Smart Card Based Digitalization of India Using Arduino

Mamidi Javi S[1], Chavan Vikramsinh V[2], Kumbhar Nitin S[3]

[1, 2, 3] Dept of E&TC

[1, 2] Bhivrabai Sawant Institute Of Technology & Research, Wagholi

Abstract- *Even today a large number of organization collect data using paper forms. It can be difficult to aggregate and analyze the data collected using paper forms better management and processing of forms and applications is indispensible to improving customer experience but typing the data into spreadsheet is time consuming mundane and may result in errors various attempts have been made to automate the process but the solutions require the use of expensive hardware. Digitizing this data will result in the reduction of process time and help them gain invaluable insights about their business as an alternative to paper forms online forms are gaining momentum.*

Keywords- Digitization of India, Paper less, Netbeans, Useful for educational and official purposes

I. INTRODUCTION

Most of the organizations rely largely on data collection for their business operations. This data is usually captured in the paper forms. Paper forms make the data collection task simple and reliable. For example, Mumbai Grahak panchayat, a voluntary consumer organization in India whose aim is large scale commodity distribution on no profit no loss basis, uses paper forms to collect numeric commodity requirements from consumers . Digitizing this data will result in the reduction of process time and will help them gain invaluable insights about their business. As an alternative to paper forms online forms are gaining momentum. But online forms require wireless network access and established IT infrastructure which may not be easily available everywhere. In such cases, paper forms provide ease ofuse and can be distributed conveniently. Paper formshave more truth value attached to them as compared to online forms as it iseasy to identify and authenticate the person filling the paper form .The problem with data collected using paper forms is aggregation and analysis. In orderto convert data into machine readable form, a data entry operator is needed to feed data from paper forms into the system, which is dull and error-prone. We need a solution that easily converts data from paper forms into a machine readable format without relying on a specific form structure. Multiple solutions are available in markets that capture data from the image of a form. But the main problem is that we need the form structure to be in a predefined format. For example, Optical Mark Recognition (OMR) technology can work only with bubble-based form specifically designed for use with the system and is unable to digitize data in existing forms. Also it needs a specialized scanning device, thus all forms have to be manually collected at one location adding transportation cost. This calls for a robust solution that digitizes data from, forms of any structure or format and eliminates the need of a specialized scanning device while simultaneously providing portability

II. HARDWARE DEVELOPMENT

The hardware architecture is as shown in below figure. It has following components Arduino, RF ID reader, RF ID's ,Netbeans software.
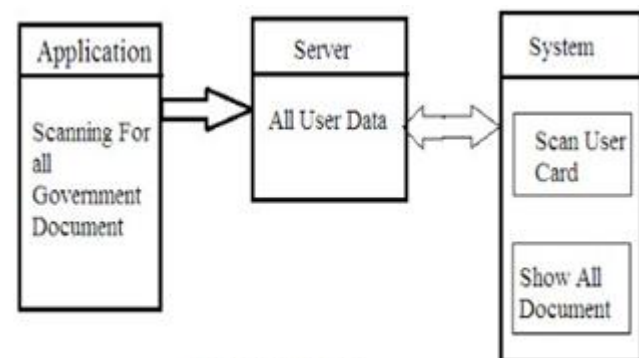
BLOCK DIAGRAM:

Fig. Block Diagram

1. Arduino Microcontroller

The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market. The Arduino is open- source, which means hardware is reasonably priced and development software is free. This guide is for students in ME 2011, or students anywhere who are confronting the Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources. The Arduino project was started in Italy to develop low cost hardware for interaction design. An overview is on the Wikipedia entry for Arduino. The Arduino

home page is http://www.arduino.cc/. The Arduino hardware comes in several flavors. In the United States, Sparkfun (www.sparkfun.com) is a good source for Arduino hardware.This guide covers the Arduino Uno board (Sparkfun DEV-09950, $29.95), a good choice for students and educators. With the Arduino board, you can write programs and create interface circuits to read switches and other sensors, and to control motors and lights with very little effort. Many of the pictures and drawings in this guide were taken from the documentation on the Arduino site, the place to turn if you need more information. The Arduino section on the ME 2011 web site, https://sites.google.com/a/umn.edu/me2011/, covers more on interfacing the Arduino to the real world.

This is what the Arduino board looks like.

Fig: Arduino Microcontroller

2. RFID (Radio Frequency Identification)

This paper provides a survey on radio frequency identification (RFID) technology. Initially RFID tags were developed to eventually replace barcodes in supply chains. Their advantages are that they can be read wirelessly and without line of sight, contain more information than barcodes, and are more robust. The paper describes the current technology, including the frequency ranges used and standards. With the increasing ubiquity of RFID tags, however, privacy became a concern. The paper outlines possible attacks that can violate one's privacy and it also describes counter measures. The RFID technology did not stop at item-level tagging. The paper also presents current research that focuses on locating and tracking labeled object that move. Since the uses for RFID tags are so widespread, there is a large interest in lowering the costs for producing them. It turns out that printing tags might become a viable alternative to traditional production. The paper reviews the current progress. Keywords: Radio Frequency Identification, RFID, RFID tags, Electronic Product Codes, EPC, Supply Chain Management, Security, organic printing, Location and Tracking
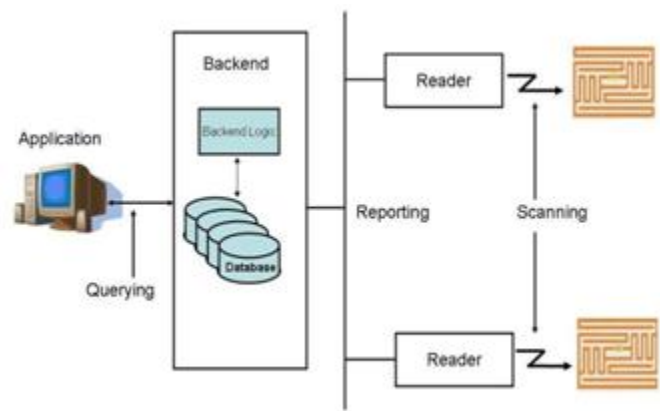

Fig: A simplified RFID

III. PROCEDURE

1. Install Netbeans software on computer to be used
2. Connect Arduino hardware to com port and RFID reader
3. Scan RFID card on RFID reader.
4. The string passes through the com port this is read by Netbeans software
5. The documents are displayed on screen related to the RFID card scanned
6. From here these documents can be printed and used for official purposes.

IV. CONCLUSION

In this paper we have proposed Digitization of India using Arduino microcontroller. Nowadays customers have to carry lots of documents with them for verification purposes using this method we can reduce the burden of carrying documents. And also help students to secure their documents safely for future purposes.

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