Intelligent Touch Queuing

Wireless Calling System Proposal

Catalogue

First, System Overview

China is a populous country, and queues are required in government offices, bank service halls, hospitals, telecommunications outlets, maintenance service points, warehousing and other service locations. Sometimes, queues last for several hours or more. This service method where service representatives sit and customers stand and wait goes against the service principle of "users are God"! Therefore, in order to improve service quality and establish a good image, our company has conducted sufficient market research and technical research to develop this queuing and number calling system. The system simulates the queuing process, and through simple processes such as ticket collection, waiting for leisure, and calling for numbers to handle affairs and leave, we turn the hard work and restlessness of waiting in line into leisure time, giving people a happy and beautiful mood, and making the environment elegant and orderly, Doing things well is conducive to the construction of a harmonious society.

The queuing system, through scientific management and intelligence allocation of various functions not only solves the problem of queuing order, but also improves the level of service management. By providing dynamic information on queues, business acceptance windows, and service time of service personnel, users who register and handle business in turn are allocated to corresponding business acceptance windows in a reasonable manner. Improve the overall work efficiency of the staff. After using the queuing system, the work environment was optimized, customer emotions were improved, service quality was enhanced, and the service image of enterprises and institutions was enhanced.

In China, the application of queuing machine systems has a history of more than ten years. With the continuous maturity of China's informatization, the demand for queuing machine applications has also changed. From single machine management to networked management, from button based to touch based, from standard software to personalized customization needs, from

wired wiring methods to wireless convenience methods, from on-site queuing to WeChat network appointment queuing, from audible calls to silent calls, from enterprises and institutions to various industries involving places that require queuing, from domestic to foreign, the computer information management of queuing systems has become increasingly scientific and perfect.

Second, Requirement Analysis

1. Customers are increasingly demanding service

For a long time, people have been queuing and waiting in front of banks, hospitals, telecommunications, traffic police, industrial and commercial halls, sometimes for over an hour at a time. This service style of employees sitting and customers standing and waiting is completely contrary to the service tenet of "users are God"! Improving service quality, establishing a good image, solving the problem of fatigue queuing, and creating a humanized service environment have become urgent issues that need to be addressed.

2. The pressure on the office continues to increase

The office still serves as the main channel for business promotion and service provision, with a large number of on-site staff. With the growth of business volume and types in the service industry, queuing has become a practical problem that people face.

3. Difficulty in service management in the office

In order to improve their service quality and establish a good social image, some operators have formulated detailed rules and regulations, and some units have also established corresponding institutions or departments to supervise and inspect the work attitude and efficiency of relevant service personnel. However, this cannot completely solve the problem.

4. System characteristics

As a part of the business service system, the queuing system should be designed as a front-end system based on the following characteristics for direct customer facing systems.

5. Reliability

Due to the frequent use of the system directly facing customers, reliability is crucial, and even in the event of system or network anomalies, it can still function normally after recovery.

6. Security

The queueing system generally needs to be installed in some public places such as office halls and waiting areas, with a large number of people in contact. The system considers personnel factors and can set passwords to enter the system interface after startup.

7. Scalability

At present, queuing systems are mainly applied in the service window industry, and their internal use within institutions and organizations is also developing towards deeper aspects. Therefore, queuing systems should have sufficient scalability in terms of functionality. With the construction of information systems, the queuing system will eventually become an important component of the entire management information system, so full consideration should be given to interconnection with other systems.

8. High performance

In the same hardware environment, business scope continues to expand and transaction processing is busy. A high-performance software architecture is a prerequisite for ensuring the highest cost-effectiveness of system expansion. Adopting efficient queuing algorithms is a major focus of our design.

9. Manageability

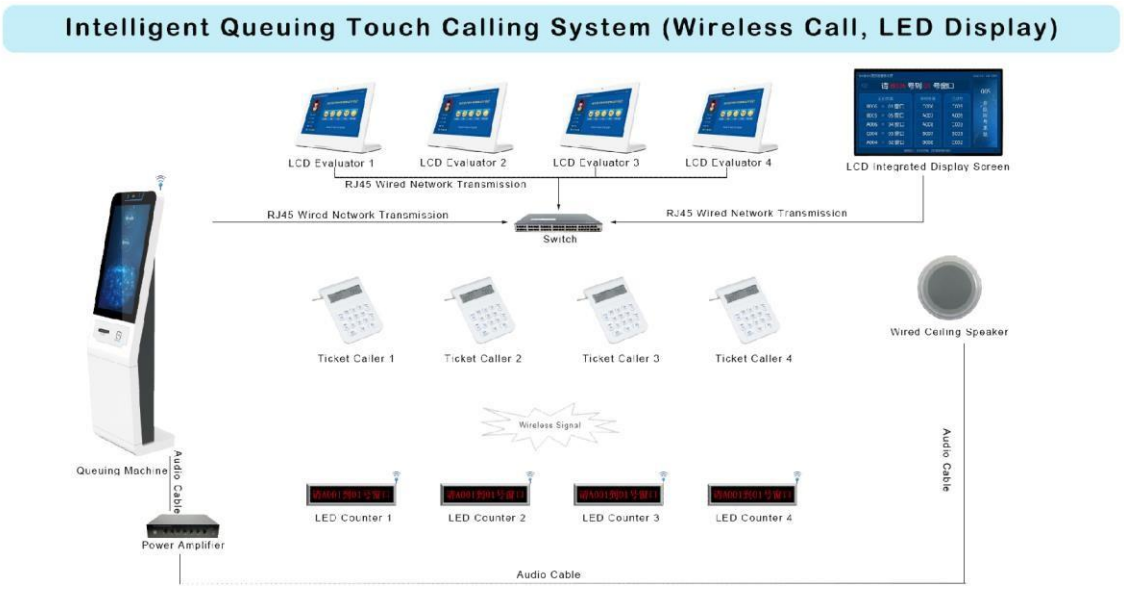
According to the characteristics of the end users of the queuing system, in order to facilitate use, the queuing system should have a high degree of manageability, allowing business users to flexibly set the types of business according to business needs.

10. Diversified statistical methods

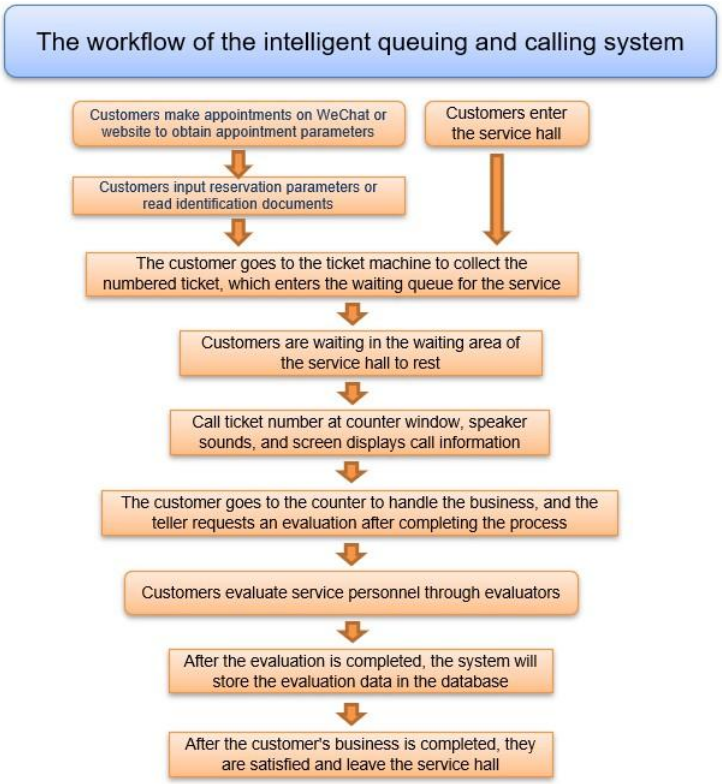
In order to provide decision-makers with a clear understanding of the business situation of each branch, we will comprehensively display the queuing data in different classification methods to provide them with the reference decision data they need.

Third, Scheme Description

1. System Topology Diagram

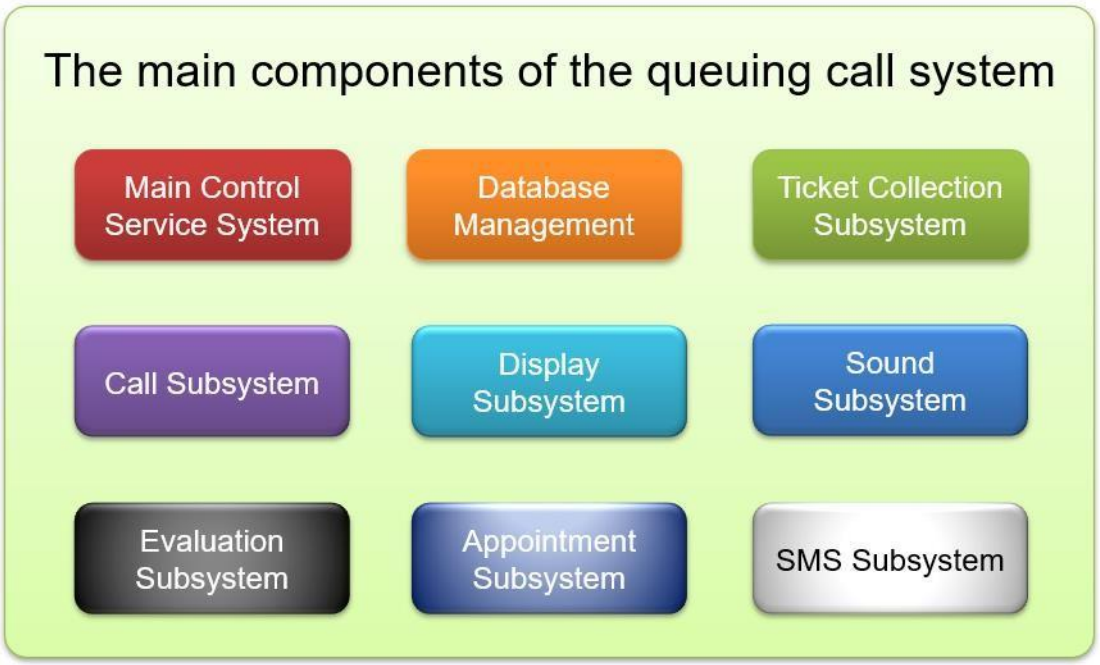


2. Process of handling affairs



3. System composition structure

The structure of our call system provided by our company is as follows:



Main Control Service System: The core of the call system, which manages and controls various subsystems;

Database Management: data backup and restoration;

Ticket Collection Subsystem: provides functions for information entry, number allocation, and printing of receipts;

Call Subsystem: Implement the allocation of customers to specific service windows through business rules, service processes, etc.

Display Subsystem: To display the basic information of the ticket number on the LED screen or LCD screen, reminding customers;

Sound Subsystem: Implement voice reminders, voice broadcast ticket numbers to windows or other types of rooms, etc.

Evaluation Subsystem: Conduct satisfaction surveys on the attitude and efficiency of service personnel, providing improvement basis for improving employee work efficiency;

Appointment Subsystem: Implement priority processing for appointment numbers, save waiting time, and support appointment methods such as WeChat and the internet;

SMS Subsystem: Send SMS messages to customers regarding the status of ticket numbers, reminding them and making silent calls.

4. Ticket Collection Subsystem

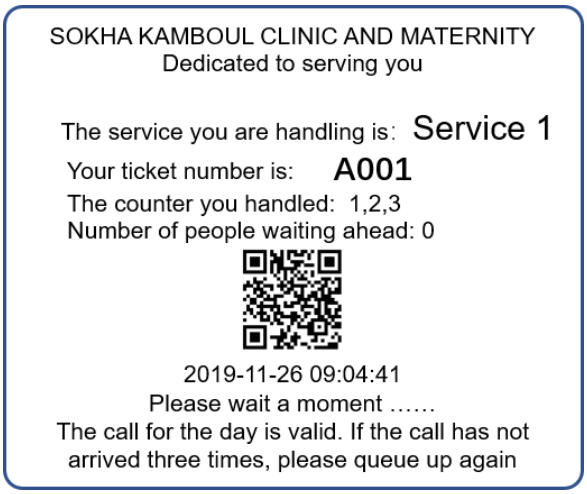
The ticket collection subsystem is mainly used to place and print numbered tickets in the lobby, and to divert customers to different service windows through business rules. The main equipment is the ticket collection machine, which is composed of touch display screens, printers, PC controlled computers, or other auxiliary devices, providing customers with small ticket paper as a basis for queuing.

The numbering software supports setting the display of webpage backgrounds, so any animations, controls, logo icons, FLASH, videos, etc. that can be implemented on the webpage can be displayed and played; Support custom background image replacement; Support custom business button images, making the ticket retrieval interface more attractive, and even allowing for simple information to be posted.

The ticket collection software supports restricting ticket issuance by swiping ID cards, QR codes, one-dimensional codes, IC cards, ID cards, social security cards, etc. Support manual input of specific information such as license plates, phone numbers, etc. for ticket issuance, support for person ID comparison, facial recognition for ticket issuance; Support entering appointment codes or swiping ID cards to obtain appointment tickets; Support secondary development.

The number retrieval software supports multiple ticket retrieval terminals to simultaneously retrieve numbers without conflict, and supports simultaneous operation by multiple people and devices. The software interface is roughly shown in the following figure:

The content of the receipt supports the printing of LOGO, QR code icon, second-generation ID number (key digits can be hidden), name, etc. The approximate style is shown in the following figure:



The content of the small ticket supports printing other information such as manually entered license plate numbers, second-generation ID cards, mobile phone numbers, etc., making it easier for service personnel to handle business.

5. Call Subsystem

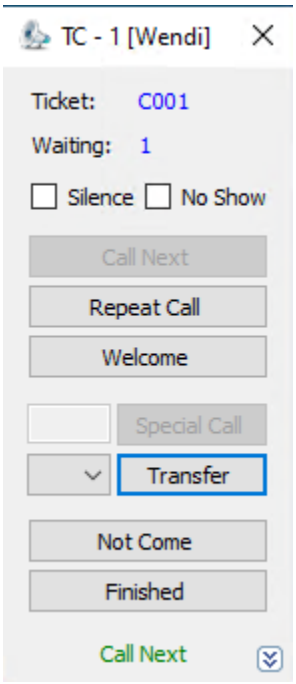
The calling subsystem is one of the core functions of the queuing system, which is used by service personnel to call customers to specific locations to handle business.

The core of the calling subsystem consists of hardware pagers and virtual calling software, which are further divided into wireless and wired types; The main equipment of the calling subsystem consists of the transmitting end and the receiving end;

The functions of wireless calling and wired calling are the same, but the communication methods are different. Wireless calling is achieved through 433MHz micro frequency communication, consisting of wireless modules and hardware pagers, which only need to be powered on and have consistent channels to achieve communication; A wired call consists of a communication controller, a relay, and a wired caller. The communication controller has two

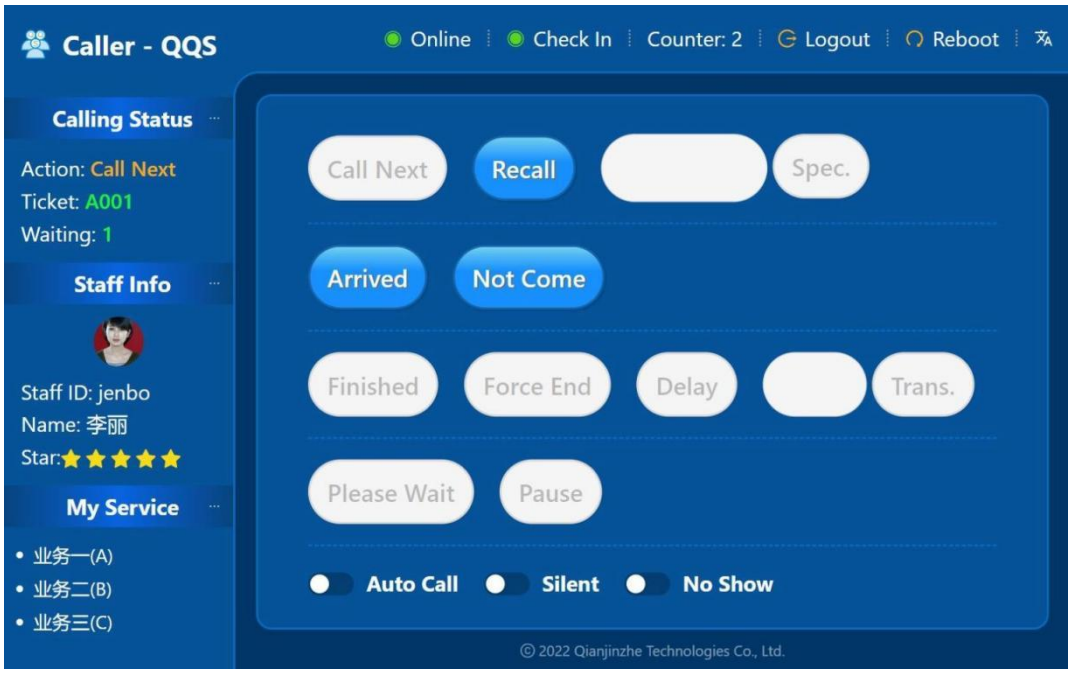
ports connected, mainly converting the computer's RS232 signal into an RS485 signal. The RS232 end is connected to the host's COM port through a serial port extension cable. The RS485 end is connected to the input end of the relay or the wired LED screen through a network cable or a 2-core copper wire. The output end of the relay is connected to the wired caller and the input end of the next relay through a network cable, Implement cascaded wired communication. Note: In the wired scheme, a signal repeater needs to be added every 30 windows to amplify the RS485 signal.

Virtual pagers need to be installed on each PC terminal. Each calling end can call independently without interfering with each other. After the call, the sound and display will be synchronized and sent to other subsystems. The main functions of the virtual calling program are shown in the following figure:



The calling subsystem can enable employees to log in and log out; Can specify a specific ticket number to call; Support window transfer of ticket numbers; Implement ticket number calling, automatic calling, re calling, confirmation, and completion; Support ticket number lag, termination process, and other ticket number status settings; Support business suspension; Supports full input of letters and numbers; Support window assistance function; Support seamless integration of evaluation; Support secondary development.

The hardware pager has an Android version with LCD pager, network communication, support for wired (RJ45) and wireless (WIFI), and the display screen is shown in the figure:

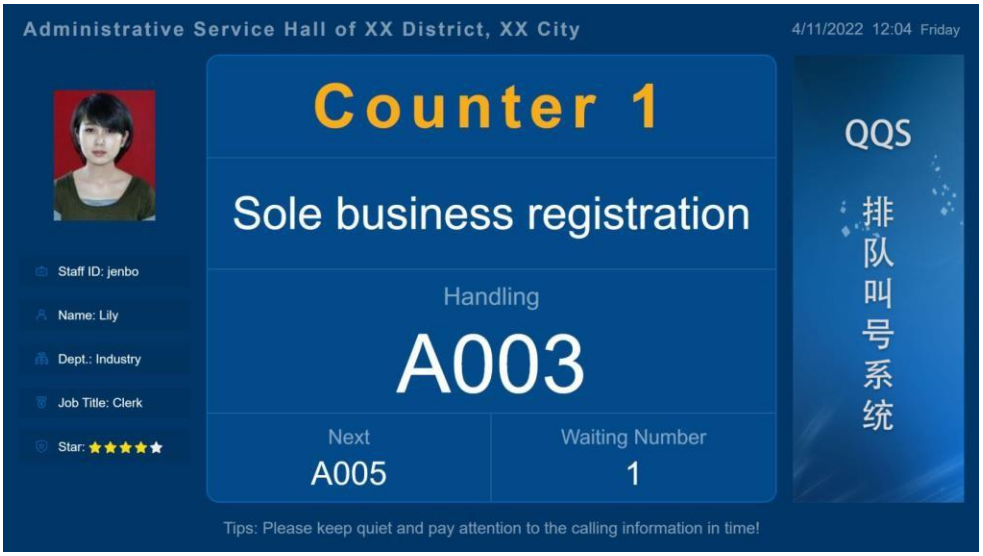


6. Display Subsystem

Display is an indispensable part of the queuing and calling system, mainly providing customers with visual reminders to facilitate their finding of service counters. With the continuous development of queuing and calling systems, people's living environment is constantly changing, and their needs are constantly increasing. Display systems have evolved from simple LED screens to LCD displays. At the same time, other accompanying reminder solutions have also emerged, such as SMS reminders, WeChat reminders, and so on.

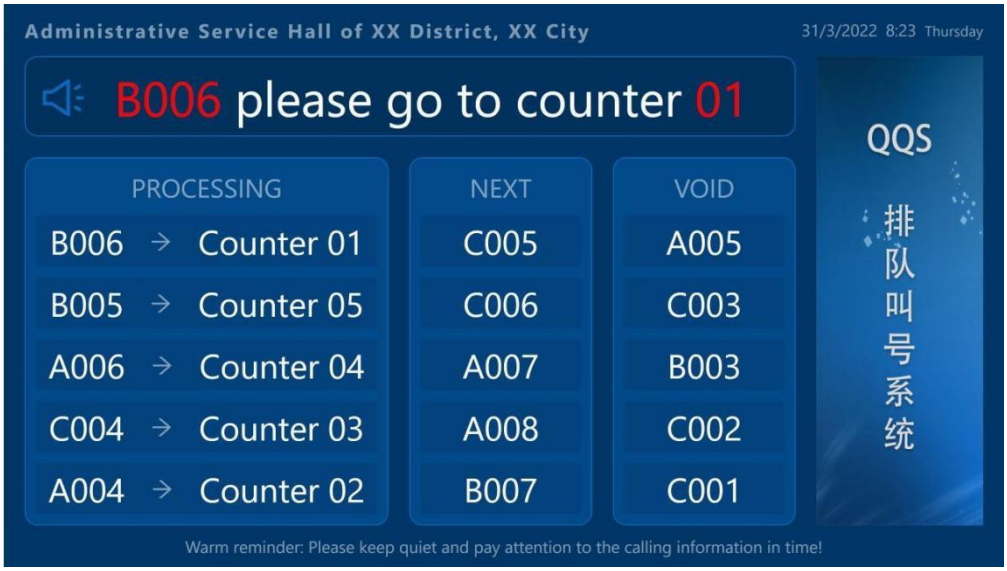
LCD Counter Screen

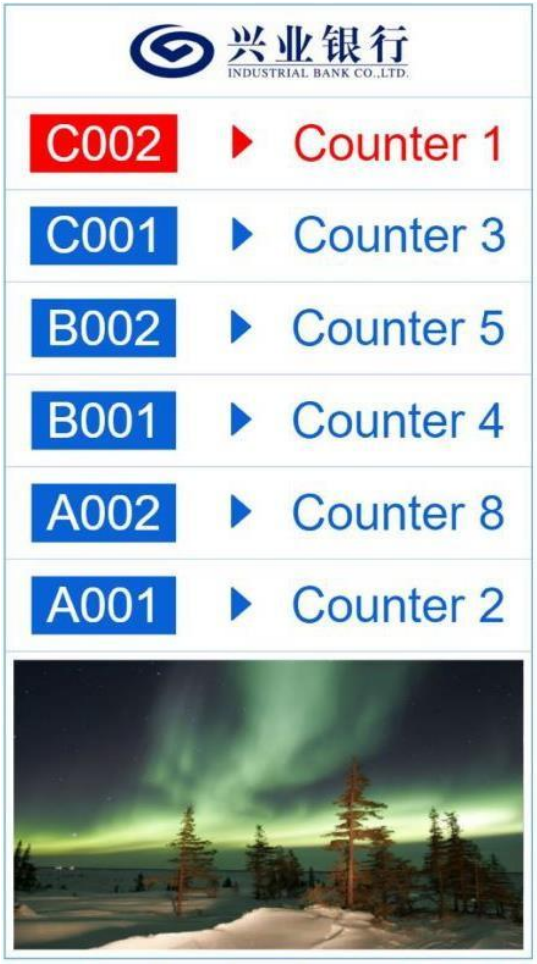
Replacing LED window bar screens and LED centralized screens with LCD all-in-one machines has become the mainstream solution for the new generation of queuing and calling systems. The main components of the LCD display solution are the LCD all-in-one machine and LCD display software.
Various display formats provide customers with a better audio-visual



experience, while improving the overall level of the service hall; In terms of display, various display styles can be set according to customer needs, which can not only display basic call information, but also display scrolling information, play videos, images, text and other information. It supports various video file formats, image formats, text formats, such as displaying employee photos, names, professional titles, etc., such as displaying company logos, names, dates, time, etc. As shown in the following figure

LCD display supports both Windows and Android platforms. The Android platform has lower cost compared to the Windows platform, but weaker functionality. It displays call information based on a fixed template, supports horizontal and vertical screen display, supports number passing display, supports displaying the next waiting number, and supports displaying scrolling information; The Windows platform has powerful features and stable performance. It can customize the display screen according to customer requirements, and has a convenient label design scheme that can be freely moved to display content in designated positions. The LCD all-in-one machine mainly communicates with the host through the network or WIFI to achieve the exchange of call information data. The following images are examples of centralized display:


Administrative Service Hall of XX District, XX City
31/3/2022 8:23 Thursday
B006 please go to counter 01
PROCESSING
NEXT
VOID
B006 → Counter 01
C005
A005
B005 → Counter 05
C006
C003
A006 → Counter 04
A007
B003
C004 → Counter 03
A008
C002
A004 → Counter 02
B007
C001
QQS
排队叫号系统
Warm reminder: Please keep quiet and pay attention to the calling information in time!



Forth, System hardware parameter description

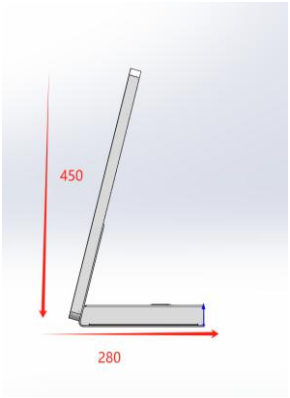
1. Queue Kiosk

Display Screen	21.5 Inch Lcd Floor Standing Kiosk
Pixel Numbe	1920*1080
Brightness	300cd/M2
Contract	1000:1
Display Colors	4k
Led Lifetime Min Hrs	50000
Touch Points	Multi-Finger
Touchscreen Technology	Capatitive Touch
Processor	Intel Core I5
Ram	4gb Ddr4
Storage	64gb Ssd
Operating System	Windows 10
Connectivity	Ethernet (Rj-45), Wi-Fi(802.11ac), Bluetooth 5.0
Usb Ports	3*Usb3.0 Ports
Printer	Built-in thermal printer Paper width:80mm. paper roll Diameter*:135mm maximum. Paper Thickness*65 to 85 micrometer. Minimum Ticket length*:45mm:
Card Reader	Integrated Rfid/Nfc Card Reader
Audio	Integrated Speakers And Microphone
Power Supply	Ac100-240v,50/60hz
Security	Lockable Enclosure/Anti-Theft Cable Lock
Compatibility	Support 3rd Party Application
Safety	Ce Standard

2. LCD Counter Display Screen

Image

Desktop model



model	JTA-MW15.6
Screen size	15.6inch
Resolution	1920*1200 pixels
Technology	IPS LCD,Capatitive touch screen ,anti-glare
Processor	Quad-core ARM Cortex-A55 (RK3568), 2.0GHz
Operating System	Android
Memory & Storage	4GB DDR4 RAM, 64GB eMMC storage, Expandable via microSD
Battery	7500mah
Wifi	Wi-Fi 802.11a/b/g/n/nc/ax
Bluetooth	Bluetooth 5,USB Type C
Branding	Customized design and branding options for integration
Accessories	Charging power adapter,data cable
Safety	CE
Additional Features	S Pen support, Knox security
Warranty and support	One year

Fifth. Main functional characteristics of the system

1. The queuing system software is independently developed and can provide software copyright certificates and secondary development packages;

2. The queuing system software supports three operating interfaces: Simplified Chinese, Traditional Chinese, and English. The front-end display interface supports multiple languages around the world, and the voice supports more than 20 languages worldwide;

3. Supports a business quantity of 999 or more, supports a window quantity of 999 or more, and supports ticket numbers with a length of 6 or more digits;

4. Support hierarchical display of business, with no limit on the number of hierarchical pages;

5. Each business can have its own priority set, with a priority level of 255 or higher;

6. The business classification letters in the ticket number support 3 or more, and the length of the numbers can be set;

7. Can dynamically adjust the business to be handled by each window, and support independent priority setting for each window's business;

8. Supports simultaneous playback of Chinese, English, and Cantonese voice, with adjustable sound formats and the ability to play any text or voice;

9. Support voice playback in different regions, without interfering with each other's voice in each region;

10. Support calling according to the preset process. After the same ticket number is processed at a certain window, it can enter the waiting queue of the next window again to continue being called. The number of times it can be called again is greater than 10, and the window for queuing again can be pre-set;

11. The number retrieval machine button can be visualized and set in the background, including the number, text, position, size, color, background image, and title. When exiting the software, a password can be set for input;

12. When calling, it can support playing recorded voice or TTS voice. TTS voice supports multiple languages and supports setting volume and speed;

13. The content on the ticket can be visualized and set using a WYSIWYG editing method. Whatever text is entered can be printed, and the font and size of the text can be set arbitrarily. The branch logo icon can be displayed, and the ticket number can be dynamically displayed as a one-dimensional code and a two-dimensional code;

14. Support setting the start and end times for all business transactions throughout the day, and independently set the start and end times for morning or afternoon transactions, as well as the number of votes processed for each transaction;

15. Support setting the font, size, color, display speed, entry effect, and exit effect of window screens and comprehensive screens, as well as setting the power on display content, pause display content, and display content without operation timeout;

16. The integrated screen supports filtering windows and can be set to display only specified window call information;

17. Support setting employee operation permissions, and support any form of work ID, name, password, and photo;

18. Support verification for issuing invoices, which can verify the number of specified digits on the bank card. Only when it matches can the invoice be issued;

19. Support setting the prompt content before each business number retrieval;

20. Support the use of SMS cats and SMS platforms to send SMS reminders, which can be set to be sent based on the number of people in queue or the queue time;

21. Support swiping ID cards to collect tickets, and limit the number of times each ID card can be collected per day;

22. All backend settings can be reset before saving to prevent errors. The queuing system software supports automatic data backup and cleaning every day, and the backup and cleaning time periods can be set;

23. The software supports 24-hour uninterrupted operation, ensuring normal business operation without restarting the queuing machine;

24. Support playback window for voice assistance, and the voice content can be set;

25. Support playing background music, music content and location can be customized;

26. You can set the number of tickets to be ticketed each time you collect tickets;

27. You can set the number of times the voice is played during each call;

28. Support online reservation, WeChat reservation, and real-time WeChat waiting number push;

29. Support the function of comparing personal identification cards and verify faces by swiping second-generation ID cards;

30. Support sending call information to televisions and all-in-one devices, and can set the format of displayed content, including call information, advertising images, and scrolling prompts;

31. Support flexible database management, automatic database backup, ensuring easy data backup and restoration without data loss.

Sixth, System solution equipment list

1. Hardware Inventory

Val	Name	Model/Specification	Unit	Qty	Remarks
1	Wireless touch screen queuing machine	PD2229: Midrange 32 inch wide capacitive touch screen; 32 inch wide display; PC control host (industrial control motherboard, Intel Core I5 2.5G, 4GB, SSD 128GB) 80mm thermal printer; Second generation ID card reader; One-dimensional and two-dimensional barcode scanners; 433MHz wireless data transmission module; 32 inch wide luxury metal paint cabinet with speaker, USB, Ethernet port, etc;	pcs	1	Front paper replacement
2	Wireless pager	JH204:16 key; 10 digit LCD display; USB; DC 5V; 180 grams; one hundred and thirty-two × eighty-five × 29mm	pcs	1	Choose one from two Mandatory
3	LCD pager	JH3063: 10.1 inches; RK3288; RAM 2GB; SSD 16GB; Android 8.0; WIFI; RJ45	pcs	1	
4	Wireless evaluator	PJ303:4 key; USB; Wireless pager power supply; one hundred and seventy-five × one hundred and twenty × 130mm	pcs	1	Choose one from two Optional
5	LCD evaluator	PJ4043: 10.1 inches; RK3128; RAM 1GB; SSD 16GB; Android 6.0; WIFI; RJ45	pcs	1	
6	Wireless LED window screen	LS1202: Φ 5.0; P7.62; Single line, single red, 8 Chinese characters per line: 1016 × one hundred and sixty-two × 55mm; 220V; Built in power supply;	pcs	1	Choose one from two
7	LCD window display screen	KK11011:21.5-inch IPS high-definition LCD screen; A40i quad core 1.2GB, 1GB memory, 16GB storage; WIFI; RJ45; Android 6.0, native WebView browser	pcs	1	
8	Wireless LED centralized screen	LS1206: Φ 5.0, P7.62; Four lines of single red, with 8 Chinese characters per line; one thousand and sixteen × five hundred and twenty-eight × 55mm; 220V	pcs	1	Choose one from two
9	LCD integrated display screen	KK11013: 43 inch IPS LCD screen; RK3288 quad core 1.8GB, 2GB memory, 16GB storage; WIFI; RJ45; Android 8.0, native WebView browser	pcs	1	
10	Wireless speaker transmitter	WX202; 600MHz; A radius of 150-300 meters; DC 12V; one hundred and fifteen × seventy-five × 35mm	pcs	1	
11	Wireless ceiling speaker	LB1201:10W; Sight distance 120-150 meters; AC 220V; two hundred and twenty × two hundred and twenty × 75mm	pcs	1	Choose one from two Or mixed selection
12	Wireless wall mounted speaker	LB2202:15W; Sight distance 120-150 meters; DC 7.5V; two hundred and eighty × two hundred × 105mm	pcs	1	

2. Software Inventory

Val	Software Name	Specifications	Unit	Qty	Remarks
1	System control program	The core software of the queuing system server, all peripheral programs need to communicate with the server, and it provides the system's call rules, voice prompts, LED display, and LCD display.	set	1	essential
2	System Settings Management	It is the connection hub between server programs and peripheral programs, responsible for setting and managing business processing, service windows, sound formats, display formats, ticket retrieval methods, ticket content, and ticket retrieval interfaces.	set	1	essential
3	Virtual calling software	The caller program is installed on the staff's computer to call ticket numbers. In addition to supporting ordinary call, recall, pause, designated call, and window transfer functions, there are also unique functions such as time lag, vote lag, silent call, no display call, sending text to the window screen, cloning caller, pausing business number retrieval, and querying statistics.	set	1	
4	Ticket collection end program	The ticketing procedure is used to allow customers to print numbered tickets. The background can be changed according to the customer's requirements, such as web page background, pictures, etc., which can display any desired display effect of customers. It supports hierarchical ticketing, swiping ID cards, entering mobile phone number, license plate number, ID number, reservation code and other customized ticketing, and swiping barcode ticketing.	set	1	
5	Database maintenance program	Perform backup and restore operations on the system database; Automatically backup the database to avoid data loss caused by unexpected situations; Support setting data storage days and statistical data storage days to avoid system crashes caused by large amounts of data.	set	1	
6	Semicolon end program	The numbering program is usually installed on the front desk of the service hall or the triage desk of the hospital, making it convenient for staff to manually assign ticket numbers and intervene in the direction of ticket numbers. Support browsing all currently waiting ticket numbers, business names, ticket retrieval times, and other parameters; Support the selection of ticket machine printing or local printing, support manual allocation of ticket numbers waiting for processing on the same day to designated windows, and support setting the priority of ticket numbers.	set	1	
7	LCD display program	Display call information on the LCD display or LCD TV. Supports connecting multiple LCD displays to a single host. The LCD display program supports customizing the location, size, font, color, and background of call information, setting the position and size of the entire program on the screen, and displaying various formats of videos, audio, images, text, etc.	set	1	
8	Statistical query program	The query and statistics program can perform statistics on the number of ticket numbers, classify them by window, employee, and time period, and output corresponding reports. The query statistics program can also query ticket numbers, modify ticket number status, delete ticket numbers, and view employee satisfaction evaluation results. The query statistics program supports networked management and can manage all queuing servers in the internal network within a single machine, and view corresponding statistical data.	set	1	

Seventh, Project Implementation Plan

1. Demand Survey Plan

Within 48 hours from the date of contract signing, send software and hardware engineers to the customer's location to understand detailed requirements, and complete the requirement decomposition within 3 working days. Invest 2 people for 3 days.

2. System Development Plan

Hardware procurement, solution validation, and software development should be completed within 30 working days. Invest 5 people for 30 days.

3. Installation and Debugging Plan

After the system development is completed, installation and debugging will be completed within 10 working days, with 6 people and 10 days invested.

4. System Maintenance Plan

The software system provides 3 years of maintenance. If there are problems that the customer cannot solve on their own, they will be dealt with on-site within 24 hours.

Eighth, Service Commitment

1. Pre Sales Service

The company has an obligation to provide customers with detailed introductions of relevant products.

The company is responsible for providing technical lectures on related products to users, including product usage and maintenance, product assembly, product usage characteristics, and other technical issues. If users need to provide services, the company will dispatch the best engineering and technical personnel to provide services and technical lectures to customers.

The company has set up a service hotline to answer various product related questions and difficulties for users, with a service hotline number.

2. In Sales Services

For newly developed users, the marketing department will contact the customer by phone within one week of the arrival of the goods to inquire about the acceptance status, including whether the product quality can meet the customer's needs, transportation methods, packaging conditions, and other customer requirements.

For newly developed products, it is required to deliver the goods to the user, introduce the product to the user, assist the user in installation, introduce the usage method and technical requirements.

Key users should send personnel to visit once to twice a quarter to solicit opinions and solve the problems raised by users.

3. After-sale Service

Forward Technology provides one-year maintenance for our company's products. The maintenance period starts from the date of project acceptance. During the maintenance period, malfunctions caused by technical issues within the system or other non-human factors shall be covered by the company's warranty. After the maintenance period expires, sign a separate maintenance agreement. To ensure the good operation of the system, the specific maintenance plan is as follows:

1) Establish installation, daily maintenance, and repair service records to record the use and repair of equipment.

2) Regularly conduct on-site follow-up visits to address specific issues encountered during use and take preventive measures.

3) Assign a dedicated person to coordinate the after-sales service work of this project.

4) Provide long-term backup components for hardware equipment, replace them first and then repair them to ensure the normal use of customers.

5) Provide system usage training and software maintenance.

6) Assist in providing consumables and ensure the supply of consumables.

7) We will comprehensively consider the after-sales service of this project in terms of management, system, materials, and technology, providing comprehensive guarantees for the system to have fewer and no problems.

4. Fault Handling Commitment

During the warranty period, any issues with the system should be resolved first by phone. If they cannot be resolved by phone, someone should be sent to the site for guidance as soon as possible.

After the warranty period, both parties may sign a separate agreement on software upgrades and improvements based on the actual situation.