

Advanced scholastic management system

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ABSTRACT

It was observed that attendance system prevalent in most contemporary educational institutions was nothing but manual processes of marking, logging and book keeping. With rapid increase in the number of students enrolled for any given class these days, the old system of marking attendance on paper has fallen out of place as it is not only time consuming but is also inefficient with students having an upper hand to manipulate and fake their attendance by smart but illicit means. The log-keeping of attendance is intended to keep a track on student's regularity in course and overall performance. Therefore it is a critical piece of information about a student for any responsible and concerned parent. With advanced curriculum coming up in all educational institutions, the learning experience is no longer constrained to *Closed-Door-Classrooms*; in fact it has transitioned into a dynamic curriculum having more of an *Out-of-Class* experience. The student is engaged all day round and has to be mobile, attending different subjects / courses throughout the college or school campus. Having exhaustive data on the number of Courses Attended, Performance in Tests/Examinations and the birds-eye view on the inclinations and interests of a particular student can be pivotal in helping the student hone his or her skills in turn giving them the opportunity to identify their talents at an early stage. This would also lead to improvisation in standards and in the development of pro-student curriculum. But the documentation process involving the ever increasing number of students at present at different laboratories, presentation rooms, athletic gymnasiums and classrooms can become cumbersome. Hence there is a great need for the deployment of an automated system to keep track of the student. This is where our project chips in and provides a much more efficient solution to the above problem by leveraging the advantages of RFID (Radio Frequency Identification) & GSM Technologies and we hereby propose the ADVANCED SCHOLASTIC MANAGEMENT SYSTEM (A.S.M.S.)

Keywords: Radio Frequency Identification (RFID), Global System for Mobile Communication (GSM), Scholastic Management Centre (SMC).

1. INTRODUCTION

With invasion of computers and high end electronic gadgets into the rapidly developing world, there are very few sectors that have shown resistance to adapt to the latest technology. The smarter generation, sensing the urgency to upgrade for increasing process efficiency, mostly out of fear of obsolescence has adapted to the work flow process involving the most recent available techniques and practices. In this race to sustain and maintain high standards, even the "Education Sector" has shown great vigor with most of the Institutes coming up with advanced pro-student program that is intervened with technology to enable the holistic development of the Student Fraternity. With the Student Interests taking the center stage [1-6], the adaptive curriculum has evolved into the one which can even pay individualistic attendance to the special capabilities of each and every student by putting modern technology at work. The Report Cards on Parent Teacher Meetings are no longer mark sheets, now we have comprehensive performance sheets containing the information on Social, Cultural, Athletic and Special Talents of the students and not just Academic Information. The A.S.M.S. is a system that intends to implement a scholastic management system that can track the student performance throughout the academic year by maintaining a record of the courses taken up by the student in the Academic, Socio-Cultural and Athletic-Sports Domain, his or her attendance in the courses and the subsequent results of the ward in the respective examinations. This record would be nothing but a graphical representation in the form of soft- web based document with anywhere internet accessibility, the *Dynamic Performance Cards (DPC)*, which would paint the picture about the students interests, *Attendance-Performance Relationship* and other factors affecting the students' performance at the institute. The attendance would be monitored using the *RFID Cards (RFC)* as the given to each and every student and which the student would use to enter the premises for the lecture and mark his or her attendance for that particular class or lecture [6-12]. The RFID units installed all across the campus would then have the real time data about the number of students attending a particular course and would source the data to a *Scholastic Management Centre (SMC)* Office where the data from all units shall be received and serve the basis for monitoring the student fraternity. This way both the faculty and the parent can be kept up to date about the students.

2. MATERIALS AND METHODS

2.1. Basic Functioning of the System

- Scholastic Management Centre (SMC)
- RFID Cards(RFC)
- Dynamic Performance Cards(DPC)

The three subsystems will work in unison to monitor performance of each and every student with real time updating of the database.

2.2. Scholastic Management System

The SMC system is the central office where data from all RFID units across the campus is routed and logged into individual student profile database. This gives the real time information on the whereabouts of the student and his or her previous records. Not only such a database will be useful in tracking all the students individually but will also provide the ability to get the overall picture of the student behavior and performance. The SMC will also perform the function of making the information available to the parents and would help to keep them updated about their wards. Here the main function of maintaining the DPC pertaining to each student will also be performed (Fig.1).

2.3. RFID Cards



Figure 1
SMC

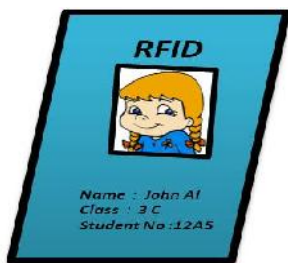


Figure 2
RFID CARD

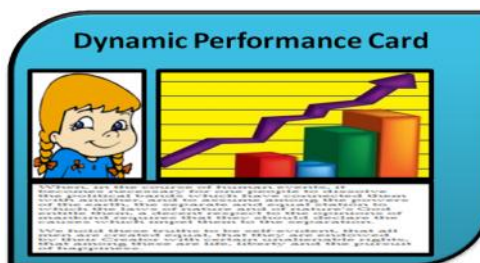


Figure 3
Dynamic Performance Card

The RFID cards are nothing but RFID tags which will work as the Advanced Student Identity Cards having the data about student's attendance and performance which will be routed from the individual RFID units to the SMC. These RFID

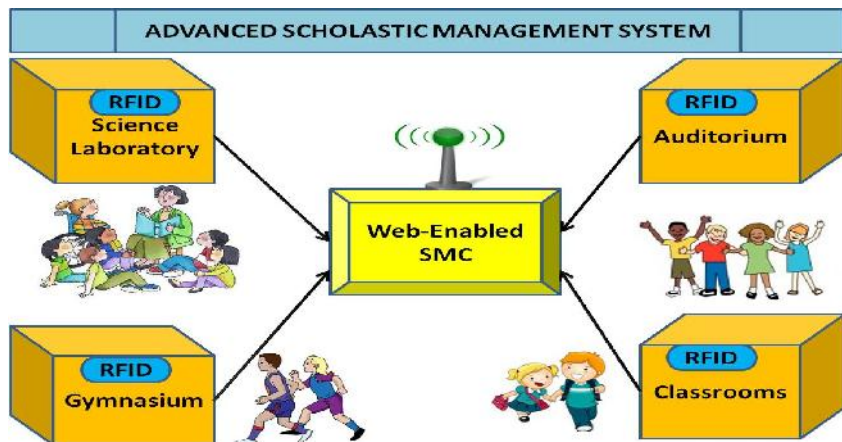


Figure 4
Basic Function of the A.S.M.S. Setup

cards contain nonvolatile memory which can also have the capability of Read/Write along with a decent readability range (Fig.2). This card will be carried by each and every student and they will use it at the entrance of each class for marking their own attendance. These way teachers would be relieved from cumbersome manual work and it is also an efficient way to take attendance. RFID tags are classified into three spectral regions depending on the frequency:

- LF-Low frequency (30 - 500kHz)
- HF-High frequency (10 - 15MHz)
- HF-Ultra high frequency (850 - 950MHz, 2.4 - 2.5GHz, 5.8GHz)

2.4. Dynamic Performance Cards

The DPCs would be the modern day report card with up to date information about the student. The parents will be able to access the entire information over the web, which will be maintained by the SMC. The dynamic cards will have graphical data which will help in understanding about the students study patterns interests, talents and inclinations towards particular subjects. The DPC cards would also be very useful in keeping a track record of students' entire schooling period and would help in understanding the need to hone the skills and build upon qualities that are inherent (Fig.3).

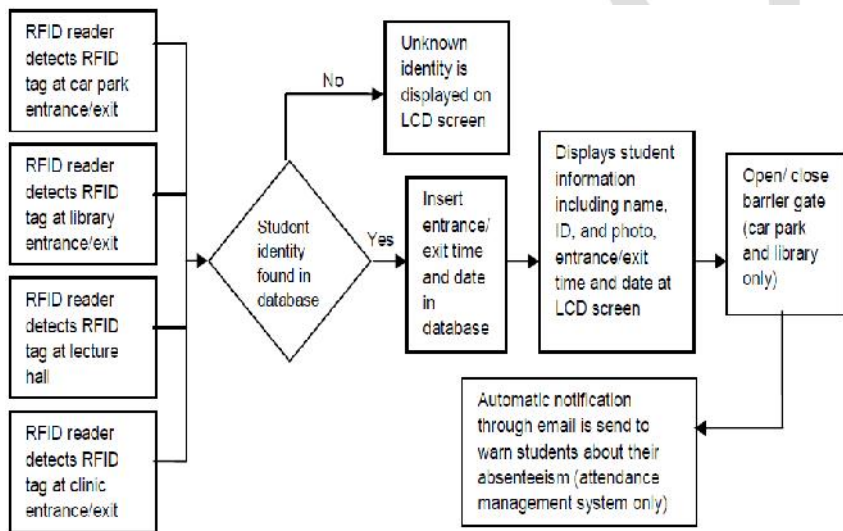


Figure 5
RFID based Attendance management system

3. SYSTEM DEPLOYMENT

The deployment of the entire A.S.M.S. setup would require equipping all places inside the campus with RFID interrogators and then linking these RFID interrogators to the central facility of SMC inside campus which would channelize all the data to the A.S.M.S. database. The deployment of this system would create an atmosphere where students and their welfare can be monitored and this would become a great asset to the college infrastructure. RFID devices and software are supported by a sophisticated software architecture that enables the collection and distribution of location based information in near real time. The RFID attendance system combines the RFID Tags and readers with access to global standardized database, ensuring real time access to up-to-date information on the card.

4. ADVANTAGES

4.1. Advantages of A.S.M.S. Setup

In its complete implementation the A.S.M.S. setup can be very useful as a performance measurement tool in Educational Institutions as well as at other such places where constant up to date information is required to monitor large number of people (Fig.4). By leveraging the advantages of RFID technology A.S.M.S. can achieve far greater efficiency than the conventional technologies like Bar Code Tag etc.

4.2. Advantages of RFID Technology

The RFID technology has been one of the most sought after technologies especially in the Inventory Control and Supply Chain Management Sector due to the following advantages over the conventional bar code technology (Fig.5). Advantages:

1. No Line of Sight Requirement
2. Smaller Footprint on Tag
3. Decreased cost of equipment and enhanced readability as compared to Bar Codes

4. Security can be increased using advanced code encryption techniques.

5. CONCLUSION

The deployment of the A.S.M.S. setup at a University, School or any other such Institution can bring about drastic change in the ways the records have been maintained in the past. Such Automated Systems will not only bring great level of uniformity but can also bring about rapid advancement in the way we handle such data. The consolidated data that would be generated from such a setup at the SMC can be used to research and analyze the trends at Scholastic Centers and would in turn trigger improvisations in the practices that are currently followed. This would not only step towards the betterment of student fraternity but also a great leap towards bridging the gap in understanding between the student fraternity and the faculty resulting into a more conducive study environment.

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