Original Research Article

Multimedia Intelligent Call Center Construction Solution Based on 5G New Calling Technology Research and Application

LiHui Wu, Tian He, Hua Huang

CETC Eastern Communications Group Co., Ltd Fintech Innovation Center, Hangzhou Zhejiang, china

Abstract: The article discusses the design, implementation and evaluation of a multimedia intelligent call center based on the new 5G calling technology. The importance of system architecture design and its integration with 5G technology is presented, emphasizing the key role of high-rate and low-latency communication in improving the performance of call centers. The technical realization path is detailed, including audio and video codecs, streaming media transmission, real-time communication protocols, and the application of artificial intelligence and machine learning technologies. The key elements of hardware and software configuration and integration are analyzed, and the establishment of the application effect evaluation index system is discussed. Through the analysis of actual cases, the key factors for the successful application of multimedia intelligent customer service center are summarized. The necessity of continuous optimization and upgrading of the system is pointed out, and corresponding suggestions are put forward. The article aims to provide theoretical support and practical guidance for the construction and development of multimedia intelligent customer service center based on 5G new call technology.

Keywords: 5G new call technology; Multimedia intelligent customer service center; System architecture design; Technology realization path; Hardware and software configuration and integration

1. 5G New Calling Technology Overview

1.1. Characteristics and Advantages of 5G New Call Technology

As an important representative of the new generation of communication technology, 5G new call technology has significant features and advantages. 5G new call technology has a very high data transmission rate, which can realize ultra-high-speed voice, video and data transmission, and greatly improve the communication efficiency. 5G new call technology has a very low latency, which can ensure the real-time and smoothness of the communication, and bring the users a more smooth communication experience. 5G new call technology also has the characteristics of large capacity, high reliability and wide coverage, which can meet the needs of large-scale users' simultaneous communication, and ensure the communication of large-scale users. The new 5G call technology is also characterized by large capacity, high reliability and wide coverage, which can meet the needs of large-scale users for simultaneous communication, and at the same time ensure the stability and reliability of communication. These features make 5G new call technology show great potential for application in various fields[1].

Specifically, the high-speed characteristics of the new 5G call technology make it possible to realize a smoother and more realistic experience in high-definition video calls, online games, virtual reality and other applications. Low-latency characteristics make 5G new call technology has a wide range of applications in the field of automatic driving, telemedicine and other areas that require real-time response. The high-capacity feature

enables 5G new call technology to support more users online at the same time to meet the communication needs of large-scale activities, public places and other scenarios. High reliability ensures the stability and security of communication, providing a solid guarantee for important communication tasks.

1.2. Application Potential of 5G New Call Technology in the Field of Customer Service

5G new call technology shows great application potential in the field of customer service. 5G new call technology's high speed rate and low latency characteristics enable customer service personnel to real-time and efficiently interact with users in voice, video, text and other multimedia, greatly improving the efficiency of customer service and user experience. Through 5G new call technology, customer service personnel can more intuitively understand the user's problems and needs, so as to provide more accurate and personalized service.

The large-capacity feature of 5G new call technology enables the customer service center to support more users online at the same time and meet the needs of large-scale user inquiries and complaints. During peak hours or large-scale activities, the customer service center can quickly increase service channels through 5G new call technology to ensure that users can quickly get responses and solutions.

The high reliability of 5G new call technology also ensures the stability and security of customer service communication. In important communication tasks, such as financial transactions and customer identity verification, 5G new call technology can provide a solid guarantee to ensure smooth communication and information security.

1.3. Development Status of 5G New Call Technology At Home and Abroad

At home and abroad, 5G new call technology has shown a rapid development trend. Internationally, major communication giants have increased the R&D investment in 5G new call technology to promote the continuous innovation and application of the technology. At present, 5G new call technology has been commercially deployed in many countries and regions around the world, providing users with more high-quality and efficient communication services.

At home, China also attaches great importance to the development and application of 5G new call technology. The government has introduced a series of policies and measures to encourage and support the development and application of 5G new call technology. Domestic communication enterprises have also actively responded to the call of the state, increasing R&D investment and efforts to promote the rapid development of 5G new call technology. At present, China has become one of the important application markets of the global 5G new call technology, providing high-quality communication services for domestic and foreign users.

Specifically, both domestic and foreign countries have made significant progress and achievements in 5G new call technology. In terms of technology research and development, countries have strengthened cooperation and exchanges to jointly promote the innovation and development of 5G new call technology. In terms of application, 5G new call technology has been widely used in various industries and fields, providing users with more convenient and efficient communication services. Countries are also actively exploring new application scenarios and business models to promote the further popularization and application of 5G new call technology.

2. Multimedia Intelligent Customer Service Center Demand Analysis

2.1. Customer Demand Research and Behavior Analysis

In the process of building a multimedia intelligent customer service center, an in-depth understanding of customer needs and their behavior patterns is crucial. Customer demand research not only involves a basic

understanding of the type of service, frequency and satisfaction, but also requires in-depth analysis of the user's psychological expectations, habits and potential needs. Through questionnaires, in-depth interviews, data analysis and other methods, we can obtain customers' expectations, preferences and pain points in the use of customer service centers. Behavioral analysis focuses on mining valuable information from the user's behavioral data, such as user access time, browsing path, interaction frequency, etc., in order to reveal the motives and patterns behind the user's behavior. By combining the results of customer demand research and behavioral analysis, we can more accurately grasp customer demand and provide strong support for the construction of multimedia intelligent customer service center.

In the process of research and analysis, it is necessary to pay attention to the differences of different user groups. For example, young users may be more inclined to use video calls and instant messaging for consultation, while older users may prefer traditional voice calls. Different industries, different scenarios of user needs are also different, which requires research and analysis process focus on details to ensure the accuracy and comprehensiveness of the results.

2.2. Problems and Challenges of the Existing Customer Service System

Before discussing the multimedia intelligent customer service center construction program, it is necessary to conduct an in-depth analysis of the problems and challenges of the existing customer service system. At present, many enterprises still rely on traditional customer service systems, which are not capable of coping with large-scale user inquiries and handling complex problems. Specifically, the existing customer service system problems mainly include: slow response time, low service efficiency, unable to meet the user's personalized needs. These problems not only affect the user experience, but also restricts the further development of the enterprise.

The existing customer service system is also facing the pressure of technology update and service model transformation. With the rapid development of 5G, artificial intelligence and other technologies, the traditional customer service system can no longer meet the needs of modern enterprises. Users' needs for services are also changing, and they expect more convenient, efficient and personalized services. Enterprises need to carry out a comprehensive upgrade and transformation of the existing customer service system to adapt to market changes and user needs[2].

2.3. Expected Functions and Objectives of the Multimedia Intelligent Customer Service Center

Multimedia intelligent customer service center as a new type of service mode, its expected functions and goals are mainly reflected in the following aspects: to achieve multimedia interactive services, including voice, video, text and other communication methods to meet the diverse needs of users' consultation; through the introduction of artificial intelligence technology, to achieve automation and intelligence of the service process to improve the efficiency and quality of the service; the use of big data analysis technology, in-depth mining and analysis of user behavior, and to improve the quality of service. User behavior for in-depth mining and analysis, to provide valuable market insights and business optimization recommendations for enterprises.

Multimedia intelligent customer service center should have the following functions: first, quickly respond to user inquiries and provide real-time and efficient services; second, automatically identify user intentions and intelligently recommend related products or services; third, support users of multiple languages and cultural backgrounds and provide globalized services; and fourth, have the ability of self-learning and optimization to continuously improve service quality and efficiency. Through the realization of these functions, the multimedia

intelligent customer service center will be able to bring better user experience, higher service efficiency and broader market prospects for enterprises.

3. Intelligent Customer Service Center Construction Plan Based on 5G New Call Technology

3.1. System Architecture Design

When building a multimedia intelligent customer service center based on 5G new call technology, system architecture design is a crucial part[3]. An efficient, stable and scalable system architecture needs to be designed to ensure that the customer service center can handle a large number of concurrent requests and complex business logic. The system architecture should adopt a layered design that clearly divides different functional modules, such as the user interface layer, business logic layer, data storage layer, etc., in order to improve the maintainability and scalability of the system.

Considering the high speed and low latency characteristics of the new 5G call technology, the system architecture should support the real-time transmission and processing of multimedia data. For this purpose, an architecture model based on cloud computing and edge computing can be adopted to deploy some of the computing and data storage tasks on edge nodes close to users to reduce the delay and bandwidth pressure of data transmission. In order to guarantee the stability and security of the system, the system architecture should also include fault tolerance mechanisms, backup recovery mechanisms, and security protection mechanisms.

The system architecture should support multiple communication protocols and interface standards to achieve seamless interfacing with different devices and systems. This includes communication interfaces with 5G networks, interaction interfaces with user terminals, and data interfaces with business systems. Through standardized interface design, the complexity and maintenance cost of the system can be reduced, and the flexibility and scalability of the system can be improved.

3.2. Technology Realization Path

When realizing the multimedia intelligent customer service center based on 5G new call technology, the technical realization path is the key. It is necessary to build a stable and reliable 5G network environment to ensure that the call center can make full use of the high speed and low latency characteristics of 5G technology. This includes selecting suitable 5G network equipment, configuring network parameters, and optimizing network performance.

In order to realize the real-time transmission and processing of multimedia data, it is necessary to use advanced audio and video coding and decoding technology, streaming media transmission technology and real-time communication protocols. These technologies can ensure the clarity and smoothness of audio and video data and improve the user experience. In order to support intelligent service processes, it is also necessary to introduce artificial intelligence and machine learning technologies, such as natural language processing, speech recognition, and image recognition. These technologies can help the system recognize user intent, automatically answer questions, and recommend relevant services.

In order to achieve system scalability and maintainability, modern software development technologies such as microservice architecture and containerization technology are also required. These technologies can split the system into multiple independent service units, reduce the complexity and coupling of the system, and improve the maintainability and scalability of the system.

3.3. Hardware and Software Configuration and Integration

When constructing a multimedia intelligent customer service center based on 5G new call technology, hardware and software configuration and integration is an essential part. It is necessary to select appropriate hardware equipment, such as servers, storage equipment, network equipment, and audio/video acquisition equipment, according to the requirements of the system architecture and technical realization path. These devices should have good performance and stability to ensure the normal operation of the system and efficient service.

In terms of software configuration, it is necessary to choose a suitable operating system, database management system, middleware and other software platforms, and install the corresponding applications and tools. These software platforms should have good compatibility, scalability and security to support the stable operation of the system and business expansion.

After the hardware and software configuration is completed, it is also necessary to carry out system integration work. This includes connecting and configuring each hardware device and software platform to realize data exchange and functional synergy between systems. In order to ensure the smooth progress of system integration, it is necessary to develop a detailed integration program and implementation plan, and conduct adequate testing and verification work.

In the process of system integration, it is also necessary to pay attention to the compatibility and stability of the system. Since the multimedia intelligent customer service center involves the collaborative work of multiple systems and devices, it is necessary to ensure the compatibility and stability of the various systems and devices to avoid problems such as system crashes or data loss.

4. Intelligent Customer Service Center Application Effect Evaluation and Optimization

4.1. Application Effect Assessment Index System

When assessing the application effect of the multimedia intelligent customer service center based on 5G new call technology, it is crucial to build a comprehensive, scientific and reasonable evaluation index system. The indicator system should be able to comprehensively reflect the performance of the customer service center in terms of service quality, user satisfaction, operational efficiency and other aspects[4]. Specifically, the indicator system should include the following aspects:

Service quality is one of the core indicators for assessing the application effect of customer service center. Service quality can be measured in terms of service response time, problem resolution rate, service accuracy and other dimensions. Service response time reflects the response speed of the customer service center to the user's needs, and is one of the important factors in the user's perception of service quality. Problem resolution rate reflects the ability and efficiency of the customer service center to deal with user problems, directly related to user satisfaction. Service accuracy refers to the accuracy of the information and advice provided by the customer service center, which has an important impact on user decision-making.

User satisfaction is one of the important indicators to measure the application effect of customer service center. User satisfaction surveys, user feedback and other ways to obtain the user's evaluation of the customer service center. User satisfaction reflects the user's recognition of the quality and efficiency of customer service center services, is an important reference for assessing the effectiveness of customer service center applications.

Operational efficiency is also one of the important indicators to assess the application of customer service

center. Can be measured from the customer service center human resources utilization rate, equipment utilization rate, service costs and other aspects of operational efficiency. Human resources utilization rate reflects the efficiency and effectiveness of the use of human resources in the customer service center, equipment utilization rate reflects the efficiency and effectiveness of the use of equipment in the customer service center, and the service cost is directly related to the economic efficiency and competitiveness of the enterprise.

4.2. Actual Example Analysis and Lessons Learned

In order to more deeply understand the application effect of multimedia intelligent call center based on 5G new call technology, several actual cases are selected for detailed analysis, and the experience and lessons learned are summarized. These cases cover enterprises of different industries and sizes, and are widely representative.

In the case analysis, several common problems and challenges were found. Some enterprises lacked adequate planning and preparation when introducing multimedia intelligent customer service centers, which led to many problems after the system went live, such as performance bottlenecks and data security risks. Enterprises should fully assess their own needs and resource conditions when introducing new technologies, and develop reasonable planning and implementation programs.

The degree of intelligence of the multimedia intelligent customer service center is found to have an important impact on the application effect. Some enterprises, when introducing the intelligent customer service system, only use it as a simple information display platform without making full use of its intelligent functions, resulting in low system efficiency and poor user experience. When applying intelligent customer service system, enterprises should fully explore and utilize its intelligent functions to improve the automation and intelligence of the system.

Some successful experiences and practices have also been found. For example, when introducing multimedia intelligent customer service centers, some enterprises focus on integration and collaborative work with business systems, realizing data sharing and business synergy and improving overall operational efficiency. These successful experiences are worthy of reference and study by other enterprises.

4.3. Continuous Optimization and Upgrading of the System

With the continuous development of technology and changing user needs, the multimedia intelligent customer service center based on 5G new call technology also needs to be continuously optimized and upgraded. The goal of continuous optimization and upgrading of the system is to improve the system's stability, security, performance and user experience, in order to better meet the needs of users and enterprise development.

In order to achieve continuous optimization and upgrading of the system, the following measures can be taken:

Establish a regular system maintenance and update mechanism. Regular system maintenance and updating is an important means to ensure system stability and security. Reasonable maintenance and update plans can be formulated according to system usage and user needs, and implemented in strict accordance with the plans.

Pay attention to the development dynamics of new technologies and applications. With the continuous progress of technology and the continuous expansion of application scenarios, new technologies and applications continue to emerge. You should pay close attention to the development of these new technologies and applications, assess their impact on the system and potential value, and introduce and apply them at the right time.

Targeted optimization and improvement of the system can also be carried out based on user feedback and data analysis results. User feedback and data analysis results can reflect the actual operation of the system and

changes in user needs, and based on these feedback and analysis results, targeted optimization and improvement of the system can be carried out to improve system performance and user experience.

5. Conclusion

After an in-depth study of the multimedia intelligent call center based on 5G new call technology, the following conclusions are drawn. The technology provides strong technical support for the development of multimedia intelligent customer service centers by providing high speed rate and low latency communication services. This not only enables the customer service center to handle more diverse user requests, such as video calls and real-time file transfers, but also significantly improves the user's service experience, making it more convenient and efficient for users to obtain the information and services they need[5].

Through the construction of a comprehensive, scientific and reasonable application effect evaluation index system, it can comprehensively and objectively assess the application effect of multimedia intelligent customer service center. This not only helps to understand the performance of the customer service center in terms of service quality, user satisfaction, operational efficiency, etc., but also provides strong data support for the continuous optimization and upgrading of the system.

In the case study, it was found that successful multimedia intelligent customer service centers often have the following characteristics: first, they focus on integration and collaborative work with business systems to achieve data sharing and business synergy; second, they make full use of intelligent functions to improve the automation and intelligence of the system; third, they have established a regular system maintenance and updating mechanism to ensure the stability and security of the system. These successful experiences provide useful references and lessons for other enterprises' applications.

However, it should also be noted that the multimedia intelligent customer service center still faces some challenges in the process of development. For example, how to better meet the diversified needs of users, how to further improve the level of system intelligence, how to ensure system stability and security. In view of these challenges, it is necessary to continue to carry out technological innovation and system optimization to continuously improve the service quality and user experience of the multimedia intelligent customer service center.

In summary, the multimedia intelligent customer service center based on 5G new call technology has significant advantages in improving service quality, meeting user needs and improving operational efficiency. By building a reasonable evaluation index system, learning from successful experiences, and continuing technical innovation and system optimization, we can further promote the development of multimedia intelligent customer service center and create more value for enterprises and users.

References

[1] Cen Shaofei. Research on the construction program of 5G technology application for new energy vehicles[J]. Digital Communication World, 2021(7):2-3.

[2] Feng Xiaofang. 5G new call technology and application research[J]. Telecommunications Express, 2023(9):11-15.

[3] Li Yi, Liu Chunping, Wu Xiaoxue. Research and application of intelligent mine based on 5G technology[J]. China Coal, 2020, 46(11):7-8.

[4] SHAN Boxuan,YANG Yu. Application and research of new power system communication technology[J]. Smart Grid, 2023, 13(6):8-9.

[5] FANG Yongjun. 5G edge computing in smart security[J]. Engineering Technology Development, 2023, 4(1):5-8.