

# Creating sustainable customer value through digitality

Creating  
sustainable  
customer value

Tero Rantala, Juhani Ukko and Minna Saunila

*LUT School of Engineering Science,  
LUT University Lahti Campus, Lahti, Finland*

Hanna Puolakoski

*Annomen Oy, Helsinki, Finland, and*

Hannu Rantanen

*LUT School of Engineering Science,  
LUT University Lahti Campus, Lahti, Finland*

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## Abstract

**Purpose** – Because the global economy is increasingly driven by digital businesses, and digitalization affects the businesses of traditional industrial organizations, the need exists for a theory, and empirical understanding, that elucidates the actual value-creating elements. By focusing on traditional industrial organizations that are facing changes and transformation caused by the increase in digitalization, the purpose of this paper is to increase the understanding of the characteristics of creating sustainable customer value through digitality.

**Design/methodology/approach** – To increase the understanding of creating sustainable customer value through digitality among traditional industrial organizations, quantitative and qualitative methods of data collection were utilized in the study.

**Findings** – The results suggest that value creation through service process- and product-related elements constitutes improved company performance, whereas cost-related elements do not. In addition, when it comes to the role of digitality in value creation, results show that to generate benefits, digitality must be implemented in the company's strategy and in an existing business model.

**Originality/value** – Despite the increasing amount of literature on value creation in the digitalized world, theory and empirical understanding that reflect the complexity and dynamism of the delivery of value to customers through digitality are still lacking. This study contributes to this research gap, by presenting the characteristics of sustainable customer value that contribute to value creation.

**Keywords** Sustainability, Customer value, Value creation, Digitalization, Digitality

**Paper type** Research paper

## 1. Introduction

Digitality has affected the operations and businesses of traditional industrial organizations, and brought major changes related to the delivery of products and services, markets, customers and business itself (Saunila *et al.*, 2017). According to Dufva and Dufva (2019), digitalization can be seen as a key motivation for the concept of digitality. Negroponte (2015) defined digitality as a concept or phenomenon referring to living and operating in a digital and digitized culture. Dufva and Dufva (2019) contended that digitality refers not only to the philosophical mathematical system but also to the effects digital technologies have on society. Thus, in this study, digitality is seen as a concept related to digitalization that affects the operations and businesses of organizations operating in traditional physical business environments. One way in which traditional industrial organizations can, and must, react to change caused by increased digitality is to focus on the development of digital services, as well as on the creation of sustainable customer value (Saunila *et al.*, 2018). This reaction by industrial companies has resulted in an increase in digital business, which refers using technology and digitality as an advantage in a company's internal and external operations. Powered by the ongoing IT revolution and increase in digitality in the business environments of traditional industrial organizations, customer value creation can be seen as



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an important process in the dynamic and competitive business environment. Increased digitality and contemporary digitalized solutions enable different economic actors to exchange resources, and thus, co-create value, through virtual, rather than physical, interfaces (Breibach and Maglio, 2016; Davis *et al.*, 2011; Makarem *et al.*, 2009). Focusing on service process-, product- and cost-related elements (summarized in Table I) of customer value in digitalizing business environments enables organizations to achieve better relationships with their customers, and to improve the service experience.

The importance of customer value creation has increased in recent years due to fiercer competition (Grönroos, 2011; Grönroos and Voima, 2013). The competition in digitalizing business environments is even stronger than in traditional industrial business environments, because the capital required to start something that operates in the digital environment is less than what is needed in the traditional industrial business environment.

Elements			References
Service process related	Service delivery	Process records: accuracy, flexibility in emergency cases, reliability, on time Reliability and speed of supply	Uлага and Chacour (2001), Möller and Törrönen (2003) and Uлага (2003)
	Service availability	Availability Time and place of service delivery Responsiveness Customer understanding Technical support Service support: services and information flow, outsourcing activities	Fitzgerald <i>et al.</i> (1994), Ravald and Grönroos (1996), Lapierre (2000), Uлага and Chacour (2001), Möller and Törrönen (2003), Uлага (2003) and Heinonen (2004)
	Service quality	Quality Flexibility Reliability Order handling, storing, warranties	Fitzgerald <i>et al.</i> (1994), Lapierre (2000), Uлага (2003) and Walter <i>et al.</i> (2003)
Product related	Production process	Effective production and supply chain Process records (capacity, speed, quality, flexibility) Prototype development, product testing	Möller and Törrönen (2003), Uлага (2003) and Mejtoft (2011)
	Product quality	Quality Performance, reliability Usability Consistency of product Product's characters	Ravald and Grönroos (1996), Lapierre (2000), Sweeney and Soutar (2001), Uлага and Chacour (2001) and Uлага (2003)
	Technology	Product customization Technical competence and new technologies Product innovation Radical innovations Product functionality	Sheth <i>et al.</i> (1991), Lapierre (2000), Uлага and Chacour (2001), Möller and Törrönen (2003) and Walter <i>et al.</i> (2003)
Cost related	Continuous improvement	Cost reductions by process and incremental improvements Alternative solutions	Lapierre (2000) and Möller and Törrönen (2003)
	Relationship	Efficiency, effectiveness, and quality of relationships Networks Supplier knowhow Supplier solidarity with customers	Ravald and Grönroos (1996), Lapierre (2000), Weill and Vitale (2001), Möller and Törrönen (2003), Uлага (2003), Walter <i>et al.</i> (2003) and Mejtoft (2011)
	Price	Product costs Product-/service-related price	Sheth <i>et al.</i> (1991), Lapierre (2000), Sweeney and Soutar (2001), Weill and Vitale (2001) and Uлага (2003)

**Table I.**  
The elements of customer value

In addition, digitalizing businesses are not bound to certain physical locations; thus, companies are able to operate in many countries across the world. Weitzl and Hutzinger (2017) argued that in the era of digital communication, many customers who are dissatisfied with a service experience more often use digital channels, such as social media solutions, to articulate their opinions about products, brands or companies, through public online complaints.

It has been shown that customer value can increase a provider's profits, as the value increases the customer's intention to buy again. This has been the situation in all industries in recent years, and digital business is no exception (McDougall and Levesque, 2000). For example, Xu *et al.* (2017) found that posting product condition information and e-retailer information online influences customers' willingness to pay. Digitality is blurring the boundaries of different companies, so organizations are working more closely with their customers and their partners (Morabito, 2014). Previous researchers have shown that closer contact with customers can assist in creating positive outcomes, for example, in terms of innovativeness, customer satisfaction and value (Chu *et al.*, 2016). Closer relationships are maintained only when both parties expect to gain mutual benefits. This is one reason customer value creation is becoming increasingly important for traditional industrial organizations to survive in digitalized business environments.

As digital business operations are increasingly adopted by industrial organizations as part of their other businesses, digital resources are harnessed to find new sources of competitive advantages, and new sources of customer value, as digital technologies can be used to deliver value to customers in ways that extend customers' normal conscious experiences in the contexts of time and space, as Watson *et al.* (2002) argued. For example, the digital nature of the e-retail industry has created opportunities for e-retailers to quickly collect and analyze customer data at a low cost, and provide unique content that is directly relevant to each customer (Ho and Bodoff, 2014; Oberoi *et al.*, 2017). The main idea of digital business is that it is changing existing businesses or traditional industrial organizations in a holistic and customer-driven way, by renewing the processes, such as by digitizing processes and developing electrical services. For example, among the biggest categorical changes that create pressure on supply chain and purchasing management in the twenty-first century are service integration and digitalization (Immonen *et al.*, 2016).

As digitalization and digital businesses affect operations and business models of traditional industrial organizations, this study will provide guidance for organizations operating in traditional business environments so that they can create and manage sustainable customer value when digitalizing their businesses. According to Breidbach and Maglio (2016), despite the growing academic interest, contemporary technology-enabled value co-creation processes remain largely unexplored, and understanding the performance implications of digital business adoption remains a key challenge for service research (Ostrom *et al.*, 2010; Rai and Sambamurthy, 2006). Thus, the objective of the study is to explore the characteristics of sustainable customer value through digitality that contribute to value creation in terms of increased company performance. In this study, the characteristics of sustainable customer value are analyzed based on the following distinctions: service process-, product- and cost-related elements.

## 2. Literature review

### 2.1 Customer value creation

New business logic, focusing on customers instead of on the market share, as traditional transactional business models did, has been emphasized during the past few years (Vargo and Lusch, 2004, 2008). The growth in competition among different types of companies has posed challenges for companies regarding maintaining their customers and achieving business objectives, because of which companies have shifted their focus from traditional marketing to relational exchange practices with customers who could yield greater business

profits in the long term (Hanaysha, 2018). According to Byus and Lomerson (2004), this change has forced organizations to design all of their operations in a way that creates and maintains satisfied customers. In addition, customer co-creation of value is critical in helping firms achieve competitive advantage, due to its influence on customer satisfaction and loyalty (Navarro *et al.*, 2016; Delpechitre *et al.*, 2018). Value can be seen as the fundamental basis for all marketing activities, as market exchanges occur because all actors involved expect to gain value in the exchange, as Ulaga (2003) stated. Therefore, no interaction between different companies occurs without value being created and delivered. Companies are also trying to find superior competitive advantages by providing customer value based on the belief that a high level of customer value and satisfaction are related to sales, brand and company loyalty, market share and profitability (Woodruff *et al.*, 1993). Thus, it is fundamental to understand that value is not the product or the service itself, but what customers get out of using it (Vandermerwe, 1996). The positive impacts of value creation can be the monetary worth that a product or service provides or nonmonetary benefits, such as competitive gains, competencies, social relationships and knowledge (Möller and Törrönen, 2003). According to Thorpe and Holloway (2008), a customer's source of happiness can be time, quality, service or cost.

Because value is subjective, as different customer and market segments value different things, it is not easy to know how a specific customer views the provider organization. As a result, customer value cannot be generalized easily, which makes it harder for companies to create it, and manage value creation. Ulaga and Chacour (2001) identified that organizations need to consider different kinds of customers, meaning former, present and potential customers, to cover the variety of customers. According to Blocker and Flint (2007), companies face an intense rivalry based on what customers currently value. Current knowledge about what customers value will not hold in the future. To gain and maintain a sustainable advantage, companies need to anticipate what customers will value in the future. For this reason, Blocker and Flint (2007) divided the causes of change into four categories: customers' desires, customers' competitors' actions, offerings of customers' suppliers and the macro-environment, such as technology and regulation. Changes in one or more of these categories will change what customers will value in the future.

Understanding what customers value currently, and in the future, requires a comprehensive understanding of the customer (Woodruff *et al.*, 1993). Without knowledge of what customers need, an organization is not capable of providing value. According to Ravald and Grönroos (1996), this means an organization can create value only when the organization understands what customers are seeking to gain with the organization's product or service. Therefore, a provider needs to know the customer's operations, understand the market where the customer is operating, and know what the product or service is used for, and how it is used. The provider needs to understand the value the company is creating for its customers; when the provider understands the value, the provider will be able to protect the organization more effectively from competitors. Value creation can then be seen as a competitive advantage.

When an organization concentrates on providing a service, the customer must experience the service (Grönroos and Voima, 2013). Likewise, the customer has to use the product being offered. Therefore, not all value is created by the provider, or through cooperation between the provider and the customer. The customer creates some part of the value alone, which means the provider cannot affect all phases of value creation. The organization providing the market offering and the customer can create value alone or jointly. This results in different forms of value creation and co-creation. The customer alone creates value in a use situation, which can be called value in use. In addition, the provider and its partners create value together, as Payne and Holt (2001) identified. According to them, customer value creation includes three types of actors: the customer, company

employees and external stakeholders. Related to the roles of these actors in value creation, Payne and Holt (2001) presented that each of these groups represents opportunities for value creation and delivery. Among customers, these activities are attracting customers, measuring customer satisfaction and ensuring customer retention. Within the group of company employees, these activities include employee recruitment, employee satisfaction and employee retention. External stakeholder activities involve stakeholder engagement (engaging the right stakeholders, such as investors and suppliers), stakeholder satisfaction and stakeholder retention (retaining them and ensuring that shareholders' needs, for example, are satisfied). Furthermore, value can, in turn, create at least four interactions: the partner's and the provider's interaction, the provider alone, the customer's and the provider's interaction, and the customer alone.

### *2.2 The elements of customer value*

Exploring which elements and drivers create value for customers is a prerequisite for all businesses, and thus, an interesting and ongoing issue for practitioners and academics. These value elements can be categorized in many different layers or dimensions (Ravald and Grönroos, 1996; Lapierre, 2000; Ulaga and Chacour, 2001; Möller and Törrönen, 2003). Previous researchers, for example, divided the elements of time, place, price and needs, as Byus and Lomerson (2004) identified, or time, quality, service and cost, as Thorpe and Holloway (2008) stated. These elements can also be the product, service or relationship, as Ravald and Grönroos (1996) mentioned. As a theoretical framework for this study, the elements of customer value are combined from previous works and presented in Table I.

In general, customer elements are those related to the service process, product and cost. In Table I, the value elements are divided into these three categories based on the elements' characteristics. Service process-related value elements are intended to increase customer value by renewing and reorganizing the service delivery and service availability. Product-related value elements are intended to increase customer value by creating, for example, new product innovations and exploiting new technologies. Cost-related value elements are focused on lowering product and service costs by utilizing continuous improvement and different partnerships. In other words, the focus of creating service process-related value is to improve service delivery and availability. The focus of creating product-related value is to improve product design, and that of creating cost-related value is to improve service and reducing cost. Regarding the present study, the focus of creating customer value is to improve the customer value performance with digital intervention. Therefore, exploring whether these elements can be facilitated by digitality in a way that affects the different performances of the studied organizations is interesting.

As a result of the increase in digitality business environments, competition is fiercer, and the changes taking place in the business environment are more massive than ever. However, this also provides opportunities for growing the business, in terms of turnover, as well as regionally. The essential issue is what types of drivers are emphasized when digitalizing traditional businesses in a way that increases customer value and performance. In this study, the focus of the value creation is on adopting digital business in traditional business environments, and therefore, the value elements presented are considered to fit the special features of digital business.

### *2.3 Characteristics of customer value creation in digital business*

Due to the increase in digitality, and the digitalized solutions with which industrial organizations develop and update their offerings, new opportunities and challenges for sustainable value creation arise (Breidbach and Maglio, 2016; Edvardsson *et al.*, 2010). Thus, digital technologies affect every aspect of people's lives, and that is why they are the

main drivers of innovations, and thus, customer value, today. Edvardsson *et al.* (2010) argued that advances in digitalized solutions are transforming the service systems of organizations, and technology-driven advances must be considered when exploring the creation of business value through digitality. Although the terminology concerning digital technologies and digitalized solutions varies, Glückler and Hammer (2011) argued that the common denominator seems to be the high level of ICT-mediated interpersonal interaction human economic actors increasing the human-to-human exchange as part of the value creation process.

Digital technologies, in general, are used in three dimensions. These dimensions are the customer interface, the partner interface and internal information flow. Digital technologies improve the processes related to these dimensions. All of these processes are related to customer value creation, and in these processes, some amount of customer value can be created. Therefore, it is important to pay attention to all of these interfaces. In particular, the partner interface is an important dimension, because the entire supply chain must be considered when creating customer value. Most of the networking value is created in these interactions. The internal information flow is important, as everyone in the company must provide customer value. In addition, internal processes have a large impact on product-related value creation. Most of the value is likely created in the customer interface, as all services provided are due to the interaction between the customer and the provider (Chaffey, 2015).

Digitality can have an effect in three categories. One category is the new digital products and services themselves that the company provides to its customers. Using digital resources to transform either business processes or business strategies represents two more categories of digitality (Bharadwaj *et al.*, 2013). This makes it possible for digitality to be used as an platform for interaction between the provider and the customer, to be a market offering, or to be a part of some operational process while producing the offering. In addition, digital business can refer to the changes in how goods and services are produced and designed (the process), the kinds of goods and services offered (the market offering), or how goods and services are brought to the market (the business model), as Brynjolfsson and Kahin (2000) defined. Whichever is the case, a similar method of creating customer value occurs, and these three categories of digitality are not exclusive; thus, they can be in force simultaneously. Especially when operating with digital market offerings, a provider has to focus strongly on its offering's reliability and trustworthiness. These two elements are the most important qualities in digital business, and they are related to the product.

Because digital business is changing rapidly all the time, and there is a lot of competition, product quality is a given in the industry. If one cannot provide the same quality as one's competitors, one cannot survive in the market. Product quality and customer service levels that are substantially below those of the competition will be judged unacceptable. In addition, as no traditional production takes place in digital business, this industry is different from other industries. Product-related characteristics, therefore, are not the main source of customer value in digital business, but they need to be acceptable.

### 3. Research methodology

In this study, the focus of creating sustainable customer value through digitality was on traditional industrial companies, as those companies have been doing business as usual for several decades. Now, as the business environment is changing substantially, it is important to examine whether they have been making changes in their businesses related to digitality.

Quantitative and qualitative methods of data collection were utilized in the study. First, a survey was conducted to trace the important factors of customer value that constitute the performance. Second, interviews were conducted to clarify how the mechanisms of sustainable customer value operate in practice.

### 3.1 Quantitative methods

The quantitative part of the study consisted of a Web-based survey, which was sent to 23 industrial companies in Finland. In Finland, numerous traditional industrial companies that have operated their businesses in physical surroundings, and have based their customer value creation based on these business logics, exist. However, as in many other countries, the increased digitality is changing the businesses of these traditional organizations, and they have to change and update their value creation methods. In other words, as a part of their traditional businesses, they need to create sustainable business value through digitality. Thus, these companies were selected as the target group, because they suited the scope of the study. Although these companies have done traditional business for years, big changes are happening, due to digitality and the accelerating use of digital resources. The respondents were intentionally selected from different units and work assignments to avoid several specific views and biases. For example, Saunila *et al.*'s (2017) study indicated that the most recent digital solutions and services in industrial organizations are commonly adopted and utilized among sales representatives and research and development (R&D) workers. As these two groups of workers commonly utilize digital solutions, and increased digitality affects their operating environments, these employees understand how sustainable business value is created through digitality. For that reason, these groups were selected to participate in the survey. The survey featured four sections and themes: background, digitality, dimensions of customer value and characteristics of customer value. The items and references are presented in Table II.

The means and standard deviations of the quantitative data were found, after which the analysis of variance was utilized to test differences between different groups. In addition, regression analyses were conducted to trace the relation between customer value elements and different performance dimensions.

### 3.2 Qualitative methods

To deepen the results of the survey, five interviews were conducted. The interviewees included the managers of industrial companies and representatives of development organizations. Three of the respondents worked at industrial companies where digitality has brought many changes in recent years. These respondents' views and opinions were relevant to see what is really happening. These representatives were in manager positions, because the study needed a key informant approach. It was necessary that the respondents had worked for the company for several years. Three industrial companies were in different stages of digitality implementation in their market offerings. One company has a modeling tool, one makes physical products for the construction industry and one makes automation solutions, including modeling and physical products. That sample gave the study the needed comprehensive view of how the topic is dealt with in industrial companies. The respondents were chief executive officers (CEOs) and chief business officers, because the study needed a comprehensive view and understanding of companies, and how all of the functions and operations relate to one another. In addition, information obtained from the study regarding investments was needed. These three companies were suitable for the study because they operate in a changing industrial business environment.

Two respondents were from development organizations, which represent entrepreneurs in South Karelia and Tavastia. Their opinions were relevant to get a bigger picture of what is happening in these regions. Two representatives were from organizations that help entrepreneurs, companies and public organizations grow, and acquire education and information. One is focused on entrepreneurs and smaller companies, with only private companies a part of that organization. The other organization has public-sector organizations as members, with private companies being bigger. The respondents were the CEOs of these organizations, because they have the most comprehensive views of how these companies operate.

Themes	Items	Scale	References
Background questions	Company size Operating unit Performance dimensions (financial, operational, renewal, sales, sustainability)	Open field Management/marketing, R&D, production From 1 to 4 (from weak to excellent)	
Digitality	What is the level of digitality in your company?  How is digitality is shown in your: (1) market offering (product/service), (2) process, and (3) business model? How is digitality shown in your company's strategy?	From 1 to 4 (from no digital resources in use to everything digital) From 1 to 4 (from no digital resources in use to everything digital) From 1 to 4 ("not digital strategy," "doing something digital," "making a totally new digital strategy," and "transforming the old business model to be digital")	Moore (1999)  Brynjolfsson and Kahin (2000) Moore (1999)
Dimensions of customer value	How significant do you consider the following things in customer value creation (1) Characteristics of end product/service (e.g. quality, production, price) (2) Characteristics of services (e.g. price, delivery support services) (3) Characteristics of the relationships with customers and partners (e.g. networks, customer relationship, brand)	From 1 to 5 (not significant to very significant)	Ravald and Grönroos (1996) and Lapierre (2000)
Characteristics of customer value	(1) Qualitative characteristics of end product/service (2) Production characteristics of end product/service (3) Additional innovations for existing product/service (4) The price of the end product/service (5) The prices of other services (6) R&D functions (7) The characteristics of deliveries (8) Characteristics associated with the level of service (9) Cooperation networks (10) Characteristics of the customer relationship (11) Understanding the customer's business environment and the competition (12) Brand	From 1 to 5 (strongly disagree to strongly agree)	Fitzgerald <i>et al.</i> (1994), Ravald and Grönroos (1996), Lapierre (2000), Sweeney and Soutar (2001), Ulaga and Chacour (2001), Weill and Vitale (2001), Möller and Törrönen (2003), Ulaga (2003), Walter <i>et al.</i> (2003), Heinonen (2004) and Mejtoft (2011)

**Table II.**  
The survey of  
customer value

The interviews focused on the same levels of customer value that were utilized in the survey tool. In this study, a thematic qualitative analysis approach was taken. Thus, the interviews consisted of several themes, and the answers were arranged so that the respondents replied about all of these themes. The key themes in the interviews were explored with the following questions: How would you assess the level of digitality in your company, and how is digitality shown in action, for example, in terms of customer behavior, processes and the markets? What forms the customer value in your products and services? How much do you invest in customer



value creation? What are the benefits of investments in customer value creation? The interview questions were decided in advance, but the discussions were informal, and were facilitated using supporting questions and researchers' comments. Generally, the interviews lasted a minimum of 45 min to a maximum of 90 min, based on the interviewees' availability and commitment. All the interviews were recorded and transcribed to enable in-depth analysis. The data analysis was conducted in line with the content analysis method. As our goal was not to achieve scientific generalization, we used theoretical concepts as templates with which to compare the empirical results (Yin, 2003). This process was conducted iteratively. The content analyses were made through two rounds of a coding process, to generate patterns and understanding of the creation of sustainable business value through digitality. The aim of the first coding round was to explore the phenomenon of customer value creation through digitality from the perspective of individual companies. Thus, during the first round, each interview transcript was analyzed individually to understand the customer characteristics from the perspective of each company. During the second coding round, the results of the first round were combined to ensure agreement of sustainable customer value creation through digitality.

## 4. Results

### 4.1 Survey results

*4.1.1 Description of the data.* The means and standard deviations of the data are presented in Table III. In all of the companies, digitality was exposed, and it was present in all of the categories: the market offering, the processes and the business model. Based on the questions about the dimensions where digitality was used, and the extent to which it was used, it could be stated that digitality was most commonly used in production processes, meaning the technologies in production.

The level of digitality in a company's strategy was also inquired about. Most of the respondents were transforming their old business models to be digital, so quite a lot of digitality was implemented in the organizations' strategies. Only one respondent answered that there was no digitality strategy in their company. It can be stated that companies in Finland today are focusing increasingly on implementing digitality in their strategies.

The dimensions of customer value included the product, service and relationship. Based on the survey, it was noticed that the product dimensions were perceived as the most significant, and relationship as the least significant.

The top 5 characteristics of customer value in which the companies invested their money and efforts were related to product dimensions (Table IV). The element most invested in was considered the qualitative characteristics of a product or service. It could be that quality was perceived as necessary to compete in the markets, but the actual value was created by collaboration and an effective customer relationship. Networks were not seen as important; however, subcontractors were included, as they are important for a company's success.

	Mean	SD
Level of digitality (overall)	2.62	0.498
Digitality in market offering	2.43	0.870
Digitality in process	2.67	0.796
Digitality in business model	2.19	0.680
Digitality in company's strategy	2.86	0.854
<i>Significance in customer value creation</i>		
(1) Characteristics of end product/service	4.24	0.436
(2) Characteristics of services	4.05	0.590
(3) Characteristics of the relationships with customers and partners	3.67	0.730

**Table III.**  
Description  
of the data

**Table IV.**  
Results of the  
analyses: strategy

	Mean	SD	Level of digitality		<i>F</i>	Digitality in strategy		<i>F</i>
			Low	High		Low	High	
(1) Qualitative characteristics of end product/service	4.19	0.750	4.13	4.23	0.094	3.57	4.50	10.597**
(2) Production characteristics of end product/service	4.00	0.973	3.63	4.25	2.093	3.67	4.14	1.006
(3) Additional innovations to existing product/service	3.76	1.136	3.63	3.85	0.180	2.86	4.21	9.487**
(4) The price of the end product/service	4.00	0.707	4.00	4.00	0.000	4.00	4.00	0.000
(5) The price of other services	3.19	1.030	3.13	3.23	0.050	2.86	3.36	1.104
(6) R&D functions	3.70	0.979	4.13	3.42	2.745	3.14	4.00	4.050****
(7) The characteristics of deliveries	3.67	0.966	3.50	3.77	0.373	3.29	3.86	1.689
(8) Characteristics associated with the level of service	3.86	0.910	3.75	3.92	0.172	3.29	4.14	4.957*
(9) Cooperation networks	3.48	0.873	3.63	3.38	0.364	3.00	3.71	3.519****
(10) Characteristics of the customer relationship	4.00	1.049	4.25	3.85	0.724	3.43	4.29	3.508****
(11) Understanding the customer's business environment and the competition	3.76	0.995	4.00	3.62	0.730	3.14	4.07	4.843*
(12) Brand	3.95	0.973	4.00	3.92	0.029	3.43	4.21	3.406****

**Notes:** \*\*\* $p \leq 0.001$ ; \*\* $0.001 < p \leq 0.01$ ; \* $0.01 < p \leq 0.05$ ; \*\*\*\* $0.05 < p \leq 0.1$

*4.1.2 Statistical analysis results.* In this section, whether differences were found between the responses regarding company customer value characteristics based on the level of digitality and the level of digitality in the company's strategy is discussed. In addition, the effect of the level of digitality and the level of digitality in strategy for different performance dimensions was tested. The differences were investigated via a comparison of the means, where the analysis of variance was utilized.

First, the differences in the characteristics of customer value creation were examined according to the levels of digitality in companies. The significant differences concerning all of the questions are illustrated in Table IV. As the table indicates, no statistically significant differences were found. The level of digitality did not affect the investments made in different characteristics of customer value creation.

Second, the differences between companies that have digitality well represented in their strategy and those that have no or only a little digitality represented in their strategy were examined. As Table IV illustrates, statistically significant differences were found for eight questions. Companies with digitality well represented in their strategy invested more in many characteristics of customer value creation than did those that did not have digitality well represented in their strategy. In particular, the qualitative characteristics of an end product or service and additional innovations for an existing product or service received more emphasis in companies with digitality in their strategy.

In Table V, the statistically significant differences in different dimensions of performance are shown. The differences were examined based on the level of digitality and the level of digitality in a company's strategy.

**Table V.**  
Results of the  
analyses: performance

	Mean	SD	Level of digitality		<i>F</i>	Digitality in strategy		<i>F</i>
			Low	High		Low	High	
(1) Financial performance	2.48	0.981	2.38	2.54	0.132	2.43	2.50	0.024
(2) Operational performance	2.52	0.814	2.13	2.77	3.492****	2.00	2.79	5.285*
(3) Renewal	2.52	0.680	2.38	2.62	0.607	1.86	2.86	19.396****
(4) Sales performance	2.71	0.784	2.88	2.62	0.531	2.43	2.86	1.425
(5) Sustainable performance	2.67	0.730	2.63	2.69	0.040	2.14	2.93	7.031*

**Notes:** \*\*\* $p \leq 0.001$ ; \*\* $0.001 < p \leq 0.01$ ; \* $0.01 < p \leq 0.05$ ; \*\*\*\* $0.05 < p \leq 0.1$

In total, only one statistically significant difference was found in the performance dimensions in companies with low and high levels of digitality. In contrast, when the differences based on the level of digitality in a company's strategy were examined, statistically significant differences were found in three dimensions. Companies with a high representability of digitality in their strategy performed better in terms of renewal, operational performance and sustainable performance.

Next, the items of the characteristics of customer value were entered into factor analysis, which resulted in three factors with an eigenvalue higher than 1. The factors were labeled as follows: service process-related elements (including the qualitative characteristics of an end product or service, R&D functions, the characteristics associated with the level of service, and understanding the customer's business environment and the competition), product-related elements (including the production characteristics of an end product or service, the delivery characteristics, the characteristics of the customer relationship and the brand) and cost-related elements (including additional innovations for an existing product or service, the price of the end product or service, the price of other services and cooperation networks). The reliability of factors was ensured by calculating Cronbach's  $\alpha$  values (over 0.6 in all factors).

Regression analyses were performed to examine the relation between the factors and different dimensions of company performance. As shown in Table VI, the service process-related element was statistically significantly and positively related to renewal and sustainable performance. The product-related element was statistically significantly and positively related to financial performance, operational performance and sales performance. The cost-related element was not statistically significantly related to any of the performance dimensions.

#### 4.2 Interview results

Based on the survey results, semi-structured interviews were conducted. The results considering the sustainable customer value in digital business were analyzed based on the following distinction: product, service process and cost related.

The results of the interviews indicated that digital resources were in use at all of the companies, and in all of the dimensions: the market offering, the processes, and the business model. Overall, digital end products or services were not common in the interviewed industrial companies. Digital resources were used more frequently in processes such as R&D and in sharing information between different operators. In addition, quite a few digital resources were used in making purchases.

In the interviews, it was pointed out that product quality, support activities (service related), relationship and understanding are the most relevant elements for customer

Dependent variable	Financial performance		Operational performance		Renewal		Sales performance		Sustainable performance	
	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$	$\beta$	$t$
<i>Independent variables</i>										
Service process	-0.226	-0.889	0.084	0.381	0.734***	4.452	-0.095	-0.388	0.649**	3.514
Product	0.473*	2.213	0.664**	3.661	0.219	1.134	0.547*	2.695	0.337	1.617
Cost	-0.311	-1.467	0.312	1.780	0.265	1.654	-0.170	-0.809	0.101	0.527
<i>F</i>	4.900*		13.404**		19.824***		7.265*		12.347**	
<i>R</i>	0.473		0.664		0.734		0.547		0.649	
<i>R</i> <sup>2</sup>	0.224		0.441		0.538		0.299		0.421	

**Notes:** \*0.01 <  $p$  ≤ 0.05; \*\*0.001 <  $p$  ≤ 0.01; \*\*\* $p$  ≤ 0.001

**Table VI.**  
Results of  
regression analyses

value creation. Product quality can be seen as something extra if it is really good, for example, if it is ensured by quality certificates. Still, in most cases, the quality of the market offering was seen as a given, as competitors could provide the same offering. That is why something extra is needed to win customers. Still, even with quality, some kind of dissociation could be made, for example, with certificates. Furthermore, the interviewees indicated that sustainability issues are becoming increasingly important, and that digital technologies are seen as a tool for increasing, for example, environmental friendliness.

The interviewees were unanimous in saying that to create value through the digital environment, companies need to offer comprehensive product and service ranges. Just one market offering is not enough; the offering has to be configurable, and have different features, such as options between big and small, fast and slow, and added features. In addition, the services provided with the product need to be comprehensive, including, among others, maintenance, support and delivery services. However, based on the interviewees' perceptions, the companies themselves need to focus on their core businesses, while other operations need to be outsourced and performed by subcontractors. This brings networking skills into a key role. In addition, digital resources in these interactions are important. Some were already used, but in the future, more are required, and it was acknowledged that more will be used.

Understanding the customer is the basis for all transactions, and is the only way to really create customer value, as by understanding the customer, one is able to fulfill the customer's requirements and desires. This relationship with customers can be supported by digital tools. Even the biggest companies thought they need more developed systems and resources. Especially in networks and with subcontractors, more digital resources were needed to share information more quickly. Although digitality was seen as a way to increase customer value, human interaction could not be forgotten. Although digital resources smooth the interaction, relationships still have to be built and maintained. The initial purchasing decision was based on actual face-to-face meetings.

Price in this study was seen as compulsory, but competing with that was not seen as a clever strategy. The prices of services were an interesting issue, because customers are not willing to pay anything for them. Price competition in some industries is still quite common, which requires that the quality of the offering be similar. Still, because competition is fierce in many industries, similar products with similar quality can be found, so it cannot be the only thing creating value. The importance of augmented offerings, such as services and maintenance, is increasing.

#### *4.3 Contribution to theory*

As a summary of the explored characteristics of sustainable customer value contributing to value creation in terms of high company performance, the results of this study revealed the following. Companies with digitality integrated into the company strategy are investing more in the characteristics of customer value and value creation, especially service-related ones. This can be because when digitality is a part of the company's strategy, it is likely to be connected to an existing business model in terms of developing and intensifying services and solutions. Thus, the strategy assists in creating and generating value for customers through digitality. The results support Raval and Grönroos (1996), who presented that an organization can create value only when the organization understands what customers are seeking to gain with the organization's product or service. The results also support Grönroos and Voima's (2013) statement that when focusing on providing a service, it has to be acknowledged that the customer must experience the service. This experience consists of elements such as the availability, time and place of the service delivery, flexibility and service support (c.f. Ulaga and Chacour, 2001; Möller and Törrönen, 2003; Byus and Lomerson, 2004; Thorpe and Holloway, 2008; Saunila *et al.*, 2017). All of these elements can be facilitated with digital solutions.

It was also found that companies with higher appreciation of cost-related elements in digital solutions and services performed worse in terms of performance dimensions. In better-performing companies, value creation through digitality was connected to the service process- and product-related elements. The effects of the elements of customer value on different performance dimensions were as follows:

- The product-related elements of customer value in digital business affect financial, operational, and sales performance.
- The service process-related elements of customer value in digital business affect renewal and sustainable performance.
- The cost-related elements of customer value in digital business (meaning lower prices due to the decrease in manufacturing costs, and development aiming to lower manufacturing costs) do not affect any of the performance dimensions.

Also highlighted in the interviews was that price was seen as compulsory, but competing on price was not seen as a clever strategy.

Although previous studies have presented cost reduction as a driver for increased performance (Lapierre, 2000; Möller and Törrönen, 2003; Thorpe and Holloway, 2008), this is not the case in digital businesses. The higher performance of companies that emphasized service process-related elements indicates that digitality is more valuable in improving service processes than in cutting costs. In addition, new digital innovations and solutions can support customer value and value creation if they are linked to service-related production. One main reason for that might be that the internal productivity and effectiveness within Finnish companies are at a high level, and that new digital innovation and solutions cannot generate much more value by lowering costs. Instead, these digital solutions and innovations should be linked to service-related production to generate customer value.

## 5. Conclusions

This study explored the characteristics of customer value in digitalizing business environments of industrial organizations that contribute to value creation in terms of increased company performance. Previous researchers concluded that because the global economy is increasingly driven by digital businesses, the need exists for a theory that elucidates the actual value-creating elements. This study extends the results of these previous studies by concentrating on digital industrial services in the business to business context. As a main contribution, the study has clarified the characteristics of customer value that contribute to value creation and performance. The results suggest that value creation through service process- and product-related elements constitute higher company performance, whereas cost-related elements do not. In addition, when it comes to the role of digitality in value creation, digitality must be implemented in a company strategy, as well as in an existing business model, to generate benefits.

Several limitations exist concerning the data collected. However, due to the nature of the research subject, combining quantitative and qualitative methods is an appropriate research strategy for gaining a deeper understanding of customer value creation in digitalizing business environments. This study showed that more in-depth action research and case studies are needed to validate the results in terms of suitability, usefulness and acceptability. Although the results supported many of the propositions in literature, they also generated a number of open questions for further research. First, it might be interesting to conduct comparison studies in other industries, to investigate whether a relationship exists between the cost-related elements of value creation and company performance in these industries. Second, future studies should focus on investigating how value creation can be measured to better support its improvement in terms of high company performance.

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**Corresponding author**

Tero Rantala can be contacted at: [tero.rantala@lut.fi](mailto:tero.rantala@lut.fi)