

ERP System for College Automation Using Quick Response Code

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ABSTRACT

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An enterprise resource planning system (ERP) is a method used by almost all businesses today due to its ability to incorporate various domains and fractions of work. The ERP method atomizes the majority of the manual work performed internally in each of these units, as well as combining the total work output, allowing for a better overall view of the company. The education field, which also has several fractions that need integration, uses the same high-quality ERP framework. Paperwork in the education sector has long been a concern, owing to the ease with which errors can be made when work is performed manually. This proposed framework entails using Quick Response Code to introduce an ERP system for college automation. The use of a QR Code tag allows each student to be assigned a unique ID, which is then used for automated college process labeling. This framework consists of a series of integrated software modules that provide real-time support for the college. From the director level to the student level, several modules are built to serve each fraction of the institution. When this method is implemented, there is no paper work and no data inconsistency. It has many advantages for administrators, teachers, and students. In terms of deployment and maintenance, this is a low-cost system.

Keywords: Quick Response (QR) Code, Multiple modules, Enterprise resource planning (ERP).

I. INTRODUCTION

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final paper submission is available from the IJRST website.

In today's atomized society, when everyone desires a simple and easy existence, it is vital to build a system that allows students and teachers to simplify their working methods. An ERP system

goes a long way toward assisting students and teachers in atomizing all of the tasks they have to deal with. Most firms established the first centralised computing systems in the 1960s, and further capabilities were added to them in the early 1990s as new modules and functionalities. However, the implementation of an ERP system in college was first frowned upon by the majority of colleges around the world. Certain US institutions implemented an ERP system on campus, which was eventually shut down due to the following flaws:

1. The system's inability to handle the predefined functionalities.
2. A larger budget and a lower throughput.
3. Increased maintenance and training costs.
4. Not very user-friendly.
5. Incorrect system operation.

These flaws were addressed in a later version of the ERP system by improving the modules and the user interface. The interface was simple to use and self-explanatory. The proposed system uses Quick Response Code to automatically mark up students' entire work and generate a report for each student. This has decreased the workload on teachers while also making the system less prone to errors. In addition, the student-teacher chat system for advice and counselling is an add-on to the system that makes the colleges more flexible and open. Modules such as automatic report creation, event creator, entrance fees and document management, sharing of learning resources, attendance updation, chat system, and library section have aided and simplified these time-consuming activities. Because all of the data in the system is stored on the cloud, it is simple for all of the modules to access the data and make changes to it. This facilitates data modification, insertion, and deletion. It is also very simple and user-friendly to configure a cloud for a system. This system has a lot of potential in the future since modules will be added to

the existing system and improved functionality will close all of the system's flaws. The capabilities of the business process will be extremely straightforward to estimate and map on the ERP system.

A. What s ERP System?

ERP college web application is a type of web application that integrates all of the modules and features of the college system on a single system that can be managed by the administrative head and accessed by students and faculty with a valid user id and password. The college ERP system provides a simple interface for the management of various student, department, faculty, library, and other information. Every college has a number of departments and instructional modules such as courses, seminar halls, and so on. Managing all of these departments and other modules manually is a tough, time-consuming, inefficient, and costly endeavour. So, in this section, we suggest an ERP system for a college.

B. What are QR Codes?

Definition: A QR code (short for Quick Response code) is a sort of matrix barcode (or two-dimensional code) that was originally developed for the automotive sector. Because of its fast reading and fairly huge storage capacity, the technology has recently gained popularity outside of the business. The code is made up of black modules in a square pattern on a white background. Any type of data can be used to encode the information.

C. Features Of QR Code

- 1) Traditional 1D tags or barcodes can only store a maximum of 20 digits, however 2D standardized tags or QR codes can store hundreds of times more data. As a result, QR codes have a higher stacking limit than normal standardised tags.
- 2) Unlike bar codes, which can only store information in one direction, QR codes may store information in both horizontal and vertical bearings. Because of its

two-dimensional storage capacity, the QR code can hold the same amount of data in one-tenth the space of one-dimensional conventional identifications.

3) It is simpler and safer to use QR codes, given the scenarios in which QR codes can become contaminated or damaged. QR codes are coupled by artificial error correction capability, i.e. Reed Solomon codes. QR codes are accompanied by three positional discovery designs in its three corners, allowing for quick checking. A QR code may be read from any angle, thus there is no necessity to study the QR codes from a specific direction.

4) QR codes are visible in both online and disconnected modes. Another benefit of QR codes is their ability to accept languages such as Kanji, Kana, and others.

5) Denso Wave released the QR code in the public domain for free.

II. LITERATURE SURVEY

1) Richard E. Mayer and Roxana Moreno University of California, Santa Barbara "A Cognitive Theory of Multimedia Learning: Implications for Design Principles." [1], Presented as, Research on educational innovations, ranging from motion pictures to computer-based tutoring programmes, reveals a discouraging history of bold promises for emerging technology accompanied by large-scale implementations that ultimately struggle (Cuban, 1986; Mayer, in press). For example, in 1922, Thomas Edison, the famous inventor, predicted that "the motion picture is destined to revolutionise our educational system and that it will supplant...the use of textbooks in a few years" (cited in Cuban, 1986, p. 9). Despite this, Cuban (1986, p. 17) concluded that "most teachers used films in classrooms infrequently" after analysing the presence of motion pictures in schools throughout the decades after Edison's grand predictions. Similarly, in the 1970s, the game-like

computer assisted instruction (CAI) systems that were heralded as the wave of the future in education ultimately proved to be no more successful than teacher-based modes of instruction, fifty years later (Cognition and Technology Group at Vanderbilt, 1996). Today, similar arguments about the potential of multimedia learning environments are being made.

2) By Moreno, Roxana; Mayer, Richard E. "Cognitive principles of multimedia learning: The role of modality and contiguity" [2], presented as, Students watched a computer animation showing the lightning strike. In Experiment 1, they listened to a narration while simultaneously viewing on-screen text displayed close or far from the animation. In Experiment 2, they watched on-screen text or listened to a narration at the same time, showed on-screen text after or before the animation, or listened to a narration after or before the animation. Retention, conversion, and matching assessments were used to assess learning. In Experiment 1, students understood better when visual and verbal materials were physically close together. Students learned more when verbal feedback was interpreted auditorily as speech rather than visually as text in both studies. Two cognitive concepts of multimedia learning are supported by the findings. (c) 2012 APA, all rights reserved.) (PsycINFO Database Record (c) 2012 APA, all rights reserved.)

3) Ruth C. Clark, Frank Nguyen, John Sweller "Efficiency in Learning: Evidence-Based Guidelines to Manage Cognitive Load" [3], Presented as, Efficiency in Learning provides a roadmap for the most efficient use of the three primary forms of training communication: graphics, written text, and audio. The book's methods can be easily extended to your lesson presentations, handouts, reference guides, or e-learning screens, regardless of how you deliver your training materials—in the classroom, in print, through synchronous or asynchronous media. Efficiency in Learning's guidelines are clearly

demonstrated with real-world examples, making it a practical resource for all instructional professionals.

4) Robinson, Rhonda; Molenda, Michael; Rezabek, Landra, "Facilitating Learning"[4], Presented as, Facilitating learning is often a realistic practice, regardless of whether it takes place in a classroom, at a student's workplace, or in virtual environments. High-quality teaching, learning facilitation, and growth are focused on a sufficient theoretical understanding of learning, competence building, and humans as learners and builders of their own competence.

5) Clark, R. C., Nguyen, F., & Sweller, J, "Efficiency in learning: Evidence-based guidelines to manage cognitive load"[5], Presented as, Efficiency in Learning provides a road map for the most efficient use of the three primary forms of training communication: graphics, written text, and audio. The methods in this book can easily be extended to your lesson presentations, handouts, reference guides, or e-learning screens, regardless of how you deliver your training materials in the classroom, in print, or through synchronous or asynchronous media. Efficiency in Learning's guidelines are clearly demonstrated with real-world examples, making it a practical resource for all instructional professionals.

6) Pavel ANDREEV, Bohos Aprahamian, Marin Marinov, "QR code's maximum scanning distance investigation"[6], Presented as, The current research discusses the relationships between QR code size, distance, angle of view, type (printed/screen shown), code content, and scanning device resolution. Experiments were conducted with each of the aforementioned criteria, and the findings were summarized. Other than resolution, factors such as brightness change and technological differences across scanning machines are not considered.

7) Mukesh Arora, chetan kumar, Atul kumar, "Increase Capacity of QR Code Using Compression Technique"[7], Presented as, The primary goal of this research is to increase the data storage capacity of QR

codes. By completing the research goal, we can see a significant expansion in the application areas of QR Codes, particularly in smart cities where large amounts of data must be stored. Currently, India is going through a demonetization process led by the country's Prime Minister, and QR codes can play a significant role in this process. They are also beneficial to a cashless society because many sellers have registered with various e-wallet businesses such as paytm, freecharge, and so on. These e-wallet businesses have QR codes embedded at such vendors' pay registers. When a customer wishes to pay his bills, he just scans that specific QR code. Following that, the QR code decoder application begins to work by doing necessary actions such as activating a payment gateway, among others. As a result, the goal of this research study is to solve this problem using the provided methodology.

8) RouA-Lin, FengYuan, GengYing, "QR code image detection using run-length coding"[8], Presented as, We examine the coding and decoding procedure of the QR code picture in order to improve the practical application property of the two-dimensional barcode Quick Response (QR) code. Run-length coding is applied to binary QR code images in order to speed up QR code image identification. The QR code is converted into a series of data runs with alternate black and white pixels. A unit module is produced by the connected runs of data among neighbouring rows. After scanning the entire image, all of the modules in the binary QR code image can be created correspondingly. The experiments of picture binarization, image searching, and localization correction are carried out in sequence using a noisy QR picture recorded by an industrial camera as an example. The error correcting algorithm is also thoroughly detailed. A QR code decoding system is created, and online detection experiments are carried out. The desired outcomes have been obtained.

III. PROBLEM DEFINATION

In today's world of atomization, where everyone craves for a simple and easy life, it becomes necessary to develop a system which enables the students and teachers to simplify their way of working and avoid manual and papered work. To address the problem of existing system we develop a proposed system is about implementing an ERP system for college automation using Quick Response Code.

A. Proposed System

Today's universities must contend with numerous issues, including employment generation, economic growth, environmental sustainability, and social resiliency. Citing these trends, it is essential that we comprehend where we are in the evaluation of ERP system.

Today's institutions are faced with various challenges, including creating jobs, increasing the economy, preserving the environment, and meeting society's needs. Planning future ERP deployments requires a lot of research to understand where we are in the evolution of the internet. we are developing the system, which is completely based on the java platform, to aid the users in finding information that they are interested in. our database is designed for the institute, all of the institute's records, such as assignments, attendance, publications, lab results, etc. most of the basic demand is satisfied by the qr code module in the ERP system, and the ERP function modules with a higher degree of automation are put in place. This system should improve the way of tracking student data in the classroom and provide a new, more accurate, and more efficient way of recording the information. This technology offers greater stability, lessens the use of time.

A. Block Diagram

Block Diagram for the Proposed System is follows:

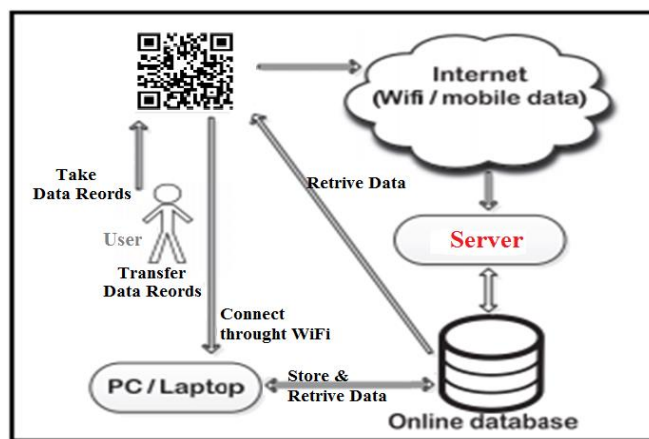


Figure 1: Block Diagram of the System

B. Working

A college management system is a cloud-based educational ERP software that allows higher education institutions and colleges to manage online admission, student enrollment, student attendance, online fees, grades, assignments, library books, and other similar functions. It can also generate online results, marksheets, and student performance reports, among other things, easing the burden on faculty. ERP College Management System is an end-to-end solution for schools that automates the Student-Faculty lifecycle and campus administration to boost operational efficiency and institutional outcomes. This college ERP, which is hosted on the cloud, assists educators in streamlining all core activities by utilising the most recent technology stack, such as biometrics, business intelligence tools, and an analytics dashboard, which generates precise reports on college admission, enrollment, scholarship, previous academic record, domicile, fees, alerts, attendance, and compliance management.

C. Objectives

In this proposed model, we will include the following features:

- 1) To create a portable suggested system with an online database. Why To prevent data loss while also promoting paperless offices and a cleaner environment.

- 2) In addition, the application will help to reduce lost time.
- 3) To provide data security assurance.
- 4) To deliver rapid and simple services.
- 5) Integration and scalability

D. Algorithm

Algorithm for Encoding:

- 1) A. Collect Info Information (Content Information to be encoded).
- 2) B. Convert Info Information to ASCII Equal Qualities.
- 3) C. Use ASCII to make a double change.
- 4) D. Make use of the Information Pressure Method (Lossless Pressure – ZIP Encoding).
- 5) E. Produced Compressed Paired Information.
- 6) F. Use a customized shading QR Encoding Procedure (based on the zxing library) – RGB shading model based 8 unique color blends.
- 7) G. Create four distinct shading QR codes.
- 8) H. Use multiplexing on each of the four QR Codes (MUX).
- 9) I. QR Code with High Capacity Shading.

Algorithm for Decoding:

- 1) A. High Capacity QR Code.
- 2) B. Scan QR Code Using a High Capacity QR Deciphering Application on an Android-based sophisticated mobile phone.
- 3) C. Make use of extraction/de-multiplexing (DEMUX).
- 4) D. All four distinct color QR Codes – Created.
- 5) E. Use the modified shading QR Deciphering Method (based on the zxing library) – Reed-Solomon for self-harm resistance.
- 6) F. Twofold Information Compressed – Created.
- 7) G. Execute the Information Extraction Procedure (Compress Lossless Decompression method).

- 8) H. Apply ASCII Change Twice.
- 9) I. Convert two-fold values into their corresponding Content Information.

IV. RESULT

The result of the application is a complete ERP system with student, teacher and admin login. After registration of student through administration panel a unique QR for every student is generated. After scanning of the QR code in particular section the information related to that section is displayed. A part of an application where a QR code for student is displayed and the result after scanning the same QR code is displayed in the below result pictures of the original app:

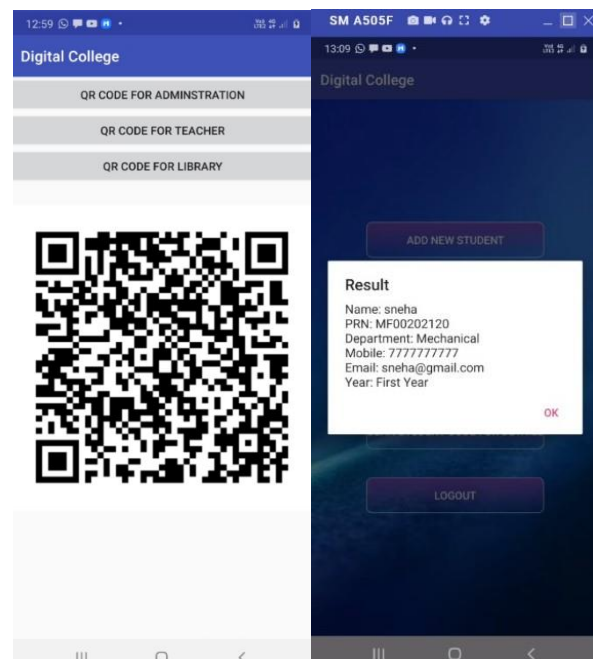


Figure 2: QR code generated for student and the result of the same QR code is generated

V. CONCLUSION

We suggest the college ERP system, the QR code is used to gather the information on students' personal information. In particular, real-time data acquisition and disposal increases the system efficiency. Most of the basic demand is satisfied by the QR Code module

in the ERP system, and the ERP function modules with a higher degree of automation are put in place. This system should improve the way of tracking student data in the classroom and provide a new, more accurate, and more efficient way of recording the information. This technology provides reliability, saves time, and delivers it with great security. Administrators and instructors have full control over the student record as long as long as it is connected to the web. In the future, we must enhance security for the purpose of overall safety. Additional features could be added to the project, such as sending a text message each day of the attendance of students. Online exam should be more useful, efficient, dynamic, and engaging so it helps students get a better experience.

VI. FUTURE SCOPE

In the future, we will need to improve additional security for the sake of safety. The project can be improved further by including features such as sending SMS notifications to students' parents about their daily attendance. Make the online exam more effective, efficient, and lively in order to gain the student's support.

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