

# Credentials Students with 13.56 MHz RFID

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**Abstract**— *RFID by its initials in English Radio Frequency Identification is a system for storing and remotely retrieving data using devices called tags. The main purpose of RFID technology is to transmit the identity of an object (like a unique serial number) via radio waves. RFID technologies are grouped under the so-called Auto ID (Automatic Identification). Based on technology that makes a student identification card with the main purpose of storing personal information which we can find: name, address, phone, key voter, RFC, date of birth, age, state, county, town, school data pertaining to each educational level such as: kindergarten, elementary, middle, high school, undergraduate, and so on. Each level will store the following information: name of institution, city, state, key center, average, date, page, principal's name, registration number, and period. Thereby it would be avoided the falsification of official documents, slow registration process and / or references where information related to each person's education can be needed, and in turn contributing to the ecology avoiding the waste of paper, since with each process lots of copies are made to cover all procedures, which are unnecessary due to the emergence of new technologies which may be replaced by computer files papers.*

**Index Terms**—cards, RFID, antenna, transmitter, receiver,

## I. INTRODUCTION

With the use of RFID technology and database, this project is accomplished, which helps to have available all the information regarding personal data and school data. Radio Frequency Identification Systems Device (RFID) is composed of three elements: the reader, the label (which will be located in the instrument) and an antenna. This technology requires no direct contact or visual field between the reader and the label which will allow us to access information without the bearer has to show it. A database or bank is a set of data belonging to the same context and stored systematically for later use. At present, due to technological development in fields such as computer and electronics, most databases are in digital format (electronic), which offers a wide range of solutions to the problem of storing data <sup>[1,2]</sup>.

## II. BODIES AND SCHEMES

There are programs called database management systems for data, abbreviated SGBD to store and subsequently access data quickly and structured. The general purpose of database management systems is to manage data in a clear, simple and ordered way, a set of data which later will be converted into relevant information to an organization <sup>[3]</sup>. Databases change over time as added and deleted information. The collection of information stored in the database at a given point in time, is called an instance of the database. The overall design of the database is called a scheme of the database. In any data model

is important to distinguish between the description of the database and the database itself. The description scheme is known as the database (or metadata). This scheme is specified during the design and it is not expected to change very often. In most data models are used certain conventions for representing schemas in the form of diagrams, so the representation of a schema is called schema diagram. Figure 1 shows a schematic diagram of the database that was used in Figure 2, the diagram shows the structure of all types of records used in this work.

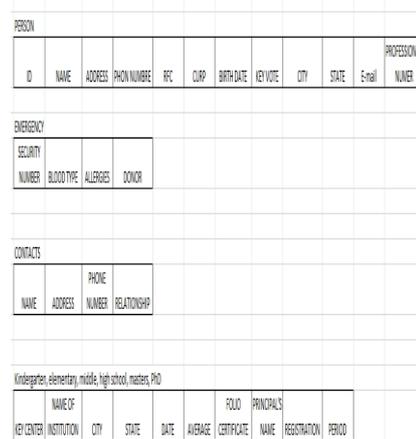


Fig 1 Diagram Schema database

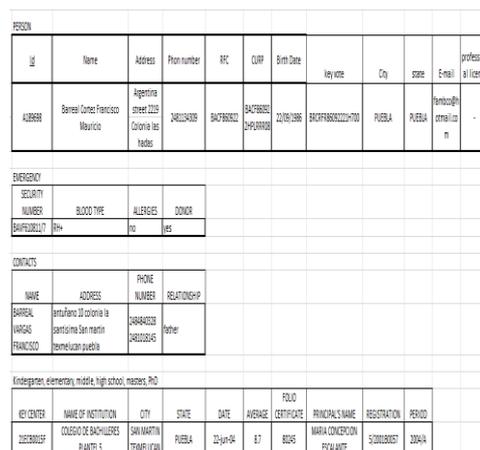


Fig 2 Diagram records

## III. ENTITY-RELATIONSHIP MODEL

The E / R model allows the designer to design the database to a higher level of abstraction, isolating it from considerations of the machine (both logical and physical level) and users in particular (externally), and focusing on a plane on which the analysis of information plays a fundamental role. Figure 3 shows the entity relationship diagram of this project <sup>[4]</sup>.

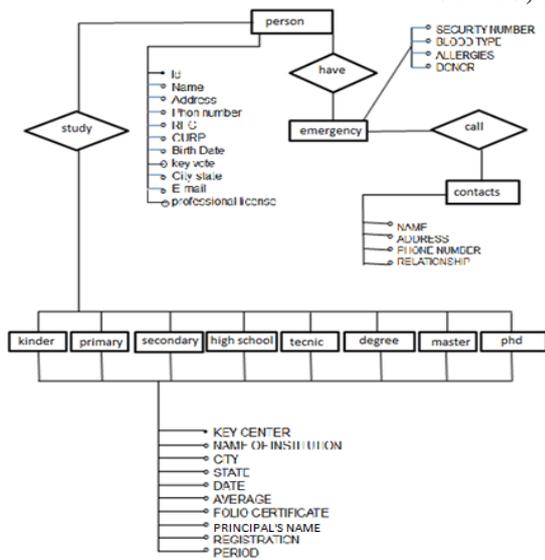


Fig 3 General diagram of the database

IV. INTERFACE

For the interface in C # is a language of object-oriented programming developed and standardized by Microsoft as part of their platform. NET [8]. In the RFID tag stores the photo and personal data which is entered in the XML format because by its nature allows information to be stored and transferred to the card system in a structured manner. Once the image data and a file will be stored within the RFID card (Figure 4), which has a capacity of 4K and whose characteristics are:

- Mifare Model
- Frequency 13.56MHz
- ISO14443A Protocol
- Size 4 Kbyte, organized in 32 sectors with 4 blocks and 8 sectors with 16 blocks each block of 16 bytes.
- PVC Material
- Temperature -20 °C - +50 °C
- Dimension 85.6 × 54 × 0.86 (mm)



Fig 4. RFID Card

To store the information in the RFID tag, you need a RFID card reader (Figure 5) with the following characteristics [5, 6, 7]:

- Model SL500
- Frequency 13.56MHz

- ISO14443A Protocol, ISO14443B, ISO15693
- USB interface
- Temperature -20 °C - +50 °C
- Dimension 110 × 80 × 26 mm
- Weight 100 g
- Windows 98 \ 2000 \ XP \ NT \ ME \ Vista
- Maximum Range 5cm



Fig 5 RFID Card Reader

You have created the following window (Figure 6) in which was made the following operations:

- Sign the card reader
- Get the serial number on the card
- Read the information stored
- Write the information inside the card

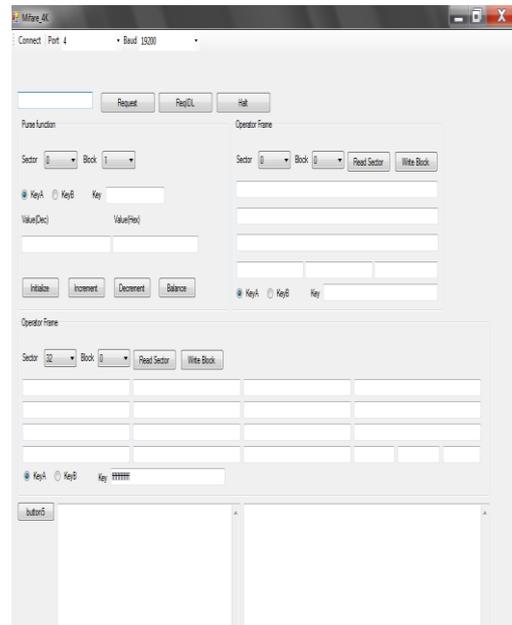


Fig 6 Window for testing the RFID card

The following figures show the interface and its operation. Figure 7 shows the main window which reads the content ID and RFID, the personal data window see Figure 8, which shows all personal data stored and action buttons which if oppressed in the emergency button to send us the window with the same name, which is the information of the person in an emergency (Figure 9), and if you press the button corresponding to the level of study will go to the window each level (Figure 10), or pressing the button "All " will display all the information related to educational level as shown in Figure 11.



Fig 7 main window RFID reading



Fig 10 Window degree level study

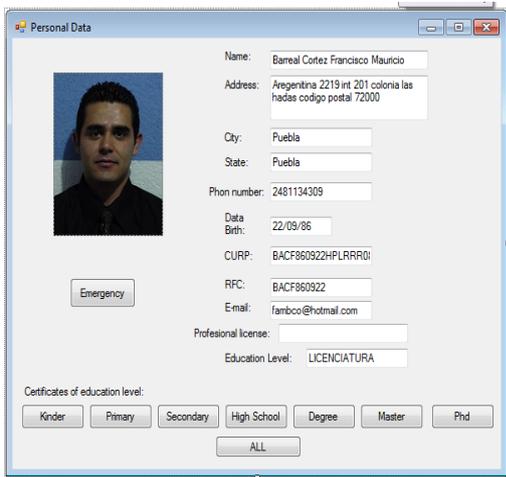


Fig 8 action window and personal data

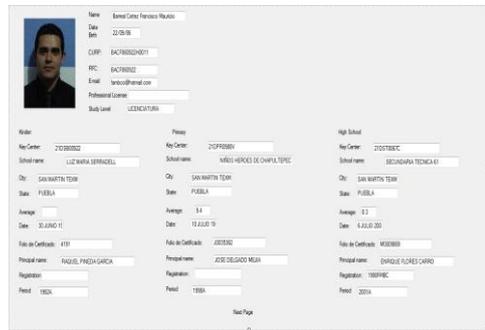


Fig 11 all the information window of educational level.



Fig 9 emergency window

## V. CONCLUSION

RFID technology brings many advantages, especially to improve agility and speed of processes, as well as significantly reduce the errors that occur in processes related to educational data, this project will largely prevent the waste of paper favoring ecology and improving the fight against counterfeiting of documents. As future work, it is proposed to encrypt students' credential information RFID so that only authorized personnel can access it. This work to enter credentials applications from students, to have in one document all academic history and this allows educational institutions to check that your documents are original and also reduce the time in terms of check document in a document admission process, for example.

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