

# Fear of Coronavirus on Continuance Intention to Use Food Delivery Apps

Prashant Raman, Institute of Public Enterprise, Hyderabad, India\*

## ABSTRACT

The objective of this research is to explore the determinants impacting the Indian consumers' continuance intention (CI) to use food delivery apps (FDA) during the COVID-19 pandemic. The study develops a conceptual framework which integrates technology acceptance model (TAM) and expectation confirmation model (ECM), with fear of coronavirus (FOC) and health anxiety (HA). The survey responses of 598 FDA users during the COVID-19 pandemic period in India were examined using PLS-SEM approach. The findings reveal that FOC is the most significant determinant, and HA, satisfaction (SAT), perceived usefulness (PU), perceived ease of use (PEOU), and confirmation (CON) have significant impact (directly/indirectly) on users' CI to use FDAs at the time of coronavirus pandemic. The new normal, which includes social distancing, self-protection, etc., has created new buying habits. The policymakers, start-ups, etc. can gain considerable insights from this research.

## KEYWORDS

Continuance Intention, Coronavirus, COVID-19, ECM, Fear of Coronavirus, Food Delivery Apps, Health Anxiety, Indian Consumer Behaviour, Online Food Delivery Services, TAM

## 1. INTRODUCTION

Over the years, adoption of mobile devices has seen a steep rise and their usage among the people have also witnessed a huge increase globally. As indicated by Statista (2020a), smartphone users across the globe touched 3.5 billion in 2020, and among them, around 700 million users were from India (Statista, 2020b). Although, mobile based services have penetrated into many industries, its implementation in food delivery app (FDA) is still very nascent. With the growing smartphone user base, FDAs in India are beginning to gain popularity and steadily spreading their tentacles in the Indian market. The online food delivery market in India is around \$10 billion which is expected to touch \$14 billion by 2024 (Statista, 2020c).

In the interim, the novel Coronavirus (Covid-19) outbreak created a grave situation and within a span of few months, the virus steadily extended to all the continents of the world (Shi et al., 2020). According to World Health Organization (WHO), around 76,250,431 verified cases of people suffering from Coronavirus were registered worldwide and about 1,699,230 deaths were reported until 22 Dec

DOI: 10.4018/JECO.300302

\*Corresponding Author

This article published as an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

2020 (WHO, 2020). Amidst the pandemic, certain safety measures and precautions such as wearing masks in public, physical distancing, avoiding crowds etc. were suggested to the general public to mitigate the risk of spreading the virus (Aquino et al., 2020). Due to these restrictions and safety measures, very few customers seemed interested in dining out at restaurants. According to a report by TRANSFIN (2020), the effect of the pandemic on the restaurant industry in India led to a loss of more than \$13 billion.

At the same time, in spite of the detrimental effect of Coronavirus on the business of the restaurant and food sector, the pandemic has altered the people's consumption behaviour and expedited the metamorphosis of the standalone restaurants from conventional dine-in services to online delivery of food services to survive in this dire situation. A survey conducted among the consumers of Britain, Italy, Brazil, and South Korea has revealed the favourable influence of Covid-19 on FDAs and the continuance intention to use it (Citivelocity, 2020). As physical distancing will continue to remain an important measure to control the menace of Coronavirus worldwide for the coming months; it is highly unlikely that the restaurant and catering industry will be able to recover their losses. Many small restaurants and eateries have already shut their shops due to lack of customer inflow. Hence, online food delivery has come as a sustainable alternative for the restaurants that purely operated on dine-in mode. Even after the easing of social distancing norms, the customers are apprehensive of visiting the restaurants and it is very likely that FDAs will gain more popularity in the times to come. India is witnessing an upsurge in the number of people ordering food online. A detailed study on the effect of Coronavirus on FDAs will be valuable as social distancing and fear of visiting the public places will result in more people using FDAs to order food online instead of going to the restaurants. India having more than 10,099,066 confirmed cases of Covid-19 as on 23<sup>rd</sup> December, 2020 (WHO, 2020) is likely to persist with the safety norms, and use of FDA may increase even more. In this pandemic period, FDAs are not only able to meet the requirements of the restaurant industry but are also able to satisfy the consumers by providing hygienic food with utmost safety (Liu and Wang, 2020).

As a result, factors influencing users to continuously utilise the services of FDAs during the Coronavirus period are crucial for the stakeholders to decipher the customers' needs and aspirations. The current research tries to evaluate the role played by perceived usefulness (PU), perceived ease of use (PEOU), confirmation (CON), satisfaction (SAT), health anxiety (HA) and fear of Coronavirus (FOC) on continuance intention of Indian users to use FDAs. The research uses the expectation confirmation model (ECM) to analyse the post-adoption behaviour of the users (Oliver, 1977). Along with ECM, FOC and HA are also incorporated in technology acceptance model (TAM) to build a holistic model. Past studies have predominantly taken a myopic view on the adoption of FDAs and its continuous usage (Ozturk et al., 2016; Wang et al., 2019) but the current study tries to address this lacuna by proposing a situational based comprehensive model in the Indian context. Existing research works also suggest that there is a dearth of studies on FDAs in India (Ray et al., 2019).

By reviewing the existing literature, the current study has identified the different determinants that affect the continuance intention of the users to use FDAs. Two important factors - FOC and HA have not been employed in the past researches especially in the context of FDAs. These two factors are assumed to play a critical part in understanding the users' satisfaction and continuance intention to use FDAs. Past literature also unveils a paucity of research on examining the simultaneous influence of PEOU, PU, CON, SAT, HA and FOC on continuance intention. Moreover, ECM and TAM have never been combined together in the past with respect to FDA. The current research hence focuses on the lacunae stated before by analysing the antecedents that affect the use of FDAs in India.

The remaining part of this study is structured as listed below; Section 2 discusses the existing literature, development of the conceptual framework and hypotheses proposed. Section 3 outlines the methodology and process of data collection. Section 4 provides an overview of data analysis and the results. Section 5 comprises of the deliberations and implications of the research. Section 6 concludes the study with limitations and directions for future research.

## 2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

### 2.1. Food Delivery App (FDA) in India

As the Covid-19 pandemic resulted in a complete lockdown in March 2020, food delivery apps came into prominence in India. Due to the upsurge in the Coronavirus cases across the country, people started to favour online ordering of food, thereby, increasing the sales for companies such as Swiggy, Zomato etc. The basic functionality of FDAs is to connect the restaurants to the customers through the use of technology. They are majorly classified into two forms (Ray et al., 2019):-

- i) Standalone restaurants like McDonalds, Pizza hut, KFC etc. delivering orders through their own platforms.
- ii) Food aggregators like Swiggy, Zomato etc. acting as intermediaries and providing a platform for the restaurants to receive and deliver the orders.

During the pandemic time, FDAs offered a contactless delivery option to all its users in India, which meant that the food order be left at the customers' doorstep, lobby etc. without any direct contact between the delivery person and the customers. Such kind of initiatives resulted in effective management of social distancing norms (Qian and Jiang, 2020). As the demand for ordering food from customers working from home started to increase through food delivery apps, the Indian food tech sector also witnessed an incredible amount of funding; approximately 35 times increase in the last five years (Google-BCG, 2020). Despite the Covid-19 pandemic, global investors invested around \$1.36 billion in the year 2020 in different online food delivery companies in India (Fortune India, 2020). India's online food delivery market is growing at around 15% which is more than the global growth rate of 9% (Financial Express, 2019).

Lots of past research works have concentrated on different antecedents influencing users' intention to accept FDAs. Prabowo and Nugroho (2019) identified post-usage usefulness as an important determinant which influenced the intention of the users to accept online food delivery services. A study conducted by Roh and Park (2019) found perceived usefulness and perceived ease of use as prominent predictors of users' intention to use FDAs. Satisfaction is also considered as an important antecedent which considerably impacts the adoption of online food delivery services (He et al., 2018). Similarly, Zhao and Bacao (2020) identified confirmation and satisfaction as significant influencers of continuance intention to use FDAs. Mehroliya et al. (2020) observed that during a pandemic like SARs, Covid-19 etc., the fear of getting infection disseminates quicker than the ailment itself. Customers tend to avoid travelling and visiting public places and the fear of getting infected from the Coronavirus and the health anxiety associated with it influences the users' buying behaviour and intention to use FDAs. To decode the direct and indirect effect of users' PU, PEOU, HA, FOC, CON and SAT, on continued intention (CI) to use FDAs, require more research. The present study will help in exploring the important dimensions that promote the use of FDAs in India.

### 2.2. Theoretical Foundations

#### 2.2.1 Technology Acceptance Model (*tam*)

TAM is an accomplished model that tries to predict how the users tend to adopt and accept a particular technology. The model states that when users are introduced to a novel technology, they are persuaded by many factors, post which they decide how to use the technology (Davis et al., 1989). TAM measures the behavioural intention through two technology acceptance measures: perceived ease of use and perceived usefulness. The model is immensely effective in predicting acceptance of new technology in many Information System (IS) related areas like on-demand ride services (Malik and Rao, 2019), online grocery shopping (Kurnia and Chien, 2003) and online food purchasing (Nguyen et al., 2019). As TAM has been extensively employed in different domain areas, other similar models are also available

to examine the technology adoption behaviour. One such model is unified theory of acceptance and use of technology (UTAUT) developed by Venkatesh et al. (2003). The current study uses TAM as the base model instead of UTAUT because of multiple reasons. First, in UTAUT, moderating variables (gender, age, experience and voluntariness) are used to attain a higher R<sup>2</sup> value. This makes UTAUT less parsimonious. Second, some of the studies suggest that the constructs - facilitating conditions and social influence are measured through a wide variety of disparate items which make the constructs problematic in nature (Van Raaij and Scheepers, 2008). In view of the flaws associated with UTAUT, a more conventional and established TAM was used to build the conceptual model.

### **2.2.2 Expectation Confirmation Model**

The model suggested by Bhattacharjee (2001), is based on the expectation confirmation theory (ECT) (Oliver, 1980). The model includes important determinants like performance expectancy, confirmation and satisfaction to examine the users' intention to use a technology continuously. In the last ten years or so, many research studies have recognised the capabilities of ECM particularly when evaluating the post-adoption behaviour of the consumers. The model has been extensively applied in the areas of mobile technology, concentrating exclusively on users' continuance intention to use mobile apps (Tam et al., 2018), mobile commerce (Lee and Chen, 2014) and mobile advertising (Hsiao and Chang, 2014). Furthermore, ECM is playing an important role in combination with other adoption models to examine the users' intention to use a technology continuously (Cheng and Yuen, 2018; Shang and Wu, 2017).

### **2.2.3 Discussion of Theoretical Framework**

Past studies suggest that TAM model predominantly concentrates on anticipating users' primary acceptance of a novel technology than on continuous usage. But in the recent years, identifying the essential antecedents that impact the users' intention to continuously use a technology has gained significant prominence (Al Amin et al., 2020). In the wake of improving the predictive capabilities of the continuance intention models, many studies in different domains have evaluated and examined factors like expectation, confirmation and satisfaction (Almazroa and Gulliver, 2018), PU and PEOU (Cheng and Yuen, 2020). This study incorporates two additional factors, FOC and HA to understand the users' mental perception concerning the continuous usage of FDAs at the time of Coronavirus pandemic. These two factors are supposed to measure the users' perception towards health risk and uncertainty involving visiting public places like restaurants etc. (Mertens et al., 2020) and may positively impact continuance intention of the users to use FDAs. The proven capability of ECM model to predict users' continuance intention to use a technology, amalgamated with the TAM model, incorporated with anxiety and fear of getting affected from the virus is poised to have a huge effect on the decision making of users in the pandemic times. Thus, the conceptual framework proposed is exhaustively and holistically designed.

## **2.3 Hypotheses Development**

### **2.3.1 The TAM Constructs**

#### **2.3.1.1 Perceived Ease of Use (PEOU)**

TAM suggests two crucial determinants in the adoption of new technology i) PEOU and ii) PU. PEOU signifies the degree to which a probable user anticipates that using a novel technology will be uncomplicated (Davis, 1989). Users perceive a technology that is convenient and simple to use to be offering better benefits. Moreover, TAM suggests that PEOU is supposed to have a significant influence (direct and indirect) on continuance intention to use technology through PU (Davis et al., 1989; Venkatesh and Davis, 2000). Similarly, many studies confirm that PEOU has a considerable effect on PU (Sohn and Groß, 2020). In the online food purchasing context, past studies also establish a positive influence of PEOU on PU (Nguyen et al., 2019). Reflecting from ECM, when a user's

expectation is confirmed, he/she is satisfied and, in turn, is more than happy to continue using the technology. The dearth of ease will impact the user's satisfaction levels and continuance intention. Past studies have examined the positive impact of PEOU on satisfaction and continuance intention (Natarajan et al., 2017). Many research works have also successfully integrated PEOU with ECM and have achieved significant results (Cheng, 2020). Hence, the current research deliberates that PEOU has a favourable impact on PU, satisfaction and continuance intention of using FDAs. Hence, the ensuing hypotheses are proposed:

- H1: PEOU has a positive influence on PU of using FDAs at the time of Coronavirus pandemic.
- H2: PEOU has a positive influence on SAT of using FDAs at the time of Coronavirus pandemic.
- H3: PEOU has a positive influence on CI of using FDAs at the time of Coronavirus pandemic.

### 2.3.1.2 Perceived usefulness (PU)

PU is regarded as the degree to which a user thinks that using a novel technology will ameliorate his or her efficiency at work (Davis, 1989). PU has been studied in both pre-adoption decision in TAM (Davis, 1989) and post-adoption expectation in ECM. In both the models the effect of PU is found to be significant. This indicates the favourable impact of PU on continuance intention to use a technology. PU in FDAs relates to easy mechanism of ordering food, ability to compare different food items and restaurant options and convenience of tracking the order (Ray et al. 2019). The ECM framework suggests a favourable effect of PU on the satisfaction levels of the users (Thong et al., 2006). It is essential for the users to be certain about the usefulness of any new technology, whether it actually improves the efficiency, saves time and cost etc. before making any decision to use it in the future. Users feel satisfied only when they perceive the usefulness of using an online technology (Bhattacharjee, 2001). They feel a sense of satisfaction towards using an online technology when the technology is perceived to be helpful and simple to operate (Li and Fang, 2019). Past studies have amply established the significant influence of PU on user satisfaction (Mou et al., 2017). Therefore, the subsequent hypotheses are posited:

- H4: PU has a positive influence on SAT of using FDAs at the time of Coronavirus pandemic.
- H5: PU has a positive influence on CI of using FDAs at the time of Coronavirus pandemic.

## 2.3.2 The ECM Constructs

### 2.3.2.1 Confirmation (CON)

As per ECM, consumers before using a technology tend to have an initial expectation about it. They form certain notions about the effectiveness of the technology as per their usage experience. The consumers evaluate the perceived performance vis-à-vis the initial expectation, and form their level of confirmation. Based on the confirmation level, the consumers develop the satisfaction level, and as a result ascertain their intention to use the technology continuously (Wang and Wang, 2019). A study conducted by Bhattacharjee (2001) and Oghuma et al. (2016) on usage of technology confirm that users' confirmation level has a favourable effect on their satisfaction levels. When the initial expectation is lower than or matches the users' actual experience, the confirmation leads to higher satisfaction levels. However, when the initial expectation exceeds the actual experience of the users, it results in dissatisfaction. The current research describes CON as the measure of users' confirmation of their primary expectations of using FDAs, which determine their satisfaction level towards continuance intention to use FDAs at the time of Coronavirus pandemic. Prior studies also validate that confirmation results in an enhanced perception of usefulness whereas disconfirmation leads to a reduced perception of usefulness (Islam et al., 2017). As the performance level is determined by confirmation (Bhattacharjee, 2001), the impact of confirmation can also be seen on the post-acceptance

perceived usability which further encourages the users to continuously use the technology (Susanto et al., 2016). Similarly, the level of confirmation has a substantial and favourable effect on PEOU. As the users gain confirmation experience, their PEOU also improves (Malik and Rao, 2019). In view of this, the next hypotheses are posited:

H6: CON has a positive influence on SAT of using FDAs at the time of Coronavirus pandemic.

H7: CON has a positive influence on PU of using FDAs at the time of Coronavirus pandemic.

H8: CON has a positive influence on PEOU of using FDAs at the time of Coronavirus pandemic.

### *2.3.2.2 Satisfaction (SAT)*

Past studies suggest that user satisfaction act as an essential determinant in understanding the continuous intention to use products or services (Kim et al., 2019). According to ECM, SAT has a favourable effect on the consumer behaviour and is in fact described as a comprehensive emotion-based assessment of a technology (Oliver, 1980; Yuan et al., 2016). An increased level of satisfaction encourages the users to persist using the technology in the future as well (Hsu and Lin, 2020). When the perceived performance of a service exceeds the users' expectations, they feel satisfied and intend to use the service continuously (Zhao and Bacao, 2020). This is important for fostering and sustaining an effective and enduring association between the users and the service providers. For example, Malik and Rao (2019) identified the significant influence of SAT on CI to use on-demand ride hailing applications. Many studies in the context of mobile technologies in the recent past have established the positive impact of SAT on CI (Marinković et al., 2020; Zhao and Bacao, 2020). Hence, it has been propounded:

H9: SAT has a positive influence on CI of using FDAs at the time of Coronavirus pandemic.

### *2.3.3 Constructs Related to Health and Coronavirus*

#### *2.3.3.1 Health Anxiety (HA)*

Health anxiety is described as “a persistent fear of illness or disease that often involves the misinterpretation of bodily symptoms as signs of serious illness” (Jones et al., 2014). Addo et al. (2020) suggest that health anxiety considerably influences the behaviour of the users. They become extra cautious and take considerable care in buying and preparing food and tend to avoid going to public places at the time of a pandemic. Existing literature has closely linked health anxiety with the consumption of food especially during the time of a pandemic (Nam et al., 2019). Users who are anxious about their health tend to develop a self-protective behaviour during the time of a pandemic. A similar type of behaviour was also observed during the SARs pandemic, where the fear of catching the infection led to an increase in the anxiety levels of the customers. Health anxiety often results in a safety/precautionary behaviour. Industries like travel (Turnšek et al., 2020) and tourism (Elizabeth et al., 2021) have also witnessed a change in the behaviour of the users owing to anxiety and fear factors. During the pandemic times, customers look for solutions that can reduce the risk of acquiring the disease. Ordering food through FDAs can be one such solution which can reduce the anxiety levels of the users. It can be assumed that users ordering food from the safety of their homes instead of visiting the restaurants during the time of a pandemic will probably have a positive influence on the satisfaction of using FDAs.

Some of the studies suggest that health anxiety can be a significant predictor of FOC (Mertens et al., 2020). A study conducted by Wheaton et al. (2012) established that an increased level of HA led to a higher degree of fear towards H1N1 “Swine flu”. In a similar study conducted by Blakey and Abramowitz (2017), it was concluded that health anxiety had a significant influence on the fear

of catching Zika virus. Hence, it is expected that health anxiety can be a significant influencer for the fear of Coronavirus. Therefore, the following hypotheses are posited:

H10: HA has a positive influence on SAT of using FDAs at the time of Coronavirus pandemic.

H11: HA has a positive influence on FOC.

### 2.3.3.2. *Fear of Coronavirus (FOC)*

Previous studies pertaining to consumer behaviour reveals that fear is defined as an unfavourable ramification of a particular occurrence that can result in a major shift in the behaviour of the consumers (Solomon, 2017). From that perspective, Covid-19 pandemic has altered the purchase intention and behaviour of the consumers as they fear catching infection (Laato et al., 2020). The fear of Coronavirus has led to a dramatic rise in the online delivery business (Nielsen, 2020). A report by Wallstreet online (2020) suggests that the fear of the pandemic has increased the demand for online food retailing. A survey conducted in Germany during March 2020 showed that the primary reason for the consumers to opt for online food delivery services was because of the fear of the Coronavirus (Dannenberg et al., 2020). The fear of Coronavirus has led to anxiety, depression and stress in the society and consumers now prefer to buy products via online platforms as they consider it to be a safer means of transaction (Pantano et al., 2020). It can be assumed that health related behaviour can have a massive influence on continuance intention to use a particular technology. Consumers evaluate the perceived benefits associated with a technology (Mehroliya et al., 2020) which in turn leads to long-term usage of it. When consumers presume that performing a particular task can reduce the exposure to a health issue, they continue to engage in that behaviour (Jeong and Ham, 2018). When India went into a complete lockdown and many people were compelled to stay at home, the most preferred mechanism to buy food items was through FDAs. The benefits offered by FDAs such as convenience, safety, low price etc. have a favourable effect on the consumers' buying intention at the time of Coronavirus pandemic (Mehroliya et al., 2020). Using FDAs lowers the fear of Coronavirus as it offers services such as contact-less delivery, online payment etc. (Nguyen & Vu, 2020). Hence, it can be safely assumed that FOC will have a favourable influence on the continuance intention to use FDAs. Therefore, the following hypotheses are proposed:

H12: FOC has a positive influence on SAT of using FDAs at the time of Coronavirus pandemic.

H13: FOC has a positive influence on CI of using FDAs at the time of Coronavirus pandemic.

## 2.4 Research Model

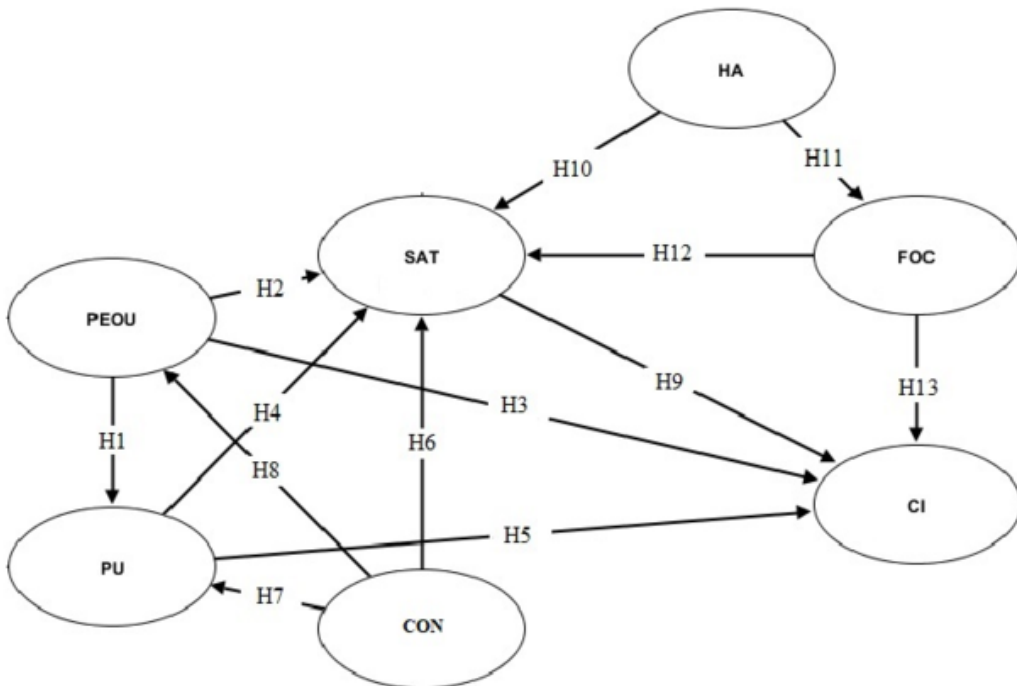
As per the past research works and the hypotheses proposed, the conceptual framework integrates variables from TAM and ECM and incorporates two additional constructs related to health viz. FOC and HA (see Fig. 1).

## 3. METHODOLOGY

### 3.1 Data Collection and Sampling Protocol

The target participants for the current study were the existing users of FDAs in India. Two sampling techniques were employed to collect the data: judgemental sampling and snowball sampling. The duration of the data collection was from 1<sup>st</sup> April 2020 to 31<sup>st</sup> July 2020. India went into a lockdown from 25<sup>th</sup> March 2020 but online food delivery remained operational during that period. A questionnaire was framed with the help of Google forms and shared with the participants online (WhatsApp, email). To secure the safety of the participants, the process of collecting the data was conducted via online mode only. As only previous users of FDAs were considered for the research, a filter question was

Figure 1. Proposed conceptual framework



added in the survey to weed out the ineligible participants. At the initial stage, the respondents were identified on the basis of judgemental sampling. Subsequently, supplementary list of respondents were acquired from the original group of respondents. The respondents also cooperated by sending the questionnaire to their contact network. In total, we received 685 responses and after inspecting the questionnaires thoroughly, 87 participants did not have any prior experience of using FDAs. Hence, only 598 valid responses were considered for subsequent examination, leading to a response rate of 87%. The participants' socio-demographic distribution patterns are highlighted in Table 1.

### 3.2 Questionnaire Formulation and Scale Development

The conceptual framework and hypotheses developed were validated through a questionnaire survey. The questionnaire was divided into two segments. The initial segment focused on the demographic details of the participants like age, gender, and order frequency through FDAs during the pandemic etc. The second segment consisted of questions related to continuance intention to use FDAs. Table 2 presents an overview of the measures and the source of the scale items.

## 4. DATA ANALYSIS AND RESULTS

Based on the exploratory nature of the study, PLS-SEM was employed to examine the data (Fornell and Bookstein, 1982; Hair et al., 2011). The present study used a sample size of 598 which exceeded the threshold value 10 times the highest number of inner path model (Chin and Newsted, 1999). The study conformed to the protocols of the PLS-SEM technique using bootstrapping procedure (5000 sub-samples).



Table 1. Profile of the participants

Measure	N	%
<b>Gender</b>		
Female	292	48.8
Male	306	51.2
<b>Age</b>		
Less than 21 years	150	25.1
21 - 30 years	303	50.7
31 - 40 years	66	11.0
41 - 50 years	61	10.2
Above 50 years	18	3.0
<b>Marital status</b>		
Married	72	12.0
Single	526	88.0
<b>Education</b>		
Graduation or below	348	58.2
Post Graduation or Master's degree	222	37.1
PhD and above	28	4.7
<b>Occupation</b>		
Unemployed	9	1.5
Student	237	39.6
Working Professionals	339	56.7
Retired	13	2.2
<b>Income</b>		
Less than Rs. 20,000	216	36.1
Rs. 21,000 - Rs. 40,000	163	27.3
Rs. 41,000 - Rs. 60,000	75	12.5
Rs. 61,000 - Rs. 80,000	58	9.7
Rs. 81,000 - Rs. 1,00,000	42	7.0
Above Rs. 1,00,000	44	7.4
<b>Order frequency</b>		
At least 1 time in 3 days	203	33.9
At least 1 time in a week	183	30.6
At least 1 time in 2 weeks	96	16.1
At least 1 time in a month	116	19.4

#### 4.1 Measurement Model

The measurement model examined the internal consistency, reliability and validity. The indicator loadings, Cronbach's alpha values and composite reliabilities (CR) were greater than required value of 0.700 (Hair et al., 2014). Convergent validity was established by evaluating the average variance

Table 2. Constructs and measurement items

Constructs	Item Codes	Items	Scale Source
<b>Health Anxiety</b>	HA1	I am always afraid that I have a serious illness	Lagoe and Atkin (2015)
	HA2	I usually feel at high risk for developing a serious illness	
	HA3	If I have a body sensation or change, I must know what it means	
	HA4	I am aware of aches/pains in my body all the time.	
<b>Fear of Corona Virus</b>	FOC1	I am very worried about the corona virus outbreak.	Merterns et al. (2020)
	FOC2	I am taking precautions to prevent infection (e.g., washing hands, avoiding contact with people, avoiding door handles)	
	FOC3	I am constantly following all news updates regarding the virus	
	FOC4	I have stocked up on supplies to prepare for problems related to the Coronavirus outbreak	
	FOC5	For my personal health I find the virus to be much more dangerous than the seasonal flu	
	FOC6	I feel that the health authorities are not doing enough to deal with the virus	
	FOC7	I am worried that friends or family will be infected	
	FOC8	I take more precautions compared to most people to not become infected	
<b>Satisfaction</b>	SAT1	I am very satisfied that FDAs meet my requirements during the COVID-19 pandemic.	Bhattacharjee (2001); Hung et al. (2012)
	SAT2	I am satisfied with FDAs efficiency during the COVID-19 pandemic.	
	SAT3	My interaction with the FDAs is very satisfying.	
	SAT4	I think I did the right thing by using FDAs during the COVID-19 pandemic	
<b>Confirmation</b>	CON1	My experience with using FDAs is better than what I expected.	Bhattacharjee (2001); Hung et al. (2012)
	CON2	The functions of FDAs are more than what I expected.	
	CON3	The service provided by FDAs is better than what I expected during the COVID-19 pandemic.	
	CON4	Overall, most of my expectations from using FDAs were confirmed	
<b>Perceived Usefulness</b>	PU1	Using FDAs enable me to track the order and receive the food.	Hu et al. (1999); Pinho and Soares (2011)
	PU2	Using FDAs make it more convenient for me to order and receive the food.	
	PU3	Using FDAs improve the process of ordering and receiving the food.	
	PU4	FDAs will be useful for me to order and receive the food.	
<b>Perceived Ease of Use</b>	PEOU1	I find it easy to order food using FDAs.	Hu et al. (1999); Wu and Wang (2005)
	PEOU2	It is easy for me to learn how to use FDAs.	
	PEOU3	Using FDAs do not require a lot of mental effort.	
	PEOU4	It is easy to become skillful at using FDAs.	
<b>Continuance Intention</b>	CI1	I intend to use FDAs during the COVID-19 pandemic continually.	Bhattacharjee (2001); Shao et al. (2019); Cho et al. (2019)
	CI2	If I have an opportunity, I will continually order food through FDAs.	
	CI3	I have an open attitude to use FDAs continually.	
	CI4	I am willing to use FDAs in the future continuously.	

extracted (AVE) value which was greater than 0.500 (see table 3 and table 4). Discriminant validity was established by analysing whether the square roots of AVEs were more than the inter-construct correlations or not (Fornell & Larcker, 1981). Additionally, heterotrait-monotrait (HTMT) ratios were also evaluated to check the discriminant validity and the results suggested that all the values were below the prescribed limit of 0.900 (Henseler et al., 2015).

**Table 3. Indicator loadings, Composite Reliability, Cronbach's alpha and Average Variance Extracted**

Constructs	Item Codes	Outer Loadings	Composite Reliability	Cronbach's alpha( $\alpha$ )	Average Variance Extracted
<b>Confirmation</b>	CON1	0.842	0.926	0.893	0.758
	CON2	0.876			
	CON3	0.879			
	CON4	0.884			
<b>Fear of Corona Virus</b>	FOC1	0.892	0.966	0.960	0.781
	FOC2	0.885			
	FOC3	0.913			
	FOC4	0.910			
	FOC5	0.901			
	FOC6	0.885			
	FOC7	0.870			
	FOC8	0.809			
<b>Health Anxiety</b>	HA1	0.831	0.928	0.896	0.762
	HA2	0.879			
	HA3	0.892			
	HA4	0.888			
<b>Perceived Ease of Use</b>	PEOU1	0.901	0.941	0.916	0.798
	PEOU2	0.908			
	PEOU3	0.889			
	PEOU4	0.875			
<b>Perceived Usefulness</b>	PU1	0.911	0.963	0.949	0.867
	PU2	0.938			
	PU3	0.937			
	PU4	0.938			
<b>Satisfaction</b>	SAT1	0.864	0.918	0.881	0.736
	SAT2	0.850			
	SAT3	0.867			
	SAT4	0.851			
<b>Continuance Intention</b>	CI1	0.897	0.939	0.913	0.794
	CI2	0.886			
	CI3	0.901			
	CI4	0.879			

### 4.2 Structural Model

After examining the internal consistency, reliability and validity, the structural model was evaluated. Fig. 2 summarises the results of the structural model. At the beginning, the collinearity issues were checked by evaluating the Inner VIF values and all the variables scored less than 5 (Neter et al., 1985). The R<sup>2</sup> (coefficient of determination) values were analysed and the explained variances of PU, PEOU, SAT and CI were R<sup>2</sup> = 0.24, R<sup>2</sup> = 0.26, R<sup>2</sup> = 0.74 and R<sup>2</sup> = 0.63 respectively, which established that the structural model was able to explain the endogenous construct considerably. The analysis of the f<sup>2</sup> effect sizes revealed that the strength between the variables ranged from small to large. PEOU had a very small effect on PU (0.015), SAT (0.022) and CI (0.041). SAT also had a small effect on CI with a value of 0.026. FOC and HA had a moderate effect on CI (0.175) and SAT (0.160) respectively. A large effect of HA was noted on FOC (0.995), while CON had a substantial influence on PEOU (0.476). The Stone-Geisser’s Q<sup>2</sup> values of all dependent variables were more than 0, signifying that the path model had predictive relevance (Hair et al., 2017). The model fitness was assessed through SRMR value (0.045) which was under the suggested limit of 0.08 (Henseler et al., 2015). Table 5 displays the f<sup>2</sup> values.

### 4.3 Hypotheses Testing

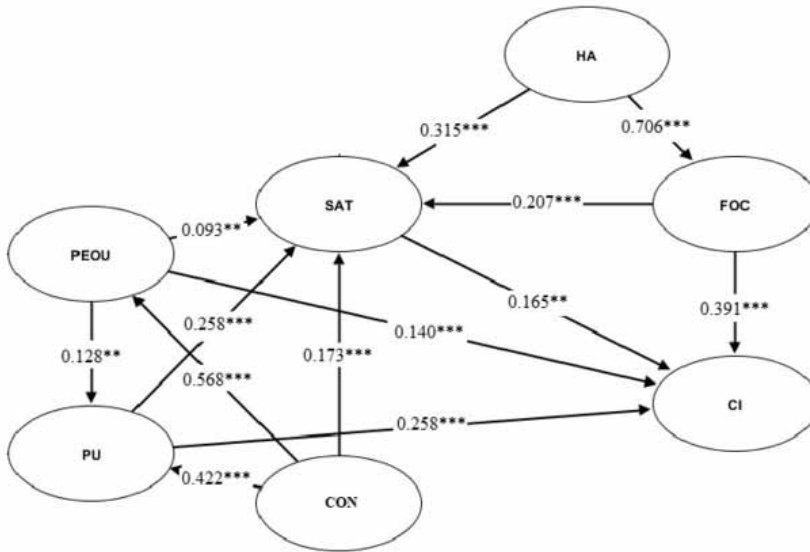
Bootstrapping procedure was employed to test the hypotheses with 5,000 sub-samples. The results indicated that continuance intention to use FDAs amidst the Coronavirus pandemic was favourably influenced by PEOU (β = 0.140, p = 0.001), PU (β = 0.258, < 0.001), SAT (β = 0.165, p < 0.01) and FOC (β = 0.391, p < 0.001) directly (see table 5). Hence, hypotheses H3, H5, H9 and H13 were supported. The outcomes also showed that SAT was favourably impacted by PEOU (β = 0.093, p < 0.01), PU (β = 0.258, p < 0.001), CON (β = 0.173, p < 0.001), FOC (β = 0.207, p < 0.001) and HA (β = 0.315, p < 0.001) respectively. Thus, hypotheses H2, H4, H6, H10 and H12 were accepted. Moreover, CON had a favourable influence on PU (β = 0.422, p < 0.001) and PEOU (β = 0.568, p < 0.001), while PEOU had a significant impact on PU (β = 0.128, p < 0.01), thereby supporting the

Table 4. Discriminant analysis –Fornell and Larcker and HTMT ratio

	CI	CON	FOC	HA	PEOU	PU	SAT
CI	<b>0.891</b>						
CON	0.641	<b>0.870</b>					
	(0.710)						
FOC	0.755	0.555	<b>0.883</b>				
	(0.806)	(0.599)					
HA	0.710	0.582	0.706	<b>0.873</b>			
	(0.785)	(0.649)	(0.760)				
PEOU	0.493	0.568	0.434	0.512	<b>0.894</b>		
	(0.539)	(0.626)	(0.463)	(0.565)			
PU	0.702	0.495	0.700	0.632	0.367	<b>0.931</b>	
	(0.752)	(0.537)	(0.733)	(0.685)	(0.394)		
SAT	0.718	0.652	0.747	0.773	0.538	0.722	<b>0.858</b>
	(0.800)	(0.737)	(0.812)	(0.871)	(0.600)	(0.786)	

Note: The diagonal values in bold are the square roots of AVE. The off-diagonal elements represent inter-construct correlations. HTMT ratios are displayed in parentheses.

Figure 2. Results



hypotheses H7, H8 and H1. Lastly, HA had a considerable influence on FOC ( $\beta = 0.706, p < 0.001$ ). Thus supporting hypothesis H11.

**5. DISCUSSION**

One of the major aims of the current research is to develop a robust model that can explain the users’ continuous intention to use FDAs in a much better manner as compared to the existing models like TAM and ECM. The results of this research strongly support the extension of the integrated model of TAM and ECM with additional constructs (FOC and HA), as all the hypothesized associations are significant. The outcomes of the research suggest that four determinants (FOC, PU, PEOU and SAT) have a substantial effect on continuance intention to use FDAs at the time of Coronavirus pandemic. Out of the four antecedents, FOC emerges as the most significant contributor to CI. The fear of the pandemic has led the users of the FDAs to continue using it as they consider ordering food online safe for their health. In a pandemic situation where normal daily routines are hampered and fear of acquiring a disease is high, online access to food products creates a sense of normalcy. This outcome is akin to a previous study carried out by Forster and Tang (2005). The FOC increases the desire for safety among the general public, which considerably influences their behaviour, perception and motivation. People tend to take preventative measures in order to avoid crowded places, restaurants etc. As visiting restaurants or local eateries during the Covid-19 pandemic is associated with risk and fearfulness, it has altered the way consumer ordered food and shifted their orientation towards online food ordering applications. This is in conformity to the previous study conducted by Jung and Sung (2017).

A crucial finding of the present research is the influence of HA on FOC and SAT of using FDAs. Users who are highly anxious about their health tend to suffer from the after-effects of a pandemic. This is also called as “hikikomori”, a syndrome where people become apprehensive to leave their homes (Teo, 2010). The study reveals that Covid-19 has considerably influenced the anxiety levels of the users and it is highly likely that hikikomori syndrome will result in users preferring to stay in the safety of their homes. With the growing prominence of online food delivery services, users with elevated levels of health anxiety find it easier to order food from home instead of going to a restaurant.

Table 5. Structural model and Blindfolding test results

Hypotheses	Path	Path Coefficient	R <sup>2</sup>	f <sup>2</sup> effect size	T Statistics	P Values	Q <sup>2</sup> (=1-SSE/SSO)	Model Fit – SRMR and NFI
H1	PEOU -> PU	0.128	0.664	0.015	2.798	0.005	0.521	0.045
H2	PEOU -> SAT	0.093		0.022	2.947	0.003		
H3	PEOU -> CI	0.140		0.041	3.943	0.000		
H4	PU -> SAT	0.258		0.124	6.485	0.000		
H5	PU -> CI	0.258		0.083	5.655	0.000		
H6	CON-> SAT	0.173		0.063	4.439	0.000		
H7	CON -> PU	0.422		0.162	9.764	0.000		
H8	CON -> PEOU	0.568		0.476	14.937	0.000		
H9	SAT -> CI	0.165		0.026	3.009	0.003		
H10	HA -> SAT	0.315		0.160	6.790	0.000		
H11	HA -> FOC	0.706		0.995	26.410	0.000		
H12	FOC -> SAT	0.207		0.065	4.673	0.000		
H13	FOC -> CI	0.391		0.175	8.028	0.000		
Dependent variables in the model	CI		0.664				0.521	
	PEOU		0.322				0.254	
	PU		0.256				0.218	
	SAT		0.748				0.545	
	FOC		0.499				0.386	
Model Fit	SRMR							0.045
	NFI							0.882

Thus, HA has a crucial role to play in the satisfaction levels of the users using FDAs. This outcome is along the lines of the past research conducted by Mertens et al. (2020).

As per the predictions made by TAM, the current research outcomes reveal the important part played by PEOU and PU. Past research studies mention that higher levels of PEOU leads to a favourable expectation of using a delivery application (Huang et al., 2012), which consequently affects its continuous usage (Natarajan et al., 2017). This signifies that users who perceive using FDAs as effortless are highly likely to consider such delivery applications as useful and continue to use them in the future as well. This result is contrary to study conducted by Khare and Sarkar (2020) and Yuan et al. (2016), who concluded that PEOU does not have a significant influence on CI. Moreover, the study suggests that PU has a favourable influence on SAT and CI to use FDAs. This is in accordance with the study carried out by Shin et al. (2010).

SAT also exerts a considerable influence on CI. This outcome is in accordance to the past research associated with the continuous usage of mobile based technologies (Marinković et al., 2020). The present study re-establishes the fact that SAT serves as a crucial antecedent for those users who intend to continue to use FDAs. Users tend to continue using the services of FDAs when they are satisfied with it. This finding is in conformity with the research conducted by Alalwan (2020), who identified a positive influence of SAT on CI to use FDAs. Hence, it is vital for the FDA providers to keep a track of users' satisfaction levels by offering a superior service to match their ever rising needs.

The research ascertains that CON has a favourable influence on SAT, PEOU and PU of using FDAs which is in accordance with the past study carried out by Alshurideh et al. (2020). CON indicates

the users' expectations developed from their past experience. A research carried out by Ray et al. (2019) mention that experience has a positive effect on users' intention to use FDAs continuously. Hence, it is imperative for the online food delivery providers to understand the expectations of the users so that they can enhance their proficiency and trustworthiness and offer services like contactless delivery, safe and hygienic delivery of food items during Covid-19 pandemic as per the needs of the users. This will help improve the users' experience and result in continuance intention to use FDAs.

### **5.1. Theoretical Implications**

The current study is an early attempt to comprehend the role played by fear of Coronavirus and health anxiety along with the usage of technology in understanding the users' continuance intention to use FDAs. The present study considerably adds value to the existing research works on FDAs in India in many ways. First, with regards to theory building, this research strives to develop a novel theory by incorporating two new constructs (FOC and HA) in the integrated model - TAM and ECM. The integration of the two structured models along with the two additional constructs is distinctive in the food delivery literature as no other studies around the world have employed such a combination till now. In the current study, FOC (Direct) and HA (Indirect) have been determined as significant predictors of continuance intention to use FDAs, which offer a unique perspective on the behaviour of the users to continue using a technology-based service in the food delivery arena. During the pandemic, the adoption of the FDAs has seen a remarkable growth but it is equally important to understand the sustainability of this growth. The long-term term sustainability of FDAs will eventually lead to the users' continuous usage behaviour. Hence, the current model proposed in the study will act as a pertinent tool to conceive relevant strategies to retain FDA users. Second, this study analyses different antecedents impacting the users' continuance intention to use FDAs at the time of Coronavirus pandemic. As a result, the outcomes of the study considerably strengthen the previous literature on the continuous usage of online food delivery services particularly in the context of a pandemic situation. Third, the study assesses the users' continuance intention to use FDAs in a multicultural nation, like India. With the recent advancement in mobile technology, India is witnessing an upsurge in the foodtech sector and more and more online food delivery providers are expected to join this highly competitive and lucrative industry. The current study provides a framework to all the upcoming food delivery service providers on the ways to not only increase the users' initial adoption rate but also to encourage their continuous usage behaviour.

### **5.2. Managerial Implications**

This research has many implications for marketers and practitioners in the online food delivery sector. First, the study suggests that the users perceive a lot of benefits in using FDAs, particularly in critical situations like the Coronavirus pandemic. The results reveal that the merits associated with using of FDAs like tracking order, convenience, contactless delivery etc. creates a favourable image in the minds of the users using FDAs. The marketers should focus on the benefits associated with the use of FDAs especially during the time of a pandemic. Second, to reduce the anxiety levels of users of FDAs, companies can launch marketing campaigns elaborating the safety measures followed by them at each step of the delivery process. These kinds of marketing initiatives will allay the fear of users who may be concerned about the chances of virus being spread through delivery partners. Third, as the study establishes the positive influence of SAT on CI, the FDA providers should concentrate on providing improved service quality, reliability and operational efficiency by profiting from the advancement in the mobile technology to achieve higher degree of user satisfaction levels. For example, a simply designed interface can increase the PEOU and PU of apps. This will strengthen the long-term association between the users and the firms, thereby, enabling the users to continue using FDAs even after the pandemic is over. Fourth, to enhance the trust levels and reduce the fear amongst the consumers regarding ordering food through FDAs, service providers can offer food delivery on time,

live streaming of the food being prepared at the restaurant, risk-free payment options and delivery of the food by authorised, verified and medically fit delivery personnel.

## **6. LIMITATIONS AND FUTURE RESEARCH**

The current research has certain constraints and also offers avenues for further research. First, the research predominantly concentrates on Indian FDA users and the outcomes cannot be generalised to other cultures and nations. Hence, future research can be conducted taking into account different nations and regions and a multicultural analysis can be performed. Second, as the participants of the study are existing users of FDAs, the data is skewed. The users are already accustomed to the functionality of the FDAs and hence, in the future a longitudinal research can be performed to evaluate the pre-satisfaction and post-satisfaction aspects of using FDAs. This will help in deciphering the complex association between satisfaction and continuance intention to use FDAs. Third, the present study does not differentiate between the various online food delivery platforms like Zomato, Swiggy, Faasos etc. Further research can be carried out by employing the research model in the context of different FDA service providers and check the users' brand preferences. Fourth, in the future, research on comparing the users' usage of FDA, prior and post the pandemic can be conducted to ascertain the exact effects of FOC and HA.

## **7. CONCLUSION**

In summary, the current empirical study tries to analyse the antecedents of users' continuance intention to use FDAs at the time of the Coronavirus pandemic. The research puts forward a holistic model incorporating ECM and TAM together, along with two constructs related to health anxiety and Coronavirus i.e. HA and FOC. The study examines 598 FDA users in India and data is analysed using PLS-SEM approach. The research model employs six factors to identify the crucial determinants that affect the continuance intention of users using FDAs at the time of Coronavirus crisis. The findings of the research reckon that the intention of the users to continue using the FDAs at the time of Coronavirus situation is considerably influenced by FOC, PEOU, PU and SAT. Additionally, factors like HA and CON have an indirect but significant influence on CI. The study considerably contributes to the literature on the foodtech sector both in terms of theoretical and managerial implications. The symbiotic integration of ECM and TAM models offers novel insights on the continuance intention to use FDAs.

## **FUNDING AGENCY**

Publisher has waived the Open Access publishing fee.



## REFERENCES

- Addo, P. C., Jiaming, F., Kulbo, N. B., & Liangqiang, L. (2020). COVID-19: Fear appeal favoring purchase behavior towards personal protective equipment. *Service Industries Journal*, 40(7-8), 471–490. doi:10.1080/02642069.2020.1751823
- Al Amin, M., Arefin, M. S., Sultana, N., Islam, M. R., Jahan, I., & Akhtar, A. (2020). Evaluating the customers' dining attitudes, e-satisfaction and continuance intention toward mobile food ordering apps (MFOAs): evidence from Bangladesh. *European Journal of Management and Business Economics*.
- Alagoz, S. M., & Hekimoglu, H. (2012). A study on tam: Analysis of customer attitudes in online food ordering system. *Procedia: Social and Behavioral Sciences*, 62, 1138–1143. doi:10.1016/j.sbspro.2012.09.195
- Alalwan, A. A. (2020). Mobile food ordering apps: An empirical study of the factors affecting customer e-satisfaction and continued intention to reuse. *International Journal of Information Management*, 50, 28–44. doi:10.1016/j.ijinfomgt.2019.04.008
- Almazroa, M., & Gulliver, S. (2018). Understanding the usage of mobile payment systems-The impact of personality on the continuance usage. In *2018 4th International Conference on Information Management (ICIM)* (pp. 188-194). IEEE. doi:10.1109/INFOMAN.2018.8392833
- Alshurideh, M., Al Kurdi, B., & Salloum, S. A. (2019, October). Examining the main mobile learning system drivers' effects: A mix empirical examination of both the Expectation-Confirmation Model (ECM) and the Technology Acceptance Model (TAM). In *International Conference on Advanced Intelligent Systems and Informatics* (pp. 406-417). Springer.
- Aquino, E. M., Silveira, I. H., Pescarini, J. M., Aquino, R., & Souza-Filho, J. A. D. (2020). Social distancing measures to control the COVID-19 pandemic: Potential impacts and challenges in Brazil. *Ciencia & Saude Coletiva*, 25, 2423–2446. doi:10.1590/1413-81232020256.1.10502020 PMID:32520287
- Bhattacharjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *Management Information Systems Quarterly*, 25(3), 351–370. doi:10.2307/3250921
- Blakey, S. M., & Abramowitz, J. S. (2017). Psychological predictors of health anxiety in response to the Zika virus. *Journal of Clinical Psychology in Medical Settings*, 24(3), 270–278. doi:10.1007/s10880-017-9514-y PMID:29063232
- Cheng, M., & Yuen, A. H. (2020). Junior secondary students' acceptance and continuance of e-learning system use: A multi-group analysis across social backgrounds. *Behaviour & Information Technology*, 1–24. doi:10.1080/0144929X.2020.1811378
- Cheng, M., & Yuen, A. H. K. (2018). Student continuance of learning management system use: A longitudinal exploration. *Computers & Education*, 120, 241–253. doi:10.1016/j.compedu.2018.02.004
- Cheng, Y. M. (2020). Why do customers intend to continue using internet-based sharing economy service platforms? Roles of network externality and service quality. *Journal of Asia Business Studies*.
- Chin, W. W., & Newsted, P. R. (1999). Structural equation modeling analysis with small samples using partial least squares. *Statistical Strategies for Small Sample Research*, 1(1), 307-341.
- Cho, M., Bonn, M. A., & Li, J. J. (2019). Differences in perceptions about food delivery apps between single-person and multi-person households. *International Journal of Hospitality Management*, 77, 108–116. doi:10.1016/j.ijhm.2018.06.019
- Citivelocity. (2020). *How covid-19 is impacting online food delivery platforms*. Retrieved December 29, 2020 from: <https://www.citivelocity.com/citigps/how-covid-19-is-impacting-online-food-delivery-platforms/>
- Dannenberg, P., Fuchs, M., Riedler, T., & Wiedemann, C. (2020). Digital transition by COVID-19 pandemic? The German food online retail. *Tijdschrift voor Economische en Sociale Geografie*, 111(3), 543–560. doi:10.1111/tesg.12453 PMID:32836487
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems Quarterly*, 13(3), 319–340. doi:10.2307/249008

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. doi:10.1287/mnsc.35.8.982

Elizabeth, A., Adam, I., Dayour, F., & Badu Baiden, F. (2021). Perceived impacts of COVID-19 on risk perceptions, emotions, and travel intentions: Evidence from Macau higher educational institutions. *Tourism Recreation Research*, 1–17.

Financial Express. (2019). *Online food delivery may touch \$12.53 billion by 2023*. Retrieved December 24, 2020 from: <https://www.financialexpress.com/industry/online-food-delivery-may-touch-12-53-billion-by-2023/1732353/>

Fornell, C., & Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *JMR, Journal of Marketing Research*, 19(4), 440–452. doi:10.1177/002224378201900406

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *JMR, Journal of Marketing Research*, 18(3), 328–388. doi:10.1177/002224378101800313

Forster, P. W., & Tang, Y. (2005). The role of online shopping and fulfillment in the Hong Kong SARS crisis. In *Proceedings of the 38th Annual Hawaii International Conference on System Sciences* (pp. 271a-271a). IEEE. doi:10.1109/HICSS.2005.615

Fortune India. (2020). *Food delivery apps rise to the occasion*. Retrieved December 27, 2020 from: <https://www.fortuneindia.com/enterprise/food-delivery-apps-rise-to-the-occasion/104972>

Google-BCG. (2020). *Demystifying the online food consumer: An \$8 Billion Opportunity*. Retrieved December 24, 2020 from: <https://www.bcg.com/en-in/demystifying-the-online-food-consumer-an-8-billion-opportunity>

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. doi:10.2753/MTP1069-6679190202

Hair, J. F. Jr, Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. doi:10.1108/EBR-10-2013-0128

Hair, J. F. Jr, Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. Sage.

He, Z., Han, G., Cheng, T. C. E., Fan, B., & Dong, J. (2019). Evolutionary food quality and location strategies for restaurants in competitive online-to-offline food ordering and delivery markets: An agent-based approach. *International Journal of Production Economics*, 215, 61–72. doi:10.1016/j.ijpe.2018.05.008

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. doi:10.1007/s11747-014-0403-8

Hsiao, W. H., & Chang, T. S. (2014). Understanding consumers' continuance intention towards mobile advertising: A theoretical framework and empirical study. *Behaviour & Information Technology*, 33(7), 730–742. doi:10.1080/0144929X.2013.789081

Hsu, C. L., & Lin, J. C. C. (2020). Understanding continuance intention to use online to offline (O2O) apps. *Electronic Markets*, 30(4), 883–897. doi:10.1007/s12525-019-00354-x

Hu, P. J., Chau, P. Y., Sheng, O. R. L., & Tam, K. Y. (1999). Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems*, 16(2), 91–112. doi:10.1080/07421222.1999.11518247

Huang, T. C. K., Liu, C. C., & Chang, D. C. (2012). An empirical investigation of factors influencing the adoption of data mining tools. *International Journal of Information Management*, 32(3), 257–270. doi:10.1016/j.ijinfomgt.2011.11.006

Hung, M. C., Yang, S. T., & Hsieh, T. C. (2012). An examination of the determinants of mobile shopping continuance. *International Journal of Electronic Business Management*, 10(1), 29–37.

- Islam, A. K. M., Mäntymäki, M., & Bhattacharjee, A. (2017). Towards a decomposed expectation confirmation model of it continuance: The role of usability. *Communications of the Association for Information Systems, 40*(1), 502–523. doi:10.17705/1CAIS.04023
- Jeong, J. Y., & Ham, S. (2018). Application of the Health Belief Model to customers' use of menu labels in restaurants. *Appetite, 123*, 208–215. doi:10.1016/j.appet.2017.12.012 PMID:29248690
- Jones, S. L., Hadjistavropoulos, H. D., & Gullickson, K. (2014). Understanding health anxiety following breast cancer diagnosis. *Psychology Health and Medicine, 19*(5), 525–535. doi:10.1080/13548506.2013.845300 PMID:24102547
- Jung, E., & Sung, H. (2017). The influence of the Middle East respiratory Syndrome outbreak on online and offline markets for retail sales. *Sustainability, 9*(3), 411–412. doi:10.3390/su9030411
- Khare, A., & Sarkar, S. (2020). Use of mobile apps in online shopping: Scale development and validation. *International Journal of Indian Culture and Business Management, 20*(1), 74–92. doi:10.1504/IICBM.2020.105560
- Kim, K. H., Kim, K. J., Lee, D. H., & Kim, M. G. (2019). Identification of critical quality dimensions for continuance intention in mHealth services: Case study of onecare service. *International Journal of Information Management, 46*, 187–197. doi:10.1016/j.ijinfomgt.2018.12.008
- Kurnia, S., & Chien, J. A. W. (2003). The acceptance of the online grocery shopping. In *The 16th Bled Electronic Commerce Conference* (pp. 219–233). Academic Press.
- Laato, S., Islam, A. N., Farooq, A., & Dhir, A. (2020). Unusual purchasing behavior during the early stages of the COVID-19 pandemic: The stimulus-organism-response approach. *Journal of Retailing and Consumer Services, 57*, 102224. doi:10.1016/j.jretconser.2020.102224
- Lagoë, C., & Atkin, D. (2015). Health anxiety in the digital age: An exploration of psychological determinants of online health information seeking. *Computers in Human Behavior, 52*, 484–491. doi:10.1016/j.chb.2015.06.003
- Lee, H. M., & Chen, T. (2014). Perceived quality as a key antecedent in continuance intention on mobile commerce. *International Journal of Electronic Commerce Studies, 5*(2), 123–142. doi:10.7903/ijecs.1150
- Li, C. Y., & Fang, Y. H. (2019). Predicting continuance intention toward mobile branded apps through satisfaction and attachment. *Telematics and Informatics, 43*, 101248. doi:10.1016/j.tele.2019.101248
- Liu, S., & Wang, J. (2020). *The Internet Society in China*. Springer. doi:10.1007/978-981-13-8237-6
- Malik, G., & Rao, A. S. (2019). Extended expectation-confirmation model to predict continued usage of ODR/ride hailing apps: Role of perceived value and self-efficacy. *Information Technology & Tourism, 21*(4), 461–482. doi:10.1007/s40558-019-00152-3
- Marinković, V., Đorđević, A., & Kalinić, Z. (2020). The moderating effects of gender on customer satisfaction and continuance intention in mobile commerce: A UTAUT-based perspective. *Technology Analysis and Strategic Management, 32*(3), 306–318. doi:10.1080/09537325.2019.1655537
- Mehroliya, S., Alagarsamy, S., & Solaikutty, V. M. (2020). Customers response to online food delivery services during COVID-19 outbreak using binary logistic regression. *International Journal of Consumer Studies, ●●●*, 1–13. PMID:33362434
- Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders, 74*, 102258. doi:10.1016/j.janxdis.2020.102258 PMID:32569905
- Mou, J., Shin, D. H., & Cohen, J. (2017). Understanding trust and perceived usefulness in the consumer acceptance of an e-service: A longitudinal investigation. *Behaviour & Information Technology, 36*(2), 125–139. doi:10.1080/0144929X.2016.1203024
- Nam, N. K., Nga, N. T. H., & Huan, N. Q. (2019). The consumers' intention to purchase food: The role of perceived risk. *Academy of Strategic Management Journal, 18*(1), 1–12.

Natarajan, T., Balasubramanian, S. A., & Kasilingam, D. L. (2017). Understanding the intention to use mobile shopping applications and its influence on price sensitivity. *Journal of Retailing and Consumer Services*, 37, 8–22. doi:10.1016/j.jretconser.2017.02.010

Neter, J., Wasserman, W., & Kutner, M. H. (1985). *Applied Linear Statistical Models* (2nd ed.). Irwin.

Nguyen, T. H., & Vu, D. C. (2020). Food delivery service during social distancing: Proactively preventing or potentially spreading COVID-19? *Disaster Medicine and Public Health Preparedness*, 1–4. PMID:32660690

Nguyen, T. T. H., Nguyen, N., Nguyen, T. B. L., Phan, T. T. H., Bui, L. P., & Moon, H. C. (2019). Investigating consumer attitude and intention towards online food purchasing in an emerging economy: An extended tam approach. *Foods*, 8(11), 576. doi:10.3390/foods8110576 PMID:31731668

Nielsen. (2020). *The effects of covid-19 on German retail*. Retrieved January 6, 2021 from: <https://www.nielsen.com/de/de/insights/article/2020/der-auswirkungen-von-COVID-19-auf-den-deutschen-handel/>

Oghuma, A. P., Libaque-Saenz, C. F., Wong, S. F., & Chang, Y. (2016). An expectation-confirmation model of continuance intention to use mobile instant messaging. *Telematics and Informatics*, 33(1), 34–47. doi:10.1016/j.tele.2015.05.006

Oliver, R. L. (1977). Effect of expectation and disconfirmation on postexposure product evaluations: An alternative interpretation. *The Journal of Applied Psychology*, 62(4), 480–486. doi:10.1037/0021-9010.62.4.480

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *JMR, Journal of Marketing Research*, 17(4), 460–469. doi:10.1177/002224378001700405

Ozturk, A. B., Bilgihan, A., Nusair, K., & Okumus, F. (2016). What keeps the mobile hotel booking users loyal? Investigating the roles of self-efficacy, compatibility, perceived ease of use, and perceived convenience. *International Journal of Information Management*, 36(6), 1350–1359. doi:10.1016/j.ijinfomgt.2016.04.005

Pantano, E., Pizzi, G., Scarpi, D., & Dennis, C. (2020). Competing during a pandemic? Retailers' ups and downs during the COVID-19 outbreak. *Journal of Business Research*, 116, 209–213. doi:10.1016/j.jbusres.2020.05.036 PMID:32501307

Pinho, J. C. M. R., & Soares, A. M. (2011). Examining the technology acceptance model in the adoption of social networks. *Journal of Research in Interactive Marketing*, 5(2-3), 116–129.

Prabowo, G. T., & Nugroho, A. (2019, March). Factors that Influence the Attitude and Behavioral Intention of Indonesian Users toward Online Food Delivery Service by the Go-Food Application. In *12th International Conference on Business and Management Research (ICBMR 2018)*. Atlantis Press. doi:10.2991/icbmr-18.2019.34

Qian, M., & Jiang, J. (2020). COVID-19 and social distancing. *Zeitschrift für Gesundheitswissenschaften*, 1–23. PMID:32837835

Ray, A., Dhir, A., Bala, P. K., & Kaur, P. (2019). Why do people use food delivery apps (FDA)? A uses and gratification theory perspective. *Journal of Retailing and Consumer Services*, 51, 221–230. doi:10.1016/j.jretconser.2019.05.025

Roh, M., & Park, K. (2019). Adoption of O2O food delivery services in South Korea: The moderating role of moral obligation in meal preparation. *International Journal of Information Management*, 47, 262–273. doi:10.1016/j.ijinfomgt.2018.09.017

Shang, D., & Wu, W. (2017). Understanding mobile shopping consumers' continuance intention. *Industrial Management & Data Systems*, 117(1), 213–227. doi:10.1108/IMDS-02-2016-0052

Shao, Z., Zhang, L., Li, X., & Guo, Y. (2019). Antecedents of trust and continuance intention in mobile payment platforms: The moderating effect of gender. *Electronic Commerce Research and Applications*, 33, 100823. doi:10.1016/j.elerap.2018.100823

Shi, P., Dong, Y., Yan, H., Zhao, C., Li, X., Liu, W., He, M., Tang, S., & Xi, S. (2020). Impact of temperature on the dynamics of the COVID-19 outbreak in China. *The Science of the Total Environment*, 728, 138890. doi:10.1016/j.scitotenv.2020.138890 PMID:32339844

- Shin, Y. M., Lee, S. C., Shin, B., & Lee, H. G. (2010). Examining influencing factors of post-adoption usage of mobile internet: Focus on the user perception of supplier-side attributes. *Information Systems Frontiers, 12*(5), 595–606. doi:10.1007/s10796-009-9184-x
- Sohn, S., & Groß, M. (2020). Understanding the inhibitors to consumer mobile purchasing intentions. *Journal of Retailing and Consumer Services, 55*, 102129. doi:10.1016/j.jretconser.2020.102129
- Solomon, M. R., White, K., Dahl, D. W., Zaichkowsky, J. L., & Polegato, R. (2017). *Consumer behavior: Buying, having, and being*. Pearson.
- Statista. (2020a). *Number of smartphone users worldwide from 2016 to 2021*. Retrieved December 22, 2020 from: <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>
- Statista. (2020b). *Number of smartphone users in India in 2015 to 2020 with a forecast until 2025*. Retrieved December 22, 2020 from: <https://www.statista.com/statistics/467163/forecast-of-smartphone-users-in-india/>
- Statista. (2020c). *Online Food Delivery*. Retrieved December 22, 2020 from: <https://www.statista.com/outlook/374/119/online-food-delivery/india>
- Susanto, A., Chang, Y., & Ha, Y. (2016). Determinants of continuance intention to use the smartphone banking services: An extension to the expectation-confirmation model. *Industrial Management & Data Systems, 116*(3), 508–525. doi:10.1108/IMDS-05-2015-0195
- Tam, C., Santos, D., & Oliveira, T. (2018). Exploring the influential factors of continuance intention to use mobile Apps: Extending the expectation confirmation model. *Information Systems Frontiers, ●●●*, 1–15.
- Teo, A. R. (2010). A new form of social withdrawal in Japan: A review of hikikomori. *The International Journal of Social Psychiatry, 56*(2), 178–185. doi:10.1177/0020764008100629 PMID:19567455
- Thong, J. Y., Hong, S. J., & Tam, K. Y. (2006). The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. *International Journal of Human-Computer Studies, 64*(9), 799–810. doi:10.1016/j.ijhcs.2006.05.001
- TRANSFIN. (2020). *Impact of the Coronavirus Pandemic on Restaurant and Food Industry in India*. Retrieved December 23, 2020 from: <https://transfin.in/impact-of-coronavirus-pandemic-on-restaurant-food-industry-in-india>
- Turnšek, M., Brumen, B., Rangus, M., Gorenak, M., Mekinc, J., & Štuhec, T. L. (2020). Perceived threat of COVID-19 and future travel avoidance: Results from an early convenient sample in Slovenia. *Academica Turistica-Tourism and Innovation Journal, 13*(1), 3–19. doi:10.26493/2335-4194.13.3-19
- Van Raaij, E. M., & Schepers, J. J. (2008). The acceptance and use of a virtual learning environment in China. *Computers & Education, 50*(3), 838–852. doi:10.1016/j.compedu.2006.09.001
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. doi:10.1287/mnsc.46.2.186.11926
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly, 27*(3), 425–478. doi:10.2307/30036540
- Wallstreet Online. (2020). *Corona fear is causing a boom in online food retail*. Retrieved January 6, 2021 from: <https://www.wallstreet-online.de/nachricht/12336847-virus-corona-angst-sorgt-boom-online-lebensmittelhandel>
- Wang, M. M., & Wang, J. J. (2019). Understanding Solvers' Continuance Intention in Crowdsourcing Contest Platform: An Extension of Expectation-Confirmation Model. *Journal of Theoretical and Applied Electronic Commerce Research, 14*(2), 59–69. doi:10.1007/s10660-018-09325-4
- Wang, Y. S., Tseng, T. H., Wang, W. T., Shih, Y. W., & Chan, P. Y. (2019). Developing and validating a mobile catering app success model. *International Journal of Hospitality Management, 77*, 19–30. doi:10.1016/j.ijhm.2018.06.002
- Wheaton, M. G., Abramowitz, J. S., Berman, N. C., Fabricant, L. E., & Olatunji, B. O. (2012). Psychological predictors of anxiety in response to the H1N1 (swine flu) pandemic. *Cognitive Therapy and Research, 36*(3), 210–218. doi:10.1007/s10608-011-9353-3

WHO. (2020). *WHO Coronavirus Disease (COVID-19) Dashboard*. Retrieved December 23, 2020 from: [https://covid19.who.int/?gclid=CjwKCAiAz4b\\_BRBbEiwA5XIVVvRWe9U8mkWr4zXXIyDo90Fh62aeVu6uiCbhKFeU2oPKasIAFWH3xRoC8DkQAvD\\_BwE](https://covid19.who.int/?gclid=CjwKCAiAz4b_BRBbEiwA5XIVVvRWe9U8mkWr4zXXIyDo90Fh62aeVu6uiCbhKFeU2oPKasIAFWH3xRoC8DkQAvD_BwE)

Wu, J. H., & Wang, S. C. (2005). What drives mobile commerce?: An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(5), 719–729. doi:10.1016/j.im.2004.07.001

Yuan, S., Liu, Y., Yao, R., & Liu, J. (2016). An investigation of users' continuance intention towards mobile banking in China. *Information Development*, 32(1), 20–34. doi:10.1177/0266666914522140

Zhao, Y., & Bacao, F. (2020). What factors determining customer continuingly using food delivery apps during 2019 novel coronavirus pandemic period? *International Journal of Hospitality Management*, 91, 102683. doi:10.1016/j.ijhm.2020.102683 PMID:32929294

*Prashant Raman is currently working as Assistant Professor at Institute of Public Enterprise, Hyderabad. He was previously associated with the Faculty of Management Studies – WISDOM, Banasthali University, India. He has over 14 years of experience in both industry and academics and teaches Marketing Management, Strategic Management, E-Business and Consumer Behavior to undergraduate and postgraduate students. He has worked with Satyam Computer Services Ltd. (Now Tech Mahindra) as a Relationship Manager for around 7 years where he was instrumental in handling ramp ups and bulk requirements for clients like Master Card, Google, Apple, Microsoft, Motorola etc. He has extensive experience in the areas of Client Relationship Management, Training & Development (T&D), Business Analysis, Resource Management, Internal Talent Management & Cost optimization. His areas of research interest include E-Commerce, Consumer behavior in the digital age and Marketing.*