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LOW-COST SYSTEM FOR THE MANAGEMENT OF PORTABLE BASIC
CLINICAL INFORMATION, THROUGH THE USE OF RFID
TECHNOLOGIES

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ABSTRACT

Information and communication technologies are causing a positive impact on people's lives, from communication through mobile devices, which can also be used in multiple applications, such as educational, recreation, among others. One of the areas where it is causing a greater impact is health, because of how important the use of technology is both in diagnosis and treatment, it could be said that in health systems, technology is your best ally, In the present work, a low-cost system is proposed for the management of basic and necessary clinical information, which can be a determining factor in the preservation of the

person's life. There are certain factors that can help maintain people's lives in an emergency, such as blood type, if you are allergic to a certain medication, if you have a heart problem, diabetes problems, knowing your personal information, this Information must always be available and at all times. As a result of this research, it is to present a protocol for the management of this information that everyone can carry either as an identification card or as a key ring. What can be decisive in emergency cases.

Introduction

The clinical information of people is a very important asset, so much so that it can be decisive in emergency cases where life is in danger, this information must be 100% available at all times, even when the patient is not in the capabilities to provide them. The information that must be available at all times are: blood type, drug allergies, operations, heart problems, among others.

RFID devices are being used very frequently in different areas of knowledge and in daily practice, we can find the use of this technology in the processes of identifying workers as a mechanism for registering attendance [1]. In access to places is another of the techniques where RFID devices are used, being able to control and have the record of all the people who enter and leave a certain environment is important to maintain the security of the facilities [2]. In the health area, computer solutions using RFID technology are emerging every time, we can indicate the use where they are used to have available information regarding the medicine that is supplied to patients in a medical center [3].

They are also used in the control of processes to analyze the consumption levels of certain materials used, mishandling of these processes can cause major problems, as is what happens in the pharmaceutical industry, where concentrations have to be accurately controlled. of components at the time of drug manufacture [4]. In the equipment maintenance process, we also find certain applications based on RFID, where the main idea is to be able to locate and locate the equipment, working in conjunction with systems connected to multiple readers where the location of the equipment that is being used can be located with greater accuracy. find an RFID controller inserted [5]. We also find applications where the objective is to control the stock, an area where it is applied is in the pharmaceutical industry, where the stock of medicine present in warehouses is controlled by RFID technology [6]. Finally, we can also identify the use of these devices in the control of car parking lots using mobile devices, which help to control the capacity of these and with it a greater degree of service to customers.

In the proposed sample, RFID technology is used, for the registration and storage of basic clinical information of people, so that they can be available in the event of any medical emergency and can help save their life, with this we managed to locate RFID technology as an ally in the care of people's health and as we develop different applications, its potential will be noticed and how to take advantage of it for the benefit of people.

Materials and methods

The proposed methodology consists of 3 processes, where it is considered at first, the selection of information to be considered essential in order to ensure the continuity of a person's life in a medical emergency situation, to have this information it is vital to ensure adequate medical care, after selecting the information it is necessary to have a means that is portable and easy to use for storing this information and that everyone can carry it, that is why the RFID device was selected that ensures a practicality in use and easy handling both for the medical part and for people. Finally, a protocol for reading the information contained in the device is presented, therefore certain necessary steps are defined to ensure the integrity of the information.

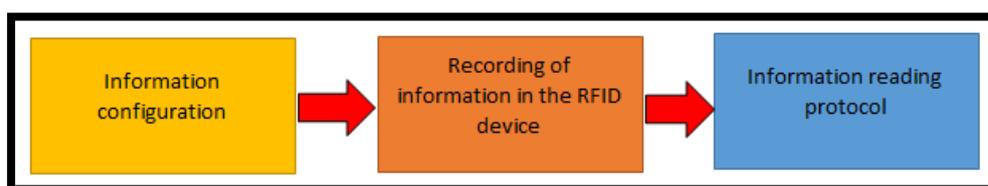


Image 1. Methodology of the proposal

Information configuration: the device configuration is the starting point of the methodology, being able to select the type of information that is considered necessary is essential, in this sense we can consider the following information to be recorded in the RFID device:

1. DNI
2. Blood type
3. RH factor
4. Allergic 1
5. Allergic 2
6. Allergic 3
7. Problem 1
8. Problem 2
9. Problem 4
10. Mail
11. Reference phone

In order to design the information reading protocol, it is necessary that the name and order of the data be taken into consideration so that there is data integrity.

Recording the information in the RFID device: After having analyzed and designated the order of the data to be used, it is necessary to record in the order according to the memory capacity of the RFID reading device, therefore it is only necessary to record the data, instead of the label that identifies the data.

Results

Below is a presentation of the devices to be used to check the operation of the proposal, it consists of a card for reading and recording information and a recording device that will be carried by everyone:

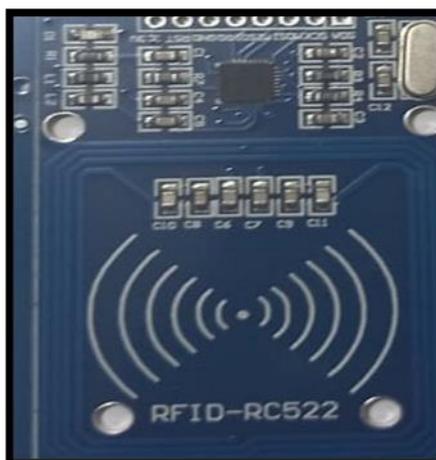


Image 2. RFID reader card, model RFID-RC522

In figure 2, the card that is necessary for both recording and reading the data is presented, this card is connected to the computer application developed to interact with the storage device.



Figure 3. RFID recording device, in the keychain presentation

In figure 3, the RFID-based storage device is presented, in the keychain presentation, it is where the necessary data for a future medical emergency will be recorded. This keychain must be carried by everyone and accessible to health personnel in case of emergency.

Example of information to be recorded in the device:

01256874,A,+,aines,0,0,Pressure,coronary,pacemaker,manuel.paredes@hotmail.com,5879858

It must be taken into consideration that the complementary personal data will be obtained with the DNI number, for this it is required that the data contained in the DNI be up to date, such as the current address.

Information reading protocol: The reading protocol is of vital importance in the handling of the information contained in the RFID device, because the information it contains must be read in an order and with criteria to ensure the integrity of the information and thereby ensure the effectiveness of the methodology, the criterion of the protocol is as follows:

1. When there is no information that can be saved in the device, for example, it is necessary to save two names, but the person only has 1, the value "0" is placed, indicating that there is no information in that field.
2. To ensure the integrity of the information, the data is read continuously until a “;” is located, this ensures that the data is between the two commas.
3. Depending on the health center, certain applications can be made to read the information that the RFID cards may contain, being able to present applications, readings in notepad format or other reading applications.

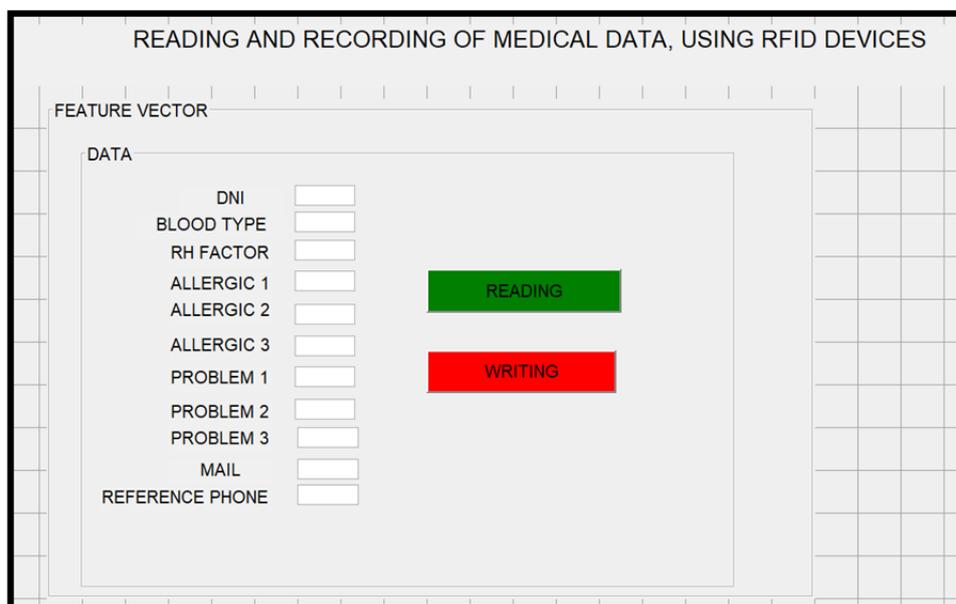


Figure 4. Interface developed for reading and writing the data of the RFID device

In Figure 4, a developed application is presented, which allows both the reading of the data contained in the RFID device, as well as allows saving and updating the data, this interface only allows the reading of the data, to

have the primary information, You must consider that with the data of the DNI number; other data can be obtained, the protocol only allows access to the DNI number; Due to the information capacity that the RFID keychain can store, we only save important information, with the DNI data, you can access the personal records system and obtain your parents, address, among other personal data that are contained in the document personal.

Conclusions

At the end of this research, it is concluded that information and communication technologies are present in all people's activities, with more emphasis on the health area. In this way, having the necessary information at the right time is possible to make critical decisions that can decide a person's life. This information is personal clinical information, such as if you are allergic to a drug, if you suffer from any disease, what type of blood you have, among other information, that if an emergency arises, they can help health personnel.

The methodology presented is practical in its application, both for health centers and for people who can carry the RFID device, the chosen model is in the form of a keychain for easy use and handling. It is necessary for the methodology to work without problems that the information management is through a system, because the information contained in the RFID device only stores the basic information and the personal identification number, with this data it can be obtained more information by accessing the national registry system of persons, therefore the impact of the methodology is expanded exponentially due to the importance of being able to use it and the advantages that can be obtained, the most important being to safeguard the life of the person, before possible health situations resulting from a medical emergency where the person's clinical information is required.

References

- Almeida Márquez, S. M. (2020). Propuesta de mejoras en el proceso de identificación por radiofrecuencia (RFID) en una Institución prestadora de servicios de salud (IPS) de cuarto nivel (Doctoral dissertation, Universidad del Rosario).
- Garnica Castillo, M., & Arevalo Angel, D. M. (2019). Construcción de un prototipo de aplicación local para el control de acceso de personal utilizando tecnología RFID en la Universidad de Cundinamarca Facatativá (Doctoral dissertation).
- Gómez, J. C. O. (2016). Sistema electrónico de control y trazabilidad de medicamentos usando Hardware Arduino con tecnología RFID-RC522. Universidad Tecnológica de Pereira. Facultad de Ingenierías Eléctrica, Electrónica, Física, y Ciencias de la Computación. Ingeniería Electrónica.
- Páez, M. A. L., Pinzón, J. M., & Morales, J. A. M. (2017). Análisis de una implementación RFID dentro de la industria farmacéutica. Ingenierías USBMed, 8(2), 37-47.

- BUSTAMANTE-Granda, W. X., MACAS-Ruiz, E. M., & QUEZADA-Sarmiento, P. A. Desarrollo de aplicación web y uso de tecnologías RFDI para la gestión de equipos computacionales.
- Morán Romero, L. G., & Peña Guano, S. I. (2018). Estudio de Factibilidad Técnica y Económica para el Control de Medicamentos por Medio de la Tecnología Rfid en los Hospitales Ubicados en la Ciudad de Guayaquil (Doctoral dissertation, Universidad de Guayaquil. Facultad de Ciencias Matemáticas y Físicas. Carrera de Ingeniería en Networking y Telecomunicaciones).