

Study on the Aging of Taobao APP in the Context of the "silver hair economy"

Zhu Ying¹, Liu Feng²

¹School of Journalism and Communication, Shanghai University, Shanghai, People's Republic of China

²(Corresponding author) School of Journalism and Communication, Shanghai University, Shanghai, People's Republic of China

Email address: panda197@163.com

Abstract—In the era of the Internet of everything, the elderly group is growing. According to the seventh Chinese census results, the proportion of people aged 60 and above in China reached 18 percent, and the senior level is gradually increasing. To develop a sound market economy for older adults and serve them well, dealing with the problems in the "silver hair market" as soon as possible is necessary. This paper aims to study the Taobao APP's aging problem in the silver-haired economy market. Through the research on the shopping needs and behaviors of older adults and the use of the Taobao APP, we propose the critical design factors for aging and analyze them in terms of interface visualization, ease of operation, information readability, feedback mechanism, shopping safety, and social interaction. This paper also proposes establishing a Taobao APP evaluation and assessment system for elderly users and provides an outlook on the future development direction and trend of the Taobao APP for aging. To better meet the shopping needs of older adults, create a better space for developing the silver hair economy, and improve the quality of life of older adults.

Keywords— Silver-haired economy; age-appropriate; digital divide; intelligent voice.

I. RESEARCH BACKGROUND AND SIGNIFICANCE

1.1 Background of the selected topic

With the increasing aging of the global population and the improvement of people's living standards, the consumption ability and demand of the elderly group are growing. Against the backdrop of the rapid development of mobile wireless technology and the construction of digital government, the silver-haired economy market has become a new bright spot for economic development. Secondly, in the face of the essential issues and challenges of an aging population, the government is trying to implement the development concept of active aging from all aspects, and the elderly group itself is actively trying to integrate into the digital society. However, older adults' consumption habits and needs have also significantly changed, and they need more convenient, practical, and easy-to-use shopping methods. In addition, influenced by differences in physiology, psychology, information literacy, and other factors, there are still a considerable number of older people who are at the disadvantage of the digital divide and have difficulties in using innovative technology and digital services for aging have become a top priority.

Taobao is now one of the largest e-commerce platforms in China, with a considerable scale of development. According to the China E-Commerce Research Center, consumers have

gradually moved from placing orders on PCs to cell phones as far as their buying experience is concerned. In addition, data from Alibaba's 2022 earnings release shows that nearly 124 million annual active users spend an average of more than 10,000 RMB on Taobao and Mall[1]. This indicates the critical role of Taobao in China's e-commerce market and the scale of its operations. In addition, the use of Taobao by older adults also has data that cannot be ignored. According to data released by China Senior Magazine, the percentage of e-commerce users aged 45-59 reached 76.8% in 2018, and the percentage of users aged 60 and above also reached 56.8%. These figures show that the number of elderly groups using Taobao is quite large. In addition, Taobao has also launched a special "Elder Edition" to provide a more convenient shopping experience for older users.

1.2 Research Significance

In this era of "The Internet of Everything," with the increase in smartphone penetration, the elderly have become one of the critical user groups of mobile Internet. According to the "China Aging Industry Development Report" released in 2022, it is predicted that by 2050, China's elderly consumption market will grow to 107 trillion yuan, accounting for 33% of the gross domestic product, ranking first in the world[2]. For older adults, shopping with Taobao APP is a new way of shopping. Therefore, the aging of the Taobao APP will have significant practical significance and economic value. First, it can provide a reference for the design and development of the Taobao APP to provide older adults with more convenient and practical services that meet their shopping needs; second, it can expand the development space of the silver-haired economy market and create more employment opportunities and economic benefits; third, it can further meet the shopping needs of older adults and improve their quality of life. Therefore, this thesis's research has important practical and far-reaching social significance.

II. CONCEPTS AND PRINCIPLES OF AGING IN THE SILVER-HAIRED ECONOMY MARKET

2.1 Silver hair economy market concept

China has already entered an aging society and has a large elderly population. The Fifth Plenary Session of the 19th Party Central Committee elevated the active response to population aging to a national strategy. China is expected to have 412 million and 480 million in 2035 and 2050, and the population of people aged 60 or above will account for about 30% in

2035 and about 38% in 2050[3]. The silver-haired economy is a consumption model in which older adults are the leading service targets, and its scope covers various fields such as medical care, health care, tourism, culture, education, and housing. At present, the market share of the "silver hair economy" in China is not high; as an essential way to actively cope with the aging of the population, promoting the "silver hair economy" should be included in the social development plan[4]; by exploring the ways of "silver hair economy" development, we can scientifically and scientifically promote the development of "silver hair economy." The concept of scientific and healthy aging has been proposed through the exploration of the development of the "silver-haired economy," and the development of social elderly services and the promotion of the aging industry has been continuously enhanced, forming a new driving force for the construction of the "silver-haired economy"[5].

2.2 APP aging-related concepts

In the report of the 20th Party Congress, the mission and task of "comprehensively promoting the great rejuvenation of the Chinese nation through Chinese style modernization" were elaborated, and it was pointed out that Chinese-style modernization is "a modernization with a large population" and "a modernization with common prosperity for all people." It is a modernization with a large population" and "a modernization with common prosperity for all people"[6]. Actively responding to population aging is a national strategy, and how to actively respond to the implementation has become the key. At present, the elderly group in China is significantly lower than the young group in the proportion of using the Internet due to the limitation of material conditions and education level. Regarding the acceptance of information technology, the frequency of information resources, and the understanding of information knowledge, there is a blatant inequality in digital information participation among older adults [7], creating a "digital divide."

With the declining physical function and learning ability of older adults, they have gradually become a "vulnerable group" in Internet development. In 2020, the State Council issued the "Notice on the Implementation Plan for Effectively Addressing the Difficulties of Using Smart Technologies for the Elderly," which explicitly states that we should promote the aging of mobile Internet applications (Apps) and take this as an opportunity to address the issue of population aging actively. Aging-friendly design, also known as elderly-friendly design, refers to the design and manufacturing of products and services with attention to older adults' interests, needs, demands, and habits so that they can use the products and services conveniently and comfortably. The principles of aging-friendly design include the following: simple to use, easy to operate, focused on safety, and meet effective interaction.

III. THE AGING OF SHOPPING APPS FACES A DILEMMA UNDER THE WAVE OF SILVER HAIR

3.1 Rejection of digital products by the elderly group

In the era of traditional media dominance, seniors are mainly passive in receiving information from the media, while they are relatively passive in receiving information on education, learning, leisure, and entertainment. In the highly competitive media market, seniors are no longer "told" but can select and obtain information at any time, any place, and at their discretion, to realize the use and satisfaction of information.

In the era of intelligent media, the digital consumption needs of older adults have yet to be fully opened. The inconvenient search, complicated page design, and numerous advertisements when using Apps have caused the elderly to reject digital products, and to a large extent, they prefer to accept some functional guidance Apps that are convenient, fast, and clear rather than wasting time researching related software. For example, during the epidemic, the presentation of health codes and travel cards became a necessary procedure to enter public places, and older people, unfamiliar with the use of digital devices, often turn to young people labeled as "Digital Natives" and have a low degree of independence; in addition, cell phone software to take a taxi In addition, mobile phone software for cab travel has become the norm in digital cities, and cabs are usually connected to digital ports, using taxi programs to pick up and deliver passengers. Each time the children "feedback" the technology, it is easy to break the psychological discomfort of older adults.

Usually, because companies do not conduct sufficient market research and invest enough money, they do not have a deep understanding of the needs for the digital product preferences of older adults in terms of standard functions, difficulties and pain points of software operation, Etc., so it can cause the adaptation to aging to be a formality[8]. Take intelligent TVs as an example; in the product design, artificial intelligence audio interaction, sound control font enlargement, and other functions are added. However, these are still only a superficial understanding of the needs of older adults. According to the survey, there are still nearly half of older adults use a smart TV; they can not find the TV program they want to watch, in the case of unknowingly; also tend to turn the TV into a blue screen state before the "smart" will be avoided. In addition, the level of digital applications in poor areas needs to be improved. The China Internet Information Center (CNNIC) recently published the 49th Statistical Report on the Development of the Internet in China, which shows that the Internet penetration rate of Chinese seniors reached 43%. However, as of the end of 2021, there are still about 100 million rural seniors in China who do not have access to the Internet, and among senior citizens over 70 years of age[9], many have never had access to a digital environment of cell phones and computers and are very unfamiliar with digital products.

3.2 Consumer risk in the weak discriminatory ability of the elderly population

Due to the relatively confusing service standards and market of the elderly consumer market, "deception, concealment and deceit" and other damages and pitfalls to older adults occasionally occur. On the other hand, older

people must be aware of personal information security protection. Faced with the bombardment of headline parties and eye-catching and cheap poster links on the Internet, they cannot often discriminate and easily fall into the trap of false information. On the other hand, young people take advantage of the Internet medium and can actively screen the information they need according to their interests. Regarding the difference in information acquisition ability in the online society, the position of the father generation as the main body of knowledge is shaken[10]. In addition, shopping Apps will ask users to fill in personal information and bind payment methods when registering, making it easy for especially the elderly groups who rely heavily on the Internet to be easily invaded by infomercials and algorithmic recommendations. Some businesses will take advantage of the elder's feelings of longing for their children and loneliness to cheat them through emotional fraud, causing great harm to their physical and mental health. It is worth considering how to strengthen the consumer monitoring mechanism of age-appropriate Apps and build and improve the cross-bencher collaboration mechanism. To urge APP developers and download platforms to fulfill their responsibilities and to focus on the supervision of Apps prone to consumer behavior, to effectively and fully protect the rights and interests of senior consumers[11].

3.3 Inconsistent standards in the silver-haired consumer market

China's silver-haired economy consumption market has just emerged, and governments at all levels have supported the aging industry to different degrees, but problems such as insufficient strength of relevant policies and inadequate implementation are common. From the silver-haired service market perspective, the supply of medical and leisure services and senior tourism is ample. Still, the market supply of the remaining relatively immature elderly care and home economics services is lacking, and the contradiction between supply and demand increases[12]. On the one hand, the country has not yet issued a plan and related policy documents that can guide the development of the national elderly industry, and what it has now is only some guidance on the healthy development of the elderly service industry. Still, it is only one area of the elderly industry and cannot play a guiding and supporting role for the whole elderly industry[13]. On the other hand, the market access standards of the aging industry need to be more consistent, and product standards and service standardization need to catch up. User needs are the product's core, and strengthening services to connect users is the most crucial issue to consider for shopping Apps, Etc.[14]. With the continuous development of media technology, the digital product market needs to follow the trend and make specific changes in its functional positioning, product service positioning, and output.

IV. RESEARCH AND PRACTICE OF AGE-APPROPRIATE TAobao APP

To respond to the relevant national policy requirements for elderly e-commerce shopping aging, Taobao APP from the previous "standard mode" launched the "elders mode" in the

interface visualization; Taobao APP increased the font, icon, and other elements of the magnification function so that can quickly identify and click on the page of various information, improve the visual impairment and do not adapt to the small screen and other problems. In terms of interface visualization, Taobao APP adds the function of enlarging fonts, icons, and other elements, so that seniors can easily recognize and click on various information on the page, improving visual impairment problems and not adapting to small screens. In addition, the adjustment of font color, contrast, and brightness also dramatically improves the visualization experience of older adults, making it more pleasant for them to use the app.



Taobao "standard mode" interface



Taobao "elders mode."

4.1 Optimize the ease of operation of the older model

With the growth of age, the physical function and cognitive ability of older adults will decline, which requires Taobao APP to make optimization measures to adapt to older adults in terms of ease of operation. In elders mode, it is not only necessary to ensure that the overall font and line spacing of the APP is precise and the page layout is reasonable but also to ensure that the penetrability of the software is not affected by the adjustment of font and line spacing[15], and to avoid problems such as interactivity being affected by text enlargement. Take Taobao as an example; on the Taobao page, the most frequently used is "View Receipt Information," the standard mode of unshipped, pending receipt of goods and

other information in one line display; the information is dense and not easy to identify. However, the elders' version uses a through-column design to enhance the display and make it more clickable.

In addition, since the acceptance of new things by older adults requires an adaptation process, the Taobao APP user interface is designed to simplify the operation process as much as possible so that older adults can understand and use it more easily. In the process of search, purchase, and payment, redundant operations and functions should be reduced as much as possible, and the visibility and operability of each component should be improved so that users can find products, add to the shopping cart and pay, Etc., faster. Suppose some functions can only partially avoid multi-step operations. In that case, Taobao APP needs to have a complete understanding of users' needs and provide them with easier-to-grasp and more accessible instructional methods, such as step-by-step guides, operation videos, Etc., which can reduce the cost of finding trial and error for older users on new software[16].

4.2 Improvement of the feedback mechanism for each function of the elder version

Taobao's "Elder Edition" has a dedicated user feedback system for senior users - an exclusive human customer service that can help senior consumers defend their rights and interests, customers' rights, refund their fees, Etc. For example, regarding purchasing medicines, Taobao APP provides a free doctor's consultation for senior citizens, guiding them to use medicines reasonably. The feedback of this feature should allow senior users to give feedback to Taobao directly on their feelings and problems about using the older version to refine and improve the features and interface of the app.

4.3 Enhance the shopping security of the elders' version

The elderly version of the Taobao application includes confirmation and other confirmation measures for elderly users. It uses filtering methods to accurately control and review the quality and purchase behavior of drugs on the platform, ensuring that elderly consumers can legally, safely, and reliably choose drugs and their buyers, and ensure the safety of their transactions. We provide shopping tips when making risky purchases, such as returning and exchanging goods in time for purchase and applying for refunds, making senior users more aware of their consumer rights and protection and preventing them from being cheated by merchants. In addition, the developers set up various secure payment methods, such as Alipay and UnionPay, so that seniors can choose according to their needs and guarantee the security of the payment process. In terms of after-sales service, Taobao for Seniors provides a variety of service means, such as online customer service and telephone customer service, to quickly deal with after-sales problems of seniors, to protect the shopping experience of senior consumers, and enhance shopping safety.

4.4 Intelligent optimization of search methods

In the era of the development of intelligent media in full swing, elderly users are more inclined to receive information in the form of audio and video[17]. In addition to visual improvements, to allow elderly users to better adapt to the shopping needs and usage habits of the Taobao APP, the development designers have specially introduced artificial intelligence technology and used a voice search function to optimize the efficiency and functionality of the search box, making the search more convenient, accurate and efficient. To avoid usage challenges such as typing difficulties and unclear product descriptions for the elderly, older adults can browse, search and purchase products by speaking, and the robot will automatically match the search to the corresponding page, reducing the visual and physical burden of the elderly users. The proposed voice search function also makes senior users feel a stronger affinity with the search engine, making it more convenient for them to find the products they need, improving shopping efficiency while gaining more convenience and fun, significantly improving the experience and shopping pleasure of senior users.

V. SHORTCOMINGS AND SUGGESTIONS

In the Internet era, people's average standard of living is increasing, and the "silver-haired group" is not as commonly demand-centered as before but more in pursuit of diversified, personalized, and intelligent products. To gain a substantial competitive advantage in the "silver hair market," companies need to open up a new path in the existing relatively well-developed market and actively respond to the new needs of the elderly groups of the times[18].

5.1 Taobao APP age-appropriate improvement is insufficient

5.1.1 Taobao APP elders' version of the shopping experience is limited

Although improvements have been made to Taobao Elder Edition for users, there are still some usage challenges for seniors. For novice e-commerce users, the user interface for elderly users is not filtered but zooms in on the content and does not effectively push the merchandise algorithm. On the one hand, despite the audit of merchants on this version, the quality of goods is difficult to guarantee due to the source of goods and supply channels, and elderly users are still vulnerable to lousy deception by merchants. On the other hand, the variety of products in the elders' version is mainly household goods, and the number of available choices is limited in some unique products, such as medical supplies and auxiliary equipment. In terms of user registration and payment functions, older adults have difficulty in typing, but the registration process does not implant artificial intelligence voice technology, "Tao Xiaobao" can only be used in the search interface; some identity information identification and face authentication need to have the guidance of young people to complete.

Regarding returns, some older adults can only help solve them through customer service. Usually, the return time is limited. To find out the reasons for the return and wait for the courier to collect the goods, one after another, not only lengthened the return time but also exhausted the patience;

many elderly people can only be treated as "a dumb loss" and thus give up the right to defend.

5.1.2 Imperfect regulation of "silver hair economy"

With the aging population's deepening, the "silver hair economy" has gradually become an important trend in economic and social development, and online shopping has become an increasingly popular method. However, the regulation of online shopping for the "silver-haired economy" is not perfect.

First, the government lacks unified regulatory standards for silver-haired economy online shopping, which leads to unclear regulatory responsibilities and rights of different departments, Prone to regulatory scotoma and conflicting enforcement phenomena. Secondly, the regulatory departments need more effective regulatory means and resources, adequate supervision of online merchants for virtual economic activities like online shopping, and time monitoring and intervention of older adults' shopping behavior.

5.1.3 Lack of accurate research on the "silver hair economy" by enterprises

The stereotype that older people do not know how to consume, their purchasing power is weak, and the market profit are thin and unprofitable remains among some enterprises, so few will invest more energy in the "silver hair economy" market[19]. As a rule, consumers' spending power is directly proportional to their income, i.e., the higher the income, the stronger the spending power, and vice versa. The traditional misconceptions have led many enterprises to misunderstand the "silver hair economy," thus hindering the development of the "silver hair economy" market. According to the forecast of the National Development and Reform Commission, by 2050, China's silver service industry will increase from the current 7 trillion to 106 trillion, the proportion of its GDP will reach 33%, and China will form the world's largest senior service market[20]. Although Taobao recognizes the personalized and diversified senior care pursuits of the new generation of "silver-haired groups," it has developed the "older model." However, due to the lack of proper research, the developers failed to understand and grasp the consumption needs of the "silver-haired group" in a timely and accurate manner, which led to the problems of unreasonable structure and low-quality products and services in the "silver-haired market." Therefore, even if the "silver-haired market" is a "mine," it cannot bring more profits for enterprises.

5.2 Suggestions for the aging research of the Taobao APP

5.2.1 Strengthen the source of commodity quality assurance

The "silver-haired" group who enjoy the convenience of digital life will pay more attention to user psychology, user needs, and user experience. For example, in the search results related to "senior," the top-ranked products are with keywords such as "comfortable, portable." As a shopping platform, Taobao APP needs to not only enhance user stickiness and trust but also enrich the variety of goods and strengthen the quality inspection of goods, to provide more comprehensive shopping options for the silver-haired group while preventing

the emergence of bad business, to protect the safety of the elderly shopping and improve user experience.

5.2.2 Build a government-led diversified regulatory mechanism.

Taobao as a merchant, in the elder's version of the introduction of voice interaction technology, the existence of "Tao Xiaobao" makes the search service more convenient, including access to the weather, query packages, and other functions that have a more direct and effective way to open. However, as artificial intelligence, "Tao Xiaobao" still has difficulties in the face of some contexts; nagging or dialect Context can not be accurately identified. In this regard, Taobao should make more effective supervision and regulation and strive to solve the elder's version of Taobao's shortcomings. The government should also establish a unified regulatory standard for "silver-haired economy" online shopping, improve relevant laws and regulations, and clarify the responsibilities and rights of various departments. At the same time, the regulatory authorities to improve supervision and law enforcement, illegal and illegal network businesses to impose severe penalties, and advocate honest business. The government, regulators, and online businesses will work together to protect older adults' informed choices and consumer rights.

5.2.3 Improving the information literacy skills of "silver-haired" people

Taobao APP At present, many older people are unaware of the existence of the "elders version," and information literacy is low. The software mode switch also needs clear guidance and effective adjustment, assuming that the user sets the enlarged font; if the software can sense in advance and make practical tips will be twice the effort. As far as the main page is concerned, there is only a separate section designed for "aging in place" to solve the problem of the needs of the silver-haired group. On the one hand, the government should also assume the function of public social services, promote the integration of resources, and help the silver-haired group to obtain more benefits.[21], enterprises and businesses should improve their knowledge of the "silver-haired economy" market and reposition their needs; on the other hand, enterprises should continue to provide more and more accurate products and services based on research results and user feedback, and On the other hand, enterprises should continue to provide more accurate products and services based on the research results and user feedback, and strengthen the training of talents serving the "silver-haired," tap the learning potential of the elderly group under the digital information technology Internet, and help the elderly cross the digital divide by continuously communicating and exchanging the experience of using the new Internet media through multi-party cooperation. We will continue to create more possible service products in senior education, senior travel, and entertainment.

VI. SUMMARY

At this stage, China is in the trend of rapid development of aging, and the proportion of the elderly population is also rising, but the functions of the Taobao App for older adults are too limited and cannot meet the more prosperous shopping and

living needs of older adults. Most of the silver-haired group's needs for "health," "medical," and "fun" have been given high priority, but the degree of satisfaction is still unbalanced and insufficient.[22]. How to provide more services such as "learning" and "teaching" for older adults is still a challenge we need to think about nowadays. To better meet the needs of the aging trend, enterprises should increase the popularization and publicity of online payment knowledge for the silver-haired consumers, help the elderly cross the digital economic divide through multiple channels and multiple paths, and help the silver-haired group master the knowledge and skills of online payment. Society should also adhere to the people-oriented approach and strengthen humanistic care for the silver-haired group.

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