

A STUDY ON THE AWARENESS OF AND OVERALL BRAND PERCEPTION OF CONTACT TRACING APP FOR COVID 19 – THE CASE OF AAROGYA SETU APP

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ABSTRACT

Mobile health apps have been gaining popularity over the last few years and during the Covid 19 pandemic, several countries across the globe launched their own contact tracing mobile apps in an attempt to monitor the spread of the pandemic. Some of the studies on the adoption of the Covid contact tracing apps revealed concerns about the functioning of the app and data security. The Indian government also launched their own contact tracing app branded as the Aarogya Setu app. Based largely on the Technology Adoption Model, this paper has proposed a conceptual model where perceived usefulness, perceived ease of use, trust, necessity of using the app and social influence of using the app were modelled as predictors of the overall perception of the app. The overall perception towards the Aarogya Setu app, was considered an important measure towards adoption of the app and hence was used a measure of the perception towards this brand. For this study, data was collected from users of the app on their mobile phones. SEM analysis was used to test the relationship between perceived usefulness, perceived ease of use, trust, and necessity of using the app, social influence and security of using the app with overall perception. The results of this study show that perceived usefulness, perceived ease of use, trust and the app as a necessity positively influenced the overall perception of the app. However, based on the analysis of the questions on the awareness of the app, it was found that users were not aware of many of the features or the prerequisites for the functioning of the app. Hence, it can be concluded from this study that there is a need to focus on communicating the usefulness, ease of use, trustworthiness and the necessity of the App to create a better overall perception and adoption.

Keywords: Aarogya Setu App.

INTRODUCTION

Mobile health apps have been increasingly gaining popularity and of the several thousand apps on Google Play store and iTunes app stor, 53,054 and 53,979 respectively are categorized as mobile Health Apps (source – Statista.com). As the Covid 19 pandemic struck across the world, world over it was proposed that while measures are being implemented by policy makers, technology needs to be developed and integrated into the deconfinement strategies adopted by countries. Thus, to reduce the risk of spread of Covid 19, while exiting lockdown, apps were introduced by the governments of 49 countries (Google spreadsheet listing on Covid 19 tracing app tracker by MIT Technology Review). Many of these apps have at their core, the concept of contact tracing. This method (contact tracing) has been used to assess the potential transmission routes of the virus in the population and to isolate and assist individuals who may have been in contact with someone with COVID-19 (Walrave, M. et al, 2020).

The app developed by the National Informatics Centre under the Ministry of Electronics and Information Technology (MeitY), Government of India is the COVID-19 tracking mobile application that was used to spread awareness on COVID-19 and connect essential COVID19 - related health services to the people of India was known by the brand name Aarogya Setu app. The app utilizes the GPS and Bluetooth features to track the possibility of the Covid infection and was made available in both Android and iOS mobile operating systems. The app crossed five million downloads within three days of its launch, and went on to become the world's fastest-growing mobile app within 13 days of its launch, replacing Pokemon Go, with more than 50 million installs.

The initial curiosity and mandatory instructions may have increased installation of the app, this research focuses on the awareness of the features and overall perception of the app to provide insights to marketers on how to market technology apps better, even those where the users have to share their personal details, which involves security concerns.

LITERATURE REVIEW

Adoption of New Technologies

Every marketer is keen on the adoption of their new launches. A number of theories have been proposed to explain the acceptance of new technologies and their intention to use by consumers. Some of them proposed over the years are Theory of Diffusion of Innovations (DIT) proposed by Rogers (1995), the Theory of Task-technology fit (TTF) by Goodhue, and Thompson (1995), the Theory of Reasonable Action (TRA) by Fishbein and Ajzen (1975), Theory of Planned Behavior (TPB) by Ajzen (1985), 1991), the Technology Acceptance Model (TAM) by Davis, Bagozzi and Warshaw (1989), Technology Acceptance Model (TAM) Venkatesh and Davis (1996), Technology Acceptance Model 2 (TAM2) Venkatesh and Davis (2000), Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh, Morris, Davis and Davis (2003) and Technology Acceptance Model 3 (TAM3) by Venkatesh and Bala (2008). Studies have also suggested that belief factors such as usefulness, enjoyment, trust, and performance may influence one's attitude toward using a technology more strongly than by ease of use (Van der Heijden and Verhagen, 2004). Fu and Elliott have used marketing models such as theory of reasoned action and Elaboration Likelihood Model to understand the effect of perceived product innovativeness and product knowledge on consumer's intention to purchase and willingness to pay for a technology product.

Differences in Mobile Health App Use

In the context of mobile based health application use, study by (Bol, Helberger, & Weert, 2018) revealed that digital divides could lead to some people benefiting more from mobile health technology than others. These digital divides have been classified as primary first level digital divide (where the inequalities were based on differences in access to and quality of internet access), second level divide (where the inequalities were based on digital literacy and skills and third level divide also referred to as 'digital usage gap' which orients the discussion from that of gaps between 'haves' and 'have nots' in terms of access to equipment to that of gaps in tangible outcomes as a result of digital technology use (Bol, Helberger, & Weert, 2018), Scheerder, Van Deursen, and Van Dijk 2017; Van Deursen and Van Dijk 2014). This gap referred to as 'digital usage gap'.

Adoption of Covid 19 apps: In the case of Ebola and Covid – 19, digital contact tracing involved applications installed on individual smartphones. A comparative analysis of 3 apps introduced by European Governments by (Jacob & Lawarée, 2020) found issues concerning the adoption of apps related to: how the application works, security and data protection, the effectiveness, relevance, acceptability of digital tracing, the short timeframe to develop app, lack of interoperability with other apps and political power.

The TAM model² was used as a guiding framework in the development of the conceptual model given below to understand the overall brand perception of the Aarogya Setu app. Open ended questions were used to understand differentiating patterns of contact tracing app use by focusing on individual differences such as demographic factors and awareness of the this app brand.

Gap in the Literature

The TAM models, have measured the intention to use/ continue to use as a predicted or dependent variable. Since the Aarogya Setu App had a very high adoption rate within a few days of its launch, the users' attitude towards the brand (here Aarogya Setu App) was measured as a dependent construct. Synonymous to the brand awareness studies popular in marketing literature, this study has also attempted to understand the awareness of the various features of the app through closed ended questions.

Theoretical Frameworks used for framing the Conceptual Model

The relative newness of the Aarogya Setu app as a product and the Government's insistence of using the app implied that factors influencing people's overall perception of the app need to be adequately understood. Marketers need to identify the reason to use a product so that appropriate product feature enhancements and modifications can be made to ensure increased usage of the product. Unlike other new product innovations, technology products have a different life cycle pattern and reasons for adoption. Many studies in the past have used the Technology Acceptance Model by Davis to study the acceptance of technology. (Venkatesh & Davis, A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, 2000) Studies have confirmed the validity of the TAM in in mobile health app usage by highlighting the impact of both perceived usefulness and perceived ease of use on people's actual use of a health app (Wang, Park, Chung, & Choi, 2014) and their intention to continue using a health app (Cho, 2016; Cho, Lee & Quinlan, 2015). The two variables that were included from these studies are perceived ease of use and perceived usefulness of a technology.

TAM and the papers that were extensions to it have studied the intention to adopt technology as the dependent variable. However, since the app gained phenomenal acceptance in just a few days of its launch, this study attempted to understand how perceived usefulness, ease of use, trust, necessity to use the App and social influence act as antecedents to respondents' overall perception of the app. The conceptual model represented below will help understand the drivers of the overall perception of the app brand Figure 1.

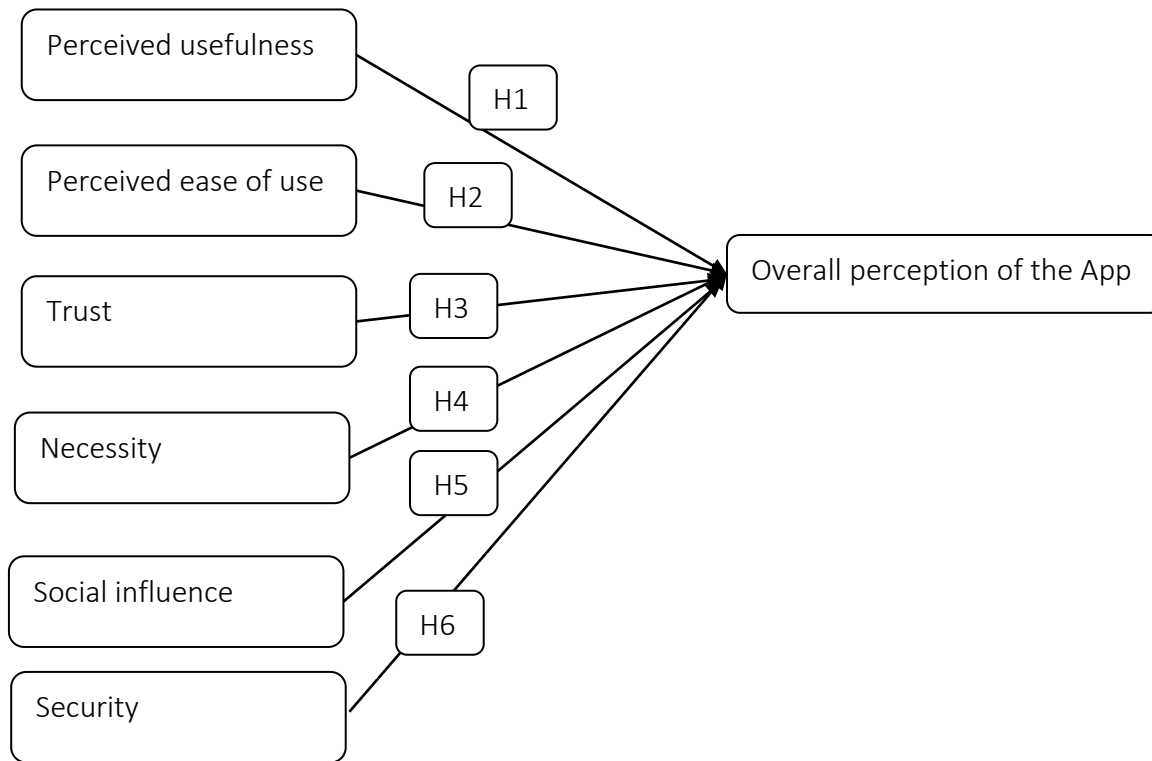


FIGURE 1
OVERALL PERCEPTION OF THE APP

Dependent Variable

Overall perception of the app has been used as a dependent measure in this model similar to the attitude towards a product or brand.

Independent Variables

- 1. Perceived Ease of Use and Perceived Usefulness:** Perceived usefulness is defined here as "the degree to which a person believes that using a particular system would enhance his or her job performance" Davis (1989). Perceived ease of use, in contrast, refers to "the degree to which a person believes that using a particular system would be free of effort." This follows from the definition of "ease": "freedom from difficulty or great effort" Davis (1989). The following hypotheses have been framed:
 H1: Perceived ease of use is positively associated with overall rating for the app.
 H2: Perceived usefulness is positively associated with overall rating for the app.
- 2. Trust:** The items for privacy/ security were adapted from the study by Ha, S., & Stoel, L. (2009).
 H3: Trust in the App is positively associated with overall rating for the app.

3. Necessity to use the app: Cialdini and Goldstein (2004) have concluded that social influence could be differentiated into two, namely injunctive social norms (referring to what most people typically approve or disapprove) and descriptive social norms (referring to what most people normally do).
H4: Necessity to use is positively associated with overall rating for the app.
4. Social influence: Venkatesh and Davis (2000) defined it as a person's perception of the need to behave in a certain way due to social pressure. This social influence (also referred to as subjective norm according to them is due to the likelihood that people may choose to perform a behavior, even if they are not themselves favorable toward the behavior or its consequences, if they believe one or more important referents think they should, and they are sufficiently motivated to comply with the referents' (Venkatesh & Davis, 2000).
H5: Social influence is positively associated with overall rating for the app.
5. Perceived security of the app: Perceived security refers to "the degree of customer's belief that the application is safe from interference and ensures protection of personal information shared over it" (Hussein and El Aziz, 2013). The items for privacy/ security were adapted from the study by Ha, S., & Stoel, L. (2009).

H₆: Perceived security of the app is positively associated with overall rating for the app.

METHODOLOGY

The approach adopted for this research was a mixed methods study using both qualitative and quantitative approaches. In the qualitative study, in – depth interview was conducted which was followed by the review of literature to identify the variables that could map the themes identified in the qualitative study. This was followed by the quantitative study to test the conceptual model using a questionnaire. Data was collected from 200 respondents which was analysed using SmartPLS (version 3). The details of the studies conducted, instrument design, data collection, and analysis are given in the next section.

Phase 1: In the first phase of the research, a qualitative study was conducted using in - depth interviews with 7 seven respondents. The themes identified from this study formed the basis for the identification of the variables. This was followed by a review of literature for the same variables.

Phase 2: Following the literature review, variables were defined and existing scales were identified and modified to create a questionnaire. The variables being reflective in nature, all of them were measured using five – point Likert scales, since five-point scales help in reducing respondents' confusion and increasing the response rate (Babakus and Mangold, 1992; Bouranta et al., 2009). 7 questions captured personal details and 15 questions were based on the variables identified for the study. There were questions to test the level of awareness of the different features of the app such as the need to keep the Bluetooth and GPS on at all times.

Data Analysis and Results

a. Descriptive analysis

The gender distribution was representative of the overall population of India. Younger respondents were more comprising up to 80% of the sample. More than 80% of the population

had completed their graduation. Only 3% of the population had not completed their class 12. Refer Table 1 for these details.

Table 1 DEMOGRAPHICS		
	Total	Percentage
Age		
15-24	108	54%
25-34	63	32%
35-44	15	8%
45-64	14	7%
Gender		
Female	82	41%
Male	118	59%
Qualification		
12th passed	6	3%
Graduate	63	32%
Post Graduate	110	55%
Under Graduate	21	11%

b. Model for the study

The model was tested using the SmartPLS software package (Ringle et. 2015). This is a component – based path modelling software based which analyses data on the basis of the partial least squares method (PLS). It’s a technique that combines principal component analysis, path analysis and regression and does not require multivariate normal distribution or sample size. Tests for the measurement validity of the instrument, followed by hypotheses testing as a part of the structural model analysis are given sequentially below Tables 2 & 3.

Table 2 AWARENESS LEVELS		
	Total	Percentage
<i>Do you know that Aarogya Setu app works only when the Bluetooth and GPS (location) is on</i>		
No	47	24%
Yes	153	77%
<i>Do you know why Bluetooth and GPS should be switched on always?</i>		
I am not aware of it	21	11%
To track the coronavirus infection	9	5%
To track the coronavirus infection; To track your location if you cross by a coronavirus infected person	27	14%
To track your health and fitness	5	3%
To track your health and fitness; To track the coronavirus infection	5	3%
To track your health and fitness; To track the coronavirus infection;	34	18%

To track your location if you cross by a coronavirus infected person		
To track your health and fitness; To track your location if you cross by a coronavirus infected person	4	2%
To track your location if you cross by a coronavirus infected person	95	48%
<i>Do you know that whenever you come in contact with a coronavirus infected person, the app traces your location, track your details and sends the alert?</i>		
No	68	34%
Yes	132	66%

Table 3					
MODEL ANALYSIS					
	Necessity	Overall rating	Perceived ease of use	Perceived usefulness	Trust
Ease1	0.486	0.461	0.928	0.320	0.353
Ease2	0.404	0.462	0.928	0.327	0.370
Necessity1	0.885	0.654	0.423	0.478	0.471
Necessity2	0.864	0.604	0.416	0.484	0.526
Overall1	0.555	0.870	0.406	0.628	0.573
Overall3	0.708	0.894	0.469	0.619	0.591
Useful1	0.505	0.639	0.288	0.871	0.599
Useful2	0.421	0.552	0.304	0.822	0.363
Trust1	0.568	0.660	0.389	0.577	1.000

Content Validity: pre – test and post – test

Content validity is conducted for the improvement and ensures logical clarity. A pre – test of the instrument was conducted among students and feedback on the clarity of the items was collected. A pilot study was conducted following this with another sample of 50 students. The reliability and validity of the instrument were tested, and the path coefficients were found to be positive in this study. Based on the above results, the final study was designed and administered using Google forms.

Measurement Model

The construct reliability and validity, and discriminant validity tests for the measurement model are given below:

Construct reliability and validity: This refers to the validation of the internal consistency reliability (Hair et al., 2019). The measures for reliability include composite reliability (CR) and Cronbach’s alpha (CA). In this case, the Cronbach’s alpha for all the variables are above 0.6 and Composite reliability for all are above 0.7 which is desirable for good reliability. The metric used to evaluating a construct’s convergent validity is the Average Variance Extracted (AVE) for all items. AVE score above 0.5 is acceptable as it indicates each construct explains at least 50 percent of the variation of its items. Refer to table 3 for the scores of these measures.

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Necessity	0.694	0.867	0.765
Overall rating	0.715	0.875	0.778
Perceived ease of use	0.838	0.925	0.861
Perceived usefulness	0.607	0.835	0.717
Trust	1.000	1.000	1.000

Construct reliability – indicator loading: To validate the measurement model, the first step is to examine the factor loadings, where a value of above 0.7 is recommended for the factors and the construct loadings are to be higher than that on all other constructs (Hair et al., 2019). As can be seen from the table, the above condition is being met Tables 4 & 5.

	Necessity	Overall rating	Perceived ease of use	Perceived usefulness	Trust
Necessity	0.875				
Overall rating	0.720	0.882			
Perceived ease of use	0.480	0.497	0.928		
Perceived use	0.549	0.706	0.349	0.847	
Trust	0.568	0.660	0.389	0.577	1.000

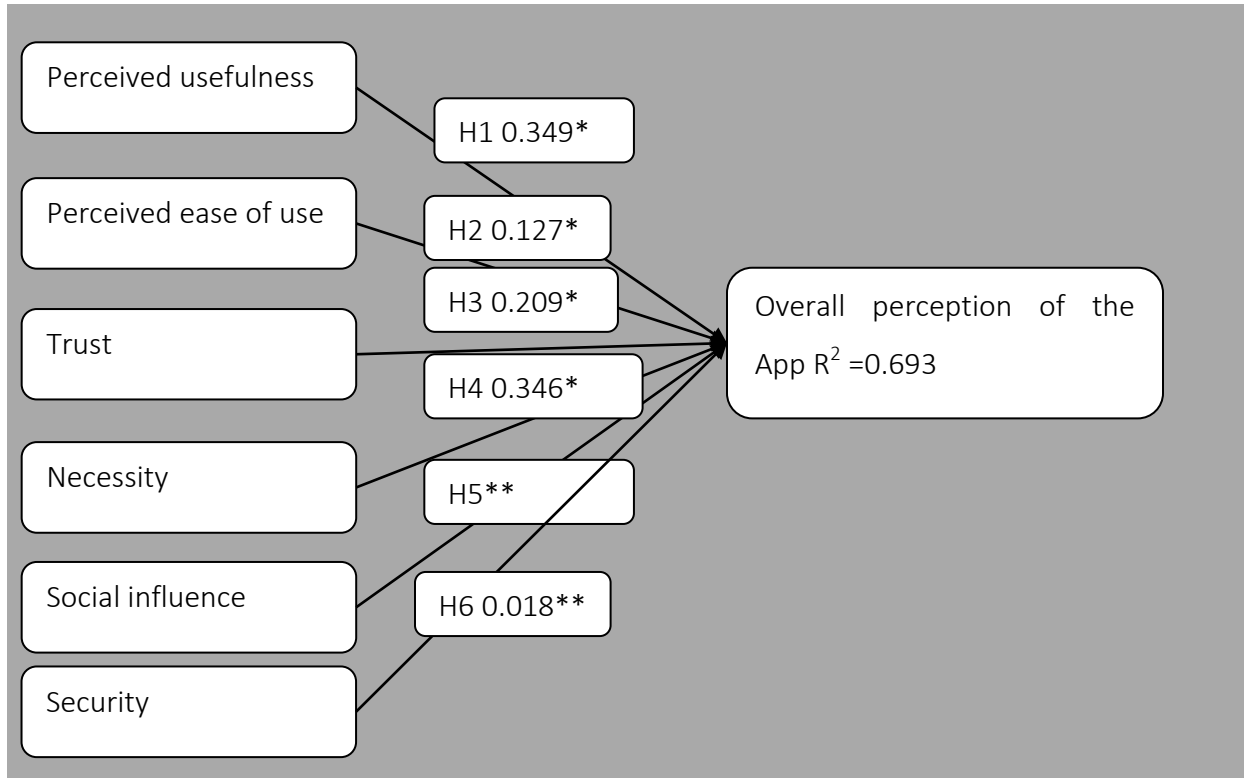
Discriminant validity: The third step is the assessment of the discriminant validity, which explains how the constructs are different from the other constructs in the model. The Fornell Larcker criterion can be used as a measure of the same. This criterion indicates that the square root of each of the construct's AVE scores, which should be greater than the correlations with other latent variables. This is satisfied for the model. The value of HTMT, if below the threshold of 0.9 is an indication of discriminant validity (Kline 2015) Table 6.

	Necessity	Overall rating	Perceived ease of use	Perceived usefulness	Trust
Necessity					
Overall rating	1.015				
Perceived ease of use	0.629	0.640			
Perceived use	0.842	1.067	0.490		
Trust	0.684	0.780	0.425	0.728	

Structural Model

In the model we see that the impacts of perceived usefulness (H1), perceived ease of use (H2), trust (H3), necessity to use the app (H4) are supported. The security and social dimension

are not supported. The r – squared of the model is 0.699 while the adjusted r squared is 0.693. and Figure 2 is the model for overall perception of the app. The following section provides a detailed discussion on the findings from the path model as well as the open - ended questions. Perceived usefulness and Trust in the App have the highest influence on the Overall Perception of the App.



**FIGURE 2
STRUCTURAL MODEL**

DISCUSSION

a) Findings from the analysis of data

Prior studies on Technology Acceptance Models have examined the influence of Perceived usefulness, Perceived ease of use, Trust, Necessity to use the technology, Social influence and Perceived security on the intention to use the technology. Here the above variables were found tested to see their effect on the Overall perception of the app. Social influence, as reliance on others’ opinions is significant only in mandatory settings (Hartwick and Barki, 1994), and in this work it has not been found to be significant. Contradictory to what was hypothesized about the need for perceived security in terms of the privacy of their personal information (Al-Hawari, 2014), perceived did not influence the overall perception of the application, as per this study Tables 7, 8.

	Necessity	Overall rating	Perceived ease of use	Perceived usefulness	Trust
Necessity	1.000	0.720	0.480	0.549	0.568
Overall rating	0.720	1.000	0.497	0.706	0.660
Perceived ease of use	0.480	0.497	1.000	0.349	0.389
Perceived use	0.549	0.706	0.349	1.000	0.577
Trust	0.568	0.660	0.389	0.577	1.000

b) Findings from the analysis of the other questions on awareness of the application

The analysis revealed that though a large number of people had downloaded the app, they are not aware of the many features of the app and they have simply downloaded it. And people who are aware are concerned with the privacy issues of it. Some people think that the app is not worth it to use. Many people are not clear as to why the Bluetooth and Location options are always on in their phones. There was a concern as to how those who didn't have smartphones could comply.. One more issue that has been aroused is that people who have installed Aarogya Setu app will be allowed to travel in domestic flights and if the person gets the negative results then why they are being quarantined?

	Overall rating
Necessity	0.346
Overall rating	
Perceived ease of use	0.127
Perceived usefulness	0.349
Trust	0.213

CONCLUSION

The findings from the SEM analysis and the awareness of the Aarogya Setu app, when examined together reveal that the awareness about the use and usefulness of the application and trust in the application and necessity of using the application have a positive influence on the overall perception about the Aarogya Setu app and respondents were aware that the app helped in contact tracing and sent alerts whenever the user comes across an infected person. However, 52% of the respondents were not aware that the Bluetooth and GPS need to be on for the contact tracing to work. It is also important to note that those who didn't use Aarogya Setu app regularly said they had data security concerns because the app requires the phone's GPS and Bluetooth to be on at all times. This finding is significant when seen in the light of the SEM analysis which showed that the security of the app did not have a significant relation with the overall perception of the app. The higher rate of download of the application will not be effective when the users are not aware of the features of the application since they may discontinue the usage of the app, if they do not understand why the Bluetooth should be on at all times, since they see that as a hindrance. The government needs to educate them on the prerequisites for the functioning of the

application, such as the need for keeping the Bluetooth and GPS on at all times. The respondent group in this study had completed their schooling and yet were not aware of the full features of the application.

Though in the case of apps launched by governments of other countries the security feature of the app was of great concern, in the case of the Aarogya Setu app launched and marketed by the Government of India was not seen as a security concern. The Government had promoted the app and requested social media to promote the same. It can be concluded that for the success of such an initiative, users need to be made aware through popular media and focused marketing campaigns educating users on the necessity and use of these applications. Communication of these aspects would increase the usage and continued usage of such technologies, developed for the society at large.

Contributions of the Research

The contribution of this research can be examined from the perspective of the theoretical contribution as well as a contribution to marketing practitioners.

Contribution to Theory

Considering the importance of consumers' willingness to use mobile health applications (Ali et al., 2018), this study provides a framework to understand the drivers that influence users' perception of a mobile health app that collects sensitive personal information.

Contribution to Marketers

The analysis of the awareness levels of the users indicates that even though users may have downloaded the app, efforts need to continue to provide awareness related to the app's usage, the marketing activities need to focus on 'how to use the app' and 'the prerequisites for using the app (Bluetooth and GPS)'. This may especially be so, since it is a technology product and marketers of such products would do well to conduct marketing research to study the awareness levels of their users during the initial phase and use these studies to further develop their marketing communication.

Scope for Future Research

The following suggestions for further research can be made based on the findings from this research study: This study was limited to the sample size of 200 only and had a larger concentration of educated respondents since the questionnaire was administered via Google forms. Perhaps future research could include a larger section of the population and a more representative one. It is recommended that future research include a longitudinal study, through which significant patterns of behavior and preferences should emerge.

LIMITATIONS

While the app is a great initiative to track cases, it is also a good awareness app for citizens as it helps them stay safe. But the app's greatest limitation is that it needs to be downloaded for it to actively share information with other phones. The second limitation is that

the number of tests in India needs to improve significantly. That number needs to grow significantly for the app to garner more data. With India approving more rapid testing kits, this number should hopefully go up. But all the same, without more signups and tests, the app would not live up to the potential it deserves.

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