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Research Article

Based on the Role of Intelligent Multimedia Man-Machine Exchange in Product Design

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Designing human-computer interaction, as the name suggests, is a branch of the study of how humans and machines (or systems) communicate or operate to better adapt machines to humans. We must first have a complete understanding of the human body. Only by fully understanding your own body's ability to stretch and range of activities can you be confident in your own abilities, so that people can better use us in the design and construction of machinery or systems. This article aims to study the role of intelligent multimedia man-machine exchange in product design, so as to realize the application and development of intelligent multimedia man-machine exchange technology in various fields. This paper proposes to focus on human-computer interaction design and also proposes the algorithm of PNSR index and the method of remote control of equipment and human-machine monitoring. Through the performance, development prospects, and development trends of human-computer interaction design in product design, human-computer interaction is introduced. The importance is of interaction design in today's product design. The experimental results of this paper show that the intelligence coefficient of my country's main intelligent network equipment has reached 245, which has exceeded the world average coefficient level and its utilization rate has exceeded 39%. Therefore, the conclusion of this paper is that human-computer interaction design plays a role in promoting the development of mobile products. It plays an important role.

1. Introduction

With the continuous progress of the information society, the application of science and media technology has become more and more comprehensive, and the role of information in life has become more and more important. Nowadays, a large amount of data requires technology in our media. So far, the research on multimedia technology in our country has all started from models. Multimedia data can make information content richer and more vivid and become an important source of information. This kind of multimedia data is different from traditional structured data. Mass data has different types and features of unstructured data. As we all know, the development of information technology is undergoing rapid development. Followed is by the continuous development of multimedia database technology. Moreover, with continuous innovation and reform, without the diversity of information such as audio, video, and images, it will continue to log in to the computer and make contact with it. Therefore, the scope of different types of knowledge is also expanding. For the role of traditional databases, multimedia database technology covers various fields [1]. The field of data processing has also been significantly improved, and the research of multimedia database exploration has also attracted the attention of people from all walks of life.

Touch-sensitive human-computer interaction technology fits well with modern screen design [2]. Guests must stand and lie down in front of the booth. When you move your hands in the air and shake hands, the computer can automatically detect human movements and use more tools. Multimedia comics show the effect of book translation [3]. The virtual reversal book brings people powerful visual effects. Through the understanding of the concept of human-computer interaction design, it analyzes the design and evolution of the human-computer interaction relationship in modern mobile products and analyzes the different needs of different user groups for mobile product interaction design. Compared with the current mobile phone market,

the human-computer interaction design in the hardware and software of various brands of mobile phones is looking forward to the implementation of human-computer interaction design in mobile phone products in the future, and ultimately encourages designers and users to the greatest extent in all aspects. The application is of human-computer interaction technology in modern display design [4]. The computer can control and adjust the objects in the lens by collecting the actions. It uses, for example, the "virtual stadium" in the Shanghai Science and Technology Museum to combine human-computer interaction with football competition to make the display process more interactive.

Many scholars at home and abroad have conducted in-depth research on the research topic based on the role of intelligent multimedia man-machine exchange in product design. Zhou S first proposed a novel framework to deliver content in VSN through D2D communication. In the proposed framework, mobile vehicles can directly exchange content with each other based on D2D communication. All content adopts a content-centric management method, and mobile vehicles can send interest to obtain content with named information, thereby reducing network traffic load [5]. Sheshjavani AG studied the buffer mapping exchange challenges in the P2P VoD streaming media system based on pull and proposed an adaptive mechanism to reduce the overhead by sending the buffer mapping about the peer's point of view. The bandwidth overhead of the proposed mechanism has nothing to do with the size of the buffer used and is less dependent on the buffer mapping exchange cycle [6]. The literature review method is carried out in three main stages: review planning, implementation, and report preparation. There are nine steps from defining system review requirements to presenting results. Data set estimation or regression, clustering, correlation, classification, and preprocessing analysis are the five main focuses revealed by the main research of stock forecasting [7]. Xu Y proposed that Converged Services (CS), which converges broadband and broadcast services, is considered to be promising to bridge the gap between scarce bandwidth and users' demand for real-time, immersive, and ultra-high-quality services in a ubiquitous environment [8]. Gong W explores the optimization of an intelligently optimized remote multimedia sports teaching system. Method: Optimize the system, including system index, logical database, and query structure, and explore system functions. Results: The optimized intelligent multimedia sports teaching system has better functions [9]. Liu K mentioned in his article that in recent years, with the rapid development of artificial intelligence (AI) technology, in order to meet the design needs of multimedia content, many various AI auxiliary tools for editing and producing multimedia content have emerged. And it has been more and more widely used in major commercial industrial chains at home and abroad. Related applications mainly include auxiliary design, interior design, video production, and page layout. The report introduces the overall process of AI auxiliary tools [10]. In the article by Sattari S, they proposed a fusion-based method at the query level to improve the query and retrieval performance of multimedia data. They discussed various flexible query types, including content combinations and concept-based queries that provide users with the ability to perform multimodal queries efficiently. They conducted a lot of experiments on video databases to show the efficiency of their methods for various types of queries. Their experimental results show that their query-level fusion method has a significant improvement in retrieval performance, especially for concept-based queries [11].

The above-mentioned scholars are very comprehensive in the research of intelligent multimedia, but the introduction of the role of intelligent multimedia-based human-computer exchange in product design is not comprehensive enough. This article will introduce its origin, development, research field, and research goal. As well as the research significance of human-computer interaction design, the focus is on the design of the mobile phone's interactive interface, and it is recommended that the mobile phone's interactive interface should be designed according to the needs of users. The author has conducted in-depth research and analysis on the different needs of different consumer groups for mobile phones and the key determinants of human-computer interaction design that affect the growth trend of mobile phones.

2. Study of Based on the Role of Intelligent Multimedia Man-Machine Exchange in Product Design

2.1. Smart Multimedia. Human-computer interaction is the product design based on the use feeling of consumers and from the perspective of users. The human-computer interaction design of modern machines is not only virtual but also voice-controlled home appliances that can help people cook. More and more people are enjoying convenience, but the laws of their lives have been broken [12], and the slow-developing habit of using only the brain instead of the hands; this is very harmful to the health of the body and cannot be recognized by machines and people. Although we can easily use machines, the feelings between people have also become indifferent. People and machines are approaching; people are moving away. People's excessive dependence on machines will affect their physical and mental health and work. It is also worth noting that mass production and mechanization have a negative impact on environmental protection. In other words, people's excessive dependence on machines harms the environment and wastes a lot of energy. Various media names have become popular words around the world [13, 14]. Therefore, it is very important for designers to clarify the differences and connections between them. In the future, the characteristics of human-computer interaction will be multichannel and multimedia. Making full use of human's multiple senses and action channels (such as voice, handwriting, gestures, sight, expressions, etc.), while not directly interacting with the computer environment (visible or invisible), so as to improve the naturalness and effectiveness of human-computer interaction [15]. The current digital media is mentioned the most on the Internet, and people usually refer to the network media format as digital media for free interaction. But as a new technology that is constantly updated and evolving, its definition is constantly enriched and updated. The existing interaction

modes (such as personal computers) are single-user, single-display surface, and single-input device, while the smart TV interactive platform is an interactive environment composed of multiple users, multiple-display surfaces, and multiple input devices. The input management module is to solve the corresponding relationship between them and optimize the performance of the input interface through multimodal fusion technology.

2.2. Multimedia Intelligent Controller. Human-computer interaction (HCI) refers to the information exchange process between people and computers who use a certain dialogue language to complete certain tasks in a certain way. With the continuous development of science and technology, mobile networks are playing an increasingly important role in people's daily lives [16]. Various terminals such as smartphones and laptops are emerging in an endless stream, and various applications that follow have also begun to appear on the mobile network [17]. Due to the rapid development of softswitch technology, terminal services have become very popular, especially video services and large-scale data download services. Instantly, available Internet applications rapidly increase mobile network traffic and increase the complexity of mobile management, bandwidth availability, and wireless network coverage. The implementation of a large number of terminals has brought about the use of bandwidth and wireless networks, which is a huge challenge [18]. In addition, the ultra-mobile nature of smartphones will significantly increase the complexity of today's network architecture, and the exponential growth of data traffic will not lead to a similar increase in operator revenue. Mobile operators need similar solutions to control the ever-increasing infrastructure and data transmission costs, while meeting the expectations of quality user experience (QoE) and providing new revenue-generating services [19]. In addition, operators are also looking for various methods to optimize network architecture and improve network transmission efficiency to better serve users. The Intelligent Multimedia Controller is a next-generation intelligent traffic management and content transmission platform designed to solve some urgent problems brought about by the rapid development of mobile broadband traffic. The intelligent multimedia controller is developed in the mobile network, located between the radio access network (RAN) and the central network (CN), which can improve the efficiency of the radio access network and reduce the complexity of central network traffic management [20].

With the continuous development of IP networks, the scale of IP networks is getting larger and larger, different applications are emerging one after another, and network equipment is becoming more and more complex [21]. These network devices have rich interfaces. They must be connected to the power circuit through the Iu-CS interface, and the packet domain must be connected through the Iu-PS interface. Intercommunication with PSTN requires SIGTRAN protocol interface, and interaction with IP terminal requires SIP interface [22]. Any interface problems will have unexpected consequences on the network. Therefore, before several new network devices are put into use on the network, it is necessary to check the function of each network device and the stability of the network after the device is connected to the network. Network equipment testing mainly includes performance testing, functional testing, interoperability testing, and compliance testing [23]. Network system testing can be divided into interface connectivity, completeness of basic system functions, system consistency testing, and network system verification. Network application testing is the ability to test various applications supported by the network system. Commonly used network equipment test methods are as follows: According to the networking function, it is divided into single node complete shell test, interoperability test between network components, end-to-end system test, etc. According to the test indicators, it can be divided into peak pressure test, stability test, overload protection test, etc.

2.3. Algorithm Based on the Role of Intelligent Multimedia Man-Machine Exchange in Product Design. The design concept of "people-oriented" is well reflected in the design of product operation interface, which is to realize the product design based on the user's feeling. If the two variables of the initial system conditions are slightly different, the distance between the two variables is exponentially distributed with time [24], as shown in the following formula:

$$\begin{aligned} K &= -\lim \lim_{c \longrightarrow 0} \frac{1}{d\gamma} \sum_{k=0} P(i_1, \cdots, i_o), \\ S_x(w) &= \int_{y=1}^{x \epsilon 0} R_t(\ell) e^{\min} d\ell, \\ R_x(\ell) &= E[x(t), E(t+\ell)] = \lim \frac{1}{t} \int_0^t x(t), \\ x(t) &= x(t) - \lim \int_0^t x(t) d\ell. \end{aligned} \tag{1}$$

For the application of human-machine exchange technology in products [25, 26], the measurement standard of its function and the quality of its quality can be compared and replaced by formulas in different quantities, as shown in the following formula.

$$\begin{aligned} f(x_0) &= (z_1, z_2, \cdots, z_l) + [1bm] + 1, \\ x_i &= (ax_{i-1} + b) \bmod M, \\ a_i(t+1) &= a_{i=1}(t), (i = 0, 1, .., n-2), \\ a_{n-1}(t+1) &= f[a_0(t), a_1(t), \cdots, a_{n-1}(t)]. \end{aligned} \tag{2}$$

PSNR is the abbreviation of "peak signal-to-noise ratio," that is, peak signal-to-noise ratio. It is an objective standard for evaluating images. It has limitations. It is generally used in an engineering project between maximum signal and background noise. Regarding this experiment, we will use the PSNR indicator [27] as the main criterion for judging the quality of the video.

$$C_i = \left\{ {}^{1,\text{Flag}=1}_{0,\text{Flag}=0} + \frac{1}{A+1} \right\},$$
$$S_N(x) = \left(x \times 10^B\right) \bmod N, B \in N^+,$$
$$|x| = 0.A_1(x)A_2(x) \cdots A_i(x) \cdots, (A_i(x) \in \{0, 1\}). \tag{3}$$

With technological innovation and the continuous expansion of machine technology [28], intelligent multimedia products have flooded people's lives, and their computing modes are also worthy of the industry's attention.

$$A_i(x) = \sum_{f=1}^{2^i-1} (-1)^{f-1}[f/2(x)],$$
$$\mathrm{A}_i(x) = f = 1[(x-d)/(e-d)] \in [0, 1], \tag{4}$$
$$\left(\frac{\text{x-d}}{e-d}\right) = 0.B_1(x)B_2(x) \cdots B_i(x) \cdots, (x \in [d, e]).$$

In the process of human-computer interaction, users need to obtain the retrieval information in the shortest time, and it is required to be comprehensive, accurate, and specific. Therefore, the content presented in the interactive interface should not only meet the needs of users in information but also be visually concise, beautiful, eye-catching, and clear, so as to prevent chaotic colors and images from affecting the visual experience. When interacting, we should pay attention to the artistic sense of the interface and be able to reach the basic level of human-computer interaction. The rough definition of the smartphone in the industry is that it can replace the computer for daily office and other purposes to a certain extent, and can seamlessly access the network [29]. At the same time, it can be easily and conveniently synchronized and shared with other computer equipment.

$$B_i(x) = \sum_{f=1}^{2^i-1} (-1)^{f-1}(e-d)(f/2) + d,$$
$$B_i(x) = 1 - B_i(x) + \{B_i[f^n(x)]\}_{n=0}^{\infty}, \tag{5}$$
$$R_s(\ell) = \frac{1}{T}\sum_{k=0}^{T-1} (-1)^K \cdot (-1)^S.$$

The human-computer interaction interface is the human-computer interaction platform of the mobile phone, and its user experience directly affects the user's product selection. The smarter the design of the human-computer interaction interface is, the more convenient it is to bring users to life, and at the same time, it can also improve users' work efficiency and life comfort.

$$J(s, c, i \bmod e|QP, \lambda_{\text{MODE}}) = SSD(s, c) + QP^2,$$
$$Y = AXA^T \text{ int } [(|W| + f)/\triangleleft] \cdot \text{sgn } (W), \tag{6}$$
$$PSNR = 10 \log_{10}\left(\frac{255^2}{MSE}\right) + \frac{1}{MN}\sum_{i=0}^{M-1} [f(i, j)]^2.$$

The fundamental purpose of man-machine interface is to make users operate and use computer system more conveniently and easily. The evaluation criteria are as follows: the ease of use; the difficulty of learning; complexity of man-machine interface; the range of functions and operation modes provided by the interaction mode; operating speed; control mode of man-machine interface; ease of development.

3. Experiments Based on the Role of Intelligent Multimedia Man-Machine Exchange in Product Design

As a kind of multimedia only, mobile phones and other portable devices have become an indispensable part of people's modern life. To a certain extent, mobile phones have become a necessity in people's daily life. Most people rely on mobile phones for communication. Nowadays, the powerful smart functions and applications in mobile phones make people's lives richer and more convenient. At the same time, we rely more on the convenience of these applications. Compared with the hardware configuration of modern mobile phones, it is no less than desktop computers three or five years ago. The powerful functions and beautiful interfaces of smartphone applications are also developing rapidly. The increasing popularity of computers and the high development of network technology have made the application of computer technology in teaching more and more common, especially in language teaching. The implementation of the multimedia teaching system has fundamentally changed the traditional teaching and learning methods and has become a modern language. Teaching provides new and effective technical tools. The use of multimedia teaching network expands traditional English teaching methods, standardizes teaching connections, improves teaching efficiency, reduces the workload of teachers, and makes full use of the school's broadband network and the motivation of teachers and students. Creative thinking will play an active role to ensure that students truly achieve the perfect combination of learning, seeing, listening, speaking, and practicing, and actively participate in learning. With the implementation of multimedia teaching, English teaching methods have also changed from teacher-student interaction to human-computer interaction. In the design of electronic products, the embodiment of man-machine interaction is an important aspect. In the product design, we should more combine the principle of human-computer interaction and design the function in the multisensory perception of vision, touch, and hearing, so that the function of the designed product can be practical. In today's highly competitive electronic product market, only the products recognized by users can be invincible in the market. To improve the recognition of users, we should pay attention to the embodiment of human-computer interaction in the design. Only in this way can the designed products be more practical and more popular with consumers.

3.1. Experimental Description and Experimental Strategy. Human-computer interaction is based on human cognitive engineering and psychology. By reflecting the characteristics of humanization in product design, the designed products are more favored by users. The application of human-

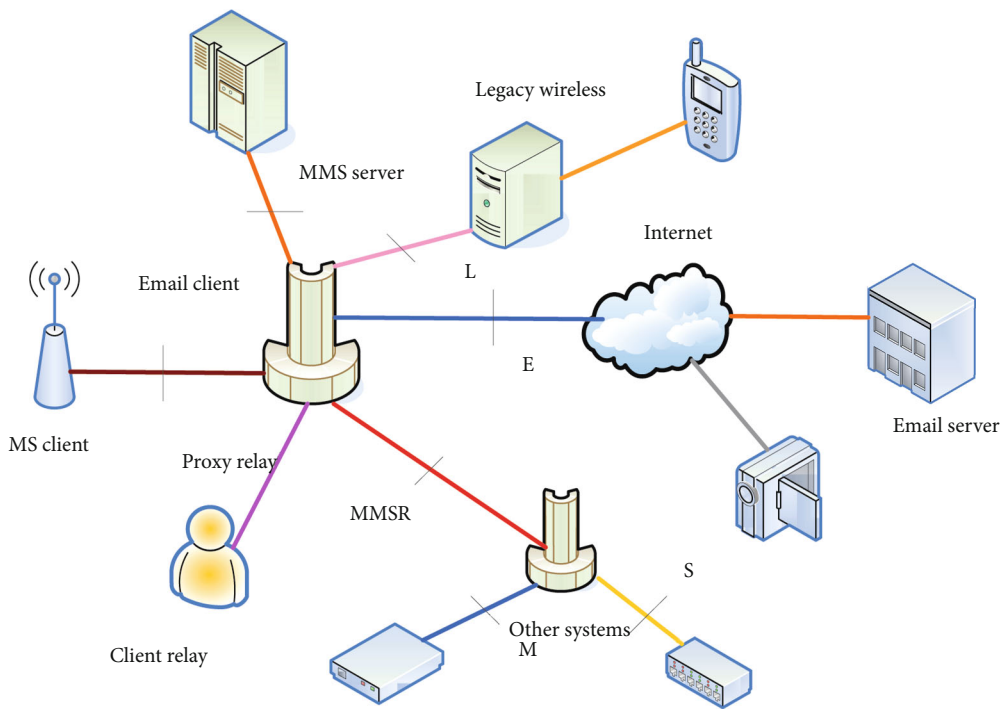

Figure 1: Man-machine exchange data network.

computer interaction in product design is mainly reflected in the operation interface of the machine. The ultimate goal of interactive software is to allow users to interact. Users are direct users of software products. It also stipulates that in the early stages of the product life cycle, we must put users in all stages of software development, and product strategies should meet user needs as the key motivation and ultimate goal. In the subsequent product design and development process, user research and understanding should be used as the basis for various decisions. At the same time, product evaluation information at each stage should also come from user comments. Combined with the design of human-computer interaction, it is very necessary to consider human psychology and logically use cognitive psychology when creating a mobile interface. When designing, try to use impressive text or images to attract the user's attention, and then make full use of the various software in the mobile phone to bring perceptual stimulation to the user, such as images, videos, sounds, or vibrations. After the user has completely received the sensory information, he will analyze it and remember it in his brain. Currently, we require simple, easy-to-understand, easy-to-use, and easy-to-remember interface design. From the expression of tasks and information to various functions, the functions should be as consistent as possible, so as to simplify the incomprehension of the user's memory, and also allow the user to have the system and interface. Be consistent as much as possible to simplify misunderstandings in users' memory and also allow users to have a better psychological understanding of the system and interface. In addition, the human-computer interaction design aims to improve the user experience. Therefore, designers must fully study cognitive psychology and have a very comprehensive understanding of the psychological state and needs of product experiencers. In this way, when designing applications or smart operating systems for mobile phones, it is easier to use their preferences to make more popular products. The human-computer interaction design of modern machines is not only virtual but also home appliances with voice, robots that can help people cook, and so on. People are enjoying more and more comfort and convenience, but their own rules of life have been violated. The habit of using the brain instead of hands is slow to develop and is very harmful to health. Machines will never recognize humans. As we use machines easily, the feelings between people begin to become cold. One-on-one mobile phone text messages have replaced the traditional New Year greetings, and the feeling of friends gathering is also conveyed through video and other methods. People and machines are approaching; people are moving away. People's excessive dependence on machinery will affect their physical and mental health and work. It is also worth noting that the production and use of a large number of machines have a negative impact on environmental protection. In other words, people's excessive dependence on machines has damaged the environment and caused a huge waste of energy. Robots can also collect data from sensors, thus minimizing the use of resources and benefiting the environment. The emergence of advanced technologies will help simplify our livelihood efforts and help mitigate the impact of climate change. Green robots can help achieve automation and complete environmental protection tasks with the highest efficiency without fatigue. But without proper consideration, large-scale automation may be bad news, increasing consumption and emissions.

3.2. Sample Collection. As a part of the industrial control system that users directly touch, the machine's monitoring interface has important functions such as system

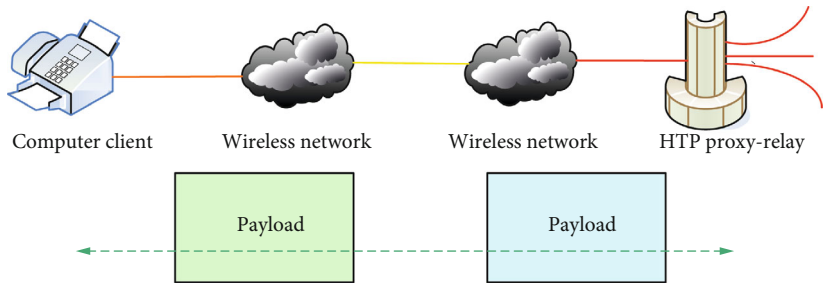

Figure 2: Client interaction model.

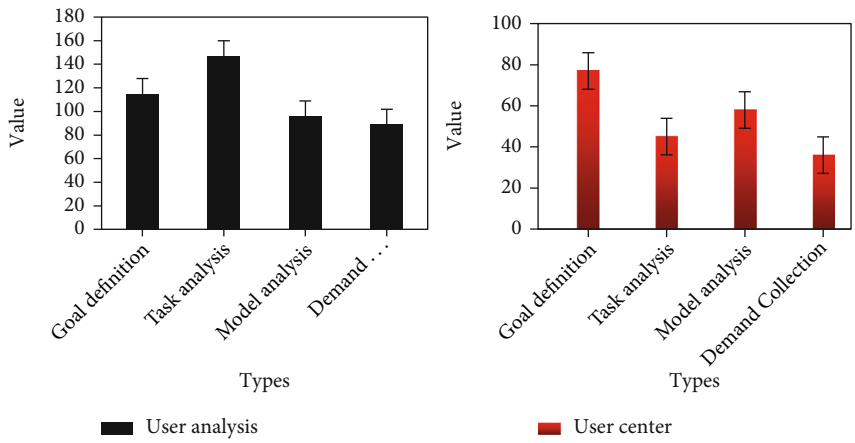

Figure 3: Overall design type.

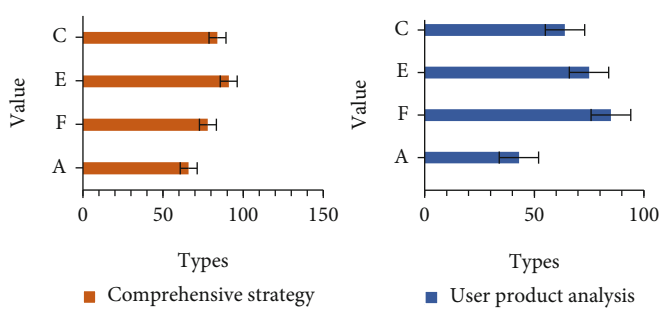

Figure 4: Product design background.

configuration, information monitoring, data display, and equipment remote control. System configuration refers to the minimum system requirements required to ensure the normal connection and use of MP4 player and computer, including software and hardware; monitoring in a broad sense means to monitor and watch from the side and try to ensure a controllable range. In a narrow sense, monitoring refers to closed-circuit monitoring and other systems in the security system; data display is to output the data in the internal or external memory of the system in visible or readable form, in the form of direct display of data value, data table display, various statistical graphics display, etc.; remote equipment refers to the electronic equipment that can access the network through the Internet and use wireless or electrical signals for remote control and remote operation. It is mainly used in remote monitoring, remote service, remote diagnosis, and so on. The interactive convenience is of the monitoring interface and the degree is of human-machine coordination that has become an important factor affecting the performance of modern industrial monitoring systems. The first personal computer monitoring interface is mainly a user interface based on the command language of the Microsoft platform. The user and the computer can only use a command language that both parties can understand.

Table 1: Different media types.

DRM	Method	Devices	Media types
Delivery	Message	254	39
Forward-lock	Right	236	41
Separate delivery	Content	475	45

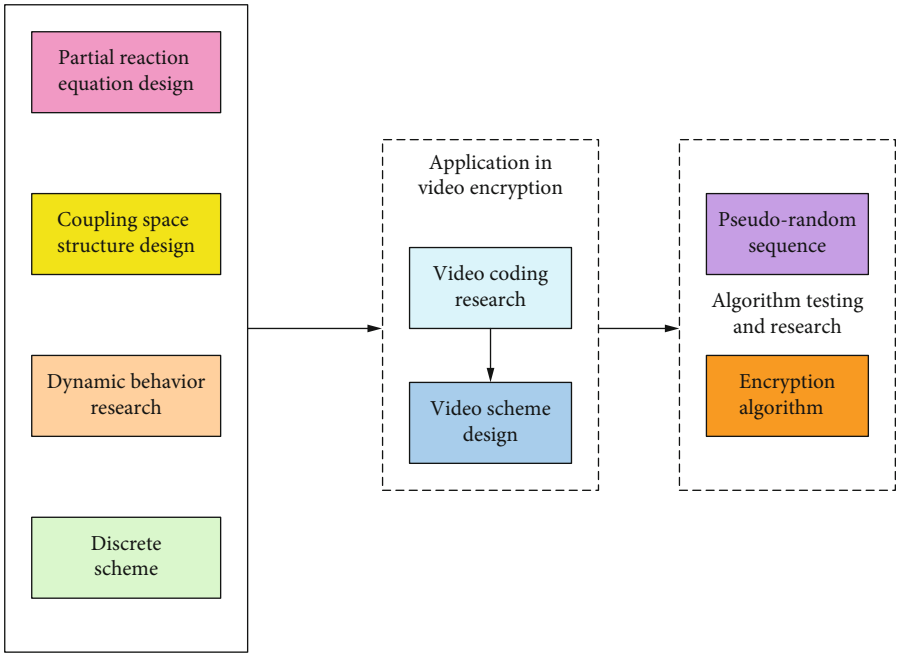

Figure 5: Video encryption technology block diagram.

This kind of human-computer interaction requires users to remember a large number of command languages. It requires special training and is error-prone, and is only suitable for professionals. Human-computer interaction is the technology of studying human-computer interaction and its interaction. Therefore, the computer occupies a very important position in the research of human-computer interaction technology. Since people began to adapt to computers, computers have continued to adapt to humans, and the human-computer interaction process has developed in a natural and harmonious direction. The ultimate goal of human-computer interaction is to make the process of human-computer interaction behave like natural human-computer interaction. Due to the significant differences between humans and computers, although computer performance has improved rapidly, computers still do not have the cognitive and physical language capabilities to communicate with humans. As a tool of man-machine information, man-machine interface is an important manifestation of the pros and cons of man-machine interaction technology, and directly affects the naturalness and effectiveness of man-machine information interaction. With the rapid development of computer technology, the human-machine interface has experienced three stages of batch processing, command line, and graphical interface development, and is developing in the three directions of multichannel, pen-based interface, and intelligent interface.

3.3. Experimental Results and Data Description. With the advent of the artificial intelligence era, intelligent man-machine exchange technology has been widely used in many fields, and its manifestation is shown in Figure 1.

The interaction model of the client HTP mode also vividly reflects the service function, as shown in Figure 2.

From the preliminary research and design of any product, it can be seen that its overall design until the specific design needs to go through a very complicated process. The data types are also complicated, as shown in Figure 3.

Comprehensive strategies and user analysis provide a rich background for product design. These materials must be systematically analyzed and expressed in a complex way that can be used effectively, as shown in Figure 4.

The media types supported by different intelligent network devices are different. Therefore, from Table 1, we can see the manifestations of different media types.

A video coding scheme closely related to the coding process is designed to ensure an effective balance between security and coding performance. The security of video coding is analyzed and verified experimentally, as shown in Figure 5.

As the product enters the implementation stage, developers spend more and more time and energy on the final adaptation of high-quality design prototypes and writing product design style templates to maintain the consistency of the styles of various parts. After the product is applied or put on the market, The designer must monitor the user's use and satisfaction, collect the problems encountered by the user in use, and solve the product problems at any time, which is not only conducive to current product sales and operations but also conducive to the development of next-generation products, as shown in Figure 6.

This experiment expounds the development background and research status of intelligent multimedia man-machine switching system, and expands the application of intelligent multimedia customer service communication in domestic and foreign markets, and the future growth trend, as shown in Figure 7.

Figure 8 introduces the flow of the intelligent multimedia man-machine switching system and briefly introduces

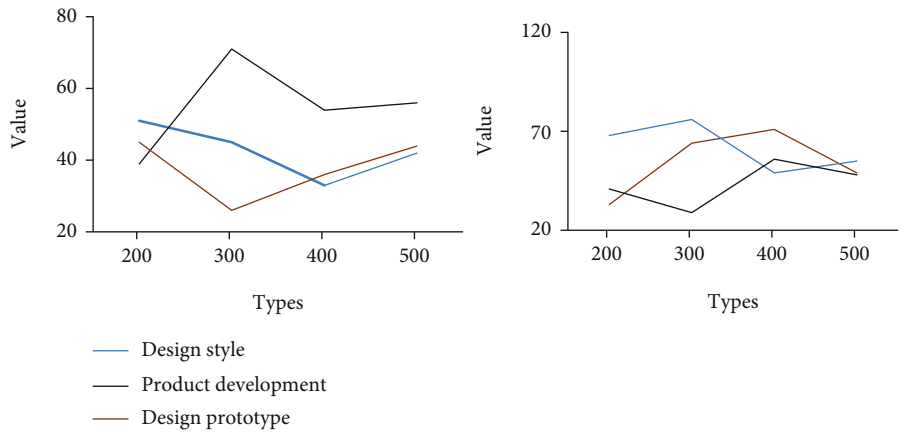

Figure 6: Implementation stage of product design.

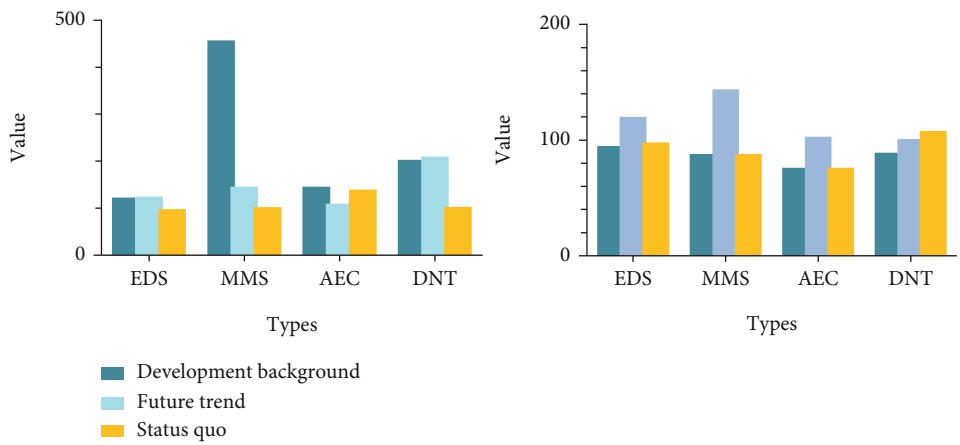

Figure 7: The growth trend of man-machine exchange technology.

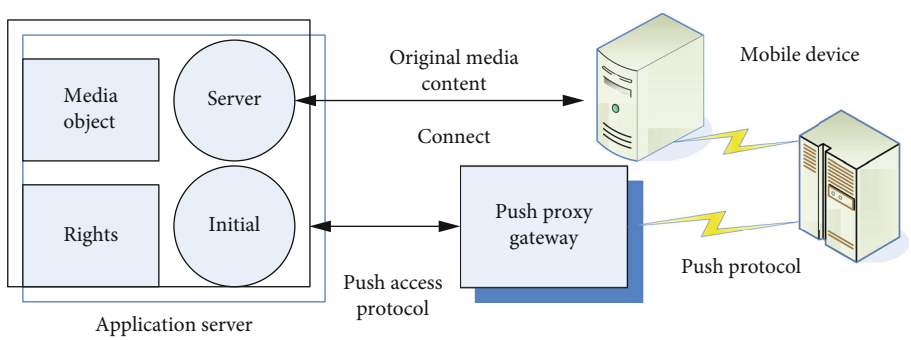

Figure 8: The role of man-machine exchange technology.

Table 2: Intelligent network label composition.

Elements	Coding	Tag or attribute	Use
Oex-rights	05	<ex:display>	256
Oex:context	08	<ds:key>	144
Odd-asset	09	<o-dd:play>	165

the important role that the system has played in reducing costs and improving business efficiency in recent years.

In order to better identify the broadband resources in the wireless functional area, the system will enter a specific type of label for it, so that the man-machine switching technology can be better implemented, as shown in Table 2 and Figure 9.

According to the characteristics of the current industrial control system and multifactor technology, the experiment improves the convenience of the monitoring system and

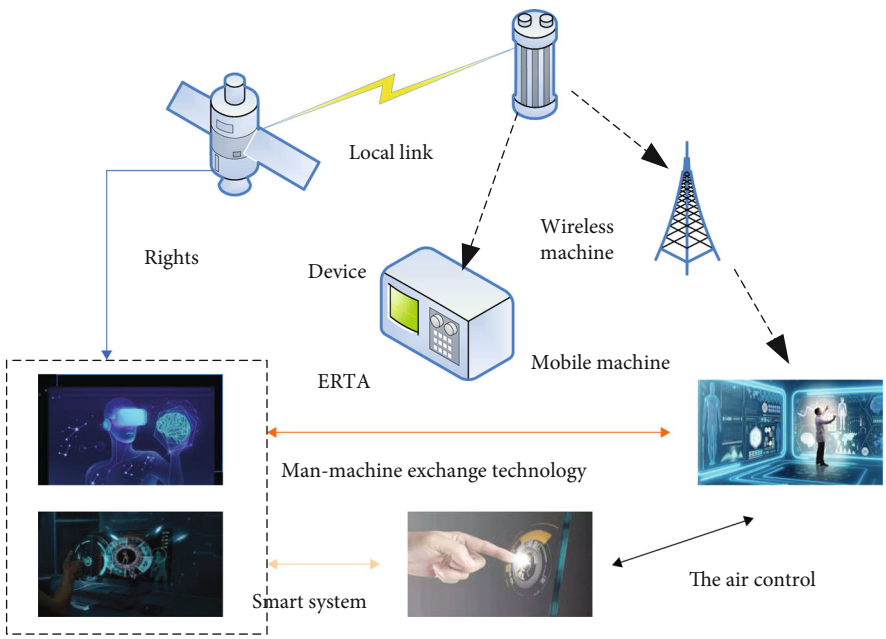

Figure 9: Intelligent network label composition.

the intelligence of human-computer interaction, and pays full attention to the important role of the industrial human-machine monitoring interface. Through the human-computer interaction process between the operator and the computer, the monitoring system can learn and understand the historical operating experience of human beings and to a certain extent can help and guide the operator to make more reasonable and effective decisions. Monitor the operation errors or delays in the process to ensure the safe and efficient operation of the industrial production process, as shown in Table 3.

In the process of sending and receiving short messages, the man-machine exchange technology is responsible for the protocol interaction with the MMS hub, sending and receiving MMS, in addition to encoding and decoding, and coordinating with the hub to complete the MMS sending and receiving tasks in accordance with the standard protocol process, as shown in Figure 10.

Different control tasks require different control systems. The development of a new control system is time-consuming and laborious, and when the controlled object or production operation changes, the source program of the control system must be changed, resulting in a long development cycle of the man-machine change monitoring system. The poor performance is shown in Table 4:

Table 3: Human-computer interaction monitoring system.

Agent	Number	Percent (%)	Ratio
Friendliness	415	66	1.2
Intelligence	781	45	0.8
Experience	511	78	1.4

4. Discussion Based on the Role of Intelligent Multimedia Man-Machine Exchange in Product Design

4.1. Route Planning Method Based on Human-Machine Coordination and Distributed Priority. Disconnected programmers program each agent independently and then check the programming plans of other agents and adjust their design plans in various ways. Commonly used methods include route coordination and priority scheduling. The first one decomposes the entire design problem into space route planning problem and speed scheduling problem in time. The agent first plans a path in space to avoid static obstacles but ignores other factors and other dynamic constraints. Then, you can use generic, priority, or passive response methods to solve the simplified speed scheduling problem so that the agent can avoid conflicts. Priority planning is often used as a supplementary method for curriculum coordination. The priority scheduling method is considered to be an effective method to solve the problem of multiagent collaborative scheduling. In this method, people design routes in order according to priorities, and high-priority factors exist as obstacles to low-priority factors in time and space. Research and optimization of priority methods can improve the quality of the solution, but simple heuristics also perform well. Since agents must plan routes in order, the entire scheduling time increases linearly with the number of agents. Priority scheduling is often centralized, and there are potential computer and communication congestion problems. A failure of an agent in the scheduling sequence will affect other factors in the future. However, in many fields, it is not necessary to strictly order in sequence planning, because not every agent needs to avoid all other agents.

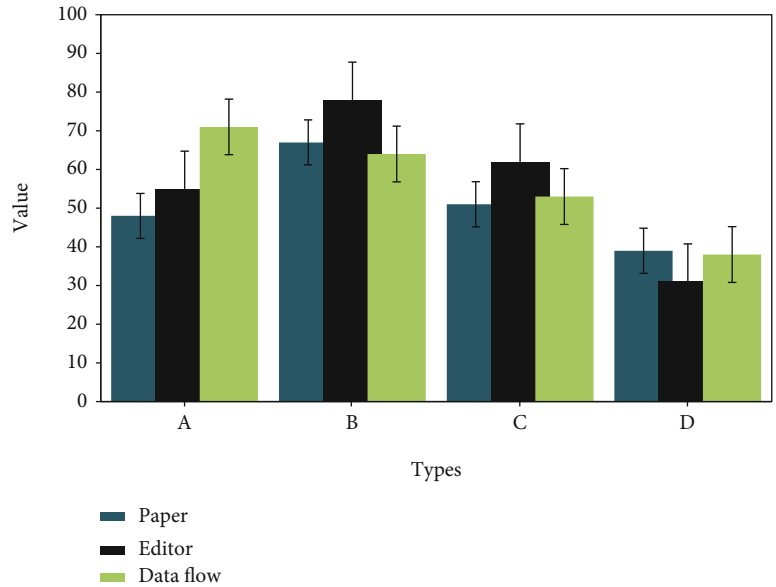

Figure 10: MMS sending and receiving tasks.

Table 4: Control task system.

Types	Configuration	Equipment	Structure rate
PLC	365	441	1.12
HSE	421	126	1.35
PEC	511	154	1.44

The term supervisory control is generally defined in terms of human information processing and the role of the operator in a given task, or from the perspective of the autonomy level of the application and the type of interaction between the operator and the autonomous system. In the task of supervision, humans play many different roles, including planning, trial teaching, surveillance, intervention, and learning. These roles usually appear in the described chronological order and may be repeated throughout the supervisory task. Someone described these roles in the form of a sequence: (1) Before starting the automatic operation, plan the action steps. (2) Instruct the computer technology to complete the task in a special way. (3) Monitor the guided automation process and make sure it is executed as planned. (4) Adjust or correct the automation process through intervention when necessary. (5) Learn from the performance and results of the automation process in order to improve the future planning level. With the continuous improvement of task complexity, the demand for planning and trial teaching is increasing. In addition, the need for surveillance and intervention depends on the quality of planning and trial teaching.

4.2. Performance of Flexible Complementary Man-Machine Collaborative Task Planning. Performance evaluation indicators are mainly used to evaluate the performance of algorithms or task planning systems. Aiming at the collaborative multifactor-oriented human-machine task design, this section proposes performance evaluation indicators for flexible human-machine task scheduling, which mainly include overall system performance, behavior evaluation standards, etc., for overall evaluation of the advantages and disadvantages of each system. This article proposes a flexible and complementary human-machine collaboration problem solution and provides a reference for the corresponding system analysis, design, and optimization.

(1) The impact of managers' decisions on the performance of task planning algorithms mainly has two evaluation indicators: the average execution time of the task scheduling algorithm (the average execution time of all tasks) and the average time ratio of each task (completely autonomous algorithm man). The ratio is of the running time to the time of the computer-to-machine collaborative work planning algorithm).

(2) The impact of task planning algorithm on the commander's decision-making performance mainly has four evaluation indicators: average completion time, number of conflicts, number of commander's decision-making interventions, and number of redesigns. The average task completion time is obtained by taking the average completion time of each task. The number of collisions is obtained from the number of collisions between design objects in the task design process. The number of times the commander decides to intervene is determined by the commander during the work planning process.

(3) The performance comparison between flexible complementary man-machine coordination scheduling method and traditional scheduling method belongs to the overall performance comparison of the system. It is necessary to carry out relevant experiments on the integrated simulation experiment platform to evaluate the performance of the flexible and complementary

man-machine coordination scheduling algorithm and traditional scheduling methods. In the design stage, the design efficiency can be improved, whether the success rate of multiagent collaborative project scheduling can be improved, etc.

5. Conclusions

Nowadays, with new interactive technologies such as eye tracking, voice recognition, and gesture input, sensory responses directly affect the way products and users interact. This improves the efficiency and user-friendliness of human-computer interaction and driving at a higher level in terms of product design and appearance. Conceptually, machine learning is a kind of computer that uses the initially input data, data and materials to make effective judgments and predictions on objects. It can be understood that he is a smart person who can study independently and make decisions. Machine learning is now the basic technology of artificial intelligence and the "brain" of the AI family. The core of machine learning is algorithms and representative algorithms and deep learning. Neural networks and improved algorithms make a large number of machine learning applications possible because of the underlying algorithms. In this regard, the use of machine learning for image recognition is a good example, surpassing humans in scale. Human-computer multimedia interaction technology is a newly emerging multimedia boundary technology in recent years. It is a technology that balances rationality (usability) and perception (user expectations). With the continuous expansion of interactive multimedia technology in the field of product design, intelligent interactive design perfectly combines interactive interface and interactive behavior to achieve human-computer multimedia interaction. This technology is considered to be the ultimate multimedia technology, which is used for effective communication and communication between people and products (including computers). It is closely related to virtual reality technology and has all the characteristics of virtual reality technology. Human-computer multimedia interaction technology will significantly promote the development of product design in a more natural, harmonious, and intelligent direction.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author declares that there are no conflicts of interest regarding the publication of this article.

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