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Examining the Relationship Between Digital Payment Adoption, Tourism Restrictions, and Public Health during pandemic

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Abstract— This study looks into how the ban on tourism, digital payments, and the spread of COVID-19 in India interact. With the use of a structural equation model that has been verified by confirmatory factor analysis, the study makes use of primary data collected from inhabitants of India using a five-point Likert scale. The results show a strong three-factor structural model with excellent fit and dependability. The main goal is to learn more about the public's knowledge and readiness for COVID-19 transmission control and evaluate how well digital payments and travel bans work to stop the virus's spread. In addition to providing empirical testing to clarify the untested model, the report highlights the critical roles that digital payment methods and tourism play in tackling the pandemic's issues. This study adds empirical support to the body of literature, illuminating the hitherto unexplored relationship between digital payments, tourism-related treatments, and their ability to lessen the effects of COVID-19. The findings offer a thorough grasp of the possible contributions of digital payment products and tourist rules in the larger framework of pandemic control, in addition to offering insightful information for policymakers.

Keywords—COVID-19 Transmission, Digital Payments, Tourism Prohibition, Structural Equation Model, Epidemic Response.

I. INTRODUCTION

According to Bashir (2020), the widespread transmission of the coronavirus disease 2019 (COVID-19) has created a serious public health issue. The problem is made much more dangerous by the fact that India is among the most populous nations. Preventive measures are crucial for state and federal governments, as stressed by KPMG (2020), even though official agencies say that the disease has not spread to the community level in India. A variety of control measures have been put in place by the government, such as the creation of medical and paramedical protocols, the labelling of containment zones with colour codes, and, most significantly, the unprecedented suspension of all modes of transportation and travel throughout the nation through programmes like the Janta Curfew and phased lockdowns [9] [18].

Amid the difficulties that Indian individuals are facing, worries regarding the virus's possible spread through banknotes have come to light. The scientific community has not completely ruled out the idea, despite the fact that there is not

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enough data to support this assumption [19]. The lack of trust in cash-based transactions caused by this uncertainty has led to a rise in the use of digital payments. Because of the total lockdown, residents are prohibited from leaving their homes for safety, which has led to a ban on travel. According to KPMG's estimate of the impact on digital payments in India (2020), the combination of increased digital payment usage and tourism prohibition has proven beneficial as preventive measures against COVID-19. This circumstance has highlighted the necessity of doing research to investigate the relationship between digital payments, the ban on tourism, and the statewide suspension of travel and transportation. Thus, the goal of this research project is to create a model that investigates the relationship between digital payments and travel restrictions and the spread of COVID-19. In order to improve understanding of the dynamics underlying COVID-19 transmission, the study attempts to develop a model based on people's impressions of a variety of claims pertaining to the use of digital payments and the ban on travel.

II. LITERATURE REVIEW

Due to the widespread belief that physical money notes could be a means of virus transmission, the appearance of Covid-19 has raised worries about the usage of physical currency notes in financial transactions [2]. Consumers have asked several banks for their opinions on this [9]. But according to scientists, earlier studies on the development and spread of viruses show that infections may live, grow, and spread on surfaces, and physical bank notes are one possible surface for this phenomenon [19].

The length of pathogen survival on physical currency notes varies from a few hours to a few days, according to multiple scientific research [1] [11]. According to research, COVID-19 can linger in the air for three to four hours and on paper surfaces for roughly twenty to twenty-four hours [8]. This means that there is very little chance of the virus spreading through actual money notes [21]. To further reassure you about the security of utilising physical currency in financial transactions, no case has been published where the COVID-19 culture has been verified on currency notes.

Beyond physical cash notes, there are misgivings about utilising debit and credit cards due to the possibility of Covid-19 transfer [25]. Banks are encouraging account users to switch to digital payments in response to these concerns by using tools like online transfers and digital wallets [23]. Digital wallets provide a contactless experience without requiring a physical device or human contact, making them a secure choice for transactions [26]. Smartphones and online programmes such as Google Pay provide QR code-based payment solutions that are likewise regarded as secure substitutes [14]. Although digital wallets are not a novel concept in India, their utilisation has surged due to the COVID-19 pandemic, and a substantial segment of the populace is currently acquainted with digital payment modalities [12].

Significant changes began with the advent of COVID-19 in India in January 2020, with the confirmation of the first case in the Thrissur area of Kerala [20]. The federal government responded to the virus's subsequent spread by enacting the 'Janta Curfew' on March 22, 2020, and a statewide lockdown from March 25 to April 14, 2020 [22]. This was primarily among students returning from Wuhan, China. In order to stop the spread of COVID-19, lockdowns were imposed in subsequent phases, each lasting 14 days, with severe limitations on movement and a ban on travel and visiting tourist destinations [7]. The tourism business was further damaged by the geographic division of areas into red, orange, and green zones; red zones were further subdivided into confinement and buffer zones [22].

The tourist industry has faced issues due to the prohibition of tourism, which is necessary for infection management and compliance with social distancing norms. These challenges have affected the economy and jobs within the sector [13]. Due to the pandemic, plans have had to change. In an effort to keep prospective tourists confident, some are promoting virtual sightseeing [20]. Even while the government is still working to stop the COVID-19 virus from spreading, the growing number of cases means that unlocking measures need to be carefully considered, especially in the tourism industry, which might be among the last to resume regular business operations [22].

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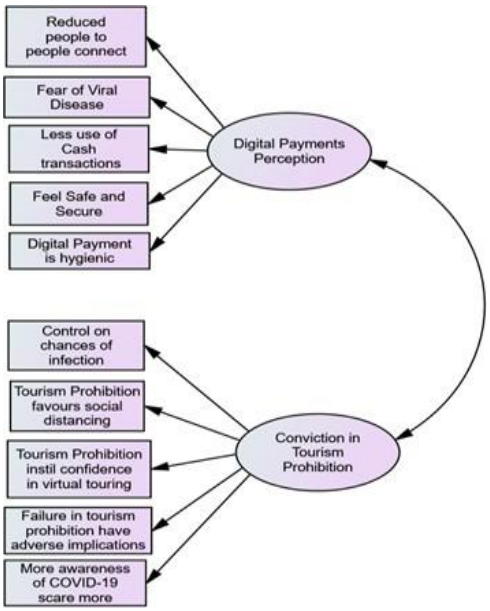
Psychology and medical professionals have remarked that longer stays at home along with increasing knowledge about COVID-19 may be contributing causes to the public's increased dread of the virus [7]. Considering these findings, a survey of the literature indicates that tourism clearly affects the spread of COVID-19, which serves as a foundation for creating a theoretical framework to investigate these dynamics in more detail.

Figure 1 Conceptual Model



III. Theoretical Framework

The theoretical framework, which was developed through an extensive examination of the literature, includes two key elements that are thought to operate as disincentives for COVID-19: the perception of digital payments and the belief that travel is prohibited. Regarding how people perceive digital payments, the framework suggests that their adoption effectively reduces face-to-face interactions, that using digital payment methods is encouraged by concerns about viral transmission, that using digital payment methods creates a sense of security, that digital transactions are viewed as hygienic practices, and that a better knowledge of viral transmission encourages people to use digital payment methods less frequently than cash-based transactions. Collectively, these attitudes towards digital payments have an impact on the spread of COVID-19.

In the context of the belief that tourism prohibition is the second deterrent, the framework proposes that the following measures control the risk of infection: banning tourism-related activities and events; restricting travel, both domestically and internationally; instilling confidence in virtual touring as a safe alternative; and deterring people from travelling by raising awareness of the spread of COVID-19 and its consequences.

For this empirical research project, a structured, closed-ended questionnaire was used to collect primary data. Since physical movement was strictly prohibited during the imposed lockdown, an online form was created and disseminated to a range of social and professional groups living in Delhi, Ghaziabad, and surrounding areas. A non-probability convenient sampling strategy was used, selecting participants based on their accessibility, because there was no sample frame available and it was not possible to get in touch with them directly. 169 participants' answers to factors converted into five-point Likert scale items that addressed both deterrents were recorded in the questionnaire. Furthermore, answers on a few demographic characteristics were gathered. Five items were created to investigate the perception of digital payments, and five more were made to evaluate the degree of conviction regarding the prohibition of tourism as a COVID-19 deterrent. The theoretical framework is validated by the Cronbach alpha coefficient and the findings of exploratory factor analysis. The saturated model was then tested using structural equation modelling.

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IV. ANALYSIS

A comprehensive analysis was performed on the gathered data to check for outliers and missing values. To make the statistical analysis that followed easier, categorical and rating possibilities were coded numerically. We analysed the interval-scaled scores for ten latent variables that included the two constructs (perception of digital payments and conviction in tourism prohibition), which were obtained on a five-point Likert scale ("5= strongly agree," "4= agree," "3= neutral," "2= disagree," and "1= strongly disagree"). In order to create the sample profile, demographic categorical data were analysed using frequency counts and percentages.

The KMO measure and Bartlett's test of sphericity were evaluated in order to evaluate homogeneity of variance and sample adequacy. Factor extraction was performed using principal component analysis, where the number of factors to be taken into account was determined by the eigenvalues. To create a rotated component matrix, the varimax rotation method was used. Each factor's structure was made up of variables whose factor loadings were greater than 0.040. By calculating Cronbach's alpha for each factor, the factor structure's dependability was assessed.

Relevant data were incorporated into additional analysis for the aim of structural equation modelling (SEM). To evaluate the model's fit, a number of metrics were evaluated, including RMSEA, CMIN, NFI, and CFI.

Table 1 Reliability Statistics

Cronbach's Alpha	N of Items
.854	10

Table 2 Results of KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.847
Bartlett's Test of Sphericity	Approx. Chi-Square	608.735
	df	45
	Sig.	.000

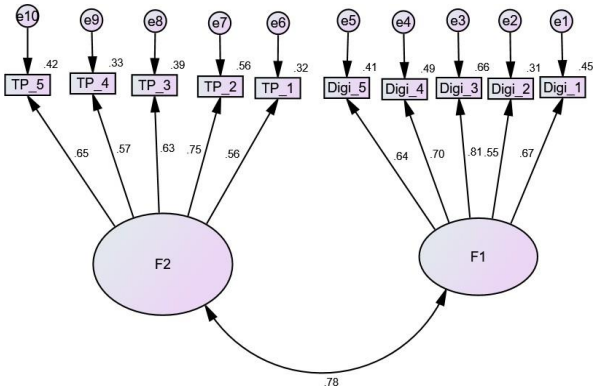

Figure 2 Structural Model

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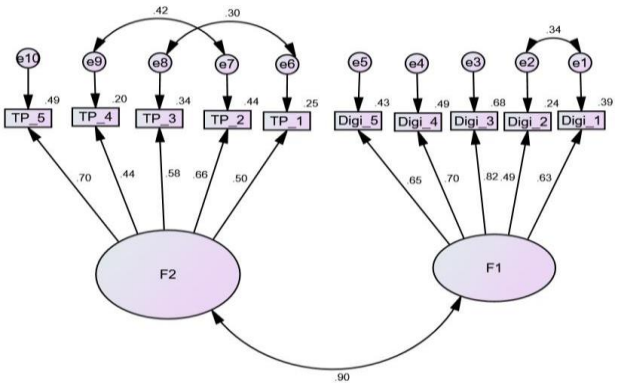

Figure 3 Structural Model (with modifications)

V. RESULTS

With 50.3% of respondents being female and 49.7% of respondents being male, the demographic data analysis showed a balanced gender distribution in the sample. The age group of 18 to 30 years old comprised the bulk of responders (77.5%). Furthermore, 81.1% of participants had a college degree, and a sizable percentage (74.6%) were single. The state of Uttar Pradesh was home to the bulk of responders (81.7%).
A significant degree of consistency was found among the 10 variables in the scale, which is connected to the control and spread of viral pandemics. The reliability testing of the scale revealed this. With a Cronbach's alpha coefficient of 0.852, the scale appears to be dependable.

Two factors were identified by exploratory factor analysis (EFA) using varimax rotation and Kaiser normalisation. These factors accounted for 57% of the variance in the sample data. "Conviction in Tourism Prohibition" (Factor 1) and "Digital Payments Perception" (Factor 2) were the names given to the factors. For every factor, the percentage of variation explained, eigenvalues, factor loadings, Cronbach's alpha, and average ratings were displayed.
The theoretical approach was used to develop a structural equation model (SEM). Figure 2 showed the standardised estimates of the interaction between Factor 1 (perception of digital payments) and Factor 2 (conviction in the prohibition of tourism). When different fit measures, such as CMIN, NFI, CFI, and RMSEA, were tested, the first model demonstrated a decent fit.

On the basis of modification indices, changes were then recommended, and Figure 3 showed the updated structural model. With higher values for CMIN and other fit metrics, the adjusted model showed greater fit and better model fit.
The proposal was made to incorporate Factor 3 (COVID-19 Transmission) into the existing three-factor structural model. Figure 4 displayed the standardised estimates for the interaction between Factors 1, 2, and 3. After evaluating the model fit metrics—which included RMSEA, CMIN, CMIN/DF, CFI, IFI, and NFI—modifications were added in accordance with modification indices. Figure 5 presents the improved three-factor structural model, which demonstrates a better fit.
Estimates of regression weights, standard errors, critical ratios, and p-values for the factors and observed variables were included in the SEM results. The majority of the numbers in the critical ratios were significant, indicating the importance of the relationships.

Overall, as shown by the CMIN, CMIN/DF, CFI, IFI, NFI, and RMSEA values, the goodness of fit measures for the suggested structural model with Factors 1, 2, and 3 showed reasonable to superior fit. An in-depth grasp of the connections between perceptions of digital payments, convictions regarding tourist ban, and Covid-19 transmission was made possible by the integrated three-factor model.

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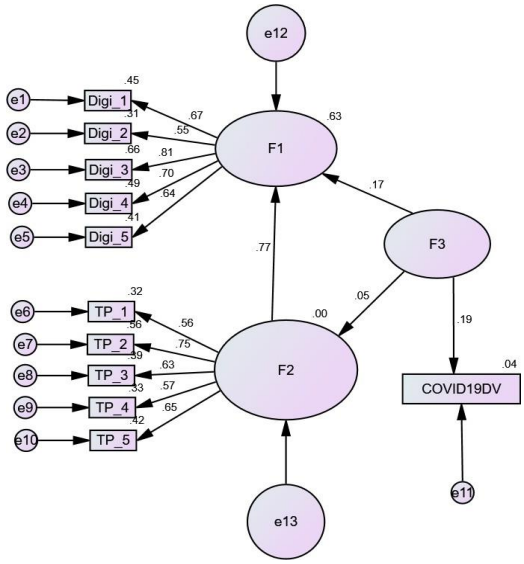

Figure 4: Factor Structural Model: F1, F2 and F3

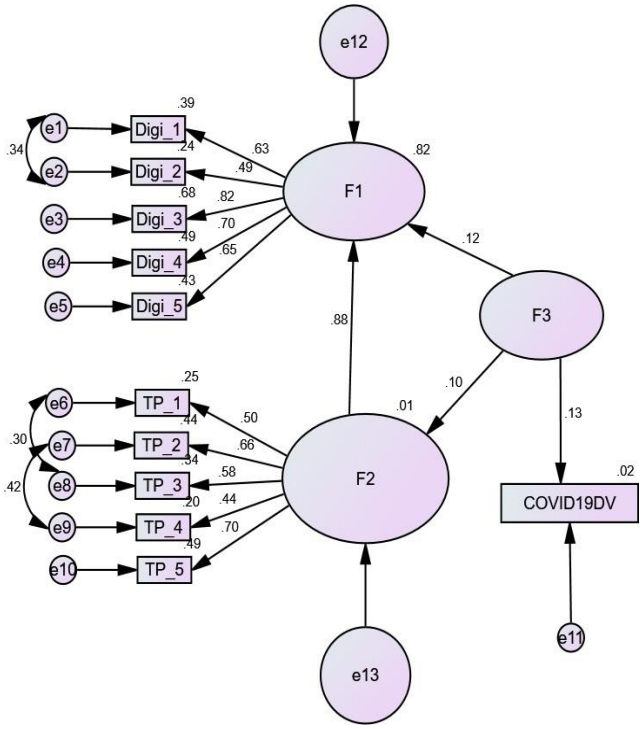

Figure 5 Factor Structural Model: (with modifications) F1, F2 and F3

VI. CONCLUSION

This study used a confirmatory factor analysis (CFA) method to model the relationship between digital payments and travel restrictions and Covid-19 transmission. The conclusion that a three-factor structural model offers an acceptable fit to the data is supported by the data analysis results. The observable variables in this model, Digi_1 and Digi_2, which are associated with the latent variable factor-1 (F1), share their corresponding error variances (e1 for Digi_1 and e2 for Digi_2), and two more variables (e6-e8 and e7-e9) within F2 also exhibit comparable error variance sharing. The factors F1 for Digi_3 and F2 for TP_5 account for approximately 49% of the variance in the observed variables Digi_4 and TP_5,

with unique factors e4 and e10 (e4 for Digi_4 and e10 for TP_5) accounting for the remaining 51% of the variance. Digi_4 and TP_5 are assessed to have a 49% reliability when measurement errors e4 and e10 are taken into account.

Additionally, the model shows a strong correlation between digital payments and the ban on tourism and Covid-19 transmission. Three modifications to the enlarged three-factor structural model result in a good fit with the data. As shown in Table 5, a number of model fitness metrics corroborate the suitability of the suggested three-factor model. Overall, the values of every parameter in the model fit evaluation validate the model's applicability and validate the research's objective of comprehending how digital payments, travel restrictions, and Covid-19 transmission interact.

REFERENCES

[1] Angelakis, E. E.-G. (2014). Paper money and coins as potential vectors of transmissible disease. Future Microbiology, 249-261.

[2] Auer R, C. G. (2020). Covid-19, cash, and the future of payments 2020. Asian Digest, pp. 56- 62.

[3] Bashir, B. (2020, May). "WHO director general: don't spread fear and stigma with travel bans". Retrieved from www.cnn.com: www.cnn.com/asia/live-news/coronavirus-outbreak-02-04- 20/index.htm

[4] BBCNEWS. (2020, May). Coronavirus: Wuhan Shuts Public Transport over Outbreak, 2020. Retrieved from www.bbc.com: https://www.bbc.com/news/world-asia-china-51215348

[5] Sonali D.Patil, Atul B.Kathole, Savita Kumbhare, Kapil Vhatkar, Vinod V. Kimbahune,"A Blockchain-Based Approach to Ensuring the Security of Electronic Data", International Journal ofINTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING, IJISAE, 2024, 12(11s), 649–655. https://ijisae.org/index.php/IJISAE/article/view/4486/3145

[6] commfaculty. (2014). Confirmatory Factor Analysis through the AmosProgramRetrieved 2018, from http://commfaculty.fullerton.edu: http://commfaculty.fullerton.edu/jreinard/stat_ch16.htm

[7] Cross Validated. (2017). Retrieved July 24, 2018, from https://stats.stackexchange.com:https://stats.stackexchange.com/questions/286099/difference-between-multiple-regression-with-categorical-independent-variables-ve

[8] Debnath, R., & Bardhan, R. (2020). India nudges to contain COVID-19 pandemic: A reactive public policy analysis using machine-learning based topic modelling. PLOS ONE. doi: https://doi.org/10.1371/journal.pone.0238972

[9] K. N. Vhatkar and G. P. Bhole, "A comprehensive survey on container resource allocation approaches in cloud computing: State-of-the-art and research challenges," Web Intelligence, vol. 19, no. 4, pp. 295–316, 2021, doi: 10.3233/WEB-210474.

[10] Gardner, B. (2020, March 8). Dirty banknotes may be spreading the coronavirus, WHO suggests. Daily Telegraph.

[11] Hindustan Time. (2020, June). 20 days, 20 steps: A look at government's measures against Covid-19 amid lockdown. Retrieved fromwww.hindustantimes.com/:https://www.hindustantimes.com/india-news/20-days-20-steps-a-look-at-government-s- measures-against-covid-19-amid-lockdown/story-aUNOgQ9Om2dxQt9WAyEaGI.html

[12] IBM.(2018).KMO and Bartlett's test. Retrieved from https://www.ibm.com:https://www.ibm.com/support/knowledgecenter/en/SSLVMB_subs/statistics_casestudies_projectddita/spss/tutorials/fac_telco_kmo_01.html.

[13] Jagannathan, M. (2020, March 9). World Health Organization: 'We did NOT say that cash was transmitting coronavirus. MarketWatch.

[14] Atul Kathole , Dinesh Chaudhari "Secure Hybrid Approach for Sharing Data Securely in VANET", Proceeding of International Conference on Computational Science and Applications pp 217–221, © 2022 The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

[15] Jain, A., &Sarupria, A. (2020). The Impact of COVID-19 on E-wallet's Payments in Indian Economy. International Journal of Creative Research Thoughts, 2447-2454.

[16] Jaipuria S., Parida, R., & Ray, P. (2020, November 01). The impact of COVID-19 on tourism sector in India. Tourism Recreation Research, Taylor &Francis. Doihttps://doi.org/10.1080/02508281.2020.1846971

European Economic Letters
ISSN 2323-5233
Vol 14, Issue 1 (2024)
https://doi.org/10.52783/eel.v14i1.1239
http://eelet.org.uk

[17] Kim, C. T. (2010). An empirical study of customers' perceptions of security and trust in e- payment systems. Electronic Commerce Research and Applications, 84-95.

[18] Atul Kathole , Dinesh Chaudhari "Securing the Adhoc Network Data Using Hybrid Malicious Node Detection Approach", Proceedings of the International Conference on Intelligent Vision and Computing (ICIVC 2021) pp 447–457 © 2022 The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd.

[19] Kline, R. B. (2005). Principles and Practice of Structural Equation Modeling. New Yark: Guilford Press.

[20] KPMG. (2020, June). Government and institution measures in response to COVID-19. Retrieved from https://home.kpmg: https://home.kpmg/xx/en/home/insights/2020/04/india-government-and-institution- measures-in-response-to-covid.html

[21] K. Netaji Vhatkar and G. P. Bhole, "Self-improved moth flame for optimal container resource allocation in cloud," Concurrency and Computation: Practice and Experience, vol. 34, no. 23, Oct. 2022, doi: 10.1002/cpe.7200.

[22] KPMG. (2020). Impact of COVID19 on digital payments in India. ET Edge, 1-32.

[23] Krishnakumar, B., & Rana, S. (2020). COVID 19 in INDIA: Strategies to combat from combination threat of life and livelihood. Elsevier , 389-391.

[24] Kumar, S., Kumar, D., Christopher, B., & Doss, C. P. (2020). The Rise and Impact of COVID- 19 in India. Frontiers in Medicine.

[25] Prasanna, J. K., & Bhanu, T. T. (2020). The Effect of COVID-19 Lockdown on Indian Tourism and Hospitality Industry. Journal of Dental & Oro-facial Research.

[26] Reuters. (2020, March 11). Banknotes carry no particular coronavirus risk: German disease expert. Reuters.

[27] SIRU. (2020, April 23). Measures taken by Government of India to aid Businesses during COVID-19 lockdown. Retrieved from www.investindia.gov.in:https://www.investindia.gov.in/bip/resources/measures-taken-government-india-aid- businesses-during-covid-19-lockdown

[28] Sudha, G., Sornaganesh, V., Thangajesh, M. S., &Chellama, A. (2020). Impact of Covid-19 Outbreak in Digital Payments. International Journal For Innovative Research In Multidisciplinary Field, 159-164.

[29] TATACAPITALBLOG. (2020, May). What are the Steps Taken by the Government to Fight Coronavirus in India? Retrieved from www.tatacapital.com: https://www.tatacapital.com/blog/trends/what-are-the-steps-taken-by-the-government-to- fight-coronavirus-in-india/

[30] Thomas , Y., Vogel, G., Wunderli,, W., Suter, P., Witschi, M., Koch, D.,Kaiser, L. (2008). Survival of influenza virus on banknotes. Applied and environmental microbiology, 3002- 3007.

[31] A. B. Kathole, K. N. Vhatkar, and S. D. Patil, "IoT-Enabled Pest Identification and Classification with New Meta-Heuristic-Based Deep Learning Framework," Cybernetics and Systems, vol. 0, no. 0, 2022, doi: 10.1080/01969722.2022.2122001.

[32] Undale, S., Kulkarni, A., & Patil, H. (2020). Perceived eWallet security: impact of COVID-19 pandemic. Vilakshan-XIMB Journal of Management. doi:https://doi.org/10.1108/XJM-07- 2020-0022

[33] www.ncbi.nlm.niti.gov. (n.d.). Model fit summary. Retrieved 2020, from ww.ncbi.nlm.niti.gov: www.ncbi.nlm.niti.gov

[34] Xiao-AiZ hang, Hang Fan, Qi, R.-Z., Zheng, W., Zheng, K., Gong, J.-H., Liu, W. (2020). Importing coronavirus disease 2019 (COVID-19) into China after international air travel. Elsevier, Travel Medicine and Infectious Disease.