Analysis of Selected Characteristics of e-Consumer Behavior of Czechs During the First Wave of the COVID-19 Pandemic

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Abstract The paper is devoted to the analysis of the selected aspects of e-consumer behavior. Specifically, to the application of innovative methods of evaluating customer interactions within the environment of the virtual social network Facebook. From the point of view of the actual implementation of presented research, the activity of customer tribes of the five largest e-commerce entities in the Czech virtual market was analyzed and evaluated. The data needed to process the analysis were collected during the first state of emergency declared in the Czech Republic in connection with the COVID-19 pandemic. Through the analysis of data on the interactions of customer groups in a highly non-standard situation, it was possible to outline specific patterns of consumer behavior, in particular the extent and nature of their interactions in B2C communication on the social network Facebook. From the findings we can deduce a shift in the timing of interactions towards the morning hours, which we consider both as an effect of working from home and as a deviation from the usual patterns of behavior. In our opinion, it is necessary to take both of these effects into account when planning marketing communication.

1   Introduction

Within the Internet and the World Wide Web, we can see that the entire industry has been undergoing significant development for more than three decades. Currently, due to the technological level of the market and changes in consumer behavior, even relatively small players have the opportunity to actively participate in e-commerce processes. At the beginning of our study, we would like to point out the basic terminology and basic concepts. The literature teaches us that doing business in traditional shops becomes online business (e-business), or electronic commerce (e-commerce) with the use of information and communication technology (ICT) tools. Mobile commerce (m-commerce), as part of e-commerce, allows consumers and users to use wireless handheld devices in which online commercial transactions can be made. This creates a huge number of business opportunities. (Hassan et al., 2018). Mobile commerce is electronic commerce using mobile devices such as smartphones. We know mobile trading in these two forms: mobile shopping via mobile web browsers and mobile shopping via mobile applications on a smartphone (Cheong & Mohammed-Baksh, 2019). Mobile commerce and m-commerce, respectively, have relatively quickly become an irreplaceable approach in various industries to meet the demands of technology-oriented customers from the N generation. However, consumer behavior preferences of m-commerce have not yet been examined it is only a borderline group of consumers in e-commerce and not unique consumers of services with different characteristics (Shin et al., 2018). For mobile retailers expecting cost savings and higher sales, customer retention should be the overriding goal (Chopdar & Balakrishnan, 2020). As part of new technological developments in e-commerce / mobile commerce and the widespread adoption of mobile devices and social media, organizations are able to improve customers' shopping experiences and brand interaction anytime, anywhere (Bilgihan et al., 2016). The new opportunities provided by social media allow consumers to engage in social interactions over the Internet, which provide and generate certain values for businesses and consumers. It can be seen that users use social media within their mobile phones, which is optimistic about the integration of m-commerce within social media (Hossain et al., 2020). The growth of m-commerce motivates a better understanding of building trust within the mobile device (Li & Yeh, 2010). Customer satisfaction expressed interactively through direct C2B communication and the subsequent ability of organizations

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to respond or directly demonstrate sensitivity to customer requirements is certainly an important factor in competitive advantage (Taha et al., 2013). Currently, e-commerce has to face a global problem, namely the COVID-19 pandemic. As for global economic damage, it can reach the level of 2 to 4 percent of world GDP (Luo & Tsang, 2020). It is assumed that the spread of the disease began in the Chinese city of Wuhan in December 2019 by consuming an unidentified animal (Wu & McGoogan, 2020) and despite the differences in numbers, the disease ends in death in a significant percentage of those infected. At the time of writing, it has been confirmed that more than 2 million people have died from the disease and that more than 100 million people have become infected (World Health Organization, 2020). How has the crisis affected the lives of individuals? Obviously, our habits had to adjust under the pressure of circumstances. Social distancing, limited mobility and various forms of lockdowns in economies have significantly changed the usual patterns of customer behavior. The subject of our research is the interactions of more than a million Czechs for the marketing communication of the five largest e-shops during the first spring lockdown. So, what did Facebook's customer interactions look like during the first spring lockdown caused by the COVID-19 pandemic? We will deal with the frequency of adding posts of individual e-shops during the lockdown period and the interaction of their customers in the form of likes, shares and comments on individual posts.

2   Theoretical background

Within the sale and purchase of goods and services through m-commerce, it is possible to monitor their constant growth. Maree et al. (2019) claim that within the number of m-commerce users, the number of users in Australia increased from 0.62 million users in December 2010 to 3.4 million users in December 2013, a percentage increase of 448%. As a result, organizations around the world accept the medium very quickly to reach their target customer groups. Thongpapanl et al. (2018) are of the opinion that m-commerce, despite potential growth, accounts for only a small part of the overall global e-commerce market. Rana et al. (2019) already claim that in the modern business era, m-commerce is changing the way we do business over the internet. However, they continue to say that the incidence of m-commerce between small and medium-sized enterprises (SMEs) within the UK is minimal. Cui et al. (2020) argue that cross-border m-commerce

(CBMC) has significant potential, but that few online organizations are involved in CBMC markets due to low buyer and seller acceptance. In addition, CBMC customers can switch between several different electronic marketplaces. Alduaij (2018) in a study conducted in Kuwait, based on a quantitative approach on a sample of 1,000 students, concluded that the decision to positively accept a given mobile business by consumers is influenced to a greater extent by key benefits than key obstacles. Key benefits of m-commerce include its speed, time savings, convenience, usefulness and practicality across all locations. Poor network coverage, slow connection and data transfer and, in addition to security risks, the invasion of privacy is considered to be key barriers to m-commerce. Heinze et al. (2017) argue that despite the assumption that mobile commerce will become another mega trend with an ever-increasing number of buyers, they have to face strong consumer resistance in some industries where they are trying to embrace this trend. Within the mobile trade, high numbers of early abandonment of the entire sales process are still reported. This is particularly the case for comprehensive services, such as insurance, and it is also particularly visible in the case of complex products, such as insurance, which is often examined online by consumers at first, but whose purchase is completed offline by consumers. This is because consumers can enjoy direct human contact in this way, which will ultimately help them better understand the product and reduce the risks involved. (Heinze & Matt, 2018) A long-standing sales tradition in this area with a network of banking advisors. brokers and agents have caused a perceived difference between an established and an emerging sales channel (Heinze et al., 2017). Hossain et al. (2020) found that the adoption of the digital payment method is influenced by the level of education of consumers, who, if they are proficient online, are more likely to use the digital payment regime. Through an electronic questionnaire survey, Wozniak and Zbuchea (2018) gathered the views of more than 450 Poles, Ukrainians and Romanians in three groups, analyzing the impact of various Internet experience measures on their decisions to disclose personal data when downloading paid or free mobile applications. For consumers who had more experience with the Internet, which was calculated by measuring the time of use of the Internet by consumers, the time of use of the smartphone by consumers and life in a country with a higher electronic readiness index, they found that within this group of consumers it is likely to they will not download a mobile application on their smartphone if they would have to provide some of their personally identifiable information to the application under the terms of the

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free download compared to consumers who had less experience with the Internet. Bilgihan et al. (2016) argue that a significant amount of potential revenue is lost globally due to the bad online customer experience, resulting in the failure to reach the full potential of e-commerce. Organizations should "hook" customers in e-commerce by providing them with an impressive online experience. Saidon and Musa (2017) found that the most important factor in creating digital experiential value among consumers is the entertainment factor. They also found that the least important factor is economic value. Yassierli et al. (2018) argue that there are also significant positive relationships between service quality, information quality, usability and user satisfaction and their intention to continue purchasing. Bilgihan et al. (2016) found that for a satisfied online customer it is important to easily locate the web or applications, their ease of use, their perceived usefulness, their hedonic and utilitarian functions, the perceived pleasure they bring, their personalization, the social interaction they bring have and their compatibility with multiple devices. Positive brand perception, positive WOM (Word of Mouth) and repeat purchases are the results of a positive online customer experience.

In the theoretical discussion, we pointed out the fact that e-commerce is increasingly an integral part of the core business, in the case of a large number of companies. As for the transition of the company to e-commerce, under standard conditions it is a long-term process, which is a long-term necessity for the company, but in most cases, it is not yet conditioned by the very existence of companies in the short term. But what in the event of a sudden collapse of much of the traditional B2C market? As part of the pandemic caused by the new coronavirus, a state of emergency was declared in the Czech Republic on 12th March 2020. It was a partial closure of the economy and its significant slowdown. In some cases, it was also a matter of blocking the traditional B2C market.

3   Objectives and methods

During the first of the COVID-19 lockdown, specific conditions were created in the market we monitored, these conditions created a model environment for research in almost every spectrum of science.

The first part of the paper presented the results of desk research in the field of e-commerce, the aim of which was to approach the theoretical basis of the analyzed problems.

The aim of the second part of the paper in the presented study will be to describe and evaluate selected activity indicators of more than one million customers of the five largest e-commerce entities operating in the Czech virtual market, ranked based on traffic to their websites in the journal E-Commerce Bridge for 2019 (E-Commerce Bridge, 2020). The duration of the research represented the period of the first lockdown announced in the Czech Republic during the state of emergency in the months of March to May 2020.

The research set consists of customers shopping in Czech e-shops. The research sample is made up of fans of the official profiles of the research subjects within the environment of the social network Facebook. It consists of 1,594,180 users.

From the point of view of recording data for subsequent analysis, in the period from 12th March to 17th May 2020, the activities of monitored business entities in the form of posts and parallel interactions of monitored customer groups on these posts were systematically recorded on a daily basis.

For the purposes of the analysis, it will further examine the nature and timing of interactions of individuals in the marketing communication of business entities in the form of Facebook posts. By post for this case, we will therefore understand the contribution of the dominant character of marketing communication, which will be published in the monitored period by the subject, resp. subject profile manager on the official profile of the monitored company. Forms of customer interactions / reactions will be as follows:

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- Like;
- Comment;
- Share.

As for the data collected, they will first be classified, then evaluated through descriptive statistics and finally interpreted graphically to illustrate key findings. Subsequently, the analysis procedure will be evaluated, as well as its achieved partial results relevant to the defined goal of the paper.

Within the study itself, space is created for the identification of possible patterns of customer behavior, which was identified on the basis of a sample of almost 1.6 million customers of the five largest e-commerce entities in the Czech Republic. With this contribution, the authors want to contribute to the shift of knowledge within the managerial and economic sciences, with the aim of creating a qualitative knowledge base within the needs of future in-depth research into the impact of the COVID-19 pandemic on the economy.

Taking into account all the facts and variables, the research question can be formulated as follows: "There is a change in the pattern of behavior in our chosen research group in the form of a change in the relative number of interactions compared to previously performed reference measurements."

4   Results and discussion

Within the specific situation, a model environment was created to examine the specifics of customer behavior. E-commerce brings companies many advantages compared to traditional forms of trading. Such benefits include, but are not limited to, real-time feedback. Unknown consumers become active followers, communicating with assertive feedback, their own dynamics, determining the value of companies through their attitudes towards it. In the context of this issue, the question arises: What effect does the "black swan" have in the form of the forced closure of the economy and the subsequent collapse of the traditional consumer market and supply chain on the interactions of these assertive and active followers?

Table 1 shows the basic indicators of e-activity of the monitored entities and their customer groups on the social network Facebook. Specifically, these were the Facebook profiles of the following entities: Alza.cz, Mall.cz, CZC.cz, Aukro.cz and Lidl Czech Republic.

Table 1: basic e-activity indicators

	No. of posts (n)	No. of likes (n)	No. of comments (n)	No. of shares (n)	No. of days (n)
SUM	689	349,315	479,541	72,904	67
Max	8	27,516	96,035	11,455	67
Min	0	0	0	0	67
Average	2	1,043	1,431	218	67
Modus	1	0	0	0	67
Median	2	109	30	4	67
Total fans 1,594,180					

source: own elaboration

From previous research (Pollák & Dorčák, 2017) presented in Figure 1, we know that users are most active in terms of like interactions in the time frame between 20:00-00:00, at the same time we know that between 12:00-16:00 they reach interactions in the form of shares a daily relative maximum. Interactions in the form of comments reach their maximum in the morning in the time frame 08:00-12:00. We considered it necessary to compare these findings with the values measured by us. Let's take a closer look at the following visualization of interactions during the reference day model and the model day during the COVID-19 pandemic lockdown:
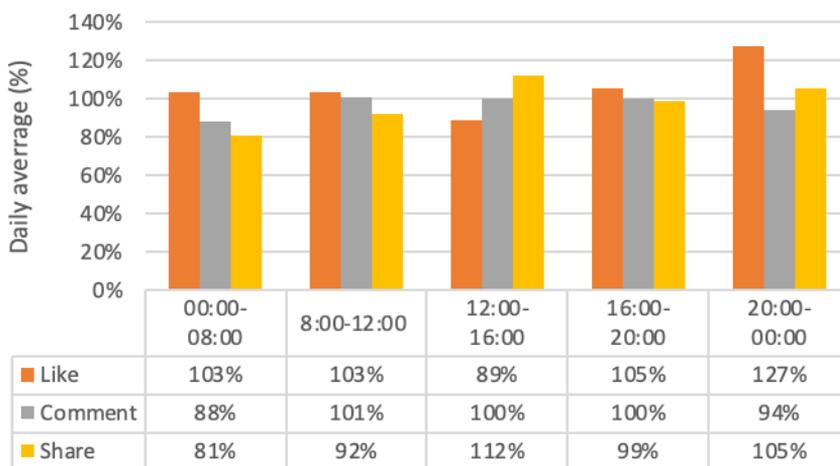
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Figure 1: Interactions - Model Day (reference research)
Source: (Pollák & Dorčák, 2017)

	00:00-08:00	8:00-12:00	12:00-16:00	16:00-20:00	20:00-00:00
■ Like	103%	103%	89%	105%	127%
■ Comment	88%	101%	100%	100%	94%
■ Share	81%	92%	112%	99%	105%

Based on data from the reference research, we can compare the data with the data measured during the lockdown caused by the pandemic, as there are presented in subsequent Figure 2.
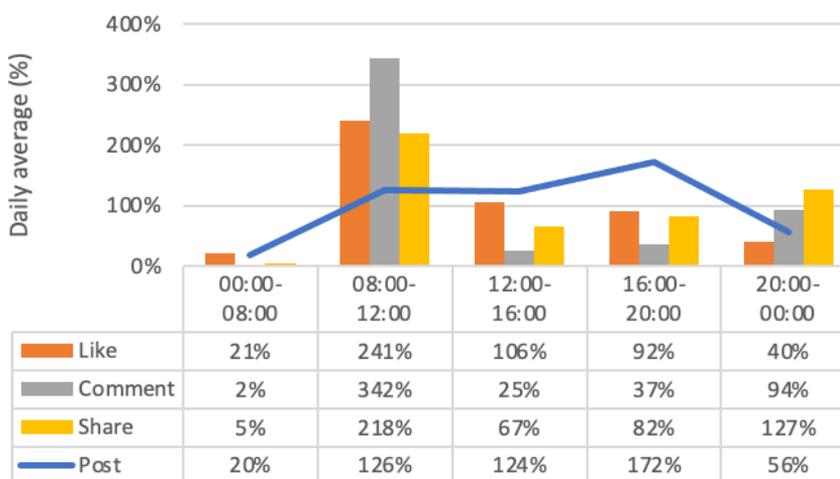

	00:00-08:00	08:00-12:00	12:00-16:00	16:00-20:00	20:00-00:00
■ Like	21%	241%	106%	92%	40%
■ Comment	2%	342%	25%	37%	94%
■ Share	5%	218%	67%	82%	127%
— Post	20%	126%	124%	172%	56%

Figure 2: Interactions - Model Day during COVID-19 lockdown
Source: (Pollák, Dorčák, 2017)

During the monitored period of 67 days, 821,462 user interactions were recorded within 689 published contributions on the profiles of the surveyed e-commerce entities. From the point of view of the total number of fans of Facebook profiles of the given subjects, it can be stated that these are relatively active groups.

Based on the obtained data, we can formulate the answer to the research question as follows:

In the research set analyzed by us, there is a change in patterns of behavior in two of the three parameters:

- in particular, the highest daily relative frequencies of shares are achieved by posts / contributions published in the time frame 08:00-12:00, compared to the reference time frame 12:00-16:00;
- the highest daily relative abundances in terms of likes are achieved by posts / contributions published in the time frame 08:00-12:00, compared to the reference time frame 20:00-00:00;
- from the point of view of daily relative frequencies of comments, the time frame remains unchanged, posts / contributions published in the time frame 08:00-12:00 reach their daily relative maximum frequencies in both cases.

Thus, we can state that during the pandemic, user activity in the form of selected interactions shifted to the morning. The maxima for the simplest interactions in the form of likes, but also for more complex interactions in the form of shares, are moved from contributions published during the evening to contributions published in the morning.

5   Conclusions

Within our research set, interactions are predominantly recorded in posts published during the morning, so with a certain degree of abstraction we can state that this happens during standard working hours. We also noticed a jump in maxima of all monitored types of interactions during the pandemic, which may indicate increased activity of customers on social networks. We have no answer as to the impact of the introduction of a home office for a significant percentage

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of the population on this indicator. At least not with an adequate degree of accuracy. We did not have enough empirical material to examine this question. Again, however, we can say that with a degree of abstraction, we are inclined to the possibility that the home office may have had an adverse effect on maintaining attention and labor productivity during the working day during the lockdown of the economy. In our opinion, it is necessary to adapt the hitherto customary formulas to these changes, which are taken into account in the planning and implementation of marketing communication from the perspective of business entities, as well as better delegation of work (and control) by employers. Only by actively adapting to changing market approaches can entities maximize their competitive advantage.

From the point of view of the limitations of our research, we can state that we worked with a limited sample of e-commerce entities within the research. Also, the reference framework of data used to compare the indicators of user activity was developed for entities with lower order of user bases. Seasonality was also not taken into account in the research. To confirm our findings, it is therefore necessary to carry out continuous research on the issue. In view of the above, the findings formulated by us are of a dominant qualitative nature.

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