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# Fully Automated Token Based Appointment Calling System

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**Abstract:** *The advent Token Management System is used to manage crowds / queues efficiently by issuing tokens in customer-facing businesses and departments. Since time plays a significant role in human life, the main objective of this project is to reduce the wait time for customers and make their service smooth. Token Management system is a public initiative to help every enterprise publish their calendar of resources (people, counters, meeting rooms, interviews rooms, queues etc) along with their available capacity and time slots for the public to take a token. They can book their own appointment by their name and receive a token online (no OTP, email or mobile number is mandatory).This will help avoid unwanted queues and waiting time for the public. It also brings significant discipline and saves a lot of time which when put together saves billions of hours every day.A Fully Automated Token-Based Appointment Calling System is a modern, technology-driven solution designed to streamline and optimize the appointment and queuing processes in various service-oriented environments. These systems aim to eliminate the chaos and inefficiency often associated with traditional waiting lines, providing a more organized and pleasant experience for both service providers and customers..*

**Keywords:** Appointment Calling, RFID Tokens, Voice announcement, Automation, IOT

## I. INTRODUCTION

Today, reliable technology around us started gaining trust of common people and thereby making them comfortable to rely upon such emerging technology. The most enhancing technology that we are familiar with today is internet. Internet is most trustworthy, people starting using it because they can manage most of the things from anywhere in the world. Example for consistently increase in the use of internet is banking, ticket booking and so on. The reason for increase in online facility by the users because they want everything should move far, everything should happen within a blink. Because now we know how valuable the time is, we don't want to stand in the queue, waiting for our turn to come. To overcome this issue, token system technique is introduced. This system is successful in breaking the queue in front of the window. Digitation of the token system makes it more comfortable for the employees and also to customers to, because now they can sit in the bank premises instead of standing in a line. Still people have to spend their time in waiting of the number to come. In this project, we are going to introduce a new system which can successfully reduce the waiting time of the customer in the bank. Token system is specially designed to bring about to prefer, efficiency and comfort in places such as banks, railway stations, public utility offices, health care and other places where people have to wait on the line to get a service. Initial concept of token system is to reduce a real and apparent waiting time, speed up service delivery, improves services quality and increases customer satisfaction. In this project we are using GSM based token system. The GSM modem is used to send and alert SMS to the respective token holder before his turn to come.

This will help avoid unwanted queues and waiting time for the public. It also brings significant discipline and saves a lot of time which when put together saves billions of hours every day and also decrease staff idle time. • Token Management System will help organizations manage their services by automating and simplifying the process of booking appointments. Use of digital token - which certifies the bearer's rights to some kind of products or services - is


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quite common nowadays for its convenience, ease of use and cost-effectiveness. Many of such digital tokens, however, are produced with software alone, making them vulnerable to forgery, including alteration and duplication. For a more secure safeguard for both token owner's right and service provider's accountability, digital tokens should be tamper-resistant as much as possible in order for them to withstand physical attacks as well.

## II. LITERATURE SURVEY

A literature review discusses published information in a subject area, and sometimes information in a particular subject area within a certain time period. A literature review can be just a simple summary of the sources, but it usually has an organizational pattern and combines both summary and synthesis. A summary is a recap of the important information of the source, but a synthesis is a re-organization, or a reshuffling, of that information. It might give a new interpretation of old material or combine new with old interpretations. Or it might trace the intellectual progression of the field, including major debates. And depending on the situation, the literature review may evaluate the sources and advise the reader on the most pertinent or relevant.

***Title:Mobile-Augmented Smart Queue Management System for Hospitals*** Author: Sudeep Rai, Priyesh Ranjan, Amarjeet Singh Cheema, Praveen K Srivastava Abstract: They presented a method on how to use "Queue management system" which has unique properties and that are entirely different from other standard solutions available in the market. Patients often need to queue up at various service areas in hospitals such as at registration, laboratory test and bill payment counters. It provides multiple interfaces for token generation and consumption on mobile devices integrated with hospital service counters, while using smart algorithms for token generation and allocation

***Title: An IoT Smart Queue Management System with Real-Time Queue Tracking*** Author: Mohammed Ghazal, Rania Hamouda, Samr Ali Abstract: This paper proposes a smart queue management system for delivering real-time service request updates to clients' smart phones in the form of audio and visual feedback. The proposed system aims at reducing the dissatisfaction with services with medium to long waiting times. To this end, the system allows carriers of digital ticket to leave the waiting areas and return in time for their turn to receive service. The proposed system also improves the waiting experience of clients choosing to stay in the waiting area by connecting them to the audio signal of the often muted television sets running entertainment programs, advertisement of services, or news.

***Title: An Approach for Queue Management System of Non Critical Services*** Author: Mai Abusair, Mohammad Sharaf, Tuqa Hamad, Raghad Dahman, Shahd Abu Odeh Abstract: In many public and private sectors that provide services there are physical queues. Waiting in the queue can affect the clients experience and can exhaust them as well. On the other hand, idle time in many sectors of valuable resources, such as, healthcare sectors, can be expensive. In this paper we aim to enhance the clients experience when they are looking for non-critical services. The paper suggests an approach for appointments using queue management system. The customers in the queue are divided into several priority classes that is considered in computing the expected waiting time. To show the efficiency of the suggested approach, we applied it on healthcare vaccination system.

## III. METHOD OF DISEASE DETECTION

Well we here design a fully automated token management system that solves all these issues. The system allows for fully automatic token calling system that can operate without any errors.

The system makes use of an PIC microcontroller along with an RFID reader for sensing REID token numbers, a keypad for settings, an LED Display and buzzer for notifying and displaying token number along with basic electronics components and PCB board to develop the system.

The system uses the LED display and keypad to interact with the user. It provides to options to user on start:

- Settings Mode
- Running Mode



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In the settings mode the user is allow to adjust some settings. This includes the buzzer On/Off settings and buzzer volume settings. If buzzer is turned off it will not beep when next token number is displayed. When turned on the buzzer will beep with the volume set by user.

When the system is set in running mode, it begins operation for token system. We hereby use RFID tokens for demonstrations. The tokens have a number written on them and are kept on desk for customers to pick up when they arrive.

When a customer picks up a token, he/she needs to scan it on the system. The system has an integrated RFID reader that monitors for RFID tags. As soon as the user scans a Token, the number associated with the tag is stored in the controller list.

New additions are added in the end of the list. The list tokens are now treated on a FIFO basis for token calling. The First token inserted in the system is the first token to be called. The doctor/receptionist/operator needs to press a button on keypad to indicate current token session has ended, and then next token number is to be called. The token number that has been called is then deleted from that list.

In this way the system keeps on storing new token scans in a FIFO list and then calls them in the same order as inserted. Thus the system keeps operating the appointments automatically without any delay or error. Thus the system puts forth a fully functional automatic token calling system using RFID.

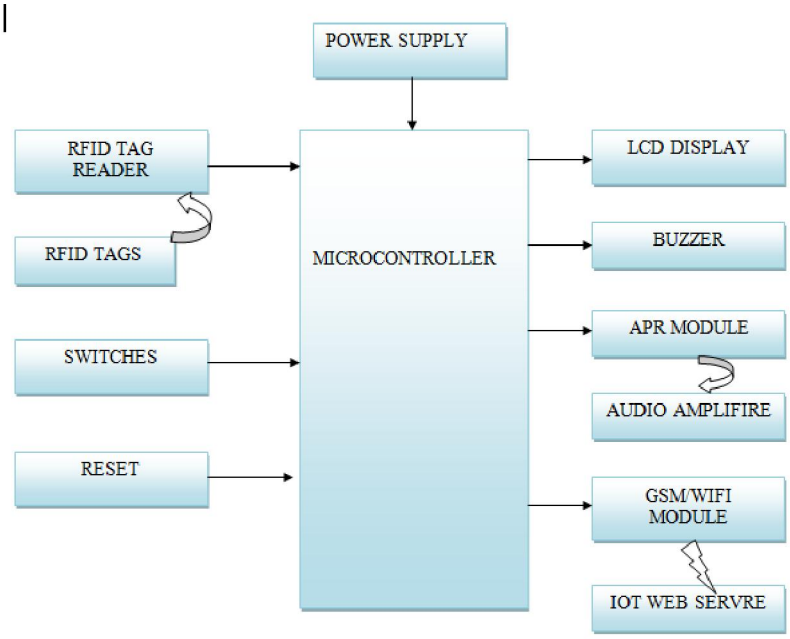


Fig. 1. Block Diagram

**PIC18f4520Microcontroller**

PIC18f4520 is a 40 PIN Micro-controller from Microchip with 13 channel 10 bit Analog to Digital Converter.

Special PIC18f4520 Micro controller Features

- Up to 10 MIPS Performance at 3V
- C compiler optimized RISC architecture
- 10-bit ADC, 13 channels, 100K samples per second
- Programmable Low Voltage Detection Module
- Master Synchronous Serial Port supports SPI™ and I2C™ master and slave mode
- EUSART module including LIN bus support


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- Four Timer modules
- Up to 5 PWM outputs


Fig. 2. PIC 18f4520

**RFID Tag Reader**

It is used to read unique ID from RFID tags. Whenever RFID tags comes in range, RFID reader reads its unique ID and transmits it serially to the microcontroller or PC. RFID reader has transceiver and an antenna mounted on it. It is mostly fixed in stationary position.When RFID tag comes in range of signal transmitted by the reader, transponder in the tag is hit by this signal. A tag draws power from the electromagnetic field created by reader. Then, the transponder converts that radio signal into the usable power. After getting power, transponder sends all the information it has stored in it, such as unique ID to the RFID reader in the form of RF signal. Then, RFID reader puts this unique ID data in the form of byte on serial Tx (transmit) pin. This data can be used or accessed by PC or microcontroller serially using UART communication.

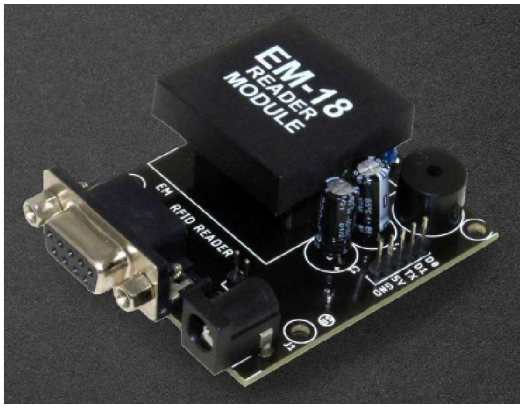


Fig. 3.Em18 RFID Tag Reader

**Audio Player**

Board plays wav files from memory card giving high quality sound output. The board is controlled from an external microcontroller or PC which sends simple ASCII string telling board what to play. You can also give it external triggers if you want standalone operation. The board is a tiny Audio-Sound module that can play back pre-stored audio files such as voice and music from a micro-SD memory card. The module supports various 8/16 bit stereo/mono uncompress audio files having sampling rate from 8Khz to 48Khz. By using the free available software tool, any audio file(WAV, MP3, PCM, etc) can be easily converted to supported format. The compact board takes minimal board space and is ideal for any application that required embedded audio.


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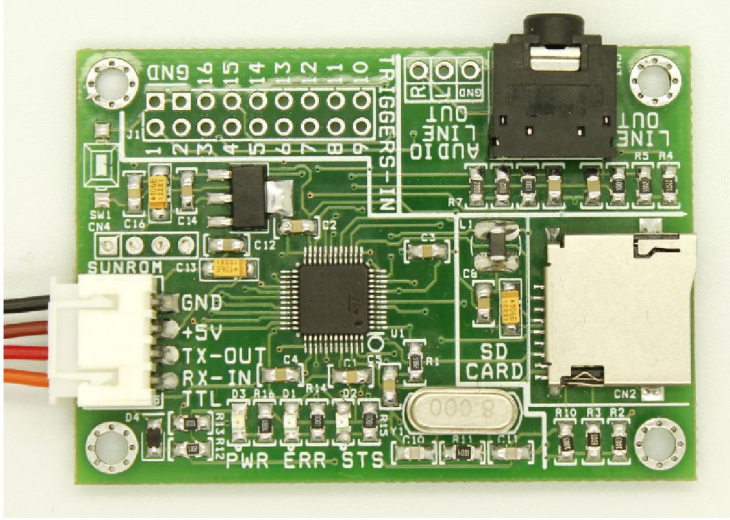


Fig. 4.Audio Player

**GSM Module**

The Sim800C GPRS/GSM Shield with Antenna provides you with a way to use the GSM phone network to receive data from a remote location，and it is compatible with all boards which have the same form factor (and pinout) as a standard Arduino Board. This shield can also be applied to DIY phones for calling, receiving and sending messages, making GPS trackers or other applications like Smart home, etc.

Fig -5:GSM Module

**LCD Display**

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD


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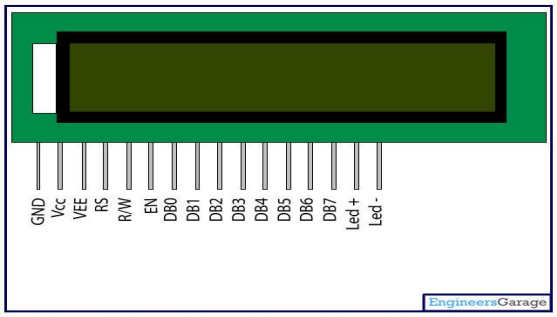


Fig. 7.LCD Display

## IV. CONCLUSION

This project is a small step towards making life easy. The waiting time for ones turn to come in a long queue could be easily overcome by this project. Mobile phones gave a new dimension to the Remote access mode of communication system. The main aim of this system is to minimize the waiting time in long queues and also to reduce the crowd in the premises. By installing this systems in such places will help people to save their time and it also help to cost of space requires for the construction of waiting room by reducing the crowd. This project exploits the full facilities of IOT communication service. Hence establishing a strong reliable communication link between server and User. This project, guarantees an efficient synchronization between Man and Machine and step much clearer than the existing technology, ensuring the freedom of life.

***Benefits:***

- Reduced Wait Times: Automation minimizes delays and ensures efficient customer flow.
- Improved Customer Experience: A structured and organized queuing system enhances customer satisfaction.
- Increased Service Efficiency: Service providers can focus on delivering services rather than managing queues.
- Enhanced Organization: The system provides a clear and transparent view of the queue, reducing confusion and frustration.
- Data-Driven Optimization: Data analytics enable service providers to identify areas for improvement.

***Applications:***

- Hospitals and Clinics
- Banks and Financial Institutions
- Government Offices
- Customer Service Centers
- Restaurants and Retail Stores

In essence, a Fully Automated Token-Based Appointment Calling System leverages technology to create a more efficient, organized, and customer-friendly service environment.

## ACKNOWLEDGMENT

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