

# Design of Smart Sign System Based on RFID and Mobile Communication Technology

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**Abstract:** RFID and mobile communication technology and other departments in the enterprise can get more extensive application in the process. But there are some disadvantages. The system design process is not to achieve further scientific and reasonable. Many enterprises and departments for the understanding of the intelligence check system process is relatively one-sided. It did not make the true value of intelligent check-in system maximized. And for other departments in the enterprise of the corresponding negative effect in efficiency. From the point of the development of science and technology, RFID and mobile communication technology has been widely used in many different areas. In the development process of intelligent check in system, however, the use of RFID and mobile communication technology process and the embodiment of the importance and don't get too much. Eventually lead to only sign in system just to stay on the surface, but did not get deep mining. In this paper, combining the current situation of the corresponding research process, further exploration and development for the future to lay a solid theoretical basis.

**Keywords:** Radio frequency identification, the mobile communication technology, smart sign in system, design research.

## 1. INTRODUCTION

The mobile communication technology is widely used for enterprise development provides a great support, makes the enterprise work efficiency greatly improve, thus achieve the goal of fast development. However, RFID and mobile communication technology in the process of the enterprise and the related department to sign in name is not obvious. As reflected in the intelligent system of intelligent characteristics have not been on full display. Work on its efficiency and sign in the accuracy of certain factors control.

In this paper, combining with the status quo of its intelligent check-in system further process. In this through the system as a whole design process simple. And combine the specific hardware parts and design its sign in intelligent system for comprehensive embodiment [1]. From which to effectively improve its database, makes the research and development and application of intelligent check-in system is able to get a solid data base. And for each function module for effective overview. It is the embodiment of its function to be more direct, to ensure that RFID and mobile communication technology of intelligent sign in system design process is rigorous.

## 2. THE SYSTEM OVERALL DESIGN

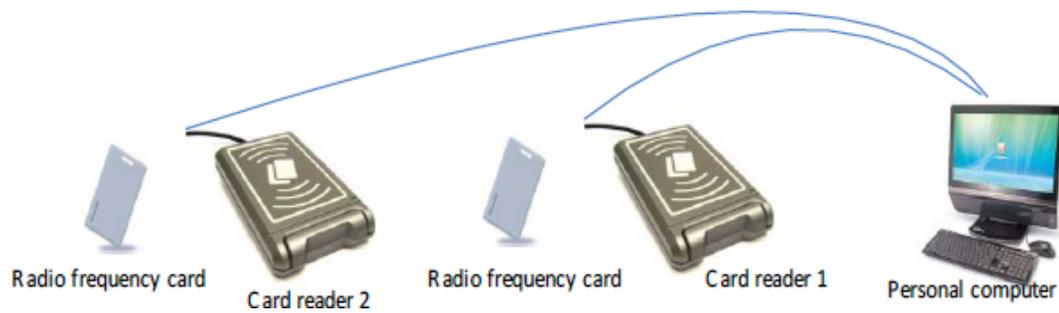
RFIDMss system structure as shown in Fig. (1). It with non-contact IC card as data carrier, MC68HCgo8JLSMCU

as main control chip, implement the relevant departments of this unit staff meeting attendance paperless. Management, reduces the error of artificial management, greatly improve the efficiency of management. This system consists of hardware and related application software of two parts. The hardware part mainly card reader, used to complete the recognition of rf card. When the participants of the radio frequency card into the card reader induction area, card reader in the reading card module can automatically, quickly and accurately record the participants at the card number. And sending to a card reader in the Mcu, Mcu will read the card number to the connected to the PC through the wires, by PC software related sign in oh card processing. Software part by MCU and PC software, both mutual cooperation, common to complete the sign in to continue the operation of the credit card. In addition, the PC side software also has the functions such as query and related database maintenance. Specific content in detail later. The whole system operation friendly interface, simple and practical.

## 3. THE HARDWARE PART OF THE DESIGN

The hardware part of the design process is mainly reflected in the design of card reader, from its market value is a tiny part of the RFID system composition of the hardware. And the most fundamental hardware part should contain several important aspects, the first is RFID unit, carrying the goal without specific information transmission between the second to have unit of the antenna, the third is the receiver and transmitter. The last is to read and write [2].

This a few important hardware constitute a system, to meet the specific needs of different things, in this process it



**Fig. (1).** RFIDMSS system structure diagram.

is important to note that separate independent design according to their own needs. In this paper, combining the corresponding research, through reading and writing modules of the system hardware design process further.

## 2.2. Experiment on Basic Physical Properties of High Liquid Limit Soil

### 3.1. The MTP-K4 Read-only Module

In read-only module hardware design, the use of the Beijing 125 kHz far xing: radio frequency card reader module (original) in Taiwan. MIP a K4 by antenna to send out a certain frequency of rf signal, when the rf card after arrived in magnetic field will get the corresponding energy supply, which will effectively to send its own coding and other relevant information, after the MTP K4 will these data and information effectively to accept. And want to server for data transmission, data could be more properly processed. Among the characteristics of the module itself can get further. First is the relatively stable performance, signal transmission effect can get effective safeguard. Also ideal for manufacturing cost at the same time, its high cost performance. The second is that card read distance has a great advantage, from the perspective of a generally small card reader card read distance, usually only stay between five to ten centimeters, and the MIP K4 read-only module maximum card read distance can maintain at about 30 cm [3]. And the third is read card in the process of reaction rate is relatively sensitive, for radio frequency card read process can keep well, and in the whole process of reading card won't appear any error, so for the validity of the card read process can provide a more effective guarantee. To complete the crash more effective to solve problems. Provide all the technical information module. A conjunction with MTP K4 module production of all kinds of card reader, can be directly and visually auxiliary users with various microcontroller embedded application development. Without a single chip microcomputer secondary development could directly use MTP K4 module, in A direct reading card number to the target device (such as computers, entrance guard controller, etc.).

### 3.2. SD-I Rrln Hardware Design of Card Reader

In today's society and the future development, for the direction of the RFID card reader used by a few specific hardware mainly from several aspects. First is Switzerland imports read-only card, rf card read by Taiwan's original production module manufacturers and MOTOROLA chip and

LCD liquid crystal display and so on. This card reader besides has the corresponding reading and writing module, but also has special features, mainly card number output way, keep the dc power supply in the whole process of reading card, the keyboard area stores do not need to connect the external power supply. In the process of wire by card reader side access, this card reader can be placed on the desktop. It can also be fixed on the wall, concrete hardware parts by Fig. (2) can be clearly visible.

## 4. THE PC SOFTWARE DESIGN

In the process of this paper, the PC software design using visualBasic6.0 language to write effectively, through means of ADO database access, data collection and sorting.

### 4.1. Database Design

In the system database design and construction process, the first internal basic information for the corresponding form is established. And attendance at enterprises corresponding assessment data to determine the assessment content. In the main contains employee name, department, position and other basic information. This information sheet is to effectively statistical process unit staff. Rf card information and statistics as the main content should include staff involved AD card number, position, subordinate part, the cardholder's own working code. And so on, the information table is mainly for staff sign in information for effective statistical and records, provide convenience for later check and query process conditions [4]. Rf card information and information form close ties between employees themselves, can be seen from the content of the information table. There are a lot of the same information between the two tables, and the accuracy of the information for the cardholder's can be fully guaranteed. However in the process of enterprise development, personnel changes are more common. So the information in the process of rf card attendance also should undertake the corresponding change. In addition to its power consumption is retained, other rf card related information to synchronize changes, database for information management process to achieve a clear and effective. In the process for staff sign in information for further processing, will increase to the check-in information form employees working within the ranks of, and its position and affiliated department also add effectively, makes the personnel changes in the process. For employee information change amplitude gradually narrowed, and maintain the database between employee turnover and form a unified, coordinated development.

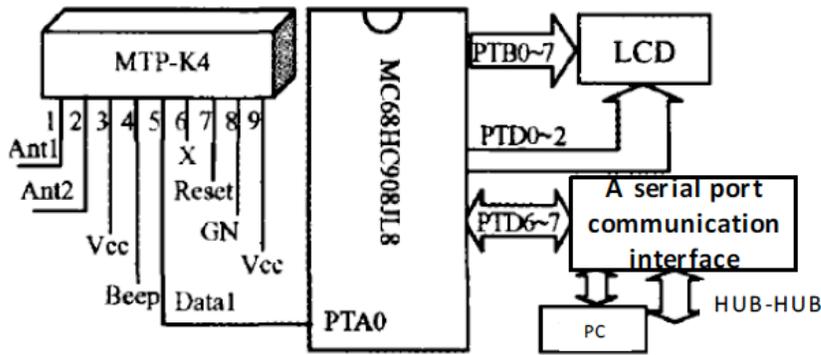


Fig. (2). Card reader hardware diagram.

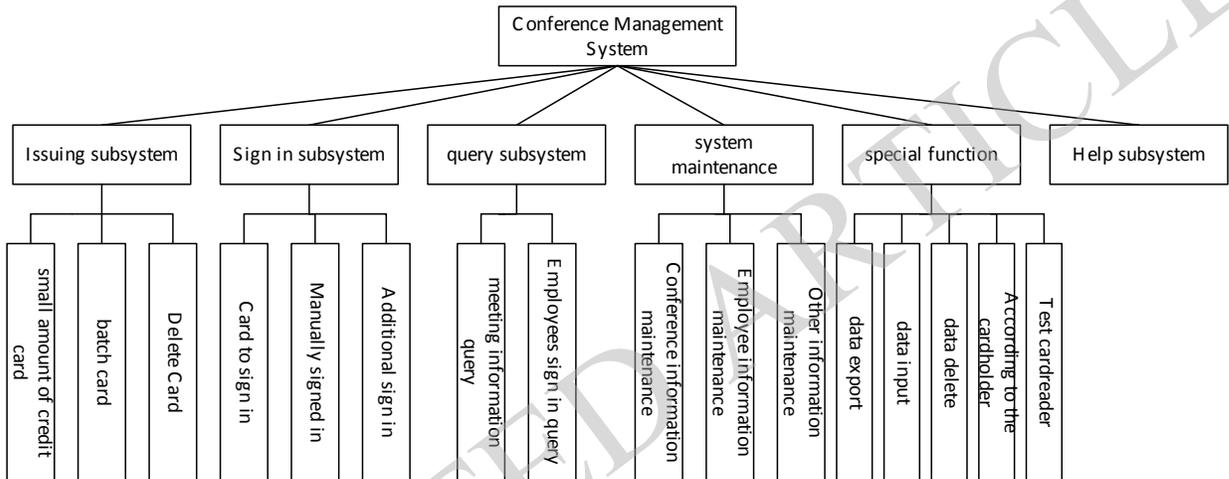


Fig. (3). RFIDMSS PC program composition block diagram.

**4.2. PC Software Functions**

RnDMSS PC side software aspects function is mainly to the MCU program for effective coordination, so as to make the check-in process can maintain more smoothly, for the former to improve efficiency at the same time. So for the simplification of the personnel management system, motivation management thoughts can provide effective help. Their respective function specific module as shown in Fig. (3), the main interface and software through the figure, will be able to reflect.

**4.3. Each Function Module Briefly**

**4.3.1. Submodule of Sending Card**

In the process of the construction of this module, mainly to achieve the ultimate goal of effective management to sign the card. In this process can be done by each employee's own data in the database information, on the fly a card with the corresponding sign in. The staff can sign in the current situation of the card is invalid, it will also to delete all the records of their employees [5].

In the process of staff on-the-job, shall be distributed to its AD card, so the effective statistical process for system data can give full guarantee.

In the process of to checkin card information registration, provided the basic information of the need to pass to the employees themselves for effective treatment. Such as effective collection and query of information by computer related work, for employees' own information don't need to do a second input, which can sign in to the card, need further query work, conversely guide audit to correct to find relevant information on the card. When employees out of work at the same time the AD card should be effectively recycled.

**4.3.2. Sign in Sub Modules**

Starting from different angles, for check-in process possible problems we consider the corresponding classification, sign in divided into three types, for personnel who hold check-in card belongs to normal sign in the sign in, and in the process of the need for credit card credit card before work. Program for progressive level will think of him even the card reader signal corresponding to shake hands, once appear. AD card brush in front of the card reader, the card reader to shake hands after successful by its signal, and then upload this information to the server [6]. Since then the server will be in a short period of time to checkin personnel information processing, which mainly covers the check-in time, leaving time and so on related information. Another type is a sign in personnel forget carry AD card, can only rely on manual for effective sign in at this moment, the need

for relevant personnel to confirm the sign in password. This is also have the corresponding effect, check-in process through check module to deal with the check-in process and complete check-in. In addition to manually signed in to ask for leave, late, leave early are able to do the corresponding data collection, and to deal effectively with its data.

However a staff to mobilize, effectively perform additional sign in this module, only need to input in this sign in with the exact name of the person. The next job this module can be automated process, which makes the check-in process more simple, small and thus can improve the efficiency.

#### 4.3.3. Query Statistics Submodule

At the end of the check-in process, computer attendance system will provide two effective reporting to management system, involves the whole sign in person here present situation and the specific situation of the personal sign in two aspects. Overall situation of check-in mainly covers should be to the person's name, the names of the actually realized people, absent the names of the people and leave, late of the specific name, and so on. And mainly involved in the late schedule of personnel is the content of the name, job number, department, jet card time and so on details. Ask for leave and detail reflects and late personnel the same information. Schedule of personnel management and absence of content is keep the same with the above content. For the staff attendance report should cover all previous in the credit card details, and management department can through own temporary need to output the report form module system, personnel management for the related units can produce positive effect.

#### 4.3.4. System Maintenance Module

This module mainly aims at is the maintenance of the database to give effective process, which can give the integrity of the whole system database provides powerful protection conditions, thus achieve the effectiveness of all the data in the database have stronger. In the process of calculation and internal data management, the basic information for each of the personnel should be saved in time, however, these data in the system installation process should be for effective transmission, which can ensure the data modification process can effectively [7]. However, these are to be carried out in the concrete implementation process should be effectively between things, according to different usage combined with transactional epicuticular personnel deployment process can be effectively modified. These should be within the whole module, this module is combined with the different nature of work in the process of design for the corresponding change.

#### 4.3.5. Special Function Module

In the process of special function modules of study, mainly provides several special functions, the following is to introduce the several functions accordingly. First, sign-in data can be effectively and give full backup, and maximum time limit can be exported to check data within a year. The second is that lies in the support system on the export of the backup data to the database, and import the data period in a

year, as well as the biggest also supports a small amount of data import process.

Third, it is for removal process can achieve systematic data, can effectively remove time to sort the data. Fourth, within the special function modules for the data compression process, enables the system storage space to maximize. Fifth, for the card reader can effectively detect process, so that to enhance the efficiency of the normal work of the card reader to be able to provide effective help. Finally by the cardholder to carry on the charge process, can carry on the clear display of its identity information, the management of the system operator provides a powerful and convenient conditions.

## 5. CONCLUSION

Above is based on RFID and mobile communication technology in intelligent check-in system carries on the effective use of the concrete research process, in the overall design, hardware design of the system and PC software design three aspects discussed. In this paper for the various functional modules, mainly covers the hair clip module, check module, query statistics module, system maintenance module, special function, the essay discusses five aspects. This makes the research process of this system is more comprehensive, specific work for further research in the late development to provide strong support.

## CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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