Original Research Article

# Home health monitoring system for the elderly based on the Internet of Things: Research on marketing strategy

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***Abstract:*** As global aging intensifies, the demand for health management and safety monitoring of the elderly has surged, particularly in China. Internet of Things (IoT) technology offers technical support to address the issue of home care for the elderly through real-time monitoring, data analysis, and intelligent early warning. This paper will integrate marketing theory to explore how to combine IoT technology with the marketization of elderly health monitoring products, analyze changes in industry demand, competition patterns, and policy orientations, and propose a feasible path for the coordinated development of technological optimization and marketing strategies.

***Keywords:*** Aging population; Health monitoring system; Marketing strategy; Smart elderly care

## 1. Introduction

Population aging has become a global issue, and for China, pensions are a significant concern. According to the latest statistics, by the end of 2023, the population aged 60 or above will have reached 297 million, constituting 21.1% of the total population. This indicates that China's aging process is accelerating. As early as the "Twelfth Five-Year Plan" in 2011, the Ministry of Civil Affairs explicitly proposed the "9073" pension model (meaning 90% of the elderly depend on home care, 7% on community care, and 3% on institutional care). [1] Relevant research indicates that the development of home care services in China is relatively slow, and health risks continue to rise in the context of home-based care. Often, the elderly's children are not present, making it difficult to provide adequate support and assistance to the elderly. Faced with such challenges, the traditional healthcare model has struggled to meet the increasing needs of the elderly for home health care. At this juncture, the Internet of Things health detection system has emerged.

The IoT health detection system achieves real-time collection and analysis of vital signs and environmental parameters of the elderly via a multi-tiered architecture, which includes the application layer, network layer, and perception layer.[2]). Driven by relevant policies of China's "Healthy China 2030" and "Silver Economy" policies[3], the market potential is becoming increasingly profound. Against the backdrop of broad market prospects, relevant marketing strategies must keep pace with the times. This paper will combine a series of marketing strategies with the design of the Internet of Things health monitoring system to explore a feasible path based on consumer demand and achieve commercial success.

## 2. Brief descriptions of internet of things health monitoring system

### 2.1. Perception layer: Data acquisition and front-end perception

Responsible for collecting the physiological data of the elderly and environmental information in real time. It realizes the preliminary data screening and preprocessing through embedded sensors and edge computing technology.

### 2.2. Network layer: Data transmission and communication guarantee

Responsible for securely and stably transmitting the data from the perception layer to the cloud or local server. It is necessary to take into account low latency, high reliability, and the network coverage area.

### 2.3. Application layer: Data analysis and user interaction

Through the cloud platform and terminal applications, it realizes in-depth data analysis, health management, and emergency response, and needs to support the collaboration of multiple roles (users, family members, and medical staff).

## 3. The application of marketing theory in iot health monitoring products

### 3.1. STP strategy: Market segmentation and positioning

#### 3.1.1. Market segmentation

1) Segmented according to user needs:

This group of elderly individuals living alone deserves particular attention, with a focus on functions such as fall detection, emergency calls, and abnormal behavior recognition. In the current environment of rapid economic development, children, as guardians of the elderly, face their own work pressures and a fast-paced lifestyle, which limits their energy to care for the elderly in every aspect.[4] With the assistance of smart wristbands, mattress sensors, and other intelligent devices, the elderly can be monitored in real-time, and their activity statuses can be tracked. Should they fall or remain stationary for an extended period, the system will automatically trigger an alarm and notify family members or emergency centers for prompt emergency treatment. The postoperative rehabilitation group also requires monitoring of their postoperative health data and access to rehabilitation guidance services.

2) Divided according to the ability to pay:

Inclusive basic monitoring: This service is aimed at the majority of ordinary income earners, offering them basic monitoring functions to lower the barrier to access. Affordable smart wristbands or fundamental health management platforms can satisfy the requirements for daily health monitoring. The home care health monitoring and management system not only provides real-time tracking of the vital signs of the elderly at home but also offers health and disease prediction services. This enhances the level of self-health management and the quality of life for the elderly at home.[5]

### 3.2. P marketing mix strategy

#### 3.2.1. Product strategy

1) Core Products,

In terms of hardware equipment, with the help of smart bracelets, mattress sensors, smart sphygmomanometer and other smart devices, the user's health data is collected in real time, and then customized accurate analysis is carried out. The smart wristband can monitor the user's heart rate, blood oxygen and sleep quality, while the mattress sensor can detect the user's breathing rate and physical activity.

In terms of software services, The platform can generate weekly or monthly reports according to the historical health data collected by users, give personalized health suggestions, and then make an annual summary.

2) Value-added services:

Family doctors carry out online consultation, which can provide users with professional health consultation

and diagnosis and treatment suggestions. The contracted service of family doctors can improve the coordination of diagnosis and treatment of home-based elderly care, and help stabilize their various physiological indicators. Moreover, as a new community service method, family doctors' participation in the medical and health services of home-based elderly care can largely meet the medical needs of the elderly[6].

### 3.2.2. Price strategy

1) Penetration pricing: Basic devices enter the market at a low price, attract users to subscribe to a data service (SaaS), and rely on subsequent service fees to realize the value. For example, smart wristbands are sold at cost, and users have to pay a monthly subscription to a health management platform.

2) Value-based pricing: The high-end version incorporates AI diagnostic functions and is priced 20 to 30 percent higher than the industry average to highlight the technical advantages and value of the service. For example, the high-end health monitoring system, which offers AI-assisted diagnosis and personalized health management solutions, is priced high, but users recognize its value.

### 3.2.3. Channel strategy

Online channels: E-commerce platforms such as Jingdong Health and Tmall Medical can increase product exposure by virtue of their own traffic advantages. Offline channels: Cooperate with medical institutions and nursing homes: enhance user trust through experiential marketing (such as equipment use, health lectures, etc.). For example, experience areas can be set up in nursing homes so that elderly people can experience the functions of health monitoring devices.

### 3.2.4. Promotion strategy

Content marketing: Make short popular science videos for elderly health, and spread them through platforms such as Douyin and wechat to enhance brand influence. For example, make short videos such as "fall prevention methods for the elderly" and "Tips for daily management of chronic diseases", in order to attract the attention of target users.

In terms of word-of-mouth marketing: launch a user recommendation reward program to encourage families to make multi-device purchases and expand market coverage with the help of user word-of-mouth.

## 4. Industry competition landscape

China's Internet of Things health monitoring market has now presented a three-dimensional structure of alienated competition, in this market pattern, different types of enterprises with their own unique advantages in the competition to occupy a place. Yuyue Medical as a typical representative of the traditional medical device manufacturers. Over the years, Yuyue Medical has accumulated a large amount of clinical data by virtue of its in-depth work in the medical field and become its important competitive advantage[7]. Among the products of multi-parameter vital signs monitoring instruments, the number of its products certified by CFDA is 37% higher than that of scientific and technological enterprises[8]. It fully shows the profound accumulation and professional ability of medical device research and development and certification of traditional medical device manufacturers. Tech giants Huawei and Xiaomi have taken a different path. Huawei developed an advanced fall warning algorithm with Centeng AI chips, relying on Huawei's strong technical strength in chip research and development and artificial intelligence. The delay of the algorithm is successfully compressed to 0.5 seconds [9]. This excellent performance not only reflects Huawei's innovation ability in technology research and development, but also provides strong support for intelligent application health monitoring products. Through the fast algorithm response, the safety and practicality of the product can be improved, and abnormal conditions such as user falls

can be warned in a more timely manner.

Emerging companies, such as Chongqing Sessengel Technology, focus on the niche of edge computing devices. In terms of technology research and development, it has shown strong innovation ability. Its self-developed ECG-SJ01 chip has made significant breakthroughs in power consumption control, which is 42% lower than the industry average [10]. In the context of the increasing requirements of Internet of Things devices for battery life and energy efficiency, The research and development results of low-power chips make Sessengel's products have a unique competitiveness in the market. It can meet the needs of users who need to use their devices for a long time without frequent charging, while reducing the operating costs and environmental impact of the devices. This difference between different types of enterprises in terms of competitive advantages and building competitive barriers leads to the standard difference of market share of Top 10 enterprises in 2024 reaching 19.7[11]. This standard difference reflects the dynamic balance of market concentration and innovation vitality.

## 5. Empirical research: the market expansion path of Shilongshan Technology

### 5.1. Construction of enterprise innovation ecosystem

Shilongshan Technology has actively responded to the national pension policy and embedded its own business in the construction plan of "15-minute pension service circle". In 127 communities in Chongqing, the company has carried out a three-in-one promotion activity of "equipment experience, health assessment and subsidy application". Through close cooperation with the Health and Health Commission, the use of the special fund subsidies of the health and Health Commission effectively reduced the terminal price of the equipment, from the original 1,680 yuan to 598 yuan, with the subsidy ratio reaching 64.5 percent. This substantial reduction in price has enabled more elderly people to afford the smart elderly care equipment, which has greatly improved the market accessibility of the product. This kind of government-enterprise coordinated promotion model not only expands the market share for enterprises, but also provides more convenient and efficient elderly care services for the elderly, achieving a win-win situation for enterprise development and social welfare.

### 5.2. Commercial effect and industry enlightenment

For the industry, the successful experience of Shilongshan Technology offers significant insights: Firstly, government subsidies should concentrate on supporting innovative functional modules with clinical value. Secondly, the integration of insurance products can effectively mitigate the elderly's price sensitivity. By combining insurance with equipment, while diminishing the focus on equipment prices, it provides more comprehensive security for the elderly and boosts product sales. Lastly, the crucial method to enhance user loyalty is through asset-based physical sign data. By analyzing and applying a vast amount of physical sign data, Shilongshan Technology not only increases the company's revenue but also enhances users' brand dependency and trust, developing valuable services. Companies within the industry should focus on the collection, storage, analysis, and application of data.[12]

From the two aspects of technology integration and marketing strategy, this study systematically explores the development path of home health monitoring and emergency warning system for the elderly under the background of the Internet of Things. The research shows that the Internet of Things technology is a key driving force for smart elderly care, and with the help of modular design and algorithm optimization, the reliability of the system will be significantly improved. Marketing needs to focus on the pain points of users and use policy resources to create a competitive strategy of business alienation. The system monitors the physical signs of the

elderly data, on the one hand, these data are transmitted to the server in real time, so that the elderly themselves or their guardians can view the specific numerical information of the physical signs at any time; On the other hand, the system also has a data storage function, so that doctors can give more reasonable medical prescriptions based on the recent physical signs data of patients with chronic diseases[13].

In the future, in terms of technology, 5G and edge computing need to be explored for real-time monitoring. On the market side, we can develop cross-border pension market to tap the needs of aging countries in Southeast Asia. Driven by technological innovation and market expansion, the smart elderly care industry will have a broader space for development, which can provide strong support to meet the challenges of global aging.

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