

Novel Method of Design of E-Vaccination based Integrated System for Covid 19

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Abstract. Different countries will have different standards, so an international traveller who has received all of his vaccinations from different countries may find himself in the Unvaccinated category when he returns to his home country. To avoid this, a global solution such as an International Vaccination Chip that can be scanned anywhere globally and make the Vaccination based entry should be proposed. For Security checking of Vaccination based entry in the existing system corrupted people will show some body's vaccination certificate and get entry into these crowd gathering places, these people sometimes may carry covid-19 Virus and may lead to a massive spread, so in our proposed system person who carries a Vaccination Chip stand in front of the security person he will be having a unit which will shows the Photo Identity and the Vaccination details fetched from the International Vaccine Page with live body temperature of the person standing in front of the security check in.

Keywords: Covid 19, vaccination chip system, IoT, E-Vaccination, Digital vaccination.

INTRODUCTION

Covid 19 is a completely automated, on-demand oxygen delivery and treatment device designed to offer life-saving therapies to patients in an emergency [1]. Covid 19, developed and produced by Aethlon Medical team members, combines a novel mix of powerful artificial intelligence and 3D printing to provide precise dosages of oxygen to patients who have few or no signs of hypoxia. Covid 19 can provide high-quality oxygen to patients in a fraction of the time that typical therapies need. The Covid 19 system can give an uninterrupted supply of oxygen to patients, decreasing the load on emergency responders and hospitals [2].

Scientists and researchers discovered that Covid-19 becomes an endemic over the next decade each time various mutations of Corona Virus produce distinct versions. Medicines and immunizations used for prior variants and mutations have little effect on the newly detected Corona Virus variants [3]. As a preventative step, various booster injections of Covid-19 Vaccination should be taken each time for preventing isolation/quarantine and illness transmission to others [4].

Vaccination-based entrance security checks in airports, movie theatres, shopping malls, and other public places where masses gather are causing problems for foreign travellers and international workers [5]. There is no common platform for identifying individuals who had varied vaccine doses from different countries due to different governments' limits on citizens' personal data sharing [6]. Different countries have several criteria; therefore, an international traveller who has obtained all of his vaccines from different countries may find himself in the Unvaccinated group when he returns home [7]. To circumvent this, a worldwide solution should be suggested, such as an International Vaccination Chip that can be read anywhere in the world and create the Vaccination-based entry [8].

Long before the pandemic, the health care industry recognised the benefits of IoT devices. These technologies had already proven their worth in a variety of industries before COVID-19 put them to the test. From the outside, the importance of IoT in vaccination deployment may not be immediately obvious. IoT devices can also be useful after patients have received their vaccines [9]. Both the Modern and Pfizer vaccines require two doses, and patients may be reminded of this via wearables. Many individuals currently use health wearables such as smartwatches, making it simple to utilise these devices to track their immunizations [10]. IoT devices can help hospitals increase the efficiency of their record-keeping systems [11]. The more effective these

procedures become, the better hospitals will be able to maintain track of immunisation data. As a result, the vaccination deployment will be more successful overall [12].

A vaccination certificate is a health document that documents a vaccination service received by an individual [13]. It is generally in the form of a paper card that includes critical facts about the vaccinated individual, vaccine delivered, date administered, and other data in the core data set [14]. Digital vaccination certificates are electronic immunisation records that can be accessed by both the vaccinated individual and authorised health personnel, and they may be used in the same way as paper vaccination cards: to maintain continuity of treatment or to give evidence of vaccination [15]. The main objectives are

1. To create a safety mechanism because there is no common platform to identify people who received varied vaccination doses from different nations due to different governments' restrictions on citizens' personal data sharing.
2. Vaccination doses from different countries may result in him being classed as unvaccinated when he returns to his native country. To avoid this, a global solution, such as an International Vaccination Chip that can be scanned anywhere in the globe and produce the Vaccination-based admission, should be made available.

RESEARCH METHODOLOGY

This project comprises four different modules,

1. Digital Vaccination CHIP module for the public.
2. Vaccination status checking unit for all the vaccination checking places like Restaurants and malls.
3. Vaccination status update Server Page for the govt and private medical sectors
4. Mobile scanner app.

Digital Vaccination chip as shown in Figure 1, contains IoT enabled controller with QR display unit to show the QR at the entry places of the vaccination checking. Vaccination Checking Unit contains wireless receiver to receive the code from scanner app and TFT display to display the Name [16], Age, photo, Vaccination status like partial, fully and booster etc. of the respective public. Vaccination status updater page is for update the vaccination details for every public who is taken the dose every time.

VACCINATION CHIP UNIT

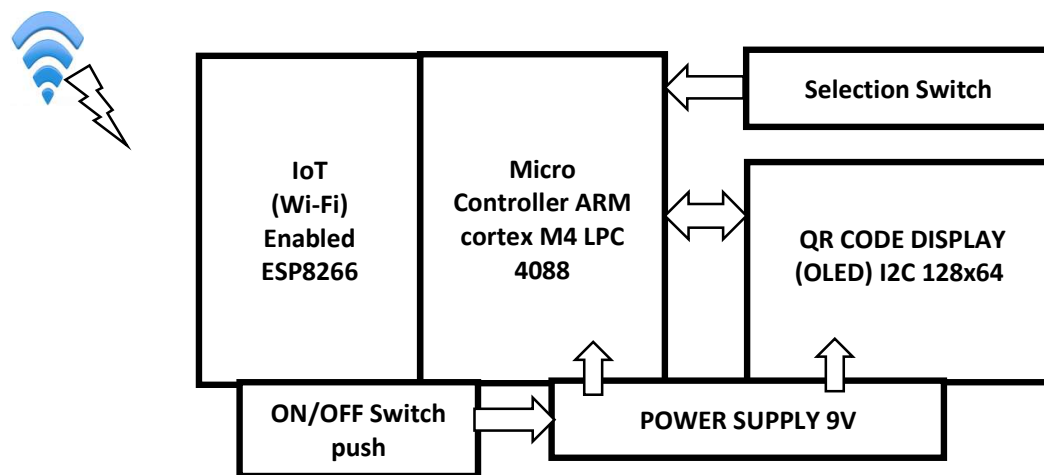


FIGURE 1. Vaccination Chip Unit

Here the chip unit consists of the microcontroller to control all things and QR code display to view the code. Although there are many kinds of Cortex, the ARM Cortex A8 is the most common one. A Cortex A8 is the most basic and most well-known Cortex architecture. The ARM Cortex is the CPU that is used to build the Raspberry Pi. It is a very versatile CPU which can be programmed to run a wide number of different applications, but one of the most popular among them is the ARM Cortex A8.

This is a Cortex M3 processor. ARM Cortex is a series of microprocessor cores based on the ARMv7 architecture. The ARM Cortex processors have a number of advantages over the x86 architecture that power most personal computers. They have high performance; support multitasking, and have excellent power management.

VACCINATION STATUS DISPLAY UNIT

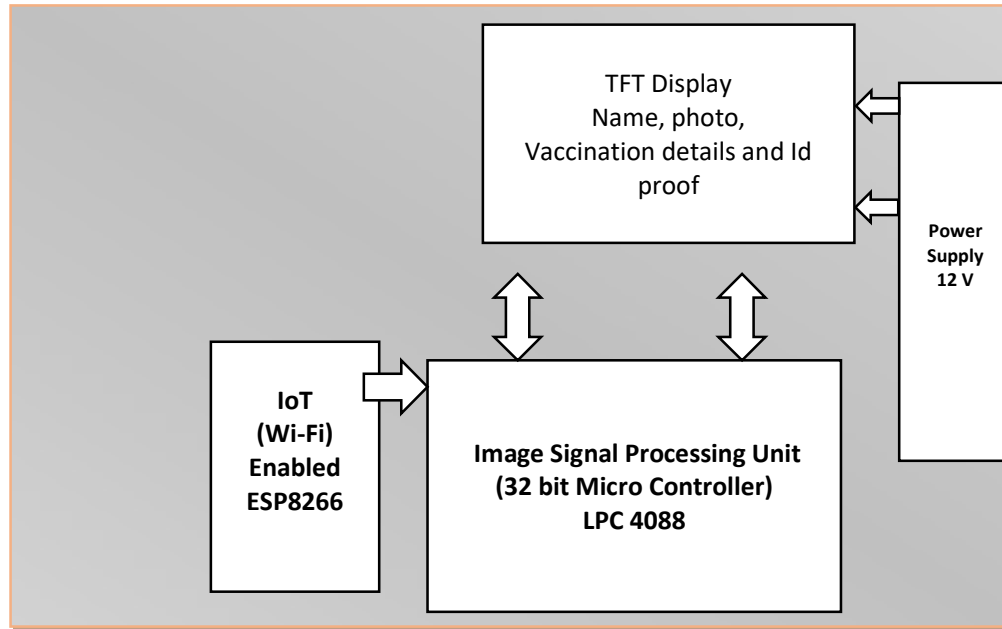


FIGURE 2. Vaccination Status Display Unit

The internet of things is a collection of hardware, software, and devices that enable people to use data from devices and sensors in their everyday life. For example, a camera can be used to take photos, and a speaker can be used to make sound. The internet of things can be used to allow people to take photos and make sound, or it can be used to enable people to use the internet of things to communicate with other people. Figure 2 shows the display unit. IoT is a new concept in the world of smart things that can interact with each other and the Internet. Figure 3 shows the webpage.

Using a mobile device such as a clinical smartphone or tablet, a healthcare professional will produce an electronic record of an individual's immunisation. The issuer creates a secure smartcard or label and distributes it to the vaccinated person. It will feature a barcode or QR code embedded with vaccination data, which may be validated later with a simple scan. The health status is recorded 'inside' the card or label, with a backup on the IOT available as an option. This is a practical choice for people who have digitalized their wallets and do not want to risk losing the document identification. Their current health state is now saved locally on the device, with a backup option. This helps to prevent fraud while also making it possible to simply change a printed label or card credential if necessary. The user will be allowed to continue about his or her business immediately since the verifier will have no reason to doubt the correctness of the vaccination proof.

HARDWARE Requirements:

1. QR Scanner
2. TFT Display
3. Wi-Fi
4. OLED Display
5. Microcontroller

SOFTWARE Requirements:

1. Embedded C
2. IDE
3. php
4. Android app

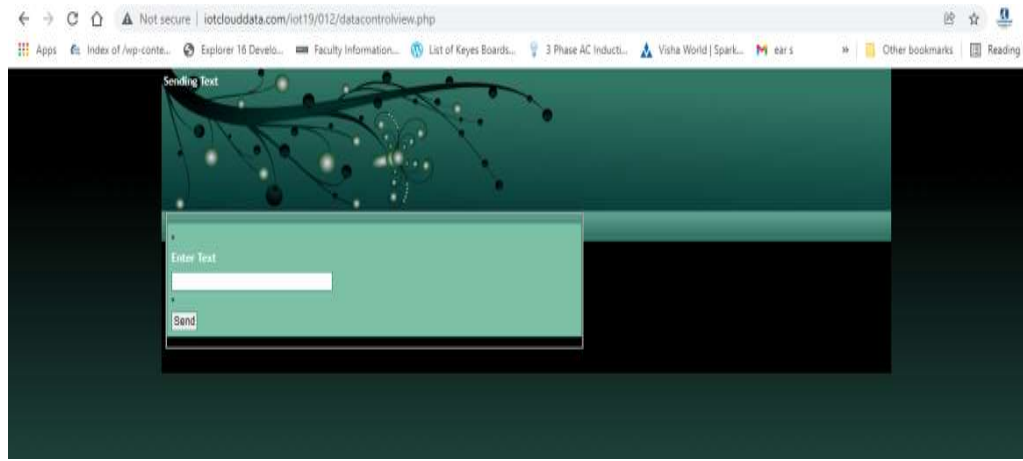


Figure 3. Status Updating Page

RESULTS AND DISCUSSION

Vaccination dosages from different countries may result in his being classed as unvaccinated when he returns to his native country. To avoid this, a global solution, such as an International Vaccination Chip that can be scanned anywhere in the globe and produce the Vaccination-based admission, should be made available. In our suggested system, if a person with a Vaccination Chip stands in front of the security checkpoint as shown in Figure 5, he will have a unit that displays the Photo Identity and Vaccination data acquired from the International Vaccine Page as well as the person's live body temperature.



Figure 5. Proposed Module

International travellers and international workers have issues with vaccination-based entrance security checks in airports, movie theatres, shopping malls, and other public venues where crowds assemble. Due to different governments' restrictions on citizens' personal data sharing, there is no single platform for identifying individuals who received different vaccination doses from different nations to ensure the security of vaccination-based entries in the present system. Corrupted persons will produce someone else's vaccination certificate and gain admission into these crowd meeting locations; these people may transmit the Covid-19 Virus, resulting in a tremendous proliferation.

CONCLUSION

However, not all countries are developing vaccine verification frameworks at the same rate, and there are gaps in the rules outlining when, when, and how immunisation must be validated. This fragmentation causes dissatisfaction and delays. It also creates holes in a process that, in order to be most successful, must be implemented universally. As a result, many people are beginning to question whether it is really conceivable to develop a verification system that is available and accepted by all participants worldwide. The sensing platform intends to increase people's self-awareness of COVID-19 risk factors or symptoms, as well as hot spot locations and contact tracking data. Aside from self-assessment of symptoms, the system may be modified to add "new sensors and collect information such as vaccination status," according to the researchers. So, under our suggested system, if a person with a Vaccination Chip stands in front of a security checkpoint, he will have a unit that displays the Photo Identity and Vaccination data acquired from the International Vaccine Page, as well as the person's live body temperature.

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