

## Article

# The Implementation of New Technologies in Customer Value Management—A Sustainable Development Perspective

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**Abstract:** The constant development of information and communication technologies (ICT) has led to numerous social and economic changes. In this article, we aimed to identify the framework of use of new technologies in the process of customer value management from the perspective of sustainable development in the context of the concept of the engaged customer. The research objective involves an empirical verification of the forms of customer engagement from the point of view of the utilisation of ICT. To discover and explore the patterns that follow, research based on quantitative methods was carried out. The study was conducted with a sample of 1134 individual respondents from Poland, which is one of the biggest and fastest growing e-market in Europe. The findings prove that in the process of customer value management, informal communication, both offline and online plays a critical role. From the perspective of business practice, a company should stimulate customer engagement by making use of the online environment, thus gaining greater control over the entire process of co-creation of value for both customers and itself. Taking advantage of ICT in the process of customer value management is highly relevant and much desired during the time of the Coronavirus Disease 2019 (COVID-19) pandemic.

**Keywords:** customer value; customer value management; customer engagement; sustainable development; ICT



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## 1. Introduction

Along with the development of the computer era, dating back to the 1960s, being the first stage in the development of information and communication technologies (ICT), a technological evolution continuing till today began. The numerous social and economic changes occurring along the way have caused an era of transformation [1]. The changes resulting from digital transformation have a very broad impact—they determine the operations of economic actors, influence market processes and structures and affect the lives of individuals. The digital transformation era occurs simultaneously with the dynamic development of emerging (transformational) technologies, such as: Artificial Intelligence, Big Data, Cloud Computing, Internet of Things, Social Media, etc. These innovations may influence micro and macroeconomic evolutions, by changing the way economies and businesses operate, e.g., tools based on Artificial Intelligence solutions (i.e., artificial neural networks) made it possible to analyse and solve complex issues related to companies' /economies' future condition—forecast an economy's development [2] or an enterprise's financial development [3] or predict sales volume and turnover [4]. The common access to the Internet, used by 59% of the world's population [5], to social media, whose users are 49% of the global population, and to mobile devices, 66%, has affected customer behaviour and the marketing strategies of businesses [6]. ICT has contributed to the evolution of the role of the customer in an organisation—from a passive participant of market processes to an

active actor having a real impact on an organisation's practices. In addition to the above, the numerous technological changes have contributed to the emergence of a new type of customer—an individual who is knowledgeable and up-to-date thanks to unlimited access to knowledge, an individual who is rather impatient, who values a personal approach and convenience, who also regularly shares opinions and ideas online (blogs, message boards, social media). From the point of view of corporate growth, a very important goal is to act in line with the concept of value co-creation, which takes the form of operational or strategic collaboration based on customer engagement and a strong relationship with the company [7]. The modern customers, the relationship with such customers and the knowledge about them are the most valuable marketing resources of a business [8].

The recent years have breathed some significant changes in the perception of sustainable development in the economic life, which has also contributed to the numerous metamorphoses of the ways in which economic actors operate. The idea involving a mutual collaboration of entities aiming at the fulfilment of their needs while curbing the potential losses at the same time [9] has been approved not only by governmental organisations but also by manufacturers and end users [10]. Combined with the social and economic changes brought about by digital transformation [1], the concept of sustainable development changes the way in which businesses operate and how customers act and behave. A customer concerned about sustainable development is an altruist willing to share their possessions with others, driven by motives completely unrelated to an intention of making a profit [11]. The growing popularity of the philosophy in question [12] forces business to change its approach to customers, to evolve its marketing strategies and the process of managing customer value. A new perspective in customer value management is now customer engagement, which is a crucial phenomenon in the aspect of forming, maintaining and strengthening the relationships between businesses and their customers.

In this article, we aimed to identify the framework of use of new technology in the process of customer value management from the perspective of sustainable development in the context of the engaged customer concept. The research objective involves an empirical verification of the forms of customer engagement from the point of view of the utilisation of ICT. We conducted a study among 1134 respondents to prove that nowadays customers adopt a more active attitude to their favourite brands and companies—they are also willing to create value through advocacy. To get a fuller picture of customer engagement we made predictions of its future directions, thus corresponding with the process of customer value management. Our findings show that in the process of customer value management, what matters a lot is informal communication. This is highly important from the perspective of business practice and allows to conclude that companies should make use of the online environment to stimulate customer engagement—it is also much desired in the time of the world's health crisis and limited mobility as a result of the Coronavirus Disease 2019 (COVID-19) pandemic.

## 2. Literature Review

### 2.1. Customer Engagement

From the point of view of a business, the concept of customer engagement is an important aspect employed in the process of building a competitive advantage [13]. Engagement potential can be used, e.g., in the process of building customer value, maintaining long-term customer-company relationships, inspiring brand loyalty and promoting co-participation in a company's marketing activity—Word of Mouth (WOM) and Online Word of Mouth (eWOM) [14]. The concept takes the principles proposed by, e.g., the relationship marketing theory [15] and the theory of prosumption, further emphasising the role of the customer in an organisation [16], and offers a new perspective on customer value management, where the customer is actively involved in building the company's reputation and provides valuable feedback regarding the company's actions, thus having a real impact on the income generated [17]. The collaboration between a business and a customer spending an average of 6 h and 43 min online [5] should take place at each and every stage of value creation [6].

Today's customers are actively involved in the co-creation of business value, which not only is to be an advantage to them but also is to facilitate the purchasing process and bring satisfaction to other—often new—customers. Vivek, Beatty and Morgan [14] associate the concept of customer/consumer engagement with the reciprocity theory, implying that customer engagement comes from the sense of being provided with some tangible or intangible value from a company, a value which others do not receive as part of the same offering.

Customer engagement is manifested in the process of informal communication—both offline (WOM) and online (eWOM). As part of the process, customers and companies exchange their views about a given brand and the products or services it offers [18]. The outcome of informal communication is a set of formulated opinions in the form of blog posts, social media comments and views and impressions shared with friends and family members.

Studies show that customers' positive associations with a brand translate into a greater level of engagement as well as into readiness to purchase from the brand again as a result of a growing sense of loyalty to the company that has delivered the said positive experience [19]. Moreover, without a clear psychological engagement with the company, the customer is unable to take any immediate action manifesting their behavioural engagement [20]. A factor that has a positive impact on the level of customer engagement is the innovative nature of a product or a service.

## 2.2. Customer Value Management

A natural consequence of customer engagement is its impact on the perceived customer value [14]. The emergence of the concept of customer value management was driven by the adoption of the relationship marketing perspective in the second phase of the evolution of the domain of marketing [21]. In a discussion on the so-called "third wave", Toffler [22] noticed that the border separating companies and customers was gradually vanishing, and the value co-created by customers was becoming increasingly important. The role of a modern business, which should be focused on the customer's needs and satisfaction at every stage, is to skilfully manage the co-created value.

Customer value management can be defined as a managerial approach measuring customer value and aiming at increasing it through the implementation of processes designed to improve the quality of the customer-company relationship; in this perspective, a customer is treated as the company's crucial resource [8]. The most important qualities of customer value management include: orientation on the customers and on their needs, viewing the customer as a partner co-creating value and playing a significant part in the adopted business model, building long-term, lasting relationships with customers to benefit the process of value co-creation.

Depending on the motivation behind the engagement in the process of value co-creation, customers may receive internal and/or external value [14]. The internal dimension of value involves situations in which the customer appreciates the opportunity to get involved, and the external dimension of value is about a possibility to perform certain actions better or to gain some tangible benefits. Study findings show that a high level of customer satisfaction correlates with the customer's inclination to co-create both internal and external value [23].

## 2.3. Technologies in Customer Value Management

With the arrival of Web 2.0, a stage of development of the Internet characterised by a shift in the role of the web user, from a passive user, a mere consumer of online content, to an active user, a creator [24], a change of the role of the customer in an organisation occurred. The development of ICT has made it possible to keep in constant touch with customers, the store and analyse their data [8] and reach out to them with personalised messages in real time. The existing technologies (e.g., social media, semantic networks) make it possible to recognise a customer as a company's partner and main stakeholder [25].

In the age of digital economy, advocacy, the last stage of the marketing funnel, is no longer limited to word-of-mouth marketing but is enhanced by mobile technologies and actions taken in social media [26].

The IT solutions streamlining the process of customer value management include dedicated customer relationship management (CRM) systems—such solutions make it possible to analyse customer behaviour based on the behavioural data (“traces”) they ‘leave’ online [27]. These solutions are based on, e.g., technologies incorporating machine learning and Artificial Intelligence, which enable them to send personalised marketing content in real time.

Today’s social media platforms play such a vital part in the process of communication between their users that researchers agree [27] to refer to them as certain specific social CRM systems. Social media can be used to build relationships with customers but also to manage contacts, which contributes to a growing engagement on the part of customers. Social media platforms, e.g., Instagram and Facebook, enable a continuous dialogue between customers and businesses and other customers, which lets them exchange their opinions and share their experience [28]—customers can act within groups, bringing together users interested in and following a given brand, which translates into co-creation of the image of the company owning the brand in question [6]. An important role of marketing based on social media is the elimination of the potential information asymmetries existing between market actors [18].

In order to improve the experience customers get when interacting with a company, many businesses decide to create dedicated mobile applications aimed at facilitating the communication between customers and their brands [26]. For customers, such applications are a medium of content—offering textual and video resources; a self-service channel—enabling them to place and track their orders; an integrated system associated with the key customer experience of a product or a service.

#### *2.4. Perspective of Sustainable Development*

Parallel to the progressive development of customer engagement processes, the concept of sustainable socio-economic development emerges. It can be defined as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [9]. It is considered one of the megatrends of today [12]. According to this idea, the economy, societies and the natural development develop in parallel [29]. Sustainable development concept is supported by the Sustainable Development Goals 2030 adopted by the UN in 2015 (former Millennium Development Goals), included in the 2030 Agenda for Sustainable Development [30]. The programme defines 17 goals divided into 169 specific targets to be achieved by UN member states by the end of 2030. They focus on five areas (5xP): people, peace, partnership, prosperity and planet.

In terms of the numerous socio-economic changes resulting from digital transformation and being a consequence of the implementation of the concept of sustainable development, we can see changes, e.g., in the nature of the consumption of goods and in customer attitudes and behaviour. The sustainable development philosophy aims to limit overconsumption and excessive utilisation of resources, especially non-renewable ones. The model of a circular economy, where the amounts of the resources consumed and waste generated is limited by making use of the available assets for as long as they do not lose their properties, is becoming more and more popular as a corporate business model—the process can be represented visually as a closed process loop [31]. Technologies based on, e.g., Artificial Intelligence make it easier to implement innovations optimising processes and enabling making effective use of circularity, e.g., design and acquisition of the right resources or the improvement of the performance of certain business models. Furthermore, the phenomenon of sharing economy, which involves individuals making their physical goods, resources, services, assets or capitals available to other individuals on a paid basis and without the transfer of ownership, is becoming increasingly popular [32].

The goods and services offered via online platforms based on the sharing economy concept are priced competitively to goods and services offered directly by companies. Bartenberger and Leitner [33] suggest that reducing the extent of individual ownership to the benefit of shared consumption reduces demand and thus has a positive impact on sustainability. Moreover, the users of the sharing economy are often motivated by such factors as the willingness to share their goods with others and help them, as well as the intention to have a more sustainable lifestyle and putting new experiences over new possessions, which proves the social significance of the ongoing changes [11,34].

Abbas, Gao and Shah [35] have proven that companies' initiatives incorporating elements of corporate social responsibility and sustainable development have a positive impact on customer engagement. Adopting and making good use of a sustainable development strategy is correlated with both an increase in the level of income and a growth in the level of engagement among customers willing to act for the company, with whom they identify thanks to a strong bond based on the sense of acting together for society. Actions and initiatives communicated in the right way translate into a growing loyalty towards the company and more willingness to advocate for the company. An important aspect supporting building long-lasting relationships with customers is a marketing strategy incorporating the promotion of the undertaken corporate social responsibility (CSR) activities.

In terms of the perspective of sustainable development, the process of customer value management has been changing in its nature. The conducted studies show that reaching out to customers with a sustainable offering based on the UN's sustainable development goals corresponds to their growing sense of satisfaction, which translates into a unique value proposition [36]. In addition to the above, an end product, being a result of the co-creation of a value based on the sustainable development goals, fulfils the needs of contemporary societies and causes no harm to future ones, which is in line with the definition of sustainable development.

### 3. Materials and Methods

Since the end of the twentieth century, deep and dynamic changes in socio-economic life in Poland have been observed, which also take place due to the development of ICT. Poland is one of the biggest markets in Europe and country with rapid growth of digital technologies usage among customers. It can be used as an example of a market where significant change can be identified in customers' attitudes towards sustainable development goals and engagement with brands in online environment. The development and dissemination of the Internet, the diffusion of social media and the growing importance of mobile devices have strongly influenced customer behaviour and marketing activities of enterprises. The key research questions posed referred to the following: what motivates the customer to engage? What feelings are caused by customer engagement? Is the engagement one-time or repetitive from the sustainable perspective?

The empirical studies have been carried out in accordance with the positivist approach to research, a dominant research trend in management sciences [37,38]. When adopting the positivist approach, the idea is to attempt to recognise the general, overall state of reality on the basis of the identified laws and rules governing customer behaviour. The basic aim of the research carried out in line with this approach is therefore to discover and explain patterns and to predict phenomena, which is substantiated by the fact that such research is of a cause-and-effect nature and focused most of all on verification and conclusions. Data are collected mainly based on quantitative methods.

The adoption of the positivist approach as the primary research trend has influenced the selection of the research method and technique, which is why the source of the data presented in the article is a series of Poland-nationwide studies carried out by means of online surveys [39] with the use of the SurveyMonkey application, conducted between the end of September and the beginning of October 2017 among individual respondents.

Before proceeding with the main study, a pilot survey was conducted in order to make sure whether the formulated questions were fully understandable to the respondents.

The questionnaire was to be completed by 1632 people over 18 years of age. Ultimately, 1134 respondents were qualified for the analysis, which constituted 69% of the respondents starting the research. Single missing responses for better measurement quality were not replaced by a median. The average time to complete the questionnaire was over 17 min (median 15 min), and it was over 5 min longer than the SurveyMonkey application forecast. The study was conducted by 570 women and 570 men. The average age of the respondents was 31. Over half of the respondents held a higher education diploma (52.6%). Almost 64% of the respondents considered their financial situation to be very good or good, and 2/3 of them said they shopped online at least once a month. The research sample consisted of 100% Caucasian individuals.

It is important to underline that the measurement scales used in the study were characterised by “attractive parameters”, and all of the considered latent variables are highly reliable because the value of the CR coefficient is over 0.75. This makes it possible to acknowledge that the findings are accurate and reliable, which provides solid grounds for cause-and-effect analyses.

#### 4. Results

According to the relevant source literature, customers’ engagement in a company’s marketing activity usually takes on the following forms: Word-of-Mouth (expressing opinions, making comments, sharing recommendations) [40], direct/indirect interaction with the company (e.g., to make a complaint) and product co-creation [41]. In Table 1, the answers provided by the respondents correspond area-wise with the adopted forms of customer engagement.

Most respondents (around 2/3) share their opinions and impressions with friends and family members offline, while over half of those surveyed use the Internet to share their opinions and impressions with a broader audience (Word-of-Mouth). A similar number of respondents (over 58%) rate products or services, indicating their level of satisfaction at the same time. A little over 43% of the respondents say they participate in various types of events organised by companies.

Almost every fifth respondent co-creates products by getting involved in activities/campaigns organised by companies online, and every eighth respondent says they engage in such projects in a traditional way (offline, without the use of the Internet). At the same time, almost 80% of the respondents do not take part in offline activities/campaigns organised by companies, meaning they do not take any advantage of the chance to co-create their promotional strategies.

The analysis of the forms of customer engagement involved a re-application of the method of extraction of principal components, which revealed a multi-aspect nature of the forms of customer engagement with brands/companies. Bartlett’s test of sphericity proved that the correlation matrix was not an identity matrix in the case of the analysed scale (approximate  $\chi^2 = 6909.427$ ,  $Df = 78$ ,  $p = 0.000$ ), and the value of the Kaiser-Meyer-Olkin (KMO) coefficient, amounting to 0.871, showed that latent structures existed and that the forms of customer engagement with brands/companies were multi-dimensional in their nature.

To determine the number of factors, the less strict Jolliffe criterion (Table 2) and a scree plot were used. Based on the above, it was possible to determine five factors as the optimal solution.

In the last step, the obtained matrix of factor loadings was subject to a Varimax rotation (Table 3), the aim of which is to maximise the variances of standardised factor loadings for each factor.

**Table 1.** Forms of customer engagement (N = 1133, in %).

Detailed List	Definitely No.	Rather No.	Hard to Say	Rather Yes	Definitely Yes
I share my opinions and impressions about products and companies without the use of the Internet (with my friends, family members, shop employees), but I don't contact the manufacturer directly	7.8	19.1	9.8	40.5	22.8
I rate the product or the company on a point scale (indicating the level of my satisfaction with the product, my rating of the quality of the product/service and of the customer service, the overall level of customer satisfaction, etc.)	8.3	18.5	14.9	41.7	16.6
I share my opinions and impressions about products and companies using the Internet (e.g., on a discussion forum or on the shop's website), but I don't contact the manufacturer directly	11.3	26.1	10.2	39.7	12.7
I take part in events/training/workshop sessions organised by companies, which helps me expand my knowledge and skills	19.3	24.9	12.2	32.8	10.8
I take part in events organised by companies who provide me with entertainment	17.2	22.9	16.7	35.0	8.2
I add my own comments to the existing online reviews of products and companies	15.5	31.9	9.6	35.1	7.9
I contact manufacturers via the Internet on my own initiative, expressing my opinions/adding comments concerning the products I have used or intend to use	30.7	36.2	11.9	16.7	4.5
I take part in activities/campaigns organised by companies online, which let me become a co-creator of a product, e.g., of packaging, a brand, etc.	33.2	37.4	9.9	16.1	3.4
I take part in activities/campaigns organised by companies online, which let me become a co-creator of promotional activities, e.g., of an advertising slogan, a script for an advertising spot	34.7	35.8	11.5	14.8	3.2
I take part in activities/campaigns organised by companies in various ways, which let me become a co-creator of any corporate activity/element—except for products and promotion	32.8	34.4	16.7	13.6	2.7
I take part in activities/campaigns organised by companies offline, which let me become a co-creator of a product, e.g., of packaging, a brand, etc.	37.3	40.2	10.4	10	2.1
I contact manufacturers on my own initiative in various ways offline, expressing my opinions/adding comments concerning the products I have used or intend to use	39.6	38.5	10.1	9.3	2.5
I take part in activities/campaigns organised by companies offline, which let me become a co-creator of promotional activities, e.g., of an advertising slogan, a script for an advertising spot	40.3	39.6	9.6	8.6	1.9

**Table 2.** Initial eigenvalues and variances of the extracted factors.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	% Cumulative	Total	% of Variance	% Cumulative	Total	% of Variance	% Cumulative
1	5.462	42.018	42.018	5.462	42.018	42.018	3.566	27.430	27.430
2	1.544	11.875	53.893	1.544	11.875	53.893	2.084	16.032	43.462
3	1.261	9.700	63.594	1.261	9.700	63.594	1.697	13.052	56.513
4	0.928	7.135	70.729	0.928	7.135	70.729	1.604	12.335	68.848
5	0.803	6.177	76.906	0.803	6.177	76.906	1.048	8.058	76.906
6	0.629	4.842	81.748						
...	...	...	...						
13	0.189	1.451	100.000						

**Table 3.** Factor loadings of the extracted factors of forms of customer engagement (N = 1128).

	Variables	Component				
		1 *	2 **	3 ***	4 ****	5 *****
COCREAT	I take part in activities/campaigns organised by companies online, which let me become a co-creator of a product, e.g., of packaging, a brand, etc.	0.789				
	I take part in activities/campaigns organised by companies offline, which let me become a co-creator of a product, e.g., of packaging, a brand, etc.	0.807				
	I take part in activities/campaigns organised by companies online, which let me become a co-creator of promotional activities, e.g., of an advertising slogan, a script for an advertising spot	0.807				
	I take part in activities/campaigns organised by companies offline, which let me become a co-creator of promotional activities, e.g., of an advertising slogan, a script for an advertising spot	0.803				
	I take part in activities/campaigns organised by companies in various ways, which let me become a co-creator of any corporate activity/element—except for products and promotion	0.779				
ONL_OPN	I rate the product or the company on a point scale (indicating the level of my satisfaction with the product, my rating of the quality of the product/service and of the customer service, the overall level of customer satisfaction, etc.)		0.662			
	I share my opinions and impressions about products and companies using the Internet (e.g., on a discussion forum or on the shop's website), but I don't contact the manufacturer directly		0.859			
	I add my own comments to the existing online reviews of products and companies		0.757			
OFFL_OPN	I share my opinions and impressions about products and companies without the use of the Internet (with my friends, family members, shop employees), but I don't contact the manufacturer directly			0.959		
CONT_W_MAN	I contact manufacturers via the Internet on my own initiative, expressing my opinions/adding comments on the products I have used or intend to use				0.769	
	I contact manufacturers on my own initiative in various ways offline, expressing my opinions/adding comments concerning the products I have used or intend to use				0.820	
EVNT_ENT_KNOW	I take part in events organised by companies who provide me with entertainment					0.822
	I take part in events/training/workshop sessions organised by companies, which helps me expand my knowledge and skills					0.854
	Share	0.274	0.160	0.081	0.123	0.131

\* Scale summary: mean = 10.46, standard deviation = 4.66, N = 1134, Cronbach's  $\alpha$  = 0.906. \*\* Scale summary: mean = 9.45, standard deviation = 2.99, N = 1128, Cronbach's  $\alpha$  = 0.728. \*\*\* Single-item dimension. \*\*\*\* Scale summary: mean = 4.242, standard deviation = 1.96, N = 1132, Cronbach's  $\alpha$  = 0.700. \*\*\*\*\* Scale summary: mean = 5.84, standard deviation = 2.34, N = 1129, Cronbach's  $\alpha$  = 0.778. Note: Compiled with the use of the IBM SPSS 23 suite.



The results obtained for the principal components reveal the existence of 5 dimensions which account for 76.9% of the commonalities of all variables, i.e., forms of customer engagement with a brand/company. After the Varimax rotation, it was found that the first component (covering 5 variables), which should be interpreted as a customer's participation in a company's initiatives that let the customer become a co-creator of the company's products and other brand elements (COCREAT), accounted for 27.4% of the total variation. The second factor concerning posting reviews and expressing opinions online—without contacting the manufacturer directly (ONL\_OPN), accounts for 16% of the total variation and covers 3 variables. The next single-element factor is sharing opinions and impressions without the use of the Internet, without contacting the manufacturer directly (OFFL\_OPN), accounts for 8.1% of the total variation. The fourth factor, covering sharing one's opinions and impressions directly with the company (CONT\_W\_MAN), consists of 2 variables and accounts for a total of 12.3% of the variances. The last-fifth-factor, covering 2 variables accounting for 13% of the total variation, is participation in a company's events aimed at providing customers with entertainment or knowledge (EVNT\_ENT\_KNOW).

The analysis of the descriptive statistics of the forms of customer engagement with a brand/company has shown that among the surveyed dimensions, sharing one's opinions and impressions offline (without contacting the manufacturer directly) (OFFL\_OPN) has been given the highest score by the respondents—a mean of 3.51, a median of 4 (Table 4). The dimension in question has also proved to be the most diversified.

**Table 4.** Descriptive statistics of forms of customer engagement with a brand/company (N = 1128).

Variables	$\bar{x}$	Mean	St. Err.	Min.	Q25	Med.	Q75	Max.
Sharing opinions and impressions without the use of the Internet—without contacting the manufacturer directly (OFFL_OPN)	3.51	1.25	0.04	1.00	2.00	4.00	4.00	5.00
Sharing opinions and impressions online—without contacting the manufacturer directly (ONL_OPN)	3.15	1.00	0.03	1.00	2.33	3.33	4.00	5.00
Participation in company events providing the customer with entertainment or knowledge (EVNT_ENT_KNOW)	2.92	1.17	0.03	1.00	2.00	3.00	4.00	5.00
Sharing opinions and impressions by contacting the company directly (CONT_W_MAN)	2.12	0.98	0.03	1.00	1.00	2.00	3.00	5.00
Participation in company initiatives which make the customer a co-creator of products and other brand elements (COCREAT)	2.09	0.93	0.03	1.00	1.20	2.00	2.80	5.00

The dimensions ranked the lowest among all five were contacting companies (CONT\_W\_MAN)—the mean rating was 2.12 (the median was 2), and product co-creation (COCREAT), which was ranked the lowest—the mean was 2.09, and the median was 2. The difference between the highest ranked (OFFL\_OPN) and the lowest ranked (COCREAT) dimensions was 1.42 on a 5-point scale.

When analysing Kendall's tau-b correlation coefficient [42] for the dimensions of the forms of customer engagement, it is necessary to stress the moderate positive correlation existing between the co-creation of products and other brand elements (COCREAT) and the inclination to share one's opinions and impressions by contacting a company directly (CONT\_W\_MAN; 0.462) and the participation in company events aimed to provide customers with entertainment or knowledge (EVNT\_ENT\_KNOW; 0.428) [6]. Interestingly enough, there is virtually no correlation (0.085) between sharing one's opinions and impressions offline (OFFL\_OPN) and sharing one's opinions and impressions online (ONL\_OPN)—Table 5.

Based on the obtained findings, it was possible to characterise how customers behave towards their favourite brands in a typical month. In a typical month, over 75% of the respondents visit online shops, and almost 72% visit brick-and-mortar shops of their

favourite brands. Almost 40% of them post comments and reviews regarding their favourite brands online, and 29% take part in events related to these brands (Table 5).

**Table 5.** Correlation matrix of dimensions of forms of customer engagement (N = 1128).

Variable	COCREAT	ONL_OPN	OFFL_OPN	INT_W_MAN	EVNT_ENT_KNOW
COCREAT	1				
ONL_OPN	0.287 *	1			
OFFL_OPN	−0.002	0.085 *	1		
INT_W_MAN	0.462 *	0.296 *	−0.044	1	
EVNT_ENT_KNOW	0.428 *	0.254 *	0.135 *	0.254 *	1

\* Correlation is significant at the level of  $p < 0.001$ .

In order to get a more in-depth perspective on the respondents' behaviour towards their favourite brands/companies in a typical month, an exploratory factor analysis has been carried out. Bartlett's test of sphericity proved that the correlation matrix was not an identity matrix in the case of the analysed scale (approximate  $\text{Chi}^2 = 1620.674$ ,  $Df = 15$ ,  $p = 0.000$ ), and the value of the KMO coefficient, amounting to 0.755, showed that latent structures existed and that the forms of customer engagement with brands/companies were multi-dimensional in their nature. As a result of the adoption of the Jolliffe criterion, three factors, accounting for 74.24% of the commonalities of all variables, were included in the further analysis. The applied Varimax rotation made it possible to determine the factor loadings for the individual variables (Table 6).

**Table 6.** Respondents' interaction with a favourite brand/company in a typical month (N = 1132, in %).

Specification	Definitely No.	Rather No.	Hard to Say	Rather Yes	Definitely Yes
You visit the brand's/company's online shop	4.8	14.0	5.7	43.4	32.1
You visit the brand's/company's brick-and-mortar shop	4.3	14.2	9.9	46.2	25.4
You talk about the brand/company with friends, you look for information in the press, you pay attention to traditional advertising	4.3	14.4	11.2	48.6	21.5
You search for/read information, opinions, reviews, comments concerning the brand/company online	6.7	20.3	10.7	39.6	22.7
You post comments, opinions, reviews concerning the brand/company online	16.1	32.7	11.3	28.9	11.0
You take part in events related to the brand/company	13	37.1	20.9	21.9	7.1

Ultimately, the result was three consistent dimensions of factor loadings describing the respondents' forms of interaction with their favourite brands/companies in a typical month (Table 7):

1. The 'active reviewer and participant of brand-related events' (ARaPoBRE) is a dimension accounting for 30.4% of the total variation, covering such variables as: talking about one's favourite brand/company with friends, searching for information in the press, paying attention to traditional advertising, taking part in events related to the brand/company and posting comments, opinions, reviews concerning the brand/company online.
2. The 'searcher for brand offering and information online' (SfBOaIO) is the second dimension, accounting for 25.6% of the variances, concerning visiting online shops

- and searching for/reading information, opinions, reviews, comments concerning the brand/company online.
- The 'brand's brick-and-mortar shop's customer' (BBMSC) is the third dimension, accounting in total for 18.4% of the variances, concerning customers visiting brick-and-mortar shops of a brand/company—a single-item factor.

**Table 7.** Factor loadings of extracted factors concerning respondents' forms of interaction with their favourite brands/companies in a typical month (N = 1130).

Specification	Variables	Component		
		1 *	2 **	3 ***
ARaPoBRE	Talking about the brand/company with friends, looking for information in the press, paying attention to traditional advertising	0.608		
	Taking part in events related to the brand/company	0.865		
	Posting comments, opinions, reviews concerning the brand/company online	0.699		
SfBOaIO	Visiting the brand's/company's online shops		0.841	
	Searching for/reading information, opinions, reviews, comments concerning the brand/company online		0.745	
BBMSC	Visiting the brand's/company's brick-and-mortar shops			0.939
	Share	0.304	0.256	0.184

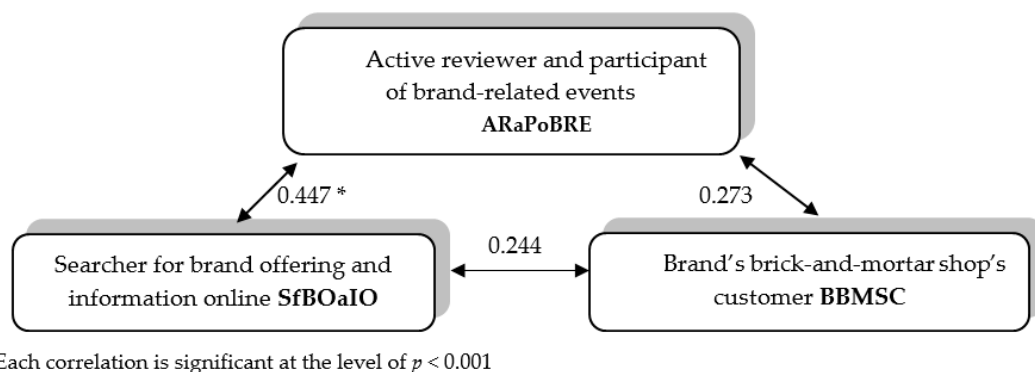
\* Scale summary: mean = 9.28, standard deviation = 2.78, N = 1130, Cronbach's  $\alpha$  = 0.688. \*\* Scale summary: mean = 7.35, standard deviation = 2.03, N = 1134, Cronbach's  $\alpha$  = 0.623. \*\*\* Single-item dimension.

This was followed by an analysis of the descriptive statistics of the dimensions of the respondent's interaction with their favourite brands/companies in a typical month (Table 8). Visiting a brand's brick-and-mortar shop (BBMSC) was rated at 3.74 on average on a 5-point scale (a median of 4 points), where the standard deviation amounted to 1.12. The mean value for the dimension of searching for brand information and offering online (SfBOaIO) was, in turn, 3.68, with a standard deviation of 1.02. The lowest-ranking dimension, falling significantly behind the other ones, was commenting on and participating in brand-related events (ARaPoBRE)—a mean of 3.09, a median of 3.0. The diversification was the lowest among all forms of engagement, amounting to 0.93.

**Table 8.** Descriptive statistics of the nature of customers' interaction with their favourite brands/companies in a typical month (N = 1130).

Variables	$\bar{x}$	Mean	St. Err.	Min.	Q25	Med.	Q75	Max.
Brand's brick-and-mortar shop's customer (BBMSC)	3.74	1.12	0.03	1.00	3.00	4.00	5.00	5.00
Searcher for brand offering and information online (SfBOaIO)	3.68	1.02	0.03	1.00	3.00	4.00	4.50	5.00
Active reviewer and participant of brand-related events (ARaPoBRE)	3.09	0.93	0.03	1.00	2.33	3.00	3.67	5.00

Kendall's tau-b correlation coefficients make it possible to notice statistically significant weak and moderate correlations between the three dimensions of the respondent's interaction with their favourite brands/companies in a typical month (Figure 1). The strongest correlation (moderate dependence—0.447) occurred between the 'active reviewer and participant of brand-related events' (ARaPoBRE) dimension and the 'searcher for brand offering and information online' (SfBOaIO) dimension. Weak correlations were found, in turn, between the 'active reviewer and participant of brand-related events' (ARaPoBRE) dimension and the 'brand's brick-and-mortar shop's customer' (BBMSC) dimension—0.273, as well as between the latter and the 'searcher for brand offering and information online' (SfBOaIO) dimension—0.244.



**Figure 1.** Correlation coefficients for factors of customer interaction with a favourite brand/company in a typical month (N = 1130).

The extracted areas prove that given the occurring market changes, customers adopt a more active attitude to their favourite brands/companies. They talk about brands with their friends, they spend their time to look for information about brands, take part in events organised by brands/companies and create value through advocacy (recommendations).

Customer engagement as active reviewers and participants of brand-related events is more than their satisfaction and loyalty. Engagement provides a real competitive advantage that drives companies to use technology in their customer value management process with a sustainable development perspective.

To get a fuller picture of how customers interact with their favourite brands/companies, a hybrid CART-logit model—a combination of classification and regression trees and binomial logit models—was adopted. Adopting such a method of analysis enables making correct predictions of the future directions of customer engagement, thus corresponding with the process of customer value management. The adopted predictive models addressed:

- visiting brick-and-mortar shops (model M1),
- visiting online shops (model M2),
- searching for information about the company online (model M3),
- searching for information about the company offline (model M4),
- participating in events organised by the company (model M5).

All forms of the respondents' interaction concerned their typical month.

The respondents who share their opinions and impressions concerning products or companies online but otherwise than contacting the manufacturer directly (e.g., on a discussion forum or via the online shop) are almost 3.5 times more willing to visit the online shop of a brand/company (model M2) than those who do not share their opinions about brands/companies online. Moreover, in the case of such customers, the likelihood of taking part in events organised by a company increases over two times (model M5). They tend to look for information about the company online 38% more often than those who do not share their opinions or impressions regarding brands and companies online (model M3).

Customers who share their opinions and impressions concerning products and companies with their friends, family members or shop staff (offline), but also who do not contact the manufacturer directly, will be almost 2 times (1.84) more likely to look for information about the company offline (model M4) compared to those who do not share their opinions and impressions with friends and family members. In addition, they will be 1.5 times (1.37) more likely to visit the company's online shop (model M2). In addition to the above, such customers will look for information about companies online (model M3) almost equally often (odds ratio = 1.34).

The respondents posting comments under the existing online reviews of products and companies will be 56% and 57% more willing to visit a brick-and-mortar shop and an online shop (models M1 and M2), and almost 2.5 times more willing to look for information

about the company online (model M3) compared to customers who do not tend to review brands/companies this way.

In the case of customers who contact manufacturers online on their own initiative, posting opinions/comments about the products they use or intend to use, the likelihood of visiting the manufacturers' online shops (model M2) is approximately 2 times greater compared to those who do not tend to contact product manufacturers directly. The likelihood of searching for information about the company online (model M3) increases in their case by 56%. In the case of offline searching (model M4), in turn, it is 63%.

An interesting case is that of those customers who contact manufacturers on their own initiative in various ways offline, expressing their opinions/adding comments concerning the products they use or intend to use. The likelihood of visiting an online shop (model M2) is two times smaller in the case of the said customers than in the case of those who do not engage in such interaction. However, this is 2–3 times greater when it comes to their taking part in events organised by companies as compared to those respondents who do not take the initiative to contact manufacturers in various ways offline.

Customers participating in company events providing them with entertainment are 2–4 times more likely to take part in other company events (model M5) and 2 times more likely to visit companies' online shops compared to the respondents who do not take part in events organised by companies. Meanwhile, the likelihood of visiting a brick-and-mortar shop (model M2) grows 1.77 times in this case, and the likelihood of searching for information offline (model M4) increases 1.63 times.

We have a similar situation in the case of customers participating in events/training/workshop sessions organised by a company, which help them expand their knowledge and skills; they are 2.4 times more willing to take part in company events (model M5) compared to those who do not participate in such knowledge and skills improvement events. Moreover, such individuals are 52% more likely to look for information about the company online.

## 5. Discussion and Conclusions

In recent years we have been witnessing a changing role of the customer on the market. A contemporary customer 'collaborates' with companies actively and of their own free will, providing them with feedback, remarks, or suggestions for product, marketing and process innovations. By sharing recommendations and information in their environment, such a customer contributes to customer retention and recovery. From the point of view of sustainable development, the excessive, unreasonable individual consumption of goods and services leads to many negative phenomena, such as the waste of natural resources or climate change. Hence, the trend to limit consumption can be seen to grow among contemporary customers, with minimalist movements—encouraging individuals to focus on 'being' (experiences) rather than 'having' (possessions)—being on the rise. At the same time, it involves reducing the consumption and use of natural resources and environmentally harmful materials and substances (waste, greenhouse gases). Many of the contemporary customers appreciate the access to goods and the possibility to use them more than actually owning them. The evolution of the client and the related change in their expectations in relation to the activity of the customer value management of companies becomes a flywheel for a development model based on personalization, recommendation, co-creation of value or a comprehensive process of managing customer value.

Research findings clearly prove that in the process of customer value management, what matters a lot is informal communication (company-customer-customer-company), both offline and online. In the era of the COVID-19 pandemic, the exchange of information has come to involve an extensive and more common utilisation of ICT [43,44], taking digital transformation to a completely new dimension—one beyond the predictions and forecasts of the greatest futurologist of the 21st century even at the beginning of the year 2020. The results confirm the need for businesses to focus on providing customers with unique emotional experience—build customer experience, which is a prerequisite for the

use of new technology in the process of customer value management from the perspective of sustainable development.

To conclude, from the perspective of business practice, a company should stimulate customer engagement by making use of the online environment, thus gaining greater control over the entire process of co-creation of value for both customers and itself. Taking advantage of new technologies in the process of customer value management is highly relevant and much desired in the time of the COVID-19 pandemic. At the same time, it remains in line with the socio-economic sustainable development concept resulting from the digitalisation of our everyday life, given the limited mobility of customers on account of the ongoing pandemic [45]. Furthermore, in order to meet customer requirements in the era of sustainable development, companies should develop a process for identifying, obtaining and appropriately using information related to customer engagement.

It also needs to be stressed that the authors of the article are aware of the limitations of the presented findings. The main deficiency of the conducted study is the unrepresentativeness of the sample, which makes it impossible to generalise the findings by considering other Polish customers, but the study itself may be a contribution to more in-depth studies and analyses focusing on customer engagement in the context of the progressing digital transformation and sustainable development. Moreover, the data were collected before the outbreak of the COVID-19 pandemic, which significantly affected the performance of enterprises, customer behaviour and expectations towards brands and markets in general. Certainly, the relation between sustainable development and customer value management in the era of digital transformation still needs to be explored, especially taking into consideration changes as a result of the COVID-19 pandemic. Additionally, we raise the following questions to be addressed as future lines of research. Firstly, is there a need to redefine the concept of “sustainable development” in the context of changes occurring in the pandemic era? Secondly and finally, how should the validation of the research scales used in research on customer value management from the perspective of sustainable development in the pandemic era be carried out? Research described in this paper broadens the existing knowledge on implementation of new technologies in customer value management from sustainable development perspective, which is extremely important from a business perspective in challenging pandemic times. While the “new normal” situation leads to the “new future”, deeper and long-term research on these issues should be conducted soon.

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