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# Online co-creation: comparative pilot study on Poland, Ukraine and Spain

## Co-creación en línea: estudio piloto comparativo sobre Polonia, Ucrania y España

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ABSTRACT. The article presents the process of co-creation on the Internet as an innovative method of product and service innovation development by modern companies. The aim of the article is to present the process of co-creating products on the Internet based on desk studies and own pilot surveys conducted on respondents from three countries: Poland, Ukraine and Spain. The research methods included: desk research, online diagnostic survey in three countries, and statistical methods. The hypothesis is made that the participation of contributors is higher for longer traditions of using the Internet and availability of the Internet in a given country. The main respective hypothesis, which has a high degree of generality, could not be confirmed by the analysis of the rather limited amount of data collected through the survey. To properly test this hypothesis, a considerably wider sample would have been required. However, specific hypotheses have been confirmed or partially confirmed. On the basis of deliberations, author's division of the online co-creation process into stages was also presented. The conclusions provide recommendations for entrepreneurs intending to engage their clients in products and services co-creation on the Internet and the opportunities for further research.

RESUMEN. El artículo presenta el proceso de co-creación en Internet como un método innovador de desarrollo de innovación de productos y servicios por parte de las empresas modernas. El objetivo del artículo es presentar el proceso de co-creación de productos en Internet a partir de estudios documentales y encuestas piloto propias realizadas con encuestados de tres países: Polonia, Ucrania y España. Los métodos de investigación incluyeron: investigación documental, encuesta de diagnóstico en línea en tres países y métodos estadísticos. La hipótesis es que la participación de los contribuyentes es mayor para las tradiciones más largas de uso de Internet y la disponibilidad de Internet en un país determinado. La principal hipótesis respectiva, que tiene un alto grado de generalidad, no pudo ser confirmada por el análisis de la cantidad bastante limitada de datos recopilados a través de la encuesta. Para probar adecuadamente esta hipótesis, se habría requerido una muestra considerablemente más amplia. Sin embargo, las hipótesis específicas han sido confirmadas o parcialmente confirmadas. Sobre la base de las deliberaciones, también se presentó la división del autor del proceso de co-creación en línea en etapas. Las conclusiones proporcionan recomendaciones para los empresarios que intentan involucrar a sus clientes en la co-creación de productos y servicios en Internet y las oportunidades para futuras investigaciones.

KEYWORDS: Online co-creation, Poland, Ukraine, Spain.

PALABRAS CLAVE: Co-creación en línea, Polonia, Ucrania, España.

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# 1. Introduction

Product co-creation is a novel way of upgrading products, which involves gathering ideas for new products from customers, as a new or additional source of innovation in companies. It should also be noted that this method is much cheaper than maintaining R&D departments. Customers' knowledge and opinions allow to create original solutions that meet the needs of the market [Wolny, 2016]. Co-creation is a phenomenon that has emerged with the development of modern information technology. Many factors contributed to its development:

– related to technology and hardware development,
– related to companies,
– related to consumers.

Factors related to technology and hardware development include:

– development of Internet technologies and applications (development of mobile applications, easy and inexpensive Internet access from fixed and mobile devices, creation and development of technologies for interactive real-time contact with potential customers) [Bjeković&Kubicki, 2011; Pöppelbuß et al., 2011]
– the rapid development of social media (creation of new media, the rapid increase the number of users, facilitate access to the media by the development of hardware, applications, infrastructure) [Kępiński et al., 2015]
– hardware development (mobile devices: smartphones and tablets, notebooks, price availability of equipment),
– development of Internet infrastructure (transmission networks, optical fibres, transmission capacity, development of instruments and devices, computing clouds).

Factors related to companies include:

– developing new products (continuous shortening of product lifecycles, increased competition in the market, a very wide range of competitive products on the market),
– development of CRM (Customer Relationship Management) systems and other systems and portals that enable establishing, maintaining and developing contacts with clients and interacting with current and potential customers,
– searching for cost reduction methods for research and development by companies (price competition on the market, merging R&D departments competing with one another, outsourcing R&D activities).

Factors related to consumers include:

– searching for unique products (customers want to buy unique, tailored products, best suited to their needsand they search for methods of influencing products production [Ziemba et al., 2016]),
– searching for attractive products (the most important criterion for a customer's purchasing decisions is often product's price),
– searching for attractive ways of spending time, developing skills in the field of mobile technology, personal development of Internet users,
– intense development of blogs and video blogs (bloggers' desire to gain popularity, desire to have a good time by both creators and recipients of blogs).

All these reasons have led to the emergence and development of the phenomenon of co-creation of online products as a means of relatively cheap and effective innovation, for both businesses and consumers.

It should be noted that among analyzedonline co-creation activities there is one that is not performed online. This is telephoning the customer service centre. Although this activity is not done on the Internet, it is



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intentionally placed on the list of possible co-creating activities, because some of the respondents, especially older age groups, do not have the ability to use the Internet and the telephone is often the only way to participate in the research process.

## 2. Theoretical background of co-creation

Co-creation of products and services using the Internet is a relatively new phenomenon, as it began with the development of the information society in the 21st c. It was particularly facilitated by the development of Internet technologies, especially wide, easy and inexpensive access to the Internet. The theoretical basis for co-creation is presented in a previous publication by Słoniec [2016].

Products and services co-creation is one of the methods of searching and gaining innovation. The term innovation comes from Latin, where innovatio means renewal [Bańko, 2001]. There are many definitions of thatterm, one of the generally accepted definitions is made by Schumpeter [1960], who was called the father of innovation theory. According to this author innovation is:

- the introduction of a new product or commodity species, which consumers have not already met,
- the introduction of a new method of production in the field of industry,
- opening a new market where domestic industry has not been operating earlier,
- acquiring a new source of raw materials or semi-finished products,
- the introduction a new organization of a specific industry, the creation of a monopoly or its break.

In general, it can be said that "innovation is the totality of activities aimed at giving a certain degree of novelty to processes, products or services implemented in an enterprise" [Kolterman, 2013]. There are many methods of searching and acquiring innovation, and one of them is co-creation of products and services on the Internet. The end of the 20th and the beginning of the 21st century has brought a massive application use of computers and computer networks in the economy. These include economic, cultural and social effects such as"expanded and immediate access to information, new forms of education, the opportunity to exchange experiences, the implementation of projects involving people from different regions of the world in the so-called open networks" [Kacprzak&Pelc, 2012]. The approach to innovation, previously treated as secret resource, is changing, because "open networks need to publish some of the goals of the company's innovative activities"[Kacprzak&Pelc, 2012]. All these factors contribute to the co-creation of products and services on the Internet.

Co-creation was mentioned by the classics of organization and management such as Kotler [2005], Drucker [2003] and Tiddand Bessant [2011].

The concept of co-creation in the literature is defined as follows:

- it is a direct client/consumer inclusion (in some cases several times) in the product development process or in the product innovation process; Companies make a commitment to clients/consumers to produce products using some concepts and/or certain initial ideas given by clients/consumers, or companies use consumers as a resource supporting the entire lifecycle of the product [Doug, 2016],
- consumer contribution process is a social, active and creative process, based on cooperation between producers (sellers) and users, the process is initiated by the producer and leads value creation for customers [Piller et al., 2016],
- co-creation "includes both the situation when the customer contributes to the product or service while being a recipient, and a different situation - when customers create customer values for other customers"; [Doligalski, 2010] also distinguished the process of co-creating value as a process that is based on communication and interaction and taking advantage of the Internet activities by customers.

When referring to the process of online co-creation, one should mention the crowdsourcing.The term

crowdsourcing comes from English and is understood as performing certain actions in the company by unidentified crowd, which is a group of people If activities are carried out over the Internet, then the crowd is understood as the Internet users. Crowdsourcing is "an interesting model of communication between the company and the consumer, because it is based on feedback. The organization changes its position from one sender to receiver. This gives the participants (...) a sense of real impact on the products or business strategy. 'Crowd' is often a valuable additional employee or consultant" [Kasprzycki-Rosikoń&Piątkowski, 2013].

There are several categories in crowdsourcing, in particular crowdfunding, co-creation and microtasking.

Crowdfunding is a concept of crowdsourcing with a similar etymology and is understood as"the process of collaboratingof more people who choose to donate their own money (...) to support the efforts, projects and visions of other private individuals as well as businesses and organizations"[Brunello, 2016].

Microtasking is the execution by the community of small tasks that are part of a larger project, such as text recognition.

According to the classification outlined above, co-creation is one of the categories of crowdsourcing and represents the creative work of the community [Kasprzycki-Rosikoń&Piątkowski, 2013].

## 3. Research objectives and methodology, research hypothesis

The aim of the study was to recognise the online process of co-creation of products with a diagnostic survey in three different European countries: Poland – an EU Member since 2004, Ukraine – a sovereign state since 1991, not a member of European Union and Spain - a so called old member state. The selection of the surveyed countries was not accidental. It was intended to compare a developed country (Spain), a European Union member country and a non-EU country. After determining the state of co-creation of products in these countries, it was intended to compare the investigated process and to identify the factors that trigger consumers to participate in the process. As a result of these studies, it was intended to identify factors that encourage or inhibit co-creation for companies wishing to initiate or intensify the co-creation process. This could help entrepreneurs improve their market position by introducing product innovation.

In order to investigate the process of product co-creation, a diagnostic survey was conducted and online survey using Google and Survey Monkey were used in three countries: Poland, Spain and Ukraine. The study was conducted in spring-summer 2015, with a sample of 100, 200 and 100 properly filled questionnaires respectively. The method of selecting the sample was random.Questionnaires were sent via email and social media.

The research tool was a questionnaire that consisted of 23 closed, single or multiple choice questions, divided into 3 categories. The first part, covering 7 questions, concerned the use of the Internet and mobile applications. The second part involved online co-creation, and consisted of 8 questions. Part three was a metric and consisted of 7 questions. The results of the research were processed using statistical methods.

The main research hypothesis is the following: The percentage of people who create products, primarily online, varies depending on the country in which the process occurs.More people contribute to creating products in countries with a longer tradition of Internet use and with a high percentage of Internet users (e.g. Spain), and the lowest number of people contributes to products in countries with a shorter Internet usage tradition and a lower percentage of Internet users (e.g. Ukraine).

Specific hypotheses were also formulated:

1. The most common co-creation activities in the studied countries are similar; however, differences may occur in the percentages of people indicating different causes between the surveyed countries.

2. Development of co-creation process of products and services varies in the surveyed countries, with co-creation in Spain being more developed than in Poland and Ukraine. The development of the co-creation process will be determined by the actions performed in its course. However, if these actions are simple (calling a customer care line, writing a complaint or email, making comments on Facebook or Twitter), the level of process development is lower, compared to the situation when the action requires time, commitment and even expertise or skills. In the latter situation, the level of development of the co-creation process is higher.

3. The most common reasons for non-participation in co-creation are similar in the analysed countries. However, differences may occur in the percentages of people indicating different causes in the surveyed countries.

4. The knowledge of respondents about the possibility of co-creating products and services in the studied countries is relatively low. The most knowledgeable group of respondents in this area are the Spanish.

## 4. Short characteristics of the surveyed countries in relation to Internet development

The three surveyed countries are large European countries with a comparable population: Poland - 38.0 mln of people, Ukraine - 44.0 mln, Spain - 46.5 mln (2017). As a result of economic development and internal situation, these countries have undergone the process of computerization in different periods. This affects the percentage of Internet users, as shown in Fig. 1 [Liczbainternautów, 2015; Інтернет_в_Україні, 2013; Gráficos, 2015].

In 2005, the percentage of individual Internet users in Poland was 27%, in Ukraine about 4%, in Spain 20.4%. The number of Internet users in Poland and Spain was several times higher than in Ukraine. The reason lies in the economic situation of the countries. In Poland and Spain the economic situation was better and more stable than in Ukraine. IT infrastructure was more developed in Poland and Spain than in Ukraine. Five years later, in 2010, the percentage of individual Internet users was 51% in Poland, c.a. 23% in Ukraine and 55.1% in Spain. Although the disproportions between Poland, Spain andUkraine has decreased, the percentage of Internet users in Ukraine is still twice lower. In 2015 (Table 1) the largest percentage of Internet users was in Spain - almost 4/5 of the population, then in Poland - over 2/3 of the population, and in Ukraine - less than half of the population. The differences between Poland and Spain and Ukraine have decreased but are still significant, especially when comparing Spain with Ukraine.

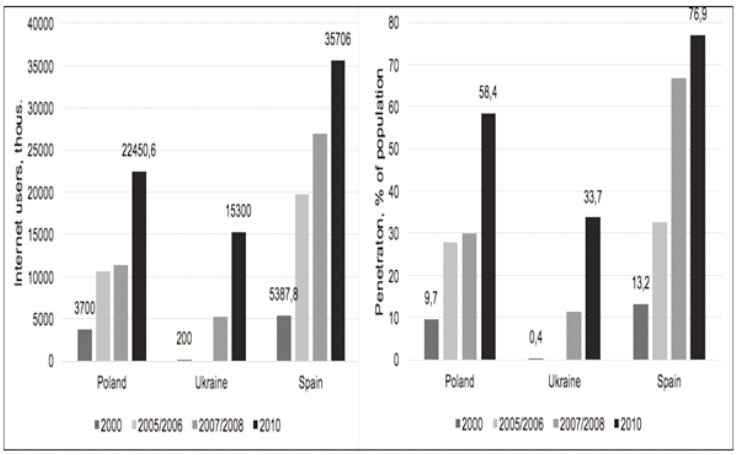



Figure 1. The growth of the number of individual Internet users:a) in Poland, b) in Ukraine, c) in Spain, %. Source: http://www.internetworldstats.com/eu/pl.htm [access: 15.07.2017].

In 2005-2006, the percent of individual Internet users was 27.8% in Poland, in Ukraine about 4%, in Spain 32.5%. The number of Internet users in Poland and Spain was several times higher than in Ukraine. In Poland

and Spain, the economic situation was better and more stable than in Ukraine, IT infrastructure was more developed than in Ukraine. Five years later in 2010 the percent of individual Internet users in Poland was 55.4%, in Ukraine 33.7%, in Spain 76.9%, although the disparity between Poland and Spain and Ukraine decreased, the percent of Internet users was still significantly lower. In 2017 (Table 1) the largest percent of Internet users was in Spain - almost 9/10 of the population, then in Poland - almost 3/4 of the population, and in Ukraine - less than half of the population. The differences between Poland and Spain and Ukraine have decreased but are still significant, especially when comparing Spain with Ukraine.

| Country/ Europe/ world | Population, thous. ( 2017) | Internet users, thous. (March-2017) | Penetration (% population) | Users in Europe % | Growth 2000/2017 % | Facebook (30-Jun-2016) |
|---|---|---|---|---|---|---|
| Poland | 38 563, 6 | 27 922,1 | 72.4 | 4.2 | | 14 000 000 |
| Ukraine | 44 405,1 | 21 886,1 | 49.3 | 3.2 | | 5 600 000 |
| Spain | 46 070,1 | 40 148,4 | 87.1 | 5.9 | | 22 000 000 |
| Total Europe | 821 555,9 | 604 147,3 | 73.5 | 100.0 | 506.1 | 309 576 660 |
| World | 7 519 029,0 | 3 739 698,5 | 49.7 | | 936.0 | |

Table 1. Use of the Internet and Facebook in selected countries and regions in 2017. Source: http://www.internetworldstats.com/eu/pl.htm [access: 15.07.2017].

The population of Europe accounts for 11.3% of the world's population. The percentage of Internet users in the world against the whole population is 50.1%, and in Europe -73.9%, which ranks it second in the world, after North America [Internet Users 2016].

Fig. 2 presents a ranking of top 10 European countries for the percentage of individual Internet users [Internet Users, 2016].

Spain, Poland and Ukraine occupy adjoining positions among the top 10 European countries according to the percentage of individual Internet users, Spain - 35.7%, Poland - 25.7% and Ukraine - 19.1%. However, this percentage is almost twice as high in Spain than in Ukraine. The reasons for this may vary, including: less developed Internet access infrastructure, higher Internet access fees in comparison to income, higher cost of Internet access devices in comparison to income. Undoubtedly, all these factors contribute to the co-creation of products and services, limiting physical access to the Internet.

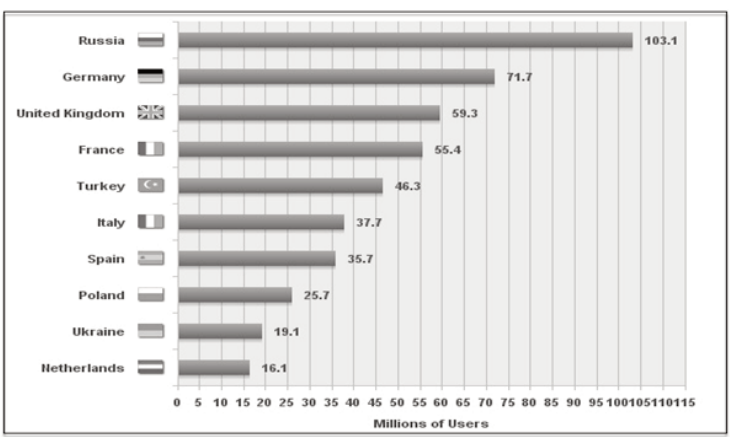



Figure 2. Top 10 European Countries - Individual Internet Users (including Poland, Spain, Ukraine). Source: [Internet Users, 2016].

## 5. Characteristics of research sample

Pilot research on the participation in the co-creation process has been conducted online in Poland, Ukraine and Spain. Fig. 3 shows the structure of respondents divided into age groups. In the surveyed group, the

majority of the respondents were young people aged up to 30 years of age (77%), and persons aged over 30 accounted for 23% of the sample. In the Ukrainian group, persons up to 30 years constituted slightly more than half of the respondents (53%), people over 30 years of age constituted 47%, and this group can be considered to be most representative of the general population. In the group surveyed in Spain, people up to 30 years old accounted for 54%, older respondents made 46% and in Spain this group of respondents was also more representative for the general population.

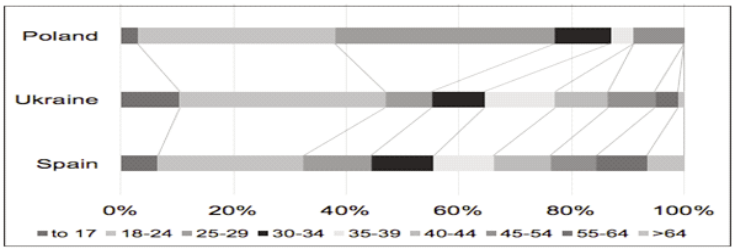



Figure 3. Structure of the surveyed age in Poland, Ukraine and Spain, %. Source: Own elaboration.

The most homogeneous was the Spanish group and the least homogeneous - Polish group. However, considering the percentage of Internet users in each age group, there is a noticeable increase in the proportion of Internet users in younger age groups and significantly lower in older age groups. For this reason, Polish and Ukrainian groups are more representative.

As for other characteristics of the group of respondents, Fig. 4 presents the structure of the respondents in each country, divided by sex.

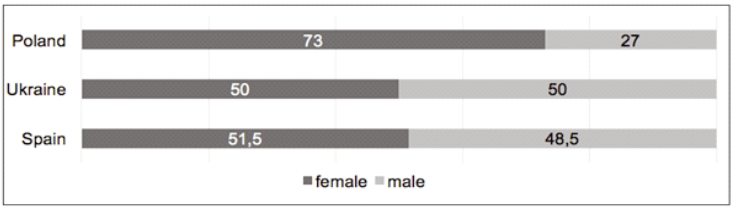



Figure 4. Sex of respondents in the surveyed countries, %. Source: Own elaboration.

The group of respondents in Ukraine and Spain was more representative (about half of the respondents were women and the same number of men) than the Polish group, where there were more than twice as women than men.

Other characteristics of the examined groups are shown in Fig. 5 and Fig. 6.

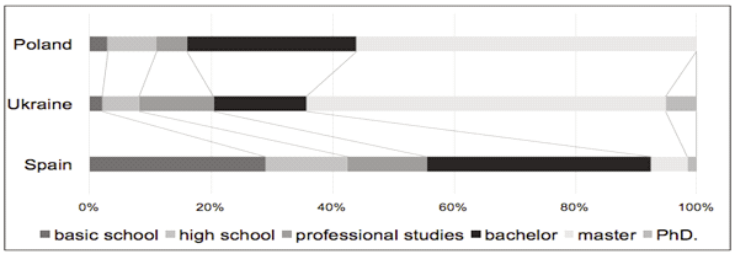



Figure 5. Education structure of respondents; %. Source: Own elaboration.

Fig. 5 shows the education structure of respondents in each country. There is a clear difference in education, especially between Poland and Ukraine and Spain. In Poland and Ukraine a small percentage of people had elementary education (primary, lower secondary, secondary), in total 16% and 20%, respectively. In Spain, in the surveyed group, there were a total of 55.5% of people with primary, lower secondary and upper secondary education. In the Polish group, the highest percentage of people were those with a master's degree - 56%, similarly in Ukraine - 58%, while in the Spanish group the highest number of people with higher education (bachelor's degree) - 37%.

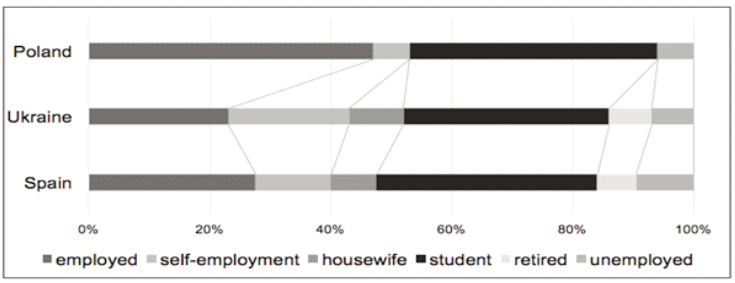



Figure 6. Structure of the current occupation of respondents; %. Source: Own elaboration.

Fig. 6 shows the structure of respondents' current occupation. In each of the questioned groups, the majority of those employed and studying - in the Polish group 47% and 41% respectively, 23% and 34% in the Ukrainian group, and in the Spanish group - 27.5% and 36.5%.

## 6. Comparation of the co-creation in the surveyed countries on the basis of own research

The results of online research were developed using statistical methods, in the Excel spreadsheet and the Statistica application.

Fig. 7 shows the structure of participation in co-creation in the surveyed countries based on own research. The majority of the respondents - 63% - participated in co-creation in Ukraine, followed by 62% of the respondents in Spain and 55% in Poland.

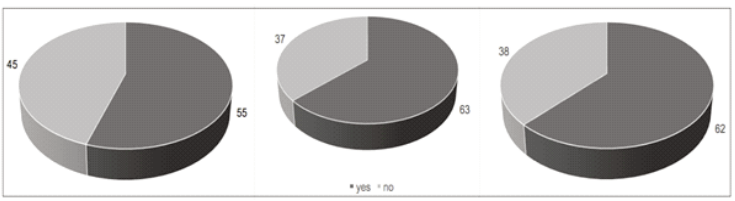



Figure 7. Participation in co-creation of respondents: a) in Poland, b) in Ukraine, c) in Spain; %. Source: Own elaboration.

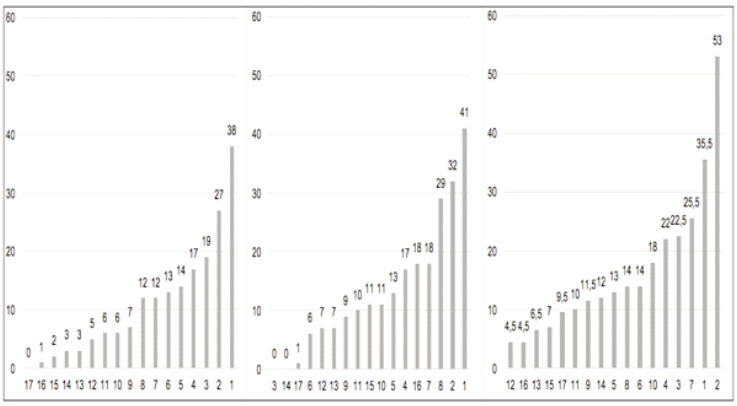
The main hypothesis of this paper is that there is a relationship between the tradition of Internet use and the percentage of Internet users and the number of contributors, and that in countries where the Internet has been available for a long time, greater availability of the Internet and a higher percentage of its users co-create products and services.

In a country where the Internet became available later, with lower access to the Internet and lower percentage of its users, fewer people are involved in the co-creation process.

Ukraine is the country which obtained access to the Internet the latest, it has the lowest level of Internet access, and the lowest percentage of Internet users (Fig. 1, Fig. 2, Table 1). However, in this country, there is the highest share of users involved in the co-creation process (Fig. 7). It undermines the main hypothesis

concerning a relationship between the tradition of using the Internet in the society and the percentage of Internet users, and the share of people who co-create products and services. However, the assessment of the whole population would require an extension so that each sample was representative of the population in the country concerned and the study should be repeated.

Figure 8 and Table 2 were prepared to prove the first hypothesis. The Figure 8 presents activities in the process of co-creation by individu-als interviewed in the surveyed countries, and the percentage of people engaged in concrete action.



Where activities are as follows:

1. Using applications that help to introduce a new product idea on company's web pages
2. Writing a post about new products or services on own blog
3. Commenting on ideas for new products and services on a corporate blog
4. Participating in public forum to discuss ideas for new products or services
5. Joining a team working on the development of a new product or service
6. Writing responses in a separate blog commenting on ideas for new products and services
7. Participating in company forums to discuss ideas for new products and services
8. Talking about new products and services with friends on other social networking sites
9. Participating in beta tests (product not yet launched) on the Internet about a new product or service
10. Posting a message on Facebook or Twitter about problems with a new product or service
11. Publishing on Twitter / Facebook about new products and services
12. Using voting applications for new product ideas on corporate websites
13. Participation in other forms of testing a new product or service
14. Talking about new products and new services with friends on Facebook
15. Participating in an online discussion (such as a forum or blog) about problems with a new product or service
16. Calling customer service line about problems with a new product or service
17. Writing a complaint or email to the company about problems with a product or service

Figure 8. Activities carried out in the process of co-creation in the last 3 years by respondents: a) Poles, b) Ukrainians, c) Spaniards, %. Source: Own elaboration.

The percentage of people performing individual activities related to co-creation of on-line products and services in Poland was different depending on the type of activity. Most people - 38% made complaints in the last 3 years or e-mailed about the problems with the purchased product or service, and none of the respondents used an application helping to introduce a new product idea on the company's websites. The activities carried out in the process of co-creation by the surveyed Poles were uncomplicated, and involved making complaints by emails or by calling the customer service line, as well as by participating in discussions on online forums and social networking sites (activities of over 10% of participants). Activities that were much less frequent were: joining product developers, participating in company forums, writing comments or posting on a blog. These are much more demanding and labour-intensive activities. Based on the results, it can be concluded that the

contributors to the products and services focus on simple activities that do not require special knowledge or commitment. This proves that co-creation in Poland is in the early stage of development.

Fig. 9 shows an overview of activities carried out in the co-production of products and services based on research conducted in Ukraine.

The most frequently performed actions in the co-production of products and services in the surveyed Ukrainians (similarly as for Poles) were: writing a complaint or email to a company about problems with a product or service or calling a customer service line and about these problems and sharing information on social network sites. In the Ukrainian study group, as in the Polish group, simple actions were usually performed. They did not require additional time or special skills. However, Ukrainians wrote comments and posts on the blog more often than the Polish group. None of the respondents in the Ukrainian group participated in the public forum or online discussion.

On the basis of the presented results, it should be noted that in Ukraine, the co-production of products and services in Ukraine is also in the early stages of development.

Fig. 10 shows an overview of activities performed in the co-creation process by Spanish respondents.

As in the case of Poland and Ukraine, also in Spain, the most common activity was calling customer service line or writing a complaint or email to the company about problems with the product or service. However, the percentage of people performing these activities among the surveyed Spaniards was slightly higher. The above considerations prove the first specific hypothesis stating that the activities most commonly performed in co-creation in the studied countries are similar.

Generally speaking, the percentage performing individual activities was the highest in the study group in Spain. In Poland 8 activities were performed by more than 10% of respondents, in Ukraine this was 9 activities, while in Spain 11 activities were performed by more than 10% of respondents. Also in terms of activities not performed at all, in the Polish group it was 1 activity, in the Ukrainian group, 2 activities, and in the Spanish group all the activities were performed. Also, the percentage of persons performing individual activities in the surveyed Spanish group was higher than the similar percentage in the Polish and Ukrainian groups. All these facts prove a higher participation of Spaniards in the process of co-creatingproducts and services compared to Poles and Ukrainians.

Although participation in the co-creation process, based on the presented research, in Spain and Ukraine is similar, the quality of this participation (performing activities requiring higher level of involvement, the percentage of people performing individual activities) is different and proves slightly higher level of co-creation of products and services in Spain compared to Ukraine and Poland. This isan indirect proof of the second specific hypothesis that the development of products and services co-creation process is slightly higher in Spain than the level of co-creation in Poland and Ukraine.

Conclusions from earlier reflections indicate the evolution of the co-creation process over time, divided into five stages of development, as shown in Table 2.

| No | Stage of evolution | Activities |
|---|---|---|
| 1. | Feeling of dissatisfaction from using a product | – Calling customer service line about problems with a new product or service<br>– Writing a complaint or email to the company about problems with a product or service |
| 2. | Expressing opinion by posting on Facebook or Twitter | – Publishing on Twitter / Facebook about new products and services<br>– Posting a message on Facebook or Twitter about problems with a new product or service<br>– Talking about new products and new services with friends on Facebook |
| 3. | Discussion on other social media and public fora | – Talking about new products and services with friends on other social networking sites<br>– Participating in an online discussion (such as a forum or blog) about problems with a new product or service<br>– Participating in public forum to discuss ideas for new products or services |
| 4. | Writing opinions on blogs and using rating applications | – Using voting applications for new product ideas on corporate websites<br>– Writing a post about new products or services on own blog<br>– Writing responses in a separate blog commenting on ideas for new products and services |
| 5. | Using company applications, participation in company's fora and blogs, participation in testing teams, beta-testing | – Using applications that help to introduce a new product idea on company's web pages<br>– Participating in company forums to discuss ideas for new products and services<br>– Commenting on ideas for new products and services on a corporate blog<br>– Joining a team working on the development of a new product or service<br>– Participation in other forms of testing a new product or service<br>– Participating in beta tests (product not yet launched) on the Internet about a new product or service |

Table 2. Evolution of co-creation process of products and services. Source: Own elaboration.

The first step is the simplest step when expressing dissatisfaction with the use of a product or service by calling the customer service line or by writing a complaint or email to a contact box. This is the stage where a dissatisfied user of a product and the customer service representative participate and the information is not distributed.

In the second stage, people participate by expressing their opinions or posting a message. The message is placed on a very popular social network site and becomes visible to a large group of friends (often several hundred). If the opinion in the message is negative it can cause a very bad effect on the product rating and the reputation of the producer.

The third stage is also public but compared to the second stage, its coverage can be much broader, and the potential negative effects of the messages given to the producer are much more serious.

In stage four, a person's personal involvement by blogging or using a special corporate voting application is required. At this stage, active participation in the co-creation process begins.

Stage five includes the most participatory contributions in co-creation and ideas for product innovation can be generated, new products tested, and beta tests done.

As for the percentage of activities from the fifth stage of the evolution of the co-creation process in each country, it was as shown in Table 3. The data in this table also indirectly proves the second specific hypothesis that the development of the co-creation process in Spain is slightly higher than in Poland and Ukraine.

| Activity | Percent | | |
|---|---|---|---|
| | Poland | Ukraine | Spain |
| Participation in other forms of testing a new product or service | 14 | 13 | 13 |
| Participating in beta tests (product not yet launched) on the Internet about a new product or service | 7 | 9 | 11,5 |
| Participating in company forums to discuss ideas for new products and services | 6 | 10 | 10 |
| Joining a team working on the development of a new product or service | 3 | 7 | 6,5 |
| Commenting on ideas for new products and services on a corporate blog | 2 | 11 | 7 |
| Using applications that help to introduce a new product idea on company's web pages | 0 | 0 | 9,5 |

Table 3. Percentage of activities from the fifth stage of the co-creation process in the studied countries. Source: Own elaboration.

Table 4 presents the classification of the activities carried out in the co-production of products and services in the surveyed countries.

| Activity | Action item in the classification | | |
|---|---|---|---|
| | Poland | Ukraine | Spain |
| Writing a complaint or email to the company about problems with a product or service | 1 | 1 | 2 |
| Calling customer service line about problems with a new product or service | 2 | 2 | 1 |
| Participating in an online discussion (such as a forum or blog) about problems with a new product or service | 3 | 17 | 8 |
| Talking about new products and new services with friends on Facebook | 4 | 8 | 6 |
| Participation in other forms of testing a new product or service | 5 | 7 | 9 |
| Using voting applications for new product ideas on corporate websites | 6 | 14 | 13 |
| Publishing on Twitter / Facebook about new products and services | 7 | 4 | 3 |
| Posting a message on Facebook or Twitter about problems with a new product or service | 8 | 3 | 4 |
| Participating in beta tests (product not yet launched) on the Internet about a new product or service | 9 | 11 | 11 |
| Talking about new products and services with friends on other social networking sites | 10 | 8 | 5 |
| Participating in company forums to discuss ideas for new products and services | 11 | 10 | 12 |
| Writing responses in a separate blog commenting on ideas for new products and services | 12 | 13 | 17 |
| Joining a team working on the development of a new product or service | 13 | 12 | 15 |
| Participating in public forum to discuss ideas for new products or services | 14 | 16 | 10 |
| Commenting on ideas for new products and services on a corporate blog | 15 | 9 | 14 |
| Writing a post about new products or services on own blog | 16 | 5 | 16 |
| Using applications that help to introduce a new product idea on company's web pages | 17 | 15 | 13 |

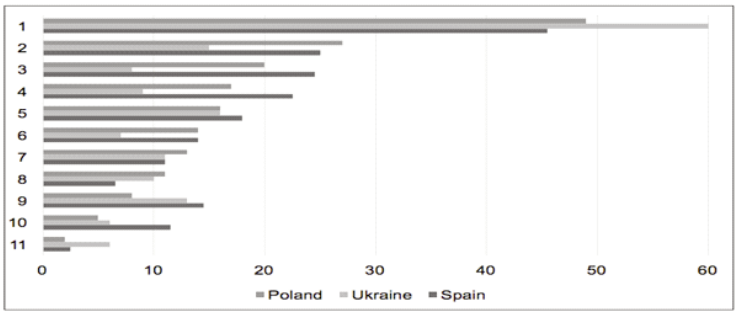
Table 4. Classification of activities carried out in the co-creation process in the studied countries. Source: Own elaboration.

The data in Table 4 shows that in the first two places all the countries have the same simplest operations. However, the activities in the following positions are different, and the participation in the online discussion on problems with a new product or service occupies the 3rd position in Poland, 17th in Ukraine and 8th in Spain.

The same is true with activities performed least often. Using an application to help launch a new product

idea on a corporate website occupies a distant position in the activities of all three countries. However, the activity of writing a post about new products or services on own blog occupies 16th position in Poland and in Spain, while fifth in Ukraine.

The presented data partly illustrates the first and third specific hypotheses that the most common and least frequent measures in the studied countries are similar, although the percentage of persons performing them vary. However, the next, most frequently and least frequently performed activities are different in the studied countries. Therefore, it should be considered that hypothesis 3. has been partially proved.




Where non-participation causes are as follows:

1. I have never thought about it
2. Lack of time
3. I never take part in consumer forums for new products
4. I never participate in discussions about products on social networks
5. Lack of knowledge that it is possible
6. I do not know how I can participate online in developing new products
7. I have no problems with products that meet my needs, because there are many alternative products to choose from
8. I think I do not have good ideas for new products
9. I never read posts about new product on blogs
10. I think companies do not take seriously the ideas that consumers may suggest to them
11. I do not think is that consumers should decide on products or services

Figure 9. Causes of non-participation in co-creation in the studied countries, %. Source: Own elaboration.

Fig. 11 shows the reasons for the non-participation in co-creating products and services in the surveyed countries. The most common cause in the three surveyed countries was: I have never thought about it, marked by 49% of Poles, 60% of Ukrainians and 45.5% of Spaniards. The indication of this cause may have different backgrounds, and it may be primarily ignorance that such a phenomenon exists, that you can participate in it, and that you can perform useful functions both from a consumer's and company's point of view. As more benefits from the co-creation of products and services are gained by businesses, they should be able to inform the public about this possibility in a variety of ways and means. This can be done by: publishing articles online and in paper editions of newspapers and magazines, organizing customer contests and posting results on online forums and company websites, informing current and prospective clients about the existence of such opportunities.

Another reason pointed out by Poles and Spaniards is lack of time - 27% and 25% respectively, and by the Ukrainians – lack of knowledge that it is possible - 16%.

The least frequent cause was: I do not think is that consumers should decide on products or services. This reason was given by 2% of Poles, 6% of Ukrainians and 2.5% of Spaniards.

The reasons for non-participation in the co-creation of products and services indicated by the respondents

show relatively low knowledge of the respondents and indirectly their societies about the existence, role and importance of this process, both for consumers and producers of products and services. The level of this knowledge can be raised through the aforementioned actions.

The results shown in Fig. 11 prove the fourth specific hypothesis that the level of knowledge about the co-creation process of products and services, its role and importance for consumers and companies is relatively low among the researched groups, with the same level represented by the representatives of all the studied countries.

Co-creation of products and services, primarily online, is, as it was already stated, a highly profitable process for product and service producers, but also indirectly for consumers. The benefits of this process for consumers contributing to the products are the following:

– the consumer receives a product ideally suited to their needs,
– the consumer often receives bonuses from the producers in a form of beta test units, which then become the consumer's property,
– the consumer receives other bonuses (discounts, opportunity to participate in company events),
– the consumer develops their own personal skills. n the research respondents were also asked about the reasons that could lead them to participate in the co-creation of products and services.

The answers to this question are presented in Fig. 10.

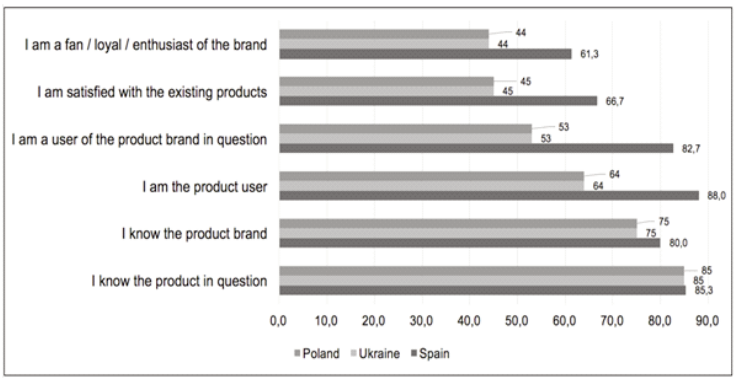



Figure 10. Probability of increasing participation in contribution in co-creation in the surveyed countries, %. Source: Own elaboration.

Poles and Ukrainians have found that they are likely to increase their participation in co-production when they know the product. This is the reason for 85% of Poles and Ukrainians. On the other hand, Spaniards have found that the probability of their participation in co-creation increases when they are product users - 88% of responses. The greatest likelihood of an increase in participation in a co-creation occurs when the participants know the product, its brand, or the product users, and therefore are the customers of the company whose product or service they would like to co-create. It follows that producers of products and services should primarily address this group as potential contributors because it is most likely to participate in the considered process. They can do this by means of loyalty programs, special websites designed for customers, corporate portals, CRM systems.

The least indicated answers for factors increasing the probability of participation in co-creation was that the respondent is a fan and a brand enthusiast. This result may be surprising, but it proves the earlier conclusion that the best potential participants in the co-creation process are the customers of the company who purchase its products and use their services.

## 5. Conclusion

As a result of the research, the main hypothesis was rejected, because Ukraine is the country with the shortest tradition and the lowest percentage of Internet users, however, it is the country with the highest, 63%, participation people involved in co-creation products and services.

The first specific hypothesis has been confirmed. The two most common reasons for co-creating products and services in the surveyed countries are similar. The second specific hypothesis has also been confirmed. The development of the co-creation process in the studied countries is slightly different: slightly higher in Spain and slightly lower in Poland and Ukraine. Also, the third specific hypothesis on the main reasons for non-participation in co-creation was confirmed because the main reasons are similar. The study also confirmed the fourth specific hypothesis that the knowledge of respondents about the ability to co-create products and services is relatively low. However, it is not true that Spaniards have more knowledge in this regard than Poles and Ukrainians.

In conclusion, practical value of the research for companies wishing to engage consumers in innovative ideas and creating new products and services should be emphasised.

The rapid development of Internet technology contributed to the fact that modern companies have been collecting huge amounts of data about the activities of customers on the Internet and beyond it. In this process companies are backed up by intelligent and connected devices such as sensors that monitor the physical condition of people, smart home systems, intelligent vehicle systems [Morey et al., 2016]. Data collected by companies can be used in various ways, including for example sale. Figure 11 shows the exchange of data collected with intelligent systems for future benefits.

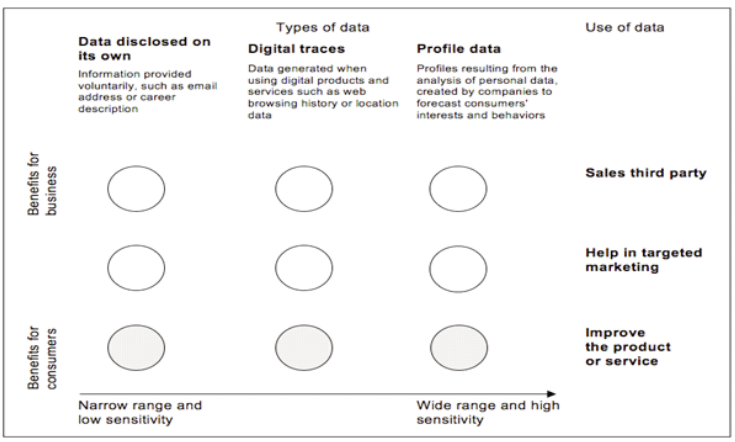



Figure 11. Diagram of the exchange of data on the benefits. Source: Morey et al., 2016], p.79.

The data disclosed by consumers, digital traces and profiling data can be used in order to improve the product and service. Profiling data is most important. Figure 10 does not contain data collected by companies through company applications and portals (for example, using an application to help introduce a new product idea on a corporate website, joining a team of people working on the development of a new product or service), and these data are the most valuable source of information in the process of co-creation.

Given the fact that the co-creation process is a relatively new phenomenon, there are many possible directions of future research, including:

– conducting research in particular areas of the economy, since co-creation of products is different from co-creation of services, and co-creation of everyday products differs from contributing to, for example,

household appliances,

- expanding research to other countries and larger groups of respondents,
- studying the evolution of the development process of co-creation in different countries,
- studying the influence of various factors (characteristics of co-creators, co-creating characteristics) on the course, intensity and size of co-creation.

The list of possible directions for research into the co-creation process is not complete, because new research and opportunities are still being explored in the course of research. In conclusion, the research of the process of online co-creating products and services is weakly recognised, interesting and highly researchable area.

Another important trend of the co-creation products and services are the use of smart products with network access. The unique data and capabilities made available through the smart product transforms the relationship between the company and the customer so that the relationship becomes continuous and timeless. The work of each functional division in the enterprise value chain is also transformed. There will also be new functional divisions, such as unified data management, continuous after-sales product enhancements, and optimization of customer relationships. Increasingly widespread use of smart products and the Internet of things will undoubtedly redefine the look of innovation and the competitiveness of businesses. The co-creation of products and services on the Internet will become a necessity for businesses in the near future.

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