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STUDY ON URBAN ELDER MOBILE PHONE USERS IN CHINA: IN THE PERSPECTIVE OF AGING ISSUE

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ABSTRACT-*This thesis is from a total innovative perspective. In the existing literature research, the main research objective mostly focuses on the young generations while the elderly, as the main focus on the research of affecting factors of mobile phone usage, the function and application of design strategy for the elderly lacks the attention to their behaviors of mobile phone. In the early 21st century, China officially entered the aging society. Under the vast circumstance of a worsen aging society in China the proportion of the elderly will maintain a stable rising tendency therefore the elderly, as a consuming objective, is becoming to play an important role. According to the social trend of population aging and the expansion of the elderly population, some scholars began to focus on the economic consumption market of the elderly as a "gold mine to be mined", study the consumption behavior of the elderly, and put forward targeted marketing strategies to provide reference for enterprises to make marketing decisions. In the recent years, specific marketing research related to the elderly mainly focused on the fields of tourism, pension consumption, healthy products, however, information consumption still lagged behind others mentioned above. This paper starts with usage behaviors and preference of mobile phone of the elderly, researches on the big data, reflects the conducts of the elderly who use media, then analyses consumption features and preferences, and proposes strategy on database market. It will help to lay out future marketing strategy, to fill market demands more effectively, to improve the operator's efficiency and economic benefits, which is of dramatic significance. In addition to this, it could inspire development and innovative design of APP, phone package and give references for related government, enterprises and research institutions.*

Keywords*: Interpersonal trust; trust relationship; trust of superiors; trust of subordinates; behavior characteristics; trust establishment*

I. INTRODUCTION

According to the figure of the fifth national population observation in 2000, it showed that the percentage of population over 60 was 10.33%, indicating that China has stepped into Aging Society since the beginning of this century (Valliappan Raju, Dr. Siew Poh Phung, 2019). United Nations once predicted the global aging population would keep increasing at an annual average speed of 2.5% while this figure in China at the same period was 3.3%. As for the proportion of aging people of the total population, it has risen up from 6.6% in 1995 to 9.3% in 2020 while it nearly doubled during 25 years (Hui, C., Lee, C., Rousseau,2007). Until 2020, the total amount of aging people over 65 will reach one hundred and sixty-seven million, which would occupy 24% of the overall global population of six hundred and ninety-eight million people. It means that among four elderly people

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exists a Chinese one. The national statistics department revealed that the scale of Chinese population over 60 would exceed two hundred and thirty million, taking up 16.7% of overall national population and deepening the aging progress. Under the vast circumstance of a worsen aging society in China, the proportion of the elderly will maintain a stable rising tendency therefore the elderly, as a consuming objective, is becoming to play an important role.

This essay is mainly based on quantitative analysis, literature research and specialist interviews. The figure is originated from the data of mobile users and television users from Qingyang district, Sichuan. SQL is used for extracting relevant original data form operator's database. Afterwards, Excel will work by filtering and cleaning data. Combining with it, SPSS 20.0 is utilized for data analysis (Hui, C., Lee, C., Rousseau,2007). The data analyzed in this paper is the statistical data from the operator's data system, which discards the systematic error caused by questionnaire and makes data high credibility. In addition, it not only fills in the gaps in the behavior research of the elderly consumer groups in China, but also presents new changes and impacts brought by the aging society from a brand new perspective. Furthermore, this essay may be helpful for providing new ideas for the future research on the elderly

***Table**1:Instrument for varibles*

Varible	*Measure*	*Source*
Management Quality (MQ)	QM1: The experienced and educated management team are leading the bank. QM2: There are effective leadership and management approaches and practices at the bank. QM3: All levels of management are committed towards the achievement of the bank's vision, mission, and objectives. QM4: Successful strategies are developed and implemented in line with business environmental changes. QM5: Good HRM practices have been placed. QM6: Managers are more innovative. QM7: Manager is well-versed with problem-solving skills.	(Simanda n, 2018). Molyneu x & Thornton (1992)
Technology Developments (TD)	TD1: The bank is utilizing up-to-date information and communication technology TD2: Innovative technologies that ease the bank's operations are improving TD3: The quality of services of e-banking, mobile banking provided by the bank improving TD4: Research & development activities in the UAE's banking industry have been enhancing TD5: Leadership & management capability towards technology adoption at the bank is good TD6: The bank's staff is effectively adopting new technologies TD7: The bank is highly focusing on the digital vision	Frame & White (2009)Be rger & DeYoung (2006)

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Mobile Phone (MP or IBP)	IBP1: The bank's revenue and profitability is improving IBP2: The number of customers/deposits/loans are increasing IBP3: Successful innovative finance products have been launching IBP4: The bank's overall assets are improving IBP5: Non-current assets are being utilized efficiently IBP6: The bank is maintaining adequate capital IBP7: Good asset & liability management practices have been placed	Sufian & Noor (2009)Khrawish (2011)

This paper starts with usage behaviors and preference of mobile phone of the elderly, researches on the big data, reflects the conducts of the elderly who use media, then analyses consumption features and preferences, and proposes strategy on database market (Valliappan Raju, Dr. Siew Poh Phung, 2019). It will help to lay out future marketing strategy, to fill market demands more effectively, to improve the operator's efficiency and economic benefits, which is of dramatic significance. In addition to this, it could inspire development and innovative design of APP, phone package and give references for related government, enterprises and research institutions.

II. LITERATURE REVIEW

Qiang Li (1991) predicted the existence of enormous consumption potentiality in market of the old and it has high development value. In his estimation, old people in urban areas expend 6000 CNY individually, accumulated to 270 billion in total which means one tenth of urban expenditure. His estimates are far from comprehensive. For instance, the pensions and retirement pay of the emeritus and retired are 344 billion CNY per year, not including the medical expenses and others, there are still 275 billion CNY counted by 80% of consumption. Besides, the scale of the old people not covered in retirement pay and those in rural areas is far beyond 62 million. If calculated by 2000 CNY of residents' minimum consumption, the number is 124 billion and 400 billion in both cities and countryside, only 8.2% in total residents' consumption in the circumstance of low-level consumption, thus the calling for further development is urgent. The aging tendency of population has given multi-dimensional impacts on economic and social development in various countries thus attracted their focus ever since 1990s. Different cultural circles have diverse definitions of the aged. According to WHO and some developed western countries, the elderly refer to people whose ages are over 65, while it is expressly stipulated by the government of PRC: "The elderly referred to in this Law are citizens at or above the age of 60". The data of the fifth Chinese National Population Census in 2000 showed that the percentage of aged population at or above the age of 60 makes up a proportion of 10.33%, which indicated that China had entered the era of aging society at the beginning of 21 century. From 2000, the aging of population in China has been in a period of rapid growth. According to the latest data compiled by National Bureau of statistics of China in 2016, the number of senior citizens aged 60 or above in mainland China exceeded 230.86 million, accounting for 13.26% of the total population, 2.93% higher than that in the fifth census in 2000, of whom 8.87% were aged 65 or above, 1.91% higher than that in the fifth census in 2000. These statistics mentioned above reveal that the percentage of the elderly in China has surpassed that standard of the UN and tended to ascend, it also reflects on the other side that the aging of population has coming into a stage of accelerated development (Chinese National

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Statistical Bureau, 2017). Considering of the prediction made by Zhenwu Qu et al (2017), by the time of 2020, 2035 and 2050, the elderly at or over 60 in mainland China will make up 17.88%, 28.83% and 34.78% of the total population which indicates two different stages of rapid growth and slow but steady development that the aging of population is about to undergo (Hui, C., Lee, C., Rousseau,2007).

In comparison to other states worldwide, there are three principle reasons attribute to the accelerated speed of aging in Chinese society: Firstly, human mortality goes down and the average life span extends (Hui, C., Lee, C., Rousseau,2007). Considering of related statistics, the average life span was 35 years before liberation. After the establishment of PRC, because of a steady society and economic development, people's living standard had increased, especially the improvement of medical conditions, the number of old population had increased rapidly. With the improvement of Chinese sanitation standard and civilian health conditions, the average life span of Chinese population has reached 60 or so in last decade. Infants and children are the biggest beneficiaries of enhance of technological level and perfection of medical technology. Death rate of infants shrank rapidly ensured newborns better chances to survive and decent living standards to grow old (Valliappan Raju, Dr. Siew Poh Phung, 2019). The increase of Chinese people's average life span is an inexorable trend along with the development of Chinese economy, and this makes a critical reason for both the shaping, development and mature of aging society. Secondly, the successful birth control reduced birth rate. Chinese population ranks first in the world, the one-child policy which began in 1970s greatly lowered the birth rate in China and constrained the booming of Chinese population, but the negative impacts are inevitable: a smaller proportion of children population and a relatively increased proportion of the old. Analyzing from this perspective, one-child policy has speeded up the progress of aging population in a way, and gotten China into aging society in advance. Thirdly, economic development and followed population mobility as well as frequency of mobilization make it possible of the elderly to aggregate in some district. Young adults who live in less developed regions immigrate to developed areas result in the aging in less developed areas more obvious (Hui, C., Lee, C., Rousseau,2007)

III. RESEARCH METHODOLOGY

With information gain, we can assess the importance of an App to an attribute. We can thus establish a user representation based on specific attributes, namely, each user attribute has its optimum app-based user representation vector. Our work in this section is treating each attribute as a tag. Therefore, the problem of mining user attributes is to detect whether a user has this tag. In other words, there are only two categories for each user attribute. From a classification point of view, this is a dichotomous problem in which one category consists of users with tags and the other consists of users without tags.

In consequence, the problem of mining user attributes can be solved by classification problem. For any user attribute, the relationship between each App and the attribute itself is measured by information gain method, so as to establish the user representation vector based on App. A dichotomous classifier then takes the user representation vector based on a particular attribute as input to detect whether a user has the tag. There are many classifiers for dichotomous classification problems. Support vector machines (SVM) have shown good versatility in solving classification problems. It maps the inputted data points into a high-dimensional characteristic space and tries to find a hyperplane that maximizes the boundary between the two categories (Valliappan Raju, Dr.

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Siew Poh Phung, 2019). The following equation is the objective function for finding the optimal hyperplane. To find the best hyperplane, SVM employs dot products in the eigenspace, which are called kernel functions.

We tried different kernel functions when training the user attribute classifier and finally found the best result came from gaussian kernel function. The number of positive samples for some attributes is much smaller than the number of negative samples, especially the attributes obtained through 10 niche applications. For the unbalanced attributes of both positive and negative samples, we increased the penalty weight of positive samples in the penalty function when training the corresponding model accordingly. In the training of classifier, we adopted the method of cross validation for five times. The sample points were randomly divided into five parts as evenly as possible. In each round, four parts were used to train the classifier, and the remaining part was used to verify the classifier. Therefore, any data sample will not appear in the training set and the test set at the same time. We repeated the process for five times.

IV. DATA ANALYSIS

This thesis is from a total innovative perspective. In the existing literature research, the main research objective mostly focuses on the young generations while the elderly, as the main focus on the research of affecting factors of mobile phone usage, the function and application of design strategy for the elderly lacks the attention to their behaviors of mobile phone. Due to this, this thesis may fill the gap in the research field.

The data source is innovative. Among the small amount of research on the elderly, questionnaire is mostly adopted as a common survey method and data source is mainly from a certain area. For this, two drawbacks may exist as followings: On the one hand, the data source is small. On the other hand, when interviewing the elderly, the objectivity of figure would be greatly declined due to poor memory of the elderly. Also, using questionnaire may cause systematic error and deviations from the real situation. The figure in this thesis is extracted from the operator's database and recorded in the real operation process. Thus the obtained figure could eliminate the error to a maximum caused by the subjectivity of the users and reflect the real behaviors objectively with a high credibility.

***Table 2**:Measurement model assessment*

Constructs	Item	Loading (> 0.7)	M	SD	α (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Management Quality (MQ)	MQ1	Deleted	3.973	0.529	0.897	0.921	0.661
	MQ2	0.754					
	MQ3	0.866					
	MQ4	0.736					
	MQ5	0.790					
	MQ6	0.861					
	MQ7	0.861					
Technology Developments	TD1	0.745	4.355	0.460	0.867	0.899	0.597
	TD2	0.824					

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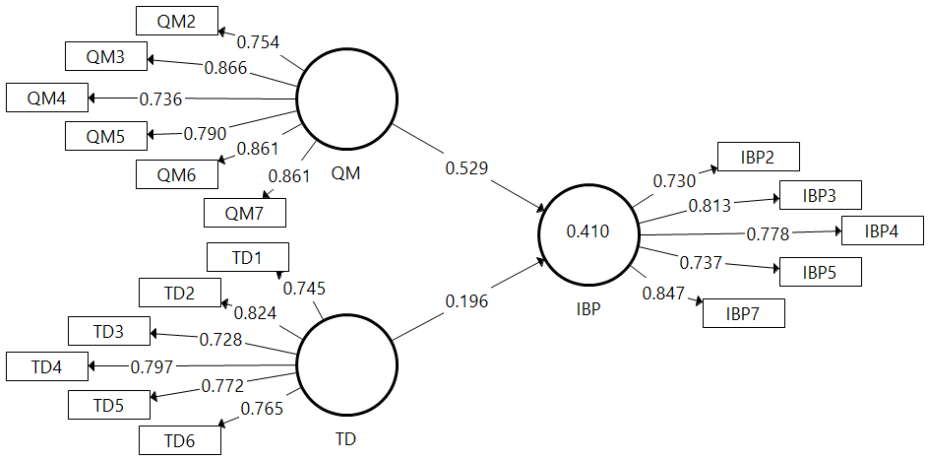
(TD)	TD3	0.728					
	TD4	0.797					
	TD5	0.772					
	TD6	0.765					
	TD7	Deleted					
Mobile Phone (MP)	MP1	Deleted	4.078	0.433	0.840	0.887	0.612
	MP2	0.730					
	MP3	0.813					
	MP4	0.778					
	MP5	0.737					
	MP6	Deleted					
	MP7	0.847					

Note: M=Mean; SD=Standard Deviation, α= Cronbach's alpha; CR = Composite Reliability, AVE = Average Variance Extracted.

Key: MQ: Management Quality, TD: Technology Developments, IBP: Islamic Banking Performance.

4. 1 Structural Model Assessment

The structural model can be tested by computing beta (β), R^2, and the corresponding *t*-values via a bootstrapping procedure with a resample of 5,000 (Hair, Hult, Ringle, & Sarstedt, 2017).



Key: MQ: Management Quality, TD: Technology Developments, IBP: Mobile Phone

Figure 2: PLS algorithm results

V. CONCLUSION

With the growth of mobile phone usage, the popularity and number of mobile APP are growing rapidly. At the same time, more and more research has been done in recent years to try to understand the APP behavior of mobile phone users. These tasks include how users download, install and use different mobile Apps, how many times users use the App each day, how long they use, and how App usage changes under different circumstances. In terms of the usage patterns of mobile Apps, the previous research investigated the frequency of users visiting the same mobile APP, and which mobile Apps are frequently used together. There is also some work to predict the installation and use of mobile apps (Valliappan Raju, Dr. Siew Poh Phung, 2019).

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The data used in this study were from backstage records of a certain operator. However, when understanding and screening the data, it was found that the background records were not originally recorded for research, so there were some problems, such as low data sampling rate, which would lead to the loss of a lot of information. For example, the sampling rate is not high when the mobile application is recorded once every hour. There is a possibility that the low sampling rate will lead to the loss of information such as the duration, frequency and sequence of application use. The information mentioned above may be missing but can help us better describe user behavior. In the future work, we will improve the data sampling rate and try to maintain and ensure the integrity of data information.

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