries. In this analysis, the authors looked at the business processes of highly traditional confectioneries that have introduced online services through a digital platform and are undergoing digital transformation.

Findings – In some industries, it is neither possible nor advisable to fully digitalise all business processes, and companies have to partially retain their traditional, analogue character to create value. The process of value co-creation during digital transformation is affected by friction between the digital and non-digital resources and is mitigated by specific lubricants (e.g. mutual reliance, smooth personal communication, willingness to help, attitude towards change). This results in the improvement of processes and capabilities in terms of digital development and traditional production. Friction may also lead to value co-destruction, for example, as the result of transformation from face-to-face to digital interactions.

Originality/value – The authors contribute to research on the digital transformation of highly traditional companies that need to introduce new, digital technologies and resources while continuing their traditional processes. The authors develop the concept of lubricants that mitigate the friction between resources and, therefore, facilitate value co-creation in a business network. Additionally, the authors provide managerial implications for how to handle simultaneous digital and traditional business processes during digital transformation.

Keywords Value co-creation, Value co-destruction, Resource interaction approach, Digital transformation, Digital resources, Friction, Lubricants

Paper type Research paper

Introduction
Digital technologies are an inherent part of every business. Digital transformation, defined as “the digitalization of previously analog machine and service operations, organizational tasks, and managerial processes” (Pagani and Pardo, 2017, p. 185), is changing the way companies operate, the goods they offer and how they create value (Matarazzo et al., 2021; North et al., 2019). Digital transformation enables business improvements (Fitzgerald et al., 2014) and allows companies to optimise their operations and obtain better operational efficiency, which leads to the co-creation of value (Taylor et al., 2020). Value co-creation is the result of direct and indirect interaction, as well as the exchange and combining of resources among different actors (Jaakkola and Haakanen, 2013; Prenkert et al., 2022; Sandberg et al., 2018), and is understood as an interactive process in which different actors in the network have an active role in creating value (Sjödin et al., 2016). The process of value co-creation is not restricted to a dyadic relationship as resources are dispersed among different network actors – linked both directly and indirectly. Direct and indirect interactions are, therefore, essential to value co-creation, as they allow the resources distributed among these network actors to be exchanged and combined. However, in some cases, the interactions lead to value co-destruction, understood as “interactions where the exchange of resources and activities between collaborating actors (or systems) leads to negative value experiences” (Jarvi et al., 2020, p. 77).

Even companies that produce or offer very traditional analogue physical products are now facing the need to incorporate digital services or software as part of their core offerings, thus transforming internal processes and their ways of doing business (North et al., 2019; Vial, 2019). However, not every company can carry out a full digital transformation. For highly traditional companies and goods that require a high level of manual labour and analogue processes, digital transformation results in constant tensions between newly
introduced digital and already existing traditional processes. This coexistence of traditional, analogue and digital processes and resources is an important challenge that has an ongoing effect on value outcomes (Vial, 2019). Although disruptive processes during digital transformation have been analysed in the literature (Nambisan et al., 2019; Vial, 2019), the subject of value co-creation, where both traditional and digital activities are closely intertwined, remains unexplored. Existing studies mainly discuss the characteristics and differences between traditional and digital companies (Bosch and Olsson, 2021; Tekic and Koroteev, 2019), the changes in traditional business models caused by digitalisation (Öiestad and Bugge, 2014) and the dynamic capabilities needed for the digital transformation of companies operating in traditional industries (Matarazzo et al., 2021; Warner and Wäger, 2019). However, current research rarely deals with the problem of the simultaneous existence of traditional and digital processes and resources, nor does it explore how their coexistence affects the ongoing activities of companies and the resulting value (exceptions include Matarazzo et al., 2021; Öiestad and Bugge, 2014; Tekic and Koroteev, 2019; Warner and Wäger, 2019).

In this paper, we analyse value co-creation and co-destruction through the resource interaction approach (RIA) (Baraldi et al., 2012). Resource interaction is a prerequisite for value co-creation, as value is created in the interaction by new elements being added to existing ones (Perna et al., 2013; Prenkert et al., 2022). Since resource interaction is “the processes of combination, recombination, and co-development of resources that happen through the interaction among organizations” (Baraldi et al., 2012, p. 266), this approach also enables the analysis of continuous digital transformation. In this paper, we deliberately adopted RIA stemming from Industrial Marketing and Purchasing Group (IMP) and network approach rather than the resource integration approach linked with service-dominant logic (SDL), even though SDL is widely used for the analysis of value co-creation and co-destruction. First of all, RIA focuses more on the process of combining resources and embedding new resources and their combinations in the existing resource structure as a key source of value (Bocconcini et al., 2020). In contrast, in the resource integration approach (SDL), “value-in use is central (although disputed), implying an actor-centric view with value as an outcome of resource integration activities” (Bocconcini et al., 2020, p. 392). As digital transformation relies on the changing and combining new (digital) resources with existing (traditional) ones, we find RIA to be a more suitable approach for analysing a dynamic and activity-centric process rather than an actor-centric process. Second of all, as Bocconcini et al. underline, “Resource Integration does not currently analyse resources as such” (2020, p. 392), as it does not focus on features or different types of resources. In contrast, RIA offers a practical tool (the 4R Model) for classifying resources and value outcomes. This is especially important if we want to focus on different types of resources and on how they are used and combined during digital transformation, as well as on the resulting value co-creation and value co-destruction. Moreover, with our analysis, we respond to the newest call for further research on “how value is measured and captured in complex networks by focusing on resource interaction” (Prenkert et al., 2022, p. 57).

A particularly useful concept for analysing the disruptive process of digital transformation within RIA is friction, which describes any destabilising movement or force between resources linked to other interconnected resources (Håkansson and Waluszewski, 2002a). When introducing new technologies or digital processes within highly traditional analogue processes, friction between different resource types is bound to occur (Fremont et al., 2019; Hoholm and Olsen, 2012). This friction may be a source of both positive and negative outcomes in terms of co-created and co-destroyed value (Håkansson and Waluszewski, 2002a). For the analysis, we applied the 4R-model (Håkansson and Waluszewski, 2002b), which defines four types of resources: products, facilities, business units and business relationships. Additionally, in this paper, we distinguish between non-digital and digital resources. The friction between these two types of resources during ongoing digital transformation affects value outcomes.

Although there is research addressing the issue of value and digitalisation that applies the resource lens, these studies mostly use the resource-based view (Eller et al., 2020; Kollmann et al., 2021) or SDL (Caridà et al., 2019) as their analytical framework. None of these studies, however, use the RIA to address the digital transformation of highly traditional companies, which requires extensive human involvement. Therefore, responding to the call of Warner and Wäger (2019), who stressed the need to empirically investigate the means through which digital transformation takes place, our paper aims to investigate how digital transformation changes highly traditional business processes and how it impacts value co-creation and co-destruction. More specifically, using the RIA (Baraldi et al., 2012; Bocconcini et al., 2020), we examine how the friction between non-digital and digital resources affects co-creation and co-destruction of value in a network during digital transformation. Based on this, we also provide managerial implications on how to handle simultaneous digital and traditional business processes so as to co-create value during digital transformation.

We base our research on a case study of a network of a digital platform provider and three traditional confectioneries. In the analysis, we look at the business processes of traditional confectioneries that have introduced online services through a digital platform and are undergoing digital transformation.

We contribute to existing studies by analysing the digital transformation of highly traditional companies that need to introduce new, digital technologies while continuing their traditional processes. As this problem may constitute an important challenge for these traditional companies, we also present the managerial implications of their digital transformation. Moreover, we contribute to the growing body of knowledge on digital transformation by studying friction between resources as an important force that affects value co-creation and co-destruction. We also propose a division of resources into digital and non-digital and develop the concept of lubricants within the RIA, which facilitates the analysis of complex digital transformation processes. Additionally, our study is embedded in a network approach for value co-creation and, as such, constitutes a contribution to the existing studies focusing mainly on a dyadic relationship perspective. Finally, in this research, we respond to the call for “further developing the notion of value generation from the combining of resources in an interorganizational context” using the IMP approach (Bocconcini et al., 2020, p. 393).

The remainder of the paper is structured as follows. In the next section, we present a literature review on digital transformation, resource interaction and value co-creation and co-destruction. This review provides the theoretical framework...
for our exploratory case study of a platform provider and three confectioneries. In the following section, we present the research method and empirical analysis. Based on these insights, we discuss our results and propose a framework for value outcomes resulting from the friction between the digital and non-digital resources of highly traditional businesses. To finish with, we present conclusions and managerial implications, as well as directions for further research.

Theoretical background

Resource interaction approach

The RIA (Baraldi et al., 2012; Prenkert et al., 2019) focuses on the interaction between resources in business networks. Every process in a company requires internal and external resources. The combination of these resources is not a singular event but rather a continuous process of mutual influence. RIA is based on the assumption of resource heterogeneity (Penrose, 1959), which posits that a single resource does not have value but that its value is a result of how certain resources are combined with others (Baraldi et al., 2012; Bocconcelli et al., 2020).

RIA classifies resources using the 4 R model (Håkansson andWaluszewski, 2002b), which defines four types of resources: products, facilities (e.g. buildings or machines), business units (individual organisations or parts of organisations that together form a useful set of physical and human resources, including knowledge and competences) and the business relationships connecting them. Products and facilities are physical, tangible resources, whereas business units and business relationships are social and intangible (Bocconcelli et al., 2020). All these four types of resources are highly interdependent and develop in a continuously interactive process. Links between resources take the form of resource interfaces defined as “interconnections at shared boundaries among at least two resources” (Dubois and Araujo, 2006).

Resource interfaces can result in friction. The concept of “friction” introduced by Håkansson and Waluszewski (2002a) refers to a destabilising movement or force between resources linked to other interconnected resources. It “creates tension between a resource exposed to a force and the history of the resources it has interfaces with” (Håkansson and Waluszewski, 2002a, p. 225). Friction generated through tensions in resource interfaces transforms existing resource combinations or creates new ones; therefore, it is a transformational force (Hoholm and Olsen, 2012). This also means that any force directed towards a resource will produce a reaction that will be distributed to all resources through resource interfaces.

Although friction can have negative connotations, it is a neutral term. Its effects can both facilitate (e.g. in terms of technological innovation) and hinder (e.g. disturbances in processes, an unplanned transformation of resource) development (Håkansson and Waluszewski, 2002a). As Shenkar (2012) explains, “too much friction will generate heat and resistance, but too little friction will bring about adverse consequences”. When dealing with friction, we can also discuss potential lubricants, that is, “elements with the potential to reduce friction at the point of contact (e.g. cultural sensitivity training)” (Shenkar, 2012, p. 15). In other words, friction between resources activates problem-solving efforts (Fremont et al., 2019). However, it should be noted that to date, the concept of lubricants has only been used in studies on cultural distance (Luo and Shenkar, 2011; Shenkar, 2012). Luo and Shenkar (2011), in their studies on cultural friction in international business, propose several organizational lubricants including communication (openness, feedback, transparency), acculturation (education, experience training), socialization (knowing social norms via social interactions) and staffing (expatriate selection, rotation, rewarding). The idea of lubricants to minimise friction within the RIA has not been refined, and its relation with the concept of relationship atmosphere, for example [including the social aspects of exchange such as trust, commitment, power, dependence and expectations (Håkansson, 1982)], remains unexplored. If we compare the concept of atmosphere with the idea of lubricants proposed in cultural studies, the latter is more focused on a specific problem and friction than the atmosphere. The atmosphere builds up rather in the long-term and characterizes the entire relationship (Ratajczak-Mrozek, 2017), while a lubricant is more like a tool that is used to prevent or reduce friction, therefore “some lubricants may have a shortened life, requiring frequent replacement” (Luo and Shenkar, 2011, p. 9).

Digital transformation

Digital transformation is the process of introducing digital technologies and solutions and digitalising previously analogue operations and processes (Pagani and Pardo, 2017) to bestow them with numerical representation that can be the subject of computation (Manovich, 2002). The goal of digital transformation can be defined as applying “pathways to transform resources within the value creation process and organizational structural changes” (Eller et al., 2020, p. 122). It entails not only transforming the already possessed resources into a numerical representation but also incorporating new resources into the already functioning processes. When introducing new resources and digital technology, there is a continuous interaction between digital and non-digital resources. This is an ongoing process since “digitalization changes components, creating possibilities for new interactions and new links with other components” (Tekic and Koroteev, 2019, p. 685). Non-digital resources are traditional and analogue and are linked with traditional analogue business processes. They usually take physical form but can also be intangible (e.g. business relationships). Digital resources, in turn, “can be defined as materials that have been conceived and created digitally or by converting analogue materials to a digital format” (Collection and Resources Development Policy, 2021), thus possessing the characteristic of numerical representation (Manovich, 2002). As opposed to traditional resources, digital resources are cheaper and easier to amplify, replicate and distribute (Tekic and Koroteev, 2019) due to their numerical form, which can be manipulated automatically via the mathematical functions of algorithms (Manovich, 2002). They can be more conveniently stored and retrieved, as well as accessed remotely (Tekic and Koroteev, 2019). However, these advantages can also be a weakness since digital resources can easily be replicated in undesirable ways.

Digital resources usually coexist and interact with non-digital ones. For instance, production in a factory (a non-digital facility according to the 4R model) can be managed automatically through software (a digital facility), non-digital products can be advertised using photos of them (digital products) and non-digital business units can communicate using communication software (a digital facility). This occurs through a number of interfaces. An example of such an
interface could be the information about non-digital resources that is handled by digital facilities. It could also take the form of business units, whose information technology (IT) competence and routines influence the functioning of digital resources. Business relationships can also serve as interfaces which drive the implementation of digital resources, such as communication-facilitating software (Baraldi, 2003). Such interfaces can make the interaction between digital and non-digital resources so seamless that they seem to appear as a single resource of dual nature (digital and non-digital) – such as a computer, which functions like a package of both traditional physical resources (hardware) and digital resources (software).

The process of digital transformation is not always seamless. According to the RIA, as a result of changes in resource combinations and the corresponding interfaces, as well as the embedding of new (digital) resources into existing (traditional) ones, tensions arise between the resources (Baraldi et al., 2012). This creates friction. However, the concept of friction has not been widely used to study digital transformation (Eklinder-Frick et al., 2020; Premont et al., 2019; Pagani and Pardo, 2017). Digital transformation is a process in which digital technologies cause disruptions by changing processes and established ways of doing things (North et al., 2019; Vial, 2019). These disruptions may be even more impactful for companies in highly traditional industries. Even companies that offer very traditional physical products are now facing the need to incorporate digital services and software as part of their core offerings (North et al., 2019; Vial, 2019). As Tekic and Koroteev (2019, p. 691) argue, the “main characteristic of these companies is that their key products are valued by customers because they are analog: handmade, human inspected, and/or built exclusively or in very small batches”.

Research on the digital transformation of highly traditional companies, where the aim of digital transformation is not complete digitalisation but coexistence of traditional analogue and digital processes and resources, is rather scarce. Available analyses of this phenomenon mainly discuss the importance of dynamic capabilities during the digital transformation of companies operating in traditional industries or focus on the transition of business models (Matarazzo et al., 2021; Warner and Wäger, 2019). An important observation was made by Øiestad and Bugge (2014, p. 54), who claimed that “in many cases both firms and industries are largely influenced by their previous [analogue] actions and current specialisations”. These previous traditional analogue actions, processes and resources and their coexistence with digital processes are the focus of our paper.

**Value co-creation through digital transformation**

Although value is the main anchor in business decisions (Corsaro, 2019), this concept is neither straightforward nor unanimously defined. Following Eggert et al. (2019, p. 14) value may be defined as “the subjective perception of the degree of goal achievement reached by an item (i.e. product, service, relationship)”. Value is assessed by taking into account the experience and perception of each actor, which means that its evaluation is always subjective, individual and time-dependent (Corsaro, 2019; Waluszewski et al., 2019). Therefore, the assessment of value should include both the material aspects (e.g. related to income, market share) and non-material, symbolic aspects (e.g. experience, trust, process improvement or better quality services) (Sandberg et al., 2018).

Value co-creation encompasses the different activities of network actors related to the absorption, application and transformation of resources (Aarikka-Stenroos and Jaakkola, 2012; Pathak et al., 2020). For value co-creation, the interactions of heterogeneous resources from different network actors (Baraldi et al., 2012; Cenamor et al., 2019) and their adjustment to specific business relationships are both important (Premont et al., 2019), as a resource only has value when it is combined with other resources (Harrison and Håkansson, 2006). The interdependencies and heterogeneity of resources affect the value of a particular resource, making it relative, context-dependent and limiting the possibilities of a network actor to use the resources (Prenkert et al., 2022). In some cases, however, the interaction between actors and resources may lead to value co-destruction, that is, when the interactions between actors and the exchange of resources do not result in the expected, positive value outcomes (Jarvi et al., 2020).

Value co-creation processes are influenced by digital transformation. Research shows that digital transformation improves value-based selling activities and helps understand customers’ expectations (Alamaki and Korpela, 2021). The disruptive effects of digital transformation enable actors to offer new products and services and to reach new customers (Nambisan et al., 2019). Additionally, as a result of digital transformation, companies (especially those from traditional industries) can profoundly change their processes, streamline their operations and integrate their resources, which results in value creation (Zhou et al., 2017), increased productivity (Wengler et al., 2021) and operational efficiency (Vial, 2019).

Digital transformation does not always lead to positive outcomes and value co-creation. As Pathak et al. (2020) showed, the opportunistic behaviours of actors as well as technological disruption may lead to value co-destruction, and in particular, to the relationship ending, business liquidation or conflict between network actors. In a similar vein, Wengler et al. (2021) indicated that digital transformation may lead to a loss of productivity due to unawareness of what drives digital success. Other reasons behind the value co-destruction that accompanies digital transformation include lack of trust and problems with communication (Jarvi et al., 2018).

This dual effect, both positive and negative, of digital transformation on value outcomes also applies to highly traditional companies that offer traditionally produced goods and which implement digital technologies while continuing analogue processes. On the one hand, through digital transformation, these companies may have better knowledge of customer preferences and can anticipate and respond to future trends, which positively influences consumer buying behaviours (Bharadwaj et al., 2013; Matarazzo et al., 2021). This results in value co-creation. However, the digital transformation of highly traditional companies may also entail negative outcomes, for example, when customers expect digital solutions that it is impossible to introduce in a particular highly traditional industry. This results in their dissatisfaction (Øiestad and Bugge, 2014), which is an example of value co-destruction.
**Method**

This research is based on an exploratory case study (Thomas, 2011), an approach that is frequently applied to the analysis of business-to-business (B2B) relationships (Halinen and Törnroos, 2005; Woodside and Wilson, 2003). By adopting this method, we can explore a “contemporary phenomenon, which is difficult to separate from its context, but necessary to study within it to understand the dynamics involved in settings” (Halinen and Törnroos, 2005, p. 1286) and thus, analyse “how” and “why” patterns occur. We adopted the abductive research approach (Dubois and Gadde, 2002), which is described as a “systematic combining” and a continuous movement between the observed and analysed empirical world and the model theoretical world. Systematic combining assumes that during the research process, the analytical framework and related research issues are successively reoriented when they are confronted with the analysed empirical phenomenon (Dubois and Gadde, 2002). Our preliminary analytical framework and questions for the semi-structured interview focused on the development of cooperation with a digital platform, and the resulting digital transformation and co-created value. The questions focused on key informants’ opinions of the analysed phenomena, that is, the ongoing digital transformation of the confectioneries, which had to transform their highly traditional processes to start working with Alpha, as well as the value outcomes of the analysed process. For example, we wanted to know if Alpha made significant product and process changes to meet the particular confectionery’s needs. Key informants were also asked to list and describe the most important detailed positive effects resulting from a business relationship and to assess if these effects were similar for both network actors. Only then, as a result of the analysis, did we notice that the analysed processes did indeed concern resources, their changes during the digital transformation and their connectedness; thus, we incorporated the 4 R model into our analytical model. In some cases, this meant not only reinterpreting the data but also returning to respondents to ask additional questions. After changing our analytical framework to encompass resource interaction and 4 R model and to enable an analysis of the digital transformation, we noted the need to categorize the resources into digital and non-digital ones. This was even more necessary as we were dealing with highly traditional non-digital companies.

As the value is co-created among different network actors, we decided to analyse this process by investigating three different buyer-supplier relationships. To this end, we conducted an analysis of the focal company (referred to as Alpha), a digital platform that sells cakes and three confectioneries working directly with Alpha (named Gamma, Delta and Epsilon). The analysed companies are a good representation of relationships that are built to co-create value. Additionally, to start cooperation with Alpha, the confectioneries needed to go through digital transformation, which allowed us to analyse the resulting value co-creation and co-destruction. The data was collected in person, by telephone or Skype in 2020 and 2021. The data presented in the paper comes from ten in-depth interviews with six key informants from four SMEs (three from Alpha – co-owner 1, co-owner 2 and a manager – and one key informant from each of the confectioneries). The choice of the companies was deliberate, based on the snowball method, that is, the particular confectioneries asked were indicated by the digital platform provider as a long-time partner important in terms of value co-creation. The confectioneries were chosen based on their importance for Alpha in terms of value co-creation.

To better understand the analysed phenomena (Kamalaldin et al., 2020) and to make sure that our results are relevant and valuable for further analysis, both sides of the dyadic relationships were investigated (Alpha–Gamma, Alpha–Delta and Alpha–Epsilon). The key informants were chosen based on their knowledge and competence with regard to the analysed problem, as well as their active participation in the relationship. Each interview lasted from 30 to 90 min.

All the interviews were recorded and transcribed to ensure confirmability (Guba and Lincoln, 1994). The transcripts were the basis for further analysis. To increase the validity and reliability of the results, the data obtained was triangulated (Woodside and Wilson, 2003) using Alpha’s internal documents, financial and sales reports, reports concerning key customers, the company’s website, official materials published on the internet and the network picture of business relationships visualised by co-owner 1 of the focal company. By using both primary and secondary sources, we were able to obtain a comprehensive picture of the dyadic business relationships of the companies studied.

The information gathered was examined using the constant comparative method (Thomas, 2011). We classified the 4 R resources into digital (D) and non-digital (ND) using the conceptualization of digital character developed by Manovich (2002). Resources that took the form of numerical data that allowed for computation where classified as digital, while all the others – as non-digital. Moreover, we focused on resources that played a significant role on value co-creation processes. We defined value as the individually assessed trade-off between tangible (material) and intangible (non-material) benefits and sacrifices (Chicksand and Rehme, 2018; Minerbo and Brito, 2022).

The content of the interviews was analysed with simultaneous coding, which involves “the application of two or more different codes to a single qualitative datum” (Saldaña, 2009, p. 267). This allowed us to add new lists of codes during the systematic combining of theory and empirical data, which occurred during the abductive research. To ensure that the answers were understood correctly and to reduce the subjectivity of interpretation, the results of the text analysis were discussed by three independent researchers. Furthermore, online meetings were organised to discuss the research data.

**Case study analysis**

**Profile of the digital platform provider and cooperating confectioneries**

Alpha is a small firm (seven employees in 2021) that was founded in the year 2012 and operated as a provider of a digital platform which connects confectioneries located all over Poland with final B2B and business-to-customer (B2C) customers. Through Alpha’s platform, both end B2B and B2C customers can buy confectioneries and have them delivered to an address within Poland. Alpha is in direct contact (usually by telephone or email) with the most important end B2B customers. Through Alpha’s platform, businesses can manage their orders and payments, track delivery status, and receive notifications for order updates.
customers and sends them individual offers. B2C customers usually place their orders via the platform’s website.

In 2020, Alpha was in partnership with 533 confectioneries. In Table 1, we present the three confectioneries that were analysed in detail. All three confectioneries perform highly traditional activities, which are the basis for their further development. These activities may not be fully digitised or performed only by machines, as customers are looking for handmade cakes or customised decorations. Therefore, each cake ordered via the platform is prepared by confectioners in a traditional way and requires the unique set of specific competencies possessed by confectionery employees. Additionally, the table contains information regarding the implementation of additional (i.e. apart from the Alpha’s main platform) digital solutions by respective companies – in the periods predating their cooperation with Alpha and after the cooperation has been developed. We considered only the major digital solutions to exclude trivial cases such as using mobile phones.

The cooperation between Alpha and other confectioneries is highly standardised and based on written, long-term agreements. All the business partners (the confectioneries and Alpha) are connected through a dedicated platform that allows users to communicate, exchange and track orders, as well as send invoices.

**Digital transformation of highly traditional companies**

When choosing partner confectioneries, Alpha does not take into account digital solutions or competencies already applied. The most important aspect considered is the quality of the cakes produced. Once a new confectionery is chosen, Alpha’s representatives educate the confectionery staff on how to use the digital platform (e.g. updating order status, invoicing) and about other cooperation requirements, such as adherence to documentation standards and the importance of timely delivery. All the analysed confectioneries’ representatives stress that working with Alpha’s platform is very intuitive.

Alpha’s platform offers cakes in three sizes and a variety of flavours. When ordering a cake, end customers may add personal elements (such as an inscription on the cake, candles or a card) before they choose the delivery time and address. Once the payment is made, the order is forwarded via the platform to the nearest confectionery (in terms of delivery location), where it is processed. Each confectionery manufactures cakes based on Alpha’s guidelines (on the flavour, ingredients and weight) and the confectioner’s know-how. However, as there are no official cake recipes that each confectionery has to follow, the products may differ locally (a fact which is highlighted on the order form). The finished cake is packed in a box with the Alpha logo. Other documents, such as delivery confirmation, also bear the Alpha logo.

All the confectioneries analysed had to modify their internal processes to start cooperation with Alpha. Alpha co-owner 1 states:

> It’s such a traditional business, and we [...] are disrupting the ordering process. Traditionally, when you want to order, you have to go to the confectionery shop, [...] choose a product, make an advance payment and come back a second time to pick it up, [...] and there is also the issue that when you pick up the cake, you also have to transport it [...] So, it is not a simple thing.

One of the key issues concerns the process duration (from production to delivery), which usually requires three days and cannot be accelerated. Confectioneries must buy fresh ingredients, and baking also takes time. Therefore, despite the implementation of order automation, some of the traditional analogue processes still require time to be completed. This, in turn, is not always understood by end customers. As one of the confectionery managers states:

> There is a generation of people who do not cook or bake, and they think that two clicks actually make the confectionery take something from the shelf and deliver it to them right away (Delta Manager).

Both Alpha co-owners point to one more issue on the customer side. Customers assume that the ordering model is the same as in e-commerce and want real-time feedback on status orders and delivery details. However, this information is not always available from the confectioneries, who mostly deliver cakes using their own vehicles.

The required changes to internal, analogue processes (including writing down cake orders, accepting payments in cash, manually preparing a list of orders to be delivered or

<table>
<thead>
<tr>
<th>Name of the confectionery</th>
<th>Size</th>
<th>Specialisation</th>
<th>Notable additional digital solutions before partnering with Alpha</th>
<th>Notable additional digital solutions after partnering with Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delta</td>
<td>Small (12 employees)</td>
<td>1. Manufactures and sells cakes (also artistic cakes) and traditional pastries 2. Has one traditional confectionery shop located in the suburbs</td>
<td>–</td>
<td>An online shop based on the solution delivered by Alpha® (created at the beginning of the cooperation)</td>
</tr>
<tr>
<td>Epsilon</td>
<td>Large (more than 200 employees)</td>
<td>1. Manufactures and delivers cakes and pastries to large B2B customers (e.g. hotels, supermarkets) 2. Has four traditional confectionery shops</td>
<td>IT tools for contacting B2B customers</td>
<td>An online shop created with Alpha’s help (but not based on Alpha’s solution)</td>
</tr>
<tr>
<td>Gamma</td>
<td>Small (six employees)</td>
<td>1. Manufactures and sells mainly artistic cakes and traditional pastries 2. Has one traditional confectionery shop, located in the city centre</td>
<td>Online form for ordering its products</td>
<td>–</td>
</tr>
</tbody>
</table>

*Note: Confectioneries may use Alpha’s IT solutions and assistance to run their own online shops (under the confectionery brand)*

1321
company to help. In total, it took Epsilon three years to align the processes of cooperation and production with Alpha’s requirements. As Alpha’s manager admits, “[…] we suggested what this process should be like for them […] So we interfered in their internal processes a bit. It worked, because it’s not difficult”.

Value co-creation and co-destruction during digital transformation

Value co-creation is the cornerstone of Alpha’s continuous growth as it wants to be seen as a market leader. As co-owner 1 underlines:

[…] it is particularly important for us that, when it comes to any innovation, we are the first to introduce it. We don’t want to chase anyone but let someone chase us.

This attitude translated into relationships with confectioneries. As a result of the partnership, confectioneries can develop employee skills, as in the case of Epsilon. The implementation of the platform entailed more intense digitalisation of Epsilon and the use of digital technologies for a larger number of internal processes, such as order tracking and invoice automation.

The managers of the confectioneries admit that as a result of using the platform, they also managed to streamline communication and automate the ordering process. As the Gamma manager adds:

 […] the customer completes [the form], which saves our time. We don’t have to ask every customer if they want this or that. […] We do not waste time because time is valuable.

Introducing online sales helps reach new groups of customers. As Delta’s manager emphasises, without the platform, they would never have reached so many customers who “want to order something even sitting in a traffic jam”. Gamma’s manager stresses that attracting the customer is paramount these days and that Alpha has the experience and know-how to do so. All key informants (from the confectioneries and Alpha) admit that through the cooperation and the use of the platform, their turnover has increased. Alpha co-owner 1 stated, “we give them specific orders that would not otherwise reach them because they come from a completely different channel which they don’t know about”.

From the confectioneries’ perspective, digital transformation and the introduction of sales through a digital platform allow for both predictability and time saving. Due to the standardisation of products, the confectioneries know what they must have in their offer, which facilitates the predictability of orders. As Gamma’s manager says:

The only thing left for us to do is to bake this product and deliver it to the customer. All the marketing has already been taken care of by this company because it is their job, they get their money from it.

In turn, one of the positive outcomes for Alpha of cooperation with the confectioneries on the platform is “the possibility to produce and deliver cakes. And to do so without using our own hands” (Alpha co-owner 1).

Alpha relies on the know-how and experience of the confectioners since:

[…] these are the people who have years of experience, they are confectioners, they do it every day manually, with their own hands. And without them, we would not have this knowledge. The knowledge about the industry in general, about the confectionery product, knowledge about raw
materials, about the prices of these raw materials is certainly a great value (Alpha co-owner 1).

Digital platform provider Alpha can ask confectioneries about new products, trends or customer preferences. According to the Alpha manager, “the confectioners’ knowledge is certainly much greater than ours. But when it comes to the products, product research, I think maybe we are a bit better at this”. However, as Delta’s manager claims, “it’s me who [more often] shares novelties with them than they do with me” but at the same time, he states that:

[..] the knowledge they [Alpha] have, I will never have. I think I would have to spend a lot of money to develop the kind of process and strategy that Alpha has.

As a result of this knowledge exchange, new products or functionalities are offered on the platform (like gluten-free cakes). Moreover, all the confectioneries introduce any new products that appear on Alpha’s platform.

However, the standardisation of cakes offered on the platform led to problems linked with deadlines. Confectioneries need to offer all the types of cakes available on the platform, and the ones that did not have experience in preparing a new type of cake sometimes missed orders. For example, at the beginning, Gamma refused to realise the order for an artistic cake within 24 h, as was demanded by Alpha. Normally, preparing such a cake takes three days. As Alpha co-owner 1 recalls:

In our cooperation, it was a big challenge to reduce the order realisation only for us to 24 hours. They [Gamma] were not used to it. And they refused to process the order as they would not make it.

Some orders realised by confectioneries did not meet the expectations of B2C customers, who made a complaint to Alpha. As the Gamma manager adds, “for a number of orders, as in any company, there will always be the so-called ‘difficult customer’ who is dissatisfied right from the beginning”. In such situations, Alpha asks confectionaries for an explanation, and if the complaint is valid, the confectionary has to pay for the order. However, for the confectioneries, the complaint process is not seen as fair. According to Delta’s manager, “Alpha is more lenient with customers who make complaints. Here I often say ‘STOP’, in the sense of ‘Listen, they want to cheat you’”. As a result of the reasons presented above, some of the confectioneries reported financial losses. Initially, the cooperation via the digital platform also led to unfulfilled orders, as the confectioneries did not have enough vehicles to distribute all the cakes sold via the platform. All three confectioneries also had a problem with order realisation as: “someone forgot something, the driver wasn’t there because they didn’t come to work - such a situation took place with each of them” (Alpha co-owner 1). These problems led to other value-co-destruction outcomes, namely, the frustration of B2C customers. This is even more important as face-to-face interactions with B2C customers in the confectioneries were partly transformed into digital interactions. This led to fewer possibilities for obtaining quick, direct information, suggestions or feedback from customers.

The negative outcomes described above were, however, in many cases mitigated by specific actions undertaken within the relationship as a response. All key informants underlined the importance of smooth and successful personal communication, mutual reliance and willingness to help (even at unusual hours), as underlined by Alpha’s manager “practically at any time or day, I am at his disposal and the other way around”. They relied on communication via the platform, but they also appreciated the possibility of talking on the phone or in person in the case of a sudden problem or misunderstanding. All confectioneries’ representatives see phone contact as a faster means of communication in the case of unexpected problems when a decision has to be made extremely quickly. Another important issue raised is mutual reliance and support. As the Alpha manager underlines, “is very important […] that I, colloquially speaking, I do not make things up, I do not lie to them that something can be done or something cannot be done”. This mutual reliance is important both at the beginning of the cooperation when confectioneries need to adapt to the rules of the digital platform, as well as during the development of the business relationship, especially if any tensions arise. Thanks to good communication and mutual reliance, issues are resolved when they arise, which reduces tension and facilitates smoother processes. Additionally, an especially important factor for ensuring smooth processes within business units is managers’ openness to change, in other words, their attitude towards digitalisation. As the Delta managers explained, “Alpha helped us a lot, introduced us to the internet market. […] I also saw great potential and that’s the way it worked out”. The aspect of mutual reliance during the digitalisation process was also raised by Alpha co-owner 1, who said, “Support? Yes, it’s a key matter. Definitely”.

Discussion

Using the lens of the 4 R-model (Håkansson and Waluszewski, 2002b), we examined the interaction between digital and non-digital resources and resource interfaces during the ongoing digital transformation of the confectioneries, which needed to keep some of their internal processes analogue and performed in the traditional way. Figure 1 presents the main 4 R resources of traditional confectioneries (products, facilities, business units and business relationships) and their interfaces during the process of production and sales before digital transformation. The confectioneries (business units) prepared their cakes (products) in confectionery shops (facilities) using ingredients (products) from suppliers (business units). They sold the products mostly to B2C customers, and in one case (Epsilon), mostly to B2B customers. When necessary, they delivered the products using their own vehicles (facilities). At this stage, digital resources did not play a substantial role in the process of value co-creation.

Figure 2 presents the main 4 R resources and their interfaces in the process of production and sales during the digital transformation of traditional confectioneries.

Our results are in line with Øiestad and Bugge (2014), who argue that despite the digital transformation, some companies are still influenced by their previous activities and specialisation. We can develop this idea further and state that in the case of highly traditional companies, despite the digital transformation, many resource interfaces remain unchanged. As in the confectionery industry, customers expect handmade products such as cakes, the main types of resources involved in the production of the product remain the same as before digitalisation and are non-digital. For the same reason, since the production process has not changed significantly, the introduction of cooperation and selling
through the digital platform (digital facility) has not changed the relationships nor resource interfaces on the supply side. The same ingredients are still needed and bought from the same suppliers, even if in different amounts. However, it is notable that in terms of deliveries, after joining the digital platform, the confectioneries needed to use external transport companies and their services (that is, non-digital products) to increase their delivery capacity. However, as far as value is concerned, these external companies rather facilitate value co-creation resulting from the confectionery-Alpha relationships and do not lead to new value itself.

In the case of highly traditional companies, where digital transformation is limited to sales and contact via a digital platform, the only digital resource (understood as numerical representation) is the digital platform itself. This digital platform can be seen as a digital facility in terms of the 4 R model as it is used to provide services, such as online orders and payments, and facilitates the exchange of products and services between customers and confectioneries as well as Alpha – the digital platform provider. Two comments need to be made in this regard. First of all, some authors (Bocconcelli et al., 2020) define facilities as strictly physical, tangible resources, which would exclude the very possibility of digital facilities existing. However, other prolific authors (Baraldi, 2003) have already recognised IT systems as facilities, which is the approach that we have chosen to follow. Secondly, depending on the adopted perspective, the digital platform could also be considered a product – when the focus is shifted from its function as a machine processing inputs into outputs (Baraldi, 2003) to that of it being the subject of exchange between two companies. However, since this platform and its processing function is central to the value co-creation processes occurring in the analysed network, we decided to adopt the former approach and treat the platform as a facility.

It may seem that introducing only one digital resource without changes in production or any other digitalisation-related processes should not entail many changes as it “only” requires replacing non-digital ordering and selling processes with digital ones. Meanwhile, the introduction of a digital platform that serves as a digital facility affects many resource interfaces and causes frictions, which, in turn, affect value co-creation and value co-destruction.

Our case study shows that the use of a digital facility such as a digital platform is not just a matter of implementing technological solutions. It involves several frictions, particularly between digital and non-digital resources. Moreover, some of these frictions are not isolated incidents but occur repeatedly, e.g. during the use of the platform (digital facility). For instance, the streamlining of sales and communication processes enabled by the platform may require adjustments in traditional products to make full use of the platform’s potential. In our case, this meant introducing new products – types of cakes – to the offer and using simpler recipes. Even though the main types of non-digital tangible resources involved in production remained the same after digital transformation, the actual specific resources (that is, product categories and ingredients) had to be modified and combined, in other words, this required new interfaces between resources already used. It should also be noted that changes required by the introduction of the digital platform, such as particular ingredients or the number of products prepared, are not always possible. This may be caused by another type of non-digital resource, the traditional facilities where the products are prepared and which have limited production and development capabilities. We also observed that for larger confectioneries, it may be difficult to change the production process for a particular type of cake since this would require significant changes in their production lines (facilities). Additionally, Alpha is not an important business...
partner for big confectioneries, which may diminish their willingness to follow procedures. Smaller confectioneries may struggle to meet the higher demands, and as they have followed the same processes for years, may be reluctant to make any changes. Therefore, digital transformation should not be viewed as a be-all end-all solution to all a company’s problems. While it can lead to value creation through streamlining, optimising and expanding business processes, its scope is also limited by the initial set of non-digital resources and the flexibility of a given business model itself. Of course, no company can operate exclusively based on digital resources since not everything can be expressed as digital numerical data while retaining its core functionality. However, even in cases when non-digital resources can be converted into or replaced with digital ones or supported by separate digital resources, this does not necessarily mean that doing so would be the optimal decision. Careful balancing of digital and non-digital resources is necessary, particularly in industries where tradition has positive connotations and can be a source of competitive advantage (as in the case of confectioneries). Limiting the usage of digital resources, for example, in the production process or during communication with customers, can be a deliberate strategy for maintaining the image of a traditional business. It can also prevent the company from wasting its already existing non-digital resources that are linked to these processes (such as the knowledge and competences of employees pertaining to traditional production methods and communication skills).

The introduction of a digital facility (digital platform) sometimes causes friction with business units responsible for manufacturing a traditional product. These business units are often not prepared for such a change, which does not only concern the isolated ordering or selling process. Firstly, a new digital facility (platform) may cause modifications to other internal processes within the business unit: in our case, it forced the confectioneries to change their times of accepting orders and the delivery hours. However, this modification is not always possible, as some obstacles are inherent in traditional processes or due to limited internal resources. In such cases, this friction has to be mitigated by introducing new facilities, such as transport provided by external companies. Secondly, the introduction of a digital facility (platform) requires the need to change the attitudes of employees and managers towards digitalisation within the business unit. This is especially true for the attitudes of older employees. Moreover, a digital platform sometimes requires the acquisition of new knowledge within the

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**Figure 2** 4 R interfaces of traditional confectioneries during digital transformation – the perspective of digital and non-digital resources
business unit, both in the field of digital technologies and, for example, creating other traditional products expected by the facility. We should note that a non-digital product (cake) is also a source of friction for digital facilities (platforms). As we are dealing with a highly traditional product, it is not possible to apply all the expected short lead times typical for e-commerce solutions.

The introduction of a digital platform substantially changes the interfaces between business units, that is, companies offering a traditional product and customers. Part of the hitherto interfaces are replaced by another business unit – the provider of the digital facility. In our case, B2B and B2C customers who used to buy cakes directly from the confectionery now buy this product via the digital platform. In this context, we must emphasise an important source of friction, which is customer expectations and their lack of understanding of traditional processes within business units (confectioneries). Thus, they expect the transfer of digital solutions to non-digital products (such as the option to track deliveries). This is further compounded by the lack of direct communication during the ordering process between customers and companies offering traditional products. Moreover, such customers often unknowingly begin to associate the digital platform provider with a company offering and producing a traditional product.

Our research shows that the digital transformation of highly traditional companies following the initiation of cooperation via a digital platform results in changes to resource interfaces and friction between these resources. We agree that although the friction between digital and non-digital resources can cause problems, and thus evoke negative connotations (Eklinder-Frick et al., 2020), it ultimately is a neutral term. We confirm that its effects can both facilitate and hinder development (Håkansson and Waluszewski, 2002a), which we further relate to value co-creation and co-destruction.

We confirmed, in line with Nambisan et al. (2019), that the disruptive process of digital transformation and friction enabled the development of all the companies studied. For highly traditional companies, digital transformation leads to profound changes in internal processes, as they have to concentrate their efforts on their core business competences (e.g. cake-making) while leaving supporting competencies such as customer acquisition, order processing and customer communication in the hands of a digital platform provider (at least for those orders placed via the digital platform).

We have revealed that the companies studied co-created value in terms of both material outcomes (introducing new products, reaching new groups of customers, improved order processing, quicker cake preparation, increased turnover and financial gains), as well as symbolic, non-material outcomes (gaining knowledge on market trends and on social or industry usage). An outcome of digital transformation and of digital and non-digital resource interactions was that the highly traditional confectioneries were able to combine their non-digital resources (such as cakes, production facilities) with digital resources (the platform), to expand their offerings and meet market needs. Resource interaction also allowed for improved convenience and user experience for customers, who can order a wide range of products regardless of their location. Consequently, even though they still offered a traditional product, traditional companies increased their turnover and were able to offer their products to new groups of customers. Moreover, the interaction between digital and non-digital resources streamlined order processing and selling, which translated into increased revenue and financial gains (material value outcomes). The non-material co-created value revealed in our study included gaining knowledge on market trends, mostly regarding social and corporate application of digital technology. Through the platform (that is, indirectly, without direct contact between actors from the industry), the companies could share knowledge on market changes, which allowed them to respond quickly to market needs and industry trends.

Despite the dominant effects of value co-creation, digital transformation and the accompanying changes of resource interfaces, as well as friction between digital and non-digital resources, also resulted in negative material value outcomes (such as unfulfilled orders, delivery problems, failure to meet deadlines and financial losses) and non-material value outcomes (such as the frustration of B2C customers and fewer face-to-face interactions with B2C customers), leading to value co-destruction. In our case, friction between a digital facility (the digital platform) and the non-digital products offered led mainly to initial problems with order fulfilment and delivery, as well as failure to meet deadlines. Some orders coming in via the digital platform could not be fulfilled or were delayed, as the confectioneries did not have enough vehicles, resulting in the need to use external transport companies (non-digital products). Finally, other important co-destruction outcomes result from the change of resource interfaces between highly traditional companies and customers transferred to the digital facility. This led to fewer possibilities for obtaining quick, direct information and suggestions or feedback from consumers. The unfulfilled expectations of customers led to tensions and frustration.

The model of value co-creation and co-destruction in highly traditional companies during digital transformation is presented in Figure 3. The model emphasizes that value co-creation and co-destruction are the result of friction between digital resources (facilities and products) and non-digital resources (facilities, products, business relationships and business units).

Our research shows that continuous friction between 4R resources during digital transformation resulting in co-destruction of value can be mitigated by so-called lubricants (Luo and Shenkar, 2011; Shenkar, 2012), a term that so far has not been used in RIA studies. Even though friction is a neutral term, it is important to direct its impact so as to reduce its potentially negative effect and strengthen its positive impact. We suggest that lubricants are tools that minimise friction between resources, thereby improving the probability of positive value outcomes resulting from resource interaction. Important lubricants include smooth personal communication, mutual reliance and willingness to help, as well as attitude towards change caused by the digital transformation. In terms of the importance of communication as a lubricant, we confirm the research by Luo and Shenkar (2011) in their studies on cultural friction in international business. Personal communication smooths the cooperation (Chen et al., 2017) and allows to diminish the tensions before their escalation. Reliance is a cognitive attitude that guides “our thought and action in a way that is sensible from the standpoint of practical
or theoretical ends” (Alonso, 2014, p. 163). In our study, we identify the mutual reliance to underline mutuality that describes the perceived balance in the relationship during this guidance. It reflects the experience that one can rely on one another but without incorporated beliefs or judgements. Willingness to help in the previous research has been underlined as the evaluation factor of customers’ perception of the service quality and interaction (Martin et al., 2022; Odekerken-Schröder et al., 2022). In this regard, we also confirm the importance of willingness to help as properties of social interfaces, that is, interfaces between social resources in terms of the 4R model. It is emphasised that customers’ requests related to the assessment of willingness to help tend to be quite simple, that is possible to address in a relatively short time manner and “would not generally involve the creation or delivery of entirely new or complicated services” (Martin et al., 2022, p. 55). Therefore, we argue that the use of lubricants may result in quick problem resolution, even when actors have not developed a strong long-term business relationship. Thanks to good communication, willingness to help and mutual reliance, issues are resolved when they arise, which reduces tension and facilitates smoother processes. We need to note that these lubricants can be seen as prerequisites for commitment and trust in the relationship (Railton, 2014, p. 146) says that reliance is “an important precursor to trust”) but cannot be completely equated with commitment or trust as the latter need to change, in other words, their attitude towards digitalisation. This lubricant minimising friction between resources is vital, as digital transformation entails disruptive elements that may cause resentment among some employees. Individual lubricants can be applied towards particular resource interfaces both before and after the appearance of friction. The proposed concept of lubricants may be partly linked to the concept of relationship atmosphere, which includes the social aspects of exchange such as trust, commitment, power, dependence and expectations (Håkansson, 1982). However, we believe that this notion differs insofar as the concept of lubricants only relates to resources, not to the network as a whole, as is the case with the concept of atmosphere. For this reason, compared to atmosphere, lubricants are more focused on a specific problem and on friction rather than the atmosphere, and do not have to build up over the long-term like atmosphere, and can even be applied ad hoc when a particular tool from the list of potential lubricants is needed. Due to these characteristics, lubricants were extremely helpful in the digital transformation of traditional companies when sudden action had to be undertaken or changes needed to be quickly introduced. As a result, it was possible to limit co-destruction outcomes linked to problems with order realisation and customer dissatisfaction.

Conclusions

This study contributes to research on resource interaction and its impact on value co-creation during the ongoing process of digital transformation of highly traditional companies. We adopted a network approach towards analysis of value, as value co-creation requires the combination of resources from

Figure 3 Value co-creation and co-destruction in highly traditional companies during digital transformation – the importance of friction and lubricants
different, dispersed actors (Prenkert et al., 2022). Adopting the RIA and the 4R model in general and the concepts of resource interfaces and friction, in particular, allowed us to analyse the changes that occur due to digital transformation, even if these changes concern non-digital resources. In this way, adoption of the 4R model allows us to see a more detailed picture of digital transformation influenced by the network, including direct and indirect interactions. We confirmed that friction in RIA can have both negative and positive outcomes and may lead both to value co-creation and value co-destruction. Since the network actors cooperating via the platform have similar ultimate goals (such as an increase of turnover and improved sales), our research indicates that value co-creation effects are dominant. These outcomes are possible due to the continuous process of resource interaction among dispersed network actors (Corsaro, 2019; Håkansson and Snehota, 1995). The co-created value is also an incentive for further development of business relationships, including sharing more strategic resources over time (such as detailed knowledge possessed by business units). As value co-creation and digital transformation are continuous processes, the constant friction between digital and non-digital resources is inherent to these processes. According to our analysis, some (mainly initial) problems in resource interaction led to value co-destruction in traditional confectioneries going through digital transformation. The platform required these shops to prepare products very quickly and to offer timely delivery. As a result, they had to modify their previous activities and use different resources.

Secondly, we respond to the calls for further research on how resource interaction is linked to value creation in business relationships and networks (Prenkert et al., 2022). We contribute to existing research by expanding the concept of lubricants, which are particularly relevant for companies that continue to perform traditional processes during digital transformation. These lubricants are helpful in value co-creation since they can be considered as ad hoc tools that do not have to build up over the long time but still minimise the friction between resources during digital transformation, and as such, enhance the probability of positive value outcomes resulting from resource interaction. The lubricants that we identified include smooth personal communication, mutual reliance and willingness to help, as well as attitude towards change caused by the digital transformation. Nevertheless, we still suggest continuing research on that matter within RIA as we believe that the list of lubricants is not definitive. It is even more important as most lubricants identified by us are properties of social interfaces, that is, interfaces between social resources in terms of 4R model (i.e. business units and business relationships). Based on our study, we were not able to identify lubricants that are properties of physical interfaces (i.e. products, facilities). However, we perceive the analysis of other potential lubricants as a very promising avenue for further research.

Our research confirms the findings of Saarikko et al. (2020) that digital transformation has both positive and negative effects. However, we found that the outcomes were mostly positive over time. Our results indicate that the process of change brought about by digital transformation depends on the lubricants, the initial interaction between digital and non-digital resources, as well as the frictions that occur among them. The managerial implications provided by our study are particularly relevant for smaller companies that keep some of their processes traditional and analogue during digital transformation. Firstly, our results show that in some industries, it is neither possible, advisable nor necessary to fully digitise all processes. These industries have to always partially retain their traditional, analogue character. We agree with Tekic and Koroteev (2019) that, in some situations, staying partly traditional is an advantage for a company. In the case of the companies under study, customers buy cakes because they are traditionally handmade and tailored to the buyer’s preferences (taste, decoration, wishes and inscription). This traditional process is what makes a cake unique, so transforming it into a fully digitalised production process would decrease the value perceived by customers. Not being able to completely digitalise all processes does not have to be a hindrance for companies to grow. Some of them have to stay traditional and require traditional analogue human involvement because they are viewed as such by end customers. Therefore, remaining traditional within the core business while at the same being open to digital solutions may lead to new ways of communicating and interacting with customers. It can also result in increased operational efficiency.

Secondly, when undergoing digital transformation and simultaneously performing some highly traditional activities, companies should not only rely on their own resources or spend time developing new (digital) resources solely by themselves. On the contrary, managers should acquire new, digital resources present on the market and transform them to co-create value. However, the challenge for managers is to access and combine embedded network resources from other network actors. To make this process easier, emphasis should be put on the development of lubricants. These lubricants should be directed both internally, towards employees, such as the attitude of managers towards change or internal communication, as well as externally, at the relationship level, where mutual reliance and mutual communication play an important role.

However, these companies are also under pressure to constantly introduce more digital solutions to their operations. Due to this, many smaller companies may realise that digital transformation is a prerequisite for fostering growth as it co-creates non-material and material value with other network actors. In terms of non-material value, digital transformation helps in the acquisition of new knowledge and the development of in-house capabilities, both in terms of digital development and in the area of traditional production. Material value includes improved effectiveness and higher turnover, enabling companies to grow their business. However, as these companies rely on traditional processes, managers’ openness towards change and to the introduction of new technologies is important. Developing lubricants (such as improved communication and mutual reliance) might prove helpful during digital transformation and may improve value co-creation.

All companies, including traditional ones, face digital transformation that affects their processes and resources (North et al., 2019; Vial, 2019). Our study is focused on only one specific industry. Further research should expand this problem to other traditional industries and businesses.
undergoing digital transformation, such as cafes, mental help counselling or theatres. A qualitative longitudinal study on resource interaction during the digital transformation of companies that have to perform some of their processes manually, for example, clothing companies, would help to expand this analysis as well.

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