

Analyzing Behavioral Changes in the Elderly under the Influence of Social Media Through the Lens of the Technology Acceptance Model

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Abstract: This study explores the behavioral changes of elderly users (aged 60-65) when engaging with social media, using the Technology Acceptance Model (TAM) as the analytical framework. With global aging trends accelerating, understanding how older adults adapt to new technologies is increasingly critical. While most existing research focuses on younger populations, this study aims to address the gap in literature by examining the perceptions and usage patterns of elderly social media users. TAM's key constructs—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—are applied to understand how social media influences elderly users' social interactions, media consumption, and health-related behaviors. The findings reveal that social media enhances older adults' sense of connection with family and friends, reduces loneliness, and increases social participation, all of which contribute to higher PU and PEOU. Moreover, the study highlights the digital divide, noting the challenges of technophobia, lower digital literacy, and susceptibility to misinformation among elderly users. Comparative analysis with younger users underscores generational differences in technology adaptability, content preferences, and security awareness. The study concludes with recommendations for enhancing the user experience of elderly social media users by addressing their unique needs and fostering inclusivity in digital platforms.

Keywords: TAM, social media, behavioral, change.

1. Introduction

Social media, as an online platform, facilitates user interaction and continues to evolve alongside advancements in technology, impacting acceptance and usage patterns across different age demographics. It has transformed how individuals communicate, access information, and engage with society. However, while offering extensive opportunities for connection and information sharing, social media also poses challenges, particularly in areas such as security, misinformation, and the digital divide, especially among older populations. According to a report by the World Health Organization (WHO) [1], global population aging is accelerating, with the proportion of individuals aged 60 years and older projected to nearly double from 12% to 22% between 2015 and 2050. This demographic shift underscores the importance of understanding behavioral changes in the elderly as

they increasingly engage with social media. Accordingly, this study highlights the significance of technology acceptance among older adults.

At present, academic research on social media tends to focus predominantly on younger adults and female users, with relatively limited attention given to the elderly population. Most studies concentrate on specific aspects of social media usage. For example, Parida [2] analyzed factors influencing the use of social media for health-related activities, while He [3] examined the role of social media in elderly social participation. These studies often lack in-depth investigation and comparison, leaving a research gap in exploring older adults' behavioral changes in relation to social media. To address this gap, the current study focuses on users aged 60–65, utilizing the Technology Acceptance Model (TAM) as the theoretical framework for analysis. The TAM serves as the primary research methodology in this study, employing two key constructs, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), to explain the behavioral changes experienced by older adults when interacting with social media. Although Behavioral Intention (BI) is not a central focus, TAM has been widely applied in various studies. For instance, Moon and Kim [4] employed TAM to explain user acceptance of the World-Wide-Web, while Lin [5] used it to examine behavioral intentions in e-stock trading. Similarly, Gao [6] applied TAM to explore user engagement with TikTok. This study, however, focuses specifically on the behavioral changes of older adults influenced by social media through the TAM framework.

Findings reveal that elderly users exhibit a strong interest in social media, viewing it primarily as a communication tool to stay connected with family and friends. This connectivity significantly alleviates feelings of isolation and enhances social participation among older adults. Moreover, social media fulfills their informational and engagement needs, offering content tailored to their interests. These factors contribute to increased PU and PEOU, thereby promoting continuous use of social media by the elderly population. The study also explores potential reasons for behavioral differences between older and younger users, offering insights into how social media platforms can better meet the needs of senior users. It provides recommendations aimed at further enhancing PU and PEOU among elderly individuals to support their ongoing engagement with social media.

2. Overview of the Technology Acceptance Model (TAM)

2.1. Definition and Core Components of TAM

TAM, proposed by Fred Davis[7] in 1989, is a seminal theoretical framework that investigates user acceptance of technological innovations. Developed as an example of the Theory of Reasoned Action (TRA), TAM has become one of the most influential models in understanding technology adoption. Central to the model are two critical constructs, PU and PEOU. These constructs are interrelated, with PEOU exerting a significant influence on PU, thereby shaping users' behavioral intentions and actual use of technology.

Perceived Usefulness (PU) is defined as “the extent of a person believed that utilizing a specific technology will enhance their performance”[7]. It can be succinctly assessed as the perceived value derived from the technology. For instance, some of the amateur photographers might find that the functions of cameras can be substituted by smartphone, diminishing their perception of cameras' usefulness. Oppositely, if a product is deemed valuable, its PU will also be heightened.

Perceived ease of Use, defined by Davis as “the extent of a person believed that employing a particular system is free of effort”[7]. For example, a software with limited page is straightforward for users to control, thereby increasing the perceived ease of use. In contrast, a software demanded extensive study and challenging to navigate will decrease users' ease of use perception. In summary, PU reflects the subjective belief in the utility of a specific technology, while PEOU assesses the simplicity with which users interact with the product. TAM is fundamentally concerned with users'

subjective perceptions of utility and ease of use, rather than the objective attributes of the technological product itself.

2.2. Application of TAM in Studying Technology Adoption

TAM has been extensively validated across a range of emerging technology and information, including World-Wide-Web, e-learning, e-commerce, e-stock, online banking, mobile device, social media and more. Researchers have rigorously applied TAM to analyze user acceptance in these diverse contexts. For instance, Moon and Kin [4] employed TAM to elucidate users' acceptance of the World-Wide-Web within an educational setting. Similarly, Lin [5] utilized the model to clarify the behavioral intentions of e-stock users' behavioral intention in this model. David [8] applied TAM to assess the learning experiences of students using educational mobile devices, while Liang Gao [6] explored the factors influencing user engagement on TikTok, a popular social media platform, through the lens of TAM. These studies collectively demonstrate TAM's utility in providing insights for technology designers regarding the impact of system on the user's behavior.

2.3. Relevance of TAM in Understanding Elderly Behavior with Social media

The TAM has proven to be a valuable framework for understanding how older adults interact with new media, particularly social media platforms. By incorporating with it, TAM reflects the model's adaptability of elderly with social media, enriching the insight between technological advancement and user behavior. The integration not only help us pay more attention to elderly, but navigate the understanding of how social media shapes user behavior in the digital age. As digital technologies increasingly permeate everyday life, older adults face unique challenges in adopting and effectively using these tools. TAM provides a structured approach to analyzing these challenges by focusing on key determinants such as PU and PEOU. In the context of social media, these constructs help researchers and developers identify the factors that either facilitate or hinder adoption among the elderly.

For instance, simplified interfaces and personalized services are critical in enhancing the perceived ease of use, while the ability to maintain social connections and access relevant information can increase perceived usefulness. By applying TAM, researchers can gain deeper insights into the specific needs and preferences of older adults, thereby informing the design of more inclusive and accessible digital platforms. This not only helps bridge the digital divide but also enriches the lives of older adults by enabling them to engage more fully in the digital age.

3. Influence of Social Media on Elderly Behavior

3.1. Increased Media Consumption Patterns

With the rapid advancement of the Internet, digital technology has increasingly become a fundamental component of societal infrastructure, with social media emerging as a significant element in the lives of older adults, facilitating their engagement in a digitally-driven society. It is illustrated that, researcher [9] revealed that the daily social media usage among the elderly follows a normal distribution pattern, characterized by lower usage at both extremes and a higher concentration in the middle (See Figure 1). Specifically, 36.2% of the old adults engage with social media for 1-3 hours a day, while 22.9% report usage between 0.5 and 1 hour. Notably, 7.5% of elderly individuals spend more than 5 hours per day on social media. These findings indicate that, over one-third of elderly users allocate 1 to 3 hours daily to social media, with the average daily usage standing at approximately 2 hours, accounting for a significant portion of their daily activities. This data

underscores the critical role social media now plays as an essential information source for many older adults, occupying an indispensable position in life.

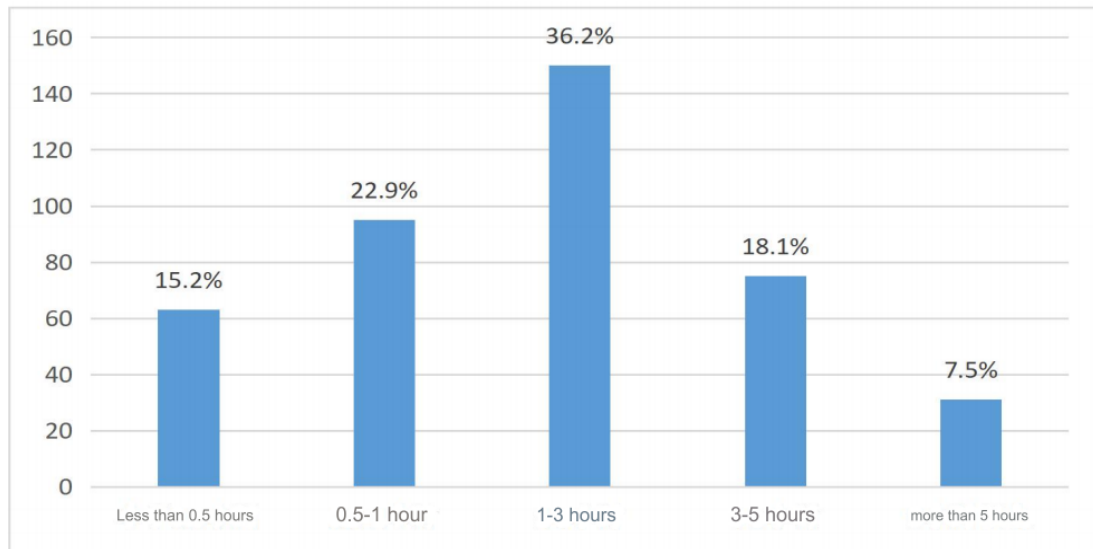


Figure 1: Distribution of daily social media usage time of the elderly[9]

3.2. Social Interaction and Communication

The use of social media serves as a vital intermediary for the elderly, enabling them to remain socially connected and engaged in contemporary society. It offers a new dimension of communication, allowing older individuals to maintain relationships and stay in touch with others[10]. Researcher has demonstrated that social media usage is linked to higher levels of perceived social support and social contact, both of which are associated with lower levels of loneliness among older adults. Several studies[10] highlight that online communication enables older adults to stay connected with friends and family members who provide emotional support, and ultimately contributing to reduced feelings of loneliness. [11] Social networking sites (SNS) primarily serve as communication tools for elderly users. Over 50% of older adults use SNS as a medium for communication, identifying it as one of the most important functions of the Internet for this demographic (see Figure 2). However, this usage predominantly supplements or replaces traditional communication with family and friends, rather than fostering new online relationships.

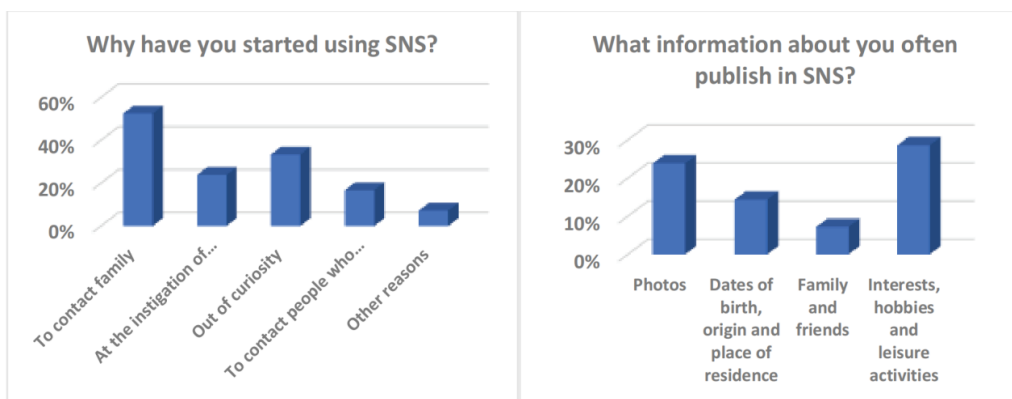


Figure 2: The starting point for considerations on the use of SNS[11]

Social engagement, the active participation of individuals in activities that promote interaction and collaboration, has become increasingly associated with social media and emerging digital technologies. Social media, in particular, has significantly impacted the social engagement of older adults. Czaja[12] claimed that using social media would reduce loneliness for those who live alone, by enhancing social support and improving overall well-being. This engagement is seen as a positive form of social contact, contributing to psychological and emotional benefits. Furthermore, research indicates that social media use can alleviate anxiety and promote relaxation. Social media also serves to overcome many of the traditional barriers to social engagement faced by older adults, including physical challenges, cognitive-related challenges, financial challenges[13]. Features such as real-time interaction, automated voice assistance, and increased Internet accessibility have created a supportive digital environment for elderly users. These technologies enable older individuals despite obstacles such as limited mobility, memory impairments, hearing loss, or the difficulties of making international call. As a result, the benefits derived from social media usage are likely to increase the adoption of other technologies designed to enhance social engagement among older adults. This trend is further supported by data showing a significant increase in Internet usage among older adults. Compared to 2023, the number of Internet users over the age of 60 has risen by 14.3% (See Figure 3) [14], illustrating the expanding role of digital platforms in fostering social interaction and engagement within this population.

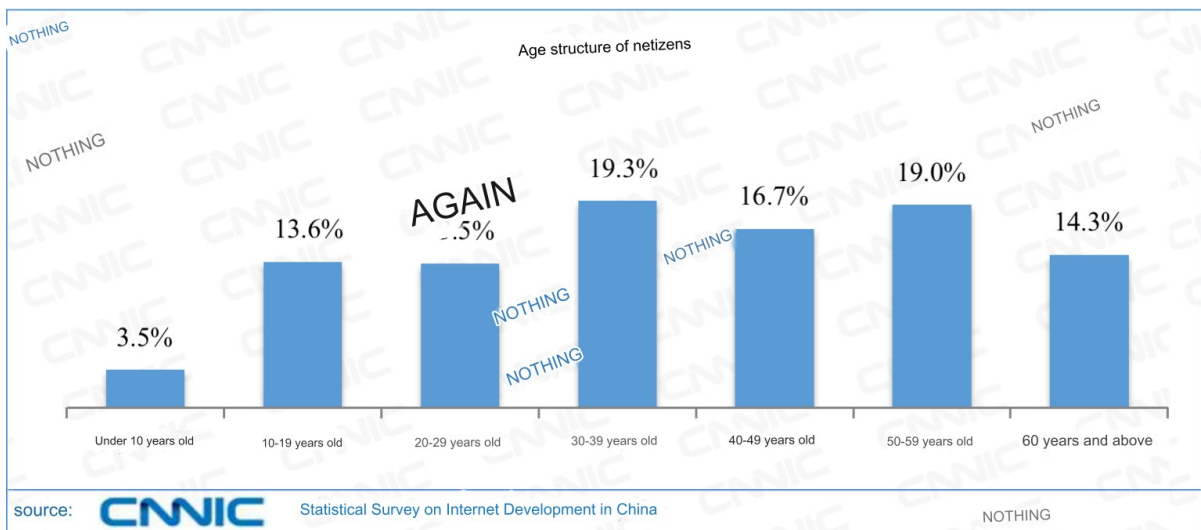


Figure 3: Age structure of Chinese netizen in 2024[14]

3.3. Health and Well-being Implications

Since the pandemic of COVID-19, the rapid digitization of public systems—exemplified by the introduction of health codes and electronic travel records has significantly enhanced societal infrastructure. Concurrently, the proliferation of health-related content on social media platforms has contributed to a growing public awareness of health issues. Social media has served as a valuable resource for disseminating high-quality health information, such as guidelines for epidemic prevention and tools for health assessments, which have the potential to encourage healthier behavior among old adults. However, despite these benefits, notable challenges remain. The elderly population faces a considerable disparity in e-health literacy compared to younger cohorts, due to differences in cultural literacy, cognitive function, socioeconomic status, and health conditions. This discrepancy exacerbates the digital divide, leaving older adults at a greater disadvantage in terms of digital engagement and access to digital engagement and access to health information.

As healthcare institutions increasingly utilize social media to deliver online services, the accessibility and convenience of these platforms have grown in prominence, positioning social media as a fundamental medium for disseminating health information in contemporary society. Social media facilitates the presentation of health information in diverse formats, catering to audiences with special needs. For example, YouTube are frequently used by the public to share health information on medications, symptoms, and diagnoses [15], and patients often leverage the platform to narrate personal health journeys, such as cancer experiences. Similarly, blogs provide tailored resources to individuals [16] and enable healthcare professionals to share expert knowledge with a wider audience.

Bandura[17] shows that biomedical interventions are not the the sole means of improving public health. Social media, as a non-medical tool, has proven highly effective in raising health awareness. It influences health behavior, providing not only greater opportunities for interaction but also making health information more accessible, shared, and personalized [16]. Additionally. social media platform have been employed to support behavior change initiatives such as smoking cessation [18] For instance, PatientsLikeMefacilitates communication between individuals with similar health conditions, enabling them to share experiences and insights [19]. Colineau and Paris [20] reported that health-related social networking sites provide a space for users to discuss sensitive issues and complex symptom with health professionals. These phenomena suggest that social media has the potential to contribute to health policy development, as medical blogs and similar platforms are increasingly referenced by mainstream media, thereby influencing public discourse on healthcare.

4. Analysis of Elderly Behavioral Changes Using TAM

4.1. PU of Social Media

The benefit of social media for the elderly span various dimensions, including technology adoption, social interaction, social engagement and health . Although old adults may face initial challenges in adopting unfamiliar technologies, the widespread availability of the internet and smartphone has facilitated a growing number of elderly adults engaging with social media. This trend reflects a willingness among the elderly to adapt to new technologies as a means of maintain social connections. Through platforms that support video calls and photo sharing, older individuals can remain in touch with family and friends, an essential factor in reducing loneliness and fostering social engagement. Moreover, research has demonstrated that high levels of social engagement among older adults are associated with documented health benefits [21], as social media enable them to overcome temporal and spatial barriers, increasing the frequency of interactions and stimulating cognitive activity, thereby enhancing well-being.

The perceived usefulness of social media for older adults presents both advantages and challenges, largely depending on how they engage with it for purposes such as information sharing, social interaction, and news consumption. The elderly are often characterized by lower levels of digital information adaptability[22]. However, if they continue to overcome these challenges and recognize social media as a beneficial tool, it could lead to significant opportunities for both society and internet industry. Their efforts not only enhance their personal lives, but also contribute to raising the overall standard of digital literacy within their communities. While there are potential drawbacks—such as exposure to electronic fraud, negative interactions, and health concerns related to prolonged screen time—the advantages of social media use for older adults generally outweigh these limitations. As the number of elderly users continuous to grow, their sustained engagement with social media fosters the formation of strong online communities among seniors, facilitating communication and peer support. Additionally, this demographic shift creates new opportunities for innovation in digital applications, encouraging companies to develop more inclusive, user-friendly designs that cater to the specific needs of older adults. In doing so, social media can help bridge the digital divide, improve

the quality of life for the elderly, and promote broader societal benefits through enhanced digital inclusion.

4.2. PEOU of Social Media

The PEOU of technology for the elderly is influenced by various of factors, including user-friendly design, health condition, social recommendations and technophobia. As the aging process leads to physical and cognitive decline—manifesting as reduced mobility, vision, hearing or manual dexterity—technology must accommodate these changes to ensure accessibility. Social applications can address these limitations by incorporating design elements such as larger text, higher contrast and simplified controls. It is intuitive and straightforward with clear instructions and simple user interface, which improves ease of use for the elderly, who may not be as agile or adaptable as young users. Additionally, social media platforms offering health-related features, such as health monitoring, wellness short videos and online medical consultations, can appeal to older adults by addressing their health concerns and further contributing to their perception ease of use.

Social influence also play a pivotal role in an old adults’ to adoption of social media platforms like WeChat and TikTok. Recommendations from family, friends, or caregivers are crucial in encouraging elderly individuals to explore and engage with these technologies. While some may initially exhibit technophobia due to limited prior exposure or experience, this barrier can often be overcome through patient guidance and the provision of a supportive learning environment. As such, positive social influence is a significant factor in improving PEOU for elderly users .

In conclusion, the ease of use of social media for older adults is shaped by a combination of health limitations, user-friendly design, social influence, and technophobia. By integrating accessible design features with strong social recommendations, social media platforms can become more user-friendly for older adults, thereby enhancing both the user experience and perceived ease of use.

5. Comparative Analysis with Other Demographic Groups

5.1. Differences in Technology Acceptance among older and younger users

The rapid advancement and continual introduction of new technologies have resulted in different age groups encountering distinct generations of technological tools. As computer pioneer Alan Kay once observed that “Technology is anything that was invented after you were born.” highlighting how one’s attitudes toward technology is significantly shaped by their generational context and age[23]. This divergence is particularly evident in the varying levels of acceptance and usage habits across age groups, especially in the context of social media platforms. (See Table 1)

Table 1: Comparison between older and younger user.

	elderly population	younger population
Technological adaptability	<ul style="list-style-type: none"> ● Spending more time on learning ● Lower PU and PEOU 	<ul style="list-style-type: none"> ● Adapting to new technologies quickly ● Higher PU and PEOU
Usage frequency and duration	<ul style="list-style-type: none"> ● Longer duration rather than frequency 	<ul style="list-style-type: none"> ● Using frequently social media in a short time
Content preferences	<ul style="list-style-type: none"> ● Nearly connect with friend and family ● Focusing on the content based on their hobbies and health. 	<ul style="list-style-type: none"> ● Information with entertainment ● Full of popular elements ● Content could rise highly interactive on social platform

Table 1: (continued).

<p>Security and Privacy awareness</p>	<ul style="list-style-type: none"> ● Less understanding of internet security ● Encountering telecommunication fraud popularly ● Susceptibility about online scams and misinformation 	<ul style="list-style-type: none"> ● High vigilance ● Paying attention to privacy ● Stronger ability of information resolution ● Education in fraud prevention
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Addressing this digital divide necessitates a coordinated effort from multiple sectors of society. It is essential to provide targeted attention and educational support that caters to the digital needs of older adults, ensuring that they can effectively engage with and benefit from evolving technologies.

6. Challenges and Opportunities in Promoting Social Media to the Elderly

6.1. Overcoming Barriers to Adoption

Researcher [24] indicates that a significant portion of the adult population remains inadequately equipped with the digital skills necessary to adopt new technologies, contributing to the emergence of technophobia—a fear of technology—as a potential new risk factor. This phenomenon not only impacts the long-term quality of life for older adults but also fosters a state of anxious aging, which becomes a barrier to the acceptance and integration of new technologies. The primary source of this anxiety stems from limited proficiency in managing digital tools and technologies, leading older individuals to feel insecure in navigating digital environments. As a result, they often develop a dependence behavior on a range of health and daily living innovations. Thus, addressing technophobia and fostering digital confidence are essential strategies for reducing anxiety among the elderly population.

User-friendly design plays a crucial role in meeting the specific needs of older adults, enhancing both accessibility and usability. The elderly faces numerous intrinsic, extrinsic, and structural barriers when they engaging with social media, and studies[25] have shown that these obstacles can significantly hinder their continued use of these platforms. To address these challenges, social media platforms have incorporated various accessibility features, such as text-to-speech functionality for visually impaired users and simplified interfaces for individuals with motor impairments, making the platforms more inclusive for the elderly [26]. However, despite these advances in user-friendly design, digital barriers still persist for senior users. It is crucial to pay closer attention to these challenges, integrating users' feedback and requirements to further improve accessibility and ensure a more seamless digital experience for the elderly.

6.2. Opportunities for Enhancing Elderly Engagement

Elderly individuals exhibit distinct preferences in their use of social media, which are shaped by their life experiences, personal interests, and the benefits they seek from online engagement. It is indicated that older adults tend to prioritize content related to national and global news, gardening, traveling, wellness and educational content that caters to their curiosity and desire for new information. Based on these preference, social media platforms, utilizing big data analysis, can tailor content to elderly audience, offering personalized and highly relevant information that aligns with their specific interests.

With the increasing prevalence of the internet, social media has evolved into a valuable platform for both education and information dissemination, particularly in areas such as health and life skills.

Since the COVID-19 pandemic, social media has served a key channel for sharing essential health information, including health tips, medical advice, and discussion on public health, significantly contributing to heightened health awareness among users. Moreover, its educational function is evident in its capacity to spread knowledge and promote health literacy. However, a study [27] revealed that elderly social media users are particularly vulnerable to misinformation, often struggling to distinguish between legitimate information and misleading content, especially when presented with sensational headlines or deceptive marketing. This presents challenges such as the "infodemic," where misinformation spreads rapidly during crises like the pandemic. To mitigate these risks, it is recommended that comprehensive information monitoring system be established to filter and ensure the dissemination of accurate information to the general users.

Social media also serves as a bridges between generations, facilitating the exchange of experiences and perspectives between younger and older users. It allows the elderly to maintain connections with family and friends, regardless of geographical distance, thereby reducing feeling of isolation and enhancing social participation. By enabling the sharing of diverse content, such as short video, live-broadcasting and trending topic, social media can challenge and break down age-related stereotypes and biases. Furthermore, it fosters intergenerational interaction, by encouraging open dialogue and mutual respect for different viewpoints. With increased support for elderly users, social media holds the potential to further promote cross-generational engagement and reduce the digital divide between digital natives and older populations, ultimately fostering greater social cohesion.

7. Conclusion

TAM provides a suitable framework for analyzing behavioral changes among the elderly in their use of social media in present study, particularly in relation to PU and PEOU. Findings suggest that patterns of consumption, social interaction, and the implications for health and well-being significantly influence both PU and PEOU, thereby contributing to the adoption of social media by older adults. However, this study does not extend to an analysis of other TAM factors, such as Behavioral Intention (BI), which future research could further expand in it.

Comparative analysis within the present study indicates substantial differences between older and younger generations in terms of social media usage duration, content preferences, and security awareness. These disparities can largely be attributed to cognitive differences associated with age. Prior research has demonstrated that older individuals with younger cognitive ages prefer to adopt new technologies, possibly due to their desire to connect with younger people, who tend to integrate intelligent technologies into their daily lives. Consequently, future research should consider the distinctions between chronological and cognitive age to provide deeper insights into technology adoption behavior among the elderly.

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