



A STUDY ON IMPACT OF THE COVID-19 PANDEMIC ON ONLINE CONSUMER BUYING BEHAVIOUR WITH SPECIAL REFERENCE TO CHENNAI CITY

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Abstract

With the spread of the COVID-19 pandemic and the increasing importance of e-commerce, the study of online consumer behavior is of particular relevance. The purpose of this study was to form a methodological approach to assess the relationships and the level of influence of the factors activating the purchasing behavior of online consumers against the background of the COVID-19 pandemic. The research methodology was based on the transformation of Cattell's questionnaire and the implementation of correlation analysis. To determine the predisposition of online consumer behavior at the time of making a purchase decision, this study used the questionnaire method. The survey was conducted among online shoppers in the top 10 countries in terms of e-commerce market growth. The scientific contribution is the proposed methodological toolkit to assess the purchasing behavior of online consumers, which identifies the most influential factors in their purchasing behavior and provides an opportunity to assess the dynamics of their activity during the study period, to identify key trends and determine changes in their behavior. The research revealed what changes in online consumer buying behavior are typical in the COVID-19 pandemic. The impact of consumer awareness and experience has increased. Online consumers have become more experienced, which has influenced the activity of their buying behavior. This study proved the shifting influence of online consumer purchasing behavior factors during the pandemic. The increasing importance of the speed of decision making by consumers when purchasing goods and services online was determined.

Keywords: behavior; correlation; e-commerce; multi-factor analysis; online shopper; pandemic; reflexive characteristics

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1. Introduction

The global economy in general and international trade in particular have suffered and continue to suffer massive losses from the coronavirus pandemic. The uncertainty in which businesses and end consumers found themselves immersed is further aggravated by multiple factors. Those include income decline, cross-border travel restrictions, shift-ing consumer demand, and the changing behavior of market actors, to name a few [1]. Global lockdown, social distancing, and other measures introduced to limit the spread of the COVID-19 pandemic have urged consumers to purchase more on the online marketplace [2]. The business landscape faced rapid transformations during the quarantine period as a result. Ultimately, the corona crisis accelerated the development of digital commerce. Globally, a new digitally immersed consumer has emerged, a more selective one, with financial difficulties.

Income losses, limited transport opportunities, and pandemic mitigation measures, which caused the reduction of supplier activities, have forced B2B manufacturers and sellers to reduce production and marketing costs, find new suppliers both abroad and within the country, and accelerate decision making. National companies received opportunities to diversify their product portfolio for the purposes of import substitution and to supply other firms and branches of foreign companies with necessary resources [3,4]. B2C markets, on the other hand, encountered a decline in purchasing power and cross-border mobility. On top of that, consumers shifted toward health and safety while maintaining a preference for inexpensive goods and services [5]. Products that bring comfort and a sense of coziness to a living space received more attention than they normally would. Overall, the uncertainty and unpredictability of the situation made consumers postpone some of their demands [6]. The industrial market and consumer market both faced a need to accelerate digitalization and make it easy to find and purchase items online [7,8]. The pandemic sparked a meteoric rise in online sales. As visits to physical stores were restricted, and many were running low on money, consumers went online to shop, causing online purchases to grow higher and higher [9]. Consumers were generally mindful shoppers even before the pandemic [10]. Because of this, some shopping categories such as experiences were gradually downgraded on their priority lists, and COVID-19 accelerated things in this direction [11]. The COVID-19 pandemic has affected the lifestyles and motivations of many people, such that their purchasing behaviors also changed.

The present study seeks to assess these changes. In achieving this goal, the study determined the impact of the pandemic on e-commerce across industries to identify the priorities of online consumers. It also identified the most important factors influencing online consumers' shopping behavior based on a multi-stage survey as the pandemic spread. Based on the correlation analysis the presence of relationships between the studied factors and the complex indicator of activation of online consumer behavior was determined, the direction of their changes against the background of the pandemic was investigated.

This study aims to test the proposed approach to assessing the purchasing behavior of online consumers, which can contribute to the identification of trends and patterns of online shopping. Therefore, it can be a component of a comprehensive toolkit in the design of e-commerce strategy, used both at the state level and for individual companies.

The structure of the study includes an introduction, a literature review that points to the increasing scientific interest in e-commerce issues during the pandemic, a methodology describing the proposed approach, the results, their discussion, and conclusions.

Literature Review

By 2022, the number of e-commerce publications had almost tripled compared to 2000. At the same time, it increased 1.4 times over the past year. This tendency indicates a rise in academic interest toward e-commerce during the COVID-19 period.

Seven clusters were found through the analysis of e-commerce

These clusters are distributed as follows:

Cluster 1 (shown in red) is the largest and encompasses 307 items, which appear fewer than 5 times in the studied papers. Scholars have paid considerable attention to issues associated with Internet advancement, concentrating in particular on security. The red cluster is related to business models and strategies, business process optimization and management, competitiveness, legislative regulation, possible barriers and risk assessment, technological readiness, etc.

Cluster 2 (green, 57 items) embraces the interests in consumer satisfaction, policy communication, data protection, and related issues. Particular attention is devoted to marketing, in particular B2B (business-to-business) and B2C (business-to-consumer) initiatives.

As most consumers were forced to eat at home during the lockdown period, the food and beverage industry saw an increase in online sales. With many online shoppers reporting a decline in income

[22], it is no surprise that affordable brands were more preferred at that point [23]. If earlier a consumer basket included a wide range of goods and services, then during the pandemic the focus was on essential items, medication, antiseptics and disinfectants, delivery services, etc. [24]. Shopping patterns specific to the holiday season also underwent substantial changes. An average budget for holiday shopping was smaller during the pandemic as compared with previous years, and many shoppers (nearly all generations) turned to contactless shopping [25]. The basic purchasing criteria remained the price, availability, and convenience, and a new criterion has emerged—hygiene [26]. Along with the growth of food sales, the pandemic saw an increase in the sales of medical supplies, children's products, sporting items, and entertainment goods [27]. The percentage of spontaneous purchases decreased, and the percentage of planned purchases increased [28]. The rationalization of shopping behavior during the pandemic encouraged most companies to rethink their business strategies and consider a new situational driver of procurement to retain and attract new customers [29].

Consumer behavior was influenced both by the COVID-19 pandemic itself and by government restrictions. Consumers of all generations during the COVID-19 crisis were more likely to buy goods and services digitally [30]. Overall, there was a significant shift toward e-commerce spending. The frequency of shopping also increased [31]. Factors that drive online consumer behavior during the COVID-19 pandemic include strong and sustained growth in the number of Internet users and increased awareness of online shopping, increasingly active online product releases, low prices due to bulk purchases, etc. [32]. The COVID-19 pandemic, social distancing, and staying at home are expected to push consumers to shop online. However, uncertain consumer demand and supply chain issues could affect the e-commerce industry. The COVID-19 pandemic issue may also affect large merchants, who are experiencing a decrease in casual shopping, supply chain disruption, and increased purchases of essential hygiene and disinfection products, groceries, and other products [33].

Considering the changes in consumer behavior caused by COVID-19, marketing research in this area has also undergone changes. More and more marketing research on consumer behavior is taking place online (online questionnaires, call center surveys, and focus groups conducted via video conferencing or telephone conversations). Entrepreneurs had to adapt quickly and find innovative ways to interact with customers [34]. Although the situation has been unpredictable, and

decisions are not always easy to make, the current changes themselves cannot be called fundamentally new. Real-time analysis of changing consumer behavior, integration of online and offline channels, automation, flexibility, and attention to community values have all been discussed before. The pandemic simply resulted in the increased scientific interest in these activities. In the new world, the role of online analytics increases significantly: total quarantine is reflected in user behavior. Without understanding what exactly has changed, companies cannot plan their future actions [35]. This applies to both marketing and sales in general. Whatever the world, the new kinds of research, methods and technologies learned during the pandemic are not temporary but are being confidently implemented and opening up a new space for managing online consumer behavior.

Companies must focus on the digital capabilities of their consumers and clearly identify where they need to gain their trust [36]. Each of the trends above has accelerated significantly with the onset of the pandemic. As research shows, the cumulative impact of the pandemic on consumer behavior has significant implications for business. Companies can no longer defend their pricing policies with factors that no longer have a benefit and are not crucial to a consumer in the new reality [37].

Despite the variety of studies on online shoppers and their preferences, the factors that influence purchasing behavior remain insufficiently understood. The reviewed studies are quite multidirectional, focused on individual components of online consumer behavior. Therefore, there is a need to develop a comprehensive approach that will simultaneously consider the level of electronic instability, the commitment of an individual to introversion, adaptability to online shopping, the availability of appropriate consumer experience, as well as the speed of decision making. The presence of this knowledge gap necessitates a deep comprehensive exploration of online purchasing behavior in unstable pandemic conditions with respect to its key drivers. The purpose of this study is to develop a composite measure of online purchasing behavior amid the COVID-19 pandemic based on its drivers and use it to examine the effect COVID-19 had on the purchasing behavior of online consumers. In the process of achieving this goal, the following hypotheses were formed:

Hypothesis 1 (H1). Online consumer behavior in the face of the COVID-19 pandemic focuses on an individual's commitment to introversion.

Hypothesis 2 (H2). The behavior of online consumers against the background of the COVID-19 pandemic becomes dependent on their experience and decision-making speed.

2. Materials and Methods

Factors selected for inclusion in the Composite Index of Online Purchasing Behavior (K^{1-Q}) are qualities of a reflexive consumer deduced from Cattell's personality profile. These include (1) Constancy of Online Purchasing Behavior, INI^{1-Q} ; (2) Introversion, CNI^{1-Q} ; (3) Adaptiveness, ANI^{1-Q} ; (4) Consumer Awareness & Experience, $CENI^{1-Q}$; and (5) Promptness in Decision Making, $CENI^{1-Q}$. An increase in the value of the Composite Index will indicate that shoppers became more active online.

The present study exploits the questionnaire method to measure reflexive personality traits. The survey was conducted among online shoppers in the top 10 fastest growing e-commerce countries, namely, China, the United States, the United Kingdom, Japan, Germany, France, South Korea, Canada, Russia, and Brazil. It was conducted in 2020 and repeated 4 times during the said period. The initial survey took place in the first 10 days of June and then was repeated in August, October, and December.

Participants (online consumers) were recruited 1.

by invitation through online marketplaces. Invitations were sent to individuals who added at least one product to their shopping carts for purchase. All recruits who agreed to participate in the survey were redirected to Google Forms. The initial sample included 4112 online shoppers. However, some respondents did not reach the final survey, which took place in December. Those who failed to answer all questions clearly were also excluded from the analysis. The final sample thus included 3042 online shoppers.

To enable the extrapolation of survey results to the general population, it is necessary to make sure that the given sample is representative of the entire population. The general information about respondents (e.g., sex, age, place of residence, marital status, number of children, clickstream information, etc.) was gathered with their consent by using analytics services and from customer databases.

where: n is the required sample size; N is the general population; Z is the coefficient chosen based on the confidence level used (for CI 95%, $z = 1.96$); p is the proportion of respondents with the studied characteristic (typically, 50%); $q = 1 - p$ is the proportion of respondents without the studied characteristic; ∂ is the margin of error (typically, 5%).

The raw data from both questionnaires were then normalized so that all values were within the range of 0 and

Table 1. Characteristics of the factors used in the adapted questionnaire.

No.	Factor	Characteristics
1	A	openness to online shopping
2	B	the ability to make meaningful purchases
3	C	emotional stability
4	E	independence in purchasing decisions
5	F	impulsiveness to buy online
6	G	conscientious decision making
7	H	taking the risk when shopping online
8	I	the presence of aesthetic needs
9	L	buyer's gullibility when buying online
10	M	practicality of online shopping
11	N	refinement of taste in choosing goods online
12	O	uncertainty when buying online
13	Q1	a tendency to experiment and innovate
14	Q2	the desire for independent decisions and actions

Table 1. Cont.

No.	Factor	Characteristics
15	Q3	self-control and discipline in online shopping
16	Q4	internal tension when shopping online
17	MD	adequacy of the assessment of one's capabilities

Source: formed by the authors based on [47].

The questionnaire had 6–7 items per factor and a three-choice response format (a, b, or c). Each item was scored as 0, 1 or 2. The primary factor scores (Table 2) defined the overall level of reflexive personality factors and were converted to standard ten (sten) scores using

The algorithm for interpreting the results of the survey to determine the evaluation of external factors of a particular surveyed online consumer H^{1-Q} corresponded to the survey on the definition of external factors:

1. Decision-making speed $CENI^{1-Q}$ was calculated from the scores of answers to questions 1–2 and normalized to the value $CENI^{1-Q}$.
2. Level of consumer awareness/experience DVI^{1-Q} was calculated from the scores of the answers to questions 3–4 and normalized to the value DVI^{1-Q} .

An External Influence Questionnaire was used to determine factors behind the feeling of mispurchase (Table 4). The approval answer choice (Yes) was ranked as a 1 and the anti-approval answer choice (No) was ranked as a 0. Hence, each factor could score within the range of 0 and 2.

The value of the Constancy of Online Purchasing Behavior (INI^{1-Q}) depended on Factor C (Emotional Stability) from the conversion table (Table 2). The level of Introversion (CNI^{1-Q}) was associated with Factor F1, expressed below:

Adaptiveness (ANI^{1-Q}) was defined by Factor F4, which can be determined using the following formula:

$$F4 = \{(4E + 3M + 4Q1 + 4Q4) - (3A + 2G)\} : 10.$$

Promptness in Decision making ($CENI^{1-Q}$) was defined by responses to questions 1 and 2 in the External Influence survey (Table 3). Finally, the Consumer Awareness and Experience (DVI^{1-Q}) was defined by responses to questions 3 and 4 in the External Influence survey. These two factors were then normalized using Formula (2). The computation and compilation of data can be

performed manually or by using software applications. In this study, data processing was conducted in MS Excel

3. Results

The COVID-19-induced economic crisis has become a powerful trigger event that fueled business digitalization. Tight quarantine restrictions prioritized the primary benefits of e-commerce, such as contactlessness, better pricing, portability, and scalability. The high penetration of social media and digital marketing provided companies with additional advantages when finding and attracting new customers at global, national, and local levels. At the same time, they offered clear opportunities for significant reduction of operational costs by removing the need to invest in real estate or hire many employees. The current trends in e-commerce revolve around convenience and security.

Globally, the COVID-19 pandemic has driven consumers to digitalization and re-shaped their shopping habits. The massive shift online of people's shopping behaviors has affected all e-commerce subsectors. Figure 2 shows estimates of the effect COVID-19 had on e-commerce traffic by industry. The travel industry was the hardest hit. Travel service companies encountered a 43.7% decrease in traffic, while other industries suffered smaller losses. Media companies experienced an estimated loss of 13.2%, and the fashion industry faced a 10.3% drop in traffic. Even retailers of jewelry and watch brands, luxury goods, and household items saw a better traffic situation, with losses of 8.2, 3.2, and 3.1%, respectively. Supermarkets, on the other hand, enjoyed a 34.4% rise in web traffic. At the same time, Internet users became more interested in sports equipment, retail services, beauty products and cosmetics, and financial services, with an estimated per cent change of 23.6, 7, 3.7 and 1.8, respectively.

Table 6. Correlation of the studied indicators during 2021.

Dependent Variable	Period	INI	CNI	ANI	CENI	DVI
	June	0.496	0.623	0.367	0.639	0.339
Composite Index of Online Purchasing	August	0.473	0.562	0.474	0.727	0.694

Behavior	October	0.588	0.677	0.610	0.802	0.754
	December	0.596	0.720	0.659	0.914	0.800

Source: developed by the authors.

Thus, considering the results obtained for the studied period of the COVID-19 pandemic spread, we can state that the first hypothesis must be rejected. In summary, the leading factor influencing the purchasing behavior of online shoppers shifted over the second half of 2020 from Introversion toward Consumer Awareness and Experience. The second hypothesis is

accepted because it was proven that the behavior of online consumers against the background of the pandemic became dependent on their experience and speed of decision making. As customers' experience grew, the role of Promptness in Decision Making increased, and online shoppers became more active and faster when deciding what to buy.