European Research Studies Journal
Volume XXIV, Issue 2B, 2021

pp. 23-38

E-Consumers and their Agile Qualities as Creators of Eco-Innovations: A Case Study

Submitted 01/03/21, 1st revision 14/03/21, 2nd revision 20/05/21, accepted 10/06/21

Agnieszka Rzepka[1], Magdalena Maciaszczyk[2],
Anna Maria Wiśniewska[3] and Maria Kocot[4]

Abstract:

Purpose: *The aim of the article is to illustrate the phenomenon of "green innovation" by e-consumers and to analyze the relationship between the intensification of this phenomenon and the development of their agility.*

Design/Methodology/Approach: *The study was conducted in 2020 on a random sample of 330 enterprises. The respondents were top managers. The methods used in the study were PAPI as well as CAWI. In the first stage of the analysis, a valuation of the level of manifestation of the characteristic features of teal organizations concept was carried out with the use of a 5-point Likert scale. The second stage involved creating a model through which e-consumers create green innovations and implementing it in chosen Polish companies.*

Findings: *An in-depth analysis of the literature on the topic and the studies demonstrate a close correlation between the adoption of agile characteristics by e-consumers and the creation of "green innovations" by them. It was assumed that contemporary businesses exhibit characteristics of Teal organizations that are observable in their activities and management, but the extent of these features depends on a variety of factors.*

Practical Implications: *A proprietary model through which e-consumers create green innovations was invented and implemented in a Polish company "Zakład Zieleni i Rekultywacji". The implementation of the model in other companies may facilitate removing barriers and thus the range of innovation implementation by e-consumers may be extended.*

Originality/Value: *The model invented is a pioneer attempt to remove the barriers of innovation implementation co-created by consumers. The authors believe that the research conducted may diversify and augment the literature concerning Teal organizations and the role of e-consumers in green innovations as well as may stimulate the cooperation between companies and consumers in the field of innovations implementation.*

Keywords: *E-consumers, eco-innovations, sustainability, consumer agility.*

JEL codes*: P46, O31, Q55, Q56.*
Paper type: *Research article / Case study.*

[1]*Lublin University of Technology, Lublin, ORCID: 0000-0003-4495-6066*
a.rzepka@pollub.pl
[2]*Same as in 1, ORCID: 0000-0001-7225-4921, m.maciaszczyk@pollub.pl*
[3]*Academy of Finance and Business Vistula, Warsaw, ORCID: 0000-0003-0876-1763*
a.wisniewska@vistula.edu.pl
[4]*University of Economics in Katowice, Katowice, ORCID: 0000-0001-5150-3765*
maria.kocot@ue.katowice.pl

1. Introduction

As an integral part of progress and modernity, innovation makes a major contribution to economic development (OECD, 2018). It is also an important driver of economic development. Companies that want to consolidate (Weresa, 2018; Eurostat, 2020) their market positions should strive to introduce innovations (Halila and Rundquist, 2011; Carrillo-Hermosilla *et al.*,*2009*) and, therefore, be given the name of an innovative company.

A very important aspect of innovation is eco-innovation (Kemp and Foxon, 2007; Aarstad and Jakobsen, 2020). In view of the challenges that globalization brings, it not only has a positive impact on the environment but also helps to increase a company's competitive advantage (Carrillo-Hermosilla *et al., 2009*) and enables it to move to new markets. E-consumers can become creators of such innovation (Machado *et al.,* 2019). Their activity is intensified through the use of modern techniques and technologies – mostly the Internet. This activity also leads to the emergence of agility (Munodawafa and Johl, 2019) that enables the development of relationships with other consumers and suppliers. An e-consumer thus becomes a knowledge bank. Knowledge is a valuable source that is necessary for the creation of innovations. E-consumers are therefore the creators of innovations of various kinds (including eco-innovation) (Mat Dahan and Yusof, 2020).

2. Background

2.1 E-consumers as Active Contributors to Market

The current understanding of consumption remains in line with the postmodern paradigm in which it is seen not only as an everyday tool for satisfying needs but also as a way to find exciting experiences and sensations. It is essential that consumers can choose from a wide range of goods and services. In addition to the possibility of satisfying needs, such choices enable the individual expression of one's personality, the development of one's passions, and the realization of one's dreams (Kotler *et al.,* 2016; Thalassinos *et al.,* 2020).

The old perception of the consumer as a recipient of the market offer and his activities reduced to just buying has changed. Nowadays consumers go far beyond the simple consumption of material products. Dominated by new internet-based technologies, especially the social media and digital technology, consumers break barriers and are able to have their opinions and expectations heard by other consumers as well as vendors (Dey *et al.,* 2020; Ali *et al.,* 2019; Sorour and Dey, 2014). State multiplicative commercial offers and the availability of a wide range of communication and transaction solutions ensure that consumers have full freedom of choice and, thus, determine the fates of businesses in accordance with the work of Gabriel *et al.* (2015). Such a significant consumers' interaction with digital media (Forbush and Foucault-Welles, 2016; Ma *et al.,* 2015).

Therefore, modern consumers cannot be seen only as passive and submissive market participants who merely consume products and use services (Maciaszczyk, 2016). They become business partners (Saługa *et al.,* 2019) in marketing activities as well as product and service analyses. Consumers communicate with each other using a variety of instant messaging software. Maciaszczyk (2016) notices that they publish their opinions and comments on products and exchange suggestions among themselves, but they also share their insights with manufacturers. There is thus a continuous transfer of knowledge between consumers and companies, which is a source of innovation. Matschke *et al.* (2013) underline that the transfer takes place in two directions – from consumer to company, and from company to consumer.

Customer expectations are also rising. A typical customer demands personalized products because he has the possibility to influence and design a manufacturer's offer. As consumption becomes more interactive, it therefore becomes possible to provide manufacturers with information about a customer's perception of a product (Halicki, 2020). Some authors (Kotler *et al.,* 2016; Maciaszczyk, 2017) define the modern buyer as a "searching consumer" (trysumer) who tries out new products and can draw on his or her previous experiences. It is therefore tempting to conclude that the consumer has become an external employee of the company, actively involved in the design and manufacture of personalized products and, often, in innovation.

2.2 Agility and its Qualities

The development of the concept of agility can be seen as a specific reaction of a company to turbulent, profound, and uncontrollable changes and alterations in the business environment. Agility means the ability to survive and cope with unpredictable changes in the environment, which also necessitates an immediate and effective response to market changes and developments. Coping with dynamic market changes also means acting quickly. This includes the introduction of product innovations, process and technology innovations, and information and communication technologies; these require the reorganization of current marketing strategies and the formulation of new strategies (Centobelli *et al.,* 2020).

Consumer agility is the ability of a customer to influence the way products are made, enabling them to meet their growing individual needs (Agile Forum, AT Iacocca Institute). In this aspect, agility can be understood as the ability to use opportunities as incentives; these are then aimed at innovative market solutions and consequently used in the process of competition in the market by building market relationships (Yin *et al.,* 2020). Consumers can skillfully identify their own market needs and react to critical situations in order to obtain products that are perfectly suited to their needs (Nath and Agrawal, 2020). Agility can also be understood as the ability to react quickly and effectively to an emerging change (McGaughey, 1999). It is also the ability to "find one's way back" under turbulent market conditions by reacting appropriately to changes in a dynamic business environment (Rigby, 2000).

2.3 Nature and Typology of Eco-Innovations

In view of the increasing changes in the environment (Hugies *et al.*, 2018), a company must respond to innovation and develop the characteristics (agility, self-management) that enable the company to survive in such an environment (Rauch *et al.*, 2020). In particular, companies must develop the ability to quickly identify market opportunities (Sambamurthy *et al.*, 2003). It could be argued that if a company wants to introduce innovations, these innovations must be part of a chain that creates an innovation ecosystem (Laamanen *et al.*, 2018) which consists of a number of interconnected links. Today, in the age of Economy 4.0, the amount of technology and talented personnel is so large and the potential so great that innovations (Bouncken and Kraus, 2019) rarely occur in the vacuum of a single company (Bouncken and Fredrich, 2016). If we take a strategic approach, ecosystems consisting of internal and external business partners can help reduce risk and increase the pace of innovation.

At the same time, the public's environmental awareness has increased, which makes us realize that sustainability is a factor in maximizing profits over the long term. In this way, the relationships among environmental governance, social governance, and economic governance have been shaped.

There are many definitions of this concept in the scientific literature. Many of them seem to be rather general (Carillo-Hermosilla *et al.*, 2010; Kemp and Arundel, 1998). Karakaya *et al.* (2014) defined eco-innovation as innovative products and processes that provide value for business customers while reducing environmental impact. A similar definition can be found in the work of Kemp and Arundel (1998) or García-Granero *et al.* (2020). Both Kemp and Pearson (2007) and Oltra and Jean (2009) defined it as new products and services that reduce negative environmental impacts.

In 2004, the European Commission (2004) classified green innovation in the category of environmental technologies that are less harmful to the environment than the relevant alternatives. In 2007, the EC extended its position by defining green innovation as all forms of innovation that aim to make significant progress towards sustainable development by reducing negative environmental impacts or using natural resources more efficiently and responsibly (Trimis, 2020).

Thus defined, innovation refers to those production processes, services, and management methods that are aimed at preventing or reducing pollution as well as the rational use of natural resources (DG Environment, 2008). Several types of green innovations can be distinguished in the literature on the subject. This subdivision is presented in Figure 1 has been proposed by the authors of the study report that can be found in the MEI Project (2020). They distinguish among environmental technologies, organizational innovation, product- and service-related innovation, and "green" systemic innovations.

Figure 1. *Typology of green innovations*

Source: *Own creation.*

2.4 E-Consumer Agility as Creator of Green Innovations

E-consumer activities are not limited to the exchange of opinions and reviews. Sharing consumers' knowledge and insights leads to a transfer of knowledge that helps to create innovation, including eco-innovation. This process affects almost every phase of e-consumer behavior. There is an opportunity to create "green" innovations that are created precisely through the interaction between consumers and manufacturers. These innovations then emerge as a result of such interaction (Figure 2).

Figure 2. *Green innovation as a result of cooperation between consumers and manufacturers.*

Source: *Own creation.*

A large proportion of the new solutions are often the result of user dissatisfaction with the products and services available to them. Building relationships and cooperation between businesses and consumers enables us to take advantage of the free market.

One of the most important advantages is the generation of an influx of new ideas (Luecke, 2005) and the possibility to use unique external knowledge bases, which subsequently leads to the establishment of one's own market position. In a modern company, consumer activity can be a driver of innovation thanks to the opportunity to exchange opinions and views.

The concept of innovation networks fits into a similar trend. Innovation theories suggest that network relationships allow their participants to learn from each other while being an important source of innovation (Pyka and Kuppers, 2002; Tepis *et al.*, 2011). The main function of such a network is to share the knowledge of the people involved. An innovation-based cooperation network means the creation of new technical and organizational solutions as well as their transfer and practical application in the economy.

It can be concluded from this that the creation of eco-innovation by consumers is still embedded in a complex network of relationships (Czakon, 2007; Zakrzewska-Bielawska, 2018). A new dimension of competition for scarce resources is emerging. The dogma of competition is replaced by the strong need to coordinate with other entities in the market, including e-consumers (Dworzecki, and Krejner-Nowacka, 2002).

3. Materials and Methods

"Zakład Zieleni i Rekultywacji" (“Greening and Reclamation Plant”) was part of a research project entitled "Teal organizations in the age of Industry 4.0" as one of 15 case studies being a part of pilot studies. "Zakład Zieleni i Rekultywacji" is a company founded in 1988 and since 1 April 2001 it has been operating as a civil partnership under the name "Zakład Zieleni i Rekultywacji". The activities of the company include landscaping, construction of parks and green areas, logging and tree care, construction and paving services related to green areas, small architectural services (playground facilities) and garden design, gardening and landscaping.

It was a relatively extensive survey distributed among top management from different countries. The questionnaire consisted of parts devoted to different topics, like general information, innovation and technology, relationship, social capital, knowledge and information, trust, structure, organizational culture, associations and personal profile), and each part had 5 to 7 questions. The aim of the survey was to examine the extent to which contemporary companies cooperate with consumers and exhibit the characteristic features of Teal organizations as well as the extent to which these features influence various aspects of the operation of the company, including its ability to innovate. It should be noted that agility remains an inherent characteristic of Teal organizations. The aim of the article is to trace behaviors of companies in creating “green innovations" by e-consumers and analyze the relation between the intensification of this phenomenon and developing by them the attributes of agility. It is also important to research whether today's companies have

certain characteristic features of teal organizations in their activities and management style, and to analyze various factors on which the degree of occurrence of these features depends.

The study was divided into stages that includes a pilot study (May - June 2020) and main stage - quantitative study (July - September 2020). The current phase of the study includes 330 respondents with 600 questionnaires sent, which means that the response rate was above 50%. One top management representative of each enterprise was asked to participate in the survey. The choice of enterprises resulted from the SMEs' availability. Moreover as a part of the survey 15 structured direct interviews were conducted in Polish companies. These interviews constitute the pilot studies for further stages of direct interviews in other countries participating in the research.

It is worth presenting the results of research from the aforementioned project. The study has been and will be conducted according to the principles and standards developed by the Network on Development Evaluation of the OECD Development Assistance Committee (DAC). The following work was carried out in the course of the study - Desk research; IDI (Individual In-Depth Interview), and questionnaire study with selected groups of people using Computer-Assisted Web Interview (CAWI) and Paper and Pencil Interview (PAPI) techniques.

The chosen method of statistical analysis was the use of the $\chi 2$ test - Pearson's Chi-square test for independence. The statistical analysis of the data obtained from the surveys was performed using the computer package SPSS STATISTICA 21. As part of the study, a series of tests were carried out to examine the extent to which contemporary companies exhibit the characteristic features of Teal organizations (among them, there were agile features as an integral part of the teal management model).

Table 1. *Territorial scope of respondents*

Territorial scope of activity (%)		Country of operation (%)		Predominant mode of companies' operation (%)	
Local	19,3	Poland	30,3	Production	13,9
Regional	8,2	Georgia	15,2	Commerce	10,3
National	30,0	England	15,0	Services	75,8
International	42,5	USA	9,1		
		India	15,2		
		Hungary	15,2		
TOTAL	100		100		100

Source: *Own creation.*

4. Results and Discussion

"Zakład Zieleni" was one of the 15 companies surveyed during the research. A structured-direct interview was used to obtain descriptive information from the top management representative. However, the question arises whether the success of the

creation of green innovations by e-consumers in the surveyed company can be generalized and transferred to all surveyed organizations. Research has shown that, unfortunately, despite establishing relationships with consumers through modern ICT technologies, the degree of innovation implementation (including the green ones) in the surveyed companies is low (Table 2). Below you have 3 questions selected that relate directly to the problem indicated in the article. Likert scale was used 1 – 5, where 1 – strongly disagree, while 5 – I strongly agree. Table 2 presents the average of the results of surveyed companies. Only a few percent of surveyed companies put emphasis on investing in modern technologies and try to make all the processes carried out in the company innovative.

Table 2. *The level of innovation[5] of the companies surveyed*

Country	Our company give priority to investments in modern technologies	We ensure that all processes carried out in company are innovative	I have tools at my disposal that use modern technologies
Poland	3,66	3,58	3,45
Georgia	4,10	3,70	3,66
England	4,44	3,86	4,04
USA	4,07	3,70	4,20
India	4,20	3,98	3,66
Hungary	3,48	3,52	3,62
Average	3,94	3,70	3,70

Source: *Own creation.*

Table 3. *Innovation[6] - respondents' average answers to the question whether the company attaches great importance to investment in modern technologies (scale 1-5)*

Age of respondents	Kruskal Wallis Test	Country					
		Poland	Germany	United Kingdom	USA	India	Hungary
25 or younger	9,655, p=0,022	3.00	1.00	-	-	4.38	3.42
26-35	15,327, p=0,009	3.75	4.09	4.69	4.50	4.11	3.57
36-45	14,888, p=0,011	3.42	4.32	4.30	4.00	4.00	3.87
46-55	9,489, p=0,091	3.68	2.00	4.50	4.10	3.91	2.78
56-65	2,453, p=0,293	4.23	-	-	3.75	5.00	-
Industry							

[5]*Alfa Cronbach = 0,900*
[6]*Alfa Cronbach = 0,900*

Hotels	4,826, p=0,185	1.00	4.55	4.44	-	-	3.67
IT	25,841, p=0,000	3.88	-	4.93	4.91	4.00	3.75
Banking	8,356, p=0,079	2.25	3.86	-	3.62	4.67	4.50
Education	0,761, p=0,859	3.43	-	-	3.50	4.00	3.43
Construction	6,863, p=0,076	3.75	3.80	2.50	-	5.00	-
Food	1,670, p=0,796	3.67	3.33	4.00	-	2.50	3.67
Other	8,711, p=0,121	3.54	5.00	4.13	3.50	4.23	3.79

Source: *Own creation.*

Few companies have tools that use modern technology. This is certainly a significant barrier to communication with customers via ICT. This can also be influenced by the low percentage of innovations introduced.

The above-mentioned example of „Zakład Zieleni" and the literature analysis show that there is an undeniable link between the development of agile qualities in a company (and among consumers) and the successful implementation of eco-innovations (Rzepka, 2020, Rzepka, 2019, Rzepka 2019a). Raschke (2019) found that the adoption of agile qualities (also by buyers) continues to be positively correlated with the effectiveness and quality of the organization's performance, including the introduction of innovations. He demonstrated that there is a strong correlation between the adoption of the qualities of an agile organization (Zhang and Sharifi, 2000; Kidd, 1995) and the introduction of innovation by the organization. It was also demonstrated that the introduction of innovative products and services over the last five years and their higher implementation rate compared to competitors is a priority when introducing product innovations (Gunasekaran *et al.*, 2001; Rzepka, 2020a).

Sambamurthy *et al.* (2003) conducted a study on the impact of IT tools on improving corporate governance. The research showed that the investments in innovation made in IT, further supported by the adoption of agile attributes and combined with digitization options, have a positive impact on the organization's success in implementing innovation (Rzepka, 2020; Barska and Wojciechowska-Solis, 2020).

"Zakład Zieleni i Rekultywacji" successfully implements environmentally friendly technology solutions through measures that lead to the introduction of innovative processes that help the company to develop (as evidenced by the increase in sales,

profit or employment) while contributing to better energy efficiency, reduction of emissions, waste management, efficient materials management.

The company's policy is to implement innovations in this area. E-consumers have become a reservoir of knowledge in this field as much as in other (Barska and Wojciechowska-Solis, 2020). Over the years of its activity, the company has developed its own system of communication with consumers. The most important thing is to understand that consumer activity is conditioned by the availability of tools - telephones, cameras and software - that allow the customer to create his own tailor-made products. In this way, the company effectively stimulates the process of exchanging unique ideas with consumers. Especially since many of them make transactions through the use of ICT technology.

The study has found that the management style in „Zakład Zieleni i Rekultywacji" gives the employee the space he needs. The decisions made in the company remain focused on the company's evolutionary goal. The company offers coaching and networking. Therefore, "Zakład Zieleni i Rekultywacji" offers an open space for communication with customers. The structure of the company remains flat and decentralized, there is no hierarchy of positions, and its employees are involved in shaping changes within the company. All employees shall be considered equal, regardless of experience, seniority or position. This results in the fact that the employee is not given instructions because he or she knows his or her duties.

Cooperation, partnership and teamwork are the cornerstones of the company. Its employees are characterized by their openness to the search for a common solution and concern for the fulfilment of their own needs and those of their business partners. Therefore, these employees can be regarded as agile. They have the ability to implement new and innovative processes and can react quickly and dynamically to unforeseeable changes in the business environment. The employees observe competitive markets with unique and scarce resources and build successful relationships with suppliers, customers and even their own competitors (high complexity).

From this it can be concluded that „Zakład Zieleni i Rekultywacji" has all the characteristics of a Teal organization. One such characteristic is organizational agility, without which it would not be possible to build relationships with customers. Moreover, as already mentioned, the eco-innovations carried out are the result of the company's cooperation with its customers thanks to the use of IT channels.

The survey showed that the buyers of the company are fully willing to cooperate. Such relationships determine the development of a collaborative culture which is necessary, among other things, to kick-start the process of creating eco-innovations. The consumer ceased to be merely a passive spectator and receiver of information. The customers of the above-mentioned company are active partners who demand high-quality communication in the form of a continuous dialog. They form a

relationship with the company based on partnership between both sides. In a way, they encourage the company to invest in modern technologies and cooperate with them in the process of product co-creation using modern technologies. Here, the knowledge of the customers is often used. Therefore, the relationship between „Zakład Zieleni i Rekultywacji" and its customers is based on cooperation in which unique ideas provided by the buyers are sensitive to changes and at the same time susceptible to improvement.

It is also important that the flow of information between the company and its buyers remains at a high level. In particular, that the company does not have hierarchical positions and that the roles within the company are not fixed from the outset. From this it can be concluded that e-consumers are characterized by independence, creativity, partnership, trust and autonomy. These characteristics can be classified as attributes of agility.

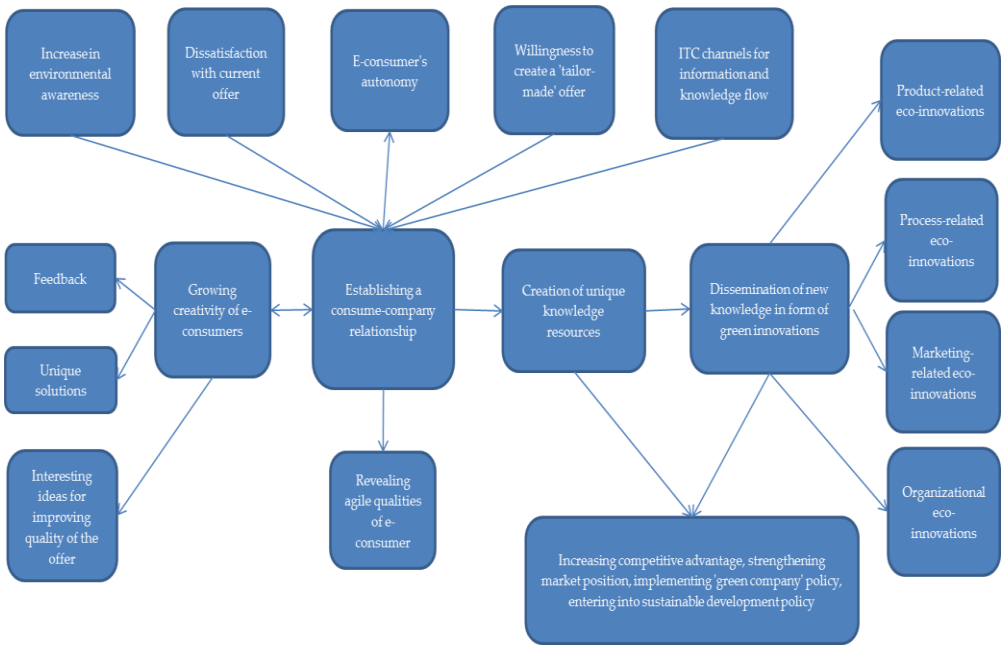
5. Model for the Creation of Eco-Innovation by E-Consumers

The discussion presented above allows us to propose a model for the creation of eco-innovation by e-consumers in the light of the emergence of new phenomena in the market environment. These e-consumer actions are represented in the proprietary model (Figure 3). It emphasizes that it is precisely the emergence of certain conditions that gives an impetus to the development of creative attitudes among consumers. These in turn contribute to the dissemination of "new knowledge" in the form of innovation.

The utility of the model presented lies in its universality, which can be an advantage if we want to illustrate the determinants of the process of eco-innovation creation by e-consumers, which are useful for the formulation of corporate sustainability policies.

The introduced model was implemented in “Zakład Zieleni i Rekultywacji”. It is a pilot model created on the stage of the research which in the next stage of testing will be put through an examination for the possibility of implementing changes in the area of the innovation. Company through own experience, started treating its buyers as ,,of creative agents". The effect of implementing the model was co-participation of e-consumers with the tenderer in the process of the marketing creation. As a result the prepared product offer as well as other marketing values fully meet expectations of clients. That allows building the long-term marketing partnership, strengthening the market position of and company, implementation of a policy,, green company "and becoming the advocate of the sustainable development. The analysis of the studies presented here confirms that there is an undeniable, close link between the assumption of agile features by the company and its buyers and the achievement of a high level of innovation. These conclusions are consistent with the case described above.

Figure 3. *Model for the creation of eco-innovation by e-consumers; Source: own creation*



Source: *Own study.*

6. Conclusions

The role of modern consumers has undergone a significant transformation from passive recipients of goods or services to informed market partners (Pierzchała and Smyczek, 2020). This is often due to a lack of customer satisfaction, as their role has been limited to that of a mere buyer. Their desire to take care of the natural environment and their own health has contributed to this (Sallnas and Bjorklund, 2020; Gunawan and Gunawan, 2019). The situation led to buyers being willing to share their knowledge (Bossink, 2018; Kumar *et al.*, 2020), which reflected in developing eco-innovations.

Building a relationship between consumers and businesses is possible thanks to advanced ICT technologies. The trends in e-consumer behavior therefore closely determine the directions for the development of innovative activities of modern companies. Cooperation with the consumer through the use of modern telecommunication technologies offers enormous advantages in the area of creating innovations, as can be seen in the example of „Zakład Zieleni". However, the research reveals how few companies introduce such innovations. The level of information flow between companies and their buyers is also unsatisfactory. The pilot model implemented in "Zakład Zieleni" will be will be put through an examination for the possibility of implementing changes in the area of the

innovation will be put through an examination for the possibility of implementing changes in the area of the innovation.

The research conducted shows that accepting by the organization agile features can stimulate e-consumers to the higher creativity that will next influence the tendency to innovating, both green and others. An efficient flow of information remains extremely important among the enterprise and e-consumers as they are highly valuable source of ideas and suggestions – often being the result of their own expectations.

References:

Aarstad, J., Jakobsen, S. 2020. Norwegian Firms' Green and New Industry Strategies: A Dual Challenge. Sustainability, 12, 361.

Ali, M., Azab, N., Sorour, K., Dora, M. 2019. Integration v. polarisation among social media users: Perspectives through social capital theory on the recent Egyptian political landscape. Technological Forecasting and Social Change, 145, 461-473.

Barska, A., Wojciechowska-Solis, J. 2020. E-consumers and local food products: A perspective for developing online shopping for local goods In Poland. Sustainability, 12(12), 4958.

Bessant, J., Francis, D., Meredith, S., Kaplinsky, R., Brown, S. 2000. Developing manufacturing agility in SMEs. International Journal of Manufacturing Technology and Management, 9, 35-40.

Bouncken, R. Fredrich, V. 2016. Business model innovation in alliances: Successful configurations. Journal of Business Research, 69(9), 3584-3590.

Bouncken, R., Kraus, S., Roig-Tierno, N. 2019. Knowledge- and innovation-based business models for future growth: digitalized business models and portfolio considerations. Review of Managerial Science.

Bossink, B. 2018. The influence of knowledge flow on sustainable innovation in a project-based industry: From demonstration to limited adoption of eco-innovations. Journal of Cleaner Production, 193, 249-262.

Call for proposals under the Eco-innovation 2008 programme. DG Environment, European Commission. http://ec.europa.eu/environment/etap/ecoinnovation/library _en.htm.

Carrillo-Hermosilla, J., Del González, P.R., Könnölä, T. 2010. Barriers to eco-innovation. Palgrave Macmillan, London.

Carrillo-Hermosilla, J., del Río, P., Könnölä, T. 2010. Diversity of eco-innovations: Reflections from selected case studies. Journal of Cleaner Production, 18, 1073.

Centobelli, P., Cerchione, R., Ertz, M. 2020. Agile supply chain management: where did it come from and where will it go in the era of digital transformation? Industrial Marketing Management, 90, 324-345.

Commission of the European Communities. 2004. Communication from the Commission to the Council and the European Parliament - Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union. Brussels.

Czakon, W. 2007. Dynamika więzi międzyorganizacyjnych przedsiębiorstwa. Wydawnictwo Akademii Ekonomicznej w Katowicach. Katowice.

Dey, B.L., Yen, D., Samuel, L. 2020. Digital consumer culture and digital acculturation. International Journal of Information Management, 51, 102057.

Dworzecki, Z., Krejner-Nowacka, A. 2002. Sposoby tworzenia organizacji sieciowych. Przedsiębiorstwo kooperujące. Grupa Doradcza Euroexpert. Warszawa.

OECD. 2009. Eco-innovation in Industry: enabling green growth. Paris.

Eurostat. 2020. Innovative enterprises as % of total enterprises – by size class and type of innovation. Retrived from: Innovative enterprises as % of total enterprises – by size class and type of innovation. RIO - H2020 PSF (europa.eu).

Forbush, E., Foucault-Welles, B. 2016. Social media use and adaptation among Chinese students beginning to study in the United States. International Journal of Intercultural Relations, 50, 1-12.

Gabriel, Y., Korczynski, M, Rieder, K. 2015. Organizations and their consumers: Bridging work and consumption. Organization, 22(5), 629-643.

García-Granero, E.M., Piedra-Muñoz, L., Galdeano-Gómez, E. 2020. Measuring eco-innovation dimensions: The role of environmental corporate culture and commercial orientation. Research Policy, 49(8), 104028.

Gunasekaran, A. 2001. Agile manufacturing manufacturing: the 21st century competitive strategy. Elsevier.

Gunawan, J., Gunawan, F.E. 2019. Factors that influence employees' intention to use enterprise social media as knowledge sharing media. CommIT (Communication and Information Technology) Journal, 13(2), 79-89.

Halicki, P. 2020. Świat Marketingu. Retrived from: http://www.swiatmarketingu.pl/index.php?rodzaj= 06&id numer=520294.

Halila, F., Rundquist, J. 2011. The development and market success of eco-innovations. European Journal Innovation Management, 14, 278-302.

Karakaya, E., Hidalgo, A., Nuur, C. 2014. Diffusion of eco-innovations: A review. Renewable and Sustainable Energy Reviews, 33, 394.

Kemp, R., Arundel, A. 1998. Survey indicators for Environmental Innovation. IDEA report. Oslo, STEP Group.

Kemp, R., Foxon, T. 2007. Typology of Eco-Innovation. In Project Paper: Measuring Eco-Innovation. United Nations University, Tokyo.

Kemp, R., Pearson, P. 2007. Final report of the MEI project measuring eco-innovation. UM-MERIT.

Kidd, P. 1995. Agile Manufacturing: Forging New Frontiers. Addison-Wesley.

Kotler, P., Kartajaya, H., Setiawan, I. 2016. Marketing 4.0: Moving from traditional to digital. John Wiley & Sons.

Kruk, H. 2009. Ład ekologiczny, społeczny i ekonomiczny we współczesnej teorii rozwoju zrównoważonego. In: Od koncepcji ekorozwoju do ekonomii zrównoważonego rozwoju, D. Kiełczewski (ed.). Wydawnictwo Wyższej Szkoły Ekonomicznej, Białystok.

Kumar, J., Konar, R., Balasubramanian, K. 2020. The impact of Social Media on Consumers' purchasing behaviour in Malaysian Restaurants. Journal of Spatial and Organizational Dynamics, 8(3), 197-216.

Laamanen, T., Pfeffer, J., Rong, K. Van de Ven, A. 2018. Editors' Introduction: Business Models, Ecosystems, and Society in the Sharing Economy. Academy of Management Discoveries, 4(3), 213-219.

Luecke, R. 2005. Zarządzanie kreatywnością i innowacją. Czarnów: MT Biznes.

Ma, J.W., Yang, Y., Wilson, J.A. 2017. A window to the ideal self: a study of UK Twitter and Chinese Sina Weibo selfie-takers and the implications for marketers. Journal of Business Research, 74, 139-142.

Machado, J.J.G., Martínez-Ávila, M. 2019. Environmental Performance and Green Culture: The Mediating Effect of Green Innovation. An Application to the Automotive Industry. Sustainability, 11, 4874. https://doi.org/10.3390/su11184874.

Maciaszczyk, M. 2016. Konsument niepełnosprawny w dobie digitalizacji. Nasilenie postaw prosumenckich. Nierówności Społeczne a Wzrost Gospodarczy, (45), 487-496.

Maciaszczyk, M. 2017. Trysumer i prosument: nowe zachowania konsumenta niepełnosprawnego. Marketing i Rynek, 4(CD), 223-232.

Mat Dahan, S., Yusof, S. 2020. Review and proposed eco-process innovation performance framework. International Journal of Sustainable Engineering, 13, 2, 123-139.

Matschke, Ch., Moskaliuk, J., Cress, U. 2013. Knowledge Exchange Using Web 2.0 Technologies in NGOs. Journal of Knowledge Management, 16, 699-707.

McGaughey, R.E. 1999. Internet technology: contributing to agility in the twenty-first century. International Journal of Agile Management Systems, Vol. 1, No. 1, 7-13.

Merit.unu.edu. 2020. UNU-MERI MEIDE Conference 2012: Micro Innovation For Development. Retrived from: http://www.merit.unu.edu/MEI.

Munodawafa, R.T., Johl, S.K. 2019. A Systematic Review of Eco-Innovation and Performance from the Resource-Based and Stakeholder Perspectives. Sustainability, 11, 6067.

Nath, V., Agrawal, R. 2020. Agility and lean practices as antecedents of supply chain social sustainability. International Journal of Operations & Production Management, Vol. 40, No. 10, 1589-1611.

OECD/Eurostat, Oslo Manual 2018. Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition. The Measurement of Scientific, Technological and Innovation Activities, OECD Publishing, Paris/Eurostat, Luxembourg, 34, 67-83. https://doi.org/10.1787/9789264304604-en.

Olesiński, Z. 2016. Międzyorganizacyjne sieci współpracy gospodarczej na przykładzie Polski, Kanady i Gruzji. Texter, Warszawa.

Oltra, V., Jean, M. 2009. Sectoral systems of environmental innovation: an application to the French automotive industry. Technological Forecasting & Social Change, 76, 567-583.

Pierzchała, K., Smyczek, S. 2020. Consumers' Rights Awareness and E-commerce-Evidence from European and American Markets. Scientific Publications / University of Economics in Katowice, 42-65.

Pyka, A., Küppers, G. 2002. Innovation networks: theory and practice. Cheltenham: Edward Elgar Publishing Limited.

Raschke, R. 2010. Process-based view of agility: The value contribution of IT and the effects on process outcomes. International Journal of Accounting Information Systems, 11(4), 297-313.

Rauch, E., Linder, C., Dallasega, P. 2020. Anthropocentric perspective of production before and within Industry 4.0. Computers & Industrial Engineering, 139.

Review of the EU Sustainable Development Strategy 2006. Renewed Strategy, Council of the European Union 10117/06, Brussels, 3-4. Retrived from: Reviews of the EU Sustainable Development Strategy - Environment - European Commission (europa.eu).

Rigby, K. 2000. Bullying in schools: guidelines to effective action. Professional Reading Guide for Educational Administrators, 21, 12-18.

Rzepka, A. 2019. Innovation, inter-organizational relation, and co-operation between enterprises in Podkarpacie region in Poland. Procedia Manufacturing, 30, 642-649.

Rzepka, A. 2019a. Relacje Międzyorganizacyjne w Zwinnych Przedsiębiorstwach. Zarządzanie Restrukturyzacją. In: Innowacyjność i Konkurencyjność w Obliczu Zmian" A. Jaki and S. Kruk, TNOiK "Dom Organizatora.

Rzepka, A. 2020. Towards Industry 4.0. In: Przyszłość zarządzania. Wyzwania w dobie postglobalizacji. Lublin, 399-407.

Rzepka, A. 2020a. Turkusowe organizacje w Gruzji. In: Z. Olesiński, Składniki turkusowych organizacji. Warszawa, Difin.

Sallnäs, U., Björklund, M. 2020. Consumers' influence on the greening of distribution–exploring the communication between logistics service providers, e-tailers and consumers. International Journal of Retail and Distribution Management.

Saługa, P.W., Szczepańska-Woszczyna, K., Miśkiewicz, R., Chłąd, M. 2020. Cost of Equity of Coal-Fired Power Generation Projects in Poland: Its Importance for the Management of Decision-Making Process. Energies, 13, 4833.

Sambamurthy, V., Bharadwaj, A., Grover, V. 2003. Shaping Agility through Digital Options: Reconceptualizing the Role of Information Technology in Contemporary Firms. MIS Quarterly, 27(2), 237-263.

Sorour, K., Dey, B.L. 2014. Energising political movements in developing countries: The role of social media. Capital & Class, 38(3), 508-515.

Thalassinos, I.E., Anjam, M., Khan, H., Ahmed, S. 2020. The Antecedents of Consumer Eco-Friendly Vehicles Purchase Behavior in United Arab Emirates: The Roles of Perception, Personality Innovativeness and Sustainability. International Journal of Economics and Management, 14(3), 343-363.

TRIMIS. 2020. Competitiveness And Innovation Framework Programme - TRIMIS - European Commission. Retrived from: https://trimis.ec.europa.eu/programme/competitiveness-and-innovation-framework-programme.

Weresa, M.A. 2018. Innovation Union initiative–an overview. Strengthening the knowledge base for innovation in the European Union, 15, 15-28.

Yin, J., Wei, S., Chen, X., Wei, J. 2020. Does it pay to align a firm's competitive strategy with its industry IT strategic role? Information and Management, 57(8), 103391.

Zakrzewska-Bielawska, A. 2018. The relationship between managers' network awareness and the relational strategic orientation of their firms: findings from interviews with polish managers. Sustainability, 10(8), 2691.

Zhang, D., Sharifi. H.A 2000. Methodology for Achieving Agility in Manufacturing Organisations. International Journal of Operations & Production Management, 20, 4.