

Project Report on  
**“RFID based Employee Attendance & Database Management System  
(READS Version 1.0) Using RFID Module [RKI-1512]”**

By

Mehta Sohil [EC-073]

Majithia Smit [EC-065]

Under Supervision of

**Prof. Yogesh K. Meghrajani**



Department of Electronics and Communication,

Faculty of Technology, Nadiad

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## **CERTIFICATE**

This is to certify that the project titled “**RFID based Employee Attendance & Database Management System (READS Version 1.0) Using RFID Module [RKI-1512]**” by **Majithia Smit Hiteshbhai** is a bonafide work carried out by him under my guidance and supervision.

Prof. Yogesh K. Meghrajani

Project Supervisor

Department of Electronics and Communication

DDU, Nadiad

Dr. N.J.Kothari

Head

Department of Electronics and Communication

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Project Supervisor

Department of Electronics and Communication

DDU, Nadiad

Dr. N.J.Kothari

Head

Department of Electronics and Communication

DDU, Nadiad

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# **1.0 Introductory Part**

## **1.1 Abstract**

In recent years, there have been rise in the number of applications based on Radio Frequency Identification (RFID) systems and have been successfully applied to different areas as diverse as transportation, health-care, agriculture, and hospitality industry to name a few. RFID technology facilitates automatic wireless identification using electronic passive and active tags with suitable readers. In this paper, an attempt is made to solve recurrent attendance monitoring problem in developing countries using RFID technology.

The application of RFID to attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions.

## 1.2 Introduction

The two major problems faced by organizations are time consuming manual attendance and wastage of electrical power. Our project is going to solve these problems by using RFID technology. Radio Frequency Identification (RFID) is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. So the RFID is a wireless identification. Normally the RFID system comprises of two main parts are RFID Reader and RFID Tag.

Radio Frequency Identification (RFID) is one of the automatic identification technologies more in vogue nowadays. There is a wide research and development in this area trying to take maximum advantage of this technology, and in coming years many new applications and research areas will continue to appear. This sudden interest in RFID also brings about some concerns, mainly the security and privacy of those who work with or use tags in their everyday life.

In a developing country like ours, lot of latest technology that has been developed such as RFID, wireless, Bluetooth, robot and so on. Therefore, these technologies can be adopted to improve our daily routines so take our life more comfortable and easy. All major regulatory firms should try adopting these technologies to improve their quality of student and management. Besides not being left behind in latest development, it will produce more quality and discipline graduates and they know to use advanced technology in the future. Attendance taking in firms should be done in more advanced method with using the latest technology. This attendance management system would be the best effective way to regulate the attendance in the regulatory firm like student of university, Employee attendance management system rather the tedious manual attendance system.

As for system development and implementation, it should be able to help in managing their student attendance systematically. The system must have database that contains employee/student information and it must be able to help lecturer to manipulate data, update database, alert manager accordingly, and also nice interface to make it easier to use. Finally, the attendance system must be user friendly for commercial purpose.

### **1.3 Scope:**

RFID Based Employee Attendance System makes use of the RFID detection system to calculate attendance of employees in an organization and do further calculations of their salaries based on it. This software has been designed to reduce the labor of manual attendance for employees in the organization. It also aims at building accuracy in taking attendance electronically and thus reducing human error so that the salaries are also calculated accurately.

The cost of implementation of the system is only one time as the RFID chips are light and cheap containing information up to a few binary digits. The chip is rewritable and so is the information that is stored in the database corresponding to the chip code.

The software system also gives a personalized working environment for each and every employee to track the working of the system, for social networking, and as an event reminder.

### **1.4 Goal of Project**

In this project we want to maintain a record of attendance of the employees in an industry. Most of the industries uses manual attendance system. We will try to link both hardware and software to serve our objective.

We will use RFID hardware to take the attendance of an employee. Each employee will be given an individual RFID tags and its record will be maintained in an database. When he will place the tag for first time in a day, time will be fetched and will be stored as intime. When he leaves he has to place the tag again and this time it will be noted as outtime. Thus maintaining the record when the employee enters and leave the premises.

The authority of accessing the records will be limited. Username and password will be given who will be called ADMIN. Here he can make new entries, modify them and even search based on a particular field.

We will include various search algorithm like based on RFID number, DATE, Employee id, etc. Other features will add is to generate a report based on search. The reports will be generated in various formats like .doc, pdf.



## 2. Overall Description

### 2.1 Product Perspective:

RFID Based Employee Attendance System is a stand-alone application. This system would detect the presence of employees in the organization premises, from a RFID chip carried along by them, by a RFID detector and calculate their attendance and generate reports based on that.

### 2.2 Software Interface

Front End Client:

READS (Graphical User Interface):

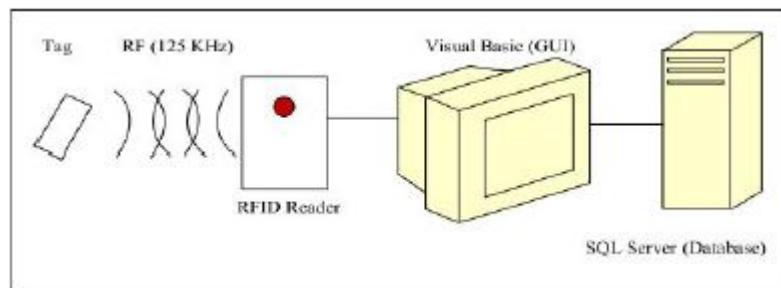
Data Base Server:

Back End:

### 2.3 Hardware Interface

RFID Side:

Server Side:



### 2.4 Product functions:

- \_ There are two basic users: a) Administrator b) Employee
- \_ Every user of the software should be an employee of the organization .
- \_ The presences of the employee within the organization premises is calculated by detecting the code in the chip carried by them and thus calculate their working hours.
- \_ Admin can view their attendance date wise
- \_ The Admin can also search for the employees' information stored in the organization database.
- \_ This software is also facilitated for interaction between the administrator and employee via READS (GUI).
- \_ The concerned authorities get a generated report of the attendance of the employees after a uniform time interval..

## 2.5 User characteristics:

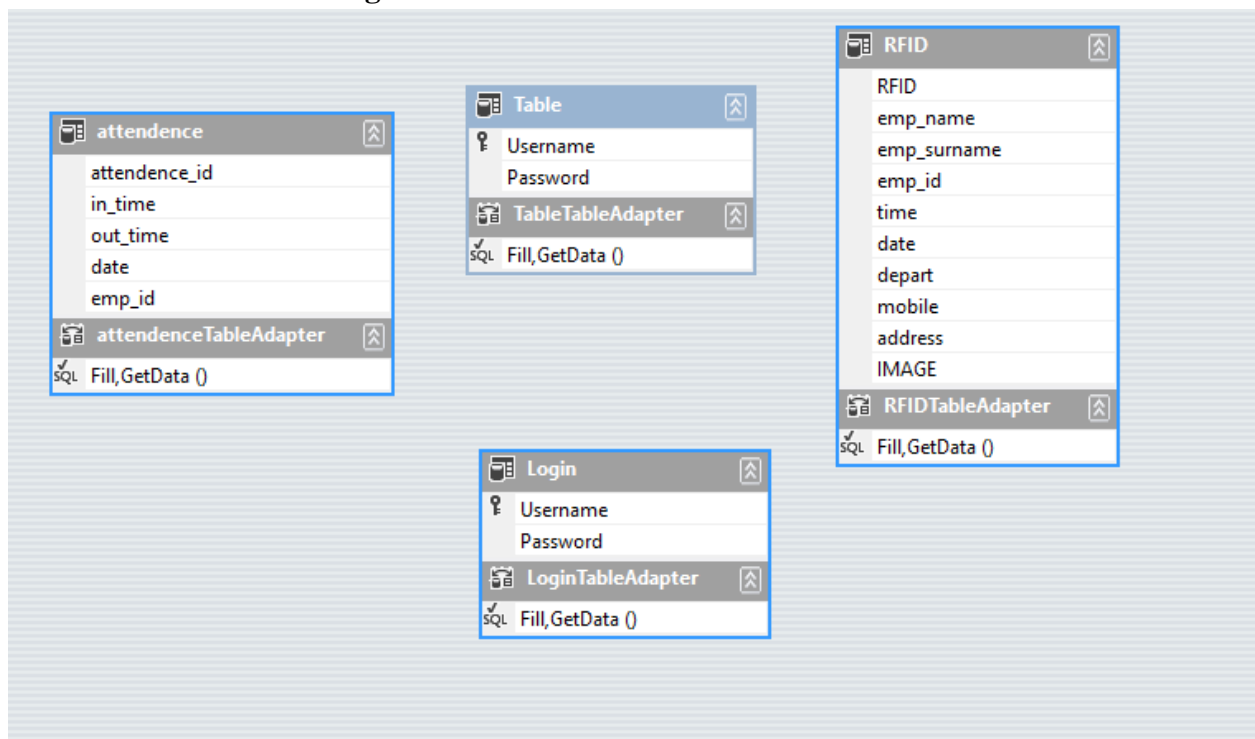
- 1) Admin – System administrator, who looks after the system and has access to all rights and permissions in the system. He is the back-end user of the system.
- 2) Employee – Actor carrying the RFID code and a member of the organization. He is the front-end user of the system.

## 2.6 Assumptions and Dependencies:

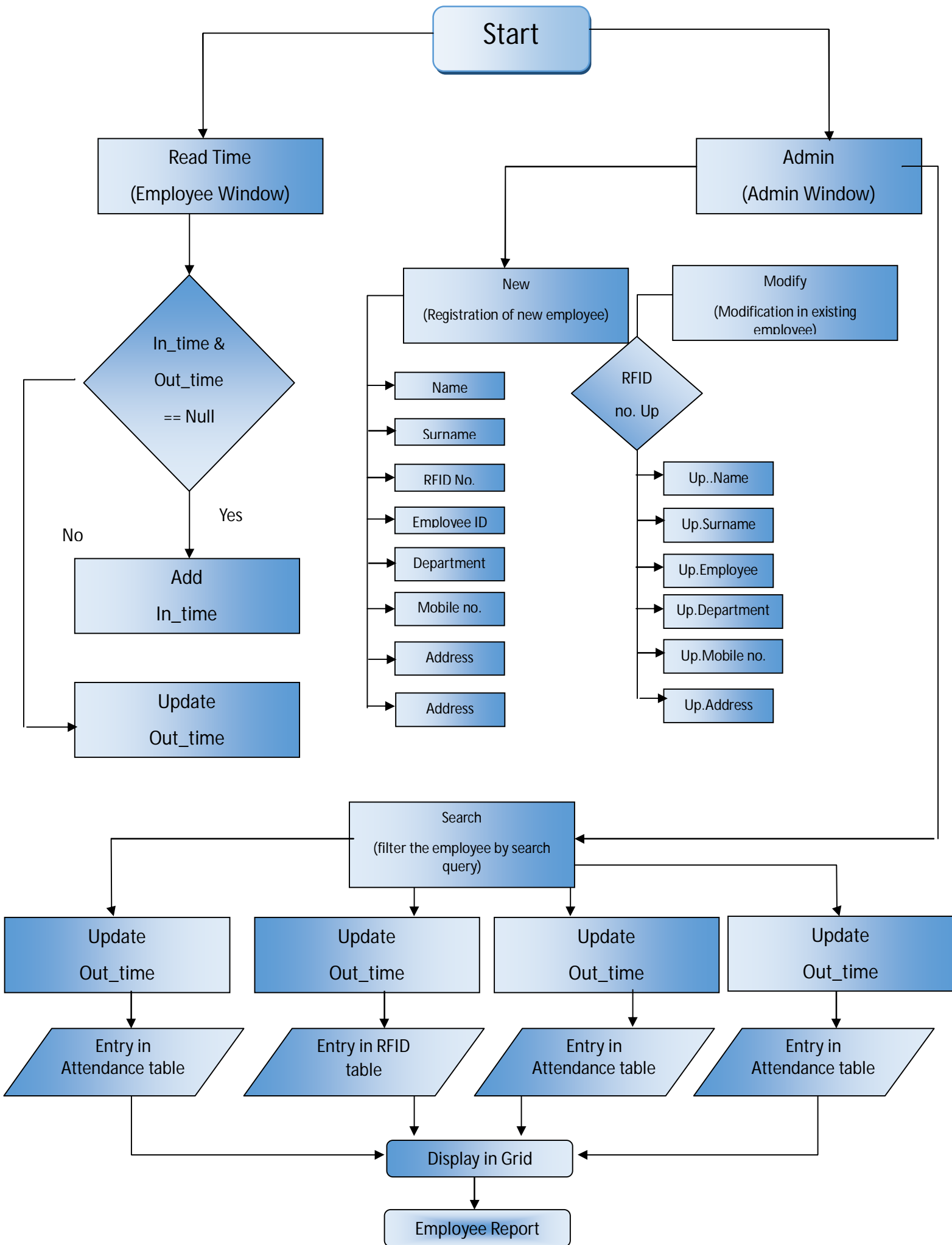
- 1) All members of the organization have a unique employee ID and a pre-assigned unique code for first time registration.
- 2) The authentication system is fed with the data to identify the admin.

## 2.7 Sequence Diagrams:

### 2.7.1 Database Design:



Database Structure of READS

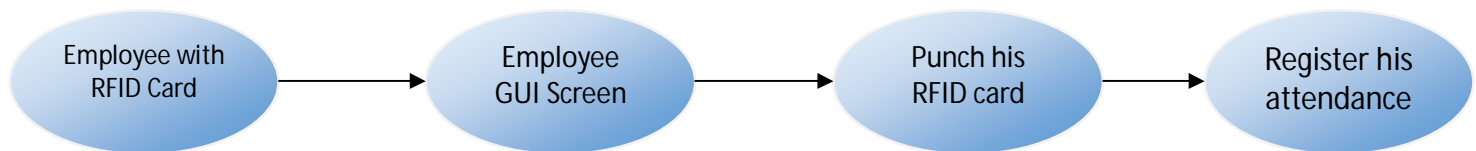


**2.7.2 Admin Entity Relationship Diagram:**



Use Case	Description
Admin login	The Admin has to enter his credentials every time to work on system
Registration of new employee	The Admin has to do one time registration into system
Modify from allocated RFID	The Admin will modify the Detail of employee by the allocated RFID viz. Name, Surname, Address etc...
Search Employee Detail	The Admin will search the employee detail like employee In_time, Out_time, Total working days, etc...
Search by RFID number	The admin can search unique RFID number
Search by Department	The Admin can search by Department in which the employee works
Filter by Date	The Admin can see the total employees detail on that Specific Date
Display all	The Admin see all the detail of all employee in that company

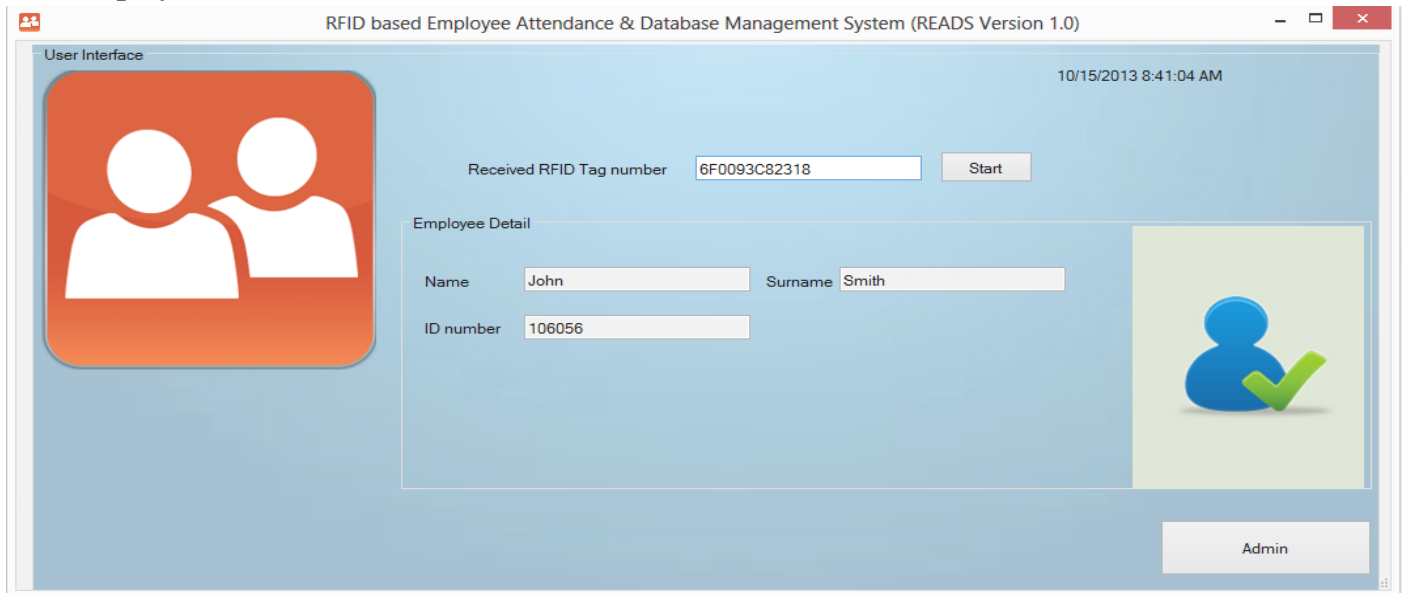
### 2.7.3 Employee Entity Relationship Diagram:



Use Case	Description
Employee With RFID	Employee enters by having his allocated RFID card
Employee Screen	Employee first encounter by employee GUI Screen
Punch his RFID card	Employee just punch his RFID over RFID module [RKI-5912]
Register his Attendance	By having punching his RFID card, the system <b>READS™ version 1.0(beta)</b> will fetch the data from RFID and then <b>READS™ version 1.0(beta)</b> will search the database and register his attendance.

### 3) READS Functional Requirements:

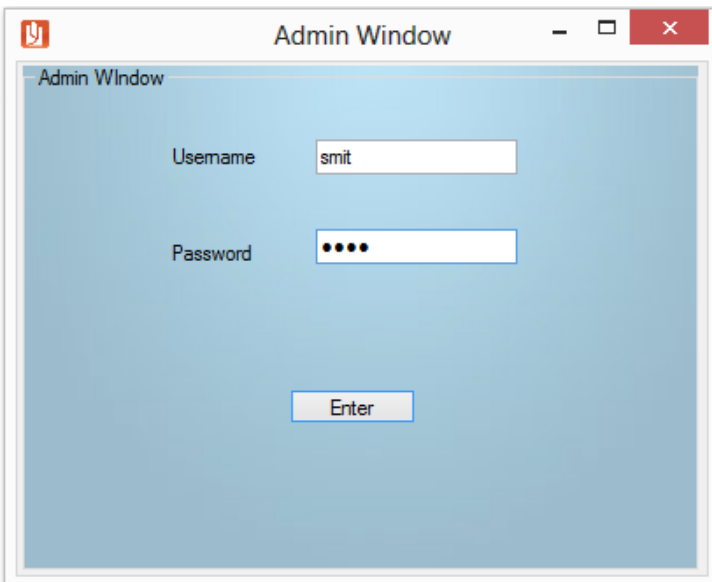
#### 3.1) Employee Screen of READS



#### Description:

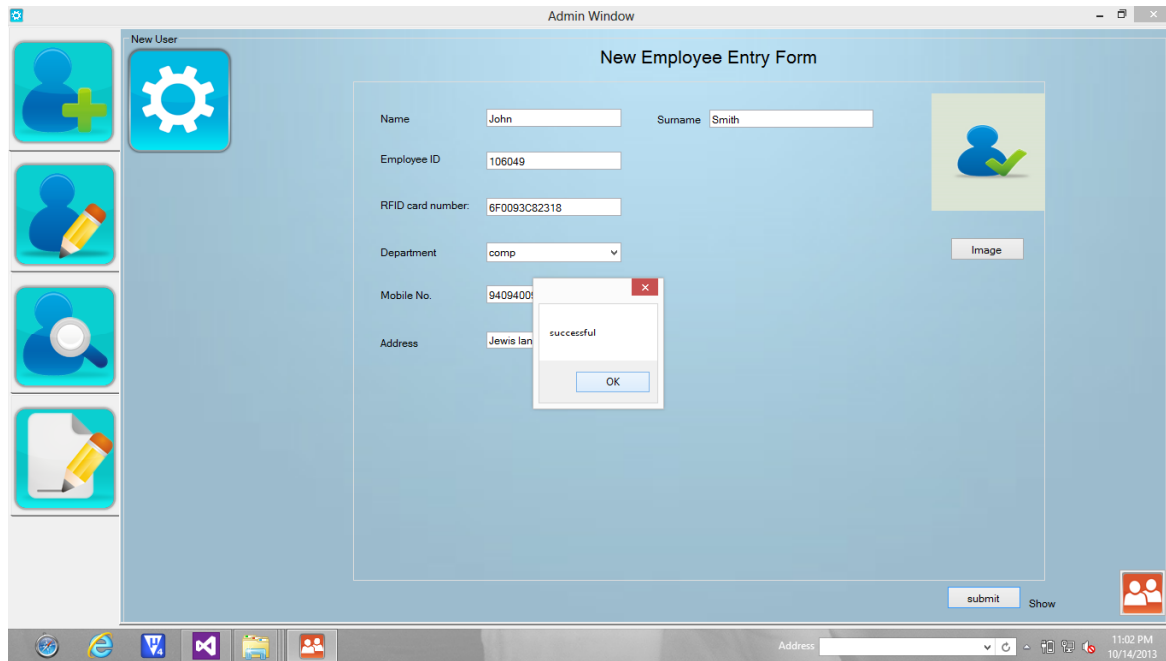
This is the window will be visible to each employee when he places his tag. Example is show with details appearing when employee, John places his tag.

#### 3.2) Admin Login Window



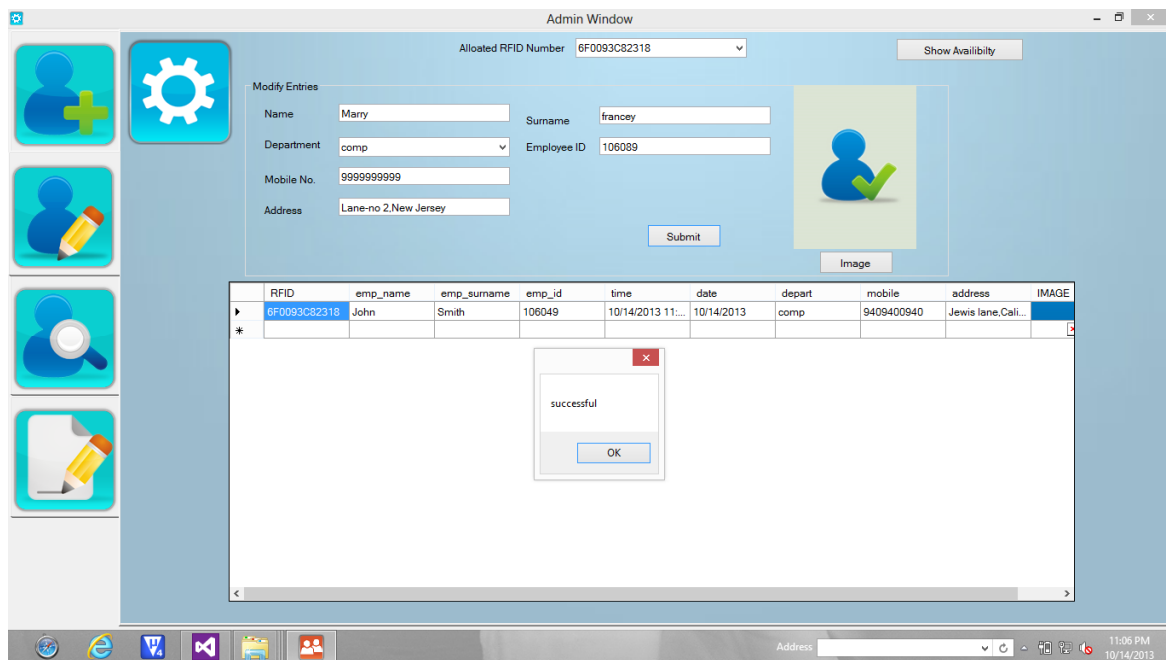
**Description:** This window is to validate where person to access records is ADMIN or not. Here username and password is asked to enter.

### 3.3) New Employee registration Form



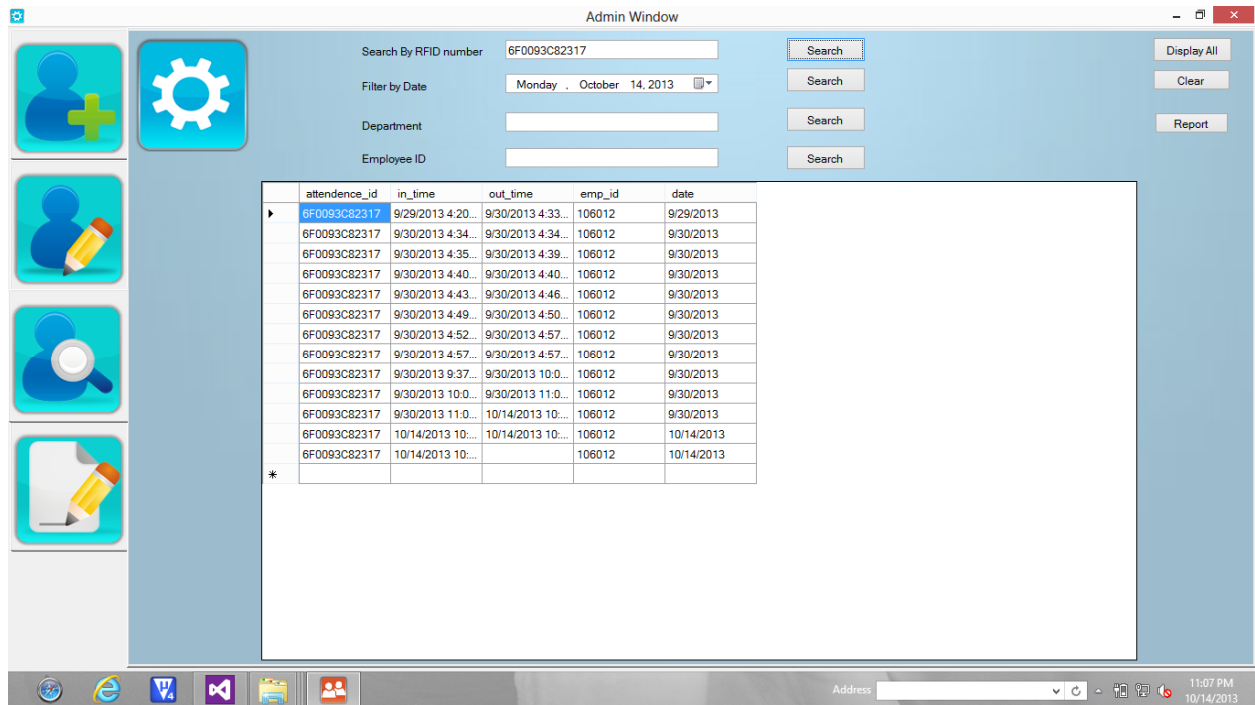
**Description:** This window is accessible to **admin only**. It shows New employee Entry form with various field to be entered. Upon successfully making the entry into the database a window with the message “successful” will be displayed.

### 3.4) Employee Modification window



**Description:** This is MODIFY window. The field to be modified of a particular employee will be searched and upon modification database will be updated and message box with message “Successful” will be displayed.

### 3.5) Search Window using query of “Search by RFID number”



#### Description:

This represent SEARCH window. Here search is performed **based on RFID number**. Grid with the searched RFID number is filled from table attendance present in database. Report can be generate in pdf format by clicking report button.



### 3.6) Search Window to show display of all Employee

The screenshot shows a web-based application window titled "Admin Window". On the left side, there is a vertical navigation menu with four icons: a person with a plus sign, a gear, a person with a pencil, and a magnifying glass. The main area contains search filters and a data table.

Search filters include:

- Search By RFID number:  Search
- Filter by Date: Monday, October 14, 2013 Search
- Department:  Search
- Employee ID:  Search

Additional buttons on the right include "Display All", "Clear", and "Report".

The data table below has the following columns: RFID, emp\_name, emp\_surname, emp\_id, time, date, depart, mobile, address. The table contains four rows of data, with the third row highlighted.

RFID	emp_name	emp_surname	emp_id	time	date	depart	mobile	address
6F0094491CAE	Sohil	Mehta	106048	9/28/2013 4:19...	09/28/2013	elect	9825999193	A-7/shrineketa...
6F0093C82317	Smit	Majhria	106012	9/28/2013 4:29...	09/28/2013	comp	9876543210	A-10/abcd.xyz
6F0093B95510	Amit	shah	106098	9/28/2013 4:30...	09/28/2013	elect	9873216540	C-10/odef,Imno
6F0093C82318	John	Smith	106049	10/14/2013 11:...	10/14/2013	comp	9409400940	Jewis lane,Cali...

#### Description:

This represent SEARCH window. Grid will be filled with all data present in table RFID present in database which contains **all personal details**. Report can be generate in pdf format by clicking report button.

### 3.7) Search Window using query of “Search based on Department”

The screenshot shows an 'Admin Window' with a search interface. The search filters are:

- Search By RFID number:
- Filter by Date: Tuesday, October 1, 2013
- Department: comp
- Employee ID:

Search buttons are provided for each filter. On the right side, there are buttons for 'Display All', 'Clear', and 'Report'.

The search results are displayed in a table with the following columns: RFID, emp\_name, emp\_surname, date, emp\_id, time, depart, mobile, address, and IN. The table contains two rows of data:

RFID	emp_name	emp_surname	date	emp_id	time	depart	mobile	address	IN
6F0093C82317	Smit	Majhtia	09/28/2013	106012	9/28/2013 4:29...	comp	9876543210	A-10/abcd.xyz	
6F0093C82318	John	Smith	10/14/2013	106049	10/14/2013 11:...	comp	9409400940	Jewis lane,Cali...	

#### Description:

This represent SEARCH window. Here search is performed based on **Department**. Grid with the searched Department is filled from table attendance present in database which contains all personal details. Report can be generate in pdf format by clicking report button.

### 3.8) Search Window using query of “Search based on Employee ID”

The screenshot shows the 'Admin Window' interface. At the top, there are search filters: 'Search By RFID number' (empty), 'Filter by Date' (Tuesday, October 1, 2013), 'Department' (comp), and 'Employee ID' (106098). Each filter has a 'Search' button. On the right side, there are buttons for 'Display All', 'Clear', and 'Report'. The main area contains a table with the following data:

attendance_id	in_time	out_time	date	emp_id
6F0093B95510	9/30/2013 4:26...	9/30/2013 4:27...	9/30/2013	106098
6F0093B95510	9/30/2013 4:13...	9/30/2013 4:17...	9/30/2013	106098
6F0093B95510	9/30/2013 9:37...	9/30/2013 11:3...	9/30/2013	106098
6F0093B95510	9/30/2013 11:3...	9/30/2013 11:3...	9/30/2013	106098
6F0093B95510	9/30/2013 11:3...	9/30/2013 11:3...	9/30/2013	106098
6F0093B95510	10/1/2013 8:58...	10/1/2013 8:59...	10/1/2013	106098
6F0093B95510	10/1/2013 8:59...	10/14/2013 10...	10/1/2013	106098

#### Description:

This represent SEARCH window. Here search is performed based on **Employee id** specified. Grid with the searched employee id is filled from table attendance present in database. Report can be generate in pdf format by clicking report button.

### 3.9) Search Window using query of “Search based on some specific Date”

The screenshot shows a web-based application window titled "Admin Window". On the left side, there is a vertical navigation menu with five icons: a person with a plus sign, a gear, a person with a pencil, a magnifying glass, and a document with a pencil. The main area of the window contains search filters and a data grid. The filters include "Search By RFID number", "Filter by Date" (set to "Tuesday, October 1, 2013"), "Department", and "Employee ID". Each filter has a corresponding "Search" button. On the right side, there are buttons for "Display All", "Clear", and "Report". The data grid displays the following information:

attendance_id	in_time	out_time	date	emp_id
6F0094491CAE	10/1/2013 8:46...	10/1/2013 8:56...	10/1/2013	106048
6F0094491CAE	10/1/2013 8:59...		10/1/2013	106048
6F0093B95510	10/1/2013 8:59...		10/1/2013	106098
6F0093B95510	10/1/2013 8:58...	10/1/2013 8:59...	10/1/2013	106098

The taskbar at the bottom shows various application icons and the system clock indicating 9:07 AM on 10/15/2013.

#### Description:

This represent SEARCH window. Here search is performed based on Date specified. Grid with the searched date is filled from table RFID present in database. Report can be generate in pdf format by clicking report button.

## **4.0 What have we achieved?**

We thought of created this project for the attendance of the employees and successfully implemented it. Along with that we have included various search algorithms such as search by RFID number, date, employee id, and department.

We have also included a form for new entries whose authority is given to the admin. Database is maintained in two tables:

- 1) RFID table: Here the personal details of the employee are stored.
- 2) Attendance table: Here in\_time and out\_time of every employee is stored.

Searches performed, select appropriate entries from the two tables mentioned above and displays it on to the grid.

We even have included the facility of generating report for the search performed.

It can be generated in doc, pdf format.

### **4.1 Limitation:**

These are the limitation of our projects:

- 1) We have included only few kind of search algorithm. Many more can be included such as search by month, city, etc.
- 2) In modification section in order to modify a particular field, we have to enter the details in all field provided in the form.

## **5.0 CONCLUSION**

As the RFID technology evolves, more sophisticated applications will use the capability of RFID to receive, store and forward data to a remote sink source. RFID has many applications as can be imagined. In this project, we have utilized the versatility of RFID in implementing functional and automatic employee attendance recording system that allows employee to enter the in\_time and out\_time just by swiping or moving their ID cards over the RFID reader which are located at the entrance of the organization with a considerable degree of success.

We hope that this system can shift the paradigm of employee attendance using register and provide a new, accurate, and less cumbersome way of taking employee attendance in an organization.