

# Sales Channel and Sales Strategy Management Based on New Intelligent Wardrobe Design

<sup>1,a</sup>Yuanyuan Wei, <sup>2,b</sup>Siyu Chen, <sup>3,c</sup>Sihan Yang, <sup>4,d</sup>Chenyu Ma, <sup>5,e</sup>Yulan Li, <sup>6,f</sup>Ying Zhang

<sup>a</sup>3084732325@qq.com, <sup>b</sup>427809385@qq.com, <sup>c</sup>2134561715@qq.com,  
<sup>d</sup>1757595700@qq.com, <sup>e</sup>2182559478@qq.com, <sup>f</sup>zhangying@qq.com

<sup>1,2,5</sup>Gingko College of Hospitality Management, No. 60, North Section 2, Square Road, Hongguang Street, Pidu District, Chengdu, Chengdu 611730, China

<sup>3</sup>University of Electronic Science and Technology of China, Chengdu Chenghua District Jianshe North Road Section 2, Chengdu 10614, China

<sup>4</sup>Hebei University of Science and Technology, No. 26, Yuxiang Street, Yuhua District, Shijiazhuang City, Hebei Province, Shijiazhuang 050018, China

<sup>6</sup>China Agricultural University, No. 2006, Binhai Middle Road, Laishan District, Yantai City, Shandong Province, Yantai 10019, China

**Abstract-** With the advancement of technology and the increase in people's demand for convenient life, smart home products are becoming an indispensable part of consumers' daily lives. The intelligent wardrobe introduced in this paper has several intelligent functions. It can not only determine the warmth of the clothes by connecting the weight sensor, help users make more appropriate clothing choices, but also obtain real-time weather information and support voice broadcast function. Users can understand the weather conditions of the day through the smart wardrobe and get targeted clothing advice. Whether it is cloudy, rainy or cold winter, the smart wardrobe can provide the most suitable clothing recommendation according to the weather conditions, so that users can stay comfortable and fashionable. The smart wardrobe also applies deep learning models for clothing recognition, which can automatically manage the user's clothing. It can identify different kinds of clothing and classify and organize according to the user's preference and style, to facilitate the user to find the desired clothing. When selling a smart wardrobe, it is important to understand the needs and preferences of your target market. This can help manufacturers customize product features and design and provide precise marketing strategies. Building diverse online and offline sales channels is also key to reach a wider range of consumers and increase awareness and sales. At the same time, formulating appropriate sales strategies includes flexible and effective pricing, promotion and channel promotion, which can attract the attention of consumers and improve the competitiveness and sales of products.

**Keywords:** intelligent wardrobe sales, clothing management, deep learning model, Channel promotion, Clothing identification

## 1 Introduction

### 1.1 Project Background

The global smart wardrobe market is developing rapidly and shows a broad prospect. With the continuous improvement of people's demand for convenience, fashion and efficient life, smart

wardrobe, as an important part of the field of smart home, has become an industry that has attracted much attention. According to market research reports, the smart wardrobe market has achieved significant growth in the past few years and is expected to continue its steady growth trend in the coming years. The popularity and acceptance of the smart home concept has led to a rapid increase in consumer demand for smart wardrobes. At the same time, the enhancement of environmental protection and energy conservation awareness has also become an important factor driving market demand.

## **1.2 Domestic and foreign analysis**

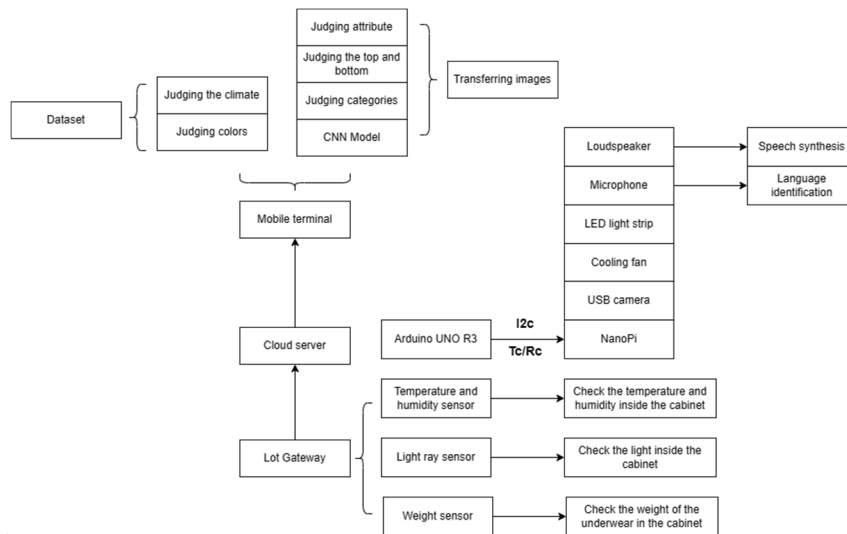
The global smart wardrobe market is growing rapidly, especially in North America, Europe, and Asia Pacific. The market growth in the Asia-Pacific region is even more significant and is expected to continue to grow at a high rate in the coming years. China's rapid economic development has led to increasing consumer demand for quality and comfort. Personalized and intelligent products and services are concerned by consumers, and intelligent wardrobe is one of the emerging products to meet this demand. The young generation has become the main consumer group. They pursue a fashionable, convenient and intelligent lifestyle, and the intelligent wardrobe is in line with their consumption concept. With the increase of urbanization and real estate development, the living space is limited, and people are more and more interested in the space-saving function of smart wardrobe.

## **2 method**

### **2.1 Implementation of wardrobe technology**

#### **2.1.1 Technical implementation**

As shown in Figure 1, the intelligent wardrobe system uses multiple sensors to monitor the internal environment of the wardrobe in real time, including parameters such as light intensity, temperature and humidity, and clothing weight [1]. According to the monitored data, the system can automatically adjust the internal lighting, temperature, humidity and environment of the wardrobe to ensure that the clothes are in the best condition. The smart wardrobe system uses weight sensors to identify the warmth level of clothing and provides users with recommendations for clothing selection with appropriate seasons and temperatures. Through the connection with the cloud server, the system can obtain real-time weather information, combine the clothing information in the wardrobe, and provide special functions such as clothing index recommendation and clothing planning for business trips. Users can remotely access the intelligent wardrobe system through mobile devices, monitor and control the sensor switches, and support the voice broadcast function. Users can operate the intelligent wardrobe through voice commands.



**Figure 1.** Wardrobe technology implementation

### 2.1.2 Hardware Settings

Intelligent wardrobe adopts a series of intelligent hardware design of light sensor, temperature and humidity sensor and weight sensor, which can ensure that there is enough light in the wardrobe for users to take clothes, monitor the temperature and humidity in the wardrobe in real time, and start the cooling and cooling equipment or drying equipment according to the preset value to maintain the comfortable and dry state of clothes [2]. The weight sensor can identify the weight of different clothes and provide the user with information about how warm the clothes are. The whole system is connected to the cloud server through the iot gateway, and users can use mobile terminals for remote control and monitoring. The hardware composition includes Arduino UNO R3, NanoPi, and a server to store deep learning models. Arduino UNO R3 is responsible for the internal management of the wardrobe and linkage control with external devices such as cameras, microphones and speakers through NanoPi. The system can realize unmanned monitoring of the whole process, so that users can enjoy the convenience of full automation [3]. This intelligent hardware provides a solid foundation for the efficient operation of the intelligent wardrobe system.

### 2.1.3 Software Settings

The smart wardrobe system connects to the cloud server through the iot gateway, and users can remotely control and monitor it through mobile terminals. The system uses CNN algorithm to identify clothing types, colors and images, and uses Baidu AI to realize the conversion between voice and text. Weather information acquisition and query functions are realized through the access network, and voice broadcast is supported [4]. The system uses MQTT protocol to provide interaction with mobile devices, so that the iot hardware device monitoring can complete the operation on the mobile terminal through the protocol. The system also establishes a clothing database, which is used in the clothing management system for user inquiries. In the Internet weather query function, the TTS engine of IFlytek is used for voice broadcast, and

according to the obtained weather conditions and clothing selection frequency, the system design algorithm is used for analysis, and clothing recommendations for dressing and business travel are given [5]. The intelligent wardrobe system performs remote data transmission and remote control through MQTT protocol. Users can view the information in the wardrobe through the mobile terminal and realize the operation of controlling various sensor switches in the wardrobe.

#### 2.1.4 Key technologies

Image matching technique: The image matching technique is implemented using Convolutional Neural Network (CNN), which uses convolution and pooling operations to extract features and reduce the dimension of the input image[5]. Through multi-layer convolution and activation function processing, CNN can extract complex features of the input image, and reduce the dimension of the feature map and retain key information through pooling operation. Finally, the features were classified or regressed through the fully connected layer to complete the matching task. In image matching, CNN can extract image features and compare the feature vectors of different images to complete the matching [7]. The convolutional neural network is shown in Figure 2:

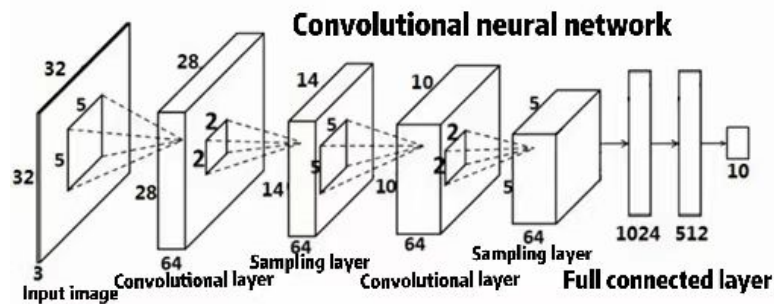


Figure 2. Convolutional Neural network

## 2.2 Product marketing methods

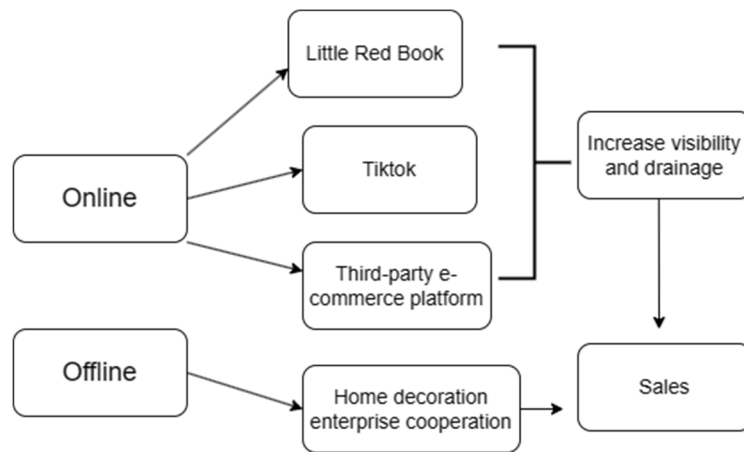
### 2.2.1 Market Positioning

Through market research and analysis, the target market of smart wardrobe is determined, and it is positioned as high-end household products to meet the demand of consumers who pursue quality and sense of science and technology. At the same time, we pay close attention to the characteristics and pricing strategies of competitive products, formulate differentiated market positioning strategies, and highlight the unique selling point of intelligent wardrobe that adjusts storage space intellectually according to user habits and seasonal changes.

### 2.2.2 Channel management

In order to promote the sales of smart wardrobe, this paper draws on the online and offline combination mode of Liangpin shop[8] and carries out precise e-commerce promotion of users through live broadcasting and short videos on social media platforms such as TikTok and Kuaishou. At the same time, it optimizes the service of physical stores, provides technical support such as product upgrading and maintenance, and realizes the integration of online and

offline omni-channel sales. On the online side, the function and user experience are displayed through platforms such as Little Red Book and TikTok to attract attention and promote purchase behavior. On the offline side, we will cooperate with home stores and decoration companies to display and demonstrate products, so that consumers can experience convenience and practicality. In addition, we will cooperate with real estate developers to promote the smart wardrobe as an optional product to purchase customers and expand sales channels. This is shown in Figure 3:



**Figure 3.** Online and offline sales chart

### 2.2.3 Customer Relationship Management

Smart wardrobe uses customer relationship management system to provide personalized service and improve customer loyalty. By collecting user information, analyzing user data and building user portraits, it can customize recommended clothing and services for users. Through speech recognition, image recognition and other technologies to interact with users, improve user experience and satisfaction. At the same time, through mobile app, social media, email and other channels to interact with users, improve user engagement and loyalty, provide free upgrade function, door-to-door customization, custom design and other value-added services, further improve user satisfaction. [9].

### 2.2.4 Sales strategy

The development of appropriate sales strategy is very important for the sales management of intelligent wardrobe, providing relevant quality and technical guarantee for customers' questions, as well as the elaboration of product value. Develop flexible and effective pricing strategy, promotion strategy and channel promotion strategy to attract consumers and increase sales. Promotion strategies such as limited time discount activities and matching sales discounts are introduced to attract consumers to buy smart wardrobes [10]. In addition, establish a professional sales team, provide training and incentive mechanisms to ensure that sales personnel have good product knowledge and sales skills.

### 3 Experimental data

In the experiment, convolutional neural network was used as the image recognition model. Different types and colors of clothing were placed in the smart wardrobe, and a large number of clothing images were taken. Through the feature extraction and comparison of these images, the results show that the accuracy of image matching technology in clothing recognition is stable at about 90%, and the highest is 92%. At the same time, the system recognition time of the intelligent wardrobe is relatively stable, usually about 3 seconds, and the fastest can reach 2.7 seconds. Through these experimental data, it can be concluded that the convolutional neural network model can quickly and accurately identify the type of clothing in terms of clothing image recognition and provide users with convenient clothing management experience. The experimental data are shown in Table 1:

**Table 1.** Experimental data

Experimental group No.	Actual categories	Predicting classes	Recognition accuracy	Recognition time (s)
1	T-shirt	T-shirt	92%	3
2	Coat	Coat	89%	2.7
3	Sweatpants	Sweatpants	91%	3.1
4	Sweater	Sweater	88%	2.9
5	Dress	Dress	90%	3.3
6	Skirt	Skirt	90%	3

### 4 Financial situation

According to the function design and sales strategy of the smart wardrobe mentioned above, as well as the market prospect of smart home, it can be speculated that the sales of this product continue to rise. Forecast In the first month, expected sales of about 205,000 yuan, profit margin can reach 25.1%. With product promotion and market awareness, sales are expected to increase to 307,000 yuan in the second month, and profit margins are expected to reach 33.4%. In the third month, sales are expected to further increase to 409,000 yuan, with a profit margin of 37.6%. In the fourth month, sales are expected to reach 511,000 yuan and profit margin is expected to reach 40.2 percent. Over time, sales in the fifth and sixth months are expected to be 613,000 yuan and 715,000 yuan, respectively, while profit margins reach 41.7 percent and 42.8 percent, respectively. Company earnings forecast is shown in Figure 4:

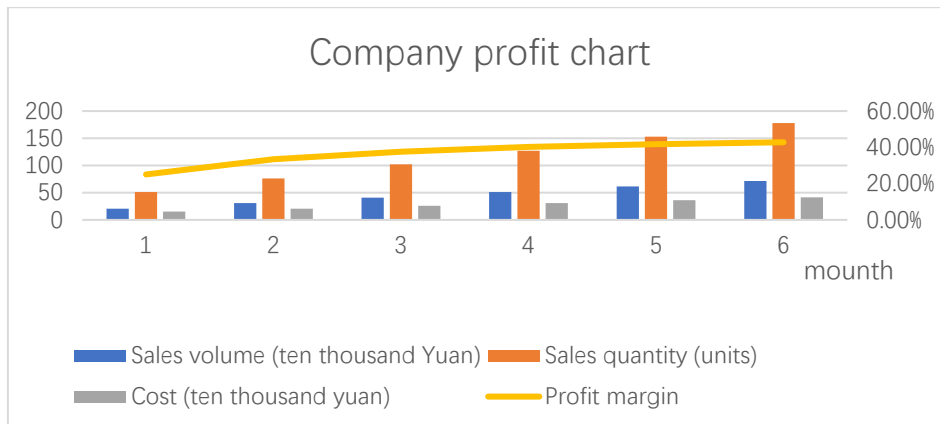


Figure 4. Company earnings forecast

## 5 Conclusion

The intelligent wardrobe control system combines multiple sensors and deep learning models with the cloud server to realize the functions of clothing identification, environmental adjustment and clothing management, and provides users with fully automatic convenient services. The smart wardrobe can also provide personalized clothing recommendations and travel clothes planning, and support voice control. In terms of market environment, intelligent wardrobe sales enterprises need to accurately locate target markets and people, collect user information for customized recommendation, discover customer needs through data analysis and modeling, promote user participation through multi-channel marketing, and provide value-added services such as door to-door customization and free upgrades to improve user satisfaction. Establish diversified online and offline sales channels, formulate flexible and effective pricing, promotion and channel promotion strategies, and launch promotional activities such as limited time discounts and matching sales offers to attract consumers to buy smart wardrobe.

## References

- [1] Qian L, Qian L I, Meng-Xin Z, et al. Smart wardrobe with composite sensor and wireless transmission[J]. Electronic Design Engineering, 2019.
- [2] Li Youjue. An Intelligent Wardrobe with Automatic Ventilation and Lighting: CN202011035494.9[P].CN112107141A [2023-12-01].
- [3] Design of intelligent Wardrobe Monitoring System [D]. Harbin University of Science and Technology [2023-12-01]. DOI: CNKI: CDMD:2.1018.173342.
- [4] Pan Zekai, Yang Qiongfang, LI Taitao. Design and implementation of intelligent wardrobe system based on Internet of Things Technology [J]. Foreign Electronic Measurement Technology, 2022(005):041.
- [5] Xu Yue-ling, ZHANG Shillong-ren, REN Wei, et al. Raspberry PI intelligent Wardrobe management System based on RFID [J]. China New Technology and New Products, 2021(1

9): 3.DOI: 10.3969/j.issn.1673-9957.2021.19.009

[6] Yang Meng-Zhou, Guo Meng-Jie, FANG Liang. Research on image classification algorithm of convolutional neural network based on keras [J]. Science & Technology Wind, 2019 (23): 2.DOI: 10.19392/j.cnki.1671-7341.201923098.

[7] Peng, Ge, Peipei, et al. Image matching technology in high power LED's eutectic welding[J]. Optics Express, 2014.DOI:10.1364/oe.22.013531.

[8] Zhang S, Pauwels K, Peng C. The Impact of Adding Online-to-Offline Service Platform Channels on Firms' Offline and Total Sales and Profits[J]. Journal of Interactive Marketing, 2019, 47(AUG.): 115-128.DOI: 10.1016/j.intmar.2019.03.001.

[9] Li L, Cao B, Yang Z. Research on the Evaluation of Multi-channel Online Advertising Combination Effects Based on Channel Click Path[J]. 2022.

[10] Kassim K A A, Isa M H M, Ahmad Y, et al. Consumer Behavior towards Safer Car Purchasing Decisions[J]. Journal of Engineering & Technological Sciences, 2016, 48(3): 359-365.DOI: 10.5614/j.eng.technol.sci.2016.48.3.9.