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Investigating How COVID-19 Affects Consumers' Online Shopping Habits

Krish Gundarania
Dept. of Computer Engineering, Devang Patel Institute of Advance Technology and Research, CHARUSAT, Anand-388421, India

Abstract: ***The study of online consumer behavior is especially pertinent today given the development of the COVID-19 epidemic and the growing significance of e-commerce. The goal of this study was to provide a systematic framework for evaluating the linkages and degree of influence of the elements influencing online consumers' purchase behavior against the backdrop of the COVID-19 epidemic. The Cattell questionnaire was modified, and correlation analysis was used, as the foundation of the research approach. This study employed the questionnaire approach to ascertain the tendency of online consumer behavior at the moment of making a purchase choice. The proposed methodological toolkit to assess online consumers' purchasing behavior is the scientific contribution; it identifies the most important variables that affect this behavior and offers a chance to evaluate the dynamics of their activity over the course of the study, to spot important trends and assess behavioral changes. The study identified the expected alterations in online consumer purchasing patterns during the COVID-19 epidemic. Consumer experience and awareness have a bigger impact now. Consumers who shop online are now more seasoned, which has changed the activity of their purchasing habit. This study demonstrated the shifting impact of pandemic-related online consumer purchasing behavior determinants. When making online purchases of products and services, consumers' decision-making speed is becoming more and more crucial.***

I. INTRODUCTION

The entire planet has been forced to change since the Covid-19 breakout. The coronavirus has significantly altered the way we learn, work, shop, pay, and take care of ourselves. Social distance is now a common occurrence in many countries, which has had a variety of effects on the economy, healthcare system, and society at large. As an example, among other issues, schools have been forced to alter their teaching strategies, and businesses have been forced to close. The global Covid-19 pandemic has significantly impacted local economies and communities around the world, having an impact on various facets of society in various ways. This unusual situation has numerous effects on customers' day-to-day lives and fundamentally changes how companies and customers interact [1].

Global economies start to experience the effects of Covid-19's proliferation on an economic, social, and psychological level, which encourages the creation of new customs, ways of life, and technologies. A lot of people started shopping, talking, and carrying out work duties from home as a result of the advice to stay at home and preserve social distancing. Due to the closing of physical retail locations during these tumultuous economic times, we have seen an increase in temporary employment and unemployment. As a result, this circumstance has allowed internet retailers to flourish and draw in more customers than in past years [2, 3].

E-commerce has dominated during the Covid-19 pandemic, and shops have made significant investments in enhancing, advertising, or even developing their online websites in order to respond to the new environment. Retailers' efforts to adapt to the new situation have also resulted in additional activities such as increased social media promotion, encouragement of online shopping and the use of online shopping apps, discounts, and the launch of new promotion campaigns in response to the Covid-19 pandemic. These activities by retailers have led to an increase in online shopping among consumers during the Covid-19 pandemic [4].

Consumers have been looking for alternate methods of acquiring goods and services in order to safeguard themselves and their families from contracting the coronavirus. Online shopping emerged as the most significant substitution, and while it was already a significant alternative before the epidemic, it now plays an even larger part in our daily life [5].

To allay customer fears during a pandemic, several internet shopping companies can employ safety measures to make sure that products are not possibly tainted with viruses. Online retailers advertise these measures on social media platforms so that customers are aware of them and may make purchases without worry. Because of this, the vast majority of internet businesses try to follow World Health Organization (WHO) recommendations. They are buying in terms of Covid-19 infection to allay the worries of their clients regarding the security of the goods [6].

The objectives of the current study are to evaluate these changes. In order to accomplish this, the study assessed how the pandemic affected e-commerce across businesses in order to discover the priorities of online shoppers. As the pandemic progressed, it also determined the key elements impacting online shoppers' purchasing decisions via a multi-stage survey. The direction of their alterations against the backdrop of the pandemic was analyzed based on the presence of correlations between the studied elements and the complex indicator of activation of online consumer activity. The purpose of this study is to evaluate the suggested method for analyzing online shoppers' spending patterns in order to help identify trends and patterns. As a result, it can be a part of a comprehensive toolkit used to build an e-commerce strategy for both individual businesses and states [7].

II. LITERATURE REVIEW

According to Kumar & Maan (2014), the introduction of the Internet has had a significant impact on people's lives by gradually shifting people's daily activities from physical to virtual worlds. The way that people shop has changed as these changes have become more apparent. Several decades later, the Internet is still crucial to how consumers conduct their purchasing. Online shopping is the term used to describe consumer purchases made via the Internet [8].

To gain a competitive edge, maintain and attract new consumers, and retain existing customers in the market, businesses need to understand the factors that influence consumer purchase behavior. By understanding customers' needs and preferences, marketers may produce desired products and provide customers with superior service versus rivals. A person's desire, the people engaged in the decision-making process, their shopping habits, their purchasing behavior, the brands they wish to buy, and the stores they visit are all influenced by a variety of factors, features, and traits. The consumer first makes an effort to decide which things he wants to buy and only chooses those that are most useful. The buyer chooses the goods, decides how much they can afford to spend on them, evaluates the prices, and then makes their purchase [9, 10].

It is now obvious that clients react differently depending on the situation, and that some products are more popular than others. During a crisis, prices are decreased for semi-durable goods like glassware and amusement items in order to meet demands for basic foods like vegetables, eggs, and grains. The seven consumer modifications listed in relation to product consumption during a crisis are: (1) prudent spending; (2) a desire for simplicity in purchasing and distribution; (3) a desire for product modifications; (4) a desire for a low price; (5) financial worry; (6) promotion adjustments; and (7) awareness [11].

According to Dennis et al. (2009), attitudes and environmental factors also have an impact on online customer behavior. According to the research, a solid brand image is extremely important when consumers are making decisions online. This implies that consumers' good brand perceptions from traditional consumers are "transferable" to online purchases and have a beneficial influence on online consumer behavior. The Theory of Planned Behaviour (TPB), which is linked to and evolved from the extension of the Theory of Reasoned Action that was first discovered by Fishbein in 1979, is one of the most well-known theories that have been used to describe and analyze online purchasing habits. The TPB model was created by Ajzen for the first time in 1985 to predict individual decisions, and it is made up of three major components. The key elements that together have a direct influence on consumers' wants to engage in a behavior are subjective standards, attitude toward behavior, and perceived behavior control [12, 13].

The influence of close relationships with one's family, friends, and reference groups is one of the variables that affects a person's subjective norms. These factors have a strong relationship with subjective norms, and numerous earlier studies have demonstrated that these factors have an impact on subjective norms. If someone decides to buy something, they can trust their friends, and this trust is closely related to the subjective standards that affect the decision to buy something. Social influence has a significant influence on people's purchasing behavior because consumer purchase decisions are based on information acquired from a variety of sources. For instance, friends, family, and coworkers are frequent reference sources for internet shoppers. Additionally, young people in particular are more susceptible to the effects of their close friends [14].

First off the term attitude refers to a psychological propensity that is represented by evaluating specific items favorably or unfavorably. The three essential components of attitudes—tendency, entity, and evaluation—are included in this definition. This definition of attitude makes a distinction between the internal tendency that constitutes attitude and the evaluations that serve as attitudes' expressions. Therefore, if consumers are sufficiently motivated and have the mental capacity to do so, they will alter their actual behavior regardless of how they perceive changing their consumer behavior. Additionally, as new information is received, attitudes change as well, and the person must take these recent changes into account [15].

During a crisis, prices have a significant impact on attitude, and customers' decisions are influenced by how those prices are perceived.

Setiawan & Achyar (2013) claim that the price has an impact on people's purchasing decisions, which influences their inclination to shop online. Consumers consider prices very carefully before deciding whether or not to buy a product. We were able to witness how difficult it was to locate and gain access to certain items during the Covid-19 outbreak. It was impossible to do traditional shopping without access to the items in actual stores [16].

The ability or difficulty a person has engaging in a certain behavior, as well as his or her capacity to see the advantages of changing it, can be used to define perceived behavioral control. Stores and retailers are working hard to improve their e-commerce and develop the best shopping websites from the consumer's point of view in order to take advantage of the scenario and consumer movements. To determine the significance and value that customers attach to online purchasing during the COVID-19 epidemic, this element has been included to the TPB model [17].

Government regulations as well as the COVID-19 pandemic itself had an impact on consumer behavior. During the COVID-19 crisis, consumers of all generations were more likely to make digital purchases of goods and services [30]. Overall, there was a considerable movement in favor of online shopping. Additionally, shopping became more frequent [31]. Strong and continuous expansion in the number of Internet users, increased awareness of online purchasing, an increase in the activity of online product releases, low pricing as a result of mass purchases, etc. are factors that influence online consumer behavior during the COVID-19 pandemic [18]. It is anticipated that the COVID-19 pandemic, social withdrawal, and staying in will encourage customers to shop online. The e-commerce sector, however, may be impacted by supply chain problems and ambiguous consumer demand. The COVID-19 pandemic issue may also have an impact on large retailers, which are seeing a decline in casual shopping, a disturbance in the supply chain, and an increase in purchases of necessary groceries, hygiene and disinfection goods, and other products [19].

III. METHODOLOGY

The attributes of a reflexive consumer inferred from Cattell's personality profile are the factors chosen for inclusion in the Composite Index of Online Purchasing Behavior ($K_i^{1\text{-}Q}$). These are the following: (1) Constancy of Online Purchasing Behavior, $INI^{1\text{-}Q}$; (2) Introversion, $CNI^{1\text{-}Q}$; (3) Adaptiveness, $ANI^{1\text{-}Q}$; (4) Consumer Awareness & Experience, $CENI^{1\text{-}Q}$; and (5) Promptness in Decision Making, $DNI^{1\text{-}Q}$. The Composite Index's value rising suggests that online shoppers have become more active [20, 21].

The questionnaire method is used in this study to assess reflexive personality traits. The top 7 countries with the fastest-growing e-commerce sectors, namely China, the United States, the United Kingdom, Japan, France, Russia, and India, were the subjects of the survey. Two times within the given timeframe, it was repeated in 2020. The first six days of June marked the start of the survey, which was then conducted again December. Through online marketplaces, participants (online shoppers) were attracted through invitation. Individuals who placed at least one item in their shopping carts for purchase received invitations. All applicants who consented to take the survey were forwarded to Google Forms. 3269 internet shoppers were included in the original sample. But not all responders made it to the survey's final round, which was conducted in December. Those who provided unclear answers to any of the questions were also disqualified from the analysis. Thus, 2116 internet shoppers were included in the final sample [22, 23].

Make sure the offered sample is representative of the full population in order to allow extrapolation of survey results to the overall population. The respondents' consent was obtained before any analytics services were used to collect general information about them, such as their sex, age, place of residence, marital status, number of children, clickstream data, etc. The following formula [26] or a sample size calculator can be used online to determine the necessary sample size:

$$n = \frac{z^2 pqN}{\partial^2 N + z^2 pq} \quad (1)$$

where: N represents the general population; n represents the necessary sample size; Z represents the coefficient selected based on the confidence level employed (for CI 95%, z = 1.96); q = 1 p is the proportion of respondents without the investigated characteristic; ∂ is the margin of error (usually, 5%); and p is the proportion of respondents having the studied characteristic (generally, 50%) [24].

After being standardized so that all responses fell between 0 and 1, the initial raw data from the two questionnaires were combined. The values for each factor were mapped into the [ẇ, w] range [46] to produce the dimensionality of the reflexive personality factors (RPFs) $\{W_i^{\mathrm{INI}^{1-Q}}, W_i^{\mathrm{ANI}^{1-Q}}, W_i^{\mathrm{CNI}^{1-Q}}, W_i^{\mathrm{CENI}^{1-Q}}, W_i^{\mathrm{DNI}^{1-Q}}\}$, as shown below [25].

$$\dot{W}_i^k = \frac{W_i^k - \ddot{W}_i^k}{\dot{W}_i^k - \ddot{W}_i^k}(\dot{w}\text{-}\dot{w}) + \dot{w} \quad (2)$$

Where $\dot{W}_i^k$ is the maximum value of the factor W_i^k possible; $\ddot{W}_i^k$ is the minimum value of the factor possible; k is the value of the reflexive personality factor; “i" is the respondent sequence number; and [w, ẇ] is the normalization scale.

Two surveys were used to evaluate consumer online shopping behavior. To assess consumer behavior online, a modified version of Cattell's Sixteen Personality item (16PF) Questionnaire with an additional self-esteem (MD) item was employed. Numerous elements of the variables utilized in the study were included in the modified questionnaire. Table 1 provides information about them [27].

Table 1: Factors employed in the modified questionnaire and their characteristics

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
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

The questionnaire contained three response options (a, b, or c), with 6-7 items per factor. Every item received a score of 0, 1, or 2. The primary factor scores (Fig. 1) were translated to standard ten (sten) scores (Table 2), which defined the overall level of reflexive personality factors.

Factor	Question/Response/Score						
MD	1. b-1 a-2	18. b-1 c-2	35. b-1 c-2	52. b-1 a-2	69. b-1 c-2	86. b-1 c-2	103. b-1 c-2
A	2. b-1 c-2	19. b-1 a-2	36. b-1 c-2	53. b-1 a-2	70. b-1 a-2	87. b-1 c-2	104. a-1
B	3. b-1	20. c-1	37. b-1	54. c-1	71. a-1	88. c-1	105. b-1
C	4. b-1 a-2	21. b-1 a-2	38. b-1 c-2	55. b-1 a-2	72. b-1 c-2	89. b-1 c-2	
E	5. b-1 c-2	22. b-1 c-2	39. b-1 c-2	56. b-1 a-2	73. b-1 c-2	90. b-1 a-2	
F	6. b-1 c-2	23. b-1 a-2	40. b-1 c-2	57. b-1 a-2	74. b-1 a-2	91. b-1 c-2	
G	7. b-1 a-2	24. b-1 c-2	41. b-1 a-2	58. b-1 c-2	75. b-1 a-2	92. b-1 c-2	
H	8. b-1 a-2	25. b-1 c-2	42. b-1 c-2	59. b-1 a-2	76. b-1 a-2	93. b-1 c-2	
I	9. b-1 a-2	26. b-1 a-2	43. b-1 c-2	60. b-1 a-2	77. b-1 c-2	94. b-1 c-2	
L	10. b-1 a-2	27. b-1 c-2	44. b-1 c-2	61. b-1 c-2	78. b-1 a-2	95. b-1 a-2	
M	11. b-1 c-2	28. b-1 c-2	45. b-1 a-2	62. b-1 a-2	79. b-1 a-2	96. b-1 c-2	
N	12. b-1 c-2	29. b-1 c-2	46. b-1 a-2	63. b-1 a-2	80. b-1 c-2	97. b-1 c-2	
O	13. b-1 c-2	30. b-1 a-2	47. b-1 c-2	64. b-1 a-2	81. b-1 c-2	98. b-1 a-2	
Q_1	14. b-1 a-2	31. b-1 a-2	48. b-1 c-2	65. b-1 c-2	82. b-1 c-2	99. b-1 a-2	
Q_2	15. b-1 a-2	32. b-1 c-2	49. b-1 a-2	66. b-1 a-2	83. b-1 c-2	100. b-1 c-2	
Q_3	16. b-1 a-2	33. b-1 a-2	50. b-1 a-2	67. b-1 a-2	84. b-1 c-2	101. b-1 c-2	
Q_4	17. b-1 a-2	34. b-1 c-2	51. b-1 c-2	68. b-1 a-2	85. b-1 c-2	102. b-1 a-2	

Figure 1: the 16PF questionnaire's scoring matrix

Table 2: Table of standard score conversions

Factor	1	2	3	4	5	6	7	8	9	10	M	δ
A	0–4	5	6	-	7	8	9	10	11	12	8.06	1.7
B	0–2	-	3	-	4	-	5	-	6	7–8	4.5	0.99
C	0–3	4	5	6	7	8	9	10	11	12	7.5	1.77
E	0–1	2	3	4	5	6	7	8	9	10–12	5.5	1.66
F	0–2	-	3	4	5	6	7	-	8	9–12	5.6	1.68
G	0–3	4	5	6	7	8	9	10	11	12	7.8	1.92
H	0–3	4	5	6	7	8	9	10	11	12	7.7	1.89
I	0–3	4	5	6	7	8	9	10	11	12	7.6	1.68
L	0–1	2	-	3	4	-	5	6	7	8–12	4.3	1.54
M	0–3	-	4	5	6	7	8	9	10	11–12	5.5	1.63
N	0–1	2	3	4	5	6	7	8	9	10–12	5.5	1.63
O	0–1	2–3	4	5	6	7	8	9	10	11–12	6.6	2.14
Q1	0–4	5	6	-	7	8	9	10	11	12	8.1	1.33
Q2	0–2	3	-	4	5	6	7	8	9	10–12	5.8	1.69
Q3	0–2	3	4	5	6	7	8	9	10	11–12	6.3	1.66
Q4	0–1	2	3	4	5	6–7	8	9	10	11–12	6	1.86
MD	0–2	3	4	5	6	7	8	9	10	11–12	6.7	1.74

With the exception of answers that equated to "0" points, this table displays the number of questions and the number of points that went toward each individual response. As an illustration, factor A is followed by the answer scores a—0, b—1, and c—2.

The survey on the definition of external elements was used as the basis for the algorithm for interpreting the survey data to determine the evaluation of external factors of a specific online consumer H_i^{1-Q}:

1) Rapid decision-making the value $CENI_i^{1-Q}$ was normalized based on the scores of the responses to questions 1-2.

2) From the scores of the responses to questions 3–4, the level of consumer awareness/experience $DVI_i^{1-Q}$was calculated and normalized to the value DVI_i^{1-Q}.

The following questions were used to create an external influence questionnaire to identify the causes of the feeling of mispurchase.

a) Do you have to make a snap decision about whether to purchase a specific good or service?

b) Do you require any purchases to be made right away?

c) Have you ever made an online purchase of this kind of product?

d) Do you believe you have enough knowledge to choose whether to buy a specific good or service?

Yes was rated as the answer of approval, while No was rated as the response of disapproval. Consequently, each factor's score might fall between 0 and 2.

Factor C (Emotional Stability) from the conversion table (Fig. 1) affected the value of the Constancy of Online Purchasing Behavior (INI_i^{1-Q}). Factor F1 was linked to the level of introversion (CNI_i^{1-Q}).), as seen below:

$$F1 = \{(2A + 3E + 4F + 5H) - (2Q2 + 11)\}:10 \quad (3)$$

Adaptiveness (ANI_i^{1-Q}).),) was defined by Factor *F*4, which can be determined using the following formula:

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

Formula (2) was used to normalize the scores for components C, F1, and F4 to produce the reflexive personality factors INI_i^{1-Q}, CNI_i^{1-Q}, and ANI_i^{1-Q}, respectively.

Responses to questions 1 and 2 of the External Influence survey were used to determine promptness in decision making ($CENI_i^{1-Q}$) (Table 3). Responses to questions 3 and 4 of the External Influence survey were used to create the Consumer Awareness and Experience (DVI_i^{1-Q}). Formula (2) was then used to standardize these two variables. Data processing and compilation can be done manually or with the use of software programs. MS Excel was used to process the data for this investigation [28, 29].

IV. RESULTS

The COVID-19 epidemic has shifted consumer behavior around the world toward digitalization and purchasing. All e-commerce subsectors have been impacted by the significant change in consumer shopping habits that has occurred online. The travel sector took the most blow. Companies that provide travel services saw a drop in traffic of 43.7%, while losses in other sectors were less severe. Media firms lost an estimated 13.2% of their revenue, and the fashion industry had a traffic decline of 10.3%. With losses of 8.2, 3.2, and 3.1%, respectively, retailers of jewelry and watch brands, luxury products, and domestic goods also had better traffic conditions. On the other side, supermarkets saw a 34.4% increase in site traffic. At the same time, with projected percentage changes of 23.6, 7, 3.7, and 1.8, respectively, Internet users increased their interest in sporting goods, retail services, beauty products and cosmetics, and financial services [30].

Online purchases significantly increased in January 2021 (Fig. 2). Online shoppers have generally grown more self-assured and interested in finding high-quality goods at competitive prices. At the same time, customers tended to favor online shops that offered a wide selection of goods. Retail and supermarket websites saw increases in transactions of 73.4 and 49.9%, respectively. Increases were observed for athletic goods (26.2%), jewelry and watches (26.4%), and domestic items (28.7%), among other categories. In the meantime, there was a reduction in online transactions for fashion items, luxury goods, and vacation services by 33, 5.2, and 2.8%, respectively. A high level of security and a flexible payment system that would facilitate cross-currency payments were required due to the increasing activity of Internet users, particularly customers engaging in e-commerce [31].

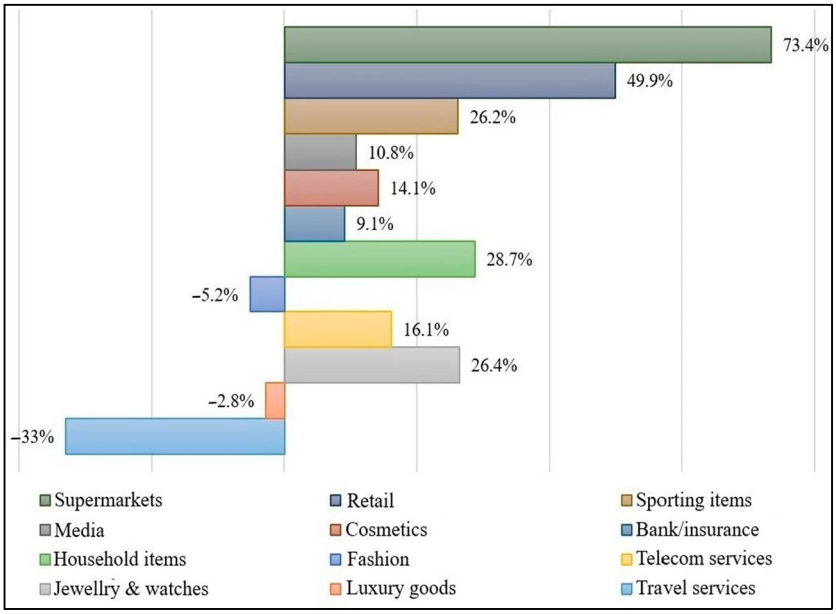

Figure 2: Industry-specific changes in e-commerce transactions [31]

The examination of survey data revealed that consumers had a tendency to abandon their shopping carts at a rate of δ = 0.27. Consequently, the probability that a buyer would buy a good or a service was p(Q2) = 1-0.27 = 0.73. Fig. 3 provides a summary of the raw and normalized RPF factor scores.

No.	INI^{1-Q}	INI^{1-Q} *norm*	CNI^{1-Q}	CNI^{1-Q} *norm*	ANI^{1-Q}	ANI^{1-Q} *norm*	$CENI^{1-Q}$	$CENI^{1-Q}$ *norm*	DVI^{1-Q}	DVI^{1-Q} *norm*	K_i^{1-Q}	∂_i^{1-Q}
1	8.00	0.67	8.00	0.67	9.00	0.75	0.00	0.00	2.00	1.00	0.60	0.40
2	9.00	0.75	9.00	0.75	9.00	0.75	2.00	1.00	2.00	1.00	0.88	0.13
3	10.00	0.83	10.00	0.83	10.00	0.83	2.00	1.00	1.00	0.50	0.79	0.21
4	5.00	0.41	3.2	0.25	8.3	0.66	1.00	0.50	0.00	0.00	0.34	0.66
5	12.00	1.00	8.00	0.67	8.00	0.67	1.00	0.50	1.00	0.50	0.64	0.36
6	11.00	0.92	5.00	0.42	6.00	0.50	1.00	0.50	0.00	0.00	0.43	0.57
7	6.00	0.50	6.00	0.50	10.00	0.83	1.00	0.50	2.00	1.00	0.68	0.32
8	10.00	0.83	10.00	0.83	10.00	0.83	2.00	1.00	0.00	0.00	0.67	0.33
9	11.00	0.92	11.00	0.92	11.00	0.92	2.00	1.00	1.00	0.50	0.83	0.17
10	9.00	0.75	9.00	0.75	9.00	0.75	1.00	0.50	2.00	1.00	0.75	0.25
11	10.00	0.83	12.00	1.00	10.00	0.83	0.00	0.00	2.00	1.00	0.69	0.31
12	11.00	0.92	11.00	0.92	11.00	0.92	0.00	0.00	2.00	1.00	0.71	0.29
13	12.00	1.00	5.00	0.42	10.00	0.83	0.00	0.00	2.00	1.00	0.63	0.38
14	8.00	0.67	8.00	0.67	8.00	0.67	0.00	0.00	2.00	1.00	0.58	0.42
15	9.00	0.75	9.00	0.75	9.00	0.75	2.00	1.00	2.00	1.00	0.88	0.13
16	10.00	0.83	10.00	0.83	10.00	0.83	1.00	0.50	2.00	1.00	0.79	0.21
17	11.00	0.92	11.00	0.92	11.00	0.92	1.00	0.50	2.00	1.00	0.83	0.17
18	12.00	1.00	7.00	0.58	8.00	0.67	1.00	0.50	2.00	1.00	0.75	0.25

Figure 3: The Composite Index of Online Purchasing Behavior and raw and adjusted variables of a reflexive consumer personality were found in the survey.

One can see how the process of normalizing the collected indicators was carried out for each respondent's answers in the example results of the evaluation of the reflective qualities of potential consumers (a fragment—18 respondents) that are based on the survey. Correlation analysis was used to assess the degree of the association between RPF variables and the web purchase behavior. Figures 4 and 5 show the results.

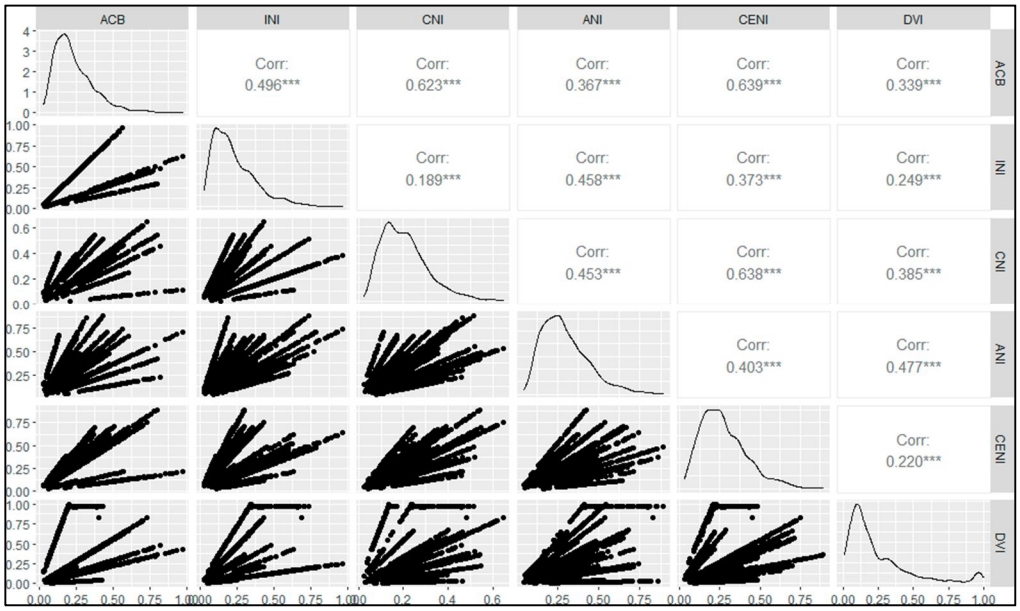

Figure 4: RPF factor and Composite Index of Online Purchasing Behavior correlation matrix as of June 2020

In June 2020, when the pandemic was in full swing, a shift in consumer awareness, experience, and introversion (propensity to purchase a certain product) had a significant impact on online purchasing behavior. The aforementioned contributing elements were linked together.

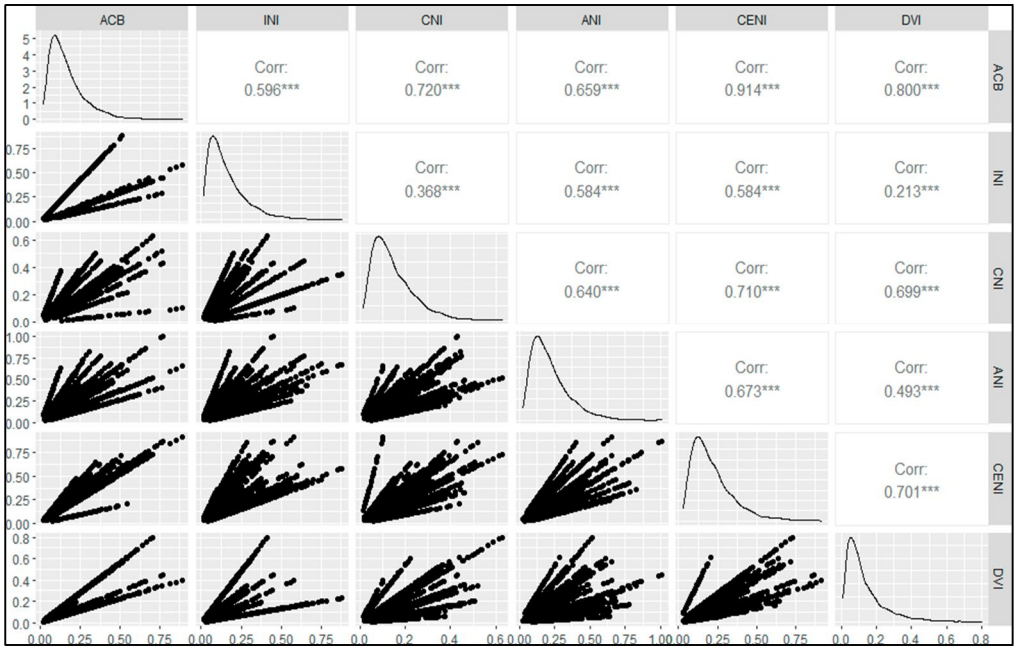

Figure 5: RPF factor and Composite Index of Online Purchasing Behavior correlation matrix as of December 2020

The loading of Consumer Awareness and Experience significantly increased in the second survey, which was conducted in December 2020. Another strong link between decision-making speed and online shopping was found. In comparison to earlier studies, the contributing factors were often more highly correlated with one another. Introversion and Constancy of Online Purchasing Behavior and Promptness in Decision Making were the only two factor pairings that did not fall into these categories. These factor pairs exhibited a tenuous relationship. This can be explained by the fact that during the epidemic, consumers stopped avoiding internet shopping because of the shutdown and instead sped up their decision-making. The majority of the consumers who participated in the poll had a lot of experience shopping online, which had an impact on their decision-making.
Table 3 displays the findings of the correlation analysis for the time frame under consideration.

Table 3: 2020 correlation of the research's key performance indicators

Dependent Variable	Period	INI	CNI	ANI	CENI	DVI
Online Purchasing Behavior Composite Index	June	0.496	0.623	0.367	0.639	0.339
	December	0.596	0.72	0.659	0.914	0.8

In the second half of 2020, Consumer Awareness and Experience surpassed Introversion as the primary factor affecting online buyers' purchasing decisions. Online shoppers' actions in the face of the epidemic were influenced by their decision-making speed and experience. Online shoppers became more engaged and swifter when making purchasing decisions as consumers' experiences improved, which enhanced the importance of promptness in decision making.
The results can help establish an effective strategy for the growth of e-commerce in the economic context, both at the level of specific businesses and at the state level. Based on these findings, businesses can alter how they conduct marketing campaigns, engage consumers in new ways, and implement effective online marketing strategies. Financially speaking, the findings showed a rise in online consumer activity and, as a result, an increase in the cash flow from online sales. E-commerce representatives can modify the management mechanism of their customers' behavior and reduce marketing expenses by taking into account the experience of their regular customers, the opportunities of potential customers, as well as the peculiarities of their changing behavior based on the findings of this study. The study's findings demonstrated how consumers' priorities changed when they made online purchases during the pandemic in a social context. The study's findings suggest that since the epidemic, online buying has been ingrained in people's consumer culture.

V. CONCLUSION

A study of web traffic during the coronavirus outbreak revealed an increase in people visiting online supermarkets. This result demonstrated how dedicated daily internet buyers are. Thus, the pandemic encouraged online customers to exhibit consistent purchasing behavior. The correlation research showed a growing correlation between online buying behavior and reflexive consumer characteristics. Additionally, there was a tendency for the association between the parameters under investigation to strengthen. Consumer Awareness, Experience, and Introversion initially influenced online purchase behavior, and other factors had little effect. But when the COVID-19 pandemic spread, the circumstances changed. Its influence grew along with consumer knowledge, experience, and decision-making speed. On the other side, introversion lost its significance.

Promptness in Decision Making and Constancy of Online Purchasing Behavior were two characteristics that showed a weak correlation with introversion. Consumers became less e-commerce-averse and more hesitant when making judgments, which reduced the link between these elements. Additionally, online users gained more knowledge. This study brought attention to a change in the variables affecting online shoppers' purchasing decisions during the COVID-19 era. Overall, it indicated that promptness in decision-making was becoming more crucial when making purchases online. The proposed methodological toolset for analyzing online shoppers' purchasing patterns, which includes an upgraded Cattell's technique and correlation analysis, is the study's scholarly contribution. It enables the identification of the key elements influencing online shoppers' purchasing decisions. These include decision-making speed, introversion, adaptability, customer awareness and experience, and consistency of online purchase habit. The suggested method enables researchers to pinpoint the major trends at the global, regional, and national levels by dynamically assessing online purchase behavior. Companies in the e-commerce industry will have the chance to modify their rules and tactics in the event of a pandemic in order to boost sales.

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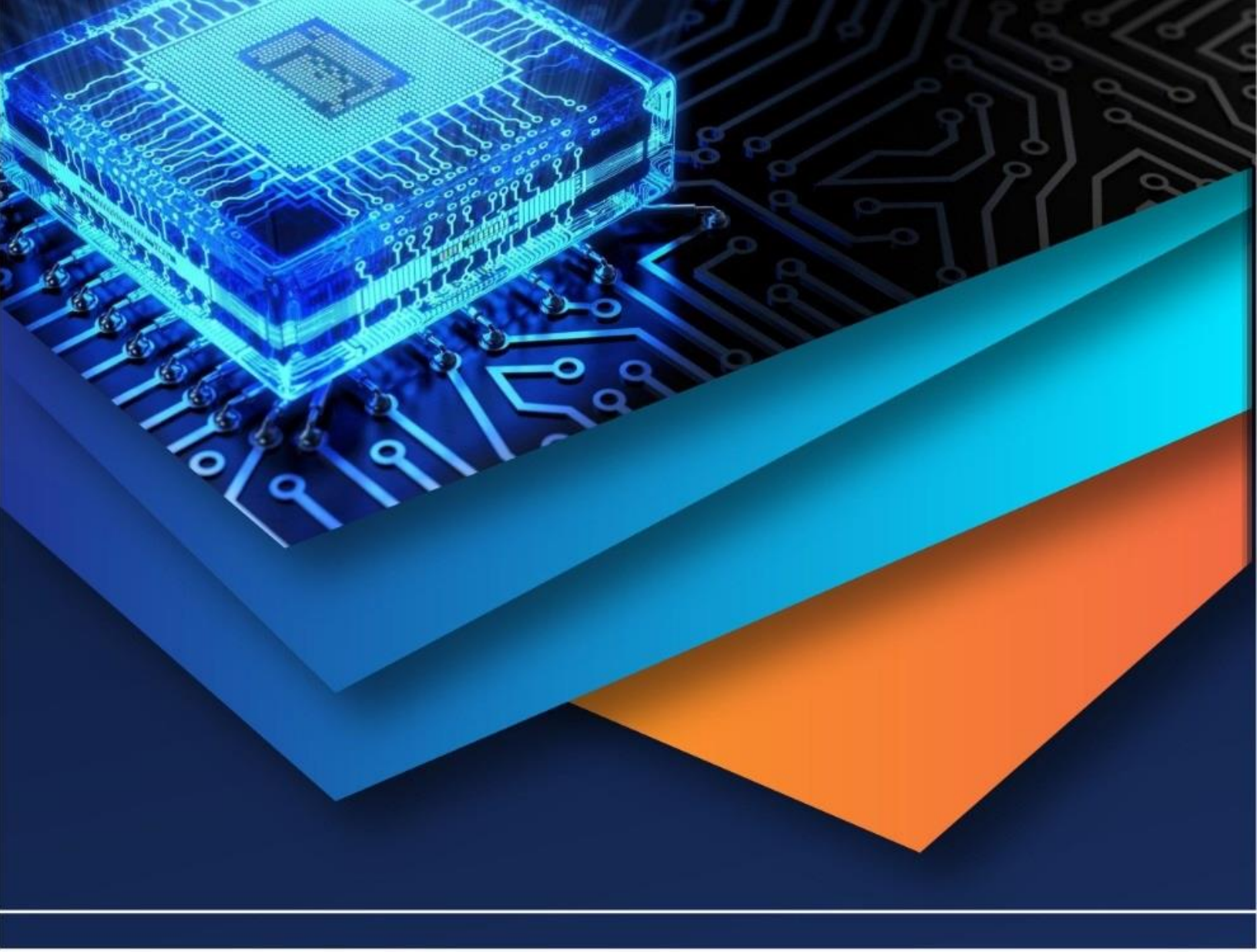

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