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## Article

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Amfiteatru Economic Journal

## Provided in Cooperation with:

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*Suggested Citation:* Yuan, Jingbo; Shah, Sayed Kifayat; Popp, Jozsef; Acevedo-Duque, Angel (2024) : Understanding the forced adoption of an AI-based health code system in China, Amfiteatru Economic Journal, ISSN 2247-9104, The Bucharest University of Economic Studies, Bucharest, Vol. 26, Iss. 66, pp. 550-567,  
<https://doi.org/10.24818/EA/2024/66/550>

This Version is available at:

<https://hdl.handle.net/10419/300609>

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# UNDERSTANDING THE FORCED ADOPTION OF AN AI-BASED HEALTH CODE SYSTEM IN CHINA

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## Please cite this article as:

Yuan, J., Shah, S.K., Popp, J. and Acevedo-Duque, A., 2024. Understanding the Forced Adoption of an AI-Based Health Code System in China. *Amfiteatru Economic*, 26(66), pp. 550-567.

DOI: <https://doi.org/10.24818/EA/2024/66/550>

## Article History

Received: 16 November 2023

Revised: 7 February 2024

Accepted: 10 March 2024

## Abstract

With the growth of technology and the exigency to continuously improve their socioeconomic position, users must gradually adopt new AI-based solutions. However, users may experience dissatisfaction and frustration when faced with the replacement of previous systems. To bridge this gap, this study proposes a theoretical model that relies on the forced acceptance and usage of AI-based services during COVID-19 in China. This research examined the implementation of a novel health code system in which users were forced to exclusively adopt this system to restrict face-to-face interactions. The study hypotheses were evaluated by employing structural equation modelling (SEM) on the data obtained from a survey of 262 Chinese users. The results show that the forced acceptability of use is impacted by technological and personal factors. This study demonstrates the forced implementation and daily utilisation of the health code system to meet the social needs of the vulnerable population and offers a comprehensive analysis of the process by which policies are formulated. This framework will incentivise socioeconomic progress in institutions and society, as well as assist other academicians in organising their thoughts and promoting the development of theory.

**Keywords:** forced acceptance, PLS-SEM model, COVID-19, health-code system, China

**JEL Classification:** O1, O3, I1, M3

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## Introduction

The cutting-edge features of technology have changed user behaviour during the very catastrophic COVID-19 outbreak that decimated the whole world (Li et al., 2021). With the choice to remain indoors, the hotel, leisure, and tourism sectors have seen significant negative effects, since individuals were unable to visit or engage in these kinds of businesses and activities. The use of innovative technology is a significant advantage in the modern period in addressing the difficulties posed by epidemics (Shah et al., 2022). Companies have developed and implemented AI-powered contact monitoring tools expeditiously to notify users and public health professionals if anyone has been exposed to the disease and to determine whether a hotspot should be declared. According to the MIT list of such applications, some are transitory, optional, and portable, while others, such as China's health code system, are mandatory, ubiquitous, and intrusive. Previously, mobile ticketing, mobile payment, and other online services have all been used by the high-speed train, airline, public transportation businesses, etc. (Khajeheian and Ebrahimi, 2020). However, the quick creation of an online AI-based "health code system" is one area of actual success that provides users' whereabouts, contact information, and physiological information through their smartphone. In addition, Chinese pharmacists and companies that were in the forefront of the pandemic quickly introduced other cutting-edge AI-based methods in response to this pandemic. The reopening of industries and the world economy has been made possible using big data and AI technologies for quick and real-time decision-making and social segregation (Li et al., 2021). Today, researchers believe that using AI-based products has advantages for both service providers and users, contributing to future socio-economic development (Meuter et al., 2003). However, users tend to prioritise efficiency and cost-effectiveness. Consequently, they tend to attribute quality improvements to the availability of self-service options and benefit from the notions of autonomy and empowerment (Collier and Kimes, 2013; Reinders et al., 2015). For this purpose, many firms have raised the acuity of the worth of their services, reduced expenditures, and expanded their distribution networks simultaneously by reducing costs to obtain economic benefits (Beatson et al., 2007; Olah et al., 2021). However, the most radical approach of businesses to force consumers to adopt such new products or services is to eliminate the original choice (Cserdi and Kenesei, 2021).

The introduction of innovative technological solutions to deliver superior service and improve cost efficiency is an essential feature of these developments for both organisations and final users (Deveci et al., 2019; Chuenyindee et al., 2022). However, introducing new technology, product, or service modes may increase user resistance and lead to a decline in intention and satisfaction (Cao et al., 2021). Therefore, the seamless integration of technological advancements is imperative (Chen et al., 2022; Ullah et al., 2023), which is not uncommon in the health industry. This sector and related users are frequently compelled to maintain only the most effective method, as cost-effectiveness is an absolute necessity. The introduction of novel systems leads to the end of the old system, which often includes the closure of individual and human interaction methods (Reinders et al., 2015; Ma et al., 2019; Cserdi and Kenesei, 2021). As passive recipients of these shifts, related users may believe that deploying the new framework is not in their best interests. Therefore, they are reluctant to accept these changes, although innovative technology-based modes would have been far more socially comfortable and economically beneficial. In these circumstances, it is vital to identify the aspects that may aid user and organisation adoption of novel systems and services.

The objective of this article is to ascertain the factors that influence the propensity of users to adopt a newly mandated system, the decisions made by firms, and the potential socioeconomic consequences of such systems. An indication of personal social and economic development can be observed in the form of elevated socioeconomic status, measured by attributes such as personal wealth and income. Other major aspects are standard of living, quality of life, and overall health. At the organisational level, socioeconomic growth can be seen in increases in global competitiveness, revenue, consumer needs, company assets, general business potential, and workforce quality. This study emphasises the considerations and perspectives of users regarding the implementation of new service procedures through mandatory usage. Since the COVID-19 pandemic, there has been limited scholarly focus on this specific subject. This study has a distinctive design, as it presents a practical example of using health code systems to develop a novel method of check-up in the COVID-19 environment. This article seeks to examine other factors that might improve the acceptance of new technologies for widespread use, going beyond the fundamental design and focal structures. As this topic has hardly ever been investigated, our findings have implications for businesses in the health industry at both theoretical and practical levels. Theoretically, this study's findings contribute to the literature by developing an idea of the enforceability of AI technology use and the socio-economic premises of forced adoption. On a practical level, it focuses on innovative health services in China and other health organisations that want to use technological innovations. All businesses that intend to switch to a novel AI-based system without preserving the old one should be conscious of the factors that might aid in the acquisition process.

The structure of this article is as follows. Following the introduction, an extensive literature review examines the background of innovative technology. The study outcomes of the forced acceptance of new service systems are also covered in depth in the literature review. Then, based on the literature study, a theoretical model of forced acceptance is presented and assessed employing the structural equation modelling technique. The research's setting is outlined in the methodology section, followed by an overview of the empirical findings. Finally, the results are evaluated in the discussion and implications section.

## **1. Literature review**

### **1.1. Health code system**

The COVID-19 outbreak started in December 2019 in China and had spread to 210 countries worldwide by May 19, 2020, with 4,731,458 cases reported (Miranda et al., 2022). On January 30, 2020, the World Health Organisation (WHO) declared the COVID-19 pandemic a worldwide public health emergency and termed this infection a "pandemic" on March 12, 2020 (Yi et al., 2020; Miranda et al., 2022). The provision of pharmacy and health services during this pandemic was a challenge that increased the importance of online AI-based services. The quick creation of an online health code system is one area of success in using AI and big data knowledge. This cutting-edge app enabled firms to keep track of a person's travels, users' contact records, and biometric information. A strong rivalry between Alibaba and Tencent served as fuel for the creation and implementation of such a product using AI and big data. On February 9, 2020. The two largest corporations in China simultaneously launched and developed their structures in their relevant capital cities. The quick expansion of the health code system throughout the whole country was made possible by competition between the two digital titans and widespread backing from local governments throughout

China. At the end of February, the countrywide health code system was embedded into Wechat for the first time. Within a month, this service was used more than 6 billion times among the 900 million WeChat users alone (Tan, 2020). Following the health code system implemented by Tencent and Alipay, which was subsequently approved by the State Council of China, all users of this application are required to provide their personal information, including travel history, contact history, and medical details. By inputting their data, the two-dimensional codes with colours categorise their health risk levels. The particular criteria and standard varied among provinces; however, the elementary colour scheme adhered to uniform regulations nationally. The green QR code permitted individuals to travel within the city; yellow indicated the potential risk of needing to isolate at home for 7-14 days; Code Red stipulated 14 days of isolation at home or in a centralised place. After meeting the isolation requirements, the code was automatically returned to green and local travel was allowed again. The development of health information systems made it possible for other firms to make and adopt this type of innovations using AI, big data, and machine learning techniques (Song et al., 2021).

### 1.2. Forced use of novel technology

Service-oriented organisations empower users to perform particular tasks by implementing cutting-edge technologies with cost savings and additional benefits. However, this ideal win-win scenario can only materialise if users effectively deploy and utilise the technology. With either negative or positive rewards, service businesses most frequently influence consumers to use innovative technology (Liljander et al., 2006). Positive inducements include discounts and one-off deals, while negative motivations include the use of penalties and fees that make the initial option less appealing. Forced acceptance and usage represent the utmost extreme situation, in which the opportunity to select a typical product or service is eliminated (Reinders et al., 2015). Punishment tactics, which elicit resistance similar to compulsion, are much less effective than reward systems (Trampe et al., 2014). Therefore, it is apparent that the process of choosing a deployment strategy is intricate and requires significant attention to detail. A business essentially determines to implement compelled use to accelerate the implementation of specific technologies and begin realising efficiency benefits. However, compulsion can alter and hinder user endorsement of a certain technological system. The erosion of intellectual control and the subsequent resistance to consuming the novel service mode is central to explaining this negative effect. The study of Feng et al. (2019) supported the theory of psychological reactance by demonstrating that when airline consumers are required to use self-service check-in vending machines, they will portray this as a risk to their freedom that will cause psychological reactance. This response will result in a pessimistic outlook and the rejection of the new technology product or service (Reinders et al., 2015). Despite users being aware of the advantages associated with technology usage, being forced into adopting an alternative may immediately provoke hostility or negative emotions (Johnson et al., 2008; Cserdi and Kenesei, 2021). Hence, the use of forceful methods diminishes user satisfaction with technology, since it heightens buyer apprehension and anxiety while assessing or using new technological services (Liu, 2012). Furthermore, such innovative technology mandates can lower users' perceptions of the firm's overall service quality (Lin and Hsieh, 2007). Reinders et al. (2015) showed in a study of the forced deployment of new technology systems in the Netherlands that even technology professionals have issues that lead to unhappiness and unfavourable word-of-mouth. Therefore, optimal retention of conventional alternatives is required in conjunction with innovative technologies to increase user and company benefits (Oh et al., 2013). Furthermore, businesses can move

beyond the early opposition and get users used to practising innovative technology systems exclusively for some service aspects. In that case, they will frequently comprehend the advantages of such technologies (Cserdi and Kenesei, 2021).

### **1.3. Previous studies**

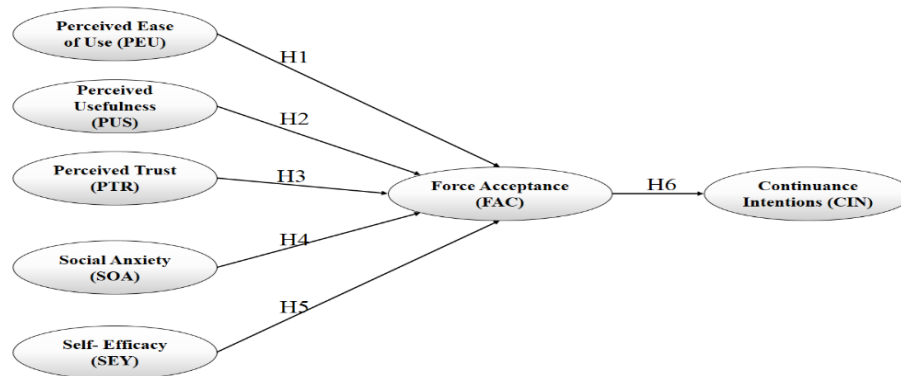
Most research on technology focuses on the ideas of innovation diffusion (DOI) and the technology adoption model – TAM (Fishbein and Ajzen, 1981). TAM became an essential paradigm applied to adopting a new technology product or service (Schepers and Wetzels, 2007; Belanche et al., 2020). According to TAM, the two primary factors of novel technology acquiescence are the perceived usefulness (PUS), which is the extent to which the consumer considers that employing the system will improve the performance of the assigned activity and the perceived ease of use (PEU), the extent to which the consumer considers the system's use will not involve extra time and energy. Acceptance is influenced both directly and indirectly by perceived usefulness and ease of use. According to the DOI theory (Rogers et al., 2005), which focuses on the process rather than the outcome, consumer traits distinguish early adopters from late adopters and the elements that facilitate adoption. Based on additional exploration, these user traits can be categorised as technology willingness, desire to engage, perceived risk, or self-efficacy (Cserdi and Kenesei, 2021). This literature review has looked at the consumer acceptance of service technologies on their own or in combination with other service technologies. For example, Lee et al. (2012) evaluated the suitability of the service procedure and the influence of enabling factors on the adoption of such services. The extra elements that substantially impacted the link between intention to use and actual usage were added to the TAM as the model's foundation. The technology acceptance model frequently augmented by numerous elements was also employed as a theoretical framework in most research on new technology products and services. According to White et al. (2012), the influence of situational elements on technology adoption is frequently more significant than sentiments about these technologies. Based on this, we also extended the TAM with other factors in the context of an innovative health code system service in China.

## **2. Proposed theoretical model and hypotheses**

Analysis of prior theoretical and empirical studies in the field of AI technology and required utilisation demonstrates that restricting user access to preferred products or services typically elicits negative user responses. Forcing one service alternative may cause reduced adoption (Feng et al., 2019), unfavourable assessment (Reinders et al., 2015), negative evaluation of the new technology (Liu, 2012), or even migration to a different service (White et al., 2012). In addition, adverse emotional, cognitive, and behavioural effects are possible. When users are forced to use a specific service without alternatives, it might cause anxiety, reduced trust, discomfort, hesitation, or perceived coercions to their independence (Feng et al., 2019).

To bridge this gap, we present a framework that focuses on the adoption of novel AI-based services through force and attempts to identify the factors that contribute to this adoption or aversion. Our main concept is the acceptability of businesses' forceful behaviour to force employees to utilise new alternative services. Therefore, our measurements focus more on the acceptability of forced acceptance rather than just its consequences. In this regard, we aim not only to investigate responses to coercive action, but also the factors that may facilitate its acceptance. Based on the adoption research and proliferation of new technologies, we

propose that forced acceptance is influenced by user personality and technological factors. The proposed model (Figure no.1) and the hypotheses are discussed below.



**Figure no. 1. Proposed theoretical model**

### 2.1. Perceived ease of use (PEU)

PEU measures how effortless a user considers it to use a certain piece of technology (Fishbein and Ajzen, 1981). The extent to which users are aware of the intricacy linked to a certain technology will influence its adoption. As a result, the same link is assumed when thinking about forced acceptance; users who think that using an AI health code system is simple would be more inclined to accept it. Therefore, we suggest the following hypothesis:

H1: Perceived ease of use is positively correlated with forced acceptance usage.

### 2.2. Perceived usefulness (PUS)

PUS refers to “the level to which a user intuitively feels that using a particular technology will benefit and boost his/her performance” (Davis, 1989). In the context of this study, PUS happens when a user of an AI health code system thinks that it will improve their ability to accomplish their needs. Based on this, we strive to study the relationship between PUS and users’ intentions and put forward the following relevant assumption:

H2: Perceived usefulness is positively correlated with forced acceptance usage.

### 2.3. Perceived trust (PTR)

PTR is related to “the product or service providing certificates and labelling as evidence of its safety and reliability” (Mayer et al., 1995; Silva et al., 2017). Grunert et al. (2014) contend that if trust in a product increases, there must be an upsurge in the belief that the product satisfies the required conditions. To create trust, some features are important, such as the existence of the certifier’s, label, and producer’s status, and prestige of the product (Anisimova, 2016). The same connection is thus considered when considering forced acceptance and usage; user who believes utilising a health code system is reliable is more likely to accept it.

H3: Perceived trust is positively correlated with force acceptance usage.

#### **2.4. Social anxiety (SOA)**

Fenigstein et al. (1975) describe social anxiety as a feeling of discomfort caused by being aware of others' opinions of oneself as a social object. In the literature on innovative technology, social anxiety is typically a location regulator identified through crowding perception, alleviating the important link between attitude and intention to practice such technology (Gelbrich and Sattler, 2014). We contend that social anxiety may function as an attribute in addition to being considered just simply as a situational aspect when using such technologies. People's actions or assessments can vary depending on their tolerance of the stress that comes from having others see them use the health code service; this is especially true when forced introduction is included. Therefore, we propose the following:

H4: Social anxiety is positively correlated with forced acceptance usage.

#### **2.5. Self-efficacy (SEY)**

Bandura (1977) defines SEY as an individual's opinion of their capability to carry out a specific behaviour. Its theoretical underpinnings are established in social cognition theory, which maintains that SEY views are a major cognitive factor that influences behaviour. Higher SEY boosts technological adoption, as the use of innovative technologies requires confidence in one's abilities (Limayem et al., 2007; Cserdi and Kenesei, 2021). A health code system adoption is more likely to be a successful procedure, even when used forcibly, the more comfortable and confident, when a person is utilising it. Therefore, we propose the following:

H5: Self-efficacy is positively correlated with forced acceptance usage.

#### **2.6. Continuance intentions (CIN)**

Forcing users to abandon an acceptable mode of a health check system may have a detrimental impact on their perceptions of the organisation through unfavourable word-of-mouth (Reinders et al., 2015; Cserdi and Kenesei, 2021). Users do not consider it equitable for a corporation to push them to perform a task they would not ordinarily do. Furthermore, Bitner et al. (2002) discovered that users may be deeply attached to the initial method of provision manner with which they are familiar. The most hazardous result of compelled practice is the creation of negative perceptions about the product or the firm, which can lead to a reduced level of user retention. Because new technology often enhances service quality, if a corporation can persuade clients to assent and welcome the forced use of newer technologies, it can lead to greater user happiness and continuance intentions (Cserdi and Kenesei, 2021; Zhongjun et al., 2022). As a result, we hypothesise as follows:

H6: Forced acceptance is positively correlated with continuance intentions.

### **3. Methodology**

This study focused on a revolutionary service system that was implemented in China during the COVID-19 pandemic, using AI and big data. To understand the user's intent towards this service, an online survey was conducted using convenience sampling methods. A questionnaire was structured based on previous literature related to the new technology services. Based on (Gelbrich and Sattler, 2014; Cserdi and Kenesei, 2021), three questions related to the SOA test were selected for the use of new technology, while the three items relating to SEY were centred on (Webster and Martocchio, 1992). Regarding the



characteristics of technology, the three questions used to assess PUS and PEU were used from the Cserdi and Kenesei (2021) work, while the three items used to determine PTR and CIN were based on (Chong et al., 2012; Park et al., 2019) research. Finally, we created a five-point scale to assess the acceptability of force acceptance and use as the main study concept. This scale covered users' cognitive, emotional, and behavioural tendencies toward health code service resulting from forced utilisation (Davis, 1989).

Next, we used a cautious approach to describe these elements in a way that would allow us to understand the key factors of forced acceptance and consumption. We adopted pre-existing scales from the research to guarantee the reliability of the scales. We employed back-translation Brislin (1970) iteratively and collaboratively to ensure the accuracy of the translations (Shah and Zhongjun, 2021; Mustafa et al., 2022). Two experts translated individually the scales' components from English to Chinese. After attaining unanimity, the items were back-translated by a third knowledgeable scholar, and after some repetitions, the group once more came to a consensus. Twenty-five people answered the questionnaire as a pilot test. A few small phrasing changes were made to ensure complete clarity based on the pilot test results.

There were two sections to the questionnaire. The introduction of the research's goal was made in the first part, which was then followed by questions on the respondents' demographics. After the section on the respondents' attitudes towards new services, forced migration, and continuous intention, general attitude questions about technology use and personal considerations emerged. After that, all the participants were instructed to distribute surveys using the "snowball" approach to friends and were informed that their replies would be kept anonymous and used only for academic purposes to safeguard their identity. The ethics council at Shenzhen University gave the questionnaire its seal of approval. This allowed all participants to provide their consent to fill out the questionnaire. We used non-probabilistic samples in this article because we were more concerned with basic psychological processes than generalising the population. Structural equation modelling (SEM) methodology permits using non-probabilistic abridged samples. The study aimed to investigate the forced acceptance phenomena rather than the descriptive arrangement of the population (Hair et al., 2016; Shah et al., 2021). A total of 262 respondents were included in the final sample after eliminating incomplete replies (Hair et al., 2017). Table no. 1 provides a thorough description of the sample. The study outcomes exhibited that men (54.9%) and women (45.03%) were involved almost equally, with more than 85% of participants aged 20 to 50 and having a higher education level.

**Table no. 1. Demographic information**

Measure	Categories	Frequency	Percentage
Location	Beijing	157	59.93
	Shanghai	9	3.43
	Wuhan	82	31.30
	Other	14	5.34
Gender	Male	144	54.96
	Female	118	45.04
Age	20-35	121	46.19
	35-50	104	39.69
	51-65	37	14.12
Education	Other	23	8.78
	Primary	45	17.18

Measure	Categories	Frequency	Percentage
	Bachelor	80	30.53
	Master or above	114	43.51

#### 4. Results analysis

The measurement model was first evaluated and then validated using a two-stage technique based on the ground-breaking work of (Anderson and Gerbing, 1988). Confirmatory factor analysis (CFA) was used in the initial phase to verify the measurement model and evaluate the reliability and accuracy of the scales. CFA was used to assess the measurement model's goodness of fit, discriminant validity, convergent validity, and internal reliability (Hair et al., 2016; Shah and Tang, 2022; Mustafa et al., 2022). In phase two, the suggested theoretical model was put into practice using structural equation modelling (SEM). According to (Shah et al., 2021), SEM is a suitable approach for concurrently analysing all correlations between observable and unobserved factors. SEM takes measurement error into account while estimating the model. It also enables evaluation of the given model's goodness of fit. Using the Maximum Likelihood Estimation technique, CFA and SEM were both carried out (Hair et al., 2016; Zhongjun et al., 2022).

##### 4.1. Confirmatory factor analysis

In the initial phase, a confirmatory component analysis and Cronbach's alpha were used to evaluate the reliability and internal consistency of the composite measures. Additionally, the seven constructs' Cronbach's alpha values varied from 0.735 to 0.876, with factor loadings values above 0.60, indicating that the latent scales have acceptable reliability (Table no. 2). The composite reliability (Table no. 3 and Figure no. 2) for each construct is satisfactory (CR > 0.7). The average extracted variance (AVE) values showed convergent validity when they were greater than 0.50 (Hair et al., 2016). The Fornell and Larcker (1981) criteria were used to test the discriminant validity, and it was found to be valid, since the square roots of the AVE values are larger than the construct's correlation. The analysis shows no issues with validity (see Table no. 4). In terms of Goodness-of-Fit, the Standardized Root Mean Square Residual (SRMR) values should be less than 0.08 (SRMR < 0.08) while the Normed Fit Index (NFI) values should be greater than 0.90 (NFI > 0.90). Here in this article, the conditions of the goodness of fit SRMR and NFI were satisfactory (Saturated Model 0.075, 0.089 Estimated Model 0.077, 0.087). As a result, we find no threat to discriminant validity.

**Table no. 2. Validity and reliability of the measurement model**

Construct	Items	Mean	SD	Factor loading
Continuance Intentions	CIN1	3.96	0.847	0.768
	CIN2	3.80	0.992	0.885
	CIN3	3.83	0.949	0.829
Forced Acceptance	FAC1	3.19	0.914	0.862
	FAC2	3.40	0.862	0.911
	FAC3	3.63	0.853	0.901
Perceived Usefulness	PUS1	3.74	0.854	0.899
	PUS2	3.30	0.850	0.906
	PUS3	3.17	0.956	0.907
Perceived Ease of Use	PEU1	3.47	0.938	0.856
	PEU2	3.45	0.994	0.813
	PEU3	3.50	0.976	0.820

Construct	Items	Mean	SD	Factor loading
Perceived Trust	PTR1	3.63	0.901	0.918
	PTR2	3.61	0.958	0.877
	PTR3	3.68	0.837	0.846
Social Anxiety	SOA1	3.44	0.873	0.766
	SOA2	3.98	0.882	0.726
	SOA3	3.85	0.943	0.869
Self- Efficacy	SEY1	3.85	0.943	0.700
	SEY2	3.84	0.933	0.889
	SEY3	3.27	0.977	0.891

Table no. 3. Construct validity and reliability

Name of Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Continuance Intention (CIN)	0.778	0.844	0.867	0.686
Forced Acceptance (FAC)	0.871	0.879	0.921	0.795
Perceived Ease of Use (PEU)	0.889	0.890	0.931	0.818
Perceived Trust (PTR)	0.855	0.864	0.912	0.776
Perceived Usefulness (PUS)	0.778	0.802	0.869	0.689
Self-Efficacy (SEY)	0.774	0.815	0.869	0.691
Social Anxiety (SOA)	0.700	0.723	0.831	0.623

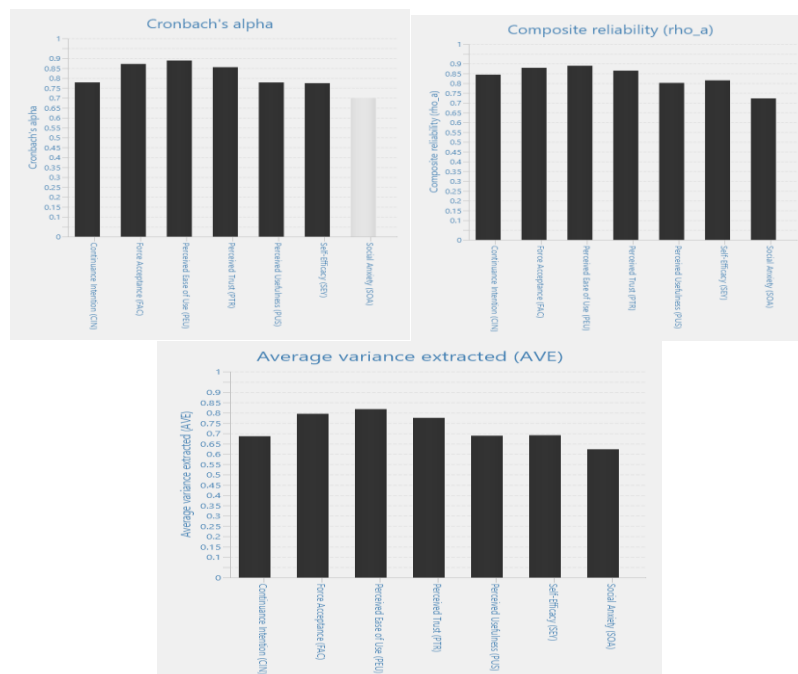


Figure no. 2. Graph of the construct validity and reliability factors

Table no. 4. Discriminant validity through HTMT

Constructs	CIN	FAC	PEU	PTR	PUS	SEY	SOA
Continuance Intention (CIN)							
Forced Acceptance (FAC)	0.684						
Perceived Ease of Use (PEU)	0.610	0.624					
Perceived Trust (PTR)	0.572	0.720	0.465				
Perceived Usefulness (PUS)	0.811	0.818	0.741	0.647			
Self-Efficacy (SEY)	0.882	0.692	0.604	0.557	0.761		
Social Anxiety (SOA)	0.821	0.684	0.679	0.563	0.921	0.889	

#### 4.2. Structural model assessment

The structural equation modelling technique was utilised to measure the proposed connections between constructs simultaneously. We examined the structural model's fit indices before giving the parameter estimations. The fit statistics suggest an excellent model fit. Table no. 5 and figure no. 3 summarise parameter estimations and the conclusions of our hypotheses. Based on structural equations, H1 is supported, since forced acceptance is positively impacted by the perceived ease of use ( $\beta = 0.118$ ). H2 ( $\beta = 0.366$ ) H3 ( $\beta = 0.311$ ), H5 ( $\beta = 0.176$ ), and H6 ( $\beta = 0.595$ ) indicate that perceived ease of use, usefulness, trust, and self-efficacy significantly affect the willingness to force acceptance. This is aligned with the TAM and SOR models and verifies the influence of these elements, which has been documented in the technological literature (Waheed et al., 2015; Blut et al., 2016; Akbari et al., 2020). The finding further found an insignificant relationship in H4. In terms of social anxiety, the concept that individuals are humiliated by the existence of persons around them was experimentally not validated in the instance of the health code system. In our approach, contentment with the provider and forced acceptance (FAC) mediate between individual characteristics and technological capabilities. We used a bootstrap approach to determine the significance of the indirect effects to investigate whether FAC indeed mediates this association. Evidence from the mediation study showed that individual characteristics and technological capabilities impact user satisfaction and intentions through FAC.

Table no. 5. Assessment of hypotheses

Hypotheses	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
H6: FAC $\rightarrow$ CIN	0.595	0.592	0.086	6.927	0.000
H1: PEU $\rightarrow$ FAC	0.118	0.106	0.049	2.423	0.016
H3: PTR $\rightarrow$ FAC	0.311	0.316	0.073	4.274	0.000
H2: PUS $\rightarrow$ FAC	0.366	0.358	0.062	5.946	0.000
H5: SEY $\rightarrow$ FAC	0.176	0.184	0.052	3.383	0.001
H4: SOA $\rightarrow$ FAC	-0.026	-0.025	0.063	0.414	0.679

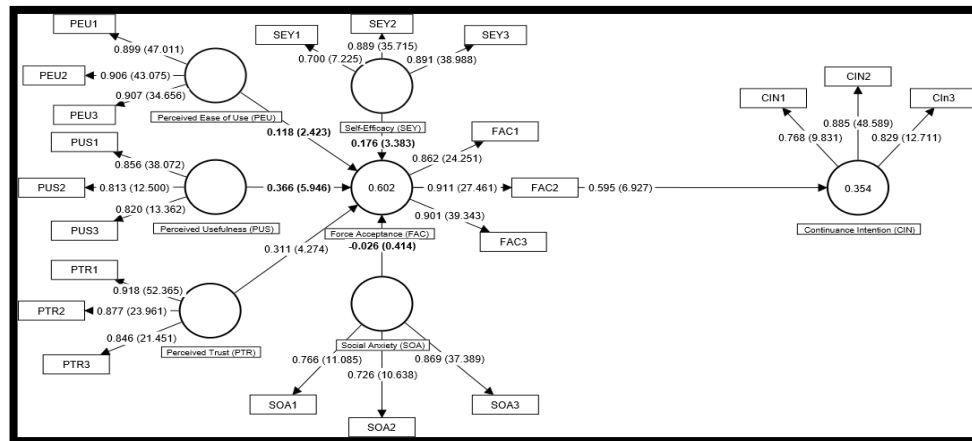


Figure no. 3. Bootstrapping results of the model

## 5. Discussion

The introduction of innovative technologies and products is a prevalent method of deploying new habits of service delivery. The use of health code systems in emergencies has raised the level of service and significantly lowered costs. However, the advent of these technologies frequently coincides with the limitations of service channels that rely on human contact. While it may seem alluring to eliminate the personal service option to realise financial gains as soon as feasible, this strategy frequently backfires. However, these developments are widespread; therefore, users of all technological levels must embrace them. We concluded this study, which was based on a real-world situation, about the variables that might facilitate the implementation of such a strategic move.

Our research was primarily concerned with identifying the elements that facilitate or restrict people's ability to comprehend the idea that they are being forced to adopt new technologies rather than choosing to do so. Our findings show that, even when users only use a health code service without the option of personalised treatment, the attributes of the technology should be considered, such as ease of use, usefulness, trust, and self-efficacy. This supports the extended TAM model's predictions about these components' effects and the research on innovative AI technologies (Blut et al., 2016).

Although the technology's attributes were important, the same cannot be true for all user considerations. It is noteworthy that self-efficacy with other consumer attributes, had a substantial role in enabling individuals to endure forced acceptance and consumption. This outcome is consistent with the function of this element in other research, which found that its existence is a significant barrier for users transitioning to such technologies (Cserdi and Kenesei, 2021).

Concerning social anxiety, the use of a health code service provided empirical evidence for the notion that people will be embarrassed by the presence of persons behind them. The explanation for this might be that utilising this system is not particularly complicated, and a healthy individual will utilise it with confidence. As a result, even if the formation of the

health code service is challenging, it will not take long for its uses to be activated. The outcome may also be attributed to the service's greater necessity, trustworthiness, and availability, all of which outweigh human service.

## **6. Implications, limitations, and future research**

### **6.1. Theoretical and practical implications**

Information technologies, including the Internet, high-speed computing, GPS systems, AI systems, and big data applications, are the main enablers of business activities and services. According to Madon (2000), the Internet and other AI-based activities have a positive influence on economic activities, such as access to education and health care. Other business activities that have an impact on socioeconomic development include navigation systems, e-commerce, online and mobile social networks, online teaching and training, and health checks. Even though not all Chinese health service providers have made the health code an exclusive option for in-person interaction after the pandemic, still the exercise of AI practices is gaining popularity. In our model, the strongest correlation exists between forced acceptance and utilisation of the health code system service. Users expressed a higher level of satisfaction with the service when they maintained a more optimistic and needy outlook concerning its mandatory adoption. Since there have not been studies on this, our findings have both theoretical and real-world applications. Thus, it will enhance theoretical knowledge about the risky approach to forcing people to adopt a new health service.

Furthermore, these findings could offer practical implications for organisations, including both public and private healthcare providers, who are contemplating the use of novel and advanced technology. Given the recent pandemic crisis and the increasing demand for AI-driven solutions, the study results focus on and help policymakers with strategies to promote the use of these emerging technologies and foster a favourable image of them. While the current pandemic situation compels individuals to embrace such tools, they may nevertheless experience a sense of coercion. This research suggests that people are more likely to embrace persuasion if they see the new technology as reliable and easy to use. Therefore, this study gives directions to firms to improve their services, as previous research has demonstrated that such technologies frequently lack user-friendly designs (Siebenhandl et al., 2013). Consistent refinement can aid in the creation of an intuitive user interface, and personalised strategies should be incorporated during the initial phases of development. The significance of this aspect was increased by our mediation study, which demonstrated that forced acceptability of the health code system influenced continuation intentions indirectly through trust and usefulness. Undoubtedly, these results indicate that reliable and efficient AI service solutions have the potential to enhance user satisfaction, even in circumstances that involve force that may ultimately affect the firm's economic condition. In addition, the results demonstrate that using AI services during pandemics does not require human contact, surveying this component is crucial for businesses looking to apply more AI technologies for future practice. It is best to adapt to the issue while minimising the availability of personal assistance. As a result, users will be more socially satisfied with the organisation if they can tolerate forced adoption. The use of health codes by people may expand due to the deployment of innovative technology and other beneficial advances, which can significantly positively affect satisfaction. Marketing initiatives may amplify this substantial positive impact by

compensating for the forced utilisation of the system through the emphasis on its state-of-the-art functionalities and the assurance of users regarding its user-friendliness attributes.

## 6.2. Limitations and future research

Despite the possibility of future benefits associated with the use of real-world scenarios in this research, there are also a few limitations. One primary limitation arises from the restricted geographical purview of this study. The selected country possesses distinctive attributes that restrict the generalisability and interpretation of the findings. The personal characteristics of the respondents cannot be generalised due to the small size and lack of representativeness of the sample. However, the variability in responses provided adequate data for structural equation modelling to analyse the effects of different aspects. The online distribution of the questionnaire may have also introduced certain biases; for instance, the results regarding self-efficacy might have varied marginally if individuals without internet access had been permitted to complete it. The experimental grounds for novel AI service options comprise contextual elements, theoretical models, and outcomes. Therefore, the significance of user characteristics is anticipated to evolve in the future of technology research. Furthermore, the exponential growth of AI applications presents an intriguing opportunity to support generations that are hesitant to utilise such technology. A significant and swiftly growing field of study could involve an industry-specific analysis of the growth of AI applications and healthcare services, which may either rival or supplement one another. It would be helpful to look at the influence of this issue based on our findings on the relationship between the demand for interaction and current initiatives to provide users with a touchless environment due to the epidemic.

## Funding and Acknowledgements

This work is supported by the National Natural Science Foundation of China (Grant Number: 72172094; 71972082); Humanities and Social Sciences Foundation of the Ministry of Education in China (Grant Number: 21YJC630160); National Social Science Foundation Project - Late funding (Grant Number: 21FGLB050).

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