Research on Use Behavior Model of Digital Intelligent Device for Elderly Users-Based on UTAUT theory

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Keywords: Digital divide; UTAUT model; digital inclusion; structural equation model.

Abstract: Due to the rapid development of information technology, people's social life has entered a digital period, and China has also put forward the implementation of national big data strategy. But while most people enjoy the digital technology dividend, there is an increasingly significant "digital divide" between the aging population and the rapid development of digital economy. The "digital divide" not only deprives the elderly of access to digital products, but also undermines China's digital transformation and development. Therefore, based on the theory of technology adoption and application arrangement (UTAUT), combined with the current dilemma faced by the elderly, this paper puts forward a model of the use behavior of the elderly users of digital intelligent equipment, and tests the fitting of the structural equation of the model, proving the internal consistency of the structural equation of the model. It provides a reference for the development trend of digital equipment and terminal market as well as the research on the aging model, and helps the elderly better join the digital community and enjoy the convenience of life brought by digital intelligent equipment.

1. Introduction

According to the results of the 7th national census in 2020, the proportion of the population over the age of 60 in China will be 18.7%, and the proportion of the population over the age of 65 will be more than 13.5% [1], and according to the global standard, it is estimated that by 2035, the proportion of the population over the age of 60 in China will exceed 30%, and China will enter an aging society with severe population. From the angle of demography, the process of China's population aging is accelerating at present, and the problem of population aging is also a difficulty to be solved and overcome in China's economic development. On the one hand, artificial intelligence, 5G and other digital technology revolution is in the ascendant, on the other hand, it is rapidly entering the aging society, these two historical nodes meet unexpectedly in China in the third decade of the 21st century. Especially with the arrival of the COVID-19 epidemic in 2020, there is a special situation around the elderly in China: they cannot take the high-speed railway without using the personal health code, they cannot pay by mobile phone or register online, and the "data gap" that the elderly cannot cross is also an urgent problem to be solved. As Yang Yeaning, President of Lenovo Group, a former NPC delegate, said," Silver Hair "is a major participant in China's economy and society. We should make good use of the Internet to really alleviate the problem of the elderly and help" Silver Hair "to bridge the" digital divide ".

Under various realistic social and historical backgrounds, the Government Office of the State Council issued the Implementation Plan on Practical Solutions to the Difficulties of the Elderly in Using the Intelligent Information Technology (hereinafter referred to as the Plan) on November 15,2020, which clearly emphasizes to promote the construction of the intelligent community project that takes the elderly into account, effectively solve the problems of the elderly in the process of using the intelligent information technology, and put forward specific requirements in the terminal tasks and guarantee measures. In addition, in December of that year, the Ministry of Industry and Information Technology also issued the Key Action Plan for Aging and Unhampered Transformation of Internet Technology, and the first batch of priority was given to the transformation of 115 Internet technology enterprises belonging to eight categories, including relevant ministries and commissions, provincial governments, institutions for the disabled, new media, public transport, finance, social communication,

life shopping and search engine, and the transformation of 43 APPs belonging to six categories, including news and information, social communication, life shopping, commercial finance, travel and medical and health care, and the transformation of aging and barrier-free design [2].Take smart phones for example. At present, the number of elderly people using mobile phones in China is about 2.74 billion, among which the number of elderly people passing through the smart phone network is about 134 million [7].This also shows that at present, about 140 million people in our country still use all kinds of functional computers, or use intelligent computers without network security. The old people's data gap will not only cause the ethical imbalance of humanism, but also cause obstacles to the development of data information industry in China.

The digital divide has become a problem that must be faced and solved urgently. Based on the theory of technology adoption and application arrangement (UTAUT), this paper puts forward the aging model of digital intelligent equipment Rong (2020) and others put forward relevant design models in the design of public terminals, but they only made empirical research on the initial assumptions, and did not make data analysis on the fitting degree of the model itself. Moreover, the model is aimed at public terminals, and the current digital gap faced by the elderly is more concentrated on the use of mobile terminals. He Cancun (2021) and others have designed and developed the digital reading interface for the elderly according to the reading habits of the elderly in China. It puts forward a rational design method, but does not make a quantitative analysis of its practical application effect. On the basis of the previous research, this paper puts forward the model of the behavior of the elderly users of digital intelligent equipment, and tests the fitting of the structural equation of the model, proves the internal consistency of the structural equation of the model, validates the premise hypothesis of the model, provides the theoretical basis for the relevant factors in the design and manufacture of digital products, and provides for better promoting the aging of digital equipment.

2. Definition of relevant concepts

2.1 Digital divide

The definition of the digital divide was first proposed in the 1990s, when scholars wanted to explain the difference in the relationship between using and not using computers and the Internet [6]. In addition, there are more extensive definitions, such as information inequality, information gap, etc. Due to the vigorous development of modern computer technology (information and communication technology, ICT), the research on digital divide in human society focuses more on the professional knowledge and technology that must be mastered in the effective use of ICT. Therefore, the earliest definition of digital divide is generally understood as the distance difference between those who can obtain ICT and those who cannot use ICT [8]. However, with the growth of the times, the research content and extension scope of the digital divide theory have been expanded. Researchers have also redefined the digital divide, and extended the former more technical theoretical scope to the background of paying more attention to society, psychology and culture [9]. In the current scientific research, people have a more comprehensive understanding of the digital divide is divided into three digital divides. First, the digital divide refers to the different ways of obtaining ICT, while the second digital divide refers to the differences in the use of ICT, and the third refers to the beneficial results used by the Internet and the unfairness brought by the application [10].Based on the existing research results and under the background of China's current social aging and digital development trend, this paper refers to the research papers on the digital divide, and defines the digital divide as the huge difference between the human society in the dissemination of information and communication technology, and the appropriate time and application of the network in actual activities.

In view of the accelerating aging phenomenon in China and the dynamic outbreak of COVID-19 epidemic, the elderly is in a weak position in this fight. If well-developed information technology is properly used, the elderly can be included in the welfare of science and technology, not the fringe of science and technology development.

2.2 Digital inclusion

The term inclusion first entered the digital divide on 22 July 2000 [3], when the G-8 issued the Okinawa Charter for the Global Information Community, which states that the guidelines for the inclusion of the information community should be "for anyone, to join and benefit from the information community in all regions, and that no one should be excluded [4]".As for the explanation of digital inclusion, different scholars have different emphases, but the author finds that the concept of digital inclusion is caused by the digital divide through summarizing the views of scholars. For the significance of data inclusion, Yan Hui (2018) and other scholars have summarized five aspects, including the connection and application of the network, effective investment in society, strengthening the attention to vulnerable groups, crossing social barriers and eliminating the digital divide.[3] The information iteration speed is very fast, but the information technology cannot iteration people out. The need for people-oriented development of digital technology is emphasized in the National Network Economic Development Trend Report "The Network's Anachronism: Towards Digital Inclusion" published by the National Bureau of Statistics. In the ASEAN Digital Master Plan 2025 mentioned by Dong Hongwei (2021) and others, it is mentioned that there are four obstacles to the establishment of a digital inclusive society, one is the convenience of digital services, the other is affordability, the third is motivation, and the fourth is skills [5]. It is suggested to build a digital inclusive community from the following two aspects: first, the threshold of digital public services needs to be further marginalized people in the community; second, the openness to the public and the further enhancement of digital technology to meet its wide acceptance of digital services.

3. Problem classification

3.1 Subjective aspects: reduced body function; unwillingness to leave their comfort zone; fear of fraud

Due to the decline of physical function and cognitive ability, the old people have insufficient cognition of new digital products. Some older people lack self-confidence in the exposure to new technologies, thinking that they are only beginners, do not have the "technical thinking" ability, and are impatient to master new technologies; while some participants are worried that if they make some "wrong" actions that cannot be changed, they will damage the equipment and even worry about information security.

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Adhere to the traditional lifestyle, unwilling to leave their comfort zone. Many older people are used to cash payments, the use of aging machines, reluctance to use smartphones, their traditional lifestyle, television or radio as the main source of information. When you have to use the Internet, rely on your children or friends. They felt they were too old to leave their comfort zone.

Concerns about cyber fraud. In an interview at a time-honored restaurant in Beijing, a 70-year-old man said:" The most fundamental reason why we elderly people don't want to pay mobile phones are fear. “We also know that the network is now developed, fraudsters are emerging on the network. They use old people's ignorance to make huge profits, so this is the old people for advanced digital technology has a "respect away" mentality.

3.2 Objective level: technical design does not take into account the needs of the elderly

With the development of digital technology, people gradually change the way of obtaining information, create a new reading environment, and produce new reading habits and reading methods. As the main audience of the traditional reading style, the new digital reading is completely unfamiliar

to the elderly. As a direct medium for communicating and exchanging messages between individuals and digital products, the interface is the first threshold for the elderly to access and use digital reading [13].But now the design of the website and app pursuit of fashion and fashion, often ignored the needs of elderly users, resulting in its operation process is complex, standards and specifications are different. A study on 1,747 elderly people over 60 years old in China showed that there were some problems in the application of the app, such as unable to remember the operation steps, unable to see the contents of the page clearly, and unable to understand the operation rules [14].Relevant studies have proved that adjusting the information structure and information acquisition mode in the design of product interface and reasonably and efficiently allocating cognitive resources are conducive to reducing the cognitive load of elderly users [13].Therefore, it is a long way to design a simple operation, single process, larger screen font and so on to adapt to the elderly group.

4. Research methods

An Overview of Digital Gap Measurement Model

Since the development of digital technology, the emergence of the digital divide has become the research and measurement of scholars in various countries. It is assumed that the definition of the digital divide is different and the measurement models used are therefore different. By reading the measurement model of digital divide and combining the research emphasis of this paper, this paper takes the digital divide and the related measurement model as the research focus, and explores the advantages and disadvantages of the previous measurement model.

4.1 Digital Divide Index Model

In 2003, OBRICM reported on "Monitoring the Digital Divide"……A preliminary concept referred to as the "digital divide index" was first proposed as a measurement tool [18].The tool is used to monitor the spread and absorption of ICT technology, which has a significant impact on the economy and different regions over time. Its "digital divide" measurement model is shown in Table 1

Economy	
Consumption	
ICT absorb	
ICT application strength	
ICT technical ability	ICT infrastructure
Labour force	Capital

Table 1. “Digital divide "measurement model.

The "digital divide" measurement model starts from the recognition of the dual nature of ICT, which develops the concepts of national information density and information use. But the digital divide as a measure of access for the elderly is too big.

4.2 Analytical Structural Model (ISM)

ISM method is one of the structural modeling techniques. It can convert obscure and unclear thoughts and views into intuitive conceptual models with correct constitution and relevance [18].According to Zhang Bin (2009) and others, there are six major factors affecting the digital divide, including Internet infrastructure connectivity, affordability, use, constraints/support to community and national policies, sociodemographic factors and connectivity. And combined with the specific situation of our country, put forward a rational structure model suitable for our national conditions. The model involves 28 indicator systems. Considering the characteristics of new information technology application,11 indicators are obtained as the main influencing factors, as shown in Table 2.Although the evaluation model puts forward more reasonable influencing factors, but the model is mainly aimed at macroeconomic policy, the government level, for the elderly into the digital society has certain reference significance. The main impression factors can be used as the reference factors of the model.

Table 2. Main Influencing Factors of Digital Divide in China.

Indicators	Meaning	Effect of indicators
Government Affairs Level and Government Policy (F1)	To encourage competition, universal service, informatization, investment, financing and training	Government policies will promote infrastructure development and enhance the public's ability to identify and accept information
Social person Factor (F2)	Gender, age, ethnicity, geography, religion, etc.	Influence consumption concept and information acquisition awareness
Education level (F3)	Basic and higher education	Related to technological innovation capacity, affordability, information identification and acceptance
Economy Level (F4)	GDP, per capita income, etc.	Determines affordability
Technological Innovation Capability (F5)	Number of patents, R & D capacity, etc.	Determined infrastructure construction
Construction of infrastructure (F6)	Coverage rate of network, penetration rate of main line, etc.	Affect the richness of information resources and equipment resources
Information identification and acceptability (F7)	Literacy rate, access to information	Awareness affects the degree of information application
Affordability (F8)	Used to pay for software, hardware, content, etc.	Application degree of influence information
Richness of Information Resources (Content)(F9)	Number of websites, number of content providers	Richness of information resources determines the level of application
Richness of equipment resources (software and hardware) (F10)	Number of integrators, number of network providers, number of SPs, number of communication channels, number of computers	The abundance of equipment resources determines the convenience of digital access
Degree of information application (F11)	Frequency, time, purpose, skill, freedom of use	The difference of information application degree determines the difference of digital access and application level

4.3 Integrated Technology Acceptance Model

The Technology Acceptance Model (TAM) given by Davis (1986,1989) is also applicable to social technologies; Integrated Technology Acceptance Model (UTAUT) is composed of eight model elements: Rational Behavior Theory (TRA), Motivation Model (MM), Technology Acceptance Model (TAM), Planning Behavior Theory (TPB), Integration Planning Behavior Theory and Integration Technology Acceptance Model (C-TAMTPB), Innovation Diffusion Theory (ID), PC Utilization Model (MPCU) and Social Cognition Theory (SCT)[15]. The structure of UTAUT model is shown in Figure 1.

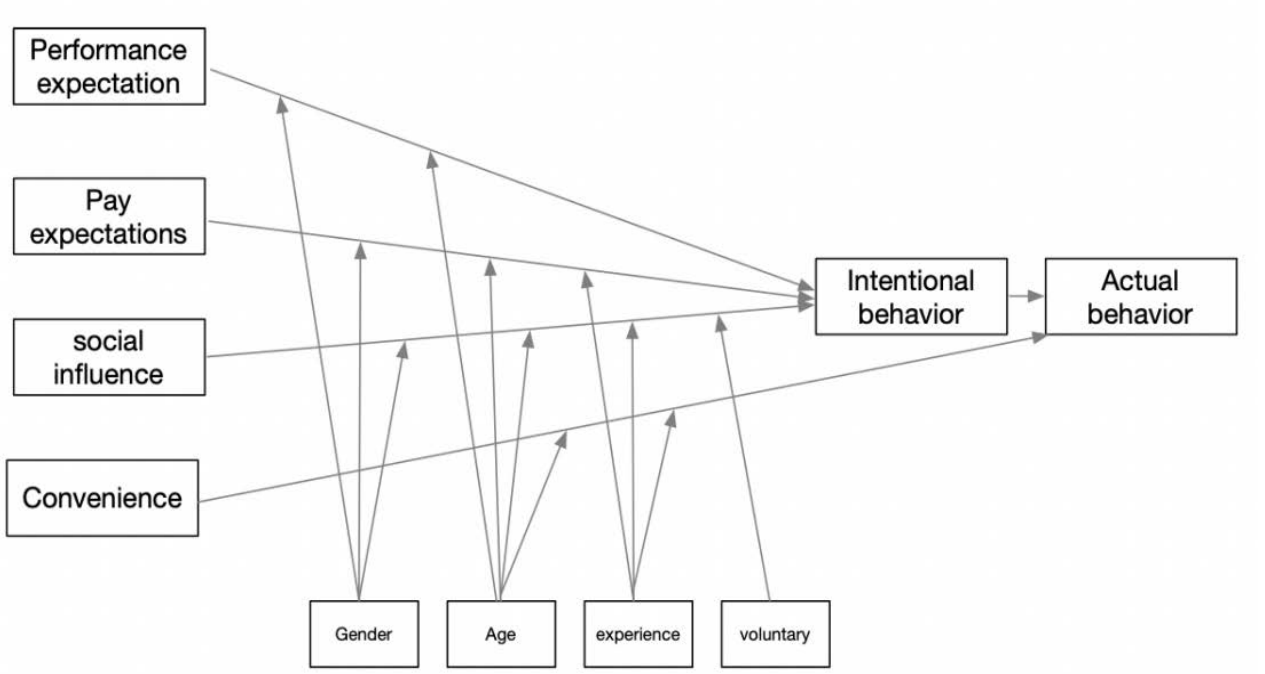

Figure 1. Integrated Technology Acceptance Model.

The UTAUT mode has been generally accepted in foreign academic circles due to its integration of some existing ideas. Now, the best mode for studying information system and computer technology is the UTAUT mode [18].Nau Rong (2020), et al. put forward the "information literacy" and "digital skills" focusing on the personal level of digital gap research through more in-depth research on UTAUT model, and studied and analyzed the causes of access ditch, use ditch and knowledge ditch, trying to start from the perspective of personal characteristics and the impact of information technology on society, and more clearly discovered the consequences and hazards brought by the different acceptance and application of public terminals by elderly users. A research model that combines the digital divide, individual cognitive characteristics, and behavioral intent.

5. Model design and inspection

5.1 Influencing factors

In view of the completeness of UTAUT-related model research, in order to ensure the most critical social demographic technology application and the variable research work of digital divide, gender and age are included in the early UTAUT-related research. This paper continues the previous scholars' research on UTAUT-related model on digital divide, and focuses on the measurement and evaluation of the elderly under the specific situation of digital technology access and use. After combing and studying the previous papers, this paper mainly focuses on quantitative analysis. We refine and decompose the indicators of the model, including performance expectation, effort expectation, social impact, contributing factors and so on. Therefore, in the design optimization of terminal products for middle-aged and old-aged applications, it is necessary to fully consider the influence of the above variables and their application feelings.

According to the user element model proposed by James Garrett, this paper analyzes the sub-elements at each level. See Table 3 for details:

Table 3. Measurement indicators.

Level classification	Sub element classification	Indicator interpretation
Performance Expectations: the degree to which individuals perceive the application of it to help them achieve good results at work	Useful cognition (TAM)	Users believe that the application of the system can improve the degree of personal performance
	External Motivation (TAM)	The user's perception of a behavior such as the expectation that a job performance, salary, or promotion may be achieved
	Operating adaptation (MPCU)	Degree to which systems improve individual performance at work
	Comparative Advantage (IDT)	Use of innovative technologies can work better
	Achievement Expectations (SCT)	Related to the outcome of a behavior, it can be an atmosphere of performance expectations and personal expectations
Effort Expectations: Does the individual think the system is easy to use	Easy-to-use awareness (TAM)	How user feels the system is easy to use
	Complexity (MPCU)	Extent to which the system is difficult to understand and use
	Easy to Use (IDT)	The degree to which users find it difficult to use innovative technologies
Social impact: the degree to which individuals are aware of the perceived need for the use of new information technologies	Subjective Specification (TRA)	A perception of whether a person who is more important to him should do something
	Social factors (MPCU)	In a particular social context, the degree to which individuals internalize a group's subjective culture and form a particular social identity
	Image (IDT)	The use of new changes can enhance the image and status of individuals in social systems
Contributing Factor: How confident individuals are that existing organizational and technical structures can support IT use	Behavior Control Awareness (TRA)	The constraints of internal and external situations on one's own behavior
	Contributing Conditions (MPCU)	Let users feel that certain situations are objective factors driving IT use
	Compatibility (IDT)	The degree to which users feel that innovative technologies are consistent with their own values, needs and experiences

5.2 Modeling

When older people try to accept and use digital devices, they are not only affected by their personal characteristics, but also by the age-appropriate degree of the digital device itself. Therefore, based on

the user experience theory and factor endowment theory, two main influencing factors of physical condition and travel demand are introduced into the newly constructed model, which makes the modeling process more scientific and reasonable. In order to enhance the interpretation ability of the model, on the basis of UTAUT, referring to the interpretation structure model (ISM) and the user element model, the factors affecting the actual behavior of the elderly are divided into use channel, access channel and knowledge channel. The ease and age of a digital device has a direct impact on its participation in accepting and using the device. To sum up, the impact behavior model of access to digital devices for elderly users constructed in this paper is shown in Figure2.

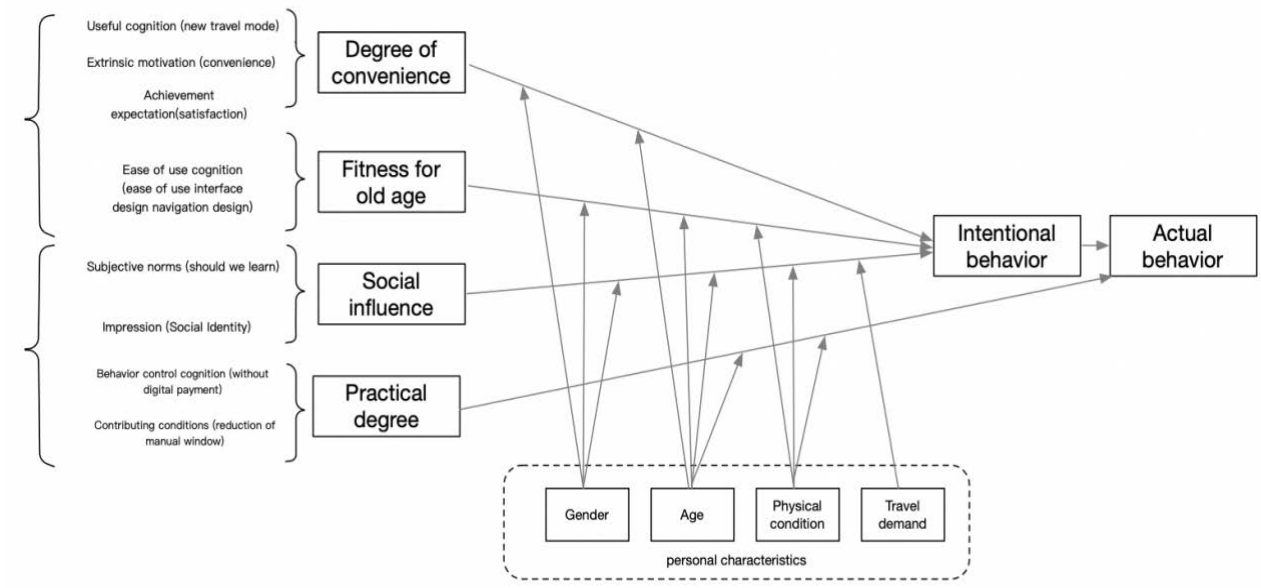

Figure 2. Behavioral Model of Digital Devices Used by Elderly Users.

5.3 Research assumptions

According to the aging model of digital equipment, the following assumptions are proposed in this study:

H1: Convenience has a positive effect on behavioral intention.

Convenience refers to the ability of the elderly to consume, socialize and entertain on the Internet, and is more than the use of the Internet to carry out paid labor and voluntary services, which is also the prominent representation of social output aging in the era of large numbers. Older people can enjoy the convenience of digital technology as easily as younger people.

H2: Aging degree has a positive effect on behavior intention.

Aging fitness refers to matching the characteristics and needs of the elderly and between the elderly users and product design [23]. Ensure that older people can use digital devices as an aid to life, not as an obstacle to their lives, as young people do. When older users get a good user experience, older people are more interested in using digital devices.

H3: Social influence has a negative effect on behavioral intention.

Community influence refers to the elderly subjective learning intelligent equipment. The old people are also willing to learn and master some of the new things. When we design and make digital equipment, we also consider to make a learning manual for the old people, which will promote more old people to join the learning and use of new equipment. On the contrary, it is difficult to learn and the learning process is complicated, which also causes the elderly to reject the psychology of digital equipment.

H4: Practicality has a positive effect on people's behavior intention.

Practicality refers to the low degree of recognition of a digital device in the face of older people who lack relevant knowledge of digital technology and cannot understand its usefulness. Practicality requires that the practicality of the product be taken into account in the real-life activities of the elderly,

rather than for the sole purpose of profit, so that the product and the elderly can form an emotional bond.

H5: Physical condition has a positive effect on behavioral intention.

The physical conditions of the elderly are different from those of the young, and their physical functions have been reduced. Therefore, the digital device is designed with the function of hearing aid and seeing aid to promote the use of the elderly [24].

H6: Travel demand has a positive effect on actual behavior.

The bigger problem facing the elderly today is to focus on travel. Old people used to wave at the side of the road, in the bus to pay a coin to reach the place they want to go. Now, without mobile phones, mobile scanning code, mobile payments are full of life. In such a disadvantageous living space for the elderly, some digital equipment according to the characteristics of the elderly aging can more promote the elderly love to go out, but also for the health of the elderly.

5.4 Data collection

The investigation data were collected through financial field visit and online distribution of questionnaires. A total of 250 questionnaires were sent out and 235 data were recovered, of which 228 were valid, with an effective recovery rate of 91.2%.

According to the sample statistics, the proportion of men and women is basically the same; the population aged 70-80 years accounts for 42.11% of the total sample; the proportion of people who are in good health or above is 68.9%(good: they can basically travel by themselves); the proportion of people who go out frequently is 62.9%; the proportion of people who are satisfied with the digital equipment is 71.5%, and 72.5% of the elderly are dissatisfied with the current digital equipment interface design.

5.5 Questionnaire analysis

5.5.1 Reliability analysis

After the model is assumed, the credibility of the collected sample data must be analyzed to ensure the validity of the model verification. Similarly, information analysis is also used to test the stability and consistency of various relational variables on the sample map. In this paper, the Cronbach coefficient is mainly used to calculate the correlation of each problem. The higher the coefficient is, the more accurate the conclusion is. The conclusion after reliability analysis is shown in Table 4 below. The overall Cologne Bach coefficient based on standardization in the questionnaire is 0.775, while the coefficients of all other variables are equal to 0.7, indicating that there is a good reliability coefficient in the measurement model, and the overall design of the questionnaire also has a good internal unity.

Table 4. Reliability Analysis of Questionnaire.

	Scaled average after entry deletion	Scaled variance after item deletion	Revised Items and Total Dependencies	Square multiple correlation	Clone Bach Alpha after item is deleted
Physical condition	20.39	33.092	-0.173	0.134	0.873
Out Frequency	20.13	31.922	-0.029	0.119	0.850
Payment method	19.55	23.032	0.623	0.452	0.787
Travel Access	19.28	23.141	0.737	0.603	0.770
Travel Guide	19.36	22.250	0.810	0.702	0.757

Equipment simplicity	19.47	21.955	0.823	0.768	0.754
Interface design	19.49	21.800	0.811	0.803	0.755
Personal cognition	19.11	24.605	0.588	0.363	0.792

5.5.2 Validity analysis

Based on the research results of Yu Smouha and others, the structural efficiency of statistical model should include convergence efficiency and classification efficiency. The construct validity should also be tested using exploratory factor analysis or verification factor analysis [19].In this paper, before analyzing the question scale, SPSS26.0 is used to carry out KMO value and Bartlett spherical test on the data scale, and then observe whether the data scale is suitable for factor analysis. The analysis results are shown in Table 5. The overall sample had a KMO value of 0.829>0.8, while the Bartlett spherical test had an approximate chi-square value of 440.401, with a zero significant level, so that the sample could be factor analyzed.

Table 5. KMO value and Bartlett spherical test of samples.

KMO and Bartlett test		
KMO sampling suitability quantity		0.829
Bartlett sphericity test	Approximate chi-square	440.401
	Degrees of freedom	21
	Significance	0.000

(1) Exploratory factor analysis.SPSS26.0 is used to measure the eight variables of the data, as the main purpose of the study of the mental factor analysis method, this paper refers to the previous research methods, through the principal component analysis method to extract the factor, and through the main variance method to expand the factor orthogonal inversion, the rotation factor matrix is obtained, the cumulative interpretation of the average variance coefficient is 71.644%, indicating that the problem has a good structure validity.

Table 6. Interpretation of total variance.

Composition	Initial eigenvalue			Extract load sum of squares			Sum of squares of rotating loads		
	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %	Total	% Variance	Cumulative %
1	3.772	53.891	53.891	3.772	53.891	53.891	3.742	53.462	53.462
2	1.243	17.752	71.644	1.243	17.752	71.644	1.273	18.182	71.644
3	0.749	10.699	82.343						
4	0.522	7.455	89.798						
5	0.354	5.051	94.85						
6	0.229	3.278	98.127						
7	0.131	1.873	100						

(2) Confirmatory factor analysis. According to Furner et al., three criteria were evaluated: in the CFA evaluation protocol, the normalized factor to normalized factor load was greater than 0.5 and reached a significant level; the average variation extraction rate (AVE) was greater than 0.5; and the combined reliability (CR) was equal to 0.7 except that the intention to act value was slightly less than

0.7.As shown in Table 7, each measurement item meets certain criteria, so the questionnaire has good convergence validity.

Table 7. Confirmatory Factor Analysis.

Variable		Indicators	Estimate	AVE	CR
Physical condition	--->	Hea2	0.891	0.6108	0.7541
	--->	Hea1	0.654		
Eligibility	--->	Sui2	0.936	0.8494	0.9185
	--->	Sui1	0.907		
Intention to act	--->	Beh1	0.65	0.5077	0.6719
	--->	Beh2	0.77		
Actual behavior	--->	Act1	0.112	0.5063	0.756
	--->	Act2	1.228		
Travel Demand	--->	Dem1	1.057	0.6873	0.806
Community Impact	--->	Aff1	0.612		
Convenience	--->	Con3	0.837	0.6273	0.8339
	--->	Con2	0.829		
	--->	Con1	0.703		
Practicality	--->	Pra3	0.963	0.6567	0.8491
	--->	Pra2	0.711		
	--->	Pra1	0.733		

By checking whether the value of the AVE square root of a construction variable is equal to the correlation coefficient between the variable and another variable (a coefficient of zero indicates that the two variables are not closely related to each other), the intrinsic unity of the construction variable can be checked. It can be found from Table 8 that the average value of all AVE square roots is higher than that of any correlation coefficient analysis, which can prove that the questionnaire has good discriminant validity.

Table 8. Differentiated validity of variables.

	Head	Sui	Par	Con	Dem
Head	0.611				
Sui	0.093	0.849			
Par	0.033		0.687		
Con			0.105	0.627	
Dem		0.065			0.657
AVE square root	0.782	0.922	0.829	0.792	0.810

5.6 Model fitting test

Based on the digital simulation results of the old user behavior of intelligent equipment, the structural equation model was established on AMOS 23.0 software system. According to the comprehensive index principle for testing the structural equation model provided by Utrecht University of Applied Sciences [20] and the standard opinions on the index principle given by Wen Zhongli et al [21] in the structural equation model test, the structural equation model established is studied by using Amos software system and the maximum likelihood estimation method, and the following table is obtained. According to Hair [22], the chi-square-to-degree-of-freedom ratio (X2/df) is used to measure the comprehensiveness of structural equation model data, and the conventional comprehensive evaluation index (NFI), comparative fit index (CFI), value-added fit index (IFI) and you and index (TLI) are closer to each other to represent the modeling coincidence rate, but generally, they need to be equal to zero nine. The root-mean-square number of approximate error (RMSEA) reflects the comprehensiveness of the scale data, and the figure should be lower than 0.05. According to the above table, the average value of x2/df is two points eighty-nine-nine-nine, equal to three, which

is ideal for adaptation; while RMSEA is, less than 0.05, which is ideal for adaptation; NFI is 0.925, greater than 0.9, which is good for adaptation; CFI is 0.909, greater than 0.9, which is good for adaptation; IFI is 0.919, greater than 0.9, which is good for adaptation; TLI is 0.844, which is good for adaptation. The over-fitting index of the structural model analyzed in this paper belongs to the recommended index, which indicates that the over-fitting of the structural equation model is high.

Table 9. Overall fitting coefficient.

X2/df	RMSEA	NFI	CFI	IFI	TLI
2.889	0.0128	0.925	0.909	0.919	0.844

5.7 Model Verification

Through Amos software, the normalized regression coefficients between variables can be obtained by using the maximum likelihood estimation method. As shown in Table 10, it can be found that the dominant P value of each path coefficient in the structural equation model is equal to zero zero five, and has been detected by the apparent level. Therefore, it is assumed that H1-H9 is established, and the aging model of the digital device finally formed is shown in figure3.

Table 10. Path Regression Coefficients.

Path			Normalized path coefficient	Non-standardized path coefficient	S.E.	C.R.	P
Community Impact	<--	Travel Demand	-0.186	-0.483	0.055	-0.061	***
Community Impact	<--	Physical condition	-0.482	-0.341	0.077	-1.315	***
Intention to act	<--	Eligibility	0.233	-2.616	0.022	-1.519	0.025
Intention to act	<--	Community Impact	-0.295	0.401	0.068	1.534	0.002
Intention to act	<--	Convenience	0.124	0.073	0.063	1.161	***
Actual behavior	<--	Practicality	0.797	0.167	0.053	0.63	***
Actual behavior	<--	Intention to act	0.802	-0.256	0.071	-0.632	***

Note: *, ** and *** are statistically significant at 10%, 5% and 1% respectively.

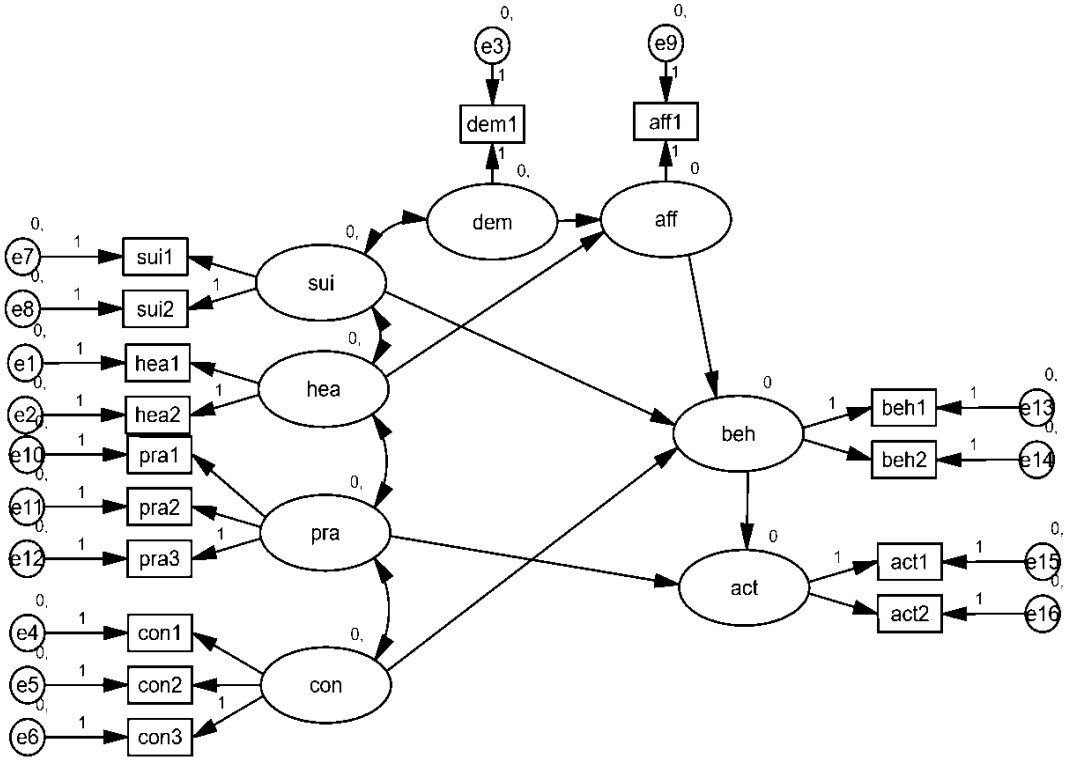

Figure 3. Behavioral Model of Digital Intelligent Device Elderly Users.

Based on our analysis of the questionnaire data, we analyzed the satisfaction and demand indicators. Based on the integration technology model of UTAUT, we modify the control variables and related variables, and finally form a digital inclusion model to measure the travel of the elderly.

6. Conclusion

6.1 Research conclusion

By analyzing the conclusion of structural equation model test, the existence of hypothesis H_1-H_6 is proved. Therefore, in view of the problems existing in the current digital equipment transformation process, this paper puts forward the following conclusions:

(1) The practical degree had a positive effect on the path coefficient of behavior intention of the elderly, which was 0. 797. Older users demand more utility from digital devices. Older users don't want digital devices to look good and be powerful like younger ones. For more elderly users, overcapacity is one of the problems, so they will not pursue more complex use mode, simple and direct can promote the trust of elderly users to digital products.

(2) The path coefficient of social effect and user's behavior intention was -0.295, showing obvious negative factors. On top of having access to digital devices and emerging technologies, older people are more likely to have access to an instruction manual that belongs to older users. Older people can also learn about and use digital devices with the help of their children, but some older people feel that their children are busy and do not want to disturb them all the time. Therefore, if the operation mode is too complex, the motivation of old users will be dispelled.

(3) The path coefficient between convenience and user behavior intention is 0.124, which has obvious positive influence. Making life more convenient is the original intention of the evolution of digital devices. Clear positioning of old customers, will bring more convenient after-sales service, but also can naturally improve the use of elderly users.

(4) The path coefficient between the behavior intention value and the user's actual activity is 0.802, which has obvious positive and negative effects. When the elderly has a large intention of behavior, can be not limited by time and space, more will evolve into actual behavior.

6.2 Countermeasures and suggestions

(1) As an increasingly large group of elderly users, only by fully addressing the digital gap between elderly users and digital devices, can the great potential of the "elderly economy" be realized. In this regard, the Government should play a leading role in promoting and pushing the elderly to bridge the "digital divide" at the national strategic level. The solution to the difficulties in encouraging the elderly to use smart technologies formulated by the Chinese Government is to promote the development of social smart technologies. But at the same time, the government should strengthen the implementation of the reform. Some Internet companies stick to the rules or don't want to raise their operating costs. They only set large fonts and high brightness for the aging transformation to float on the surface, but don't make changes to the personal needs of the elderly users. As a vulnerable group, the elderly users need to be solved by the government. “Aging Science and Technology" is also proposed in the white paper of Silver Hair Market. Due to the limitation of biological causes, the elderly may encounter cognitive disorder and difficult operation problems when applying information commodity production. In view of the characteristics of the elderly and on the basis of understanding the various functional degradation caused by aging," gerontology "explores the use of new technologies to prevent, fill and delay the" digital divide "of the elderly, so as to solve the practical problems of the elderly in the application of information, and emphasizes the entry of gerontology into the enterprise design process [11].

(2) Giving full play to the function of traditional culture. Cultural feedback is also an effective way to solve the intergenerational and digital divide [12]. In China, there has been a tradition of filial piety and respect for the elderly since ancient times, and the younger generation has a very obvious advantage in facing intelligent technology products. Strengthen face-to-face communication and interaction among family members, guide the elderly to use the smart phone, and help the elderly to use the smart phone for WeChat chat, online purchase and payment. In this process, the elderly can not only experience the warmth with their children, but also learn new technologies. Later, when they encounter problems, they can also give their children less trouble. The elderly is naturally willing to join in the learning and use of intelligent technologies. In addition, relevant offline smart technology application training courses shall be carried out to guide the middle-aged and old people to carry out relevant training, so that the middle-aged and old people can basically use the network chat application, payment application software, etc., so as to promote the communication between the middle-aged and old people and their parents and friends, relieve the loneliness of the middle-aged and improve the health level of the middle-aged and old people. In addition, a cultural atmosphere of respecting, respecting, loving and filial piety has also been established in the whole community. When the elderly faces the "digital divide ", actively help them to turn off the speed and give them more patience, so that they can enjoy a positive and comfortable old life.

(3) In product design, promote enterprises to manufacture more intelligent terminal products that meet the needs of elderly users. Where elderly people often go, such as hospitals, stations, communities, etc., it is suggested that relevant enterprises take the characteristics and needs of elderly groups into account in the infrastructure design; adopt the "online + offline" option in banks and other places, and keep the artificial window, physical consultation and other projects to better protect the rights and interests of elderly people.

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