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Research and Analysis of Smart Home Products Based on the Emotional Needs of Generation Z Living Alone

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Abstract: With the rapid transformation of China's economic structure, the concentration of industrial resources, and the widespread access to education, the young Generation Z has undergone a conceptual "metamorphosis," flocking to first- and second-tier cities, resulting in a phenomenon of living alone. In a sense, these individuals drive social development through their own efforts; however, their collective psychological characteristics often clash with the heterogeneous and transient environment in which they reside. The issue of unmet emotional needs stemming from their solitude is becoming increasingly pronounced. This paper examines the living conditions and consumption characteristics of Generation Z living alone and, from the perspective of their emotional needs, explores their preferences and demands in the application of smart home products. The goal is to provide meaningful insights for improving the quality of life for young urban dwellers living alone and to contribute to the research and development direction of smart home product design.

Keywords: Generation Z, Young People Living Alone, Emotional Needs, Smart Home Products.

1. Introduction

With the rapid economic development and profound social changes of the 21st century, we have witnessed Generation Z gradually becoming a new driving force in society. Particularly in China, with the transformation of the economic structure and the acceleration of urbanization, more and more young individuals from Generation Z are seeking greater opportunities for development and personal growth. However, this phenomenon of living alone has led to a series of social and psychological issues, particularly the lack of emotional fulfillment.

This paper aims to explore the emotional needs of Generation Z living alone. Understanding these emotional needs is not only crucial for improving their quality of life but also holds significant importance for the research on the design and development direction of smart home products.

First, the paper reviews the current research on Generation Z living alone, including their living situations, consumption characteristics, and psychological traits. It then analyzes the current research and development trends in smart home products, exploring the application of user-centered design concepts, environmentally friendly design principles, and standardized design approaches in smart home products. Finally, the paper will combine the needs of Generation Z living alone in various life

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scenarios to propose development directions for smart home products and provide a future outlook on smart home living.

Through this study, we hope to provide valuable insights for the smart home industry while creating a warmer, more intelligent, and safer living environment for Generation Z individuals living alone.

2. Current Research on Generation Z Youth Living Alone

2.1. Exploration and Analysis of the Phenomenon of Generation Z Living Alone

The continuous advancement of information technology has significantly energized Generation Z, with social media becoming their primary platform for expressing individuality and personality. Their living environment is no longer limited to basic functionality but has become a space to showcase personal style. Currently, many Generation Z youth are in the early stages of their careers, and their daily lives often involve working late into the night, immersing themselves in home-centered cultures, and enjoying the convenience of the "lazy economy." One of the challenges they face is efficiently managing daily household chores. After profiling Generation Z through relevant media and research institutions, it has been revealed that their main consumer characteristics include a willingness to try new things, a focus on aesthetics, and an emphasis on experience and data.

2.2. Consumption Characteristics and Habits of Generation Z Youth Living Alone

The "single economy," an emerging consumption model, is gradually becoming a focal point in the market. As more single individuals pursue personalized and independent lifestyles, astute businesses have recognized the immense potential behind this trend. They have begun focusing on developing and offering products and services tailored to the specific needs of single people, sparking a commercial wave under the banner of "lonely consumption." These businesses, through a deep understanding of the living conditions and consumer psychology of single consumers, have launched a range of customized solutions. From personalized home goods to convenient food delivery services, from online entertainment platforms to tailored travel experiences, every service is designed to meet the demand of single individuals for a high-quality lifestyle. Moreover, businesses actively engage with consumers through social media and online platforms, establishing emotional connections between brands and consumers, further driving the popularity of "lonely consumption." The continuous development of the "single economy" not only changes traditional consumption patterns but also brings new growth opportunities for businesses. This phenomenon reflects shifts in social structure and consumer values, indicating that future markets will increasingly focus on personalized and customized services. By continuously innovating and optimizing products, businesses can not only meet the needs of single consumers but also secure a place in the highly competitive market.

2.3. Psychological Characteristics and Needs of Generation Z Youth Living Alone

Compared to general perceptions, young individuals living alone tend to have higher educational backgrounds and pay more attention to personal development than their peers.

(1) Need for Emotional Connection and Belonging – The Desire for Community:

Due to practical limitations such as personal income, workplace location, and family circumstances, most single youth have either actively or passively chosen to live alone. However, this does not imply they reject collective living [1]. The frequent movement of urban populations, the long-term non-traditional lifestyles of young people, and the challenges of love and marriage under the pressures of material needs and time constraints all contribute to an increased sense of loneliness among single youth, heightening their desire to integrate into society.

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(2) Focus on Self-Construction:

Young people living alone are generally highly educated and place a strong emphasis on self-construction. The rise of social media has created more opportunities for interaction between individuals and groups. In the absence of family life and faced with the solitude of big cities, many young people increasingly participate in social media to form their own communities in areas they are passionate about.

3. Current Research and Development Trends in Smart Home Products

3.1. Current Research on Smart Home Products

Smart home systems represent a highly intelligent residential solution that leverages advanced technologies to provide users with a convenient, comfortable, safe, and environmentally friendly living experience. The interactive features of smart homes cover all aspects of daily life, including clothing, food, housing, and travel, significantly reducing the burden of mundane tasks, allowing people to enjoy a more relaxed and carefree lifestyle. According to research, from a global perspective, the smart home market was projected to grow at an average annual rate of 14% from 2016 to 2022, reaching an estimated value of $122 billion by 2022. The United States remains the leading indicator for industry development, with the smart home market size reaching $9.7 billion in 2016, approximately 77 billion yuan [2]. The smart home industry in China still holds vast potential for growth.

3.2. Development Trends in Smart Home Products

As technology advances, the integration of smart technology into homes will deepen, evolving from simple automation and passive responses toward more proactive and harmless solutions. Smart home products will acquire the capability of autonomous learning, enabling them to automatically analyze various scenarios in the household and respond promptly. They will adapt to the user's behavioral patterns and preferences, optimizing and updating functions to better meet the user's needs. These products will thoroughly understand user requirements and actively offer personalized smart home services. This not only revolutionizes traditional lifestyles but also greatly enhances convenience and comfort in daily living.

Moreover, the widespread adoption of smart homes will bring environmental benefits by optimizing energy use and reducing waste, contributing to the goal of sustainable development. As technology continues to advance, smart homes are poised to become an integral part of daily life, making living environments smarter, more convenient, and greener.

3.2.1. User-Centered Design Concept

User-centered design goes beyond the appearance, functionality, and materials of a product, deeply addressing both the physical and psychological needs of users. Modern designers must thoroughly understand the requirements of different user groups, taking into account ergonomics and behavioral science to create smart products suitable for home use. Additionally, designers should focus on the psychological characteristics and cognitive patterns of users across different age groups, optimizing existing products to accommodate diverse lifestyles and behavioral habits.

3.2.2. Environmentally Friendly Design Concept

When selecting materials, priority should be given to renewable and environmentally friendly options to promote sustainable development. As new technologies continually emerge, there is often a blind pursuit of the latest innovations, which can lead to resource waste. Designers should aim to improve

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product durability, allowing users to download updates to upgrade the product, while ensuring that energy efficiency remains a key feature. This will help drive the ongoing development of smart homes in a sustainable manner.

3.2.3. Standardized Design Concept

Standardized design is generally applied to products with high market demand and promising prospects [3]. This design approach not only ensures product quality but also reduces redundant work, accelerates design processes, and facilitates the application and promotion of new technologies. While there are currently numerous types of smart home products on the market, the lack of standardization among protocols from different companies often limits users to operating specific products with designated control systems. Looking ahead, the development of smart homes is expected to move toward protocol standardization, where users can control all smart home devices through a single app, establishing a unified, industry-wide standard.

4. Needs of "Generation Z" Young Adults Living Alone for Smart Home Products in Different Living Scenarios

4.1. Depictions of Different Usage Scenarios: Bedroom/Living Room/Kitchen

Bedroom Scene Depiction:

First, lying in bed late at night, scrolling through the phone, habitually staying up until two or three in the morning. Feeling regretful about the irregular sleep schedule with no one to remind them, indulging in late-night thoughts, becoming anxious as they start reflecting on life ("emo" moments), while listening to melancholic music. As they finally decide to sleep, they struggle to do so due to issues with lighting, noise, or safety concerns.

Second, due to the pandemic, they are forced to work from home. They wish to work from bed but find it uncomfortable, and tools like lap desks don't provide a good experience. Eventually, they end up working at the desk, but the sight of an untidy desk and floor demotivates them from tidying up.

Living Room Scene Depiction:

Lying on the sofa, resting, scrolling through the phone, playing games, or watching TV. Feeling both bored and lonely at times, with no one to talk to or play with. Glancing at the table cluttered with trash and takeaway boxes, they feel irritated but are too lazy to clean up.

Kitchen Scene Depiction:

First, after the takeaway arrives, they hope to disinfect it first, and then have it delivered directly to the dining room so they can eat immediately. They open a video platform, searching for a TV show, but can't decide on one. By the time they find something to watch, the food has already been sitting for a while. After eating, they leave the trash aside, too lazy to throw it away, wishing it could be automatically delivered to the door for disposal.

Second, when they don't feel like eating takeaway, they find some pre-made meals at home, realizing they can prepare them quickly. They fire up the rarely used stove to cook a meal that satisfies their hunger in a short time.

4.2. Attitudes of "Generation Z" Young Adults Living Alone Towards Smart Home Products

The generational characteristics of Generation Z will become more apparent, with socio-economic changes being the decisive factor in shaping their values and behavioral patterns. The main issues Generation Z faces when using smart home products include:

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A lack of intelligence—despite the rapid spread of internet access and smartphone usage, making connectivity easier, faster, and more affordable, many smart home products still fail to meet expectations for intelligence. As the functionalities of smart home products increase, the complexity of operating them also rises. Even though Generation Z grew up with the internet, they sometimes find smart home products inconvenient to use. In some cases, the products prioritize advanced intelligence at the expense of operational ease.

5. Conclusion and Future Outlook

5.1. Research Summary

In response to the increasing number of young adults living alone in first- and second-tier cities, this study first summarizes the characteristics of this group, identifies their specific needs, and analyzes the reasons behind this phenomenon.

From a design perspective, using questionnaires and an analysis of the living conditions of young adults living alone, the article investigates their personality traits and housing status [4]. The study identifies the key pain points in the demand for smart home products among Generation Z young adults living alone.

Through in-depth interviews with this demographic, the research further clarifies the composition of young adults living alone. Based on their needs, the study concludes that this group requires products that not only meet their household and social needs but also offer ease of use, durability, real-time communication, operational convenience, personalized experience, and systematic design.

5.2. Future Directions for Home Product Development

5.2.1. AI Multi-scene Switching Centered Around Lifestyle

Future smart homes will increasingly align with users' lifestyles, shifting from basic single-function systems controlled by users to AI-driven living scenarios. The diverse living modes of different households will be a key factor in smart home setups. By learning from users' lifestyles, smart systems will manage tasks like switching appliances on and off and adjusting control parameters. Most homes have relatively fixed usage patterns for their appliances. AI learning can center on a particular lifestyle scene, fine-tuning and adapting to switch between scenarios based on users' needs, thus anticipating and preparing for those needs in advance.

5.2.2. Establishing Smart Trust: From Strong to Subtle Sensory Interaction

Users can perceive the intelligence of smart homes and the smart nature of their lifestyles, which stems from their trust in smart automation, allowing them to relax and fulfill corresponding functions. This trust is established through a process of human-computer interaction that shifts from strong to weak. In the initial stage, when users operate smart homes, the system needs to provide clear feedback to users' commands, incorporating multi-sensory interactions such as visual, auditory, and tactile responses. The ideal state is for the smart home to sense the user's lifestyle without needing to make adjustments to its changes. This results in a silent interactive state that subtly influences users; such a silent state represents a form of weak sensory interaction that does not generate strong feedback for the users.

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5.2.3. Unified Control: Interconnection of Smart Home Systems

With the development of technology, smart home interaction platform systems will possess increasingly powerful compatibility, integrating more technologies and allowing more smart home manufacturers to connect to the smart home interaction platform.

The goal is to build a unified interaction platform system for smart homes, enabling products from various manufacturers to operate independently while also functioning within the interaction platform system. This is akin to a universal remote control, which can both use the original remote to operate appliances and also be programmed to control those appliances. This integration will ensure that smart home products truly come together to meet the current demands of end consumers for smart home solutions.

5.2.4. Ensuring Physical and Psychological Safety with Smart Homes

Improving software stability, increasing the accuracy of voice recognition, and establishing stricter "Three Laws of Robotics" for AI, including robots with some degree of autonomy, will help eliminate the risk of accidental or intentional harm to users by smart home products [5].

The design must include the principle of "I can control it," incorporating something akin to a "highest emergency clause" that allows users to fully take over the system in emergencies, even if it means sacrificing some cost-effectiveness and convenience to provide supporting measures for this feature.

References

[1] *Li, W., & Fan, R. (2021). A study on kitchen product service design for young adults living alone. Design, 34(14), 127-129.*

[2] *Xiong, X., Li, R., & Bai, H. (2021). The current status and development trends of the smart furniture industry in China. Journal of Forestry Engineering, 6(01), 21-28. https://doi.org/10.13360/j.issn.2096-1359.202003002*

[3] *Gu, T., Wang, W., & Chen, X. (2021). Exploration of development trends in smart home products under the background of the Internet of Things. Furniture & Interior Decoration, (02), 27-29. https://doi.org/10.16771/j.cn43-1247/ts.2021.02.009*

[4] *Cai, F. (2022). Research on the prospects of the pet economy based on young adults living alone. China Business Theory, (19), 79-81. https://doi.org/10.19699/j.cnki.issn2096-0298.2022.19.079*

[5] *Dong, B., & Liang, J. (2019). Development outlook for the safety performance of smart homes. Smart City, 5(07), 31-32. https://doi.org/10.19301/j.cnki.zncs.2019.07.016*