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Knowledge Management, Trust and Communication in the Era of Social Media

Edited by
Joanna Paliszkiewicz

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About the Editor

Joanna Paliszkiewicz works as a full professor at the Warsaw University of Life Sciences (WULS—SGGW). She is the director of the Management Institute. She is also an adjunct professor at the University of Vaasa in Finland. She is well recognized in Poland and abroad for her expertise in management issues: knowledge management and trust management. She has published over 200 papers/manuscripts and is the author/co-author/editor of twelve books. She has been a part of many scholarship endeavors in the United States, Ireland, Slovakia, Taiwan, the United Kingdom, and Hungary. She has actively participated in presenting research results at various international conferences. Currently, she serves as the deputy editor-in-chief of the *Management and Production Engineering Review*. She is an associate editor for the *Journal of Computer Information Systems* and *Expert Systems with Applications*. She is the vice president of the Polish Association for Production Engineering in Poland. She also serves as chair of the International Cooperation in European Business Club. She serves as the vice president of the International Association for Computer Information Systems in the United States. She is a board member of the Intellectual Capital Accreditation Association. In addition, she serves as a member of the editorial board of several reputable and high-impact international journals. She has successfully supervised many Ph.D. students, leading them to completion of their degrees. She has also served as an external reviewer for several Ph.D. students in Poland, India, and Finland. She is actively involved in participating in the scientific committees of many international conferences. She was named the 2013 Computer Educator of the Year by IACIS.

Preface to "Knowledge Management, Trust and Communication in the Era of Social Media"

Trust, knowledge management, and communication are essential in business and society in the era of social media. This book presents the main challenges and opportunities posed by trust, knowledge management, and communication in the social media age in a manner relevant to both practitioners and scholars. The book is also useful for companies and organizations to leverage trust, knowledge management, and communication for an optimal course of action.

This book aims to bring together the theory and practice of trust, knowledge management, and communication in the era of social media.

The purpose of the first article is to identify financial measures that are related to Corporate Social Responsibility (CSR) involvement activities. The study concerns the food industry, in which clients and stakeholders increasingly appreciate socially responsible companies, which could be a crucial factor for future growth strategy. The results confirmed that CSR reporting was a critical factor that differentiated companies in terms of profitability, market capitalization, and share price. The second article presents the impact of digitalization on the enterprise's marketing activity in services by promoting online sales via electronic distribution channels, social networks, and mobile applications. A comparative system of estimating the parameters of digitalization's influence on the enterprise's marketing activity was proposed as a confirmation of this impact. The third article identifies the conditions for the use of smartphones and mobile applications in Poland. This article's scope aimed to fill a gap in the quantitative and qualitative methods applied to examine the use of mobile devices and mobile software. At the same time, this study creates the foundations for further research on intercultural differences. The fourth article, entitled "Digital Media: Empowerment and Equity", investigates the use of digital media, specifically social media technologies, in the workplace in Taiwan. The findings reveal that both genders use social technology platforms for business support, experience benefits, and believe that these technologies could empower success. The next article aims to discuss the possibilities of utilizing social media marketing by a creative company dealing with computer games production. The authors have attempted to analyze selected computer game promotion elements used by the CD Projekt Capital Group. The article entitled "Selected Aspects of Evaluating Knowledge Management Quality in Contemporary Enterprises" broadens the understanding of knowledge management and estimates select aspects of knowledge management quality evaluations in modern enterprises from theoretical and practical perspectives. The seventh article aims to present the results of pilot studies on the four largest Information Communication Technology (ICT) companies' involvement in promoting the Sustainable Development Goals (SDGs) through social media. Studies examine which communication strategy is used by companies in social media. The primary purpose of the eighth article is to present the relationship between trust and knowledge sharing, taking into account the importance of this issue in the efficiency of doing business. The results showed that trust is vital in sharing knowledge and essential in achieving a high-performance efficiency level. The ninth article presents the impact of social media on consumer choices in tourism and tourist products' specificity. The study's main purpose was to indicate the most commonly used social media in selecting a tourist destination and implementing Generation Y's journey. The 10th article aims to identify the most critical purposes of using social media by responding to women's attitudes according to age and their respective countries' economic development. The research was done through an online survey in 2017–2018, followed by an analysis

of eight countries' results. The article entitled "Integrated Question-Answering System for Natural Disaster Domains Based on Social Media Messages Posted at the Time of Disaster" presents the framework of a question-answering system that was developed using a Twitter dataset containing more than 9 million tweets compiled during the Osaka North Earthquake that occurred on 18 June 2018. The authors also study the structure of the questions posed and develop methods for classifying them into particular categories to find answers from the dataset using an ontology, word similarity, keyword frequency, and natural language processing.

The book provides a theoretical and practical background related to trust, knowledge management, and communication in the era of social media. The editor believes that the collection of articles can be relevant to professionals, researchers, and students' needs. The authors try to diagnose the situation and show the new challenges and future directions in this area.

Joanna Paliszkiewicz
Editor

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Article

Digitalization of the Marketing Activities of Enterprises: Case Study

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Abstract: The pace and scale of the digitalization of today's global information society open up new opportunities for business. At the same time, they set new challenges for business owners and managers in the field of marketing. Given this fact, the purpose of the study was to present the impact of digitalization on the marketing activity of the enterprise in the field of services by promoting the use of online sales via electronic distribution channels, social networks, and mobile applications. A comparative system of estimating the parameters of the influence of digitalization on the marketing activity of the enterprise was proposed as a confirmation of this impact. Based on the developed "tree of goals," the dynamics of the digitalization of services were projected and the prospects of development of this sphere of activity were outlined. For testing the proposed methodology, the railway passenger transportation company (JSC "Ukrzaliznytsia") was chosen as the object of the research. Research methods used in the study include: (1) statistical; (2) SWOT analysis; (3) systematization, comparative, and structural-dynamic analysis; and (4) an expert survey. As a result of revealing the impact of individual elements of digitalization on the level of marketing activity, the number of recommendations regarding the development of digitalization of electronic ticket sales services and their accounting for enterprises dealing with railway passenger transportation were proposed.

Keywords: digitalization; marketing activity; management; electronic tickets; joint-stock company "Ukrzaliznytsia"; electronic distribution channels; sales activity

1. Introduction

The global information society, coupled with modern innovative capabilities, contributes to the digital transformation of countries, industries, and individual companies. Due to digitization, economic growth is achieved, and the competitiveness of goods and services increases. Given the significant scale and pace of digital transformations that take place today, the speed of responding to their main trends is a significant competitive advantage. In common practice, one of the most successful tools of information and communication technologies determines digitalization [1]. The development of the information society, the smart economy, and globalization processes make it necessary to digitize the marketing activity because consumers prefer those brands and companies that quickly master the

use of digital channels. However, [2] emphasize that the uniform approach to this process must be refused because of the specifics of national socio-cultural profiles of consumers. At the same time, the number of business processes is increasing under current conditions, which requires new methods and approaches to the transformation of views on managing the marketing activity of an enterprise. The experiences of many foreign and domestic companies indicate the significant impact of digitalization on sales activities as an essential element of the enterprise's marketing system. Digital methods of processing and using information are a major source of efficiency and effectiveness of such activities [3].

Modern globalization challenges contribute to the rapid implementation of the latest innovative capabilities of the digital world and the activity of railway transport as the leading industry in the road transport industry of the country. JSC "Ukrzaliznytsia" [4] which was one of the first companies that actively digitized its work, was selected to test the proposed methodology. In particular, it refers to the digitalization of the sale of electronic tickets. Competition in the market of transport services requires enterprises to introduce new approaches to the provision of quality online ticket sales services. The JSC "Ukrzaliznytsia," which is directly involved in the sale of electronic travel documents, is interested not only in their confirmation and sales, but also in promoting them among various modern social platforms and networks, tracking demand for specific areas, determining the need for additional wagons or trains, and identifying problems which online buyers may face.

The paper investigates the impact of digitalization on sales activity (as one of the key components of marketing) in the service industry. The main advantages of digitalizing the sale of electronic travel documents are the following: the facilitation of communication between the person and the information system; the ability for passengers to use devices to obtain real-time data on the availability and number of available seats in a particular car and train; the ability to receive information about the number of passengers traveling on a particular train in real-time; the ability to plan and organize the required number of trains on different routes according to customers' requests; and openness and accessibility of services to consumers, regardless of their location and time of day. Although there are the works of scientists, practitioners, and managers that are devoted to the study of this problem, the impact of digital technologies on marketing activities in general, and in particular, on sales in service sectors, such as the implementation of travel documents of enterprises providing railway transport, has not been sufficiently investigated from a practical point of view. That is why our goal was to present the impact of digitalization on the effectiveness of marketing activities of the enterprise.

2. Literature Review

The term "digitalization" has come into use since the middle of the last century. The Oxford English Dictionary [5] interprets it as accepting or extending the use of the digital or computer technology of organizations, industries, countries, etc. Castells [6] understands that the new economy, society, and culture under the digitalization considers this concept as one of the characteristics of the modern era. Other authors, such as Brennen and Kreiss [7], point out that digitalization has been referred to as structuring many different areas of social life around digital communications and media infrastructure. According to Parida et al. [8], the necessary condition for maintaining its competitive position or its conquest in our time is not only the use of computer technologies, but also the transition to modern innovative business models.

The digitalization is a necessary process for the development of modern organizations. Its main task was to simplify and accelerate the work with large data sets, automate the activity of the enterprise, and establish communications with the external environment. However, there are several major obstacles to implementing the digital business model of an organization based on digitalization. These include the lack of a digitalization strategy, a low level of staff competence in this area [9], fear of change, lack of funding, low level of thinking, and the needs of Internet customers. Modern organizations are not yet able to simultaneously use all the directions and possibilities of digitalization. Most often, they use only individual technologies, and as a result, such a situation negatively affects the development of the enterprise and reduces its competitive advantages. Consumers increasingly value their time,

meaning they need instant feedback, as well as well-designed information resources, online chats, and an individual approach. The expectations of customers regarding the speed and quality of service provision are growing rapidly. To meet the high needs of clients, companies shall accelerate the digitization of their business processes, that is, to digitalize the work of the organization. According to Honore [10], the concept of "digitalization" is the optimization of a business with software and IT solutions that will make it simpler, more cost-effective, and better in the context of customer service delivery and satisfaction. Based on this definition and a review of the literature on the problem, the definition of digitalization of electronic ticketing services as a transformation and improvement of use of digital technologies was developed to improve and expand the channels of business processes related to the sale, as well as the accounting of electronic travel documents through various online services and media channels.

Problems of digitalization and the digitization of marketing activity are covered in many works. They focus on different aspects and analyze the topic from different points of view. In particular, the influence of digitalization on the activity of the enterprise is raised by Chudaeva et al. [11]; Trasca et al. [12]; Lerch and Gotsch [13]; Brennen and Kreiss [14]; Verhoef et al. [15]; and Singh and Hess [16]. In turn, Majerova [17]; Rachinger et al. [18]; and Verhoef and Bijmolt [19] investigate its innovative and digital business models. Works of other scholars were related to the major trends in the digital transformation across different scenarios [20], models of marketing diversification [21], expediency of using electronic communication technologies [22,23], the influence of the trend of marketing digitalization on consumers [24], and digital transformation technologies for large companies [25,26]. Furthermore, other researchers concentrate on the application of digitalization, such as in terms of the network of Portuguese companies [27], banking [28], the problem of digitalization in the retail trade [29,30], and the change of marketing approaches to the consumer through the lens of digitalization of marketing activity [31,32]. Finally, there are works that propose an original event management architecture based on the holonic principles to improve the monitoring and diagnostic processes of a fleet of mobile systems in order to design an effective event management system for trains [33], and explore the statistical distribution models of high-speed railway train delays [34]. However, some aspects of research on railway transport deserve special attention, for example, research on the study of social factors as important components of the digitalization of the business model of railway transport enterprises [35], as well as major opportunities, challenges, and prospects for the digitalization of the rail industry [36–39].

3. Materials and Methods

The research methodology included tools that made it possible to evaluate and determine the impact of digitalization on the enterprise's marketing activities, as follows: methods of systematization—to summarize the theoretical achievements of scientists for the development of the concepts of "digitalization of services for the sale of electronic tickets"; benchmarking—to conduct a structural and dynamic study of the implementation of electronic travel documents through various sales channels through online services, in particular, to determine the growth rate of the number of purchased railway tickets; linear regression analysis—for the construction of predictive models of specific weights of electronic travel documents in their total number for 2019–2020 (based on the results of the retrospective analysis for the years 2011–2018); methodology of a system analysis for the choice of methodological apparatus of research in the comparative system of assessing the impact of digitalization on the marketing activities of JSC "Ukrzaliznytsia"; SWOT analysis—to identify the main features and threats of digitalization of services for the sale and accounting of electronic travel documents; using the expert method surveyed to identify passengers' awareness of online ticketing services; determining the preferences of the passengers of the Ukrainian railways in choosing the methods of buying an electronic ticket; and evaluation of the organization of services for the registration and payment of a ticket. This study used data from 11,116 respondents who were the users of rail passenger services. Among other basic parameters of the questionnaire, the following was

identified: the form of the study—an individual questioning, the frequency—one-time, and the type of expert assessment—questioning-opinion. The questionnaire consisted of 10 questions and forms for filling in the personal data of the respondent. The questions were of open and closed formats. The authors used the statistical methods to process the data obtained from a survey among consumers of Ukrainian railways services. Recommendations for the development of the digitalization of electronic ticketing services and their accounting for the enterprises engaged in railway passenger transportation are proposed.

4. Results

The main components of digitalization are the following: cost structure, consumer segments, sources of income, channels of sale of goods and services, the structure of relations with consumers, key partnerships, types of resources, types of activities, types of business processes, etc.

Business process digitalization involves defining and analyzing the main goals and objectives, identification of the main benefits of digitalization of business processes, selection and implementation of digital technologies, checking and analyzing the effectiveness of the digital solution, and making adjustments as needed.

The realized research made it possible to identify and systematize the main factors of the impact of digitalization on business processes, including the sales activity of the company: increasing the competitiveness of the company, goods, and services in the domestic and foreign markets; increase in sales of goods and services; acceleration of all business processes; promotion of efficient production, economic, financial, logistic, information, and marketing activities; more rational use of available resources; coverage and processing of large data sets in a short time; improving economic security; raising customer awareness of the company, products, and services; and the opportunity for consumers to purchase goods and services online through various online platforms, mobile applications, and social networks.

In general, the mechanism of the impact of digitalization on sales activity (including marketing activities) is presented in Figure 1.

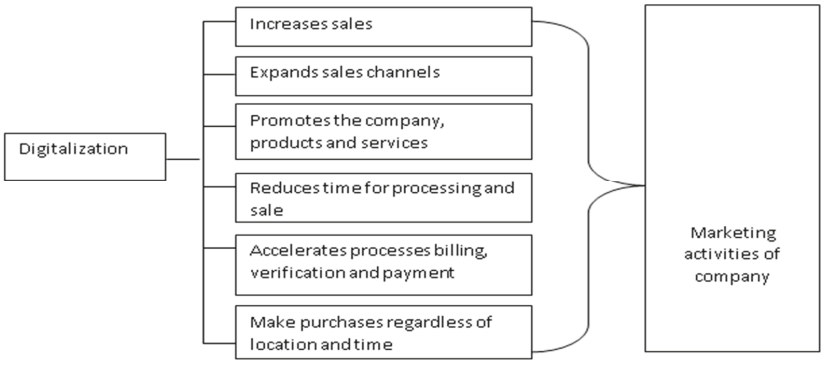

Figure 1. Key factors of the impact of digitalization on marketing activities.

Using the system approach, which involves a comprehensive and purposeful study of objects based on system analysis, the parameters of the influence of digitalization on the sales activity are determined. Per the methodology of this analysis, a "tree of goals" was developed, with a general goal on the pinnacle, namely the impact of digitalization on sales activity, depending on environmental factors (Figure 2).

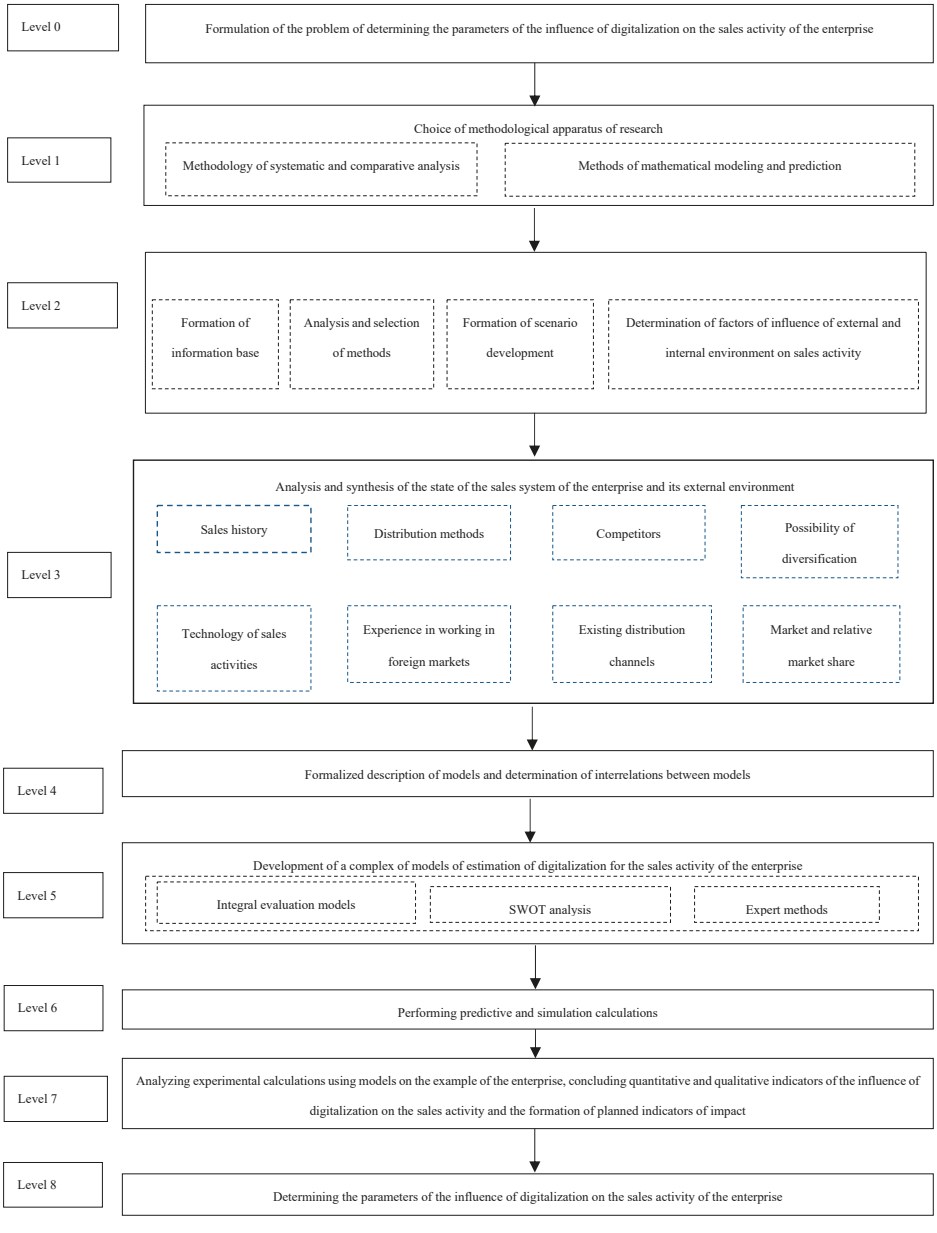

Figure 2. The level system for assessing the influence of digitalization on the sales activity of the enterprise.

Each of the main objectives of the research of the influence of digitalization on sales activity includes a set of subcontracting tasks (sub-goals), which were considered in the context of the developed "tree of goals" to solve the main problem.

The goals of levels 1–8 were transformed into functions of the system as a whole, of subsystems, and of elements. Furthermore, the sub-goals of the lower levels (parameters), which were the means of

achieving the higher-level goals, transformed into tools by which the functions were realized and the reverse process of the composition network of tasks was carried out; this involved the achievement of the main goal, namely to determine the parameters of the influence of digitalization on sales activity.

The achievement of the general goal was influenced by various conditions and restrictions of an economic and informational nature.

After formulating the problem and defining the system and factors of the environment, as well as the main goals and objectives of the research for determining the parameters of the influence of digitalization on sales activity (components of the goal of level 0), the transition to the goals of the first and second levels of the specified "tree of goals" was realized, namely the choice of methodological apparatus for research and systematic analysis of the influence of digitalization on sales activity.

To analyze the retrospective period and identify the main trends in its development, as well as the correlation of indicators that characterize these trends, the development of information support to solve the problem of determining the influence of digitalization on sales activity was a necessary stage of this research.

The preparation of information support involved the collection and processing of output data for the formation of a database, which would later serve to generate equations, model solutions, and analyze the data obtained.

The implementation of the goals of the various levels was carried out using scientific methods, integrated into the tools of system analysis. Informal, graphical, quantitative, and simulation methods may be the principal ways of implementing the developed comparative system of the influence of digitalization on the sales activity under the above conditions and restrictions.

The presented level of systematic assessment of the influence of digitalization on the sales activity of the enterprise was proposed to be applied to JSC Ukrzaliznytsia. In particular, at the first level, the choice of methodological apparatus of the research was made: methodology of systematic and comparative analysis, and methods of mathematical modeling and prediction. At the next level, an information base was formed, methods of influence of digitalization were analyzed and selected, and so on.

The third level included the analysis and synthesis of the sales system of JSC Ukrzaliznytsia and its external environment, including the sales history, distribution methods, and channels, as well as the marketing technologies.

In late 2008, the JSC «Ukrzaliznytsia» launched its first stage on the way to digitalization, where tickets were introduced through the official website of the JSC «Ukrzaliznytsia» [40] a network of agents was created, through which electronic tickets could be issued through online services. These include PrivatBank [41], Oschadbank [42], ticket sales sites [43–47], and other online resources. Extending the functionality of digitalization, the online ticket sales service for mobile apps allows storing them in the AppleWallet app and adding travel information to Google Calendar.

Within the period from 2011 through to 2018, the JSC «Ukrzaliznytsia» sold a total of about 435 million travel documents, while the share of purchased electronic tickets was 18.31% or about 79 million electronic travel documents. The systematized and calculated indicators of the number of registered and sold electronic travel documents for this period are presented in Table 1.

The structured-dynamic analysis conducted during this period demonstrated a growing linear tendency of sales of electronic tickets through online services from 1.06% in 2011 up to 50.13% in 2018. If we consider growth rates by years, then there was a nonlinear and uneven structure. The largest increase in sales of electronic travel documents was observed in 2012. In 2018, this figure was 1.26 and showed an increase in sales of e-tickets through online services by 26% compared to 2017.

The use of linear regression analysis made it possible to build predictive models of the proportion of the total number for 2019 and 2020 as electronic travel documents. The accuracy of the developed model was based on the ex-post forecast for 2011–2018. The model was based on transformed information, where all regression equations and their parameter estimates were statistically significant, the model was adequate, and absolute and relative prediction errors were within acceptable limits with

a given level of significance. Therefore, the forecast values of the share of electronic travel documents in the total number of travel documents for 2019 will be 55.57%, and 63% for 2020. As we can see, over the eight years studied, linear dependence was observed, and the forecast for the next 2 years also showed a linear increase in these specific weights.

Table 1. Dynamics of indicators of issued and purchased electronic travel documents at the JSC «Ukrzaliznytsia».

Year	Total Number of Seats (pcs)	Number of Purchased Electronic Travel Documents (pcs)	Proportion of Electronic Travel Documents in Total (%)	Growth Rate Factor of the Number of Electronic Travel Documents Purchased
2011	65,758,800	693,868	1.06	-
2012	61,749,966	2,116,753	3.43	3.05
2013	61,008,208	4,758,197	7.80	2.25
2014	45,306,511	5,823,801	12.85	1.22
2015	43,624,429	11,746,090	26.93	2.02
2016	48,784,030	16,651,167	34.13	1.42
2017	53,669,618	21,944,761	40.89	1.32
2018	55,183,763	27,664,464	50.13	1.26

A formalized descriptions of models and definitions of their interrelation were realized at the fourth level.

The fifth level envisaged the development of a complex of models for the evaluation of digitalization of sales activity of the enterprise, consisting of a model of integral valuation, SWOT analysis, and application of the method of expert assessments.

The potential of SWOT analysis was used to further investigate the issue of the digitalization of electronic rail ticketing services. The application of this method made it possible to identify the main opportunities and threats of the digitalization of services for the sale and accounting of electronic travel documents. The main opportunities for digitalization include increasing the popularity of online ticketing services through mobile applications and social networks, and attracting additional agents to expand their network in Ukraine and abroad. Threats include the risk of unauthorized access to customer payment systems data and the possibility of hacking attacks on the site of JSC «Ukrzaliznytsia».

Considering the strengths and weaknesses of the results of this analysis, it was possible to conclude there was a need to improve the existing system of selling online tickets. The strengths included saving time on the confirmation of an e-travel document through online services without being tied to a place or time of purchase. On the contrary, the weaknesses were as follows: the issues of information security, cybersecurity, and protection of personal data; imperfection of the personality of life and protection of human rights by digital technologies; changes and protection of trust in cyberspace; failures and technical malfunctions in the work of the site of the enterprise; lack of an opportunity to purchase an online ticket for additional in-house trains; and in the case of traveling with additional or international trains traveling in conjunction with the Commonwealth of Independent States (CIS) countries, a passenger shall first confirm and pay the ticket online, such that an order form is exchanged at the railway station for an ordinary paper ticket that will be sent to his mailbox. This, in turn, creates some additional time costs.

The growth in demand for the purchase of railway tickets through online services and sales channels requires the involvement of additional personnel in the process of the digitalization of electronic ticketing services and their accounting. This will significantly expand the sales channels and increase the sales of electronic travel documents. It is proposed that such functional duties are to be imposed on Social Media Manager (SMM) managers. The basic skills of SMM managers shall be as follows: knowledge of the basics of marketing; ability to analyze potential service users;

knowledge of the basics of sales psychology; ability to quickly study and analyze the potential audience; ability to analyze the needs in certain areas of railway services; ability to evaluate the activity of services in social networks; use of different methods in promoting services through planning, advertising, and collaboration with bloggers, etc. Engaging SMM managers, in our opinion, will enable representation of the enterprise interests of online electronic ticketing through social platforms and networks, and constantly increase the popularity of the railway services provided due to them being more environmentally friendly and safer than other types of transport.

The results of the conducted survey made it possible to conclude that there was no complete volume of information for identifying the advantages of railway transport passengers when choosing the method of booking, confirmation, and payment of travel documents. Thus, one of the important prerequisites for identifying problems in this area was lacking, as well as the adoption of appropriate management decisions by enterprise management. This resulted in the practical significance and feasibility of using expert assessments as a method for obtaining conclusions on the main advantages of users of passenger transportation by rail.

To identify the benefits of passengers whenn choosing the method of booking, confirmation, and payment of travel documents in 2016, a questionnaire was carried out of passengers of six regional branches of the JSC «Ukrzaliznytsia». The results of the questionnaire were as follows. The age structure of respondents' sample was distributed in the following way: up to 18 years old—7%; from 18 to 29 years old—29%; from 30 to 44 years old—37%; from 45 to 60 years old—38%; over 60 years old—4%; respondents who did not give any answer about their age—8%. The data on the main types of occupations (of six railways) was systemized as follows: the largest share was professionals, workers, employees (32%), then students and schoolchildren (22%), and entrepreneurs (17%). Smaller shares characterized the following categories: civil servants (13%), temporarily unemployed (9%), housewives (9%), managers (8%), pensioners (6%), and other categories (1%). It should be noted that 8% of respondents did not answer the question about their occupation. One-third of the respondents lived in the oblast centers of the country, 22% in large cities, 24% in rayon centres, and every sixth passenger lived in Kyiv.

The frequency of trips by rail was mostly high or moderate: monthly (28%) or several times per year (also 28%), once a year and less frequently (23%), weekly (15%), commercial travel (19%), and business trips (18%). The purpose of the trips of the respondents was mostly personal affairs (24%) and study (21%). These goals should lead to a rather high frequency of calls to transport services, and therefore their growth was observed. It should be noted that the pattern of distribution of the frequency and purpose of travel among the respondents was characterized by unevenness in the context of the six regional branches.

Taking into consideration the certainty and/or stability of the purposes of travel, 51% of respondents planned their trips, where 25% booked not less than a month in advance, and 26% booked not less than a week in advance. Approximately one-fifth of respondents (22%) decided on a trip within a few days, 12% of respondents made such a decision only on the eve of the trip, and 8% on the day of departure. Since most passengers planned their travel in advance, the booking service was in demand, and according to the results of this survey, 17% of respondents always used this service, sometimes—22%, only during mass travel of the population—20%, in exceptional cases—14%, and never—19%.

The results of the processing of information according to the passengers' responses demonstrated their loyalty and commitment to the purchase of electronic travel documents through the online service. In particular, the level of awareness of passengers about the availability of booking, confirmation, and payment of travel documents through the Internet was sufficient: 73% of respondents knew about this service, and 46% of them already used it. A total of 7% of the respondents were partly informed about the service and 13% were not informed, of which 7% indicated that they were not interested in this service at all. At the same time, passengers of the four regional branches had a very high level of awareness: Prydniprovska (93%), Pivdenna (88%), Lvivska (87%), and Pivdenno-Zakhidna (84%) railways; the lowest one was Odeska (49%).

Among the real users of the service this year, 34% of the respondents started to appeal to it for the registration, 32% of the respondents used the Internet to book tickets, and 26% of the respondents paid for tickets online. By the degree of commitment to Internet services, most respondents use it: those who use it from the very beginning of introduction—14%, for several years—18%, more than a year—19%, for several months—17%, those who recently started using this service—13%, and those who used it only once—10%.

As for the convenience of the method of booking and payment of travel documents, 44% of the respondents for various reasons prefered ticket offices (see Figure 3). The main reason for that is the ability to get the necessary information about a trip (27% of respondents) and ease of procedures (21%). A significant portion of respondents (44%) noted the convenience of booking and payment of travel documents via the Internet. The advantages of this method in comparison with cash are traditionally noted: time-saving (30%), the convenience of the procedure (22%), and possibility to purchase a travel document for the desired date (10%). The services of Ukrposhta satisfied only 4% of the respondents who could not apply to the ticket office in advance (28%), or were attracted by the convenience of the procedure (15%) and time-saving (also 15%).

In general, the respondents assessed the organization of the services of reservation, booking, and payment of travel documents in the following way (average weighted scores in points on a five-point scale): via Internet—4.09 points, via a ticket office—3.93 points, and via the Ukrposhta branch—2.96 points. Figure 4 presents the distribution of respondents regarding the method of booking and payment of travel documents that they prefer.

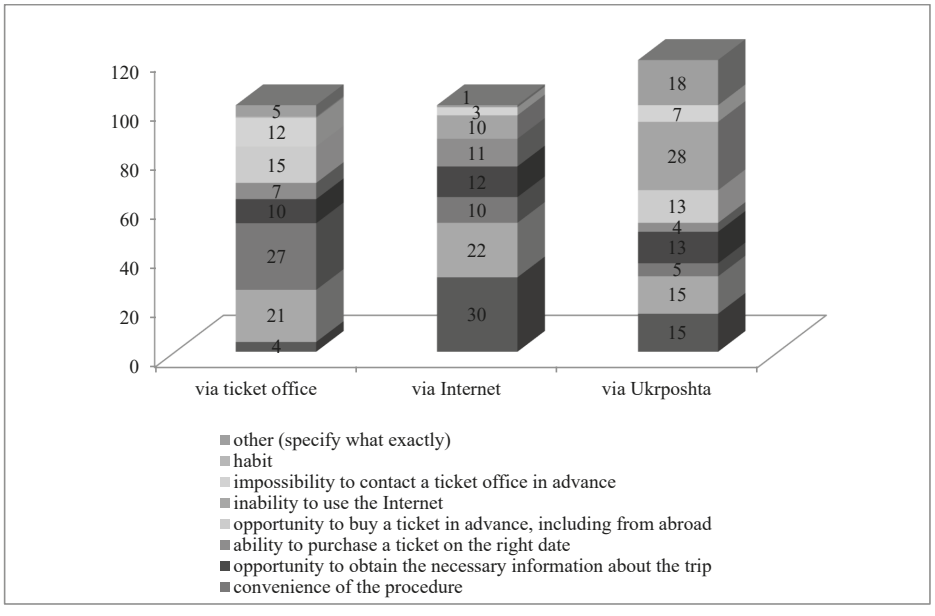

Figure 3. Distribution (%) of respondents by advantages in choosing the method of booking and payment of a travel document.

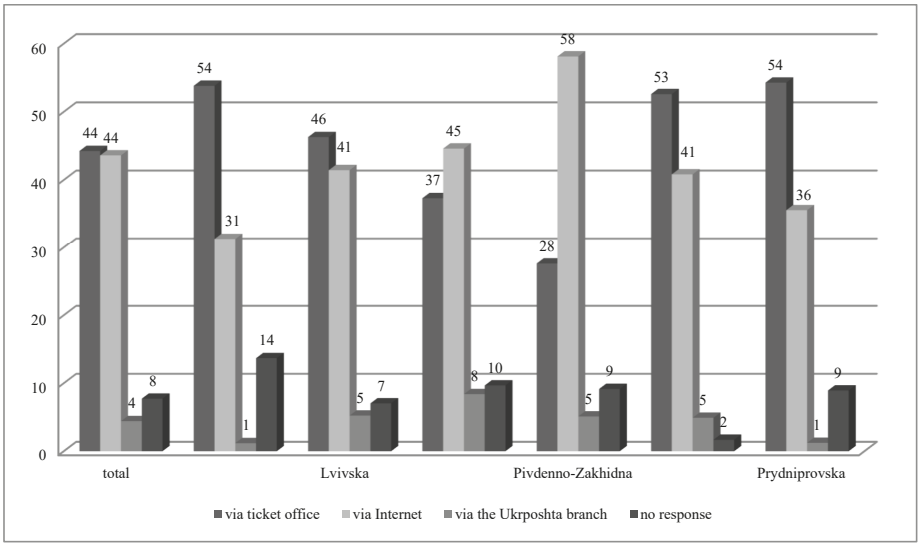

Figure 4. Distribution (%) of the preferences of respondents in the method used for booking and payment of travel documents in total and per separate railway.

When choosing a more convenient way of booking, registration, and payment for travel documents, personal characteristics, such as age, occupation, and place of residence, as well as the possibility to use the Internet, were the most common factors considered by the respondents. For instance, Internet access (at home and/or at work) was specified by 93% of the respondents. This segment was steadily increasing, which could be explained by the fact that more and more passengers were using the mobile Internet that makes it possible to be a user of the network regardless of the place of residence, location, household, economic conditions of the population, and other limiting factors. This positive fact undoubtedly contributed to the growth of the user segment.

For the sixth and seventh levels, the forecasting and simulation calculations, their analysis, and forming the conclusions according to the relevant defined models regarding the qualitative and quantitative indicators of the influence of digitalization on the sales activity of JSC "Ukrzaliznytsia" were realized. Therefore, at the eighth level, the parameters of the impact of digitalization on the sales activities of the studied enterprise were determined.

5. Discussion

The review of the literature sources on the problem presented in this paper made it possible to conclude that there was a lack of theoretical and practical study of the impact of digitalization on the marketing activities of the enterprises providing services in the field of passenger transportation. This, in turn, limited the comparative analysis of prior periods, and based on them, forming appropriate conclusions about the effectiveness of such impacts.

The research made it possible to evaluate the impact of digitalization on marketing activities from a practical point of view. This, in turn, gave grounds for confirming our hypothesis regarding such an impact. The proposed method of determining the parameters of the impact of the digitalization on the sales activity of the enterprise, which represented a tiered system regarding the influence of the digitalization on the sales activity of the enterprise, made it possible to carry out such an assessment from the stage of the determining the parameters of influence of the digitalization on the sales activity of JSC "Ukrzaliznytsia" (level 0) to the stage of determining such parameters at the eighth level. In particular, the fifth stage involved the application of the expert method for the development of a

complex model of evaluation of the digitalization of sales activity. An expert survey of clients of JSC "Ukrzaliznytsia" showed a significant increase in the segment of railway passengers, who preferred to use the Internet for the booking, processing, and payment of travel documents, considering that one in five passengers could not plan their trips. Furthermore, the number of Internet users continued to grow, both in cities and rural areas, along with their awareness of this service being already high enough, and therefore, the number of passengers with experience of using this service continued to increase. Thus, the electronic method of booking and payment of travel documents over the past year retained the loyalty of passengers and did not lose its attractiveness. The reasons for the increase in loyalty were likely to be the improvement of the technology of the existing procedure and the reduction of the cost of Internet services at the expense of a smaller amount of commission, compared with confirming and purchasing a ticket through the ticket office, and cancelling the fee for using the "e-ticket" service when confirming a travel document through the official website of the enterprise.

The use of linear regression analysis made it possible to build predictive models of the size of electronic travel documents regarding their total numbers for 2019 and 2020. The analysis of the accuracy of the model developed was based on the use of the ex-post forecast for 2011–2018. Their forecast values are 55.57% for 2019 and 63% for 2020.

6. Conclusions

This study conducted theoretical and applied research that allowed for confirming the hypothesis concerning the influence of digitalization on the marketing activity of an enterprise in the sphere of the sale of services. According to the results of the research on the problem of digitalization of marketing activity of an enterprise: (1) a categorical and conceptual apparatus of the term "digitalization of electronic rail ticket sales services" was developed as a transformation and improvement of the use of digital technologies to develop and expand the business process channels related to the sale and accounting of electronic travel documents of the enterprise through various online services and media channels; (2) a method for determining the parameters of the impact of digitalization on the sales activity of the enterprise in the form of a comparative system for evaluating the impact of digitization on the marketing activity of the enterprise was proposed. Its practical application was carried out using the example of JSC "Ukrzaliznytsia." In particular, the results of such an impact on the example of the sale of electronic transport documents was demonstrated in the dynamic and strategic perspectives for railway undertakings. The emphasis was placed on innovative sales channels that emerged as a result of digitalization processes. The differentiation of sales channels through the implementation of various online IT services was demonstrated, which helps enterprises to increase their customer base by expanding the potential audience of consumers (including foreign countries), and reducing the cost of issuing and printing tickets and time to purchase them.

In the future, it would be advisable to specify the impact of each of the distribution channels on the results of sales activities of the enterprise and the effectiveness of the widespread adoption of digital technologies in other areas of marketing activities. In particular, the following recommendations are offered for improving the digitalization of services for the sale of electronic travel documents and their accounting in an enterprise: to develop their strategies and tactics to take into account the dynamics of development of digitalization technologies with subsequent application in the construction of business models; to ensure constant monitoring of inquiries and demand for the most demanded routes of passengers; to develop and analyze statistics on the number of electronic tickets issued through various online services and distribution channels; to engage specialists (SMM managers); to actively introduce mobile applications of the enterprise website in social networks, i.e., Facebook and Instagram; to attract additional agents for the sale of electronic tickets in order to expand their network; and to promote online ticket sales services through mobile applications and social networks.

The further development of the sale of electronic travel documents and the digitalization of other services for passengers, in our opinion, should be carried out in compliance with the principle of customer service desegmentation.

The level of development of digitalization in the country as a whole and of each enterprise, in particular, makes it impossible to ensure fast digitalization rates at the macro-, meso-, and micro-levels, which are the research limitations. Also, the research on this problem requires the formation of an information base, including specific and reliable statistical data, which limits its application to other enterprises.

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The Usage of Smartphone and Mobile Applications from the Point of View of Customers in Poland

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Abstract: The main objective of this article was to identify the conditions for the use of smartphones and mobile applications in Poland in the second half of 2018. The scope of the present analysis was limited to a selected sample of more than 470 respondents, and it examined the group of the most active users of smartphones and mobile applications. The author adopted the CAWI (computer associated web interview) method, which was previously verified by a randomly selected pilot sample, in his study. The obtained results were compared with the findings of other studies. They indicated that users of smartphones and mobile applications in Poland do not differ in their assessments from users in Europe and around the world. In this context, the key implication for researchers is the identified level of development of the use of smartphones and mobile applications in Poland at the end of 2018. The main limitation of the research was the selection of the research sample, which consisted only of members of the academic community. The scope of this article aimed to fill a gap in terms of the quantitative and qualitative methods that are applied to examine the use of mobile devices and mobile software. At the same time, this study creates the foundations for further research on intercultural differences. It is important to note that the present research sample needs to be extended beyond the academic community for the research results to be fully generalized.

Keywords: smartphones; mobile applications; evaluation of mobile applications; usage of smartphones

1. Introduction

The primary purpose of this article was to identify the conditions for the use of smartphones and mobile applications in Poland in the second half of 2018. The research, on the one hand, focused on technical issues, e.g., taking particular smartphone operating systems into consideration, and, on the other hand, it evaluated the use of smartphones in both everyday life and economics (mobile-commerce, m-banking, etc.). If we compare the present findings to the results of the study conducted in 2014 [1], the current analysis of the use of smartphones and mobile applications shows that we may observe a specific stability of particular trends, perhaps due to the lack of significant impulses for new products (fewer smartphones sold, extended use of "old" (already owned) items, and a slower increase in the number of new users). This development is not threatened by the specific "intermediate" forms between a personal computer and a smartphone (including foldable, flexible smartphones), nor their compact size, combined with specialisation (e.g., smartwatch, FitBit bands and other wearables). Nevertheless, it seems that quantitative development is slowly being replaced by the qualitative development related to both devices and the software supporting them. One should also pay attention to the impact of an increasing number of such devices, sometimes reaching even the level of billions of items, on the development of the infrastructure supporting them, e.g., fog computing, that enables their better, faster, and more selective use.

The term "smartphone" is used to represent a mobile (portable) multimedia device that possesses the functions of both a mobile phone and a fully portable computer (PDA—personal digital assistant), as well as an increasing number of functionalities of other devices such as electronic cameras, voice

recorders, GPS navigation, notebooks, computer game consoles (smartphones supporting gaming), and health sensors controllers. In this case, a mobile application can be described as a type of software prepared to be used on smartphones and other mobile devices, including independent (without the need to access the internet) and specialised mobile services, client streaming services (access to the internet resources is available on demand), and computer games.

In order to carry out the above-mentioned purpose, this article adopts the following structure. After the introduction, in the Section 2, the author presents the literature background. In the Section 3, the author presents the methodology and the research sample examined in the study. The analysis of the results and their discussion are included in the Section 4 of the paper. The last part contains a comparison of the findings obtained in the research with the results of other studies. In the same section, the author also discusses the conclusions of the tests carried out, their limitations, and directions for further studies aimed at addressing the outlined research problem.

2. Literature Background

Studies concerning the use of smartphones mainly focus on identifying the quantitative correlations of smartphones in relation to specific user groups divided by gender, age, place of residence, countries, regions and time of use, the frequency of using the smartphones per day or week, rankings of manufacturers, etc. [2]. There have been relatively few attempts to combine the findings of quantitative and qualitative research, i.e., focused on their practical applications in the context of mobile electronic commerce (m-commerce), electronic mobile banking (m-banking), or international comparisons [3]. This article belongs to a group of quantitative and qualitative research and may be seen as a preparatory stage for the intercultural research of the use of this technology. Therefore, its main goal was to examine the situation four years after the previous research related to this topic was carried out by the author [1]. It has emerged that the main problem to be solved at present is to identify the specific circumstances of the use of smartphones among the selected respondents, i.e., the population that includes the most active internet users [4].

The existing limited literature has mostly relied upon actual data collected from either a limited number of individual internet users' level information. There has been very little overall research, such as [5], based on, for example, utility functions. A completely different approach is represented by the research on the sociological effects of the use of smartphones (research customers' sentiment or cultural determinants of applications [5,6]). In general, it can be said that the basic research gap in articles on this topic is to focus on technical, market, sociological, or specific problems, e.g., the user's relationship to social media. Usually, there is no opinion on the possibilities of using m-commerce or m-banking for one purpose. This article is intended to fill this gap.

There are currently over 3.6 billion smartphones in the world, and their number increases by about 8% per year [7]. The two dominating operating systems in the market are Android and iOS [8,9]. It was estimated that at the end of 2018, there were almost 30 million smartphones in Poland [10]. The opinion polls from December 2018, published by the Polish Office of Electronic Communications (Urząd Komunikacji Elektronicznej), showed that 74.8% of the respondents used smartphones on a daily basis. Thus, it appears that the issue connected with the use of smartphones and relevant research on the topic is becoming more and more important on both a global and national scale. That is why the author decided to carry out a study whose primary purpose was to analyse market conditions for the use of mobile applications. The results presented in this article take the form of a summary report from the second phase of research.

3. Methods and the Research Sample

The research methodology adopted to analyse the issue of the use of mobile applications included the following steps:

- Formulating the purpose and scope of the study.
- Establishing the method and procedure to carry out the study.

- Based on the previously conducted research, building a pilot version of the survey, verifying the correctness and intelligibility of the survey following the evaluation of a group of users who volunteered to complete this task.
- Revising and improving the prototype of the survey and randomly selecting a group of respondents.
- Inviting respondents to complete a survey made available on the internet using the CAWI (computer associated web interview) method.
- Obtaining results, analysing the findings, and discussing these findings in comparison to the data collected in previous studies.
- Drawing conclusions and providing recommendations for future research.

The final form of the survey consisted of twenty-six substantive questions and four questions related to demographics (gender, age, place of origin, and education). The questions were divided into five groups:

- The technical characteristics of smartphones (considering the division into traditional phones and smartphones, the division into private and company phones, and the number of owned smartphones, as well as analyses according to operating systems, screen cross-sections, or producers).
- Smartphone properties (advantages, disadvantages, time of use, number of applications owned, frequency of use, and the frequency of installing new applications).
- Application characteristics (offer, the quality of the application, its purpose, and use of photos taken with the smartphone).
- Possibilities of obtaining applications (the convenience of using the application store, application purchases, their value over the last six months, and the use of subscription applications).
- Using a smartphone for shopping and e-banking (shopping frequency, product range, type of e-banking used to make a purchase, circumstances of its use, and operations performed as part of e-banking).

The research was conducted in the period of November–December 2018. The selection of the test sample was not accidental; it was a case of convenient sampling, supplemented with the elements related to the random selection of the respondents. The majority of survey participants belonged to the 18–25 age group (98% in 2018, 69% in 2014), i.e., the population that many studies [11] have identified as the most active in terms of the use of smartphones. In addition, it is a group characterised by innovation in terms of both the application and testing of the latest technologies. The research was carried out among students of the University of Warsaw. This solution ensured a higher response rate of the survey—university students manifest greater knowledge and research curiosity than other people from the same age group. The pilot group (32 people) was made up of individuals who accepted the invitation from the University of Warsaw's Faculty of Management website to complete the first version of the survey questionnaire that included 52 questions. After the initial verification and modification, as well as the reduction of the survey to include only 26 questions, the authors sent invitations to complete the online survey to randomly selected student groups. It was a structured survey. The expected results of this sampling were, among others: a very high share of individuals who have had smartphones for a long time, a high frequency of their use, a small number of company smartphones, and a smaller number of paid applications in contrast to the high number of the applications that can be downloaded free of charge. On the other hand, focusing on this group of respondents ensured a higher response rate and reliability of information, as well as the use of broader application functionality than in the case of the remaining part of the society. It is important to note that the research conducted in this way also anticipated future trends related to using this technology in some areas. Additional section expression was used here in all questions where there was doubt as to whether the choices were completely filled. For example, in the question "Are photos taken with a smartphone you most often: sent by MMS, placed on Facebook, sent by e-mail, use in Instagram, other?" respondents supplemented with other options, e.g., I use Messenger, Snapchat, WhatsApp, Telegram, or not sharing.

In total, 584 people completed the survey. Despite its simplicity and preliminary testing on the pilot group, just over 81% of respondents, i.e., 473 people (314 people in 2014) filled in the survey questionnaire correctly. Among the respondents, 74% were women and 26% were men (63% women and 37% men in 2014). Nearly 39% of women, 4% more than men, had a smartphone with the iOS operating system. Almost all respondents—close to 98%—were from the 18–25 age group, which is typical for undergraduate and graduate students. It also appears that slightly more people in this age group had the iOS operating system. Over 97% of people declared having secondary education, and only 14 held a BA degree or declared having higher education. Over 30% of respondents came from villages (16% in 2014). Almost the same number of respondents declared coming from cities with 10,000–100,000 residents, over 25% declared coming from cities with over 500,000 inhabitants (44% in 2014), 9% of the sample declared coming from cities with 100–500 thousand inhabitants, and almost 6% declared coming from towns below 10,000 residents. Among the survey participants who came from cities with 100–500 thousand residents, almost 6% more respondents had smartphones with the iOS operating system. A similar tendency could be observed with regard to residents from cities with more than 500,000 inhabitants—the difference, in this case, amounted to 4%. The opposite situation appeared to take place in relation to rural residents—8% more respondents representing this group had a phone with the Android operating system. It is important to note that, this time, the majority of respondents filled in additional sections of the survey containing questions connected with the use of mobile devices and applications.

In summary, the study was conducted with the participation of a research sample representing a similar academic environment to one from four years ago, but the structure of this sample had different characteristics, e.g., almost 30% of the study participants were younger than the respondents examined three years earlier, and the population coming from large cities was 19% smaller than previously. The respondents living in the countryside completed only half of the previous number of questionnaires, but they were willing to provide additional comments to the questions included in the survey. It appears that the latter resulted from the random selection of groups invited to complete the survey.

4. Results and Discussion

In the first part of the survey, the respondents referred to the organisational and technical characteristics of their smartphones. This time, everyone already owned a smartphone (89% in 2014), with 1.27% additionally owning a "traditional" mobile phone. As might be expected, only 5.3% of respondents had company smartphones in addition to owning private ones (similarly in 2014), and only one person had a business smartphone and did not own a private device. Over 90% of respondents had one smartphone, over 9% had two, and less than 1% had more than three.

Subsequently, the survey questionnaire helped to identify the type of operating system used in the respondents' smartphones. Simultaneously, this section of the survey enabled the authors to verify the accessibility of mobile applications associated with particular types of operating systems. The structure of the results obtained in the study was as follows: those using the Android system accounted for 62% of all users (almost twice as many as the share of survey participants using iOS (38%)), and only one person (which was only 0.2% of the sample in previous studies—a level of 14%) was using the Windows system (10 mobile). Due to such a small number of owners of smartphones with the Windows operating system, in further analyses, only selected responses of this particular user were quoted, and this case was omitted in the further calculation of the population shares. It is interesting to note that, in the present study, there were no representatives of individuals using other operating systems, such as BlackBerry OS, Bada, and Firefox OS, all of which accounted for 1.6% of all users in 2014. The next survey questions concerned the technical issues related to smartphones. In the Android operating system, the majority of users (55%) had a camera with a screen section of 5"–5.4" or 5.5"–5.9" (34%), and relatively few (6%) owned a smartphone with a section of 4"–4.9". The opposite

situation occurred in the group of smartphone owners using the iOS system. Most of them (60%) used smartphones with a screen size of 4″–4.9″.

Over 47% of respondents had used a smartphone for a period shorter than three years, and almost 28% used theirs for 5–10 years. Over 22% had their smartphones for three-to-five years, and only slightly more than 2% of the sample said that they started using it ten years ago. As previously, the data confirmed the opinion that the longer the time a smartphone is used, the higher the likelihood to buy new applications, i.e., those who had had it for the longest time declared purchasing applications most often. There was no gender diversity in this regard—the first group declaring using the smartphone for the maximum period of over three years included almost the same percentage of women as men.

Most of the respondents (a 41% share) had smartphones with a screen of 5″–5.4″, and they considered such a screen to be quite sufficient. On average, 27% of respondents preferred a smaller screen size of 4″–4.9″ or a larger screen of 5.5″–5.9″. Slightly over 4% of study participants had a smartphone with a 6″ screen or larger. Among owners of Android systems, over 55% had cameras with 5″–5.4″ screen cross-sections, which was the most popular type of device in this group. The majority of the owners of smartphones with iOS (60%) preferred the screen with the cross-section of 4″–4.9″. Thus, it emerged that among the surveyed group owning smartphones with a 5″–5.4″ screen, 83% worked on Android; among respondents with smartphones with a 4″–4.9″ screen, 86% of the sample ran on iOS. This was probably due to the higher price of the iPhone, which appeared to be a key factor for selecting a particular device in the population examined as part of the study.

The largest share of research respondents (37%) used Apple smartphones (99% with the iOS system). Together with Samsung smartphones (26%), with 42% Android system, this accounted for almost two-thirds of all devices analysed in the study. In addition, Huawei smartphones (over 17%, with 27% being Android) and Xiaomi smartphones (almost 7%, with 11% being Android) took a significant position in the ranking created as part of the study. Moreover, LG, Sony and other smartphones, such as HTC, Motorola, and Asus, also occupied significant places in the evaluation. The diversification of brands supported by the Android system was therefore definitely higher than those that ran on iOS.

The questions contained in the second section of the survey concerned the specified properties of smartphones. Based on the findings, we may conclude that the group of most appreciated features, according to smartphone users, included high quality (21% men) and design/appearance (19% women). The further positions in the ranking were taken by the availability of applications (16%) and convenient use and reliability (from 12% to 16%). The users of smartphones with the Android operating system considered the availability of applications (17%) and high quality (17%) to be the main advantages of their devices. Smartphone users with the iOS operating system focused on high quality (27%) and design/external appearance (24%). The user of a smartphone with Windows primarily indicated low price, reliability, and ease of use. Among Android users, reliability was the least important, and iOS users did not regard the low price to be a considerable advantage (Figure 1).

As the findings suggest, a low battery capacity (26% of respondents) and a high price (24% of respondents—especially among users of smartphones with iOS, as 33% of them thought so) seemed to be the most significant problems. The survey participants also paid attention to failure rate (18%) and a small number of available applications and with inconvenient use (almost 9% each). Android users showed more concern in terms the a possible failure of the device (a difference of 2%) or the inconvenience of use (a difference of 8%). They also indicated an additional factor related to a less attractive appearance or design (a difference of 8% in comparison to iOS users). The trends described above are shown in Figure 2.

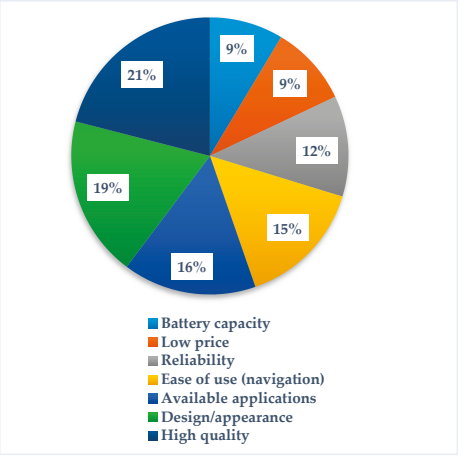

Figure 1. Advantages of smartphones used by the respondents. Source: own work.

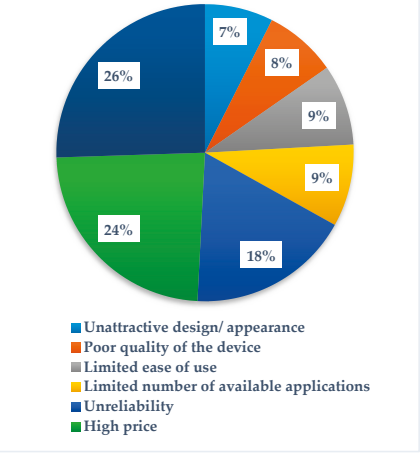

Figure 2. Disadvantages of smartphones used by the respondents. Source: own work.

Over 47% of respondents had used their smartphones for less than three years, over 28% had used their smartphones for 5–10 years, and 22% had used their smartphones for between three and five years. The smallest number of smartphone users indicated using them for more than ten years, which showed the context in which smartphones are fully used. The distribution of use over time for different operating systems was similar, with a slight advantage of the prolonged use of a smartphone with the iOS operating system. Compared to previous studies, the number of individuals who used their smartphones for a period of three-to-five years increased significantly, mainly at the expense of owning a relatively new smartphone (up to three years).

The intensity of using applications was defined as the number of continuously used applications, including those pre-loaded by the producer of the device and those uploaded by the producer and by the user himself/herself. In Table 1, the author presents the percentage shares of use of the number of applications broken down into two operating systems: Android and iOS. As previously indicated, the applications using the Windows operating system were omitted in the present study due to the negligible percentage of people using smartphones with this system in the examined sample. The most significant differences (at the level of 12%) between smartphones with different operating systems

occurred in the case of more than ten applications uploaded in the device, where iOS played a dominant role (47%), as well as in the group of 7–10 applications (5%), where we may observe the dominant share of users with Android operating system (27%). In recent years, the average use of applications has changed, primarily in the group of more than ten applications (an increase of over 6%) and mainly at the expense of reducing the share in the groups with one-to-three applications and 7–10 applications. If we also consider applications uploaded in the smartphone by users, then their owners usually belonged to the group that declared having more than ten applications (74%). This constituted an increase of over 30%. In other groups, there occurred a significant reduction (amounting to 11%) in the number of applications that were owned and used (Table 1).

Table 1. The intensity of smartphone use (the number of regularly used applications).

Labels/Operating System of the Smartphone	Android	iOS (iPhone)	Average for 2018	Average for 2014
1–3	8.53%	4.47%	6.50%	10.57%
4–6	29.01%	26.26%	27.63%	26.60%
7–10	27.30%	22.35%	24.83%	28.10%
More than 10	35.15%	46.93%	41.04%	34.73%

The frequency of using such applications as calendar, notebook, and voice recorder was another research question that provided further insight into the issue of using smartphones. The purpose of this enquiry was to establish whether using a smartphone goes beyond its standard functions (telephone or internet connection) and also includes certain "office" functions. The scale of response varied from among answers of "very often", through "often", "sometimes", "rarely", and "never". The predominating answers were "sometimes" (36%) and "often" (31%). The "often" option was mainly indicated by users of the smartphone with the iOS operating system (38%), and "sometimes" was mainly indicated by those who had smartphones running the Android system (37%).

The frequency of installing additional applications on the smartphone was another critical factor considered in the research. In the case of this question, there were three choices available, namely "rarely", "from time to time", and "often". Less than 12% chose the last option. Almost twice as many (22%) indicated "I never install additional applications", and 66% declared the possibility of installing them from time to time. It is interesting that in 2014, the option related to installing the applications often was declared by a 25% share of users. Here, a question arises whether we are dealing with saturation related to the most popular applications.

The subjective assessment of the quality of the applications used on the smartphone was the next characteristic feature analysed in the study. The majority of respondents (almost 60%) perceived the quality of the application as good, although they also noticed a considerable number of worse quality programs. The second place with a score of 32% was taken by very good quality, which means that the respondents appreciated the high quality of software design. Other opinions were of marginal importance: the sole owner of the Windows smartphone evaluated the quality of the application as average. The owners of smartphones with the iOS operating system considered the quality of applications to be very good (47%), which represented a twofold increase in comparison to the score obtained in 2014, when such opinion was expressed by 27% of users of the same group. Nevertheless, 48% of smartphones users with iOS still believed that the quality of the application was only "good". Similar opinions in the same category were shared by 67% of smartphone users with the Android operating system (23%—"very good" quality). However, this was still seen as a very good opinion, when also taking into account the conviction present in the literature that the desktop (PC) screen, at a glance, offers the user 39.18% chance of understanding the content, and a mobile screen only offers a 18.93% chance [12].

The respondents' statements showed that smartphones were still mainly used (44%) to browse the internet, to have conversations with others (40%), or to send short messages (11%); 3% of the share declared using a smartphone to listen to music, and almost 1.5% indicated that they primarily used it to

view messages. The wording "mainly" did not allow us, however, to capture such activities as taking photos and videos, which are very often carried out while using other smartphone functions. Therefore, the next question concerned using photos made with the smartphone. Most respondents (42%) used Instagram to distribute them, over 12% used messengers for this purpose, 12% sent photos directly via MMS, approximately 10% disseminated them via Facebook, and 4% did so using Snapchat. As many as 15% of respondents used them for their own purposes only and did not share them with others.

The fourth group of questions concerned the possibility of obtaining applications. In this group, respondents assessed the convenience of using online stores offering applications for their smartphones on a five-point scale (with the options of very convenient, convenient, rather comfortable, not very comfortable, and I do not use it). The highest rating (63%) was obtained in the category of the high convenience of using the shop, which was mainly determined based on the opinions of 66% of smartphone users with the Android operating system. The second position (26%) was taken by the option of "very comfortable", obtained mainly thanks to 31% of iOS users' opinions. Thus, 89% of users rated app stores very positively. In 2014, 77% of respondents assessed the shops in this way. The Windows user perceived the convenience of the store as average, similarly to 10% of users of smartphones with Android and iOS. The present results seemed to be related to the high level of the refinement of products available in the shops of the two competitive offers associated with Android and iOS operating systems, as well as the development of a specific market balance between them.

As far as payments charged for mobile applications were concerned, users of all operating systems mainly downloaded free applications on average (83%). We could observe a growing tendency in this regard, since, in 2014, this trend reached an average of 74%. At present, Android users did it 8% more often than in 2014, and a similar tendency could be observed in the case of iOS users. It is worth mentioning that the number of free applications downloaded on smartphones with Windows increased significantly. The second most popular option (on average 16%) was to buy applications. This result was mainly influenced by the 24% share of users of smartphones with iOS, the score of which was 3% higher than in the study conducted in 2014. For Android smartphones, only 12% of users were found to currently buy applications, though this was 5% more than three years earlier. The category "I do not download or buy applications for my smartphone" was reduced almost to zero.

It emerged that, regardless of the operating system used, over the last half of 2018, respondents (on average 84%) did not pay anything for downloaded applications, 10% paid below PLN 20, and in the case of a 4% sample share, the expense was estimated at the level of PLN 20–60. Only about 2% of smartphone users spent over PLN 60 on applications. At the same time, it appears that iPhone users were more willing to spend money on applications than smartphone users with the Android system. This was especially true in the cases of expenses in the range below PLN 20 and in the range of PLN 20–60, where the difference amounted to 4%, and in the range of PLN 60–120, where the authors of the study recorded a difference of 3%. However, there were 14% fewer smartphone users with the iOS operating system who paid nothing for downloading applications in comparison to users of smartphones with the Android operating system.

The use of subscription applications, e.g., websites of electronic content distributors, was another problem analysed in the study. Almost 58% of respondents declared using such an option, and over 31% on average did it often. Smartphone users with iOS used the subscription formula much more frequently than Android users (a difference of 17%), especially since over 50% of respondents who had smartphones with the Android operating system did not use this form of entertainment (20% more than in the case of iOS). Due to the fact that applications sent in exchange for a subscription fee are a specific compromise between free and paid applications, the number of subscribers had increased significantly (by 40%). This type of service has many advantages—the customer does not have to pay large amounts of money at one time and has constant access to the latest publications. From the point of view of the producer, updates can cover all customers at the same time, and they do not have to maintain older versions. The product/service providers make slightly smaller profits, but the money is

seen as regular and continuous income, and, for this reason, the producers might be interested in such a business model.

The last group of the questions concerned the use of a smartphone for shopping and e-banking. This section appeared for the first time in a survey carried out in 2018 following the suggestions of respondents taking part in the earlier study.

Almost a quarter (24.31%) of smartphone users carried out shopping and financial operations often. However, most respondents (34.25%) indicated that they engaged in them sometimes or rarely (32.14%). On average, 9.30% of smartphone users never did it. The owners of iPhones made purchases over 11% more frequently than others, and a 5% larger share declared that they sometimes do it. We could also observe differences in the share of the Android smartphone owners declaring making purchases rarely (difference of 9%) or never (a difference of 6% more in relation to iOS smartphone users) (Table 2).

Table 2. Frequency of purchases made by respondents.

Frequency/The Operating System of the Smartphone	Android	iOS (iPhone)	Average
Sometimes	32.42%	37.43%	34.25%
Rarely	35.49%	26.26%	32.14%
Often	20.14%	31.28%	24.31%
Never	11.95%	5.03%	9.30%

Another important question concerned the selection of purchases. In total, 375 people (i.e., 79% of the population) made purchases using a smartphone. Most smartphone users (42.92%) bought clothes and footwear; however, it is essential to note that the owners of smartphones with the iOS operating system spent 11% more on this group of items. Transport tickets came second in the ranking (average 20.72%), followed by tickets for events such as films or concerts. Over 10% of Android smartphone users were found to spend money on other products or services like cosmetics and taxis, which were not included in the list. Generally speaking, it appeared that smartphone owners primarily make low- and medium-value purchases. Higher-value transactions that require reflection or payment by a bank transfer or cash after delivery are made either using a laptop, desktop computer, or in person (Table 3).

Table 3. A selection of products and services purchased via a smartphone.

Product/Operating System	Android	iOS (iPhone)	Average
Clothing/footwear	38.57%	49.72%	42.92%
Transport tickets (plane, train, etc.)	22.53%	17.88%	20.72%
Cinema and concert tickets	15.02%	16.76%	15.64%
Other	10.58%	4.47%	8.25%
Food	5.12%	6.15%	5.50%
Entertainment (books, films, music, games)	5.46%	3.91%	4.86%
Information	1.37%	0.00%	0.85%
Financial services	0.68%	0.56%	0.63%
Household appliance/Home electronics	0.68%	0.00%	0.42%
IT products and services	0.00%	0.56%	0.21%

As far as financial operations are concerned, 427 people (over 90% of the sample) used smartphones to carry out financial transactions. Most of them (68.71%) used m-banking applications for this purpose (14% more owners of smartphones with the iOS operating system than with the Android system). Over 21% of respondents used online banking via the browser and the bank's website for these operations (over 9% more owners of smartphones with the Android operating system than with the iOS). Over 9% of smartphone users did not use financial banking services (Table 4).

Table 4. Types of banking used in banking operations.

Types of Banking/Operating System	Android	iOS (iPhone)	Average
e-Banking mobile application	63.48%	77.65%	68.71%
Online banking using the browser and the bank's website	24.91%	15.64%	21.56%
I don't use it at all	11.60%	6.70%	9.73%

Individuals who did not use banking services via a smartphone were asked about the circumstances in which they would be willing to use such services. The majority (47.83%) of people indicated that the issue was related to the lack of sufficient knowledge or awareness that could be supported with information from the media indicating the benefits of using mobile and online banking. The above-mentioned lack of awareness was pointed out by 12% more owners of iPhones. Almost 37% of respondents pointed to organisational problems, and, on average, 8.70% indicated the lack of proper training or instruction (16.67% owners of smartphones with the iOS operating system). Over 6% presented other reasons, such as insufficient transaction security, greater convenience in using transactions with a laptop, or simply no need to use this form of banking.

As far as e-banking and m-banking via a smartphone are concerned, on average, 48.24% of respondents usually only checked the account balance. Another popular operation was making a low-value transfer, which was reported by 31.85% of smartphone owners along with making low-value payments, which was declared by 11.71% of users. Checking a payment card balance or account history were less popular activities in this context. Among other operations performed via a smartphone, attention was paid to topping up the phone, making large-value transfers, withdrawing cash using Blik, and searching for banks and bank branches (Table 5).

Table 5. Types of operations performed as part of e-banking.

Labels/Operation System	Android	iOS (iPhone)	Average
I check account balance	49.03%	47.31%	48.24%
I make low-value transactions	31.27%	32.34%	31.85%
I make low-value payments for goods/services	11.58%	11.98%	11.71%
I check payment card balances	2.70%	4.19%	3.28%
Other	2.70%	2.99%	2.81%
I check account history	2.70%	1.20%	2.11%

5. Conclusions

The study was conducted with the participation of students, who are the most active users of smartphones and mobile applications. On the one hand, the study sampling constituted a specific limitation of the study as it is difficult to generalise the obtained results because the averages exceeded the findings obtained in surveys analysing the Polish population and the fact that the research mainly took the preferences of users aged 18–35 into account. Statistical sources have indicated, however, that over 90% of people in this group had their smartphones, and the level of ownership was estimated as 15–74% in the remaining age groups. On the other hand, taking into account this group's receptive approach to innovation and globalisation tendencies, on the basis of the findings obtained in the research, it is possible to conclude future trends in the development of activities related to mobile devices and the use of mobile applications. It is also a group susceptible to international comparisons due to similar requirements regarding general trends on the internet. In the last three months of 2018, 40% of Poles made at least one purchase via the internet. Among Polish internet users, there were already over 23% of users who only did shopping via a smartphone (15% of buyers decided to finalise the transaction via smartphone) [10]. The obtained study results basically confirmed this tendency.

The most important differences and similarities between the results presented and the data appearing in other statistics, rankings, and studies are:

- All respondents owned at least one smartphone (on average, 10% more than in Poland).
- Respondents used 12% fewer smartphones with the Android operating system than the average share in Poland at the time, 2% fewer Android smartphones than the estimated average in Europe (in November 2018, the Android score in this regard fell to the level of 64.57%), and 14% less than the average in the world [13].
- A relatively large group (37%) used Apple phones (being considered more prestigious, which may be important in this environment), which, together with Samsung smartphones (26%, with using 42% with the Android system) constituted 63% of the all the equipment. The third position was taken by Huawei, followed by Xiaomi. Compared to the Polish market at that time, Samsung was seen as a market leader (42%), followed - after an intensive marketing campaign by Huawei (25%), Xiaomi (12%), and Apple, which took the fourth position [14].
- Among the advantages of used smartphones, respondents mainly valued high quality (hence the high share of iPhones), and, as in other studies, the availability of applications and design/appearance.
- Among the main disadvantages, the study participants listed the high price and low battery capacity (50% in total), as well as the high failure rate.
- Smartphones were used increasingly longer compared to data from 2014 [1], as the number of devices used for three-to-five years or more increased at the expense of the items that were used for less than three years. This is in line with the global trends that have shown a decrease in smartphone sales and an increase in the intensity of their use due to market saturation. As predicted in 2019, 2.5% fewer smartphones were sold worldwide, which was 2 million fewer in Europe [15,16].
- As a result, according to the examined users' declarations, since 2014, the intensity of application usage in the group of more than 10 applications has increased by almost 6%.
- The opinion about the availability of applications improved (85% good and very good), and the quality rating also increased—in over 60%, it was rated as good, even though the users also took note of a number of worse quality applications.
- The use of smartphones to enable various types of functionality is difficult to apply in broader comparisons due to the fact that statistics have usually referred to it as the use of tablets and portable PCs; however, 40% of respondents emphasised the use of these devices mainly for conversations or other widely perceived internet activities (browsing news, social media, emails, etc.).
- In order to distribute photos taken with a smartphone, most users (40%) used the Instagram system, more than 12% used Messenger, the same share of respondents sent them as MMSs, 10% disseminated them via Facebook, and others decided not to publish them but rather use them for their own purposes.
- Almost 58% of users used subscription services, and their number increased by 40% in comparison to 2014.
- The rating of the convenience of using stores with mobile applications increased by 12% compared to 2014, and the same tendency could be observed in terms of the share of users downloading only free applications from the websites of electronic content providers—an increase by 9% (up to 83%). This was in line with trends occurring in Poland, although the rates of downloading free applications in this group were 8% higher than the average [10].
- Nearly 80% of smartphone owners made purchases via the internet, only 24% did it often, 34% did sometimes, and 32% indicated that they rarely engaged in online shopping.
- Purchases mainly included clothing and footwear at 43% (due to the possible return, exchange, etc. of goods guaranteed by legal provisions), transport tickets, or tickets for cultural events, cosmetics, food, etc. In general, these are still low-value expenses, and high-value online transactions are made using PCs [17].
- More than 90% of respondents carried out various financial operations via a smartphone. The respondents (69%) mainly used bank applications for this purpose, over 21% of them

used the bank's browser on the internet, and almost 10% did not use this option at all; 15% more smartphone users with iOS system tended to use banking applications (compare with [18]).

Smartphone owners mainly used passive banking operations, e.g., checking the account balance (48%), and 43% of respondents used active operations—making low-value transfers and low-value payments for goods or services (including the Blik system). As the analysis presented above indicates, when we compare the present findings with the results of other studies, the quantitative data appeared to be in line with national and international trends. In terms of qualitative data, certain specified differences resulting from the adopted methodology and the sampling procedure emerged, similarly to the case of the previously conducted research. The above considerations point to one definite conclusion, i.e., the mobile application market will continue to rapidly grow. Even if the dynamics of this growth has recently decreased [19], one needs to consider the following circumstances:

- The highest dynamics can be achieved if we start from scratch.
- Due to the increasing quality of both the technical characteristics of smartphones and mobile applications, the length of their use increases.
- If the process of technological "ageing" is slowing down, users are not interested in replacing their smartphone with a new one, and they only replace it when their device breaks down or stops working as well as before.
- Possibilities related to the replacement or repair of the items are not limited by law or technical solutions.
- Increasing the speed of data transfer to fifth-generation mobile technologies, which will probably make smartphone replacement necessary.
- Introduction of the technology of the so-called folded or broadcast smartphone screens, which will be an important technical novelty and may induce users to buy new devices.
- We may observe a growing tendency to diversify the sales structure (multiple sectors).

It is important to note that the demand for smartphones and mobile applications is currently driven by countries such as India, China, and Brazil, as well as African countries, whose inhabitants are buying an increasing number of smartphones and are also expected to use mobile application shops more and more. The pace at which new, improved applications are created is also increasing, together with the emergence of new technologies that will be entering new markets.

The presented research constitutes the second stage of research that will be completed with the use of a comparative analysis including also cultural aspects of smartphones and mobile applications in selected countries.

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Digital Media: Empowerment and Equality

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Abstract: This study investigated the use of digital media, specifically social media technologies, in the workplace in Taiwan. The data for this study were collected through an online survey. Participants responded to questions asking whether social technologies could be a source of empowerment, leading to equality. Respondents included female and male employees. The findings reveal that both genders use social technology platforms for business support, experience benefits, and believe that these technologies could provide empowerment for success. Detailed results are reported in this paper, including a comparative analysis. The differences between women and men using Facebook and YouTube were significant. Women in Taiwan have a higher awareness of the benefits of social technologies, specifically Facebook, when used for business support and empowerment. This paper reveals a comparison between the attitudes of women and men when using social technologies and investigates the realization of the economic empowerment component.

Keywords: digital media; empowerment; equality; Taiwan

1. Introduction

Digital media platforms have revolutionized how people communicate with each other by excluding socioeconomic, politics, civil disobedience, and connectivity barriers. Furthermore, digital media have brought about rapid changes in the workplace by providing new opportunities [1–4]. In the last decade, digital platforms have allowed organizations to communicate globally, provide customer service, gain exposure and new customers, market products, network, recruit employees, and increase revenues [5]. Digital media increase access to information and human interactivity [6,7].

Social technologies, as a part of digital media, give new opportunities for business support, and have changed the way employees and business owners communicate. These technologies also provide customer service, support gaining exposure and creating awareness about products or companies, acquiring new customers, looking for a new market or brand products and businesses, networking and building relationships or recruitment process of employees. In recent years, researchers have begun to focus on social network service-related issues [8–11]. Facebook, LinkedIn, and other digital platforms have changed everyday life and, more recently, the business environment.

In Taiwan, nearly seven million people are regular social media users [12]. Social media are now a cornerstone of everyday life [13]. Digital media give unique features for connecting with others, which could be beneficial for learning opportunities [14], and it can support the empowerment effects. Thus digital platforms support the empowerment of the user; however, it also brings the paradox alignment of freedom and control [15].

The gender gap, female empowerment, and digital media have been widely studied [16–20], yet there is little data on the role of social technologies to empower women and drive economic equality, to eliminate the gender gap of earnings.

Digital technologies have become more and more accessible as tangible tolls for women to overcome inequalities [3,4,19]. The usage of social media in different studies underline the high correlation with gender gaps in many different areas of life among all nations [2]. Thus it is essential to investigate the role of social network platforms in business to assess the opportunities for empowerment.

This study—part of an ongoing global study—investigated how social technologies are used in the workplace and whether benefits were experienced with the idea of empowerment for women worldwide. Survey results are revealed regarding the use of technology, the purposes for which social technologies are used, and whether women and men in Taiwan experienced benefits.

The paper aims to check the role of digital media in creating peoples' empowerment and equality. Two research questions are addressed:

(1) Is there a difference in the results for women versus men?
(2) Can social technology platforms provide tools for empowerment?

In the first part of the study concern, the literature review related to the gender gap, empowerment, and digital media is presented. Next, the research results are described. In the end, the conclusions, limitations of the study, and future directions are addressed.

2. Literature Review

2.1. The Gender Gap

The relationships among personality traits, generalized beliefs, and the use of social media platforms have been studied by several researchers [21–23]. Caison et al. [24] confirmed that there is a significant difference between technology readiness and gender, which is related to different attitudes toward technology [25]. Lin and Yu [26] also explored gender differences in adolescent Internet usage in Taiwan. The results supported the view that the gap in gender differences in Internet use has decreased in this generation.

In most societies in the world, gender provides a framework for how individuals are expected to behave [27]. Women suffer from discrimination, especially in undeveloped or developing countries, where gender stereotypes exist and where children are taught by adults to behave according to them [28,29]. It has been argued that eliminating gender stereotypes will improve access to education, which in turn will help reduce poverty [30,31]. Gender inequalities can also be eliminated by neutralizing cultural biases regarding women [32].

Although the gender gap has decreased with the younger generation, middle-aged and older women represent the lowest usage rate of information and communication technology (ICT) in Taiwan. The Taiwan Women Up (TWU) program has helped such groups to successfully learn ICT skills with the support of members of nonprofit organizations [33]. These groups are a testament to the concern that those governing Taiwan have shown regarding technology and economic gender gaps.

Globally, a gender pay gap exists, and Taiwan is no exception. Taiwan's Ministry of Labor indicated that in 2016 women made 14.6% less than their male counterparts. The gap has slowly improved since 2002 and has been narrowing over the past decade [34]. To put this in perspective, the Global Gender Gap Index 2020 ranks 153 countries according to how well they are leveraging their female talent pool based on economic, educational, health-based, and political indicators. With a decade of data, this edition of the Global Gender Gap Report—first published in 2006—shows that while the world has made progress overall, stubborn inequalities remain [35]. In the Global Gender Gap Index 2020, there are no Asian countries in the first ten places. Taiwan, an island nation, is not included in this particular study, and although inequality exists, a 15% gender pay gap would put them among the best in this report regarding economic gender equality.

2.2. Empowerment

There are many definitions of empowerment in the literature [36]. Empowerment is a process by which powerless people become conscious of their situation, organize collectively to improve it, and access opportunities, as an outcome of which they take control over their own lives, gain skills, and solve problems [37]. According to Kabeer [38], empowerment means expanding people's ability to make strategic life choices, particularly in the context in which this ability had been denied to them. Female empowerment can be defined as a process in which women challenge the existing norms and culture to effectively promote their well-being [36]. According to Wallerstein and Bernstein [39], it is a process that supports the participation of people, organizations, and communities in gaining control over their lives in their community and society. According to several studies [39–41], empowerment is a difficult concept to define and is more easily understood by its absence than its presence.

"Considering that there is a directly proportional relationship between the social and economic status of women and economic growth and development, the improvement of the social and economic statuses of women is imperative, especially in underdeveloped and developing countries. The empowerment of women concerning education, healthcare, labor participation, and political rights will increase the role they will play in growth and development by increasing their contribution to the economy [42]." However, according to Mason and Smith, female empowerment appears to be differently perceived across communities, but it is assessed as more robust when women are better educated and have more opportunities for employment [43]. Hsu [44] indicates that a series of significant transitions have occurred in the past two decades in Taiwan's social and economic structure, changing women's traditional life course, following up with the idea that women's educational opportunities are almost the same as men's in Taiwan.

2.3. Digital Media

Social media has become a vital part of digital media. There are many definitions of this term. For example, according to Xie and Stevenson [45], a social media platform is a means of communication through the Internet that enables social interaction. As defined by Kaplan and Haenlein [46] (p. 61), social media are "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and allow the creation and exchange of user-generated content". Steenkamp and Hyde-Clarke [47] defined it as a platform that enables and facilitates information sharing and participation from users of the media to create and distribute the content. Safko and Brake [48] described social media as activities and behaviors among communities of people who gather online to share information and knowledge using conversational media, which makes it possible to create and easily transmit content in the form of words, pictures, videos, and audios.

Social media contains user-generated content that is created through interactions between users. Social media enables the easy creation and sharing of information and entertainment. Social media can take on many different forms, including social network sites, media sharing platforms, and micro-blogs. Social network sites (e.g., Facebook, LinkedIn, or Google+, which was closed on the 2nd of April 2019 for private users) are based on social structures that are made up of a set of individuals and organizations, creating relationships through interaction. Media sharing platforms (e.g., YouTube) enable users to host, upload, manage, and share different multimedia materials (e.g., audio, video, images). Micro-blogging (the most popular site is Twitter) is a broadcast medium that enables the exchange of micro-posts (a small element of content) in the form of short sentences, images, or video links [5].

Social media sites, as web-based platforms, stimulate communication and sharing of information or content between individuals in virtual communities; however, there are privacy concerns [49]. Social media platforms also give a wide range of benefits in many areas.

3. Materials and Methods

3.1. Instrument and Materials

A questionnaire was developed to survey women and men in the workplace in Taiwan to investigate how social technologies are used for business support. The survey included sections on demographics, technology, and social technologies. Five different social technology platforms were studied, including Facebook, Twitter, LinkedIn, YouTube, and Google+. Applications and benefits of each platform were identified, with additional questions relating to empowerment and equality. Data were collected electronically from 218 responders, comprising 128 women and 90 men. The study was conducted in 2018. The participation in the survey was entirely voluntary, and the companies were assured confidentiality and anonymity.

3.2. Methods

Quantitative research involves an empirical assessment of numerical measurements, while qualitative methods involve numerical measures. The conducted survey was the primary source of data. Descriptive, *t*-test, Levene's test, and Brown-Forsythe tests were among the statistical analyses conducted on the results. The use of these statistics tools was associated with the verification of the homogeneity of variance when comparing the two research groups—women and men. The Levene's test is useful for equality of variance assessments for variables calculated for two or more groups, using the deviations from the group mean. The Brown-Forsythe test also assesses the equal variance violation, but for this purpose, the test uses the group median.

Using these two tests together gives more definite evidence concerning the variance differences among investigated groups.

4. Sample

The average age of the female respondents was 37. Men were slightly older at 41 on average. This average is an indication that not all respondents grew up using social technologies, since most platforms were developed within the last decade.

Over half (53.5%) of the women surveyed were married, while over two-thirds of the men (69.6%) were married. In total, 46.5% of the women and 57.9% of the men had children. Although closely divided, the majority of the respondents were in their late 30s to early 40s and married with children. As revealed in Figure 1, 11.4% of the responding women owned their own business, while over one-fifth (22.2%) of the responding men were business owners—almost double the rate of women. As expected, the vast majority of both women and men worked for someone else.

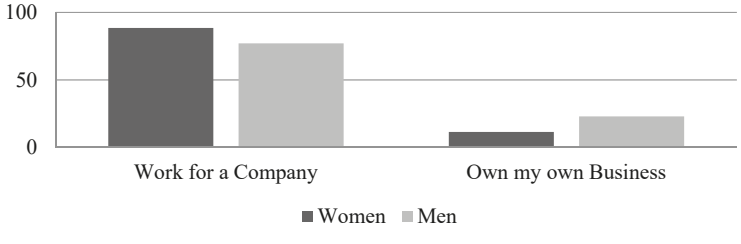

Figure 1. Career.

Figure 2 gives more specific information regarding the organizations in which the respondents work. As noted, over half of the respondents work for corporations. Within this group, more than 60% of both women and men work in either service or manufacturing.

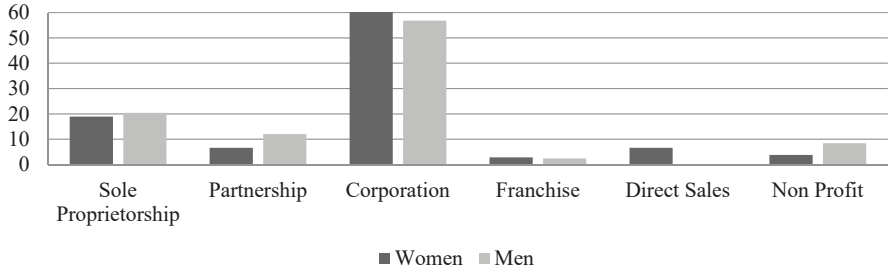

Figure 2. Employment.

5. Results

5.1. Technology

The focus of this research is on technology, with a closer look at social technologies. Specifically, the use, benefits, and differences between these factors for men and women, and whether opportunities exist for empowerment.

Respondents were asked to indicate devices or technologies that they used. Figure 3 lists the options and percentage of respondents having access by gender. Many reported access to multiple technologies, with the most used device being desktop computers. Significant differences were noticed for the use of laptop computers. Only 39.4% of the female respondents had access to laptops, while 64.8%of the men indicated usage of laptop computers. Differences relating to gender for other technologies were minimal.

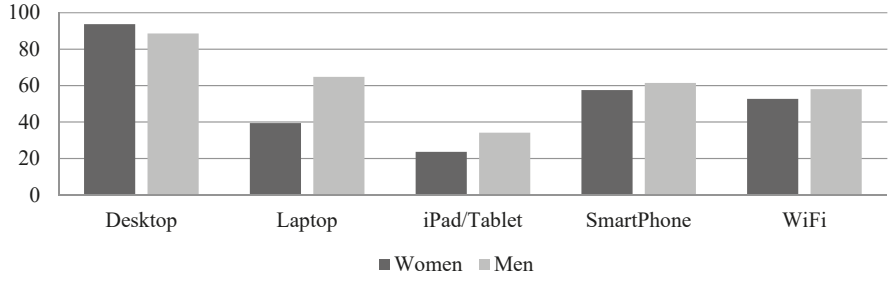

Figure 3. Access to computers and technology.

Figure 4 presents the interaction between the access to technology and gender. When respondents indicated "yes" in response to using a particular device or technology, it was coded as 1; otherwise, a code of 0 was used. The interactions reveal that both men and women have a high level of access to computers and technology.

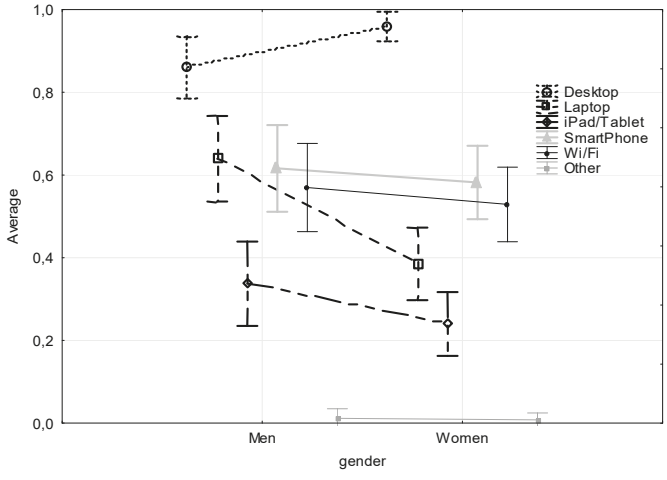

Figure 4. Graph showing the average and confidence interval (1—use; 0—no access).

Almost all of the respondents (97.7% of the women and 99% of the men) had used computers technologies for more than five years. Figure 5 reveals how respondents use computers and technologies. Again, usage between men and women was very close for business support, which was at the top. Over 60% of the respondents from both genders used computer technologies for all areas listed.

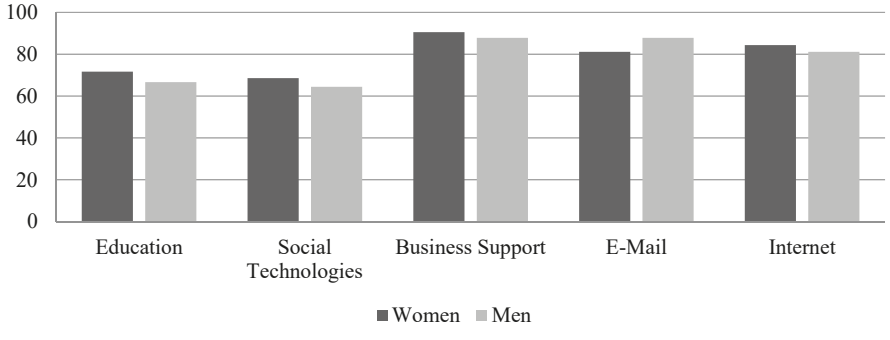

Figure 5. Computer and technology usage.

Table 1 presents the homogeneity of variance according to the *t*-test, Levene's test, and the Brown-Forsythe test. The tests were statistically significant for business support, e-mail, and the internet, meaning the hypothesis of homogeneous variance according to gender should be rejected. Their usage presents a significant variance heterogeneity. For education and social media relating to computer or technology usage, the hypothesis of homogeneous variance could not be rejected.

Table 1. Homogeneity of variances for computer or technology usage.

Detailed	*p*-Levene's	*p*-Brown & Forsythe
Use technology in education vs. gender	0.0000	0.0279
Use technology for social media vs. gender	0.0003	0.0596
Use technology for business support vs. gender	0.0000	0.0000
Use technology for e-mail vs. gender	0.0000	0.0000
Use technology for internet vs. gender	0.0000	0.0000

All respondents indicated that they are aware of the benefits technology can provide. When looking at the different areas, as shown in Figure 6, at least two-thirds of women and men found benefits in all areas, with information and communication averaging slightly higher than the others. Social technologies—the main focus of this study—received a "vote of confidence" by 75.6% of the women and 74.4% of the mean.

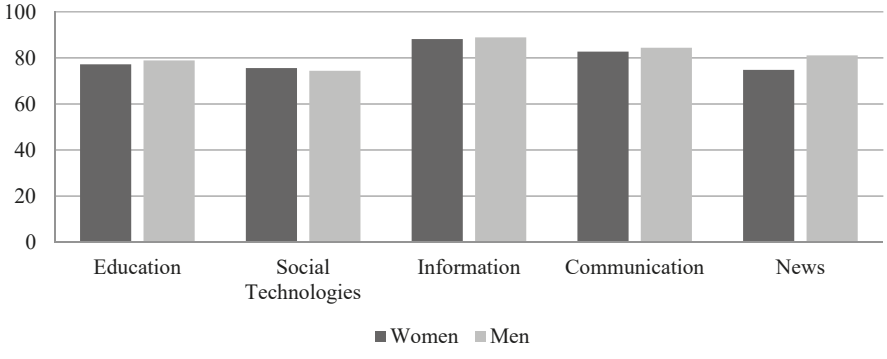

Figure 6. Benefits provided by technology.

To determine the feasibility of social technology platforms in support of empowerment, economic stability, and gender equality, questions were asked of the participants relating to Facebook, Twitter, LinkedIn, YouTube, and Google+ usage.

5.2. Social Technologies

Facebook is the largest social technology platform in the world, and as shown in Figure 7 is also the platform used by most Taiwanese female and male respondents. YouTube and Google+ came in second and third, with very minimal numbers (10%or less) of the respondents using Twitter or LinkedIn.

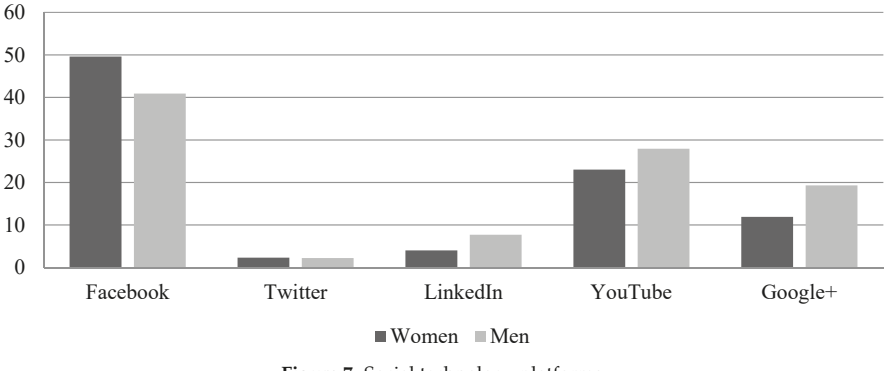

Figure 7. Social technology platforms.

A detailed investigation including purposes of use for each platform and possible benefits was conducted for the study's five platforms. Since Twitter and LinkedIn were checked by less than 10% of the participants, the results will focus on Facebook, YouTube, and Google+. Purposes listed included communicating or collaborating, customer service, gaining exposure and creating awareness, gaining new customers, increase revenue or profits, marketing, networking, building relationships, and recruiting employees.

5.2.1. Facebook

Table 2 reveals responses regarding purposes for use, and for those who indicated that this platform was used for the stated purpose(s), whether benefits were experienced. Results are statistically presented by gender. A slightly higher percentage of female respondents used Facebook for six of the purposes listed, and a slightly higher percentage of women experienced benefits in these same areas. The two areas where most discrepancies were found were increasing revenue or profits and recruiting employees. Ironically, in these two areas, a higher percentage—by approximately 20 percentage points—of female respondents used Facebook for these two purposes. In comparison, a higher rate of male participants who used Facebook for these two purposes experienced benefits. This may suggest that women in Taiwan have a high awareness of the benefits of social technologies, specifically Facebook, when used for business support and empowerment.

Table 2. Purposes for use and benefits experienced for Facebook.

Detailed	Use for This Purpose		Benefits Experienced	
	Women	Men	Women	Men
Communicate/Collaborate	84.5	80.5	89.3	86.2
Customer Service	86.8	80.5	92.5	82.7
Gain Exposure and Create Awareness	98.4	94.4	96.3	88.2
Gain New Customers	82.6	80.5	86.3	86.2
Increase Revenue/Profits	56.8	38.8	83.3	100
Marketing	93.5	91.6	94.3	87.9
Network/Build Relationships	98.4	88.8	98.1	87.5
Recruit Employees	41.6	19.4	80.9	85.7

5.2.2. YouTube

Although fewer respondents used YouTube than Facebook, organizations experienced the benefits of posting video content for business purposes. With this platform, again, there was a higher percentage of women using YouTube for all purposes, however networking or relationship building differed by less than one percentage point, with the rate of male respondents being slightly higher (Table 3). A more significant percentage of women than men experienced benefits in six of the nine areas (two-thirds). The highest percentage of both female and male respondents used YouTube for marketing purposes. Indicating high satisfaction, 100% of the women using YouTube for marketing and networking or relationship building experienced benefits.

Table 3. Purposes of use and benefits experienced for YouTube.

Detailed	Use for This Purpose		Benefits Experienced	
	Women	Men	Women	Men
Communicate/Collaborate	52	50	83.3	66.6
Customer Service	73	62.5	88.2	73.3
Gain Exposure and Create Awareness	92.9	87.5	94.7	76.2
Gain New Customers	55.5	54.2	69.2	76.9
Increase Revenue/Profits	45.8	37.5	70	77.7
Marketing	93.3	91.7	100	77.3
Network/Build Relationships	74.1	75	100	83.3
Recruit Employees	27.3	25	50	66.6

5.2.3. Google+

Although Google+ was in third place for the percentage of social technologies users, the satisfaction rate was the highest, with 100% of women experiencing benefits from three categories: gaining new customers, increasing revenue or profits, and recruiting employees (Table 4). The male respondents

expressed an even higher satisfaction rate, with 100% of the participants indicating benefits experienced in four areas: gaining exposure and creating awareness, gaining new customers, increasing revenue or profits, and recruiting employees.

Table 4. Purposes for use and benefits experienced for Google+.

Detailed	Use for This Purpose		Benefits Experienced	
	Women	Men	Women	Men
Communicate/Collaborate	93.3	76.4	84.6	84.6
Customer Service	86.6	52.9	77.7	77.7
Gain Exposure and Create Awareness	78.9	52.9	90.0	100
Gain New Customers	53.3	35.3	100	100
Increase Revenue/Profits	46.6	35.3	100	100
Marketing	73.3	52.9	90.9	88.9
Network/Build Relationships	100	82.3	66.6	85.7
Recruit Employees	46.6	11.8	100	100

A significantly higher percentage of female respondents than male respondents used Google+ for all purposes listed, with all participants who used Google+ using it for networking or building relationships and with over 90% of the women using this platform to communicate or collaborate.

Table 5 presents the homogeneity of variance according to Levene's test and the Brown-Forsythe test for Facebook, YouTube, and Google+ usage as reported by respondents. The tests were statistically significant for Facebook and YouTube, meaning the hypothesis of homogeneous variance according to gender should be rejected in this case. Their usage indicates the presence of significant variance of heterogeneity. For Google+ usage, the hypothesis of homogeneous variance could not be dismissed from the gender perspective.

Table 5. Homogeneity of variance for Facebook, YouTube, and Google+ usage.

Detailed	*p*-Levene's	*p*-Brown & Forsythe
Facebook vs. gender	0.0000	0.0000
YouTube vs. gender	0.0000	0.0000
Google+ vs. gender	0.2441	0.1361

Respondents were asked about their experiences with social technologies. Many had both positive and negative experiences, but for both women and men the positive experiences far outweighed the negative. 71% of women and 81% of men indicated positive experiences, while 43% of women and 32% of men had negative experiences. As reported, some respondents indicated both positive and negative experiences when using social technologies in business.

5.3. Empowerment

The purpose of this study was not only to determine purposes that the leading social technology platforms are used in Taiwan and whether each provides benefits, but it was important to also look at the results in terms of whether social technologies could empower women in Taiwan and other countries. Over 95% of the female respondents and 96.3% of the male participants indicated that they believe education and social technologies could provide empowerment for success.

6. Discussion

Social technologies have provided new opportunities for business support and changed the way employees and business owners communicate, provide customer service, gain exposure and create awareness about products or companies, gain new customers, market or brand products and businesses, network and build relationships, and recruit employees. These platforms have made a

difference to the bottom line for businesses savvy enough to implement social technologies into their strategic plans.

Five of the leading social technology platforms—Facebook, Twitter, YouTube, LinkedIn, and Google+—were included in the study to determine purposes for use and benefits experienced. Most participants used Facebook, YouTube, and Google+, so details about each were included in this paper. All platforms were used for all purposes listed, with benefits experienced for all. However, the percentage of "purposes used" respondents was higher for Facebook users, while the percentages of participants in the "benefits experienced" column was somewhat higher for Google+.

7. Conclusions

Overall, a greater percentage of female than male respondents use the various technologies, but the overall differences are perhaps more of a result of the country studied than a world-wide perspective. For example, results may be significantly different in developing countries, coinciding with the results of Moghaddam [25] and Fatehkia et al. [50]. More research is needed, but with the patriarchal system gradually weakening in Taiwan and the gender pay gap being less than in many countries, the results from this study show that the higher use of social technologies by women in the workplace may be an indication of empowerment, leading to narrowing of the gender gap. The differences between women and men using Facebook and YouTube were significant, but not in the case of Google+. Creating new patterns and social interactions empowers men and women to be more creative and to increase their business opportunities [51].

The findings from this study apply to the Taiwanese respondents specifically, but can be used to help empower women across the world. Women must take responsibility to use the tools and information from studies such as this to find their voice, create a network, and help others enjoy empowerment, success, and economic equality. The study results could be beneficial in areas of the on-going discussion regarding psychological attitudes to social media platforms and their roles, as well as gender differences in social and digital media interactions [43].

Digital technologies can support female empowerment, and these studies provide evidence that social media platforms such as Facebook and Twitter are used in a broad way by women, for tasks such as creating awareness, marketing, or building relationships. Women also experience benefits from using these digital technologies at almost the same level as men; however, education was deemed to be a key factor for success in this area.

The limitations of the study include the number of respondents and the limited geographic area. Expanding the response rate and global results would further validate these results, making it generalizable to a worldwide population and allowing for a comparison among countries. Future research should study: (1) the impact of training and education on users' awareness of using social media; (2) security and data protection for knowledge on the Internet; and (3) additional variables of success that may influence users' empowerment.

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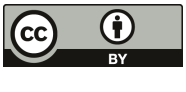

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Social Media Marketing in Creative Industries: How to Use Social Media Marketing to Promote Computer Games?

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Abstract: Currently, almost every business entity has one or more social media accounts. This statement is true for companies operating in creative areas as well. Social media make it possible to perform widely understood marketing-oriented undertakings. They allow for toll-free presentation of a particular company, its history, products, achievements, as well as for encouraging prospective customers to visit its websites. Social media marketing plays an important role in the satisfactory advertising of creative brands, companies, and products. The aim of this article is to discuss the possibilities of utilizing social media marketing by a creative company dealing with the production of computer games. The authors have attempted to analyze selected elements of computer game promotion opted for by the CD Projekt Capital Group. As of currently, The Witcher game is a product that is well known and highly appreciated all over the world. Nevertheless, its promotion has required the utilization of a proper marketing strategy, based on social media-specific tools.

Keywords: computer games; creative companies; social media marketing

1. Introduction

Up until recently, the "creative sector" term has been rarely used. Its importance for companies has increased as a result of notable changes of business specificity. When it comes to the widely understood creative industry, growth factors have been, inter alia, the emergence of the B+R sector, human capital intellectual changes, as well as, the increase in demand for the offered products. In order to properly define the "creative sector" notion, one has to start from touching upon the very "creativity" term. It is defined differently by various fields of science. When it comes to economy, it is predominantly oriented towards innovative solutions achieved thanks to the development of science, investments, and proper human resource management. In art, creativity is perceived as the ability of creating something original and new by taking advantage of fresh ideas and imagination. Creativity can therefore be considered to be the ability of creating and developing new concepts, solutions, ideas, and tools [1].

For the very first time, the creative industries notion emerged in Great Britain at the end of the 90s. In the Creative Industries Mapping Document report, the creative sector was defined as the one pertaining to branches that show the capability of creating workplaces and wealth, as a result of individual skills, creativity, and talent [2]. Thirteen sectors in which creativity had been promoted were indicated in the document. The proposed selection included, among others: designing, programming and computer services, architecture, advertising, TV and radio, publishing sector, and interactive entertainment-oriented software creation. Creative sectors have been providing products and services that are typically connected with artistic, cultural, or entertainment-specific values. The modern economy is, to a remarkable extent, based on the use of creative energy, imagination, and knowledge,

to develop unusual ideas, initiatives, and values. To a notable extent, both the expansion and market success of an organization are dependent on taking advantage of not only technological innovations and entrepreneurship, but of creativity as well [3].

A rather different understanding of the creative sector was proposed by the UNCTAD (United Nations Conference on Trade and Development). According to the established definition, it should be understood as recurring cycles of creation, production, and distribution of goods, in case of which the major resources opted for are creativity and intellectual capital. Said cycles incorporate undertakings based on knowledge. They are typically oriented towards art and generating revenue thanks to commerce and intellectual property rights [4].

According to the World Intellectual Property Organization, the creative sector incorporates all branches, the undertakings of which are aimed towards the creation, production, making, presenting, showcasing, distributing, broadcasting, and selling goods that are protected by copyrights [1].

Companies operating in the creative sector focus on intense commercial competition that covers consumer products, such as fashion and design, digital communication, entertainment, and architecture [5]. Said sector consists of national institutions, private companies, and non-profit organizations. The goal of such institutions, firms, and organizations is not only to communicate with the society, but also to create new meanings. It has been highlighted that it is a mistake to perceive the section in question exclusively through the prism of culture. It has to be remembered that marketing and advertising agencies are also included in the creative sector, even though they are connected with culture to a lesser extent than publishing houses and film agencies are [6].

Based on the presented examples of creative sector definitions, it is possible to draw a conclusion that it has a remarkable impact on the development of entrepreneurship and the overall economy of a given country. In the competitive economy, creativity is of increasing importance. Product price and the method of its production have become remarkably less vital. Creativity is an indispensable element of innovativeness and that is why the policies of numerous companies are oriented towards promoting creative patterns of behavior in employees. Up until recently, competing companies have been predominantly focused on limiting production costs and lowering the price of offered goods. Some of them have been looking for cheaper laborers in the Far East and have been opting for cheaper materials. Nevertheless, a notably better solution has turned out to be to support the creativity of workers in their attempt to improve technology and increase product quality. Therefore, it can be said that ideas, skills, and openness to new solutions or concepts are all of immense importance.

Companies from the creative sector have been focusing on creating value by means of utilizing social media. Such media have been used as distribution channels for the offered products and services, as well as utilized as vital marketing tools. Creative companies are exceptionally skilled when it comes to the utilization of social media and taking advantage of them in the managed business undertakings [7].

According to the opinion of experts, Polish creative companies have been achieving best results with regards to the creation of non-material and digital products. To prove that point, one may indicate the creation of games, comic books, and music. Polish creators have been awarded with various prizes for their outstanding animations, music, or even films. Domestic designers and stylists have also been appreciated all over the world. Social media marketing has proved to play an important role in presenting both the brand itself and products provided by creative companies.

The meaning of the creative companies and the role of social media marketing in it should be pointed out. There is relatively little researches on this subject or at least we have not come across them. Social media as a marketing technique is discussed in the context of different sectors or branches. Our article sheds light on a new direction of research in the field of the creative sector. Social media is used widely, for example in managing the IT companies [8], or in luxury item marketing [9]. This is crucial, as the computer games market is increasing from year to year. According to Newzoo [10], in 2019, this market reached the value of 148 billion USD. In addition, the Z-generation, to which the offer of companies specializing in computer games is largely addressed, has a natural connection to

the digital world. For the Z generation, the most useful means of communication is by social media which uses the modern technologies. Because of this knowledge, we would like to check whether the theoretical description of social media as a modern marketing tool is used by computer games companies, and if so, to what extent. The predominant aim of this article is to discuss the possibilities of utilizing social media marketing by a creative company dealing with the production of computer games. The authors have attempted to analyze selected elements of computer game promotion opted for by the CD Projekt Capital Group.

2. Literature Review

The concept of social media and social media marketing.

Nowadays, a key field of e-marketing undertakings is so-called social media marketing. It is caused by an increasingly more important role played by social media worldwide. Before attempting to define social media marketing, the authors are going to touch upon the very notion of social media and their specificity. The "social media" term is strictly connected with two research fields, namely—communication sciences and sociology. In the communication-specific context, media are the means of storing or sharing either information or data. When it comes to sociology, social networks are societal structures consisting of a set of social entities (individuals, groups, and organizations), and a set of connections between them. Social media are characterized by direct and multidirectional information exchange, speed, and dynamic nature [11]. The topic of social media has been approached similarly by Dutot and Bergeron [12], as well as by Kim and Ko [13], who have considered them to be a set of online tools allowing to publically share ideas with others, create and edit the content, as well as to establish relations by means of interaction and cooperation.

Together with the popularization of the Internet, social media have become a key online marketing tool. Not only individual users, but also companies, have created fan pages on digital platforms and developed business opportunities via social media [14]. The literature of the subject clearly states that the notion in question is, to a notable extent, connected with sociology and communication sciences [15]. Social media marketing is defined as commercial marketing events or processes taking advantage of social media platforms in order to positively affect purchase-related patterns of consumers [16]. Social media marketing is perceived similarly by B. Schivinski, who considers it to be a phenomenon strictly connected with gaining attention and generating online traffic via social media. The discussed tool has become increasingly more important in terms of marketing undertakings organized by various companies, because social media can be easily accessed by a vast group of potential recipients. Social media marketing minimizes the cost of marketing undertakings, as well as allowing one to reach a highly specific target group [17]. The interaction of customer behavior allows users to create identical ideologies pertaining to a given community and strengthen bonds between its members, therefore consolidating the aforementioned community. Said process can be also interpreted as overlapping user values and values followed by the community [18].

To perform marketing undertakings, various platforms are taken advantage of, such as Twitter, Facebook, YouTube, LinkedIn, and numerous blogs. The presence of a number of platforms in the digital environment results in the increase of user traffic. At the same time, there is a constant competition to acquire and retain the message recipient. Currently, undertakings performed by various companies are not only oriented towards acquiring Internet users, but also encouraging them to disclose some pieces of information pertaining to themselves, their fields of interest, and preferences. The gathered data are then taken advantage of to generate further profit. By understanding the needs of consumers better, it is possible to create a tailor-made product for them. Thanks to the Internet, consumers are capable of gathering information about products and sharing their knowledge and experiences with other clients. Social media make it possible for consumers to have a notable impact on widely understood consumption [18].

In many companies, especially those operating in the creative sector, the concept of social media is of paramount importance when it comes to marketing actions. Their owners and managers do their

best to exploit such applications as YouTube, Facebook, Twitter, or Second Life to the greatest extent possible [11].

The goals of social media marketing are predominantly connected with increasing brand awareness among users, advertising products, and improving customer servicing quality, as well as maintaining consumer loyalty at a satisfactory level. Social media marketing minimizes the costs connected with customer acquisition and allows for gathering the contact data of prospective purchasers, including e-mail addresses or phone numbers. An auxiliary goal of undertakings performed is to encourage Internet users to share obtained pieces of information with their friends, which results in the increased reliability of the published content. Application designing can be supported by the use of highly compatible materials and making such content available for mobile users [19].

Social media marketing can therefore support traditional marketing actions of various companies and organizations, while at the same time allowing their representatives to use a number of tools based on communication channels. The most commonly used social media marketing tools are: blogs, microblogging (e.g., Twitter), co-creation (e.g., NIKEiD), social bookmarking (e.g., StumbleUpon, forums and discussion boards (e.g., Google Groups), product reviews (e.g., Amazon), as well as video and photo sharing (e.g., Flickr, YouTube) [11,15,20].

Other tools that have to be pointed out and that have a remarkable impact on social media marketing as such are:

- Company's website: such website can be considered to be a visiting card of a company, for it incorporates basic data pertaining to it, applications, and links to external data. Many firms and organizations utilize websites for marketing purposes [21].
- E-mail: interactive form of direct marketing, promotional message, or informational content. In such a case, the utilized communication tool is digital messaging. E-mail marketing covers analyzing, planning, realization, and exercising control over the most important processes, namely: creation, expansion, and management of the database of e-mail addresses of users, preparation of content and graphic elements of e-mails, sending messages, and managing replies. An important element of e-mail marketing is the creation of communication schemes in order to personalize and optimally adjust e-mail messages to particular groups of recipients [22].
- Fan page: profile created on a specific social media portal and used to communicate with buyers (or brand/company fans), as well as to allow consumers to share knowledge with each other [23].
- Mobile application in two versions. The first one pertains to the promotion of application installation. Its goal is to increase the number of applications. Thanks to the fact that the users provide information on their interests and preferences, it is possible to organize customized marketing campaigns. The second version is addressed to individuals who have already installed the application. The performed undertakings aim to increase their engagement [24].
- Company's blog: a place to publish valuable posts that can be commented on and tagged by the recipients. A blog is a perfect place to present values that a given company or brand follows to a wider audience. A properly managed blog is not only the source of information about the brand, but also allows to dispel any doubts some consumers may have and encourage them to purchase a product or a service. Blogs can also inform about possible problems that clients may have, while taking advantage of goods provided by a particular company [25].
- Marketing-oriented games: they are created to promote specific products or brands. Gamers are a large, diversified, and attractive part of the global advertising market. Advertising via computer games is a relatively new form of marketing-specific communication [26].
- Content marketing: acquiring clients by means of valuable content published in communication channels supervised by the company; typically utilized marketing forms in this case are newsletters, video materials, graphic reports, company's blogs, topical websites, virtual conferences, and podcasts. Said method is not only about publishing content, but also about listening to client's needs and fully understanding them [27].

- Viral marketing: arranging a situation stimulating users to share information with each other on their own. Viral marketing is a variation on word-of-mouth marketing [28]. Viral marketing is also described as a set of advertising-specific tools that are addressed to certain groups of recipients and are utilized in such a way as to encourage them to share a specific piece of information in order to increase the awareness (of a brand, product, or service), or to increase sales [29].

The tools presented above are utilized by companies to acquire clients, engage them emotionally, curate positive experience, and increase the willingness to communicate. They allow to aggregate data on clients and to identify their needs.

Advantages of Social Media Marketing in Creative Industries

Social media represent great opportunities for the development of the creative branch. By taking advantage of message boards, companies characterized by creative focus can showcase their skills, proposals, ideas, and assumptions to a remarkably large audience. Such an approach allows one to not only gain some popularity and to become more recognizable, but also to establish contacts with other firms, including those creative ones, and conclude lucrative contracts. The creative sector utilizes various social websites for marketing purposes, making them the driving force of the market. It goes without saying that products that are specific for this branch of industry require the utilization of modern marketing forms [30].

Products offered by the creative sector have certain specific features determining their innovativeness. There is a risk of improperly adjusting the goods to the needs of customers or the current trends (e.g., in the case of fashion). It may happen that products supplied by the creative sector face market barriers or limitations. Therefore, marketing-oriented support turns out to be of vital importance. One of the key motivators is to develop an efficient marketing campaign based on the use of social media. It has to be noted that said undertakings also have to be creative in character for the advertised product (brand, company) to stand out from the crowd of other ones. The campaign has to show that the offered item or service is original and innovative [31].

By opting for social media to achieve their goals, companies have to take into account aspects distinguishing them from other online media, especially connections between and the organization of social media network. Elements of social media are based on theories of many fields of science, including psychology, marketing, and sociology. While preparing a campaign, one has to specify: content, motif, societal roles, interactions, and network structure, which may turn out to be of immense help while designing and developing a multimedia project [32].

One may also wonder why social media marketing is so useful for companies operating in the creative branch of industry. Above all else, it allows for almost instant communication with clients. Companies receive feedback on the offered products, as well as some negative pieces of information or suggestions. Every content published in social media results in a reaction. The more creative the content and the esthetical elements utilized, the greater the traffic generated by a specific website. Thanks to this, a firm or a brand becomes much more distinguishable. Alluring images, useful pieces of information, and quick responses to questions asked all result in positive experiences on the side of the client and increase his or her loyalty. Creative companies can achieve marketing success if they care about keeping the published pieces information up to date. Data published in social media should attract the attention of their users [33].

Costs associated with marketing actions performed are of importance for every company. Advertising products or services in TV, radio, or cinemas is remarkably expensive. On the other hand, promoting one's goods or services in social media generates reasonable and acceptable costs. It is not only effective, but also a cheap form of advertising products, brands, or companies to the market. What is more, the reach of such a campaign is almost unlimited in character. Said fact is undoubtedly a huge advantage of social media marketing [34].

Yet, another benefit of utilizing social media marketing is the possibility of reaching specific target groups, which is especially important in the case of creative companies, as well as presenting a

specific content to a remarkably wide audience. For example, adverts can be presented based on the user's location (province, city). One can manage comprehensive campaigns in social media, organize competitions, and offer goods for reasonable, competitive prices.

Analyses of customer behavioral patterns, number of visits, comments, and likes are also vital. Data gathered in such a way can be used to develop a new social media campaign.

3. Methodology and Specificity of the Examined Entity

An empirical analysis of the use of social media marketing-specific tools has had the form of a qualitivate research based on case study. The authors would like to illustrate how the examined creative company has been taking advantage of social media marketing tools and which one of them have been key for it with regard to reaching the potential customer. The theoretical assumptions presented above have served as the basis of identification of used tools and the creation of an efficient marketing strategy. To evaluate the social media marketing we used methods of examining documents (mainly reports) and websites. Information about CD Projekt comes from the internal sources of the company [35].

In 2011, after the transformation of the Optimus Company and the acquisition of CDP Investment, the CD PROJEKT Capital Group was established. As of currently, it incorporates the CD PROJEKT RED game development studio and the GOG.com online distribution platform. The major focus of the company is the production and sales of video games. The headquarters of the company is located in Warsaw and its regional branches can be found in Cracow and Wroclaw. Individuals employed in the aforementioned three units are responsible for creating video games. It is also worth mentioning that the company has its offices in Berlin, Los Angeles, Tokyo, and Shanghai—they coordinate marketing and sales undertakings in Asia, the United States and Europe. The greatest achievement of CD Projekt Inc. was the creation of a series of Witcher-themed games based on the works of Andrzej Sapkowski.

The CD PROJEKT RED development studio was established in 2002 and has been dealing with making games for PCs and consoles. Their most recognizable game series is The Witcher.

When it comes to GOG.com (formerly—Good Old Games), it is a digital videogame distribution platform. It has a global reach, which means that it attracts customers from the entire world. Thanks to the GOG Galaxy platform being one of GOG.com website's inventions, the clients have the possibility of playing online. The platform grants all the interested individuals the access to social and online services. The GOG.com website is an independent digital distribution platform offering interested players over 2350 meticulously selected games, made by over 550 producers and published from all over the world.

While producing its games, CD PROJEKT RED utilizes its proprietary software (game engine) entitled REDengine, which allows for the use of state-of-the-art technology while making complex plot-driven videogames. Sales are in 80% of cases realized via digital distribution platforms, such as: Google Store, GOG.com, AppStore, Origin, Steam, PlayStation Store, and Xbox Games Store.

The games that can be bought are available on the aboved mentioned platforms and in the near future will be introduced to an international platform, PSNow, which as of now, April, 2020, is not yet available in Poland, but gives many possibilities. PS Now is a revolution, which allows one to play many different games form PlayStation console (especially PlayStation 4) without installation —the game streaming from Sony servers is used instead. We do not need to have that particular game [36]. The platform, thanks to its characteristics, is a form of the marketing tool, as it positions chosen contents on the main page and the purchase of the subscription and the ability to stream and play online, which is used with the multiplayer option. Play Station Now also has an official account on Facebook, on which they post information about new games on the platform and allow people to purchase a subscription via Facebook shop. Sony can reach the prospective customers of PS Now and develop the awareness among the players about the platform, via Facebook account. What is more, they also try to discourage a player from buying a traditional CD game or saving games on the

drive and encourage them to stream the games and showing that they can choose from many different games in return for the small price of the subscription.

In June 2018, during the Electronic Entertainment Expo, CD PROJEKT RED showed the world a trailer of the Cyberpunk 2077 game. The game in question has been awarded with over 100 prizes.

Case Study—Forms of Online Promotion Influencing the Success of Games

Without a shadow of a doubt, the CD PROJEKT Capital Group can be considered to be a creative enterprise. The realized projects are unusual and highly specific in nature. The popularity of *The Witcher* games based on the books by Andrzej Sapkowski grants their creators an honorary place among the best videogame makers. The game is available on the Steam platform.

The promotion of the game is going to be discussed on the basis of selected forms of social media marketing, with regards to such fields as: company's goals, platforms adopted to pursue company's goals, target audience, distribution channels, and content shared (see Table 1).

Table 1. Computer game promotion by the creative company—case study.

Company Goals	Platforms Adopted to Pursue Company's Goal	Target Audience	Distribution Channels	Content Shared
Brand awareness	Social networks sites	Existing and potential customers being passionate about gaming	Games shop	New product information
Lead generation	Microblogs & Videoblogs		Online platforms	High quality research material to potential customers
Customer loyalty	Content communities			The goal is to provide influencers with support with regard to the buying process
Value of company	Webcasts Product review sites			

Content marketing is one of the ways of reaching the potential customer utilizing social media. Its goal is to present a product or a company in such a way for the very content of the information published to be considered interesting by the recipients. What is more, materials required or frequently searched for by the users can be provided. Materials published within the content-oriented website affect the overall loyalty of the user. The product itself, namely The Witcher game, has been presented in a non-intrusive manner and the creators have opted for numerous content forms, namely:

- product description,
- news,
- review,
- article,
- blog post,
- long-form.

Product description incorporates basic data on producers, publishers, distributors, and software, as well as recommended and optimal hardware requirements. The description also includes game logo and information on other parts of the series. One can also find a short note on the works by A. Sapkowski. The very figure of The Witcher and the historical background are also provided. Yet another important piece of information is the specification of the number of levels and locations. The

description of the product has been considered to be intriguing by Internet users. The Witcher 3 comes with the following text, encouraging the player to start his or her new adventure:

> Travel through the world torn apart by war, fight monsters, and make choices the consequences of which will follow you till the very end of your journey. The Sword of Destiny has two edges. You are one of them.

News should be understood in this context as up-to-date, fresh pieces of information. Such news is, for example, a publication stating that The Witcher game has taken first place in the top 10 games in Poland. Yet another example of news is the information that *The* Witcher 3 has been the most popular production on the Steam platform. The aim of such a type of content is to provide the user with a short communicate that will interest him or her in the topic.

Game reviews may be published by either users themselves or by experts. Sometimes clients purchase a game after previously familiarizing themselves with the opinions of other people. They trust such reviews. In the case of The Witcher, reviews have been provided by many prominent individuals. What is more, promotional undertakings covered the radio and TV as well. Positive reviews have been published on the website of the game, additionally increasing its attractiveness. Exemplary expert opinions are provided below:

> "awesome game with its roots in literature" —The Guardian (British) [37]

> "greatest advantages of the game are the variety and the number of location. It is the game for everybody" —IGN.com videogame portal [38]

> "one of the best RPG games ever produced" —Gamespot.com [39]

Such reviews make social media users more willing to purchase the game. Many players take different opinions into consideration. It is worth pointing out the management of the measurable aspect of profits. If the opinions on social media were not as important for players, would The Witcher game be as successful and would it have brought as many economic benefits to CD Projekt? The reviews highlight that the whereabouts of The Witcher affect players on an emotional level. All the sequences are directed skillfully, making the production a true masterpiece.

Yet another important promotional tool that has to be mentioned are blog posts. These are honest opinions of people who have played the game:

> "The Witcher affected me on a spiritual level, as it has the real #humantouch. It can be felt that it was made by real people. In the era where graphics and quests are made by algorithms, said fact cannot be underestimated. The Witcher is a real masterpiece to me and its every aspect has a human side to it (. . .)." [40]

One cannot forget about articles, the authors of which are members of the game development team, as well as IT experts and graphic designers. Articles published in social media have covered such topics as:

"Road to the Witcher 3",

"Why is it worth waiting for the Witcher 3",

"The Witcher 3 first impressions".

The presented forms of advertising point to a remarkable promotion of the game by its users. Various forms of content have a single goal—to win the interest of prospective customers and make them more frequent visitors of the content-oriented website. In order to retain consumers, various quizzes have been published and a number of contests have been organized. Users are informed about news and updates by means of a newsletter. It has to be noted that articles and reviews are frequently "adorned" with photos, charts, and maps.

A different form of social media promotion used by CD Projekt is targeting, which is based on the optimal selection of clients. Advertising content is published to selected groups of users only. Due to their specific features, they may become the purchasers of the promoted games one day. It has to be stated that thanks to social media, a creative enterprise can additionally gather information on such clients. A selected group of customers is undoubtedly interested, not only in the offered game, but also in the content published on the website. Targeting allows to minimize company's spending on advertising. Thanks to properly planned e-marketing undertakings, sales are maximized in a multidirectional manner. One may distinguish such types of targeting as authorial, behavioral, and contextual [41]. The very first of them is based on selecting a target group showing interest in video games. Behavioral targeting pertains to users selected on the basis on their actions. Based on users' activities on other portals, their customized profile is being developed. Then, a company targets its ads to individuals meeting certain criteria only. When it comes to contextual targeting, it is based on segmenting materials with regard to their topic. Information about a game should be published on videogame-related websites and portals alike.

An intriguing form of promotion chosen for the analysis is so-called client segmentation. It is based on dividing the market into smaller groups of clients, with the focus being put on their age, sex, educational attainment, place of residence, fields of interest, frequency of purchases, etc. During segmenting-related undertakings, the possibility of specifying the size of a particular segment is taken into account. Segments should be of varying size and address demographic factors. An important aspect when it comes to client segmentation is customer accessibility. A company should be able to reach them with its offer (for example, children should be excluded). According to the gathered data, gamers (people who have played an online game within the last month) typically are [42]:

- men (57%),
- individuals aged 15-24 (43%),
- people from big cities (43%),
- individuals with secondary education—44%,
- people with a full-time job—42%.

It is worth noting that the last version of the game was made in fifteen languages and dubbing was available in seven of them. Game-related marketing cost the company USD 35 million. Aside from the aforementioned forms of promotion, the discussed Capital Group has opted for occasional advertising methods. For example, during Halloween, the game was sold much cheaper. Such sales were organized on Steam and GOG.

The Table 2 contains information on projects conducted by CD Projekt company with social media accounts and the number of followers and subscribers observing them in 2019 and 2020, such as [35]:

- CD Projekt RED,
- The newest game of the company—Cyberpunk 2077,
- Gwint—The Witcher card game, which has many fans around the world,
- The bestseller—The Witcher,
- GOG.com—the platform which distributes digital games.

Table 2. The number of followers and subscribers.

	CD PROJEKT RED		CYBERPUNK 2077		GWINT		WIEDŹMIN		GOG.COM	
					in thousands					
	2019	**2020**	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**
Facebook	296	349	253	416	520	520	1000	1500	429	446
Instagram	287	497	0	329						
Twitter	426	645	340	704	100	104	1000	1200	330	333
YouTube	142	199	431	759	80	88	300	328	49	56
LinkedIn	44	77								
Twitch	142	182							55	62
bilibili		352								
Reddit			122	274	72	93				
Discord			56	129						
VK			44	79	87	87	84	110		
Weibo					56	59				
WeChat					40	56				
Others	91	92			25	54			25	40

From the conducted analysis, we can see that the number of followers and subscribers of social media accounts of CD Projekt company is increasing. It is worth mentioning that during the analyzed period, the company was creating new accounts which became very popular and gained many fans. It is important to point out the number of portals and platforms in social media which are used as marketing tools. We can notice that in every project, the company uses three main platforms—Facebook, YouTube and Twitter, which points out the strong and stabilized position and very strong impact of social media on the prospective customer.

To sum up, it has to be stated that the analyzed creative enterprise utilizes social media marketing to a significant extent. Interesting graphic materials and content encourage prospective customers to purchase the game. What is more, the popularity of the production all over the world makes even the skeptic users of social media to be more willing to give The Witcher a try.

4. Limitation and Conclusions

The creative economy makes it possible for entrepreneurs to take advantage of highly advanced technologies and intellectual ways of life. Creative organizations are becoming a dynamic and very profitable sector of the domestic economy. Their major goal is to realize their creative potential; so to synergize human resources, culture, society, and institutional capital. The creative sector is less susceptible to financial and economic crises than its traditional counterpart. In order for the discussed companies to develop, they must take full advantage of social media marketing. Thanks to the communication with the society and clients, they are capable of adjusting their products to the needs of the recipients. The increased focus on creative branches will result in both material and intellectual benefits.

The examinations presented within the scope of this article have certain limitations. The described case study has been executed for a recognizable creative company operating in Poland. It would be worth focusing on other creative enterprises as well, to check whether or not social media marketing trends are similar. In further research, we would like to focus on indicating the relationship between spending on social media and the financial results and value of creative companies.

Our contribution is to show the impact of the social media in creative industry. Mentioning the niche subject of our study and using the qualitative research was aimed at indicating management skills concerning the use of social media as a marketing tool in creative companies. The presented case

study was aimed at combining theoretical considerations on social media marketing and its practical application in brand identification and promotion. This article could be the source of inspiration for the creative companies and for the people responsible for marketing strategy in this field. From our research, we conclude that social media are the main source of information and a marketing tool, which is developing very quickly, and which is used to consolidate the position on the market and to point the direction in building dominance over the competitors. Currently, social media play an important role in marketing, including in the creative sector. Based on the analysis of promotional undertakings performed by the CD Projekt Capital Group, it has been discovered that it has been actively operating on various fields. The article offers a comprehensive analysis of selected social media-oriented promotion forms. It has been proven that social media marketing can cover various fields that are adjusted to the needs and capabilities of the client. Content published on various websites encourage prospective clients to purchase the advertised game (especially during a sale). Interesting graphical elements, revives, and articles may increase the interest of a purchaser-to-be. Furthermore, pieces of information published on various portals and informing about the overall success of the production make people more willing to give The Witcher a try. Based on empirical examinations, it has been proved that social media marketing-oriented undertakings performed by creative companies are sensible and may yield satisfactory effects. It is important to mention the weak points of the creative sector. Mainly, it is based on the innovative concepts of the individuals. It can be very difficult to maintain a high level of the numbers of followers having such a big number of the competitors. According to the activities of the company, a properly integrated marketing strategy should be used (with the usage of the specific social media platform).

Computer games companies mainly direct their products to the young Z generation, who do not have the stable source of income. The best way to get to them is through social media. A constant contact with the purchase stimulates opinion exchange and establishing mutual relations. Games produced by CD Projekt are being purchased by clients from all over the world. Positive opinions of the users may encourage prospective clients from all over the globe to purchase the game as well.

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Selected Aspects of Evaluating Knowledge Management Quality in Contemporary Enterprises

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Abstract: The main aim of the article was to estimate select aspects of knowledge management quality evaluations in contemporary enterprises from theoretical and practical perspectives. Measuring knowledge management is the biggest challenge for both theoreticians and practitioners. The survey was addressed to organizations conducting business activity in Poland. The research was carried out in 2019 in the form of an online survey. For international organizations, the survey was intended for representatives of these companies' local branches. It has been shown that the factors that most strongly affect the quality of knowledge are directly related to infrastructure and information technology systems (IT systems). The article contributes to managerial practice by pointing out the importance of evaluating knowledge management quality from the process perspective. The article's originality lies in the contribution to the literature of evaluating knowledge management quality by empirically analyzing it in contemporary enterprises. The results of research in the field involving assessing the quality of knowledge management have shown the need to focus not only on information technology tools (IT tools) related to infrastructure, but also on the processes approach, taking into account the priority role of the employees.

Keywords: knowledge; knowledge management; knowledge management quality

1. Introduction

The concept of knowledge management is currently perceived by modern organizations as an important element in building a competitive advantage [1–5]. Methods and strategies used until now to gain a competitive edge, such as launching new products and continuously improving processes, are becoming increasingly less effective, given that products and processes are now easier to duplicate. Adaptation to the needs of competitive enterprises through a knowledge-oriented organization management approach is aimed at increasing the effectiveness and efficiency of the organization [6–12]. The idea is to bring about improved effectiveness across all areas and processes, using to this end a specific set of instruments and tools in a continuous and permanent manner [13].

The fundamental approach to knowledge management is the process approach [3–5]. Identification of key knowledge management processes and existing relationships between them is extremely important for proper knowledge management in an enterprise [6]. The literature on the subject distinguishes various approaches to the classification of the most important knowledge management processes [9,11,13]. These processes are multidimensional; they relate to various aspects of knowledge and relate to various levels of analysis. The important area is knowledge quality, which is a vaguely defined concept because of its abundance and variability [14].

However, knowledge is an important resource in contemporary organizations; its effective use will depend, to a large extent, on its quality [15]. Chakrabarti, Arora and Sharma underlined that research on knowledge quality should grow in scope and prominence [16]. In the manuscript we focus

on knowledge quality within the knowledge management process in contemporary organizations. A framework is proposed that uses a process approach in knowledge management and checks some aspects of knowledge quality in a detailed process. The main research question was: what are the aspects of evaluating knowledge management quality in contemporary enterprises? The issues were discussed in both theoretical terms, by analyzing the literature, and practical terms, by looking into the results of empirical research studies conducted in 2019.

2. Literature Review

2.1. Knowledge Management-Process Approach

Knowledge management is becoming an increasingly popular concept and one that is being eagerly implemented in contemporary enterprises. Companies are starting to recognize the significant resources of both internal and external knowledge that should be used to build a competitive position in the market. On one hand, knowledge management has become a challenge to be faced by modern enterprises, but on the hand, it has served as a springboard for organizational activities [17]. A company's success is conditional, among other factors, on its ability to use explicit and implicit knowledge. Implicit knowledge has a technical (know-how) and cognitive dimension, consisting of a belief model and perception patterns. It is the source of the company's future successes, which is why it is so important to reach it and use it [17–19].

Organizations that have implemented and consciously used knowledge management concepts have seen a number of benefits resulting from them [12]. Most importantly, these are: improved performance and target-reaching; streamlining of processes and organization-wide adoption of good practices; development of business activity and increase of innovation; and more ease in launching new products and services [20–27]. In addition, there is also: increased adaptation of products/services to customer requirements; better customer and employee satisfaction; increased employee productivity and performance; improved communication and cooperation; and finally, improved trust [28,29]. In what concerns knowledge management in organizations, it is necessary to point out aspects concerning the use of technology and the social elements of knowledge workers and knowledge distribution. Activities related to knowledge management should be carried out in a systematic and cyclical fashion; focus on processes such as the acquisition, transfer, use, identification and creation of knowledge; and be based on linking knowledge management processes with commercial processes. At the same time they cannot be independent, must align with organizational goals, use technology to support processes and bring benefits to the organization [13]. Noteworthy as well are hard elements—systems and tools; and soft elements—organizational culture [30–32].

In enterprises centering their activities around knowledge resources, the following aspects of knowledge management can be distinguished: functional, process-oriented, instrumental and institutional [17,33–36].

One of the proposed solutions for knowledge management is a process approach [33,37]. Under this approach, knowledge management is understood as the entire process of creating, disseminating and using knowledge to achieve organizational goals [37–39]. Knowledge management should thus include the complementary processes of creating, collecting, organizing, disseminating, using and exploiting knowledge in the course of business activity. Most often, processes are identified that make up knowledge management, such as identification, acquisition, development, distribution and dissemination, use and preservation [37,38]. An important aspect of the process approach applied to knowledge management is that it enables better operationalization of individual processes [40,41].

In process terms, knowledge management is a normative and disposable proceeding aimed at creating the right conditions that will enable efficient implementation of operational functions, thereby optimizing the main processes related to knowledge, climate, culture, trust, leadership and organizational structure [15,29,42–44]. This will then allow employees to focus on developing knowledge, distributing it, acquiring it and using it correctly [45,46].

In the instrumental approach, knowledge management consists of the appropriate selection and use of instruments and tools contributing to the course of major processes involving knowledge at all levels and areas of the organization. The set of instruments is quite extensive, ranging from financial and legal to organizational and technical. These instruments may include: organizational systems, including an incentive, information, monitoring system, etc., plus a number of different tools, such as databases, IT systems and internal communication networks [13,36,47,48].

In the institutional approach, knowledge management includes a system of job positions and employee teams (strategic and operational level of the organization, formal and informal organization) who perform relevant knowledge management functions [17,38,49,50].

Strategic and operational knowledge management perspectives should also be indicated. A knowledge management strategy usually involves one of two approaches: codification or personalization, or a combination of the two. The choice of knowledge management strategy depends on the nature of the processes that take place within the company. When employee intuition and skills are used, personalization is the one that most often works given its reliance on tacit knowledge. Codification, meanwhile, tends to be reserved for standard products [51–53]. In the context of the process approach to knowledge management, the question arises: how can one measure knowledge management in order to obtain tangible effects of its use with reference to organizational goals?

2.2. Knowledge Management Quality

Evaluation of knowledge management quality and its measures is a recurring problem in the literature. It applies to all aspects of human life [54–57]. In this respect, the authors agree that the problem of defining quality is invariably an open topic for research and discussion. There is no doubt that each and every quality evaluation comes burdened with a certain degree of subjectivity—hence the necessity, as authors universally agree, to clarify the broad organizational context for knowledge management measurement.

Evaluation of knowledge management quality in the literature [16,58,59] indicates the importance of testing data quality and information quality; knowledge codification; and the exchange of knowledge, experience and intuition between employees and teams, all while taking into account the use of information technology systems. However, the biggest challenge for managers is to determine measures of knowledge quality in a knowledge management system. Knowledge quality has different levels of detail, and depending on the situation, it can be understood as either product readiness, a resource for active use, compliance with requirements or a degree of proximity of excellence [57].

The literature on the subject include research on the quality of a formalized knowledge management system [16,58,59]. According to the Deepankar, Arora and Sharma, it is important to introduce the principle of basic quality management that support knowledge management processes [16]. The authors have created a hierarchical structure of knowledge quality and described its elements and their attributes, and created a valid and reliable instrument to measure the relative importance of the elements. This model has a hierarchical approach to address the dependence relationships of knowledge quality with its elements of inherent (accurate, complete, consistent, current, relevant), contextual (culture, structure, dependence, clarity, responsive) and actionable (useful, accessible, interpretable, volatile, secure) knowledge quality [16]. The research indicated that actionable knowledge quality is the most important area of concentration for business managers in the knowledge management system (KMS). The authors Deepankar, Arora and Sharma underlined that KMS is just a tool to support organizational knowledge processes, especially for explicit knowledge, but on the other hand, organizational knowledge is implicit, context-dependent, difficult to imitate, and noncodified [16].

The very evaluation of knowledge quality is invariably a subjective assessment, as in cases of commercial and other organizations. It is a derivative of the evaluation of employees' abilities to perform tasks assigned to them. Once again referring to the arguments raised earlier in the paper, perceived knowledge quality can be said to be determined by knowledge management processes occurring in organizations [37,60–64]. Knowledge management processes and cycles consist of

subsequent activities undertaken in organizations. These are: the search for knowledge (identification), acquiring knowledge resources necessary for the organization, developing knowledge while adapting it to local conditions, distributing knowledge within the organization and using knowledge effectively. In the literature cited earlier, knowledge preservation is also indicated as an important aspect of the knowledge management process. All these stages constitute a closed management cycle found in a more or less structured way in virtually every organization (Figure 1).

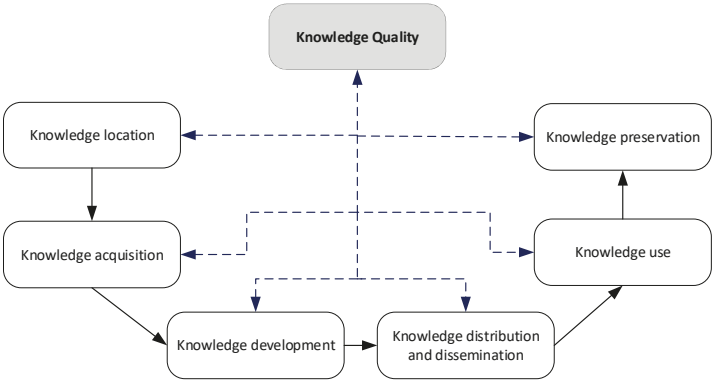

Figure 1. Elements of the knowledge management process Source: own elaboration based on [37].

In relation to knowledge management in theory, elements influencing the evaluation of knowledge quality were defined. Select aspects of the entire knowledge management process can be referred to under the process approach.

3. Materials and Methods

The research was carried out between November and December 2019 in the form of an online questionnaire. The aim of the study was to identify factors that have a positive impact on the quality of knowledge in knowledge management processes in the contemporary organization. The assessment of the quality of knowledge, which was indicated earlier in the article, is a subjective assessment. Tactical managers in organizations were invited to the study. The authors concluded that tactical managers have knowledge about the effectiveness of the implementation of the tasks entrusted to them and how to implement these tasks. Managers are able to assess the factors included in the knowledge management process, which are listed in Table 1. The authors' particular interest is the relationship between knowledge quality and modern IT tools and technical infrastructure available in modern organizations. Therefore, the research hypothesis is that the quality of knowledge is positively influenced by the technical infrastructure available in organizations, including IT tools, knowledge bases and repositories. The survey was addressed to organizations, both registered and conducting business activity in Poland. For international organizations, the survey was intended for representatives of these companies' local branches.

The companies invited to the study were organizations with which the authors of the article had previously collaborated. The key criterion that was used to select the organizations invited to participate in the survey was the economic efficiency of the organization. The initial assumption verifying economic efficiency was obtaining a positive financial result for the last 3 years, i.e., in the period 2016–2018. All organizations invited to the study met this condition, which indicates effective management of resources in the organization, including knowledge resources. The requirement of achieving economic efficiency during a period of three consecutive years was the criterion for choosing an organization for research. For this reason, the research sample cannot be considered as completely random and it has been chosen in a targeted manner.

Table 1. Elements influencing evaluations of knowledge quality in knowledge management processes in contemporary organizations.

Construct	Characteristic
Knowledge quality (KQ)	Knowledge is evaluated taking into account aspects such as its quantity, quality and availability for the implementation of tasks [16,57–59,61,62,64,65]
Identification (IDT)	There are knowledge repositories (databases, IT systems, etc.) or formal job positions related to knowledge management, e.g., knowledge manager, knowledge management specialist. Informal knowledge managers or dedicated knowledge specialists may also appear. [62,64,66]
Acquisition (ACQ)	Managers and non-executive employees have access to knowledge bases and are able to use them. In addition, knowledge managers support the work of other organization members by showing willingness to cooperate and distribute knowledge. Knowledge can be acquired from external sources (training, courses, access to external repositories). [46–48,65–69].
Development (DEV)	The organization develops resources, actively responds to the training needs of employees and organization members. Organization supports independent acquisition of knowledge by members [36,63,67–71]
Distribution (DST)	The organization creates mechanisms enabling knowledge distribution and supports knowledge-sharing processes between employees, e.g., through a mentoring, coaching system or cooperation in the task or project teams. Organization also provides tools to support distribution and exchange of knowledge between employees. [33,36,62,68–71].
Use (USE)	The organizational knowledge, including employee knowledge, is properly used to carry out specific tasks. Tasks are assigned based on employee competences, enabling full use of their knowledge and of the knowledge existing in repositories [36,66,68,69]

The companies invited all operate in modern industries (Table 2). Such activity requires them to have extensive experience and process efficiency, but also to continually develop knowledge resources. They are both international and Polish enterprises. They differ not only in industry, but also in organizational structures, market coverage and size. Both small companies, i.e., those employing up to 25 employees, and large companies, i.e., those employing more than 250 employees, were invited to the study.

The aim of the study was to determine the factors influencing the quality of knowledge management in organizations, and to identify those of them with the strongest impacts based on subjective evaluation of responses. Research questions focused on factors influencing knowledge management in business organizations. Respondents were asked to respond using a five-point Likert scale, where 1 was the lowest score and 5 the highest.

The survey was addressed to organization managers. For larger organizations, several managers representing different branches of the organization were allowed to complete the survey, as evidenced by the size of the research sample, which is larger than the number of organizations invited to participate in the study. A total of 58 organizations selected in a non-random way were invited. Out of those, 4 did not complete the survey and 12 completed it either incorrectly or not in full. The remaining 84 surveys were used for further analysis. Table 2 shows the characteristics of the analyzed organizations.

The questions addressed to survey participants were intended to indicate the factors influencing their perceived and subjectively evaluated quality of knowledge. For organizations whose goals included achieving tangible financial results, knowledge quality was evaluated through the prism of how effective a company is in achieving their goals. Therefore, the knowledge quality factor (KQ) is estimated in the study as a component of the quantity, quality and availability of knowledge for tasks implemented in the organization. Knowledge quality in the study is a response variable, influenced by the explanatory variables listed in Table 2. Each of the factors was assigned to one of the stages of

the knowledge management cycle described earlier in the paper. The study assumes that knowledge management in organizations, regardless of their size or scope of activity, encompasses elements such as conscious identification of knowledge sources and knowledge acquisition, knowledge development for the needs of the organization and its processes and projects, knowledge distribution within the organization and its effective use. Since the vast majority of respondents were managers performing job duties at the tactical level of the organizational structure, the survey was completed by team managers, functional managers and project leaders in organizations. It was therefore not addressed to those involved in organizational management at the strategic level (management board, senior management). The survey does not cover knowledge preservation issues, as this element is directly related to the implementation of organizational strategy.

Table 2. Description of research sample.

Organization's Characteristic	**N = 58**	**%**
Organization size		
Large	23	39.66%
Medium	26	44.83%
Small	9	15.52%
International organization		
Yes	23	39.66%
No	35	60.34%
Industry		
ICT	21	36.21%
FMCG	10	17.24%
Manufacturing	8	13.79%
Electric power	7	12.07%
Services	7	12.07%
Pharmaceutical and cosmetics	3	5.17%
Other	2	3.45%
Participant's characteristic	N = 84	%
Respondent age		
Under 30	11	13.10%
30–40	31	36.90%
40–55	24	28.57%
55+	18	21.43%
Sex		
Female	38	45.24%
Male	46	54.76%
Position		
Owner/CEO	19	22.62%
Manager	65	77.38%

4. Results

According to obtained responses, knowledge quality scores highest in small organizations and lowest in large organizations. Figure 2 shows the weighted averages of the responses to the question about the quality of knowledge that each organization has and manages. The measure of the coefficient defining the quality of knowledge (KQ) is a value that is the arithmetic average of the answers given by the survey's participants to the questions regarding the amount of knowledge available to the employee, the degree of matching this knowledge to the current needs of the employee and ease of access to the necessary knowledge. Ease of access applies to both knowledge accumulated in the internal repositories of the organization and access to external knowledge.

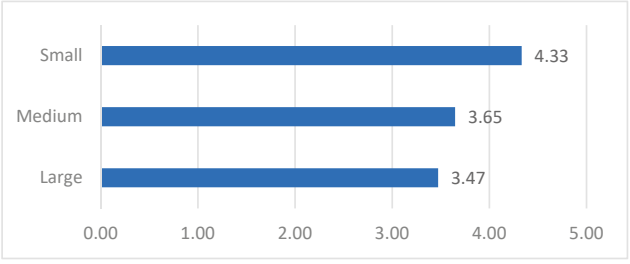

Figure 2. Evaluation of knowledge management quality in organizations by size.

All the factors described in Table 2 sprang directly from knowledge management processes taking place in organizations. To indicate the existence of a linear correlation between the factors, the Pearson linear correlation coefficient was used. The results presented in Table 3 refer to the relationship between the knowledge quality variable (KQ) and the explanatory variables. The correlation coefficient indicates the degree and direction of correlation between the variables.

Table 3. Results of linear correlation analysis measured with the Pearson coefficient.

Construct	KQ Knowledge Quality
KQ Knowledge quality	1
IDT_1	0.358366
IDT_2	0.127963
IDT_3	−0.14069
ACQ_1	0.367336
ACQ_2	−0.00077
ACQ_3	0.311507
DEV_1	0.497355
DEV_2	0.099847
DST_1	0.058817
DST_2	0.499505
USE_1	−0.08177
USE_2	0.510323

Correlation coefficient values can take values from –1 to 1, with extreme values meaning direct correlations between negative and positive factors. For example, the IDT_3 factor, which says that informal knowledge managers exist in organizations, depends on the quality of knowledge management. However, the value of the coefficient shows that this impact is negligible. Table 4, which presents the results of the correlation analysis, indicates factors whose value are > 0.25; i.e., it can be assumed that the coupling with them and with the response variable is visible. The analysis lacks coefficients for which the correlation is very strong; i.e., it is close to the value of 1, which may be partly explained by the limited research sample. A correlation analysis carried out in this way shows that knowledge quality is correlated significantly and also positively with the following factors:

- IDT_1—knowledge repositories (databases, IT systems, etc.) exist in the organization and employees are aware of the need to use them as part of duties arising from their job position
- ACQ_1—organization members have access to knowledge bases, and more importantly, are able to use them
- ACQ_3—organization enables members to acquire knowledge from external sources. In practice, this means the organization conducts training and courses, while employees have, if necessary, access to external knowledge repositories.
- DEV_1—organization actively responds to the training needs of employees, organization members. This is when employees have the opportunity to indicate to the employer a type of knowledge

that may be useful to them in order to better perform job duties. In particular, they may indicate courses, training or study that correspond to their career and development paths.

- DST_2—organization provides tools to support distribution and exchange of knowledge. These tools can be technological solutions, networks, repositories, disks or software supporting knowledge and communication management within the organization.
- USE_2—employee knowledge is well used in the implementation of tasks. This is related to the employee's subjective feelings and personal satisfaction with the tasks assigned to him/her, and the possibility of using his/her knowledge and experience in the implementation of the tasks he or she is entrusted with.

Table 4. Elements influencing evaluation of the state of knowledge management quality in organizations.

Construct	Questions—Elements of Quality in Processes
Knowledge quality (KQ)	Organization members are satisfied with the quantity, quality and availability of knowledge for the implementation of tasks
Identification (IDT)	IDT_1—Knowledge repositories (databases, IT systems, etc.) exist in the organization IDT_2—Formal knowledge manager position exists in organizations IDT_3—Informal knowledge manager positions exist in organizations
Acquisition (ACQ)	ACQ_1—Organization members have access to knowledge bases and are able to use them ACQ_2—Knowledge manager supports the work of other organization members (availability, willingness to cooperate) ACQ_3—Organization enables members to acquire knowledge from external sources (training, courses, access to external repositories)
Development (DEV)	DEV_1—Organization actively responds to the training needs of employees, organization members DEV_2—Organization supports independent knowledge acquisition by organization members
Distribution (DST)	DST_1—Organization supports processes of knowledge distribution between employees, e.g., through a mentoring system or cooperation in task teams DST_2—Organization provides tools to support distribution and exchange of knowledge
Use (USE)	USE_1—Tasks are assigned according to the employee knowledge criterion USE_2—Employee knowledge is well used in the implementation of tasks

Factors that correlate the most strongly with knowledge quality perceived by organization members can be divided into two basic groups: one is knowledge repositories and systems supporting knowledge management in the organization, and the other is factors directly related to employees—the fact of appreciating and using their knowledge and experience, along with each employee's ability to influence their further development path. This is reflected in those factors that pointed to the importance of choosing training, developing and using individual knowledge. Tools and infrastructure—which includes knowledge bases, repositories and software—support individual employees in their work and can help improve workplace performance overall, but they can also be favorable to group learning and group use of knowledge. However, while the correlation only shows the relationship between the factors, it fails to clarify the underlying causal relations between them. To this end, a linear regression analysis was performed for the analyzed variables. Regression equation, taking into account all analyzed and specified factors at a coefficient level of $R^2 = 0.69$ (meaning that the model explains the phenomenon in 69%), is a measure of the model's goodness-of-fit and is shown in Table 5 with a standard error of 0.47.

Table 5. Result of linear regression analysis for the initial model.

	Coefficient	t-Stat	*p*-Value
Intercept	−0.308710889	−0.4335395	0.665937255
IDT_1	0.121414573	1.307279	0.195335799
IDT_2	0.127159787	1.7628235	0.082233532
IDT_3	−0.084539155	−1.1245182	0.264580681
ACQ_1	0.131808493	1.5799756	0.118557558
ACQ_2	0.007576083	0.0799111	0.936532757
ACQ_3	0.143755295	1.5631931	0.122453746
DEV_1	0.13420902	1.3625544	0.177329519
DEV_2	−0.053968672	−0.6171196	0.539129916
DST_1	0.024655134	0.3469759	0.729635749
DST_2	0.295615007	3.1969216	0.002074733
USE_1	−0.077286052	−1.0307937	0.306136259
USE_2	0.326967829	3.6582281	0.000484185

As a result of subsequent iterations, the following factors were removed from the model based on the lowest t-statistic values (in order of removal):

- ACQ_2—knowledge manager supports the work of other organization members (availability, willingness to cooperate).
- DEV_2—organization supports independent acquisition of knowledge by organization members.
- DST_1—organization supports processes of knowledge distribution between employees, e.g., through a mentoring system or cooperation in task teams.
- IDT_3—informal knowledge managers exist in organizations.
- USE_1—Tasks are assigned according to the employee knowledge criterion.
- IDT_1—knowledge repositories (databases, IT systems) exist in the organization and employees are aware of the need to use them as part of duties arising from their job position.
- ACQ_3—organization enables its members to acquire knowledge from external sources.
- DEV_1—organization actively responds to the training needs of employees, organization members.

Let us note that the last three factors were taken into account earlier at the correlation stage. This means that true linear correlations exist between them and the quality of knowledge evaluated by the respondents, but the same cannot be said with confidence about the impact between them and knowledge quality. The final regression model, after the elimination of factors with the lowest values in Student's t-statistics, at the level of R^2 = 0,72 and with a standard error rate of 0.59, indicates three factors directly influencing subjective knowledge quality as evaluated by the respondents (Table 6).

Table 6. Results of regression analysis after rejection of factors with lower significance as measures by Student's t-statistics.

	Coefficients	Standard Error	t-Stat	*p*-Value
Intercept	0.094806	0.426412483	0.222333	0.824621
ACQ_1	0.214223	0.076037598	2.817336	0.006098
DST_2	0.416954	0.082605271	5.047541	2.75E−06
USE_2	0.352535	0.082910821	4.251979	5.7E−05

Factors indicated in the course of regression analysis point to the existence of and employee access to databases and knowledge bases (ACQ_1) and to information systems supporting knowledge management (DST_2), also indicating the awareness that employees' knowledge is used in their work in a way that satisfies them (USE_2).

5. Discussion and Conclusions

Knowledge management is commonly applied in both large international enterprises and SMEs (Small and Medium Enterprises) [72]. It is a multifaceted concept requiring the use of appropriate systems and tools. An important issue taken up in our theoretical and empirical deliberations was to examine knowledge management quality while taking into account individual knowledge management processes, such as knowledge identification, acquisition, development, distribution and use. The biggest challenge for both scholars and active entrepreneurs is measuring knowledge and management knowledge from a quality perspective. Knowledge quality assessment is a current issue in the context of new technologies (Industry 5.0, Internet of Things, Technology of Blockchain] and social solutions [73,74].

The aim of the study was to identify factors that have a positive impact on the subjectively evaluated quality of knowledge, against the assumption that knowledge is generally held in high esteem when it enables efficient and effective implementation of entrusted tasks. This selected representatives of business organizations answered questions related to whether knowledge available to them was sufficient, timely, up-to-date, appropriate and free of errors that ultimately affect the quality and comfort of work. An interesting conclusion that can be derived from the research is that companies tend to evaluate their knowledge well, and most interestingly, that knowledge quality scores overall higher in large than in small companies. Another thought-provoking conclusion, which nonetheless requires further research, is that among the factors that most markedly affect knowledge quality are those directly related to infrastructure, i.e., access to knowledge bases and repositories, and to IT systems. This could be an interesting diving board for more in-depth research into tools and their actual applications in business organizations. Access to tools supporting knowledge management is indeed a determinant of modern management, which fully fits into the process-oriented research stream.

The research hypothesis that the quality of knowledge is positively influenced by the technical infrastructure available in organizations, including IT tools, knowledge bases and repositories, has been confirmed.

Closely related to the human, the non-technical aspect was the third factor singled out in the analysis; namely, employee satisfaction—the awareness that their knowledge is used in a proper and exhaustive way that allows them to experience fulfillment with work. This indicates the need to focus not only on tools, but also on management processes themselves, with employees at the center of considerations. The findings of this study have several important implications for managers in contemporary organizations to measure the knowledge quality in knowledge management processes and initiate successful practices within their projects.

Some limitations of the conducted research need to be acknowledged at this point, and they concern our examining of a specific group of respondents who were representatives of both local and international companies. Future research into knowledge management quality may want to draw on a larger sample and on issues related to the use and the actual impact of technical infrastructure on knowledge management processes. The issues discussed in this paper require further in-depth theoretical and empirical studies.

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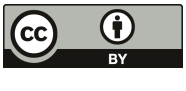

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Communication Strategies in Social Media in the Example of ICT Companies

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Abstract: This article aims to present the results of pilot studies on the involvement of the four largest Information Communication Technology (ICT) companies in promoting the Sustainable Development Goals (SDGs) through social media. Studies examine which communication strategy is used by companies in social media. The research was carried out using the method of the content of messages posted on the official Facebook and Twitter accounts of the ICT companies' analysis. The analysis showed that the companies prefer corporate ability communication strategy over Corporate Social Responsibility (CSR) or a hybrid one. Posts rarely concern the company's activities related to social and environmental responsibility. Although they engage in activities supporting the achievement of the SDGs and provide information about it on their corporate websites, the topic of sustainable development has been taken up in small numbers in the posts examined.

Keywords: communication; social media; strategy; sustainable development; corporate responsibility; ICT industry

1. Introduction

Nowadays, a responsible business is a business that joins in the achievement of the Sustainable Development Goals (SDGs), which were declared by the United Nations in 2015 and are binding for all nations. Enterprises that have a significant impact on society and environment should play a key role in promoting and implementing the SDGs. Increasing amounts of transmitted data in mobile networks, the maintenance of server rooms, data centers and the production of new equipment increase the share of Information Communication Technology (ICT) companies' global greenhouse gas emissions. Furthermore, products and services offered by enterprises in this industry significantly affect changes in the functioning of individuals and societies, that's why this industry should be the subject of research.

The article aims to present the results of pilot studies on the involvement of the four largest ICT companies in promoting the Sustainable Development Goals through social media. Studies examine which communication strategy—corporate ability or corporate social responsibility—is used by companies in social media.

In the first part of the article, Sustainable Development and Corporate Social Responsibility are described. Then in the second part, the methodology of the research is presented, followed by the results of the study and discussion. The last part of the article presents conclusions and research limitations.

2. Literature Review

2.1. Sustainable Development

In September 2015, the United Nations member states adopted the document Transforming our world—An Agenda for Sustainable Development 2030 [1], which includes 17 Sustainable Development Goals [2]. The implementation of the adopted directions of development is to eliminate poverty,

reduce inequalities and preserve or improve the state of the natural environment while ensuring economic growth worldwide.

The Sustainable Development Goals (SDGs), adopted by 193 countries, are a broad vision of a better future for the world but firmly rooted in reality. For each goal, tasks have been set with specific indicators to be achieved by the end of 2030. In order to achieve it, joint actions of governments of all countries are needed, which will make real changes in politics and the economy. However, the business also plays a crucial role in achieving the goals, which is why the United Nations has called on the private sector to engage in activities aimed at global sustainable development. The business has great potential to support the achievement of the SDGs in many areas. Starting with The Goal 8, promoting decent work for all people and economic growth, where private companies have a wide range of activities to address labor issues, through the goal of the right to equal treatment of the sexes (Goal 5) and the creation of multilateral partnerships for sustainable development (Goal 17). The role of business in achieving environmental objectives is also invaluable (Goals 6, 7, 13, 14, 15 and 16). One of the key arguments supporting the thesis about the obligation for a business to join the fight for environmental improvement is the fact that it is a business that contributes most to its devastation.

Companies can contribute to the implementation of the SDGs in two ways. Firstly, by educating the society and promoting the idea of sustainable development and the SDGs. Implementation of educational activities and running information and promotion campaigns seems to be the easiest way to get involved in the activities for Agenda 2030.

Greater business involvement is required to integrate the SDGs into the company's development strategy and to implement specific actions at the operational level. However, surveys conducted annually by The Ethical Corporation show that the interest of business in incorporating the SDGs into their daily business activities is growing [3]. Aware of the considerable role that business plays in the implementation of Sustainable Development, the UN Global Compact, in parallel with the development of the SDGs, has also undertaken work on cooperation programs with the private sector. The programs' recommendations also refer to the ICT industry, as these companies have a significant impact on society but also have great opportunities to contribute to the achievement of the SDGs.

The ICT sector is currently the main driver of development and innovation worldwide. Modern, advanced information and communication technologies significantly affect the competitiveness of enterprises and national economies, as well as changes in the functioning of modern societies [4]. When analyzing the impact of the ICT sector on the economy and society, one cannot forget about the adverse effects of its activities. The main factors influencing environmental pollution by enterprises in this sector are considered to be materials used in the production of ICT equipment (harmful chemicals) and energy consumed during the manufacture of products and later in the process of their use [5]. The results of an analysis conducted by McMaster University [6] showed that the carbon footprint left by IT equipment in 2007 accounted for 1 percent of the carbon footprint and the forecast of the carbon footprint of ICTs for 2040 is 14 percent of total greenhouse gas emissions.

The amount of CO2 emitted during the production of a new smartphone equals the amount of gas emitted to the atmosphere when using an existing smartphone model within ten years. Large companies are still tempting consumers with new models of their products, which causes another environmental problem—disposal of used equipment. The increasing number of transmitted data, maintenance of server rooms and data centers further increase the share of the ICT industry in global greenhouse gas emissions. The environmental impact of ICT companies is significant, so reducing the negative impact of the industry remains one of its priorities. ICT companies are the primary energy consumer in urban areas and the European Union is promoting measures to improve the energy efficiency of the sector in order to reduce gas emissions. The actions can be divided into two groups—the first one is actions to greening the ICT sector and the second one is the ecology-enhancing actions that the ICST supports. The database of good practices of enterprises in an area of greening information technologies has been developed as part of the Green IT Network Europe Project [7]. Not only in the pro-environmental area, the ICT sector is obliged to take corrective actions but equally, often issues of ensuring appropriate

working conditions in the supply chain are raised (e.g., in companies involved in the extraction of needed raw materials, production of electronic components or recycling of used electronics).

Stakeholders' expectations of ICT companies apply to both the activities of companies and using the communication opportunities offered by their products and services. The developing communication technologies make it possible not only to reach a vast audience with information on Sustainable Development but also to involve the recipients of communications in the debate on Sustain Development and actual participation in activities supporting the implementation of SDGs [8].

2.2. Corporate Social Responsibility

The contemporary discussion on corporate responsibility (CSR) and sustainable development shows a clear analogy between the two concepts [9]. Sustainable development means development that meets people's current needs without compromising future generations' ability to meet their needs. In order to achieve the SDGs, it is necessary to have three elements—economic growth, social inclusion and environmental protection [10]. This is a type of development that, using appropriate technologies, does not degrade the environment, is economically viable and socially acceptable. In the early definitions of CSR appearing in the literature, ecological aspects were rarely emphasized. A. Dashlrud explains this fact by the division of CSR at the end of the 20th century by the World Business Council for Sustainable Development into two areas—corporate social responsibility and corporate environmental responsibility [11]. However, both environmental, social and economic areas are marked in the definition contained in 2010 in ISO 26000 standard. The definition states that an organization's social responsibility is a responsibility for the impact of its decisions and actions (products, services, processes) on society and the environment through transparent and ethical behavior that contributes to sustainable development, health and well-being of society [12]. The standard assumptions of CSR and Sustainable Development make these concepts often used interchangeably [13].

The changes taking place both in the field of information and communication technologies used in organizations, as well as in the awareness of a wide range of stakeholders, expecting from an organization the transparency of activities and real dialogue, have increased the importance of CSR and Sustainable Development communication among company managers and scientists. The first attempt to separate research on corporate social responsibility communication in the research area of the phenomenon of CSR based on scientific discussion took place in 2002. Maignan and Ralston published the results of research on CSR communication online, which was conducted in Europe and the United States. For the first time, the authors marked the distinction between social responsibility practices and CSR communication [14,15].

A retrospective look at the development of interest of researchers and practitioners in communicating CSR allows for distinguishing several stages of the perception's evolution of this issue and factors that influenced the changes in the perception of communicating social responsibility [16]. Specific periods of evolution, together with factors of change, are presented in Table 1.

Table 1. External factors determining changes in the approach to communicating Corporate Social Responsibility (CSR).

Factor	Period	Changes in the CSR Communicating
Stakeholder involvement and co-creation	2010–currently	From linear to networked CSR communicating
Stakeholder transparency requirements, the growing role of social media	2000–2010	The convergence of current CSR and communication practices
Stimulation of governmental and no-governmental organizations	The 1990s–2000	CSR reporting
Increased activity in CSR	The 1990s.	Beginning of non-financial disclosure

Source: Own study based on Golob et al. [16].

The first stage began in the 1990s when business ethics and the practice of combining joint activities of large companies with Non-Governmental Organizations (NGOs) and trade unions became particularly important. The first international initiatives related to the regulation of business ethics principles have emerged, such as the Ethical Trading Initiative or The United Nations Global Compact. During this period, research work, which dealt with aspects of communicating social responsibility, was mainly related to the concept of reputation and management of relations with stakeholders [17,18]. The Internet and the opportunities it offered had an increasing influence on changes in communication at that time [15]. The period between the nineties and the beginning of the 21st century was a time of development of governmental and international organizations that supported voluntary CSR activities of business organizations and first attempts at non-financial reporting. The first non-financial report was published by Shell in 1998, thus setting a precedent for other companies [19]. Initiatives were launched during this period that promoted communication of activities for society and environment, developed principles of social reporting and influenced the evolvement of the concept of corporate responsibility and Sustainable Development (e.g., The Global Reporting Initiative or The Organization for Economic Co-operation and Development). The guidelines for non-financial reporting included in the Global Reporting Initiative are still the most frequently used principles in the reporting process undertaken by business and non-business organizations. The initiatives created during that period contributed to increasing the awareness of the need to communicate CSR and Sustainable Development among organizations. After 2008, there are further changes in the perception of CSR communication and the following factors cause them—first of all, there is the institutionalization of non-financial reporting; processes related to reporting of CSR activities take on vital importance in organizations. Moreover, non-financial reporting in some countries ceases to be voluntary and becomes mandatory in certain areas (e.g., France, Germany, Spain, Scandinavia, USA, Japan). In countries where reporting is still optional, pressure from the society, government and foreign contractors makes organizations aware of the need to communicate CSR and Sustainable Development activities to stakeholders using this tool. Companies report on their social and environmental activities because they want to act openly and transparently and show how they contribute to Sustainable Development [15,20].

The process of adapting the communication strategy to the organization's business strategy due to the tendency to treat communication as a strategic business challenge [21] is another factor influencing the change in the perception of social responsibility and Sustainable Development communication. The development of social media resulted in an increase in communication needs on the part of stakeholders requiring the organization to be transparent was also outstanding. After 2011, the time has come when CSR communication has become a subject widely discussed and studied by scientists and practitioners. New tools for communicating with the environment are rapidly appearing and the stakeholders themselves require adjusting the content and channel to their needs. Moreover, stakeholders expect communication, which will be a real dialogue between the organization and its environment. The expansion of social media, in a way, forces the organization's strategic approach to communicating social responsibility and Sustainable Development. Nowadays, the organization's communication has become a tool enabling the participation of stakeholders in the processes of shaping CSR policy and strategy, which respond to real challenges of the internal and external environment [15].

The list of external factors determining changes in the approach to communicating the organization's responsibility is presented in Table 1.

Sustainable Development communication is described in the literature in three forms—corporate communication, advocacy and development communication [22]. Corporate communication in this context refers to the flow of communication within the organization in order to raise employees' level of awareness and competencies about corporate responsibility and the SDGs. Corporate communication is also about creating the image of a responsible organization, aiming at the Sustainable Development, among specific stakeholder groups, for example, local community, supervisory board or customers.

- Advocacy—the purpose of this form of communication is to support the Sustainable Development policy and raise the recipients' awareness of specific problems, such as poverty, the effects of

climate change or care for clean energy. Advocacy communication goals are achieved primarily through the activities of journalists and widely understood mas media are the tools used in their implementation.

- Development Communication (also referred to as Communication for Development) is defined in the literature as a process of the based on dialog communication, which involves a strategic approach to the use of communication methods and tools to cause social change. It is used to identify and analyze the needs, problems and risks associated with Sustainable Development. The three key elements characteristic of Development Communication are process, dialogue and the pursuit of change.

Mefalopulos and Grenna also analyze in their research the main communication paradigms in the context of Sustainable Development since the last century:

- Modernization paradigm—implemented since the 1950s in communication about global development by emphasizing the role of new technologies and scientific methods in the realization of the idea of maintaining peace and prosperity around the world. Communication took place mainly through mass-media; it was a one-way communication (top-down process).
- The paradigm of dependence—initiated in the 1970s. Communication in this paradigm was understood as a tool for educating society and creating alliances between developing countries. The media should, by definition, be under the supervision of the state, as the state represents the vital interests of society.
- The co-participation paradigm—the third paradigm is based on the idea of public participation in the process of communicating about world development. In this paradigm, the possibility of exchanging opinions, experiences and knowledge between the sender and the recipient is ensured. Society becomes a co-creator of a world development strategy. The adoption of such a model of communicating about Sustainable Development does not change the traditionally understood role of the mass media. The media continue to inform and promote but this is no longer their only function in reality, where every recipient of a message can easily express their opinions.

In the research of the last twenty years, CSR communication has been increasingly important due to its role in the development of CSR policies and activities. The implementation of goals set by socially responsible organizations requires constant adaptation of business and communication strategy to the changing expectations of the environment.

Research shows that communicating using Twitter increases the level of identification of stakeholders, especially consumers, with an organization. According to researchers [23], even though external stakeholders have much less direct contact with an organization than employees, by contacting an organization through social media, stakeholders are often able to build a robust and lasting relationship with it. One of the first research papers trying to explain the role of microblogs in creating relations with the environment, based on the analysis of the content of accounts on Twitter, was the work of M. Etter et al. [24]. By analyzing tweets and reactions to them posted on the accounts of 30 companies, the researchers determined the levels of interactivity and intensity in communicating social responsibility. The intensity level was determined by the quantitative proportion of posts on CSR of the company to posts on other topics. Interactivity was measured by the number of stakeholder responses to published CSR tweets. The analysis resulted in a matrix defining four types of CSR communication strategies that companies can implement using a microblog in the form of Twitter:

1. information strategy that has a low level of interaction regardless of the level of stakeholder response,
2. personalized information strategy where low stakeholder responsiveness is combined with medium to high levels of interactivity,
3. reactive strategy—medium or high level of interactivity is combined with a high level of responsiveness,
4. an engagement strategy, characterized by a medium to a high degree of interactivity with an average level of environmental responsiveness.

Each of the surveyed companies was assigned to an appropriate strategy and the intensity level of CSR tweets posted by the company was determined. Conclusions from the research were included in the statement that the use of Twitter in communicating social responsibility may contribute to the increase of awareness of the organization's CSR activities. Users make CSR content available to others and reducing the negative attitude of stakeholders towards CSR activities and messages thanks to the dialogue conducted by the company and building relations with the environment. Successive research on the use of the microblog to communicate CSR conducted by Lee et al. [25] and Tao and Wilson [26] has shown that Twitter is an excellent tool to build a communication space for organizations. Those that have conducted CSR activities on a large scale have built a broader community on Twitter's corporate account around their activities than organizations that have not conducted CSR policies. Although Twitter enables organizations to create and conduct a dialogue with their environment, research conducted earlier has proved that organizations still rarely use this tool to communicate CSR. The analysis of company accounts of the surveyed organizations showed higher responsiveness of the organization in communicating CSR and less interactivity than in the case of tweets not concerning social responsibility. The level of organization's interactivity increased only in cases when stakeholders themselves contacted the organization through tweets [15,27].

Also, subsequent studies show that this tool has been used mainly to promote organizations, to a lesser extent, to build dialogue [28]. By investigating how organizations communicate via Twitter, Etter [27] analyzed their communication strategies. Based on the model of communication strategies proposed by Morsing and Schulz [29], the researcher distinguished the following strategies used by organizations in communicating via Twitter accounts:

1. broadcasting strategy—this strategy involves unilateral communication and information is disseminated to an anonymous recipient, rarely to an individual recipient to convey specific information,
2. reactive strategy—allows for two-way communication but messages only appear from the organization when the initiative is created on the side of stakeholders, the organization responds to questions and comments,
3. engagement strategy, enabling a proactive approach by the organization to two-way communication. The organization encourages dialogue, exchange of ideas, asking questions from stakeholders, also by frequently mentioning other users' names in tweets. It is precisely this latter communication strategy, the engagement strategy, that researchers consider being the one that should lead to the highest level of stakeholder identification with the organization and increase consumer loyalty to the brand [27,30].

Sundstrom and Levenshus [31] have narrowed down their applied research on Twitter's social responsibility communication strategies to research media companies. The analysis of the content of messages posted on the microblog allowed to identify three types of communication strategies used by the surveyed companies:

1. strategies for promoting the organization as a leader in the industry,
2. integrating social media by linking to other external sources on the internet (enhancing credibility),
3. creating relationships, fulfilling public relations functions in the context of involving stakeholders in the dialogue.

Research has also been conducted on the use of storytelling elements and emotional expressions in CSR tweets [32]. In the area of communicating CSR through a microblogging service such as Twitter, research was also undertaken in food and brewing companies. The research showed that customers expect companies representing the above industries to communicate about product responsibility; however, none of the surveyed companies used a dialogical, two-way and asymmetrical approach in communicating with the environment via Twitter [33]. Similarly, the results of the Shin and team [34] study showed that companies in most cases, despite using social media and communicating online

with stakeholders, still treat this channel as a place of one-way communication, mainly for information purposes. As Wigley and Lewis [35] point out, social media is only a communication tool and it is up to the organization to use it. It is the organization's responsibility to provide an environment, both online and offline, with a willingness to listen to what its stakeholders have to say and respond to problems that arise. Therefore, research in the field of social media and social responsibility communication is an important part of the research on the interactivity of communication, which involves all parties of the communication process. Research on the use of official company accounts functioning on Facebook by companies to communicate with their stakeholders was conducted by Kim, Kim and Sung [36], among others. The researchers analyzed company entries on 41 company Facebook accounts and the reactions of stakeholders to these entries, measuring the number of fans, posts posted by stakeholders and the number of responses to company posts. The study examined the correlation between six types of messages sent by a company to its stakeholders via Facebook accounts of the 500 largest companies and the intensity of responses from the recipients of the messages. It verified the research theses on the impact of a given type of message on stakeholder engagement in dialogue with the company [15].

The analysis of the content of posts on company accounts on Facebook, conducted by Haigh et al. [36], showed that organizations communicating social responsibility in social media primarily inform about CSR programs and activities, as well as achievements and awards. The leading communication strategy on Facebook was the strategy of informing about the organization's successes, the quality of products and services, the importance of the organization in the industry (called the corporate ability strategy). The research also proved that conducting interactive communication strengthens the positive perception of the organization and its CSR activities among stakeholders and influences their purchasing decisions [37].

Subsequent research on CSR communication in social media was conducted by Cho, Furey and Mohr [38] concerned with the adopted strategies of CSR communication on Facebook accounts. The analysis of the content of the posts showed that enterprises were more likely to implement an information strategy communicating on social responsibility than an interactive strategy involving stakeholders. The effectiveness of implemented communication strategies turned out to be low; recipients of messages did not engage in dialogue with organizations. Studies on the effectiveness of communicating social responsibility through Facebook accounts were also conducted in empirical studies by Abitbol and Lee [39]. They concluded that the most significant stakeholders' involvement in communication with enterprises was visible in reactions to posts on CSR activities related to the organization's business activity [15].

Research on the effectiveness of CSR communication in social media has so far been carried out in the food, media and brewing industries or cross-sectionally, for example, among Fortune 500 companies. The search of the subject literature made it possible to state that so far, no research has been carried out on communicating the SDGs in social media conducted by companies from the ICT industry.

The communication strategy defines the objectives, content and target groups that the messages formulated by the organization should reach [40]. In the opinion of the researchers, the choice of an appropriate communication strategy is crucial for obtaining a positive attitude of the stakeholders to the organization [41]. The research on communication of an organization's responsibility has revealed several typologies of communication strategies implemented by organizations. The literature most often quotes the typologies introduced by Wagner et al. [42], Drumwright [43], Kim et al. [36], Morsing and Schultz [29], Colleoni [28].

Wagner et al. [42] distinguished—taking into account the frequency of messages sent and financial outlays—two types of social responsibility communication strategies—proactive and reactive. A proactive, more aggressive strategy assumes higher communication-related investments, resulting from a higher frequency of CSR messages, for example, in the form of advertisements. A reactive strategy is characterized by a lower frequency of CSR messages of the organization and significantly lower financial outlays for this type of communication. Some researchers argue that an organization should use a reactive strategy, a unilateral communication strategy to inform stakeholders about its CSR

activities, explain the motives and sense of the commitment [29]. According to researchers, less frequent communication about CSR brings better results. However, it should also be taken into account that a reactive communication strategy carries the risk of low awareness of CSR activities undertaken by an organization among its stakeholders, which results in a lack of reaction and involvement of stakeholders in the implemented activities. On the other hand, the risk of adopting a proactive strategy is that stakeholders treat communicating social responsibility as "selling" the organization's commitment and creating only the right image [44].

In turn, Drumwright [43] presented the division of CSR communication strategies by purpose and content. He distinguished:

1. strategy of economic communication, where the organization's messages focus on presenting the advantages of products or services,
2. strategy of non-economic communication, the aim of which is to support the image of the organization building good relations with the environment,
3. mixed strategy, which in messages combines the promotion of products and services with the CSR message.

On the typology described above, Kim and others based their research on strategic communication of social responsibility [36]. Researchers also distinguished three main types of communication strategies used by modern organizations, which correspond to the individual strategies presented by Drumwright [43] (corporate ability strategy, corporate social responsibility strategy and hybrid strategy).

The aim of the quality strategy is, as in the economic strategy, to emphasize the quality of products and services and to build the image of the organization as a specialist on the market. Messages sent to stakeholders as part of the adopted strategy often concern the organization's success on the market, sales growth, leadership in the industry. The social responsibility strategy, on the other hand, serves the purpose of conveying information on the activities undertaken by the organization for the benefit of society and the natural environment. A hybrid strategy is a combination of the assumptions of the quality and social responsibility strategy, under which messages are sent to stakeholders concerning both the quality of products and services, as well as socially responsible activities. The aim of the quality strategy is, as in the economic strategy, to emphasize the quality of products and services and to build the image of the organization as a specialist on the market. Messages sent to stakeholders as part of the adopted strategy often concern the organization's success on the market, sales growth, leadership in the industry. The social responsibility strategy, on the other hand, serves the purpose of conveying information on the activities undertaken by the organization for the benefit of society and the natural environment. A hybrid strategy is a combination of the assumptions of the quality and social responsibility strategy, under which messages are sent to stakeholders concerning both the quality of products and services, as well as socially responsible activities [15].

Communication involving two or more parties is a fundamental condition for the implementation of the organization's social responsibility. The level at which organizations engage their stakeholders in the process of communication is a criterion for the division of social responsibility communication strategies in the Morsing and Schultz typology [29]. The researchers defined three types of communication strategies for organizations with their environment:

1. information strategy (unilateral),
2. asymmetrical communication (bilateral),
3. stakeholder involvement (bilateral).

The division, based on the theory of communication with Grunning and Hunt's environment, takes into account the level of stakeholder involvement in communicating and co-creating social responsibility. Individual levels are determined by system variables, such as location in the structure of the decision-making system concerning CSR activities and communication about them, perception by the organization of the role of stakeholders, the structure of key success indicators of the department

responsible for communication with the environment, the main strategic task of communication and support for CSR activities of the organization by external institutions [15,29,45].

Organizations that implement an information strategy communicate unilaterally, providing their stakeholders with information on CSR policy and activities but not expecting a response to the messages sent. An information strategy assumes that an organization can influence its stakeholders through communication while they are treated as potential opposition or support for the organization's actions and decisions. The main task of persons responsible for communication is to provide information to stakeholders in order to obtain or strengthen support for their actions. In an informational approach to communication, the opinions of stakeholders do not influence changes in the organization.

Similarly, in the case of the second communication strategy—the asymmetric communication strategy—here, the stakeholders do not influence the organization's strategic activities. Although in this kind of communication, the information flow is in both directions, it is asymmetrical. The organization tries to influence the behavior of its stakeholders through its communications. Communication from the stakeholders is seen as feedback when the organization wants to find out whether it has support for activities in its environment. The communication's asymmetry and asymmetry of the organization's relationship with its stakeholders are also visible in the place the organization designates its stakeholders in this process. The environment is perceived as influencing the organization's decisions; however, only messages that passively respond to the initiatives taken by the organization are taken into account.

Only the third type of strategy presented by the researchers—the strategy of stakeholder engagement—assumes a dialogue between the organization and its environment. Each of the broadcasters tries to convince the other party to changes in some areas. Thanks to regular communication, both the organization can influence the behavior of stakeholders and their attitudes towards it, as well as the stakeholders themselves, have the opportunity to express their opinions and draw the organization's attention to emerging problems related to its activities. For an organization conducting constant dialogue with the environment creates a chance to collect current information concerning stakeholders' expectations and the level of influence, which particular groups of stakeholders can exert on its activity. Therefore, the main task of persons responsible for communicating CSR in an organization is to ensure permanent and systematic dialogue with the environment, involving all main groups of stakeholders [15].

Based on the typology proposed by Morsing and Schultz [29], Colleoni [28], while researching social media, identified two main strategies of CSR communication used by organizations:

1. internal (self-centered),
2. dialogue.

The internal strategy assumes that the organization, in the model of internal consultations, establishes a plan of socially responsible activities. In contrast, by implementing the dialogue strategy, the organization actively involves its stakeholders in the arrangements concerning the CSR policy and activities. Table 2 presents the typologies of the social responsibility communication strategy.

The analysis of CSR communication strategies by organizations may raise the question about the possibility of drawing general conclusions about particular phenomena because there is a doubt whether strategies may differ depending on the target group they were prepared for [45]. The research conducted [45] showed that organizations do not differ significantly in the assessment of the importance of particular stakeholder groups, divided into primary and secondary ones. It means that their strategies for stakeholder relations are based on fundamental systemic aspects related to the communication process and can be analyzed based on quantitative research [15].

Table 2. Typologies of social responsibility communication strategies.

Author	Type of Social Responsibility Communication Strategy	Differentiator
Wagner (2009)	Proactive Reactive	Posts' frequency, financial expenditure on CSR communication
Drumwright (1996)	Economic Non-economic Mixed	Objective and content of a communication
Kim at al. (2014)	Corporate ability Corporate social responsibility Hybrid	Objective and content of a communication
Morsing and Schultz (2006)	Information Asymmetric communication Stakeholder engagement	Stakeholders engagement
Colleoni (2013)	Internal Dialogue	Stakeholders engagement

Source: own study based on Wagner [42]; Drumwright [43]; Kim et al. [36]; Morsing and Schultz [29]; Colleoni [28].

3. Methodology

The rationale for undertaking the pilot studies was the small number of research works devoted to communicating the Sustainable Development Goals in social media. The four largest ICT companies, The Big ICT Four, were selected for the study—Amazon, Apple, Google, Facebook. These companies, as leading ICT companies, have a significant impact on both the global economy and the daily lives of individuals. The Big ICT Four's impact on the environment is also significant, including through the production of new product models, the volume of data transmission, the cost of maintaining a server room or disposing of used equipment. The involvement of ICT companies in communicating the activities undertaken for Sustainable Development and promoting the SDGs to stakeholders is one of the many opportunities to get involved in the implementation of the Agenda 2030 that emerges for the most significant ICT organizations.

Taking the above into account, it seems crucial to research the communication of Sustainable Development and promotion of the SDGs by ICT companies.

An analysis of the literature shows that the research conducted so far on Sustainable Development communication and activities undertaken by enterprises in this field has focused on the analysis of information contained in companies' websites or non-financial reports [46]. Non-financial reporting arouses great interest among researchers of Sustainable Development and corporate responsibility communication, among other things, due to the significant amount of information that is available online and does not require the company's consent to access it while ensuring source reliability [46]. The disadvantage of reports as a communication tool, as well as websites, is the unilateral nature of communication. Companies through reports and company websites can inform about actions taken in the implementation of the SDGs. They can also promote the idea of Sustainable Development and the goals. Such tools, however, make it impossible for the public to get involved in the discussion about Sustainable Development and the actions taken by companies. Communication through non-financial reports and websites only serves as an advocacy function to inform the public and raise their awareness of the SDGs. Companies, as business organizations working with many stakeholder groups, should implement communication for development in the form of a two-way communication process involving sender and recipient and enabling the exchange of opinions and experiences. Such tasks can be carried out by companies using social media in the communication process to make the sender's and recipient's response possible in real-time. Communicating with social media can reach a wide range of recipients; therefore, the research on Sustainable Development communication of selected ICT

companies was conducted by the authors using established companies' Facebook and Twitter accounts. The research was conducted to find answers to the following research questions:

Q1: Do the surveyed companies communicate about the SDGs?
Q2: Do the surveyed companies use social media to communicate about the SDGs?
Q3: What types of strategies did the companies adopt in communicating through social media?

In order to answer the research questions and identify the social media communication strategy implemented by the surveyed companies, a text corpus consisting of 1400 entries (posts and tweets) on the official company Facebook and Twitter accounts was collected for analysis. The corpus was created based on the entries posted in the accounts in the period from 1 January to 31 December 2019. Then the content of the collected entries was analyzed according to the coding procedure adopted by authors. From the text corpus, entries concerning sustainable development and the SDGs were separated. When analyzing the content of the entries, coding tags were indicated, which define the thematic areas related to particular SDGs. The entries have been grouped according to the separated SDGs. The list of subject areas and coding tags is presented in Table 3. Each company can carry out SGDs-related activities in different areas and various topics related to SGDs also can be communicated through social media. Table 3 describes those areas of the SDGs in which the company took action in 2019 and about which it communicated through social media.

Table 3. Subjects of entries concerning Sustainable Development Goals (SDGs) in the surveyed companies' social media.

Company	SDGs in Social Media Entries
Amazon	1 No poverty 3 Good health and well-being 4 Quality education 11 Sustainable cities and communities 15 Life on land 16 Peace, justice and strong institutions 17 Partnerships for the Goals
Facebook	3 Good health and well-being 4 Quality education 5 Gender equality 10 Reduced inequalities 16 Peace, justice and strong institutions
Google	1 No poverty 2 Zero hunger 3 Good health and well-being 4 Quality education 5 Gender equality 7 Affordable and clean energy 10 Reduced inequalities 13 Climate action 15 Life on land 16 Peace, justice and strong institutions 17 Partnerships for the Goals

The theoretical basis of the research process was the typology of social media communication adopted by Kim and Rader [47], distinguishing three types of strategies—Corporate Ability strategy (CA), Corporate Social Responsibility strategy (CSR) and hybrid strategy. The Corporate Ability strategy is characterize by the fact that the number of posts on products and services offered by the company outweighs the number of posts on topics related to corporate responsibility and involvement in Sustainable Development. When we have opposite situation we talk about Corporate Social responsibility strategy. The hybrid strategy combines both approaches to communication.

Based on the collected quantitative data (total number of entries and the number of entries concerning Sustainable Development and SDGs), the type of social media communication strategy implemented by companies was defined.

4. Results and Discussion

The analysis of the content of 1400 posts posted on company social media accounts on Twitter and Facebook showed that the surveyed companies prefer the Corporate Ability communication strategy. The number of posts on products and services offered by the company outweighs the number of posts on topics related to corporate responsibility and involvement in Sustainable Development. For Google, Facebook and Amazon, the percentage of posts on topics and activities related to Sustainable Development was between 7% and 17% of the total number of posts made by the companies in the period from 1 January to 31 December 2019 (Table 4).

Table 4. Results of social media messages' analysis.

Company	Communication Tool	The Total Number of Posts	The Percentage of Posts Related to Sustainable Development
Amazon	Twitter	212	13
	Facebook	152	11
Facebook	Twitter @Facebook Newsroom	168	60
	Facebook	47	17
Google	Twitter	660	13
	Facebook	174	7

Apple did not communicate with stakeholders on Sustainable Development-related topics through official social media accounts (Facebook and Twitter); there was no record of such communication during the audited period. Facebook, on its official company account Twitter also did not carry out communication activities in 2019 but reported on the activities undertaken in the context of corporate responsibility and Sustainable Development through the company newsroom account (@Facebook Newsroom). In this case, the 60% percentage leads to the conclusion that the company is adopting a hybrid strategy (concerning recipients of the @Facebook Newsroom account on Twitter). In contrast, the company's Facebook account is operated according to the CA strategy, where the number of entries concerning the products and services offered by the company prevails.

In 2010, Kim and Rader [47] analyzed the content of Fortune 100 companies' websites. The results of the analysis showed that the highest-ranked companies implemented the CSR communication strategy. At the same time, the organizations placed on the last positions of the list preferred the Corporate Ability communication strategy. In a study of communication strategy conducted four years later [35] on the official Facebook accounts of Fortune 100 companies, it was shown that 89% of the companies applied the Corporate Ability strategy and only 9% of the studied cases were implemented CSR communication strategy. The remaining enterprises applied a hybrid strategy using the above mentioned two strategies in the same dimension. It can be concluded that enterprises put more emphasis on communicating their pro-environmental and pro-social activities through websites than through social media. At the same time, social media are a tool for creating the image of the organization as an expert in the industry and market leader.

Similar conclusions are drawn from the analysis of the content of the Big ICT Four's websites and the reports, where organizations provide extensive information on their social and environmental activities and participation in partnerships for sustainable development (e.g., Google's partnership with The UN Environment Programme or Facebook's participation in the Global Partnership for Sustainable Development Data). However, this information does not appear in the social media used

by companies. None of the entries analyzed for twelve months have included the concept of the Sustainable Development Goals.

The results of the research show that enterprises prefer CSR strategy in communication through unilateral communication tools, such as websites and non-financial reports. In communicating through social media, that is, two-way communication tools enabling the exchange of opinions and experiences, the surveyed enterprises apply the Corporate Ability strategy and the majority of the messages posted are aimed at promoting products and services.

5. Conclusions

Research on non-financial communication strategies of enterprises has been conducted in recent years, mainly in the area of corporate social responsibility and sustainable development understood in an environmental context. Communication about the SDGs has not been the subject of research, probably due to the short period that has passed since the objectives were officially announced (2015). A small amount of literature related to the topic of SDGs communication was a limitation in conducting literature research.

The article discusses the subject of communicating the SDGs on the example of social media analysis of the four most significant companies in the ICT industry. The results of the research show that although companies engage in activities for the implementation of the Sustainable Development Goals and report on their activities on company websites and in non-financial reports, they do not use social media to communicate about Sustainable Development and SDGs. It seems reasonable to expect companies with such a wide range of impact as The Big ICT Four to promote the idea of Sustainable Development and actions taken to achieve the goals with the use of tools with the highest possible impact, such as social media.

On account of the above-mentioned results, it can be concluded that future research should concern the identification of barriers, which cause that ICT companies do not communicate directly about joining the implementation of the SDGs and do not adopt a CSR strategy in communicating with stakeholders in social media. It is also worthwhile to conduct research on communication about SDGs in other industries in the future [48,49].

The conducted research was only a pilot study and the subjects of the study were the four largest enterprises, which does not give grounds to extend the conclusions to the whole population of the ICT industry. As the ICT industry is one of the fastest-growing industries in the global economy and has a significant impact on society and the environment, it is worthwhile to broaden future research to include more enterprises so that the statistical surveys allow for a generalization of conclusions. The answer to this question may serve as a basis for another research issue, which will be to define the determinants of communication about the SDGs and key factors influencing the effectiveness of the adopted communication strategy.

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information

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Article

The Importance of Trust in Knowledge Sharing and the Efficiency of Doing Business on the Example of Tourism

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Abstract: The ability to share knowledge in an organization may determine its success. Knowledge is one of the basic resources of an enterprise, being also the basis for undertaking various types of strategic actions. Knowledge management should be focused in the organization on such processing of all available information to lead to the creation of value defined by employees of the organization and by customers. In order to raise the issue of knowledge sharing, trust should be mentioned. Trust is a factor conditioning effective atmosphere and cooperation in an organization. The main purpose of the article is to present the relationship between trust and knowledge sharing, taking into account the importance of this issue in the efficiency of doing business. To formulate conclusions, data from surveys carried out in 148 different tourist facilities were used. Data were collected by applying the diagnostic survey method and by using a survey technique based on a prepared questionnaire. The results showed that trust is important in sharing knowledge and was found to play an important role in achieving a high level of performance efficiency. The study consists of an introduction, literature review, research results and discussion of results. At the end of the article, conclusions, restrictions and recommendations for future research are presented.

Keywords: trust; knowledge; efficiency; tourism; knowledge sharing

1. Introduction

Nowadays, in a knowledge-based economy, trust is becoming more and more important, treated as an extremely valuable element in company management. It influences interpersonal relations and causes that the employee has a greater willingness and awareness to control their own actions objectively. Knowledge that is a strategic resource can contribute to gaining a competitive advantage of an enterprise on the market. Transfer and exchange of knowledge is an essential basis for creating new ideas and developing new opportunities [1]. The most important aspect related to knowledge management is the need to share it and this applies to all employees of the enterprise. Knowledge is social in nature, in the sense that it arises from the process of continuous communication between people. Encouraging people to share knowledge rather than passively accumulate it is considered the first step towards effective, pro-development management in a modern enterprise. It is difficult to talk about knowledge if one does not take into account cooperation between people and the existence of conditions for cooperation [2]. According to Handy [3], trust is one of the life bases of every organization. He distinguished seven principles that are to govern trust in the enterprises of the future: trust cannot be blind, it must have boundaries, it requires learning, it is absolute, it requires bonds, requires personal contacts, requires leaders. Research on sharing knowledge somewhat narrows this

issue either for analysis based on a specific industry or it focuses on certain aspects [4,5]. Knowledge sharing is a multi-level analysis model [6] and is considered important for the functioning of an organization [7]. It should be noted that scientists and practice are increasingly dealing with the issue of trust. This may be due to interest in soft management issues or the spread of cynical attitudes among employees. The trust used in the organization in the aspect of knowledge sharing can lead to good cooperation between colleagues, between subordinates and managers, which may further increase the efficiency of doing business. Among the tasks belonging to the process of sharing knowledge and disseminating it, we can distinguish three categories [8]:

- Knowledge duplication is a form of central control of the knowledge dissemination process. The purpose of this is to quickly provide knowledge to many employees. These resources should be distributed immediately and permanently so that users have access to them. Knowledge duplication concerns two important areas, which are the implementation of employees in organizational culture and their training. In the first case, it is about familiarizing employees with applicable norms and values, informing them about the role they will play in the organization and the requirements they will face, and in the second, about their professional development.
- Sharing experiences from previously implemented projects and documenting them. The tools supporting this process are IT networks (Internet, intranet, extranet), teamwork software or expert systems.
- Exchange of current experience, leading to the development of knowledge. The exchange of experience is possible thanks to the use of benchmarking teams (which look for the best solutions outside the company, their task is also to support the transfer of the best solutions created within the company, with particular emphasis on improvements in key processes in the organization), teams for the best solutions (informal exchange of information between employees with the possibility of using information and telecommunications technologies).

There is explicit and implicit knowledge in every organization. Trust plays a very important role in the process of obtaining tacit knowledge. This is intuitive knowledge, related to the experience of employees, and very often determines the functioning and success of an organization. The quiet-wise exchange is fostered by results-based trust and cognitive trust [9].

Trust always has a positive impact on the functioning of an organization. Knowledge transfer and exchange is a proven way to build trust in groups that enable shared learning. The process of building trust largely depends on the quality of knowledge and the pace at which knowledge is exchanged [10]. Trust depends on risk, is related to the dependence of two people, trust is accompanied by vulnerability, it is related to expectations about the future [11]. In addition, trust influences the organization's coordination, triggers creative thinking, encourages participation in transactions, promotes exchange of information, increases the company's ability to survive a crisis, is a key factor in building a network of cooperation and social cohesion and enables the creation of civic culture. It is an important element in teamwork, developing interpersonal relations, leadership, setting goals and negotiations [10,11]. Finally, trust is the main organizational value, achievement of which requires strong ethical attitudes, and in practical management of determining operational values. This value affects economic results and should be the subject of lasting desires and actions. It is a conviction that the undertaken actions will lead to achieving the set goals and obtaining benefits for all stakeholders [11].

The purpose of the article is to present the relationship between trust and knowledge sharing, taking into account the importance of this issue in the efficiency of doing business.

2. Literature Review

In the literature on the subject, it is believed that knowledge sharing is most positively related to knowledge management in organizations [3,12,13]. According to Paliszkiewicz [14], the objectives of knowledge management are as follows:

- increasing the results of business operations;

- achieving the company's goals;
- overall company development;
- increasing employee motivation to improve company performance;
- maximum use of intellectual capital;
- development of learning organization, attitude of constant increase in the use of knowledge;
- supporting creativity, intuition and intelligence of employees;
- emphasis on continuous development and education of employees;
- making faster and wise decisions;
- creating an organizational culture supporting the development of knowledge.

From the definition perspective, knowledge sharing is the exchange of knowledge, experience and skills throughout the organization [15], it is a mutual transfer, i.e., the exchange of knowledge, understood as all information, abilities, skills and experiences relevant from the organization's point of view. The goal of this process is to transform the individual knowledge of each participant in the process into organizational knowledge [16]. Knowledge sharing is a centrally managed process of knowledge dissemination within a specific group of employees or knowledge transfer between individuals or teams of employees [16]. Knowledge transfer is the acquisition of knowledge from a database or the right source and its transfer to the recipient and its proper assimilation and use. G. von Krogh, I. Nonaka and M. Aben [17] indicate three conditions that are necessary for successful knowledge transfer:

- knowledge transfer participants must be aware of the circumstances in which they exchange knowledge,
- while waiting for the transfer of knowledge, its profitability must be studied,
- they must be properly motivated to carry out knowledge transfer.

E.K. Sveiby presents nine basic streams of knowledge flow in the organization [18]. In the internal communication these are the following transfers of knowledge:

- between units/employees;
- from employees to the internal structure;
- from the internal structure to the individual competences;
- within the internal structure (construction of integrated IT systems).

In the organization's communication with the environment, the streams of knowledge flow relate to the following transfer:

- from outside employees;
- from the environment to employees;
- from the environment to the internal structure;
- from the internal structure to the external structure (e.g., customer database);
- between organizations from the environment with which the company cooperates (e.g., how to make our clients contact each other).

Each time all activities related to the flow of knowledge are aimed at achieving greater efficiency.

Trust is undoubtedly of great importance in the process of sharing knowledge. The specificity of the issue of trust concerns various scientific disciplines: management, psychology, sociology, economics and philosophy. Trust, in general, is a kind of assumption relating to the future behavior of other people, including certain assumptions that determine the further behavior of the individual [19].

Trust can also be defined as a subjective prediction of the level of probability of the attitude of the other party, determining the undertaking of specific actions by an individual or a group. This means that trust refers to a situation where the likelihood of the other party taking specific actions is so high that the individual or group decides to cooperate [20].

Organizational trust is a mechanism based on the assumption that other members of a given community are characterized by honest and cooperative behavior based on shared standards [21]. It can also be stated that trust is a certain belief based on which individual A in a particular situation agrees to dependence on individual B (person, entity, organization) with a sense of relative security, although negative consequences are possible [22]. Trust in the organization shown to other employees is based on the principle of reciprocity, according to which something should be done for a colleague, without expecting immediate compensation, but hoping that in the future this or that colleague will do a favor [23]. The trust that occurs in an organization is very often associated with the issue of organizational culture and the appropriate organizational climate [2,24]. It is important that the work atmosphere is favorable to cooperation and creative action. There are several factors expressing the phenomenon of trust [24]: instinctive feeling, person A will not act against person B, honesty and justice, positive expectation, positive interpersonal relationships, credibility, good will and finally effective action. According to Paliszkiewicz [25], trust in an organization has an impact on many factors, including motivation, training and development processes, which may further contribute to achieving higher operational efficiency.

Building trust in an organization is a long-term process and depends on many factors: organizational culture or broadly understood human resources policy applied to employees. In a situation where employees are convinced that the organization is properly fulfilling its goals and mission and treating employees correctly, then their credibility will continue to grow. They will represent an attitude open to change and innovation, which will contribute to the significant development of the company. Knowledge management is the awareness that sharing knowledge and its wise use is effective in the development of a company and employees cooperating with each other get better results. A knowledge-based economy is the most effective way of managing. The issue of knowledge sharing is not without significance here and is affected by [26,27]:

- factors depending on the organization (integration of the idea of haring knowledge with business strategy, organizational culture, teamwork support, direct management support and the example set by the leaders at the top, providing time and creating opportunities to transfer knowledge, atmosphere, work environment, lack of employee's fear of career development or loss of position, appreciating and rewarding behaviors related to knowledge sharing, communication system efficiency, availability and quality of information technology, company size, industry and organizational structure);
- interpersonal factors (interpersonal relationships, reciprocity, commitment, trust in the proper use of knowledge, identification with specific behavior, avoidance of embarrassment, sense of belonging to a group or team, seeking of community and cooperation);
- individual factors (greed, willingness to profit, fear of punishment, self-esteem, personality traits such as optimism, self-confidence, altruism, openness to experience, costs and time to acquire knowledge, age, gender, education, family status, work experience, work position);
- factors depending on knowledge (type of knowledge determining the possibilities and time of its transfer).

There is explicit and implicit knowledge in the organization. Trust plays a very important role in the process of obtaining tacit knowledge. This is intuitive knowledge, related to the experience of employees and very often determines the functioning and success of an organization. As Holste, Fields [9], Levin, Cross [28] wrote, the sharing of silent knowledge is fostered by results-based trust and cognitive trust, while competence and confidence trust favors the reception and its transfer.

Trust will always have a positive impact on the functioning of the organization. Thanks to this, it is possible to exchange knowledge in the organization and jointly build the culture of the learning organization, and this in turn can translate to the organization's successes.

In the following, the concept of efficiency and economic effectiveness will be presented.

There is strong competition in the modern market economy. Entity owners, including those from the tourism industry, must compete with each other. In addition to various aspects of competitiveness like, among others, location, tourist attractions, quality of services, etc., the economic efficiency of the project is also important. An entrepreneur in a market economy acts both as a buyer of necessary production factors and a seller of manufactured products or services. The manufacturing process and the technologies used to achieve economic benefits from the activities undertaken depend on the information held and his decisions. The concept of efficiency is ambiguous and interpreted differently. As E. Skrzypek points out, "it is defined by terms such as operational capability, positive result, profitability, productivity, effectiveness, purposefulness, rationality, cost effectiveness or utility" [29]. It refers to the relationship between various "effects, objectives, inputs and costs" [29] in different perspectives. This concept works in social sciences, is theoretically recognized by economists, sociologists, financiers, management specialists but also used in practice by economic analysts, company managers, etc. Juchniewicz indicates that the concept of efficiency refers to the economy as well as to business activities, that is to the functioning of enterprises, processes, management, decision making, management and finance or investment. The concept of efficiency comes from English and means effective, efficient, real [30]. In a broader sense, it means the benefits achieved by a given country, economy, enterprise from conducted activity [31]. In the literature, the concept of economic efficiency can be often found and it means "action without waste and focused on achieving the best result within the available resources and technologies [32]". Samuelson and Nordhaus point out that efficiency means there is no waste. They refer to the production capacity curve, indicating that an efficient economy is on the edge of production capacity [33]. This concept is also equated with allocation efficiency (also called Paret efficiency) meaning reaching the limit of possible utilities [33]. "Efficiency is a process in which society extracts maximum satisfaction from consumers using the available means" [34]. Economic efficiency can be considered in a narrow and broad sense. In a narrow sense, it is understood as the ratio between the value of expenditure incurred and the value of effects obtained thanks to it, that is, as the ratio between the amount of expenditure of used materials and the quantity of goods produced [35]. In a broad sense, it means the best results in the production or distribution of goods and services at the lowest costs [35]. It is through the prism of economic efficiency that the competitive possibilities of business ventures are determined. M. Szudy indicates that economic efficiency is one of the conditions for achieving economic success at the level of the entire economy as well as at the level of individual entities [36]. Economists consider efficiency in the context of the functioning of business entities in short and long periods, as well as on a micro- and macroeconomic scale. The microeconomic approach refers to the enterprise—it is a real ability to improve market position and achieved results [29]. According to Bojarski, macroeconomic efficiency consists in taking into account all direct and indirect effects of a given undertaking in the national socio-economic system and selecting this undertaking which is the most beneficial from the point of view of economic efficiency for the entire economy [37]. Szudy indicates that the effective functioning of the economy requires efficiency in three dimensions: static, dynamic and distribution. Static efficiency is identified with the management of specific resources in order to avoid waste, dynamic efficiency is associated with the process of increasing resources, assets through creativity and action despite the risk, and distribution efficiency relates to the recognition by society of a fair distribution of social product [38]. The efficient use of economic resources takes place in accordance with the principle of rational management. Efficiency in managing is one of the ways to assess the functioning of a household, enterprise, defined as the relation of effects to the means used [29]. The concept of efficiency is related to the functioning of the organization. It is often defined as the organization's ability to achieve its goals and strategies. One can distinguish organizational effectiveness and management effectiveness. Efficiency is therefore an important tool for measuring management effectiveness. The efficiency of an organization means its effectiveness and productiveness measured by the degree of achievement of relevant goals. According to Drucker, effectiveness is the degree of goal achievement [39]. Management effectiveness is a measure of the efficiency of the person in charge, his predispositions, it means also

creativity in the formulation and achievement of goals set. Drucker points out that effectiveness is "a key element in human and organizational development that serves the self-realization and ability of modern society to survive" [39]. According to Lawlenss, the effectiveness of an organization, that is its efficiency, depends on the following variables: performance, morale (the degree to which members' needs are met), adaptability, flexibility, institutionalization and stability [40].

Various types of efficiency can be distinguished in the literature. J. Dąbrowski distinguishes three types of economic efficiency: technical, economic and social. Technical management efficiency refers to "the properties of things used in the manufacturing process, indicating the relationship of benefits obtained (e.g., the number of operations performed) to expenditure, e.g., (energy consumption, time needed). In a broader sense (...) it applies to the entire production process (technics, technology, work organization) and indicates the relation of the amount of product produced to the factors of production involved" [41]. This efficiency is expressed in natural units and plays an important role in determining the other types of efficiency. The economic efficiency of management indicates that it can be analyzed in relation to the technical and economic and socio-economic aspects. This term is defined as the relation of obtained effects to incurred outlays taking into account prices of production factors [41]. Efficiency in a technical and economic context is expressed in cost intensiveness, outlay efficiency, productivity or profitability. It defines the relationship between the resources used and the utility values produced [42]. The analysis of economic efficiency in the social–economic context additionally takes into account the property rights to resources [41]. The third type of economic efficiency relates to social issues. In the efficiency analyzes, social effects of management are compared with the fulfillment of society's expectations. In a broader sense, it is associated with the management process, i.e., management rationality related to the well-being of the whole society. Pszczołowski after Kotarbiński also distinguishes three meanings of efficiency: objective (dealing with the development of science), economic and technical and social, understood as the relationship between inputs and the effects of these inputs manifested in the sphere of norms and values, society and ecology [43].

The literature on the subject analyzes the efficiency of business activities from various perspectives, it may relate to the efficiency of production or the efficiency of the organization. "A comprehensive approach to efficiency should include an assessment of: social purposefulness of operations, economic rationality of organizational processes and financial efficiency of management" [44].

It is also worth paying attention to the dimensions of efficiency. There are many dimensions of effectiveness in the literature—Martyniak, Bielski, Matwiejczuk, Pohl, Skrzypek, and Łoś wrote about it. The most common dimensions are as follows [45]:

- economic—in the context of economy, productivity, profitability,
- market—referring to the degree of satisfying the client's needs as well as in relation to the efficiency category in the strictly market and market economy dimension,
- system—indicating the state of the enterprise as a system,
- political—indicating the company's relations with the environment,
- cultural—refers to the cultural identity of society and the consolidation of values and norms by the organization,
- social—referring to the interests of employees and business owners in terms of social needs and roles,
- ecological—indicating the company's impact on the environment,
- financial—referring to financial indicators in the past,
- operational—referring to the productivity of manufacturing processes,
- behavioral—expressing the interests of organization participants, indicating their assessment,
- technological—related to the technological efficiency of the factors of production involved,
- developmental—referring to creating new products, acquiring new skills.

From the tourism perspective, the efficiency of a tourist enterprise's activities can be analyzed on an economic, social and ecological level, and broadly covers most of the dimensions mentioned.

In the next part of the study we will also discuss the issue of efficiency measures.

Contemporary business entities conduct management efficiency analyzes on an ongoing basis, using various sets of measures. However, this measurement is often difficult, as Głodziński indicates, it may result from [46]:

- "Quantitative immeasurability of some (partial) effects/outlays,
- immeasurability of value of some (partial) effects/outlays imperfections of measuring tools,
- simultaneous use of the same outlays to obtain different, separately analyzed effects in the absence of an exact division possibility,
- the lack of a direct cause-effect relationship between effects and expenditures, while the presence of an indirect relationship (often only of an intuitive nature),
- lack of comparability between inputs and results as a result of their presentation using various measurement units".

One of the concepts of efficiency analysis is a multidimensional approach. Especially this type of approach, where "the assessment takes into account different aspects and different points of view" [47] is important in assessing service activities, including in the tourism industry. The multidimensional approach in the analysis of economic efficiency has been the subject of many studies [48,49].

Głodziński presents the procedure for transforming various categories of efficiency into economic efficiency, indicating that it requires the application of a specific standardization procedure. "For normalization to be possible, the impact of effects and production factors on the economic situation of the object (...) should be measurable. This means that the results and outlays identified must be quantified (quantitative measurability) and then valued (measurability of value)" [46].

The quantification of results and outlays takes place by determining the quantitative outlays for financial efficiency-financial aspects, for organizational effectiveness of organizational aspects, for technical efficiency of technical aspects, for social efficiency of social aspects for environmental performance of environmental aspects, and similarly for marketing and legal effectiveness of these aspects and evaluation of individual results and outlays in terms of value in monetary terms 1 [46].

Łoś A. proposed a model for measuring efficiency in a tourist enterprise, pointing to the mutual relations between three approaches to efficiency, in relation to the Kaplan and Norton concept [50]. He takes into account efficiency from a narrow perspective from an enterprise point of view and efficiency from a broad perspective from an economic and social point of view. It emphasizes important features that distinguish tourism, i.e., immateriality, incompatibility, as well as the special conditions of the business and services provided, which include seasonality as well as the rigidity of supply and the specificity of individual types of tourist services, e.g., catering, spa, hotel, etc. The proposed model covers three areas: dimension, main groups of criteria and detailed groups of criteria.

The proposed model includes three planes: dimension, main groups of criteria and detailed groups of criteria. The efficiency perspective has been divided into three zones I, II and III. The model includes, in zone I, dimension A divided into A1 and A2, in zone II, dimension A and dimension B divided into B1, B2, B3 and B4. Zone III contains next to A and B the dimension C divided into C1, C2 and C3. Zone I covers the economic and financial dimension—covering two efficiency criteria—A1 profitability of services and A2 service productivity and efficiency. The profitability of services in the case of hotels or tourist facilities can be measured by: ROA total assets return on investment, ROE equity return ratio, ROI return on investment, RevPar room revenue or GOPRAR gross operating profit per room. In the model of hotel efficiency evaluation as detailed measures of service productivity and efficiency (A2), the following were proposed: the indicator of the technical utilization of the facility, the indicator of the average number of nights spent and the indicator of the seasonal use of the accommodation facility. The main efficiency criteria for the organizational and market dimension, B, include:

B1—achievement of objectives, where the detailed measure of effectiveness for the hotel was the degree of achievement of the objective in relation to the expenditure on the purchase of the automatic reservation system (cost reduction by 10%),

B2—innovation, where the measure was proposed as detailed measure indicator of the number of introduced marketing innovations in relation to the expenditure on training in the Marketing and Advertising Department,

B3—market and economic value of the enterprise, assessed by means of the hotel's market share in relation to marketing costs and by the indicator of Customer Lifetime Value CLV, being a key element to its retention costs.

B4—the value for the customer, where the measure is the value of the benefits obtained by the customer in relation to the price paid by him. The socio-economic (C) dimension consists of the impact on the natural environment—C1, impact on the local community—C2 and impact on the local economy—C3. In the case of hotels, it is specified in the model that the measure of effectiveness is the Benefits/Cost B/C ratio, where the measurement is carried out in units of monetary benefits and external costs in particular planes. Effective solutions occur when B > C2 [51].

3. Materials and Methods

In relation to the considerations made in this article, research was carried out on the issue of the importance of trust in knowledge sharing, including a reference to efficiency. The conducted research concerned the tourism industry. The survey covered 148 employees representing various types of tourism companies. The research was conducted at the turn of 2019/2020. The diagnostic survey method was used, using a questionnaire that included several parts:

- the first part included questions about trust;
- the second part covered the importance of trust in knowledge sharing;
- the third part was about the importance of trust in knowledge sharing regarding efficiency;
- the fourth part concerned information on the subject.

The survey was anonymous. Data collected during the research were presented graphically and in tabular form. The study involved 99 women (67%) and 49 men (33%). Most people are people up to 45 years of age with higher education. Most of the respondents were representatives of micro-enterprises (36%), small enterprises (59%) and medium-sized enterprises (5%). All companies whose employees took part in the survey have been on the market for 2–5 years. The main purpose of the elaboration was to collect information in surveys from people who, working in a given organization for several years, could significantly convey their observations on the examined issue. Therefore, employees who worked in organizations operating on the market for a minimum of 2–5 years were taken into account. This period was considered sufficient to make observations and indicate relevant elements that were significant for the study. The research was carried out as a pilot study to identify the issue and to become well prepared for the actual research.

4. Results

During the research, the respondents were first presented with phrases regarding the perception of trust which allowed them to present their opinions on the meaning of this concept (Figure 1). The survey questionnaire used the approach developed in the literature [52].

As part of the study, the respondents received a spreadsheet in which areas of organizational trust were presented in six blocks:

- organization image: I am proud to be a part of this organization; I feel my position is stable;
- knowledge of the mission, vision and goals of the organization: I know the goals and development directions of the organization; I know the mission of my organization;

- management competencies and attitude: management communicates with employees; information and messages from superiors are precise; the organization uses the knowledge and experience of employees; I feel the support of my superiors;
- employees' competences and attitude: I am a competent employee; I am an involved employee; people in the organization are happy to share their knowledge with colleagues; people in the organization openly admit mistakes if they made them;
- work atmosphere: there is a nice atmosphere at work; there is no lobbying in the organization; I always say what I think openly; employee evaluation is fair; assessment criteria are precise and clearly defined;
- remuneration policy as well as development and promotion opportunities: I am satisfied with the remuneration policy; the organization has a policy of equal opportunities; the organization is involved in employee training and development.

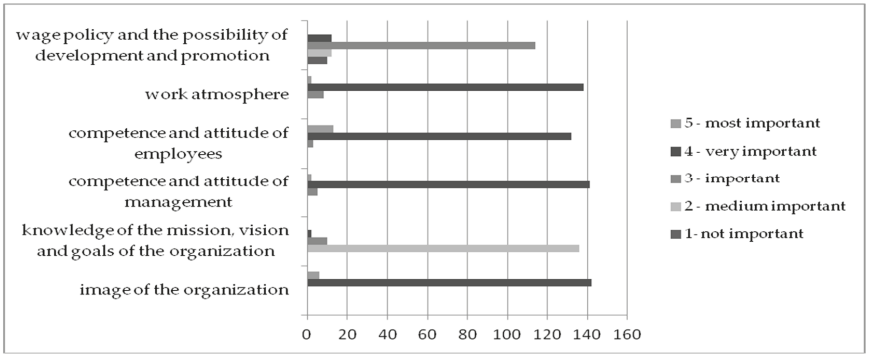

Figure 1. Organizational trust by respondents.

In each of the indicated research areas, they assigned a grade on a scale of 1–5 to each wording, where 1 meant weak significance and 5 important. In the areas of image of the organization, competencies and attitude of management, competences and attitude of employees or the work atmosphere, the most responses (about 90%) indicated a grade 4 on a five-point scale. Slightly less optimistic scoring was received by the remuneration policy statement and the possibility of development and promotion—grade 3 (77%). The weakest score (2) among the respondents was given to the area of knowledge of the organization's mission, vision and goals (96%). The obtained results show that in the surveyed companies employees identify with the organization, they are proud that they work in it, and this is a very positive feeling, especially in the aspect of the process of sharing knowledge. It is also clear that the example "goes from above", i.e., the respondents emphasized the importance of drivers in the process of sharing knowledge. The respondents drew attention to the issues of pay policy in the companies in which they work. This proves that this is a very important element for employees, which if met could contribute to much higher achieved results. An area that raises many doubts is knowledge of the mission, vision and goals of the organization. The results obtained and the low rating confirm the fact that in many companies too little attention is paid to this issue.

For the needs of the study, selected analyzes were prepared with the use of the Statistica program. The scales were summed up and a box chart was prepared in which the data obtained during the research was used. The chart related to the areas of organizational trust in which the respondents used a 5-point Likert scale. The chart specifies the median, the first and third quartiles, and the maximum and minimum values. The box-and-whisker chart gives the opportunity to determine which assessments were usually indicated by the respondents (most often they indicated grade 4) and also, based on the width of the box, the answers diversity can be seen (the largest relates to pay policy as well as development and promotion opportunities) (Figure 2).

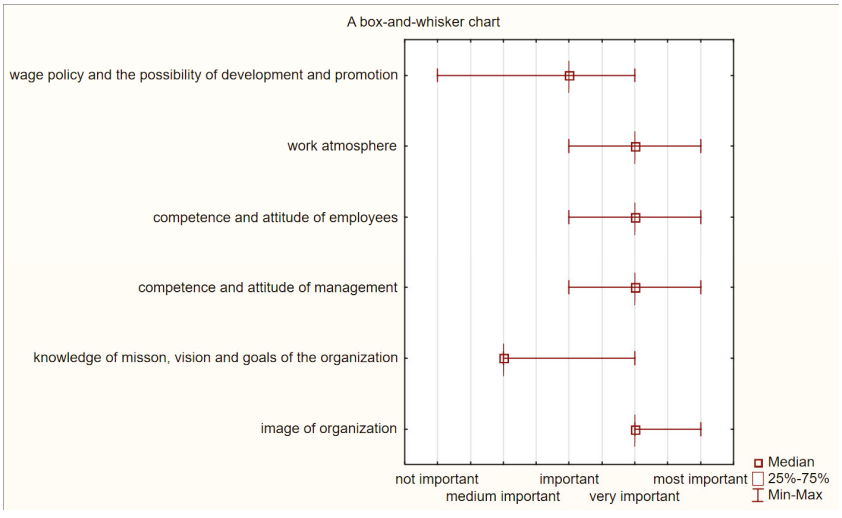

Figure 2. A box-and-whisker chart organizational trust by respondents.

Figure 3 shows how respondents assess the knowledge sharing process. Here, several statements are presented, which in the authors' opinion best reflect the importance of this issue. The obtained answers indicate the diversity of respondents' approach. Most people (95%) said that this is a necessary process in every organization for it to develop and succeed on the market. Approximately (91%) indicated that this is a process in which management's example plays a very important role. This means that respondents see a significant role of superiors in this process. For the respondents it was also important that in order to increase the willingness to share knowledge among employees, one should pay attention to additional remuneration that could improve employee satisfaction. A contented employee will work more efficiently what will also translate into better results achieved by the organization. The surveyed employees from the tourism industry also pointed out that in the area of knowledge sharing it is important to share it skillfully, what means that not every employee can do it.

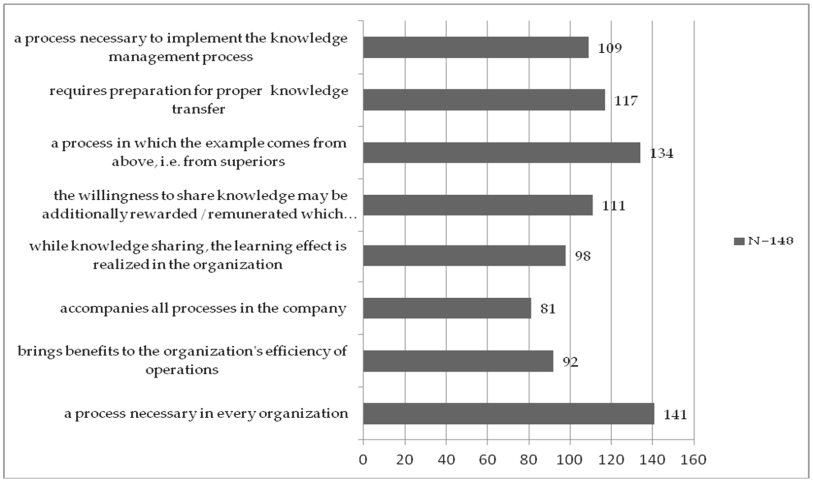

Figure 3. Knowledge sharing according to respondents. * respondents had the opportunity to indicate several statements.

The research also used a combination of results on an ordinal scale—the so-called semantic differential, thanks to which it is possible to draw conclusions on which elements men and women pointed out in the analyzed area. The analysis of knowledge sharing shows that women largely paid attention to such factors as preparation (to convey knowledge well), the superior sets an example (an example comes from the top), additional gratification (for willingness to share knowledge). Men indicated: necessity of the process, efficiency of operation (Figure 4).

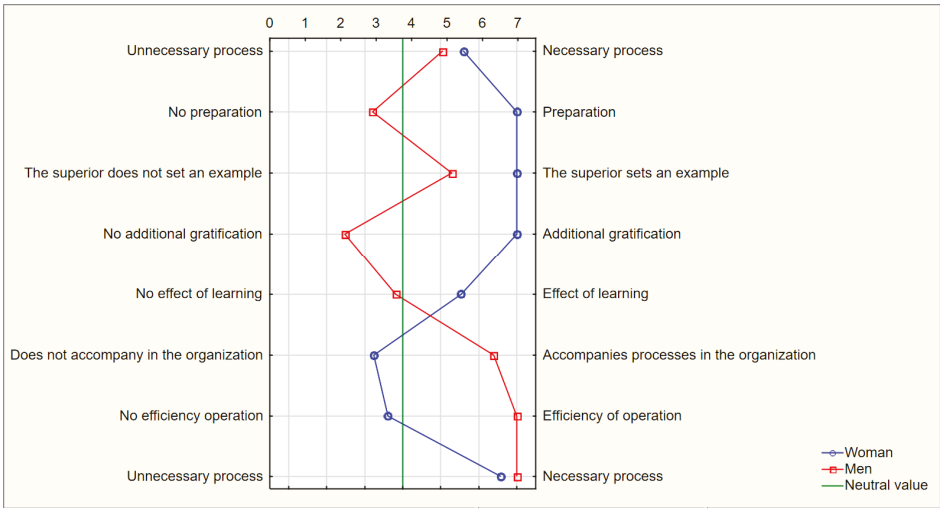

Figure 4. Knowledge sharing according to respondents (men and woman).

Table 1 lists the knowledge sharing barriers identified by the respondents. These barriers were divided according to the literature approach. Among organizational barriers, the lack of a transparent motivating system rewarding knowledge sharing (68%) comes first, the less-important but also visible ones include 'outdated' organizational culture (7%), no positive examples from the top of the organizational hierarchy (8%) or lack of indicating appropriate benefits from knowledge sharing (6.8%). As the less important respondents included: organizational hierarchy, lack of appropriate procedures or inadequate work atmosphere. Among individual barriers, the most important turned out to be the difference in the level of knowledge, experience (45%), lack of time (30%), or a sense of danger that sharing knowledge may harm us (9%) or even a personal dislike of others (7%). In the case of technological barriers, most respondents indicated a lack of training in the use of modern technologies in knowledge sharing (89%), or a lack of consistency between expectations and technical capabilities (7%). The question can be asked, how could one organizationally contribute to the removal of these barriers, is it even possible? Further in the research, the respondents were asked such a question. The obtained answers clearly indicate the great importance of financial incentives that would allow company employees to intensify the need for such activities. The surveyed employees of companies from the tourist industry also noted the importance of training in this area.

Another issue that was highlighted in the research concerned organizational support for this process. As many as 112 people said that the management pays great attention to this process. A tendency has been noticed that the smaller the company, the greater the emphasis on knowledge sharing and the indication on the high degree of trust among colleagues. The surveyed employees also noticed that a very important role was played by the work atmosphere, which made employees willing to participate in this process. In the next part of the research, the effects of knowledge sharing at the individual and organization level were highlighted.

Table 1. Barriers to knowledge sharing according to respondents (%).

Organizational Barriers	**N = 148**
No transparent incentive system favoring knowledge sharing	68
"Outdated" organizational culture	7
No positive examples from management	8
No indication of the sharing knowledge benefits	7
Organizational hierarchy	0, 7
No consistency between knowledge sharing and achieving organizational goals	5
No proper procedures	3
Inadequate work atmosphere	1
Individual Barriers	**N = 148**
Age differences	3
Gender differences	2
Cultural differences	2
Differences in knowledge, experience	45
The sense of danger that sharing knowledge can harm us	9
No time	30
Personal dislike of others	7
No language knowledge	1
Technological Barriers	**N = 148**
No training in the use of modern technologies in knowledge sharing	89
No IT support	1
No consistency between expectations and technical capabilities	7
Reluctance to use IT tools in the process of sharing knowledge	3

Table 2 presents the effects of knowledge sharing that are noticed by the respondents. These effects were divided into two areas: individual and organization. In the area of individual's effects, the respondents noted an increase in competences (90%), personal development (82%), loyalty to the company (66%), openness to others (68%) and a sense of importance (82%). Other effects were: loyalty to the company, reduction of stress and proper organization of work. Another area of effects that was examined concerned the organization. At this level, respondents considered the improvement of operational efficiency (93%), company development (93%) and achievement of competitive advantage (93%), as well as increased trust among colleagues (93%) to be the most important. The next recommendations included improvement of work organization or appropriate atmosphere of cooperation. As part of the research, a question was also asked whether, in the opinion of the respondents, trust was an element that helped/facilitated the process of knowledge sharing. Here, the relationship between the age of respondents and the verification of this statement was noticed. People under the age of 35 have stated that trust played a key role in knowledge sharing. The respondents in the range 36–40 no longer fully confirmed this statement. However, those over 40 years of age were very skeptical about trust. The respondents were also asked if they observed that over the last few years the efficiency of the company in which they work increased.

Table 2. Effects of knowledge sharing at the individual and organization level (%).

Areas of Knowledge Sharing	Results	N = 148
Individual	Increase of competence	90
	Personal development	82
	Loyalty to the company	66
	A sense of importance	82
	A proper work organization	47
	Reducing stress	66
	Openness to others	68
Organization	Improving operational efficiency	93
	Company development	93
	Achieving competitive advantage	93
	Improving work organization	70
	Knowledge transfer between different organizational units	75
	Openness to news	7
	Improving cooperation	67
	The right working atmosphere	80
	Increased trust among colleagues	93
	Group integration	53
	Equalizing of differences in knowledge	13

Source: own study * Respondents had the opportunity to choose a maximum of 3 effects in each area.

The next question in the research questionnaire concerned the issue of efficiency. People were asked about how they evaluate defined performance planes in the companies in which they work (the study did not take into account figures related to efficiency, but only the subjective assessment of the respondents). From the tourism perspective, the efficiency of a tourist enterprise can be analyzed on an economic, social and ecological level. For the purposes of the conducted research, a development plane was added to assess the effectiveness at various levels, taking into account the specificity of the tourism industry. Each of the subjects in each of the planes was to assign a grade on a scale of 1 (hardly visible) to 5 (very visible). The results are shown in Table 3.

Table 3. Subjective evaluation of effectiveness at different levels according to the respondents (%).

Specification	N	Assessment of the Importance				
		1	2	3	4	5
Efficiency on an economic level	148	6.1	2.7	4.0	87.2	0
Efficiency on a social level	148	0	5.4	79.1	12.8	2,7
Efficiency at the ecological level	148	0.7	66.2	27.7	4.0	1.4
Efficiency at the development level	148	0	0	5.4	94.6	0

The economic efficiency rating was assessed by the vast majority (87.2%) on grade 4. Only 6.1% of respondents indicated that it is hardly visible. In the social plane, the highest number of respondents (79.1%) gave a grade of 3, no respondent gave the lowest score—1. In the ecological plane, the highest number of respondents indicated the lowest score (66.2%), but the highest score also appeared (5) for 1.4% of respondents. Interesting results were obtained in the development plane. As many as 94.6% of respondents indicated note 4. This shows that in the companies in which they work, a lot of attention is paid to new skills, which in the long run can contribute to increased business efficiency.

The scales were summed up and a box chart was prepared in which the data obtained during the research was used. The chart related to the areas to determine the effectiveness assessment on various levels (economic, social, ecological and developmental). There, the greatest diversity of responses concerns social and ecological levels. The most frequently chosen answers relate to grades 3 and 4. It is worth noting that very few people assigned the lowest grade 1 (Figure 5).

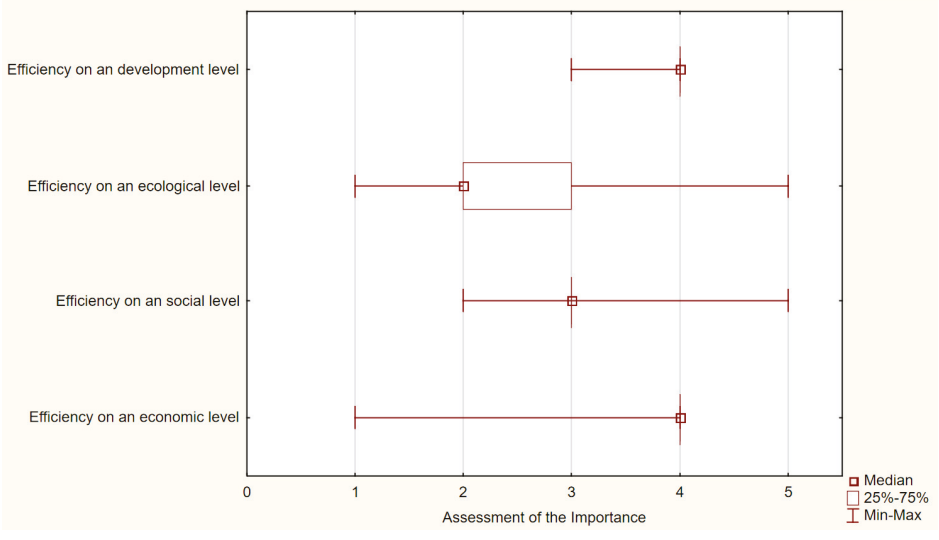

Figure 5. A box-and-whisker chart subjective evaluation of effectiveness at different levels according to the respondents.

5. Discussion

The research represents only a small sample of respondents who have expressed their subjective assessment of the importance of trust in knowledge sharing, taking into account the effectiveness of operations. The analyzed issue is undoubtedly important from the point of view of theoretical and practical considerations. The perception of the process of sharing knowledge also confirms a lot of scientific research. For example, Flaszewska [53] and Ryszko [54], based on the conducted research, stated that the most favorable factors for sharing knowledge could be financial incentives in the form of higher remuneration and additional bonuses, which are not always met in organizations. Paliszkiewicz [2] states that encouraging people to share knowledge is considered to be the first step towards effective, pro-development management in a modern enterprise. If difficulties arise in the area of knowledge sharing, they translate into a reduction in the efficiency, effectiveness and competitiveness of the organization. This statement is confirmed by research conducted in 500 largest American companies, which prove the scale of losses they suffered each year as a result of ineffective knowledge sharing or non-sharing of knowledge. The consequences of this state of affairs were, among others, project delays, professional burnout and waste of resources [55]. Sharing, flow and transfer of knowledge within an organization enables more cost and quality effective tasks to be carried out. It also enables the introduction of new participants to the knowledge exchange network, which is extremely important in the conditions of the information society, including the network [56]. The results have significant management implications. They indicate an important direction that should be strengthened in the use of all available human resource management tools so that, thanks to trust in the knowledge sharing process, the best economic results for the company can be achieved. This concept and its implementation requires an appropriate approach of the management because as the respondents noticed, "the example goes from above". The support of the supervisor and the quality

of communication have a significant impact on the trust of the first-line employee [57]. The importance of trust is also indicated in their research by Jabłoński A., Jabłoński M. [58]. It is worth to use in the organization the incentive possibilities that exist to bring the expected result. The use of motivational tools will contribute to greater confidence, which will facilitate the process of sharing knowledge. Effective motivation will also lead to a favorable atmosphere among colleagues, i.e., it can be considered that in this way it will contribute to the construction of an appropriate organizational culture model, which will provide a positive background for implementing the knowledge sharing process.

6. Conclusions

Nowadays, trust is an important element in the functioning of any organization. It is crucial in building friendly interpersonal relations. Finally, it can be compared to a huge force that affects the efficiency of doing business. Trust causes an increased willingness to act and jointly pursue organizational goals. According to Rudzewicz [59], organizations should influence employee relations and their work satisfaction, what will result in an increased level of effectiveness of the entire organization. Based on the research carried out and the results obtained, it can be concluded that in the group of surveyed employees of organizations from the tourism industry, the knowledge sharing process is recognizable and is considered to occur in every organization. The conducted research is only a certain picture of the phenomenon, which for each organization is of great importance in achieving the desired efficiency of doing business. The greater the awareness of the benefits of sharing knowledge, the greater the guarantee of positive effects. Trust in this case plays a very important role because it determines the satisfactory achievement of results. The management, as can be seen from the conducted research, is also very aware of the importance of the process of sharing knowledge because as stated by the surveyed managers, they set a good example. It should be noted that this may determine the appropriate human resource policy and organizational culture focused on sharing knowledge. The respondents drew attention to many barriers that accompany this issue, thus expressing how much more needs to be done in this regard. There are also expectations in this respect regarding rewards for sharing knowledge or training in the use of various types of tools. The respondents also pointed out the visible effectiveness on various levels: economic, social or developmental. The study allowed for collecting opinions among employees of companies from the tourism industry. The tourism industry is specific when it comes to trust issues. Here, employees very often compete in some way, which may not contribute to a positive attitude towards knowledge sharing. It can be stated that the collected material is the basis for the research tool improvement and gives the prospect of a broader research in this field and industry, which can contribute to formulating a knowledge-sharing strategy in an efficiency-based organization what can lead to better and better results for companies from the tourism industry.

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Article

The Role of Social Media in Generation Y Travel Decision-Making Process (Case Study in Poland)

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Abstract: Technological development at the turn of the 20th and 21st centuries determined the possibilities of communication. Internet access has resulted in the rapid development of social media, bringing together users from around the world. Social media affect all aspects of human life, including leisure and tourism. The article focuses on the element of this influence, namely the selection of tourist destinations made by Generation Y. It presents the influence of social media on consumer choices in tourism and the specificity of tourist products. The main purpose of the study was to indicate the most commonly used social media in the process of selecting a tourist destination and implementing the journey by Generation Y. The analysis of research results shows the important place of social media in the life of Generation Y. They mostly trust materials shared in social media, although they are aware of it coloring reality, and sharing impressions from tourist destinations is per se the purpose of the trip. Facebook, YouTube, and Instagram are the most used social media for Generation Y. It was also important to define the purpose of activity in social media (SM). Studies have shown the emergence of goals not yet declared among young SM users. One of the main goals of a trip is to report and share travel content in social media. The survey method and the analysis of the literature and available reports were used. A diagnostic survey was conducted among Polish SM users, who are considered representatives of Generation Y. The survey was conducted using the CAWI (Computer-Assisted Web Interviews) method. The subject requires further empirical research.

Keywords: social media; Generation Y; Internet; tourist destinations; communication; Polish social media users

1. Introduction

Technological development at the turn of the 20th and 21st centuries opened up new opportunities for communication. It was quickly discovered that the largest invention—the Internet —provides extraordinary socialization opportunities, which resulted in the rapid development of social media), bringing together users from all over the globe. The Internet has transformed into a new sphere of life in which many people try to create themselves again [1].

Social networks are becoming more and more present in our daily lives. According to the Global Web Index, digital consumers spend an average of 2 h per day on social media and messengers [2].

Social media affect all aspects of human life, including leisure and tourism. In 2019, Facebook had over 18 million users in Poland [3] and over 2.5 billion [4] worldwide, which proves the scale of this phenomenon. Data from the report indicate that 2.9 billion people use at least one of the company's core products (Facebook, WhatsApp, Instagram, or Messenger) each month [4]. Users are often unaware of the great impact they have on their decisions. It is all the more important to examine this impact on issues related to tourism and leisure. The article focuses on an element of this influence,

namely the choice of tourist destination by Generation Y (Generation Y, also known as the Millennium generation, is the demographic group that is the successor of Generation X) [5]. In the first part of the article, an analysis of the literature on the subject was made, screening the typology of generations. The features characterizing particular generations were discussed. The importance of social media in searching for information in the process of making decisions on the choice of a tourist destination was also shown. The second part of the article presents the results of surveys. They concerned determining the popularity of social media (SM) among the representatives of Generation Y, indicating how they use SM for obtaining information on the choice of a tourist destination, factors influencing the assessment of the attractiveness of destinations in SM, and reasons for sharing content in SM.

Young people belong to the most active demographic groups in Poland in relation to tourism. This is due to many reasons, including primarily the lack or limited professional and family obligations [6]. The purpose of the article was to indicate the most used social medium in the process of choosing a tourist destination and fulfilling the journey by Generation Y. It was assumed that the most popular social medium for obtaining information on travel destinations in the studied group is Facebook, and the attractiveness of a given destination is assessed on the basis of an opinion in social media. The hypothesis regarding the purpose of the travel was also verified.

Nowadays, the use of devices such as computers, smartphones, and tablets has become commonplace. The generation born after 1980 cannot imagine a world without technical innovations. Social media have become an indicator of their existence. You can risk saying that a person who does not have a Facebook account "does not exist" and is even excluded from social circles. Social media are not limited to the most popular ones such as Facebook or Twitter. They discuss various topics and serve as places for exchanging experiences, opinions about products and services, transferring information from everyday life, holidays, or successes. In many cases, they influence the formation of opinions in the process of making purchasing decisions. For example, those include reviews and opinions posted in social media that affect whether we buy airline tickets to a given destination or go on vacation to the same place as our friends publishing holiday photos. Inspiration can also come from a movie watched on YouTube showing a journey to interesting corners of the world that will contribute to buying airline tickets and going to the presented place. In the article, special attention is paid to the behavior concerning decision making in the tourism industry among representatives of the generation that is characterized by high attachment to social media, namely Generation Y, the so-called Millenials. Despite many social media studies on purchasing decisions in many industries, there is still a need to deepen the knowledge on Generation Y consumer behavior in the tourism industry.

Among others Xiang, Magnini, Fesenmaier (2015) [7], or Dębski, Krawczyk, Dworak (2019) [8] write about the essence of carrying out research in the discussed area. For leisure organizers, tourist offices, etc., it is extremely important to follow the client's needs and the preferred form of communication. In the conducted study, attention was drawn to the need of Generation Y to document almost every aspect of life on the Internet. In subsequent stages of the research, it would be worth defining in detail exact reasons for uploading photos or a video report from a trip to Facebook. Perhaps it is becoming an element of increasing "prestige". Particularly important, not mentioned in previous analyses, is the emerging of the aim of publishing one's trips on social media: sharing impressions from tourist destinations as a goal in itself.

2. Literature Review

2.1. Generation Typology

The Internet has become a source of interpersonal contacts, especially among young users. It revolutionized interpersonal relations, significantly influencing their quality and intensity [9]. In times of dynamic dissemination of information technologies, we are dealing with the so-called digital natives. They often treat real and virtual space as one and identical. This division is to emphasize the way the Internet is used but does not refer to proficiency in using this medium. The conventional

division date is the 1980s. Persons born in this period and later are "digital natives", and those born before this period are "digital immigrants" [10]. Digital immigrants also appear in other studies, among others, Behary (2013) and Ktoridou, Eteokleous (2011). Other authors who also wrote about this phenomenon include Loos (2012) and Marchant, O'Donohoe (2014). However, others have researched digital natives: Cantoni, Rapetti (2015); Joiner et al. (2013); Kir wan, Mc Guckin (2014); Kivunja (2014); Mäntymäki, Riemer (2014); Mitan (2014); Reid, Van Niekerk (2014). For Generation Y, the term "wired generation" also appears in the literature because of the ability to use online tools. They are confronted with the challenge for the information society, which is the dissemination of Web 2.0 websites. [11]. The literature on the subject has several classifications of generation groups. One of the possible classifications was proposed by Lyons, Schweitzer, and Eddy [12] (pp. 8–21):

- the Silent Generation—born in 1922–1944,
- Baby Boomers—born in 1945–1964,
- Generation X—born in 1965–1980,
- Generation Y (the so-called millennials)—born in 1981–1994,
- Generation Z—born after 1995. It also often appears under the name C, meaning "connect, communicate, change".
- The following generations are most often distinguished [13,14]:
- Veterans (Radio Babies, The Silent Generations)—born in 1930–1945,
- Baby Boomers—born in 1946–1969,
- Generations X (Baby Busters)—born in 1970–1979,
- Generation Y (Millennials)—born after 1980.

2.2. Generation Y Characteristics

Those in Generation Y are also called "Millennials", meaning those born in 1980–2000 [15] are described as lazy, selfish, and having unrealistic expectations in relation to work. They are confident and convinced of their own greatness. Their undoubtedly distinctive feature is openness to change and a greater level of optimism in relation to earlier generations. They have the ability to search for information that is directly related to knowledge of new technologies. They also use it to create communities, often communicating with each other. They can perform many tasks at the same time (90% of respondents aged 18–24 believe that listening to an iPod during work increases their efficiency; young people need stimuli in an almost continuous way, e.g., in the form of music that stimulates them at work) [16]. This generation is almost always online. They are active in social media, shop online, and look for information, entertainment, and social relationships online. Polish Millennials can be divided into 2 groups, namely those born between 1980 and 1989 and those born between 1990 and 2000 [Table 1]. The interest in this group is so great because of its huge social and economic potential. The first group had an opportunity to experience the times without the Internet. Together with the younger part, they are a significant group whose purchasing power is constantly increasing. According to the Central Statistical Office, 38,386 million women and men live in Poland [17], of which 28.83% are representatives of Generation Y.

Table 1. The generation defined.

Name of the Generation	Range of Years	Age
Silents	1928–1945	75–92
Boomers	1946–1964	56–74
Generation X	1965–1980	40–55
Millennials/Y	1981–1996	24–39
Generation Z	1997–2012	8–22

Source: https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/.

Millennials certainly have a significant impact on the development of the entire country and all branches of the economy, including tourism.

Generation Y is a decidedly larger part of the population between the age of 19 and 39, and at this point, their behavior is the compass that entrepreneurs must follow if they want to develop and attract their attention.

2.3. Defining the Concept of a Tourist Destination

The concept of a destination is relatively new in the literature. Earlier, it appeared in tourist offers. Is a neologism, translating "tourist destination" from English. It has a geographical dimension and is understood as geographical space [18]. Nowadays, this formulation can be found in many scientific publications, e.g., Majewski (2007), Kruczek (2017), Zmyślony (2003), and Mikos von Rohrscheidt (2009). A tourist destination is a location that meets the unique conditions in terms of tourism and has values that distinguish it from other destinations. Visitors shape a specific image about the destination as well as certain expectations based on previous experiences, heard opinions, advertisements, newspaper articles, and popular beliefs, before visiting a given place [19].

In this study, the definition for a tourism destination was adopted from Goeldner and Ritchie as "a particular geographic region within which the visitor enjoys various types of travel experiences" [20] (p. 466).

2.4. SM in Search for Information in the Process of Making Decision on a Tourist Destination

Online shopping and earlier searching for information are now an inseparable element of the purchasing process. Information disseminated in new media is more visible and noticeable, and thus the effectiveness of reaching recipients increases [21]. Social media significantly support the development of the tourist services market. They have also changed its character. Among the most active tourist groups of consumers there are primarily young users of new media [22]. The use of this communication channel is used at every stage of making purchasing decisions: from shaping needs, searching for information, comparing offers, choosing destinations, to sharing opinions with other social media users [23].

Choosing a tourist destination, making a decision about buying a service, is associated with a high risk of buying a certain 'promise'. Therefore, clients aware and knowledgeable about modern technologies, in which Generation Y certainly can be included before making a decision, seek the opinions of other clients who have already used this type of service, thus reducing the risk of making a mistake. It is worth mentioning that over 95% of tourists use digital resources while traveling. During one trip, the average traveler uses over 19 websites and mobile applications [24]. Statistical data clearly indicate the huge range of social media because the total number of active users of social media in the world in 2019 was as many as 3.484 billion. This represents 45% of the total population and an increase of 280 million compared to the previous year. The largest group of people using social media was men aged 25–34 (19%), constituting 1/5 of all users. Men were also the second largest group—those aged 18–24. The smallest number of users was in the age group over 65 (2% for both sexes) [25].

Since the beginning of the Web 2.0 era, social media have become increasingly important in the decision-making process of choosing a tourist destination and planning a trip [26]. The results of research conducted by BrightLocal in 2018 show that as much as 91% of the US population regularly or occasionally uses reviews, and 84% trust it as well as a personal recommendation [27]. Reviews have a dual use: they provide information about products and services and serve as recommendations [28]. They are a heuristic element of making shopping decisions, which is important regardless of the personal characteristics of the people who write such recommendations [29].

The reviews have, as confirmed by the results of the Local Consumer Review survey conducted in 2019, a huge impact on consumer behavior. Positive reviews encouraged 91% of consumers to take advantage of an offer of the rated company, and 82% of respondents were discouraged by negative

reviews. On average, consumers read 10 reviews before making a purchasing decision. It is important that among consumers, 97% read answers to reviews, which is extremely important from the point of view of companies in the process of building credibility and trust [30]. These results indicate how the popularity and the success of tourist destinations is closely linked to their presence on the Internet [31]. Research conducted by Gupta (2019) indicates an important role of social media in meeting informational needs in the purchasing decision-making process. The author confirms that while there are negative aspects of SM, the benefits outweigh the drawbacks [32].

The greatest value of social media for tourism and tourists is the average rating of facilities and information provided by Internet users, which includes, for example, location, directions how to reach the place, cleanliness, value for money, etc. This information is divided by types of travelers, duration of the visit, and language in which they posted information [33].

Presented by Matikiti-Manyevere and M. Kruger (2019), the results of the study show that Facebook, YouTube, Instagram, and TripAdvisor are the most frequently used sites by tourists in the travel planning process. The growing popularity of Instagram was also noted. For a travel agent, it is essential to understand the behavior of tourists in online environments to create effective marketing strategies in social media [34]. The importance of Facebook and TripAdvisor is emphasized in the research by Jadhav et al. (2018) [35].

Tourism businesses can raise the cost of conversion provided that they have an effective value creation strategy and concentrate on customizing their services [36].

3. Materials and Methods

The methodology used included tools to identify the most used social medium in the process of selecting a tourist destination and fulfilling the journey by Generation Y.

It was significant to determine the aim of the activity in SM. Hypotheses regarding the purposefulness of trips and ways to assess the attractiveness of a given destination were also verified. The initial stage of the research procedure was the analysis of literature and source materials.

The research used the survey method. According to Apanowicz, they may relate to "the state of consciousness of a given community in terms of socio-economic activities in general and in detail. The most commonly used research technique in the diagnostic survey method is interview and questionnaire. These techniques are supplemented by document analysis and statistical methods [37] (p. 71).

The survey was carried out on 111 representatives of Generation Y, i.e., those born between 1980 and 2000. The respondents completed the online questionnaire using Google Forms at the turn of April and May 2019. Among the respondents, 72% were women and 28% were men. The respondents answered a number of issues related to their experience regarding the use of social media and the presence of a tourist element in them.

The survey questionnaire was addressed to SM users. Thanks to the fact that the first question was verifying, only people using SM and the Generation Y representatives participated in the study. They were students of Warsaw universities. The questions contained in the questionnaire were closed with a cafeteria of answers. The questions initially referred to the knowledge of SM and the information contained therein concerning places of a tourist nature. Next, they involved the assessment of the attractiveness of the tourist places described in SM, its influence on the decision of choosing a destination, experiences presented in SM, and the types of published materials, its credibility, and publication purposes.

The questionnaire for the survey was initially verified among 26 people representing the Millennium generation. The selection was made using the snowball sampling technique. These studies helped verify the questionnaire, which was then addressed to the research group. In the selection of the sample, the non-probability convenience sampling method was used. It should be mentioned that the research was exploratory. The research stages are presented in Table 2.

Table 2. Research stages.

I	II	III	IV	V
Preparation of the survey questionnaire	Testing of the questionnaire among 26 respondents	Verification of the survey questionnaire	Selection of respondents	Conducting research among 111 respondents

Source: own study.

Therefore, it needs to be deepened and expanded in quantitative terms. Replication with various factors influencing the assessment of the attractiveness of travel destinations in SM and the reasons for sharing content in SM is needed. The research results are a valuable source of information for tourist enterprises, especially in the process of creating communication and promotional campaigns.

4. Results

4.1. Popularity of SM among Representatives of Generation Y

All respondents declared their presence in social media. This shows that they have an important place in the daily life of Generation Y.

The respondents mainly used Facebook (92.7%). Twitter (80.2%) enjoys relatively high recognition, although it is not actively used by young people. The data are presented in Figure 1.

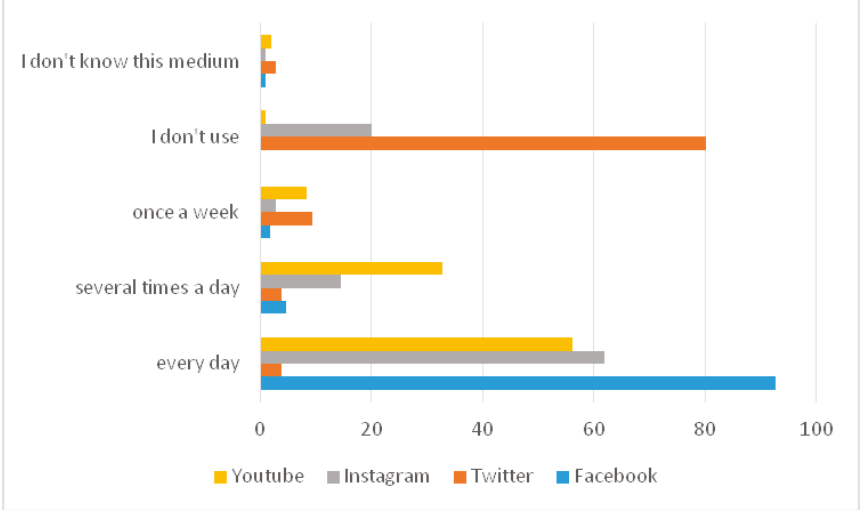

Figure 1. Frequency of use of particular social media [%]. Source: own work.

World statistics indicate 330 million active users per month in 2019. For comparison, 2.4 billion users use Facebook monthly, of which 1.59 billion use Facebook every day [38]. In Poland, Twitter is popular mainly among politicians and journalists. The idea behind this site is based on sharing short text messages known as 'tweets', which are currently limited to 280 characters. This medium is eagerly used by politicians in Poland and around the world who use it to communicate with their electorates. Instagram was the third medium indicated by the respondents (61.8%). It is important that, unlike Twitter, respondents use it every day. It probably has to do with the fact that it focuses on visual materials such as photos that Generation Y takes so willingly to depict various events from users' lives. In January 2020, 7,202,000 used Instagram in Poland, which accounted for 19% of the total population [39]. Daily use of another medium, i.e., YouTube, was declared by 56.1%, and 32.7% used YouTube several times a day. In 2019, more than 2 billion logged in users were registered who visit YouTube every month. Every day, viewers watch over a billion hours of films [40].

All media—Facebook, Tweeter, Instagram and YouTube—are not strictly tourist-oriented. Interesting results relate to the analysis of the literacy of the media, which are more associated with tourist services. The first was TripAdvisor, whose knowledge was declared by 47.7% of respondents, of which 34.6% used it, which may indicate relatively low popularity. The reasons for this phenomenon can be seen in a narrow topic, which is useful only when planning trips. Respondents also indicated Snapchat. It is a portal similar to Instagram but based on the idea of sending to friends photographic or film material that is displayed only once and then disappears forever. This solution was indicated by 21.5% representatives of the surveyed population who used Snapchat every day. The majority of respondents (93.6%) came into contact with materials representing tourist places during the use of the said media. Such great interest is an expression of the popularity of the topic of travel in social media, whose users willingly share information and experiences from expeditions.

4.2. Use of SM in Obtaining Information on Tourist Destination Selection

In the 21st century, the tourist market is increasingly moving to the Internet. The development of information and communication technologies has influenced changes in this sector. Acquiring customers in the group of Generation Y requires adaptation to their needs, style of rest, recreation, and the use of communication channels used by this generation [41]. The surveyed representatives of Generation Y, looking for tourist destinations, use various websites where they can find information, descriptions and reviews. Analysis of the research results showed that TripAdvisor was used most frequently (55.3%). The results are shown in Figure 2.

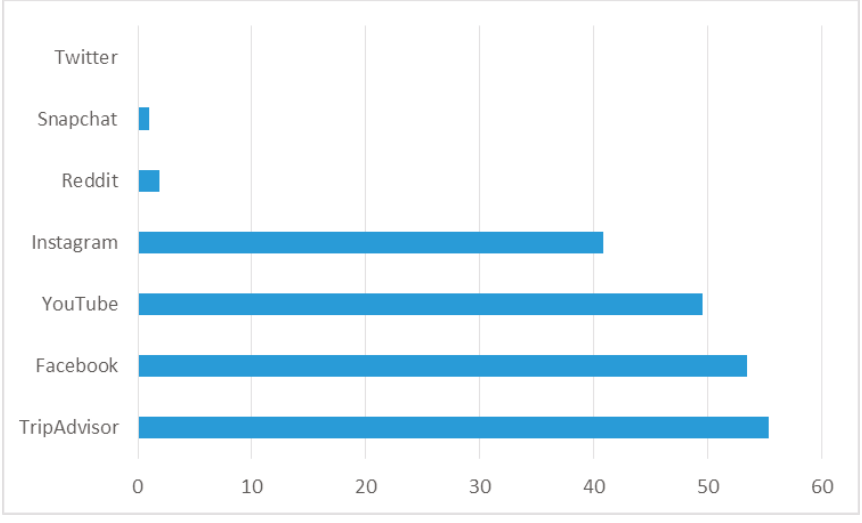

Figure 2. Media for obtaining information on tourist destinations by Generation Y [%]. Source: own work.

It is noteworthy that half of the respondents do not use this portal on a daily basis, but when they need information about a given destination, Generation Y decides to use the source associated even with the name with travel advice. Another place to look for inspiration and information on tourist destinations was Facebook (55.3%), whose popularity is closely related to the general use of this medium, which is 100% among the respondents. Generation Y prefers quick and easy access to content that interests them. One of the indicated options was YouTube (49.5%), whose strength lies in the film message allowing for greater immersion with the shown destination, and Instagram (40.8%), whose advanced tools allow presenting photos in an extremely beneficial way. Twitter and Snapchat

obtained minimal votes, indicating their unimportance in terms of impact on the Generation Y choices in the area of potential destinations of travel.

4.3. Factors Influencing the Assessment of the Attractiveness of a Tourist Destination in SM

There are many factors that influence the evaluation of a place's attractiveness. For users of social media, tourism-related materials are important. Only 6.8% of respondents believed that social media travel content did not affect their opinion of the destinations, while the vast majority of 93.2% confirmed that their travel decisions were often inspired by information posted on social media. Pictures that may induce indecisive people to choose a specific holiday destination are also inspiring. Only for 4.9% that was the main reason for making the decision, while for 64.1%, the information obtained from social media was one of the factors of choice, and therefore, they may have tipped the scales and made the place more attractive compared to other alternatives, as shown in Figure 3.

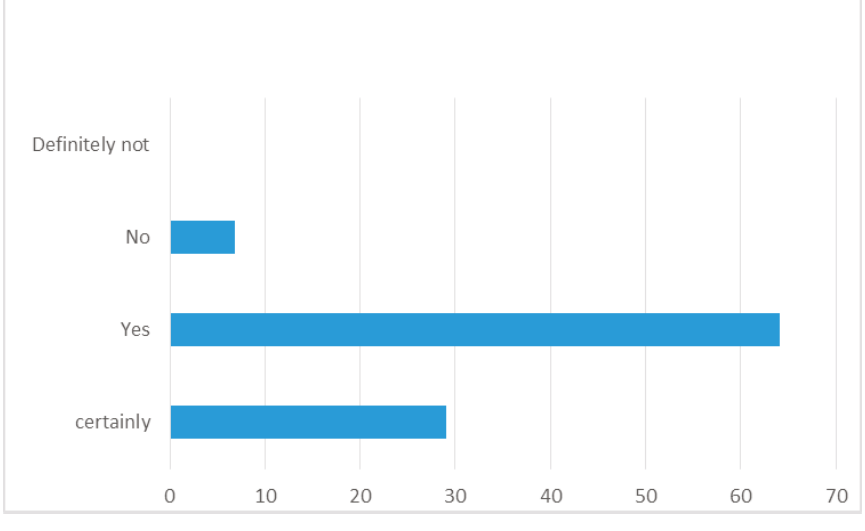

Figure 3. The influence of tourism materials in social media on Generation Y [%]. Source: own work.

The relatively high percentage of respondents who declared no such connection is puzzling. This may be due to the fact that the older Generation Y is not as dependent on the use of social media as the younger part of Generation Y raised during the great technological boom at the beginning of the 21st century.

4.4. Reasons for Sharing Content in SM

Social media users have many reasons to share their content and read other posts. The New York Times Customer Insight Group study identified five key reasons why people decide to share something with others: entertainment, self-expression, developing and caring for relationships, a sense of satisfaction that they are doing something for others, and sharing their support for social issues [42].

When considering the impact of social media on travel destination decisions, it should be noted that most of this activity is driven by the users themselves, who take hundreds of photos during their vacation, and often, some of them are later on their social accounts, where all friends can see them. Most of the respondents added such materials (88.4%), of which 41.8% did so regularly. It is a very active part that cannot imagine traveling without showing their holiday adventures to friends

and followers. Only 11.7% of respondents found it embarrassing to show themselves in this way in a public forum.

Social media users who were active in uploading materials from holidays and trips declared mainly photo materials as the ones they most often publish (96.7%). The reason for this is undoubtedly the ease with which it can be done and the weight of the moment captured in the photo. Video was chosen by only 25.3%, and the reason may be definitely the greater skills required to create a good video than a photo as well as less processing options on mobile devices, as shown in Figure 4.

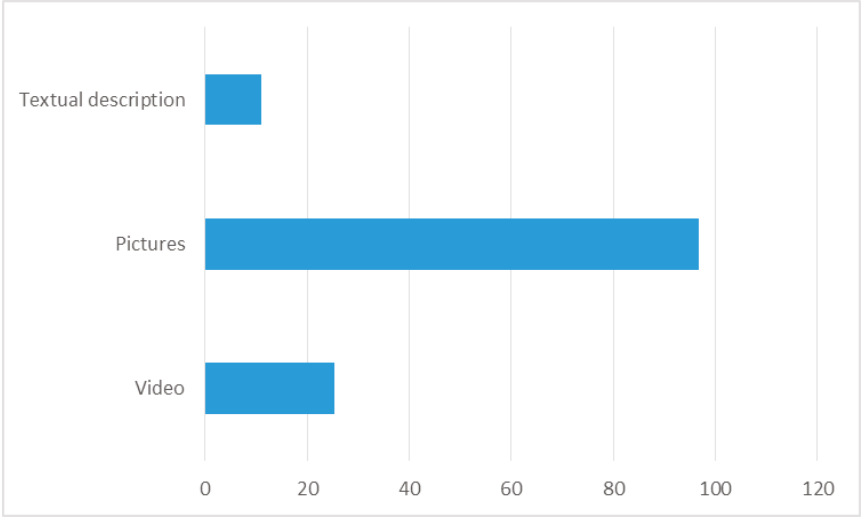

Figure 4. Type of content to be shared during the trip [%]. Source: own work.

Text descriptions were not recognized by Generation Y and appeared in addition to the more popular forms mentioned above. The shots shown in the pictures do not always reflect the true picture of reality. It turns out that almost half (46.6%) of respondents believed the images presented in social media, claiming that most of them are in line with reality. Total compliance was declared by 13.6% [43]. It is worth noting that 37.9% of respondents said that often in pursuit of recognition and the desire to show their life from the best possible side, they only commemorate the best sides of given places, avoiding showing the dark sides of tourist destinations. The data are shown in Figure 5.

Nowadays, when almost every aspect of the life of Generation Y is immortalized on the Internet, it is natural that for some, sharing travel materials can turn into one of the goals of the trip. Allianz Travel Insurance conducted a Vacation Confidence Index study among three generations: Millenials (18–34 years), Generation X (35–54 years), and Baby Boomers (+55 years), in which participants were asked how they engage in "social media". It turns out that Generation Y is much more likely than any other age group to present their travels on social media. It is worth paying attention to the reasons for such involvement. Over half (58%) share photos in which they look best, and 52% share photos in which their surrounding looks best. A relatively large proportion of Millenials (37%) do this to arouse jealousy among friends and family, and 27% treat it as a way to compete with others who also share materials from their holidays at the same time [44].

The analysis of the research results showed that as many as 80.6% use social media for leisure and visiting new places; one of the highlights, among the destinations of travel, is the emergence of a new goal, which has evolved as a result of technological development, is driving the development of social media, and now occupies an important place in the criterion of selecting a tourist destination.

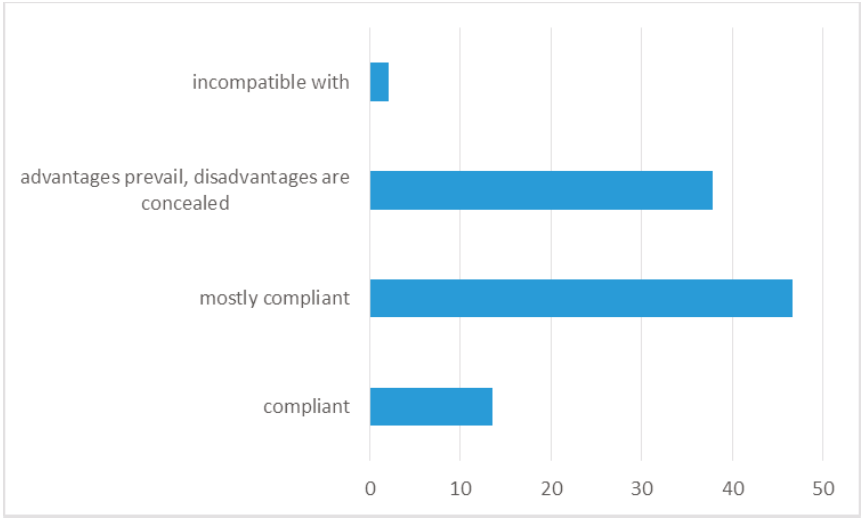

Figure 5. Conformity of the image of a tourist destination in social media with the reality [%]. Source: own work.

5. Discussion

The number of publications that examine social media shows that researchers are very interested in the impact of social media on the purchasing decisions of individual generations. Issues related to the use and role of SM in the life of contemporaries are raised in many publications by a lot of scientists from around the world. It is worth mentioning here among others Hussain (2020) [45], Flachenacker (2019) [46], Mosterd and Wijers (2019) [47], Shatal et al. (2019) [48], Kumar and Namada (2019) [49], Liebowitz et al. (2018) [50], Reformat and Reformat (2018) [51], and Christou (2015) [52].

Considering the fact that Generation Y and Z are the main social media users, testing their purchasing behavior as the basis for planning communication and promotion strategies behavior in the purchasing process of Generations Y and Z has been raised in many publications: Littman (2008) [53], Ratajczyk (2017) [54], Zhang et al. (2018) [55], Badowska and Delińska (2019) [56], and Maurer and Siller (2019) [57].

Tourist destinations in the modern world must evolve along with increasing technological and cultural changes. The key to successfully promoting tourist destinations is no longer spending millions of dollars on TV advertising campaigns or printing brochures. The most credible type of promotion is content created by people visiting given places and recommending them to other potential travelers by showing how they look by publishing photos and opinions.

As a result of the available reports and literature analysis, the most popular social media used by Millennials were presented with an emphasis on their advantages when it comes to tourist content. Many studies point to the role of SM in the decision-making processes of Generation Y. For example, this research problem is discussed by Pikuła-Małachowska (2018) [58] and Gołąb–Andrzejak (2016) [59]. According to the ACCENTURE I FASHIONBIZNES.PL report, before making a purchase decision, Generation Z uses the opinions of many people. In the first place, they take into account opinions of the immediate family (65%) and friends and verify opinions of users on the Internet (64%) [60]. On the other hand, there was no indication of the new goal, which emerged after the analysis of the results of the conducted research and mainly related to reporting and sharing the content of travels on social media. That may be the beginning of further in-depth research aimed at e.g., determining the elements of these relationships.

The main research problem concerned the impact of social media on consumer choices in tourism. The research determined the extent of impact that social media exert on the choice of destination by Generation Y. The following hypotheses were verified in the studies:

1. The most popular social medium for acquiring information on travel destinations is Facebook.
2. Generation Y assesses the attractiveness of a given destination based on opinions in social media.
3. One of the main goals of the trip is to report and share travel content on social media.
4. Content shared on social media affects the choice of travel destination.

6. Conclusions

Generation Y sees in social media the opportunity to submit their opinions on various topics. It is a channel for transmitting opinions on service providers and holiday experiences, sharing blogs to help other travelers [61]. Therefore, it can be expected that the role of recommendations communicated via social networking platforms may be even stronger in the future [62]. Among others, Buczek (2017) and Gogoi (2019) emphasize that in their research.

Research has shown that visual materials are very popular among Millenials. Generation Y mostly trusts material shared on social media but is aware of the deliberate coloring of reality in some cases. It turns out that sharing impressions from tourist destinations is the purpose per se. The most popular social media used to obtain information on travel destinations for Generation Y are Facebook, YouTube, and Instagram. Badowska and Delińska (2018) confirm that in their study. To sum up, based on the analysis of the results of the conducted research, the following conclusions were drawn:

- The representatives of Generation Y seek information about tourist destinations using TripAdvisor or Facebook,
- Generation Y indicates YouTube and Instagram as platforms that have quick and easy access to the content that is interesting for them,
- Information obtained from social media was one of the factors in the selection of tourist destination,
- Visual content, such as photographs, is very popular among the Millennials,
- More than half of the respondents share the photographs in which they look the most attractive,
- One of the reasons for sharing pictures from trips is to make friends and family jealous,
- Generation Y mostly trusts social media materials but is aware of the purposeful coloring of reality,
- Sharing the experience of a tourist destination is an end in itself,
- The content generated by the Millennials in social media is very effective advertisement, or anti-advertisement for a given destination,
- Facebook, YouTube, and Instagram are the most widely used social media by Generation Y.

It should be noted that the research was exploratory and requires deepening. Its results are a valuable source of information for enterprises whose target groups are representatives of Generation Y. The research needs to be expanded in quantitative terms and requires a replication approach. The survey should also be further deepened with issues related to the determinants of social media selection in the search for destinations, which could be helpful when creating information strategies through SM.

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Determinants of Social Media Usage in Business by Women: Age and Development of the Country

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Abstract: This paper aims to identify the most important social media purposes of usage by responding women's attitudes according to age and the economic stage of development of their respective country. Research was done through an online survey in 2017–2018 followed by an analyses of the results from eight countries: four countries that represent an emerging economy and four developed economies. Participants responded to questions concerning social technologies and their purposes of usage as well as resulting job opportunities. The conducted analysis of regarding Facebook as a platform resulted in the highest number of responses in the survey. In this paper, detailed results are presented including a comparative analysis between two groups of economies. Findings reveal that in both groups, the usage of Facebook in business is related mostly to a positive experience. The result showed that among women in emerging economies, social media were used more broadly, and from an age perspective, the results show that marketing is a key benefit emphasized among older respondents. The communication benefit of Facebook usage in business was noticed as a key factor by respondents in groups from both developed and emerging economies.

Keywords: social media in business; women; age preferences; emerging and developed economies

1. Introduction

Social media usage is mostly analyzed in groups of younger populations or students. According to Silver, Huang and Taylor [1], in most emerging economies, social media are also more likely to be used by younger adults. Thus, age is strongly correlated with the usage of social media [2] and reveals an important perspective of analysis and the gap of research among older people. Age perspective is mostly analyses from the user side [3,4], not from business benefits. Additionally, the basis for that question was stated from the assumption that social media among emerging economies developed differently than in developed countries [5]. In advanced economies, the Internet is a part of daily life and impacts social interactions, politics, culture, etc. However, social media across emerging markets are characterized by a more innovative approach and more instruments that are frequently used [6]. Phone users with higher levels of education are more likely to interact regularly through social media than those with lower levels of education [5]. The division of emerging and developed economies was implemented to assess economic opportunities for women to increase their entrepreneurial activities by social media engagement.

This paper aims to identify the extent of social media benefits according to the responding women's age and the economic stage of development of the investigated countries. Three research questions were addressed in the study:

RQ1: Is there a difference in social media usage in business by women of different ages?
RQ2: Is there a difference in social media usage in business by women from emerging versus developed economies?
RQ3: What are the main areas of Facebook usage for business success as assessed by the responding women?

The study contributes to the on-going cross-country discussion concerning motives of social media usage in the business from gender and age perspective. The achieved results contribute to social media use in work understanding by exploring key benefits. The study explores the phenomenon of social media's extensive usage from theory and price perspective. The main benefit that was noticed by older women responders was marketing activity developed through social media. Among respondents from developed and developing economies, there was a different approach to assessing the following benefits of Facebook usage in the business: communication, customer service, and marketing. It underlines the meaning of the traditional channel of customer contact across different economies.

In the first part of the study, the definitions of social media and benefits are described. The second part addresses the methods and sample characteristics. Next, the research results are provided paired with a discussion of other research results. Finally, the conclusions, limitations of the study, and future directions are presented.

2. Literature Review

2.1. Defining Social Media

The popularity of social media continues to grow around the world, and its phenomenon is increasing. The concept of social media has become popular among researchers because it has a real impact on social and business reality. There are many propositions on how to define social media. In terms of the general definition, social media is described as online applications, platforms, and media that allow individuals and communities to gather and communicate and which aim to facilitate interactions and the sharing of content in real-time [7–9]. Other definitions are presented in Table 1.

Table 1. Definitions of social media.

Authors	Definitions
Safko and Brake (2009) [10]	It consists of activities and behaviors of users who meet online to share information (words, pictures, videos, and audios).
Kaplan and Haenlein (2010) [11]	It consists of Internet-based applications (Web 2.0), allowing the creation and the exchange of the content generated by users.
Hsu et al. (2013) [12]	It is used as a platform for everyday communication where users share ideas and discuss issues.
Khan et al. (2014) [13]	It refers to online tools and websites that enable communication and interaction by giving them opportunities to share information.
Steenkamp and Hyde–Clarke (2014) [14]	It is a platform that provides opportunity for information sharing and to create and distribute the content.
Paliszkiewicz and Koohang (2016) [15]	It consists of Internet-based applications, which enables creating networks and making interaction among members of this network.
Kumar et al. (2016) [16]	It is a platform for businesses and individuals to transact and relate to each other in a mutually valuable manner.

Social media takes on many different forms, including social network sites, blogs, micro-blogs, media sharing platforms, wiki, virtual worlds, location-based services, social bookmarking services, group buying communities, review sites, and writing communities [15]. The main aim of social media is forming relationships and continuing relationships among people by the interaction amongst them.

Leonardi et al. (2013) [17] proposed the definition of enterprise social media by underlining four aspects of web-based platforms. The first applies to communication among employees or sharing information in the company [18]. The second refers to easier direct or indirect identification of communication partners at work. The third relates to the possibility of posting, editing, and sorting text and files. The last web-platform attitude involves viewing the messages, connections, text, and files posted by anyone else in the organization. Keitzmann et al. (2011) [19] presented six constructs of social media: identity, conversations, presence, relationships, reputation and groups. It enables us to characterize the extent to which users: reveal themselves, communicate with each other, exchange, distribute, and receive content, know if others are available, related to each other, understand the social standing of others, and form communities.

One of the most popular social network sites is Facebook [20]. It is a self-organizing network. Users can make decisions with whom they would like to interact. Facebook allows preparing public or private profiles with personal information, e.g., hometown, current city, education, employment, interests. It enables us to choose the list of other users with whom they share information, photos, videos, announcements, links, and opinions. Facebook has opened up new possibilities for self-presentation [21], and a user's friends are more than an audience; they are actively involved in constructing the user's identity. They can comment on content provided by the users [22]. Facebook's mission statement is " . . . to give people the power to share and make the world more open and connected. People use Facebook to stay connected with friends and family, to discover what's going on in the world, and to share and express what matters to them" [23].

2.2. Social Media Usage and Benefits

Social media sites have different features that realize different aims for the individual user and business [24]. Researchers have identified different benefits for social media use. However, the primary reason is communication and building relationships with others. Social media enables individuals to maintain relationships with family or friends [25], present photos and videos [26,27], learn from others and shar information [26,28,29].

In business, the main areas for using social media apart from communication with clients are to increase profits, support customer services, or gain new customers. Researchers underline its role in marketing as the new hybrid construct of the promotion mix [30]. Social media also are related to womens' empowerment and influence on their attendance in the economy; it helps in creating new employment opportunities, and in the recruitment process [31,32]. Social media can help to create awareness of the brand, products, or services and can help in building a good image of the company [33]. Social media in organizations can be used to: enhance communication inside the organization and enable stakeholders to be more innovative. Major challenges for social media are to be transparent, reliable, and to be able to communicate issues on time; thereby reducing rumors, and enhancing people to speak good about the company. Although there are many benefits of social media usage, it also possesses some risks related to security, privacy, accessibility, data management, social inclusion and anxiety, depression, and exposure to developmentally inappropriate content [15,34,35].

Rapid changes in emerging economies are being supported by Information and communications technology (ICT) that is easily accessible through social technologies via mobile phones. Phone users with higher levels of education are more likely to interact more regularly through social media than those with lower levels of education [5]. ICT access escalates higher efficiency, productivity, faster information sharing among employees, and supports creation and transfer of knowledge that enhances collaboration and communication due to faster transfer of information [36,37]. According to research, social media usage by women entrepreneurs in emerging economies increases a woman's self-efficacy and social capital [38].

3. Materials and Methods

3.1. Instrument and Materials

The questionnaire for the study was developed to survey women's empowerment [39]. The survey instrument consists of sections related to demographics, technology, and social technologies. Five different social technology platforms were studied, including Facebook, Twitter, LinkedIn, YouTube, and Google+. Facebook received the highest number of responses regarding usage. Questions related to social technologies included the assessment of access to technology, the purpose of the usage of technology, technological benefits for women's empowerment, and past experience in using social media in business. The survey included the following usage of social technology platforms in business: communication, customer service, gaining new customers, marketing, recruiting employees, increasing profits, building relationships, and creating awareness.

Analyzed data included responses from 980 women in the workplace regarding the use of technology, specifically social technologies, and the benefits. Data were collected electronically among women in eight countries: Georgia, Poland, Romania, Slovenia, Spain, Taiwan, Turkey, and the US. Participation in the survey was voluntary, and the respondents were assured confidentiality and anonymity. The survey was done in companies that cooperate with universities in a given country.

A sample of the study includes women's responses as follows: 137 from Georgia, 106 from Poland, 129 from Romania, 152 from Slovenia, 102 from Spain, 123 from Taiwan, 131 from Turkey and 100 from the United States.

3.2. Methods

A qualitative approach was used for this study using a survey instrument that was developed with close-ended questions. Descriptive statistical analyses were used to give the reader comparative analyses and applicable results. Quantitative research in the study embraces an empirical assessment of the most important benefits recognized in the featured age and economic development stage of classification.

The collected data were divided according to the stage of economic development: thus, two groups were distinguished: developed (USA, Spain, Slovenia and Taiwan) and emerging economies (Poland, Romania, Georgia and Turkey). The developed economies group covers 477 collected answers and 503 in the case of emerging economies. The age division includes four classes: 25 years and under, 26–35 years, 36–45 years, and over 45 years. This classification was used in a multidimensional analyses of survey answers.

For RQ1 and RQ2, the investigation conducted a comparative analysis that includes the non-parametric correlation analysis and the Mann–Whitney U test for women's age and their respective countries economic development differences for Facebook usage assessment. RQ3 was explored through the hierarchy method of agglomeration based on the Euclidean distance for a multidimensional attitude of social media usage.

4. Quantitative and Qualitative Assessments on Respondents

The average age of the women respondents was 36, while the median value was 35 years of age (Figure 1—left panel). In a group of developed economies countries, the average age was 39 years (median 38 years) and among emerging countries, the average was 34 years (median 33 years). In both groups of respondents, the standard deviation was 9 years and the predominate age ranges were 26–35 years and 36–45 years (Figure 1—right panel).

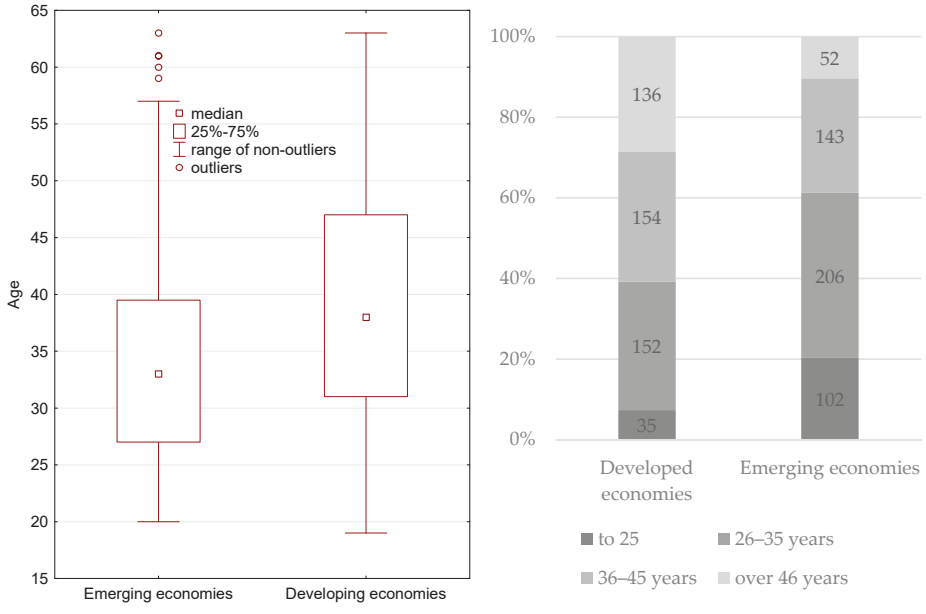

Figure 1. Age of respondents.

Figure 2 presents the share of women that work for a company or an organization versus running their own business. It is interesting to note that 20.3% of women in the developed economies group run their own business, while in the emerging economies group, it was 25.6%.

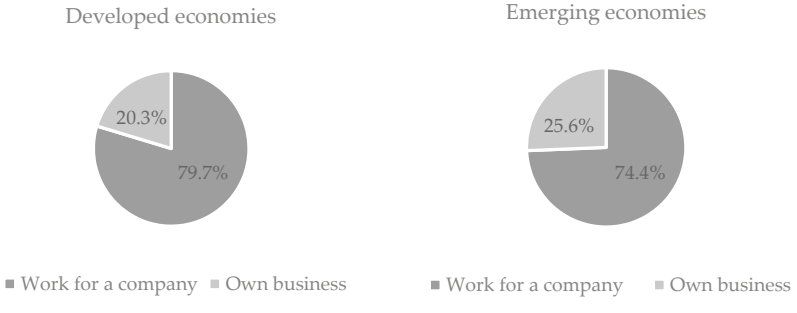

Figure 2. Working for company/organization or leading own business.

Figure 3 gives more specific information regarding the organizations in which the respondents work. As noted, 43.2% of the respondents work for corporations in the case of a developed economy, and in the emerging economies group, it was only 17.3%. In a group of emerging economies, women declare to work for "other" types of organizations, mostly public units.

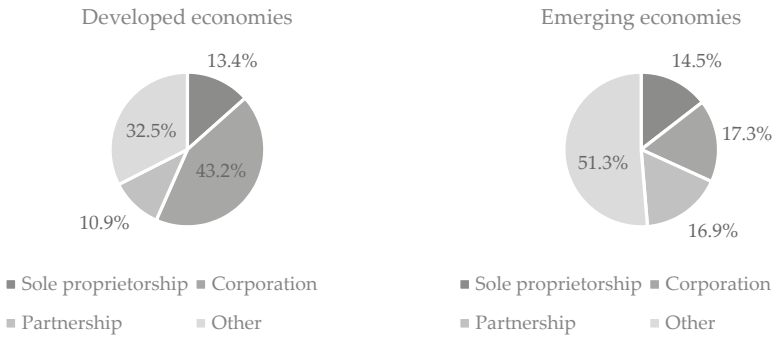

Figure 3. Type of the organization.

Figure 4 presents results regarding access to technology, specifically desktops, laptops, iPad/tablets, smartphones, wifi, and other options. Women declared access to each technology and could indicate more than one. The difference in developed and the emerging economies groups of countries was apparent in the usage of laptops where developing economies' access to this technology was higher. Only in case of access to desktops, the developed economies group indicated this technology as more accessible compared to the group of emerging economies.

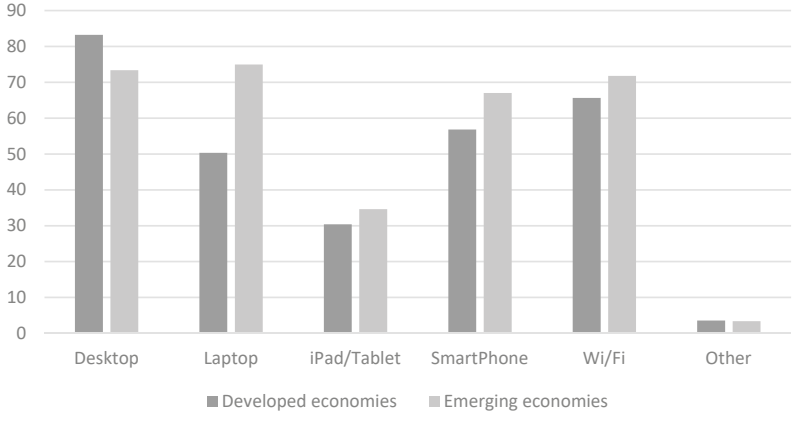

Figure 4. Access to technology.

In the developed economies group, over 95% of respondents indicated more than 5-years experience in using social media, while in the emerging economies group, the percentage was 85% (Figure 5). These differences of experience may impact the social media assessment among two groups of women.

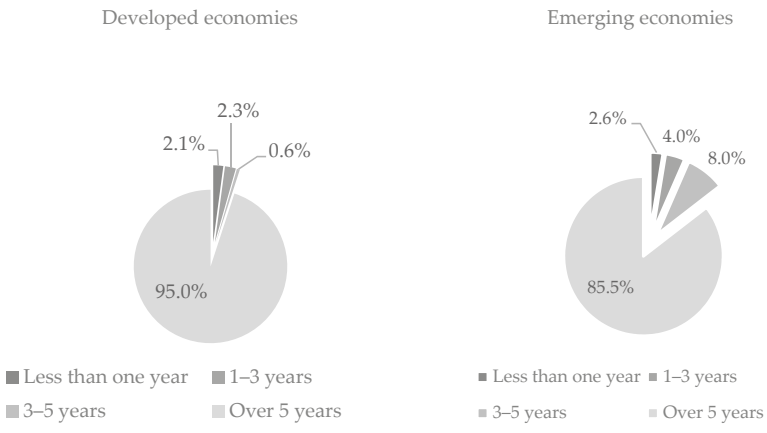

Figure 5. Experience in the use of social technologies.

5. Results

The indication of social media usage was further investigated according to the benefits of its usage (Figure 6). In the emerging economies group, benefits were reported by 96.4% of women, and across developed economies by 94.1% of women underlining the high level of benefits awareness in women's assessment and the importance of a conducted study.

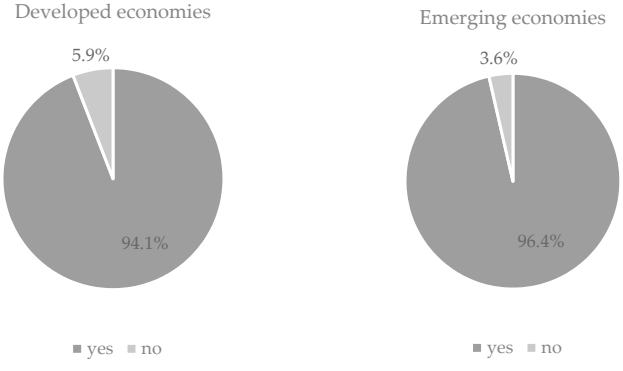

Figure 6. Awareness of benefits that social technology can provide.

Figure 7 presents the awareness of technology benefits usage in different areas of business. In every field, the slightly higher awareness of technology benefits was reached in the group of emerging economies. The highest level of technology benefits recognition was noticed in the area of information and communication: 91.9% and 91.5% for the emerging economies group and 88.9% and 86.0% for the developed economies group. The awareness of technology benefits in social media usage was declared by 79.9% of responders in the emerging economies group and 75.1% in the developed economies group.

In Figure 8 the purposes of Facebook usage in business were presented by including the group of economies division. In the emerging economies group, Facebook was used for communication by almost half of the women. In the developing economies group, only 37.1% of respondents indicated usage of Facebook for communication.

Figure 9 presents an assessment of the social technologies' experience by responders. Women from a group of emerging economies make up a significantly higher share of those indicating a mostly

positive experience in using social technologies (89.1%). In the group of respondents from developed countries, the positive experience was noted by 71.3% of women.

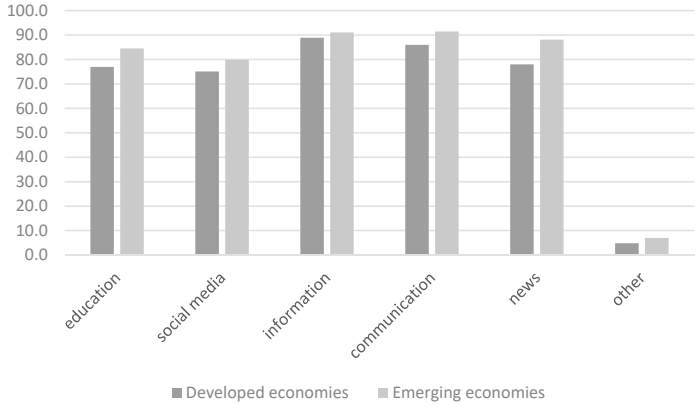

Figure 7. Awareness of technology benefits in different fields.

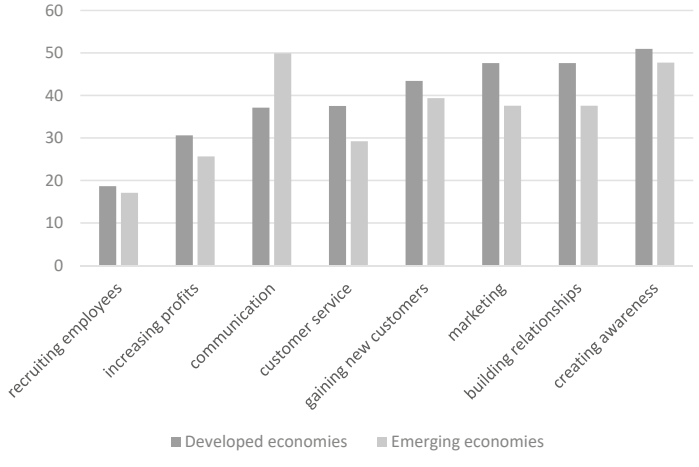

Figure 8. The purpose of Facebook usage in business.

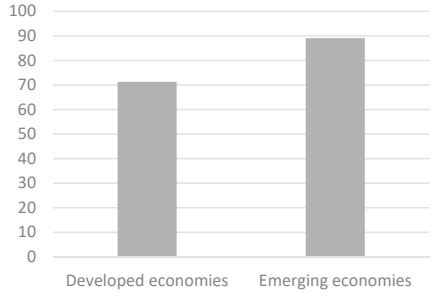

Figure 9. Positive experience with social technologies.

Table 2 shows the U Mann–Whitney test results indicating the observed difference in the mean ranks of the two groups of countries. Only significant differences were presented in Table 1 (higher ranks were recorded for a group of emerging economies). According to the U Mann–Whitney test, we stated the following null hypotheses: there are no statistically significant differences between the usage of Facebook in developed and emerging economies and the experience of its usage in women's attitudes.

Table 2. U Mann–Whitney test results.

	Rank Sum Group 1	Rank Sum Group 2	U	Z	p
Facebook usage for communication	69,599.5	85,246.5	29,413.5	−4.86640	0.000001
Facebook usage for customer service	77,539.5	70,156.5	32,755.5	2.24236	0.024939
Facebook usage for marketing	82,660.5	71,629.5	33,126.5	2.84610	0.004426
Positive experience with social technologies	225,273.5	251,502.5	98,517.5	−4.64453	0.000003

The group of emerging and developed economies countries were significantly different in communication, marketing, and customer service assessment regarding Facebook purposes of usage. These results underline the different directions of engagement for business reasons between the two groups.

Table 3 presents the correlation relationship between the age of respondents and purposes of Facebook usage in business. In this analysis, age was included as a continuous variable. For the developed economies group of responses, older responders noticed a more robust attitude in using Facebook for creating awareness and marketing. Across emerging economies, older respondents used Facebook more broadly for gaining new customers, increasing revenues and profits, marketing, and recruiting purposes. The level of correlation was relatively low, but the highest level was noticed in the case of marketing (0.2852).

Table 3. Correlation relations between Facebook purposes of usage and age of respondents.

	Developed Economies		Emerging Economies	
		p-Value		*p*-Value
Communication	0.005725		−0.022145	
Customer Service	0.021911		0.096360	
Creating awareness	0.120034	*	0.098214	
Gaining new customers	0.098907		0.217456	*
Increasing revenues/profits	−0.021770		0.271928	*
Marketing	0.132155	*	0.285172	*
Building relationships	0.055129		0.085076	
Recruiting	0.039712		0.165521	*
Other	−0.034496		0.031138	

* p-value < 0.05.

As a result of the application of hierarchical methods, dendrograms were obtained illustrating the hierarchical structure of a set of Facebook purposes of usage to the decreasing similarity between them. Forming clusters in the agglomeration method was made by using the Euclidean distance. It measures the distance between objects in a multidimensional geometric space. In the case of developed economies, the age does not significantly impact on the purposes agglomeration of Facebook usage (Figure 10). It indicates that the objectives of Facebook usage were more similar than the age of respondents in its assessment. Similar answers to Facebook's purposes of usage were recorded for three elements: communication, marketing, and building relationships. The more substantial impact of age was noticed in a group of respondents from emerging economies countries in which women's age did not impact only on building relationships with clients (Figure 11). It may indicate other/different

paths of developing contacts with customers without using Facebook on a larger scale. In the emerging economies group of respondents, two pairs of Facebook usages in business were indicated as similar based on women's answers: communication, recruiting employees and customer service, marketing.

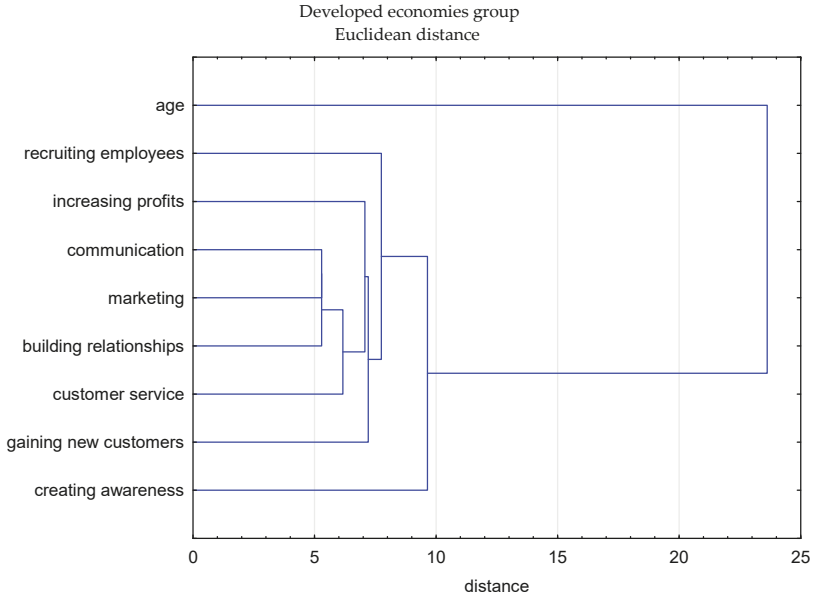

Figure 10. Hierarchical agglomeration for the developed economies group according to Facebook purposes of usage.

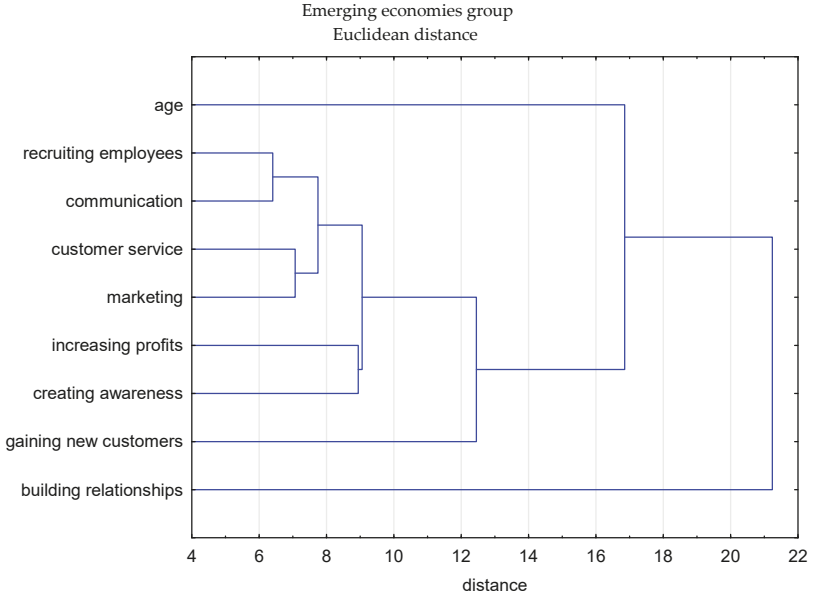

Figure 11. Hierarchical agglomeration for the emerging economies group according to Facebook purposes of usage.

6. Discussion and Conclusions

Social media has changed the ways of communication around the world [15,40]. It has helped people find, analyze, and exchange information [41] and become part of everyday life supporting many organizations as they conduct business in different parts of the world [42].

Social media has provided many channels for the development of entrepreneurship, also among women. Understanding the benefits of social media in business differs according to age [43]. The age of respondents is often used as a control variable in social media usage recognition.

According to RQ1, marketing was used as a significant benefit, which becomes more important among older respondents. However, the remaining identified benefits noted different stages of recognition between the results of developed and emerging economies according to age perspective among respondents. Facebook usage in business among emerging economies linked the age of women with increasing revenues/profits of organizations benefits assessment. The results indicated that the recognition of social media benefits is different according to age.

Communication, marketing, and sales often top social media Facebook benefits, which are recognized by businesses in every industry [44–47], especially in the case of information sharing [48]. The stage of a country's economic development also underlined differences in social media usage; however, the survey results did not indicate significantly different attuite of every benefit of social media. The awareness of social media benefits results were significant in the survey, which shows the importance of social media's role in business. According to variance analyses conducted for RQ2, benefits like communication, customer service and marketing were assessed differently among women respondents from developed and emerging economies. The agglomeration analyses revealed that among women from developed economies, three benefits were assessed similarly; communication, marketing, and building relationships—which shows three key characteristics in which Facebook is used. In the emerging economies group of women, similar answers were noted for recruiting employees and communication. Other social media platforms were not indicated as most often used, even those dedicated to recruiting employees [49]. According to RQ3, the communication role via social media is a key benefit that underlines its attractiveness that is still developed in various forms [50] by attaching users to new products or companies' services [51]. Social media is extending traditional communication channels, not replacing them, so understanding the motivations, needs related to age shows crucial benefits.

Additionally, Facebook usage for business success was noted by the respondents as positive.

Based on the research results, several gaps in the literature have been identified that need to be addressed:

- The effectiveness of different social media for business communication;
- The privacy issue related to knowledge sharing in social media;
- The impact of communication in social media on entrepreneurship and innovativeness;
- Education of users in the maintenance of their privacy on the Internet;
- Identifying the most suitable mechanisms to enhance trust-building for organizations using social media.

The current research poses some limitations that could create a new direction of research. First, the study focuses on one type of social media: Facebook. As a result, our research is only within the realm of one platform, and managers and scholars should be cautious in universally generalizing with other social media available on the Internet. Secondly, the analysis of social media attitude among developed and emerging economies cover only the eight countries and do not include macroeconomic factors that impact ICT stages of development. Thirdly, the generalization of the results may be limited due to the different age structures of the two groups of respondents.

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Integrated Question-Answering System for Natural Disaster Domains Based on Social Media Messages Posted at the Time of Disaster

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Abstract: Natural disasters are events that humans cannot control, and Japan has suffered from many such disasters over its long history. Many of these have caused severe damage to human lives and property. These days, numerous Japanese people have gained considerable experience preparing for disasters and are now striving to predict the effects of disasters using social network services (SNSs) to exchange information in real time. Currently, Twitter is the most popular and powerful SNS tool used for disaster response in Japan because it allows users to exchange and disseminate information quickly. However, since almost all of the Japanese-related content is also written in the Japanese language, which restricts most of its benefits to Japanese people, we feel that it is necessary to create a disaster response system that would help people who do not understand Japanese. Accordingly, this paper presents the framework of a question-answering (QA) system that was developed using a Twitter dataset containing more than nine million tweets compiled during the Osaka North Earthquake that occurred on 18 June 2018. We also studied the structure of the questions posed and developed methods for classifying them into particular categories in order to find answers from the dataset using an ontology, word similarity, keyword frequency, and natural language processing. The experimental results presented herein confirm the accuracy of the answer results generated from our proposed system.

Keywords: disaster information; question answering systems; question classification; Twitter analysis; natural language processing; neural disaster; word frequency

1. Introduction

Information is essential, especially in times of disaster. In recent years, numerous people have come to enjoy new ways to exchange information and share situations via texts, images, videos, and sounds using social network services (SNSs). Some of these social media tools, which have become essential to the lives of many people, were developed to support various types of events, especially those related to disasters. Since Japan is frequently struck by natural disasters, the Japanese people have accumulated a vast wealth of survival experience and have learned effective ways to stay abreast of various disaster-related events using social media as real-time tools for exchanging information. For example, just 10 min after the Osaka Northern Earthquake occurred at 07:58 a.m. on 18 June 2018, more than 270,000 tweets that included the Japanese word "地震" (earthquake) were posted [1].

In such situations, SNS information updates can help increase survival possibilities because they often include real-time data collected from on-site users in the disaster areas, news on help being provided by government agencies, or other knowledge that should be widely publicized [2]. In this

regard, with more than 45 million active users, Twitter is the most widely utilized SNS in Japan. The information and knowledge sharing is not stimulated by imposing structures and tools but by rich social interaction and its immersion in practice [3]. When information is exchanged together, information and knowledge are created through the interaction between people [4]. Therefore, the most helpful information at the time of disasters, such as safe places and useful services, can be obtained from people who exchange various information using social networks.

It is well known that numerous tweets are posted when disasters occur [5] because information and communication technology can enhance the speed of knowledge sharing by lowering temporal and spatial barriers between users [6]. However, since almost all such information is initially unconfirmed, it cannot be used immediately. Instead, it must await clarification, which means the content and meaning must be considered appropriately before it can be included in an emergency dataset. Furthermore, even though a variety of disaster mitigation systems have been created and are now in use in Japan, those systems primarily support the Japanese public using the Japanese language, which means that they are inaccessible to foreigners who do not understand Japanese. With that point in mind, we have been working on developing a system to support foreigners residing in Japan, which is expected to be useful for assisting them in obtaining necessary real-time information during disasters.

More specifically, in this paper, we report on the proposed integrated framework for a question-answering (QA) scheme in disaster domains that is based on an information provision system. To accomplish this, we collected a dataset of more than nine million tweets from Twitter on 18 June 2018, when the Osaka North Earthquake occurred [7]. After that, we classified these social media messages using an ontology, word similarity, and keyword frequency, and then we evaluated the natural language processing results to organize those messages into ten categories. The results were then statistically compared with the keyword used to classify each category [8].

In the next phase, we used tokenization and keyword stemming to develop and classify questions using those same social media messages. Then, keywords were extracted from those messages and reformatted into questions that allowed the system to understand what the questioner wanted to determine. Then, those question-related keywords were compared with the most frequently used keywords in the social media content dataset, and group keywords were assigned to categories associated with the question types. Then, answers that have previously been discovered to those questions are presented. All these processes work together to help us develop a system that can answer and respond to question-related problems using social media. Then, we verified the accuracy of the proposed QA process by calculating the confusion matrix of the result.

2. Related Work

Numerous researchers have studied QA systems in the search for ways to solve related problems in different domains, and they have presented a variety of different methods for improving the accuracy of the question-classification process. However, there are several differences in the resulting answers. For example, using applied research, Tripti et al. [9] proposed a hybrid QA system that uses machine learning (ML) to perform question classification through patterns. To accomplish this, they studied the syntactic structure of questions and conducted an experiment involving 500 medical questions. The resulting process was found to be helpful when assigning a suitable question category and identifying appropriate keywords.

In another study, Agarwal et al. [10] introduced an on-the-fly conceptual network model by applying intelligent indexing algorithms to a concept network to improve answer generation. Those researchers also proposed a framework based on a dynamic self-evolving concept network. Meanwhile, Sunny et al. [11] proposed a community QA system and a question recommendation system using the k-nearest neighbors (KNN) and Naïve Bayes algorithms. This system can determine the redundancy of questions with similar meanings on the system, and it ranks the resulting answer using "likes" and "comments" received from users.

Separately, Lin-Qin et al. [12] present an integrated framework for Chinese language intelligent QA in restricted domains. This model is implemented using a convolutional neural network, a bidirectional long short-term memory network, and question pair matching to perform QA processing. In still another study, Kanokorn et al. [13] proposed an information extraction process for both questions and answers that uses the Thai language and a related corpus. This research resulted in a web-based QA system whose answers are factoids extracted from Thai Wikipedia articles.

In addition to research on QA processes, other researchers have proposed methods to analyze social media and create disaster-assistance systems. For example, the Disaster Information Tweeting System (DITS) and the Disaster Information Mapping System (DIMS) are currently among the most popular mobile web-based applications used in Japan. These applications use a Twitter account to link with geolocation data and hashtags to obtain and share disaster information among participating users [14].

Similarly, the DETSApp English language mobile disaster app is an applied research application that can display real-time scenario contents related to disaster events accurately using images posted on Twitter. The image process works with a near-duplicate image detection algorithm and summarization using associated textual information [15]. Additionally, the DISAster-information ANAlyzer (DISAANA) and the Disaster-information SUMMarizer (D-SUMM) are mutually-supporting Japanese language web-based apps that use Twitter as an information source. Working together, DISAANA provides a list of answers related to location and information, while D-SUMM summarizes the disaster reports [16].

3. Methodology

Numerous disaster-related studies using various ML algorithms have been carried out for purposes such as data classification, prediction, and/or evacuation route planning. However, there have only been a few studies that have systematically analyzed recent developments, particularly in relation to disaster management or disaster knowledge management [17]. With that point in mind, this study explores a method for implementing a QA system in natural disaster domains that works by extracting disaster information from social media messages.

To accomplish this, we collected a dataset and performed a few necessary classification pre-processing procedures, i.e., message tokenization and keyword similarity identification, etc., in order to classify tweet sentences in the same manner as outlined in our previous research [5]. Next, we separated the system framework into three main phases. The first phase involves separating the question sentences via tokenization, classifying the questions by type, and then comparing them with previous questions with the KNN algorithms. The second step involves classifying question-related keywords by a computing ontology and WordNet similarity. After that, the keyword matching process is implemented to analyze the dataset discussed in our previous research. Then, in the third stage, we create an answer by selecting keyword compatibility and ranking the most frequent social media retweets.

3.1. Classification Algorithm

Since our proposed system uses natural sentences as input, the question-classification algorithms used are important. The system itself can be divided into the classification algorithm based on syntactic structures and the classification algorithm based on interrogative words. The syntactic structure classification algorithm, which works by extracting reasonable features from sentences, improves classification accuracy because proper syntactic structures are essential for controlling word combinations in sentences. Hence, the algorithm is used to analyze each word's role to understand the meaning of the question.

The classification algorithm, which is based on interrogative words, works by analyzing the interrogative word in a sentence. This method is used to solve the problem that occurs when syntax

analysis rules are very complex, because it is difficult to cover all grammar rules. However, the classification result can be limited to a relatively small range [18].

3.2. KNN Algorithm

The KNN algorithm, which is an algorithm in the supervised learning group, is a highly beneficial ML algorithm that is used to group data (classification). This algorithm uses various methods to decide which classes can replace new conditions or cases by checking certain numbers and determining cases where they are the same or close to each other by calculating the total number of conditions. It is used for classification and regression when classifying an unknown dataset, which is primarily based on the similarity of neighboring results [19]. The KNN algorithm does not need training data to implement classification. Instead, the algorithm works by identifying the most relevant questions from sample document groups [20].

3.3. Statistic Similarity

Statistic similarity, which is a method that can be used to calculate the similarity between questions, works using a low-dimensional vector with only a few words in one sentence. This method compares questions based on the question word set. More specifically, in a situation where two questions are given as Q1 = [word A, word B, and word C] and Q2 = [word A, word D, and word E], we can define the word set as follows: QS = Q1UQ2.

The QS word set contains all the distinct words in Q1 and Q2. Thus, a vector v that can represent each question follows Q1 = V1 = {1,1,1,0,0} and Q2 = V2 = {0,0,1,1,1}. If the word does not appear in this question, the value of the component is set to 0. If the word appears in this question, its value is equal to its frequency in the question [21]. As a result, we can measure the statistic similarity by Formula (1) below.

$$\text{Sim statistic} = \frac{\text{v1} \times \text{v2}}{||\text{V1}||x||\text{V2}||} \tag{1}$$

3.4. Word Similarity on WordNet

WordNet, which is an English word database that focuses on the relationships between words, consists of nouns, verbs, adjectives, and adverbs. Related words are linked via synonym sets (synsets). More specifically, WordNet is an ontology in which more than 100,000 words have been collected that is used primarily to find similarities (upper and lower position, synonyms, properties, causes, etc.) between keywords, after which it presents similarity scores with percentages [22–24].

The WordNet similarity equation compares two words by finding the root words of both and then obtains a similarity score for each word. The comparison result between the two words will be a score from zero to one. A score of one indicates a 100% relationship, while a score close to one indicates a firm relationship probability. In contrast, a score of zero or close to zero indicates that the two words are unrelated despite their similarity. In this research, after separating the question's sentence into keywords, we explore the meaning and relationship among words via WordNet similarity.

3.5. Confusion Matrix

A confusion matrix is a tool used to measure the ability and accuracy rate of an ML process or system. The matrix uses four values: True Positive (TP), which means the program's actual predictions and data are true; True Negative (TN), which means the program's actual predictions and data are false; False Positive (FP), which means the program makes a correct prediction, but the actual data is false; and False Negative (FN), in which the program prediction is false, but the actual data is true. [25–27]. We measure the results produced by the system using three criteria:

- Accuracy: The predicted accuracy matches what actually happens. The accuracy formula is (TP + TN)/(TP + TN + FP + FN).

- Precision: Correct and true predictions are compared with true predictions, but what happens is not true. The precision formula is TP/(TP + FP).
- Recall: The true prediction accuracy compared to the number of occurrences where both the prediction and occurrence are true. The recall formula is TP/(TP + FN).

It is necessary to measure the model or result in each step before developing or using it in various fields.

4. Framework Design

4.1. Framework of Our Proposed Integrated QA System

The systematic framework of our proposed integrated QA system for use in a natural disaster is divided into three main steps: the question processing phase, the answer processing phase, and the output processing phase, as shown in Figure 1. The first step takes an input question received from a user and goes through question processing to analyze the sentence. This process separates the question sentences into keywords and classifies the question by type. Next, the results are explored in the answer-processing phase, where matching between the keywords and the dataset takes place. This is the process where the answer is extracted from the database.

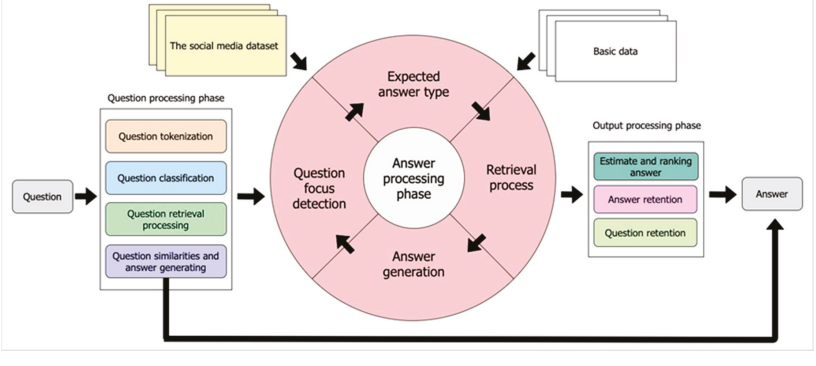

Figure 1. An overview framework of the integrated question answering system in natural disaster.

To facilitate answer creation, the system's database maintains important data in two parts: parts extracted from the social media dataset during our previous research [8] and basic data such as location, contact, and coordinate information. By comparing the question keywords with the dataset keywords and basic supplemental data, answer sets can be produced.

Next, we rank the answer result and estimate the possibility of a correct answer. The output result is most likely the closest related to the question the user wants to be answered. In the final step that follows, both the question and the answer are recorded in the database so they can be immediately available if the same question is asked in the future.

4.2. Question Processing Phase Framework

The first step of the proposed framework is the question-processing phase, during which the questions are analyzed and classified. Internal procedures such as tokenization, stop word remover, keyword stemming, question classification, and keyword selection are completed in this question analyzing process. Specifically, this process receives question messages from users, separates the structural components of those questions, and removes the unimportant components

The next process separates the sentence into words to identify the question by type and category. After that—but before sending the keyword result to the next step—the system will begin question

retrieval processing. This process checks the submitted question for similarities by comparing it with previous questions contained in the database. If a question has already been asked, the system will engage the reuse and retention processes to retrieve the previous answer and reuse it for the current question. However, if it is a new question, the system will forward it to the answer-processing phase, as shown in Figure 2.

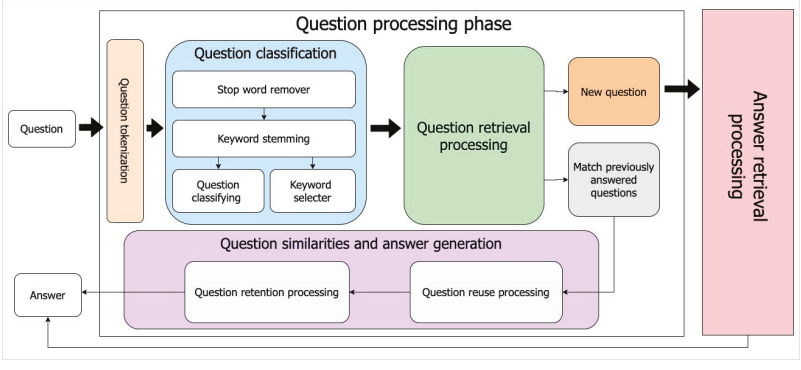

Figure 2. The system framework in part of the question-processing phase.

4.3. Framework Part of Answer Retrieval Processing and Answer Output

The second and third steps of the framework are the answer processing and output processing phases. The answer retrieval processing phase involves taking keywords from the previous process and using them to analyze the question by type (what, where, when, why, how, which, and whom) and then specifying the answer categories in which the expected answers should be located.

For example, if the question contains the word "where", it indicates that the user is asking about a location, so the system will retrieve place location information and calculate the distance between that location and the user in order to create an answer, which it will then forward to the user. However, if the question type is "what" or "how", the system will go through the matching process between the question keywords and dataset keywords to extract potential answers.

After obtaining the answer result set, the system creates an answer based on keyword compatibility and the social media content ranking that indicates the highest correct probability. The result is sent to the user in the answer output step, and both the question and answer are added to the database for reuse, as shown in Figure 3.

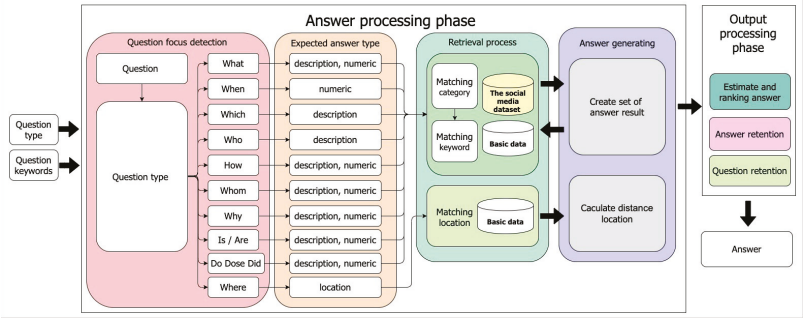

Figure 3. The system framework in part of answer processing and output processing.

5. Experiments

This section will explain how the system works by following the framework steps discussed above. More specifically, we describe how we collect and analyze necessary information from social media, perform data classification, and use the QA system answering process. The Twitter application programming interface (API) is used to access data in the JavaScript Object Notation (JSON) String form [28]. After that, all of the keywords are translated from Japanese into English in order to facilitate understanding while preparing for the next step, as shown in Figure 4.

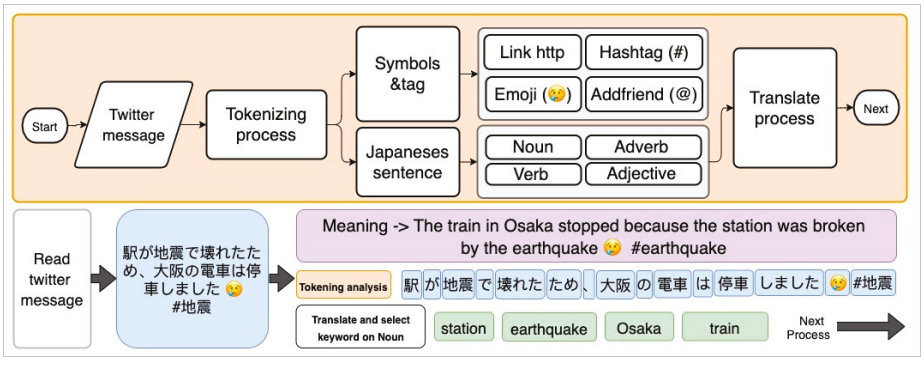

Figure 4. Tweets tokenizing and analysis process.

5.1. Data Classification of Social Media Messages

After the data gathering process, we selected ten English words to create ten categories by focusing on contents that must be known in relation to three main topics: before a disaster occurs, during a disaster, and after a disaster. Lists are compiled related to transportation (travel information, and vehicles), animals (human, pets, and other live animals), alerts (information during and after the disaster), warnings (cautions and self-preservation efforts before a disaster), places (buildings and/or other locations), damages (effects and violence caused by disasters), emotions (feeling and ideas), actions (activities during the disaster), energy (energy information), and services (available assistance and information sharing services).

Next, to classify questions sentences by type, they are compared to all ten categories in order to determine similarities. WordNet calculates a keyword similarity score by using an ontology to compare the compatibility of tweet dataset keywords and ten categories. For example, "Cat" has a higher compatibility with the category "animal" than the other categories. Moreover, it also counts how frequently the words of each category are used in the sentence [8], as shown in Figure 5.

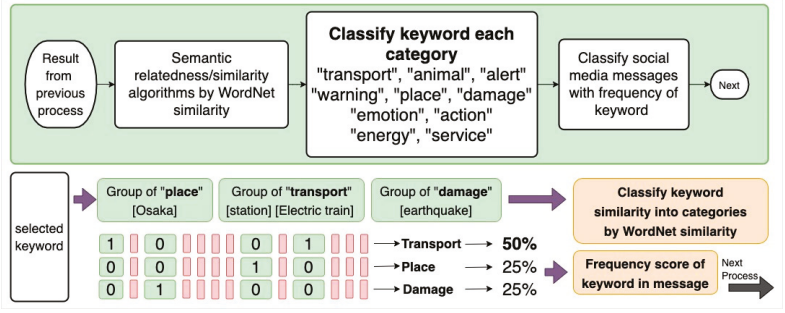

Figure 5. Classification of social media messages process.

5.2. Question Processing

Based on the framework above, the first step is to split the sentences into words via tokenization processing. For example, the question message, "How to prepare for the Osaka's earthquake?" will become [How] [to] [preparing] [for] [the] [Osaka] [is] [earthquake] [?]. The next step is the word removal process because words from tokenization have conjunctions, prepositions, or words that cannot be filtered, such as "a", "an", "the", "from", "for", and "in".

After that, the next process is stemming the keywords from the result [How] [preparing] [Osaka] [earthquake]. Since English words have added endings such as "-ing", "-ion", "-tion", "-s", "-es", "ed", it is necessary to convert those words to standard form via keyword stemming. The result of [preparing] becomes [prepare]. After this process, we get the question type = [How] and using the keyword selector get = [prepare] [Osaka] [earthquake] for the next step.

Before sending results to the answer processing step, the question processing will check the similarity measurement of the question by calculating the weighted sum of feature distance. We use KNN retrieval to find all of the closest previous questions in the database and then calculate the closeness between each keyword of the previous and new questions. For example, in Question 1, [How] [to] [prepare] [for] [the] [Osaka] [is] [earthquake] [?] and Question 2, [What] [is] [damage] [of] [Osaka] [earthquake] [?]. The statistic similarity is QS = Q1UQ2 = {how, to, prepare, for, the, Osaka, is, earthquake, ?, what, damage, of}. The resulting vector of similarity is v1 = {1,1,1,1,1,1,1,1,1,0,0,0} and v2 = {0,0,0,0,0,1,1,1,1,1,1,1}.

Next, we use the sim statistic formula obtained from the formula = v1 · v2/|| v1 || · || v2 ||, from which we then obtain a result equal to 0.5039, which means these two questions differ. If the system finds a match using a previous question, it will return the same answer to the user, as shown in Figure 6.

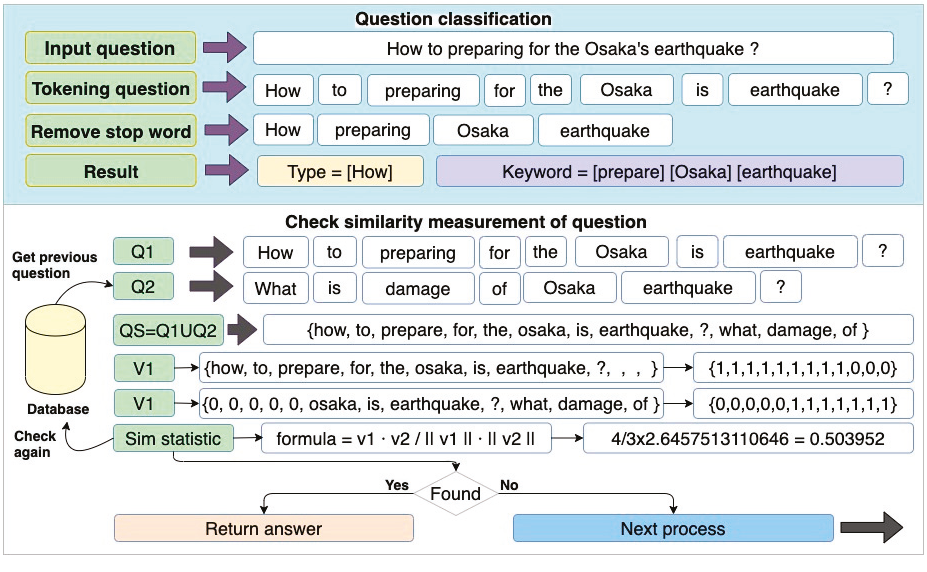

Figure 6. Question processing phase.

However, if there are many similar questions, such as Question 1, "How to prepare for the earthquake?" and Question 2, "How to prepare for the typhoon?", the calculation result is 0.857, and the vector is not equal. In this case, it is necessary to use WordNet to compare the different keywords from the vector to identify more similarities.

5.3. Answer Retrieval Processing and Answer Output

After categorizing the question similarities and differences, research work begins on the different results. The next step is to use the question keywords to find the answer. This process begins with classification, during which the question's keyword is matched with the keywords of the ten predetermined dataset categories from the database of our previous work.

However, if no keyword match is found in the database, WordNet similarity recalculations will be performed to find the keyword's score. After determining the question category, the score with the highest value in that category will be used to retrieve the dataset information.

In our experiments, we compared data compatibility by finding the answer that contained the most relevant words to the primary question keyword. For example, in the question, "How to prepare for the earthquake?", The main keyword is "prepare". Therefore, the system will retrieve the answer that has the most keyword matches or similar meanings.

The system will also pull up ten unique items and arrange them by the number of retweets from the highest to the lowest. In this process, we also eliminate spam and information that cannot be used from the data. Then, we select the first rank as the primary answer and supplement that answer by two other items as spares in case the first item is an incorrect answer.

For example, the result for the question, "How to prepare for the earthquake?" is the tweet "地震生後余震へのえ - 断水にえおに水をめる - 停にえ中灯の用意 - 食器棚の扉にはガムテプで食器が落ちない工夫を - 家族同じ部屋で休む - 枕元に避リュックとスニカを - 避リュックの中身はみ水、ラジオ、マスク、 ... " "Preparing for aftershocks after an earthquake, - Prepare extra water to avoid running out. - Prepare a flashlight for use in case of power failure. - Use tape to prevent dishes from falling on the cupboard door. - Have all family members rest in the same room. - Prepare evacuation backpacks and sneakers, and keep them at your bedside. - The contents of the evacuation backpack are drinking water, radio, mask, army..." (as shown in Figure 7).

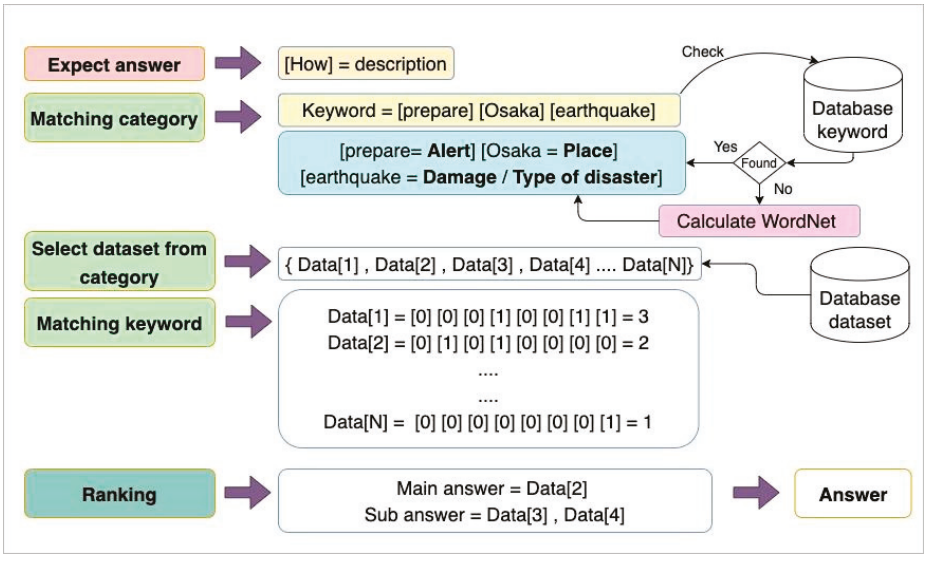

Figure 7. Answer processing phase.

5.4. Retrieval Performance and Evaluation Results

In this section, we describe the experimental results used to evaluate question retrieval accuracy and answer retrieval performance based on precision, recall, and accuracy. When evaluating the accuracy of question retrieval performance, we tested the accuracy of question calculation similarities

using a confusion matrix. To accomplish this, we created 100 questions, 50 of which were listed as previous questions, and another 50 questions that were new, and then verified the results. All 100 questions were used in each experiment. If the system found a previous question, the system will send the previous answer. If the system encounters a new question, it will be saved and sent to the next process where the prediction result and actual question will be compared. The results are as follows (see Table 1).

Table 1. Question retrieval performance accuracy.

	Accuracy	**Precision**	**Recall**
Confusion Matrix Score	0.883	0.98	0.75

Based on those results, the accuracy score of calculation similarities in the question retrieval performance is presented. As can be seen from the table, the accuracy can be as high as 88%. Then, we analyzed the accuracy imperfections caused by words that cannot be calculated via WordNet similarities such as place names or transliterated words.

These include questions such as, "How about Kansai in Osaka's earthquake?" and "How about trains in Osaka's earthquake?" Those questions should refer to the same answer, but the system cannot determine whether the words "Kansai" are the same or different from "train". In addition, the questions "What is the damage of the city?" and "What is the damage of Osaka city?" should also refer to the same answer because the database only contains the Osaka earthquake dataset.

When evaluating the answer retrieval performance accuracy, we used the same 100 questions mentioned above and investigated the answers found for all 100 questions. When some questions could not be answered, such as the question, "How to prepare for a typhoon?", no answer could be shown because the dataset only contained Osaka earthquake data. Therefore, we focused solely on the results of matching answers from the Twitter dataset that were directly or somewhat related to the questions, because some Twitter messages contained useful information but not enough to answer those questions (see Table 2).

Table 2. Answer retrieval performance accuracy.

	Accuracy	**Precision**	**Recall**
Confusion Matrix Score	0.776	0.82	0.863

With an accuracy score of 77%, this experiment showed that the system was reasonably capable of finding answers that matched the dataset. However, we found that some results did not directly match the answers because of two factors. The first factor was that the questions and answer categories used in the classification process were too small and should be increased according to the data group. The second factor is that the dataset's contents were insufficient because the results were extracted using the Japanese word "地震" (earthquake), which is not specific to certain question groups.

Therefore, in our future research, we intend to explore more dataset groups in order to gain in-depth information on topics such as rescues, preparations, services (free or charged), and shelters. Furthermore, since the dataset's contents were insufficient, some questions produced different calculation results but still obtained the same answer.

These included questions such as "What was the magnitude of Osaka's earthquake?" and "What time did the Osaka's earthquake happen?" Those questions got the same answer "18日758分、大阪府で最大震度6弱をする地震がありました。震源地は大阪府北部、M5.9。" This is translated as, "At around 07:58 on the 18th, there was an earthquake in Osaka Prefecture that produced a maximum seismic intensity of 6 or less. The epicenter was M5.9 in northern Osaka." This result occurred because the content of a large number of the retweeted Twitter messages related to that earthquake included the time, location, and damage information.

6. Discussion

The question-answering system proposed in this study is based on the dataset that we collected from social media in the event of natural disasters. This research aims to develop a system to support foreigners residing in Japan to obtain necessary real-time information during disasters. We have developed a system that continuously develops the previous study in which we investigated the social media messages from Twitter. We extracted sentences based on keywords and classify social media messages. We think that the crucial component of the system is the size of the social media dataset and the preciseness of the sentence classification. Specifically, we used the ontologies to classify texts as keywords to related categories in the classification process.

Moreover, the number of categories is important because it is used to calculate the meaning of the sentence by ontology and word similarity. After all, messages in social networks, such as Twitter, have only 140–280 characters. It is difficult to find the meaning of a sentence when the number of words is insufficient. Therefore, increasing the accuracy of finding the sentence's meaning depends on the number of categories and further improved ontology databases.

The system proposed in this paper is designed to only be used in the event of a disaster. For building a good system, it is important to consider ease of use and familiarity in the event of disasters. From that perspective, we think that it is desirable to improve our system to be a dual-purpose information system, which is capable of continuous use during normal times and natural disasters [29,30]. Since users utilize the system for collecting information daily, they can collect information without confusion when a disaster occurs.

7. Conclusions and Future Work

Herein, as part of efforts aimed at developing a disaster information provision system, we proposed an integrated framework for integrated QA processing and proposed a method that can be used to classify questions and answers in disaster domains. In the presented experimental results, we showed that the sentence patterns for typical questions are inappropriate for practical development because they generate numerous question types and are prone to typographical errors. Accordingly, as part of efforts to reduce problems and increase user speed, it will be necessary to develop a wizard-type interface for creating questions or shortcut buttons for entering important questions.

Our research also found that the accuracy of the classified questions and answers depends on the number of categories defined and the number of answer datasets. Thus, in future research, it will be useful to increase the number of categories that affect disaster content in order to increase the accuracy of the result. Moreover, the results of comparisons with other keyword datasets or the use of another disaster dataset can be expected to increase the accuracy percentage. All these research results help us develop a system that can answer and respond to question-related problems using social media, which can contributing to building a system to support foreigners residing in Japan to assist them in obtaining necessary real-time information during disasters in the future.

Author Contributions: Conceptualization, K.K. and O.U.; methodology, K.K. and O.U.; software, K.K. and O.U.; validation, K.K. and O.U.; formal analysis, K.K.; investigation, K.K.; resources, K.K.; data curation, K.K.; writing—original draft preparation, K.K. and O.U.; writing—review and editing, K.K. and O.U.; visualization, K.K. and O.U.; supervision, K.K. and O.U.; project administration, K.K. and O.U.; funding acquisition, O.U. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest: The authors declare no conflict of interest.

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information

Article

Information Sharing Strategies in the Social Media Era: The Perspective of Financial Performance and CSR in the Food Industry

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Abstract: This paper aims to identify financial measures that are related to Corporate Social Responsibility (CSR) involvement activities. The study concerns the food industry, in which clients, as well as stakeholders, increasingly appreciate socially responsible companies, which could be a crucial factor for future growth strategy. An analysis was made on a sample of 448 food companies from 50 countries in 2009–2020. As a financial measure for CSR assessment, we used profitability ratios, dividend payout ratio, price-to-earnings ratio and market capitalization. The results confirmed that CSR reporting was a crucial division that differentiated companies from the perspective of profitability, OE, market capitalization, and share price. The CSR practices that are realized and published in reports become an important signal for investors that the company has a good financial situation and is able to invest in CSR without reducing its performance.

Keywords: CSR reporting; financial performance; food industry; information sharing

1. Introduction

The issue of sharing information about companies' activity points to different strategies that are implemented. Each of these strategies is joined with social media as a direct channel of companies' activities. Corporate Social Responsibility (CSR) communication is using social media as one of the key channels to share information with stakeholders to report efforts and initiatives of the company [1]. CSR campaigns use social media to present their social responsibility [2]. CSR sustainability reports enhance the reputation of businesses and organizations [3]. An annual report about CSR activity provides a specific signal for investors. Thus, this issue is related to signaling theory. These signals are expected to be positively received and are reflected in a market price increase. Investors will receive more information due to CSR activities presentation. CSR could also be perceived to be a signal for investors about the quality of management [4].

According to Ratajczak, consumers pay more attention to the aspect of responsible practices in the agriculture sector [5] and concern the environmental impact of companies' operation. Consumers are increasingly looking for information about producers, products, and the supply chain. This approach reveals that CSR policy affects the agri-food processes or the product [6]. A passive approach to ecological problems initiated the stimulation of consumer activity that could be crucial in the food industry [7]. Therefore, the food industry is an industry with a sizeable ecological potential that is mostly untapped. Thus, some industries are more sensitive than others to social practices and their environmental impact [8]. Food industry CSR issues are also related to food safety and biotechnology supported by powerful stakeholder groups [9,10]. The food industry noticed a growth of CSR

initiatives [11], and as a result, we experience new forms of CSR communication through different social media platforms [12]. It results in higher awareness of potential consumers that could be interested in CSR food companies initiatives [13].

The research aimed to assess the relationship between CSR reports and the financial achievements of food industry companies. The research period covered the years 2009–2020 when the reports were published. The study concerns recommendations for stakeholders. The conducted study contributes to the current state of the art concerning the CSR relationship with companies' financial performance among specific food sector international analyses. The contribution of the study concerns filling the gap of companies' food industry characteristics that impact on the CSR strategy construct. The study is based on stakeholder theory that approaches bigger firms that are listed on the stock exchange. Two research questions were addressed in the study:

RQ1: Is there a difference among companies' financial performance (Return on Assets (ROA), Return on Equity (ROE), dividend payout ratio, Price-to-earnings ratio (P/E), and market capitalization) according to declare in CSR reports activities?

RQ2: Which financial performance measures have a positive relation with CSR company's activities?

This paper is organized as follows. The literature review reveals issues related to CSR engagement and financial performance. Next, the methods and sample characteristics are explained and followed by the research results. Subsequently, the discussion, conclusions, and limitations of the study, as well as future directions, are presented.

2. Literature Review

2.1. Company Social Responsibility Role in Business

The concept of Corporate Social Responsibility (CSR) is widely discussed in the literature and business practices. It covers many different aims to support companies' activities. Shelton proposed the CSR concept in 1924; then, it was later developed in 1950 by Bowen by following significant value for society. From 1970, the CSR scope of research was expanded in many fields. CSR is a way of running a business taking into account specific spheres of the company's influence such as the social and ecological spheres. CSR goes beyond the direct business interests of the company and legal regulations, pointing to the voluntary nature of the initiatives taken. The development of the CSR idea refers to Freeman's theory, according to which the company's activity is influenced by many stakeholders, such as shareholders, employees, residents forming the local community, authorities, suppliers, clients, or investors [14].

The main benefits are related to improving the image and relations with the environment by CSR practices that ensure the acceptance of stakeholders and weaken the negative consequences of possible future crises situations. Socially engaged enterprises attract investors who perceive these entities as more stable and reliable, guaranteeing investment security, which contributes to an increase in the prices of their shares. A strong financial position on stock leads to greater companies' investment expenses in aspects of CSR [15]. On the other hand, CSR activities are sometimes perceived as superficial measures inconsistent with the company's strategy. The second point of view underlines that CSR is no longer an arbitrary choice of a company. It becomes an essential requirement for the food industry [16]. However, CSR practices are often perceived as an obligation only of profitable companies [17], even though researchers noticed that CSR engagement is not based merely on financial performance [18]; however, it still creates the ground of capital access for it.

2.2. CSR Reporting as a Channel for Information Sharing

Financial statements and financial reports do not contain information about CSR activities; a dedicated CSR report can make stakeholders more aware [19]. Companies that properly communicate their socially responsible activities achieve higher prices on the financial market [20]. However, CSR activity can be differently assessed in different financial markets due to less developed information

channels [21] and institutional surroundings [22]. From the practice perspective, the information sharing through CSR could be divided into four main areas: reporting, accounting, CSR versus financial results, and impact of CSR strategy on company value.

As a form of reporting by a company, a social responsibility strategy is mostly motivated by the practice adopted among the leading competitors [23]. Another factor that determines the CSR activities are related to the company size, stakeholders' requirements, industry trends, or geographical area [23]. The impact of CSR reporting on financial performance is related to the implementation of the fundamental aim related to profits maximization or market-share increase. The results of the research in the literature do not recognize the reporting of social responsibility as a positive or negative determinant of company financial performance. It is mostly due to the higher cost that could lead temporarily to a competitive disadvantage [24,25]. Thus, the urgent issue for the food industry is the creation of a strategy that will allow companies to fulfill the CSR to society and keep the reducing cost trend due to better work efficiency [26].

The other side of research underlines the benefits that the company can compensate with higher productivity due to better quality of work [27,28]. The effects of CSR activities may bring noticeable results in the form of increased sales, improved functioning of the company, or enhanced image of the company and its products, as well as greater satisfaction for employees and their families. The creation of a CSR company image in the community is increasing employee morale [29]. Showing CSR in annual reports could result in high returns on assets, equity, and earnings per share [30]. CSR company activities signal the organizational attractiveness of a company for potential job-seekers [31].

Client satisfaction is one of the leading factors of CSR implementation and development. Another aspect of the issue is related to providing reliable information about products or services that are offered by the company. Thus, CSR activities appear to make a positive impact on customer satisfaction and company value [32]. However, this effect could be visible in the long-run perspective [33]. CSR practices of companies in the food sector could affect market visibility and positively impact financial results. CRS reporting is also helpful for stakeholders to evaluate the companies' activities and could become a part of a business strategy. The CSR concept and regulation are more applied in developed economies [29].

2.3. CSR Reporting and Financial Performance

The interlinkages between finance and CSR from a microeconomic side are influenced by the impact of stakeholder and responsible investment that could create corporate behavior [34]. The financial performance of the company affects the social, ethical, and environmental behavior of the firm. Thus, financial performance is broadly constructed in CSR research. Financial performance is defined in CSR as recognized benefits according to increased revenue, profit, and growth rates [35]. The commonly used company financial performance (CFP) indicators are mostly grouped into three areas: accounting-based (ROA, ROE, Return on sale (ROS), net operating income, net income), market-based (stock returns, market value, change in stock return) and mixed: both accounting and market-based (Tobin's Q and market value-added measure) [36].

Most of the research is based on companies' membership in the CSR index [37]. Another approach is related to specific indexes such as the KLD index, which is based on eight areas of company performance that present the multidimensions of CSR activity recognition. More and more research is associated with the CSR evaluation framework based on a higher number of different CSR dimensions [38] to underline the broad range of CRS practices. Elsayed and Paton developed this direction of research and distinguished the multiple-indicators, multiple-causes (MIMIC) model [39]. Other analyses are based on CSR content analysis and questionnaire surveys. This method includes researchers self-selecting the CSR dimensions [36].

In the short term, CSR expenses may have a negative impact on financial results due to the delay in the benefits of the implemented activities over time. According to Karnani, CSR activities increase costs without maintaining the corresponding benefits [40]. However, the relation between CSR and financial

performance could be mutually beneficial as well as complex. Thus, better financial determinants of CSR investment understanding is important [41].

A positive relationship between CSR and the company's financial results is evident in many studies [41–46]. The relations of CFP and CSR were also assessed as positive by Rogers, Choy, and Guiral [47], as they include the company's innovation effort. Oeyono, Samy, and Bampton found a positive relationship between CSR and profitability in the case of companies from emerging markets, which reveals that the reporting of social activities brings benefits [48]. The meta-analysis conducted by Wang, Dou, and Jia underlines that the effect size of the CSR–CFP relationship is positive and significant. This relation is stronger for companies from advanced economies than for firms from developing economies [49]. Wang, Choi, and Li noticed an inverted U-shaped relationship between CSR and CFP, which supports the idea of an optimal level of CSR company engagement [50].

The difference among conducted studies is related to companies' investment in intangible assets [4,47,51]. Another side of the problem is the size of the company's CSR commitment. Low social commitment has a positive effect on the financial consequences of companies in the short term [52]. Many studies results declare no direct link between corporate responsibility and financial performance [53].

2.4. Corporate Social Responsibility Disclosure

Corporate Social Responsibility Disclosure (CSRD) is the practice of presenting disclosures of company corporate social responsibility. These disclosures are related to annual reports, the main part of which is the financial statements of companies, or to separate CSR reports, such as social reports, sustainable development reports, corporate responsibility reports, sustainable and responsible business reports, or integrated reports. Corporate disclosure helps spread information among stakeholders and investors on the capital market, and it also supports the evaluation of other measures [54].

From the information asymmetry perspective, institutional investors may prefer companies that report their CSR activities broadly. CSR reduces the uncertainty of companies' future cash flows and explores business opportunities [22]. However, stakeholder relationships and agency conflicts differ between industries [22]. Thus, the information asymmetry will not be a direct issue of the conducted study due to the analysis of one sector. The previous research reveals that the relationship between CSR and dividend policy is statistically significant [55] due to dividend playing a substantial role as a signal for investors [56]. Positive relations between CSR and financial performance are related to consumer interference, which suggests that the company is responsible for its product and services. In addition, the signaling theory supports positive relations by reducing information asymmetry. Social identity theory also impacts this relation. Thus, the consumer is more interested in identifying themself with socially responsible companies [57]. This identification encourages positive evaluations of a company product [58] and increases the consumer's loyalty and satisfaction [6].

3. Materials, Methods, and Sample

3.1. Material

The study uses firm-level panel data. The sample consists of companies from the Thomson Reuters Food and Beverages index, which includes the biggest companies in the world. This index consists of companies according to weighted market capitalization. This selection contains companies that are more prone to realized CSR strategy; thus, they are operating globally. Bigger companies with high capital intensity emphasize greater product differentiation, operate in high growth markets, and are more prone to invest in CSR [35]. The research period covered the years 2009–2020. We use a two-step level of selecting the data to enhance the data quality. In the first step, we select companies from the Food and Beverage Index and in the second step, we erase all duplicate records and those without any financial measures. The minimal number of records for each company was two years and a maximum of 12 years. The investigated period was limited by a number of observations that enabled the establishment of a logit panel model. The study was conducted among 50 European countries

of a sample of 448 companies and 4493 observations. The following countries were representing investigated companies: Argentina (1), Australia (18), Austria (1), Belgium (3), Brazil (9), Canada (11), Cayman Islands (1), Chile (5), China (15), Czech Republic (2), Denmark (5), Egypt (3), Faroe Islands (1), Finland (3), France (5), Germany (1), Hong Kong (13), India (26), Indonesia (17), Ireland (5), Israel (3), Italy (1), Japan (64), Jersey (1), Korea (29), Kuwait (1), Malaysia (22), Mexico (9), Morocco (2), Netherlands (3), New Zealand (7), Norway (8), Oman (1), Pakistan (2), Philippines (5), Qatar (2), Saudi Arabia (6), Singapore (7), South Africa (6), Spain (1), Sweden (8), Switzerland (8), Taiwan (13), Thailand (10), Turkey (3), Ukraine (1), United Arab Emirates (2), United Kingdom (12), United States of America (58), and Vietnam (8).

The conducted studies do not include the detailed structure of CSR reporting, but they assess the fact that this kind of report is being published. Two types of reports were considered: CSR Sustainability Reporting and CSR Sustainability Reporting Global Activities. In the case of the first type of report, only 28.1% of observations published it; for the second, it was 28.2%.

The sample was divided into two groups: non-CSR companies and CSR companies. We include the companies to the group according to CSR reports availability. A similar approach was adopted by Maggina et al. [59] and Dumitrescu and Simionescu [60]. The average age of the firm in the non-CSR group is 40, while in the CSR group, it is 47. Companies that operate longer are more determined to introduce CSR practices. It underlines the results of studies obtained by other researchers that older companies invest more in CSR [61,62]. Most (81.2%) of the companies were operating in the manufacturing sector.

3.2. Methods

In the study, the descriptive statistics show the characteristic of financial variables. The Mann–Whitney U-test application was made for the verification of CSR and a non-CSR group of companies. This test was used for investigating differences between the highlighted groups and relies on ranking the results of a dependent variable (one of five financial measures).

The financial performance of companies was assessed by five factors such as ROA, ROE, dividend payout ratio, P/E, and market capitalization. ROA (return on assets) was defined in a study as net income over total assets. ROA is positively correlated with the stock price; a higher ROA implies higher value creation for shareholders [57]. This measure was also used in the studies of Wang et al., Tang et al., and Iqbal et al. [50,63,64]. According to Galant and Cadez, this measure could be varied when different industries are compared [36]. This problem was eliminated in the study due to one industry analysis. ROA implies the profitability based on all assets that the company possesses, while ROE presents the improving of return for stakeholders; thus, it measures net income to total ordinary equity. ROA indicates how companies increase profits and ROE, which is using its capital [65]. This measure is often used in CSR and financial performance relationship recognition. The market value of the CSR companies was mostly investigated by the P/E ratio [44] and capitalization measure [35,59]. The dividend payout is one of the signals for investors about the company's financial situation. According to Benlemlihhe, the dividend policy is more stable for firms with a high CSR score [66]. Investment in CSR and expected dividends are related mostly due to the profitability channel [67]. Thus, in a different situation, companies can invest more in CSR and reduce the dividend payment, and vice versa. The adopted strategy may depend on the expectations of stakeholders

The next step of analysis concerns the qualitative approach that was used for this study using a logistic regression panel model with a binary dependent variable. We used as the dependent variable the binary variable CSR_{it}, which equals 1 if the i-th firm publishes a CSR report in the year t, and which equals zero when companies did not have this kind of report.

$$CSR = \begin{cases} 1 \; if \; CSR > 0 \\ 0 \; if \; CSR = 0 \end{cases} \quad (1)$$

The effects of CSR are noticeable in the long term. In a short time, the impact of individual projects or selected areas can be assessed. Thus, in the study, we include a one-year lagged value for financial measures the effect of CSR publication. The basic regression form of a binary-choice panel model is in Equation (2):

$$y_{it}^{*} = \beta x_{it} + c_i + \varepsilon_{it}, \quad (2)$$

where superscript i represents the i-th company,

t—denotes time ($t = 2009, \ldots, 2020$),

β—is the vector of K structural parameters $(Kx1)$,

ε_{it}—is the vector of disturbance term,

c_i—is the individual effects,

x_{it}—is the vector of explanatory variables, including the following series:

$$x_{it} = [ROA_{it}, ROE_{it}, DIVpayout_{it}, P/E_{it}, MartCap_{it},]'$$

4. Results

Table 1 demonstrates the descriptive statistics of financial performance measures in two groups of companies. Companies that report CSR practices notice a higher level of ROA and ROE. The higher difference in the average ROE (6.78 pp) may result from the fact that the CSR group includes larger, older, and more recognizable enterprises. Empirical findings show that companies that do not invest in CSR activities do not publish CSR reports, even though they have a higher P/E ratio. However, the variation of this measure in this group was very high. It could be related to companies that are already highly assessed by investors (high prices) and do not see a competitive advantage in CSR investment for further growth. It was also stated in Hartmann's research that CSR allows firms to differentiate and enhance food companies' competitiveness [68]. Kong also underlines the positive reaction of the investors on the financial market to the level of CSR in the food industry. According to his research results across food companies, CSR activities are an essential factor impacting investor investment decisions and thus affect the price and bring long-term benefits [69]. However, these companies are not the biggest one on the market. Companies from the CSR group noticed higher market capitalization, which is mostly explained by the fact this group includes enterprises operating globally.

Table 1. Descriptive statistics.

Variables	CSR.		Non-CSR	
	Mean	**Std. Dev.**	**Mean**	**Std. Dev.**
ROA (%)	6.89	6.92	6.45	9.78
ROE (%)	18.03	49.32	11.25	50.66
Dividend Payout Ratio (%)	52.81	125.45	82.88	1207.84
P/E	28.13	64.08	31.88	211.91
Mkt Cap (mln EUR)	7065.3	23,842.4	517.1	2713.5

The Mann–Whitney U-test results (Table 2) confirmed the significant differences between CSR and non-CSR companies with respect to ROA, ROE, P/E, and market capitalization. The more robust predictor of group difference was noticed for ROA, P/E, and market capitalization. The dividend payout ratio does not differentiate a group of CSR and non-CSR companies significantly. The dividend payment is more often met in companies with a high CSR score [66], which shows different strategies among CSR groups of companies. Thus, this measure is not a key factor for assessing the financial performance in the food industry. It is related to the disappearing dividend trend on capital markets [56].

Table 2. Mann–Whitney U-test results between Corporate Social Responsibility (CSR) and non-CSR companies.

Detailed	U	z-Value	*p*-Value	N_1	N_2
ROA	1,294,791	−5.6142	0.000000	2751	1066
ROE	1,403,554	−2.0536	0.040015	2751	1066
Dividend Payout Ratio	935,954	−0.0479	0.961832	1950	961
P/E	979,277	−9.2590	0.000000	2385	1026
Mkt Cap	687,852	−23.4090	0.000000	2546	1066

Source: Own elaboration based on Eikon Databased.

At the 5% significance level, we can confirm the significant positive influence of ROE and ROA as well as market capitalization on the explained variable (Table 3). Market capitalization and profitability measures reflect the size and position of the company in the industry. Current levels of dividend payout ratio and P/E do not have a significant influence on CSR involvement. Thus, the negative investor's markets responses that are visible in P/E are related more strongly with the food industry's current situation than CSR reporting. Moreover, in the case of the logit regression, we can also confirm a positive effect of profitability ROA and ROE on CSR engagement. The profit motivation of investors suggests that strength and more financially stable companies participate in CSR activities [69]. A negative relation was noticed in the case of P/E. This was due to the higher valuation of shares of companies from the non-CSR group; thus, in these companies, the motivation for CSR investment could be weaker.

Table 3. Estimation results for the logit Fixed Effect (FE) model.

Detailed	Conditional Fixed-Effects Logistic Regression	
	Coefficient	*p*-Value
ROA_{-1}	0.0095	0.0000
ROE_{-1}	0.0041	0.0000
Dividend Payout $ratio_{-1}$	−0.0001	0.2652
P/E_{-1}	−0.0056	0.8641
$MartCap_{-1}$	0.0001	0.0000
Number of observations	2432	
Number of groups	370	
Number of observations per group	min 2 max 12	

5. Discussion

The findings confirm the significant differences among CRS and non-CSR companies with respect to profitability (ROA and ROE), market capitalization, and price of shares. However, these assessments are based on the verification data of companies from 50 countries, and research results reveal two main contributors to CSR strategy. The first is firm characteristics such as profitability. In food companies, the leverage does not impact CSR engagement so strongly due to diverse access to debt capital. The firm-specific features in CSR contribution were mostly indicated by market capitalization, which relates to firm size. Large companies have more financial resources because of the economies of scale effect [70]. The main difference in engaging the companies in CSR activities was company size. The majority of companies that promote CSR activities were from a group of larger units [11]. A similar examination for one country could not conclude a similar conclusion for CSR engagement financial characteristics worldwide. For example, the study of the Bucharest Stock Exchange examination noticed no significant difference in financial performance between CSR companies and non-CSR companies [60]. Similar results were performed for food and beverage companies from Greece. Thus, in this study, even large companies due to the economic crises do not spend money on CSR actions. In addition, according to the study of Kurilets, CSR announcements of American food companies

do not have the impact of their stock return [71]. It was explained by the level of CSR activities attractiveness that could be evaluated by different stakeholder groups differently [72]. The lack of uniformity of research in assessing the financial situation and implementation of the CSR strategy was also confirmed by Becchetti et al. [73]. Roberts noticed a positive relation of profitability to CSR disclosure, based on the stakeholder theory of strategic management ground [74]. However, another perspective shows that less profitable companies tend to publish more information about CSR activities to gain investors' attention [75]. Berthelot et al. also confirmed this conclusion [76] and suggested that the publication of sustainability reports will benefit a company from a longer perspective.

The results suggest that CSR is affected by the efficiency of the company's financial performance (higher ROA and ROE belong to the more socially responsible firm) [65,77]. However, past studies explained that the food industry ignored the CSR due to the lack of short-term profit changes [16]. The long-term sustainable creation of shared value involves serving, supporting, and helping society directly as a good practice [78]. Food companies that implement the CSR strategy noticed lower risk measures that could be related to a larger group of stakeholders. Companies in the food industry that generate CSR strategies and CSR history are better prepared for crisis management [79].

The results do not underline the direction of impact financial performance of CSR implementation directly and conversely. The positive relation between CSR report publication and ROE was also noticed in other studies [80,81] as one of the factor that determines higher net income in the future. According to Conway, a positive and significant effect from CSR on ROE exists [59,64,81,82]. It underlines the issue that more profitable firms feel the obligation to invest in CSR [17]. The results of the study also confirmed that spending on CSR does not reduce the financial performance of food companies. Trihermanto and Nainggolan also noticed similar results [62]. In other studies, the impact of ROE on market value is essential and statistically significant in every sector [83], so it is not an industry characteristic directly.

The CSR activities could enhance income and put companies in a better position to pay (higher) dividends [67]. However, this situation did not occur in the research sample, which could be related to a small number of companies that regularly paid a dividend [84].

6. Conclusions

In a given company, the higher the values of profitability and market capitalization, the more prone the company is to invest in its CSR engagement. However, smaller and younger companies could not have this possibility due to lower profitability and a smaller scale of performance. The CSR strategy approach shows a long-term strategy that is being implemented by companies with a more grounded position in the market. Thus, the level of CSR involvement (or the only situation in which this strategy is realized) does not reduce company income.

Based on the research results, several gaps in the literature have been identified that need to be addressed. Every company has a different range of CSR practices and its commitment to it is also quite diverse. The limitations of the study concern the unbalanced panel data. The study is also limited by not having included the effect of the companies' investment in intangible assets.

Further research should be related to the level of economic development of the country and the financial market itself in terms of the importance of information asymmetry. This issue could concern the most effective channels for information sharing to achieve the most beneficial CSR practices that have an influence on company value.

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