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QR Code Based Smart Identity Card

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ABSTRACT: As the population growth is in race, people need to be recognized by using identity cards (ID).
The proposed system takes care of smart ID card to Grant a Chunk to be in the race of this smart era. Smart Id cards is the summary of Student's information.
Identity establishment necessitates a pre stored readily available data about self and to the administrator to authenticate it with claimer's personal information.
However, it has been observed that in most of the cases smart identity card solution has been preferred by a user and administrator both.
    Here, we are discussing about the variability of smart card technology as an identify solution and its ability to perform various functions with strong access control that increases the reliability of smart card over other technologies. The Smart Id card would contain the information of a student's personal details, student's account details, fees transaction details, library details, scanned copy of submitted documents to the college.
Smart Id card help us to overcome the manual work in a smarter way.

KEYWORDS: Smart card, Security, access control, Grant, Chunk, era.

I. INTRODUCTION

We live in the era where technological trends and advancement are making our life easier and smarter. To track the summary, manage official documents, transactions, staff or student smart card plays a major role. This work introduce a system embedded a QR-Code engraved on the card and a Smartphone App which will scan the QR-code and verify it. Keep a track on student's performance is a scan away these days. Calculating the attendance and sorting the data is still done manually. To pay exam fees or any fine we can use this card. Instead of using cash and various cards. It is way better to use a single multipurpose portable card.

Smart Identity Cards:

        A smart card is a movable computer, its generally the size of a credit card, without having a display and a keyboard. Microprocessor, memory is integrated into the card. Its use in alliance with a contact or contactless card reader. It is a very familiar portable object with a rather long life - cycle(3-10years) and a light carbon footprint. These cards are used for ID cards, driving licenses, health cards and many more.

    Smarts cards provide ways to securely identify and authenticate the holder. They provide a secure way to store the data and protect communication with encryption.
Smart cards provide:
1.Security
2.Confidentiality
3.Portability
4.Convenience

QR-Code (Quick Response):

        A code that uses numeric, alphanumeric and byte/ binary encoding modes to store data which is easily accessed with smartphone or PC is QR -Code. In comparison with barcode QR -Code can aa store a lot more data. QR- Code codes are used to make payments, sharing a password protected Wi-Fi network, transferring money, sharing contact information, logging a website or much more. QR – Code can contain more information with fewer errors, it is easy to read and print.
It is more Secure.

QR – Code Scanner :
QR code can be scanned by any smartphone/PC/Laptop having webcam anytime at anywhere.

II. LITERATURE SURVEY

In 2014, Md. Sanaul Haque, Richard Dybowski proposed a system Advanced QR Code Based Identity Card: A New Era for Generating Student ID Card in Developing Countries. The project "Advanced QR coded Student ID Card Generation" is being created to decrease the effort of human as we know before people use the handwritten ID card. Nowadays barcode is replaced by QR code. In this automated system the card generation process is completely done by the computer with the help of the software. The information of the students is stored in the database and by this time the student ID card can be provided by the administration. Hence, wastage of time is reduced and storing is suitable.[1]

In 2015, A.Surekha, Rubesh Anand, and I.Indu proposed a system of E-Payment Transactions Using Encrypted QR Codes. In earlier system, while any e - payments the customer needs to share the details of the card for further processing. In the proposed system , the information provided by the customer is minimized by providing minimal information. This is accomplished in the proposed design by the introduction of QR-Codes and application of virtual cryptography. This proposed system can be also used in E-tickets.[2]

In 2016 Vassilya Uzun and Sami Bilgin proposed a paper with title Evaluation and implementation of QR Code Identity Tag system for Healthcare in Turkey. They designed a QR code identity tag system to integrate with healthcare system. Every patient had different QR code identity tag. These QR code contain detailed information of patient history. It can be wore as a bracelet, necklace or can be carried as an identity card. QR code scanner in any smartphone can be used to scan the code.[3]

My School -School Management System Based on Web "SMS"(2016) Khaled J.Awadallah propsed School Management Systems that helps teachers to complete grade book, track students attendance, input class notes, create lesson plans and detailed reports, and communicate with other staff members, students, and parents all via e-mail. the system works as a centralized database and application that schools can easily access the system from anywhere based on the login credentials.[4]

In 2016 Md Riasath Arif Prodhan, Noor Nabiul Alam Siddiqui and Albert Rozario published a paper titled Advanced Management System for Educational Institutions in which they introduced an advance management system for educational institutions which was fully online based and solved a great deal of problems related to the communication between students,teacher, parent and staff. By using the system they all could acknowledge to each other. Therefore the communication between them increased sufficiently.[5]

In 2017, Emmanuel C. Ayeleso a*, Adebanjo Adekiigbe a, Ndidi C. Onyeka a, Mathias O. Oladele b proposed a system identity Card Authentication System Using QR Code and Smartphone. In this paper, the author proposed a system where the students are given a identity card printed with a QR-Code on it and a Smartphone App which is used for authenticating the QR code. Keeping in mind the network issue this process is a offline process. In-built camera is used to recognize the embedded QR-Code. QR code has edge over RFID-based systems.[6]

In 2017,Venkateshwar Amingad, Sushma Poornima and Harish Arpitha propsed a method for school administration system. It is user interface for controlling all the function that happens in the school. This application is aimed to develop school administration application software which can streamline the administration of the school.school administration system that deals with all kind of school details such as academic related reports, student details, faculty details and other resource related details too, in Web Based School Administration System.[7]

In 2018, Goh Khai Hong and Sharad Sinha proposed a system of tracking vulnerable people using body worn QR code. The QR-Code technology is in use in many medical facilities, mainly in Asia-Pacific domain, mostly for accessing and controlling patient related processes and data. A web and mobile application is developed and implemented for the

public usage for customized QR code-based human-tracking. This is aesthetically appealing, more durable and much less intrusive compared to QR Code stickers. The rationale of selecting a hash function and a QR code type is also presented with sufficient technical analysis.[8]

III. PROBLEM STATEMENT

This project is developed to ease the work and save the time of staffs and students. A unique card is given to each student called "smart id card". This card is useful in admin section for knowing account details, Students personal information, Transaction details and attendance details.

Architecture of how the system works:

QR – Code Scanner   Details Processing

Data stored in Database
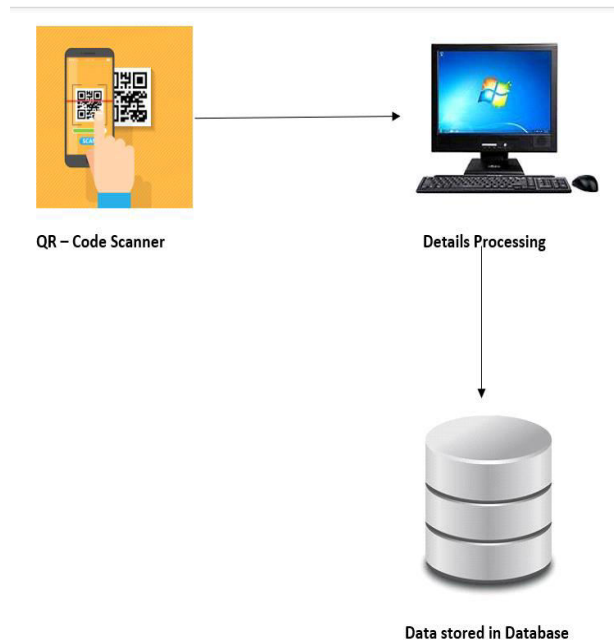
This paper proposes the system that, the details of the students is saved in the database. Various modules such as attendance system, fees transaction, etc are been look upon to overcome the manual work. A separate card with a personalised QR is been handled to the student when scanned the QR code a page with various modules will be generated. Whatever module' s worked is required he/she may carry on with further processing.If student wants to check his attendance or fees enquiry it is just a scan away and with a better and a smarter way. There are different login credentials for admin/staff section and for student section.

Why QR code:

QR code is better than barcode because it can store more data which also includes URL links. Apart from that QR codes are more secure. Static QR codes are machine readable and content inside them cannot be changed once generated. While in dynamic QR- Code content can be changed, but we would need access to the user account that created them in the first place. QR codes can be used to give a unique identity to assets.

System Flow Diagram:
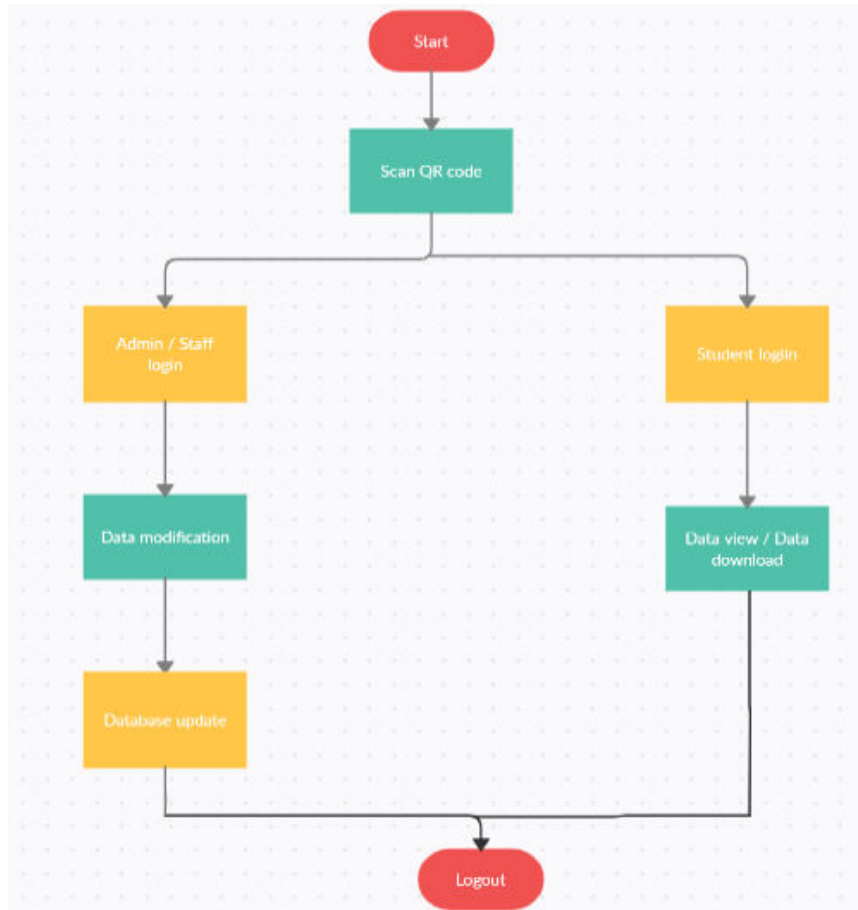
In the above diagram, first scan the QR code. After that fill the login details like username and password. Select the module as per own requirements. If we want to update any detail then update it in data updation step and logout from account.

The proposed system has been explained as follows:

Step 1: Start
    Scan QR code .

Step 2:Login
     Fill the login details.

Step 3: Module selection
     Select the module as per requirement.

Step 4: Data updation
    Update the details in selected module.

Step 5: Database updation
    Database will be updated as per the updation that have been done in previous step.

Step 6: Logout.

1)QR code scanner:
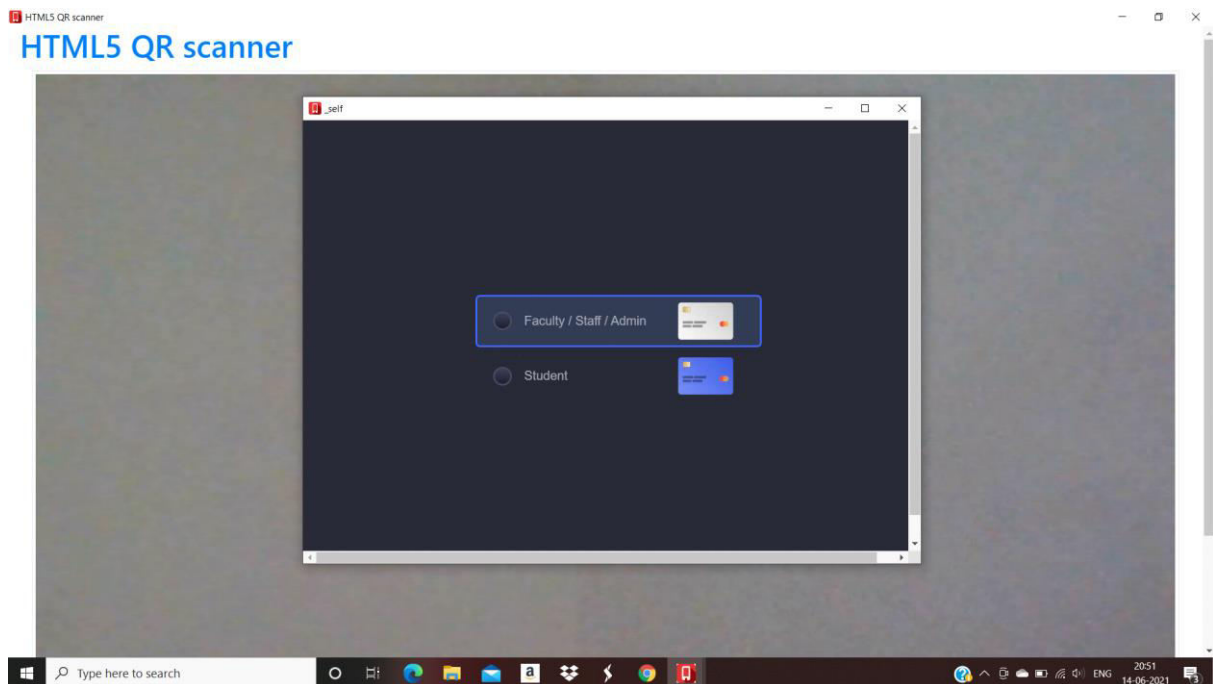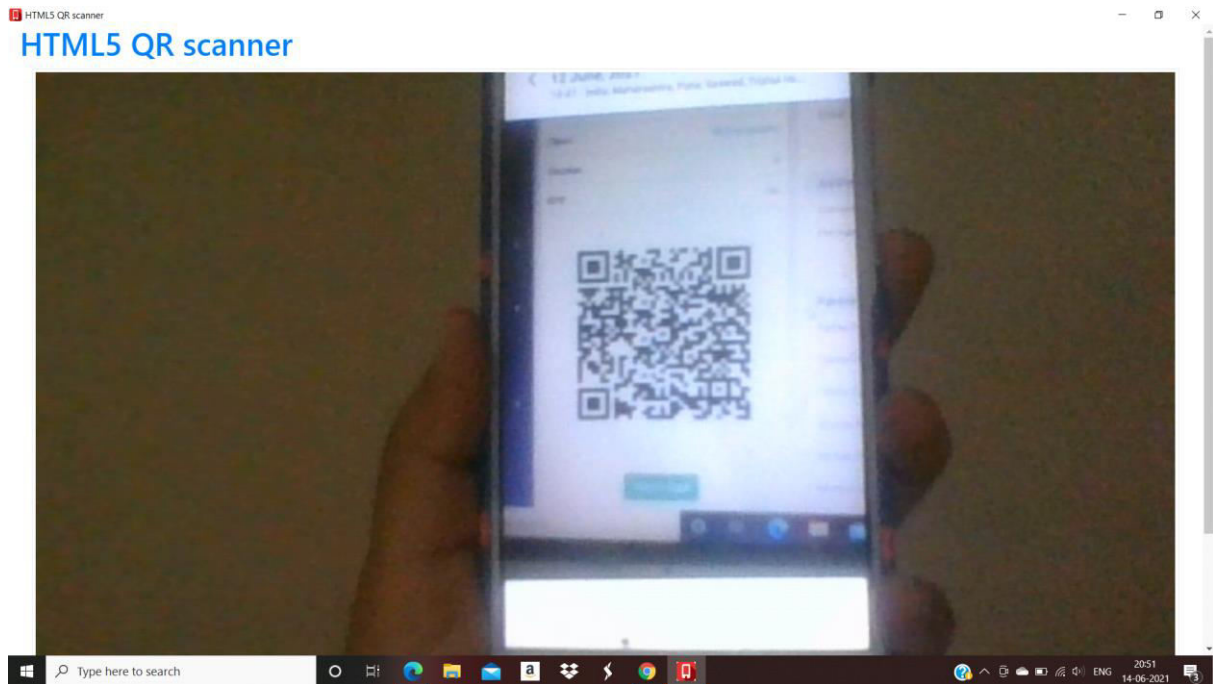
2)Student Module:

Student login:
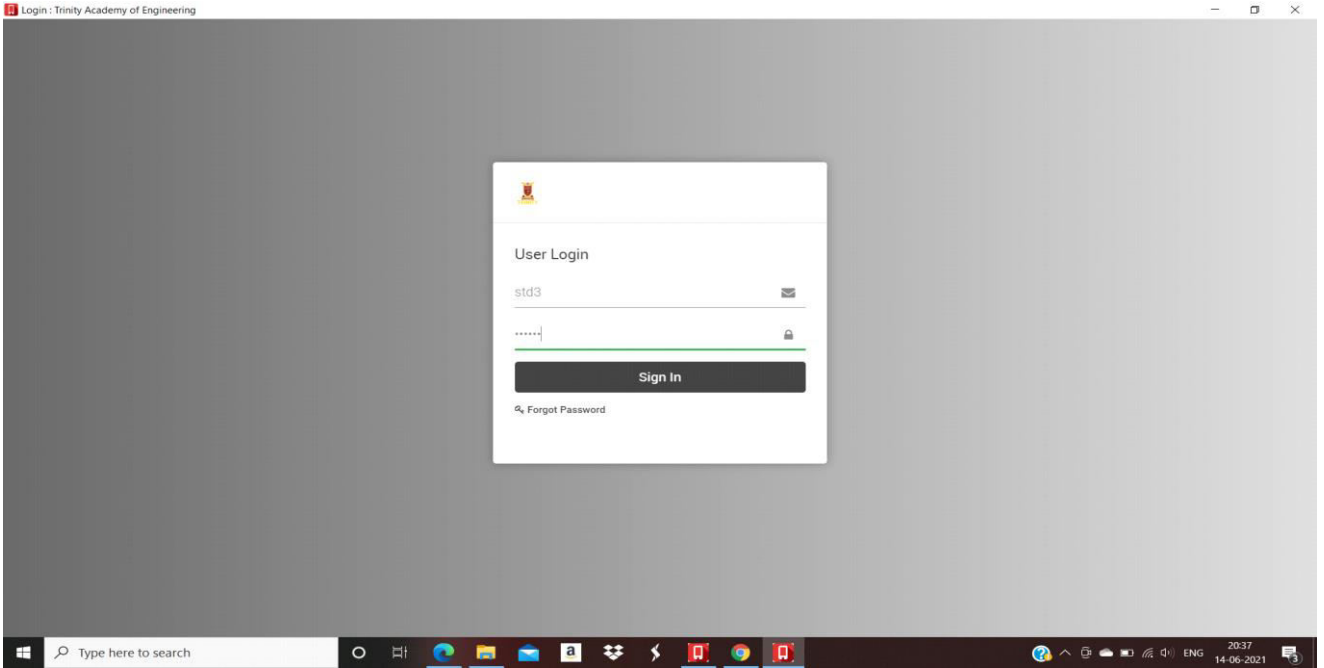
This is the login page for students. Individuals have to enter their asked details to have their login.

Student profile:
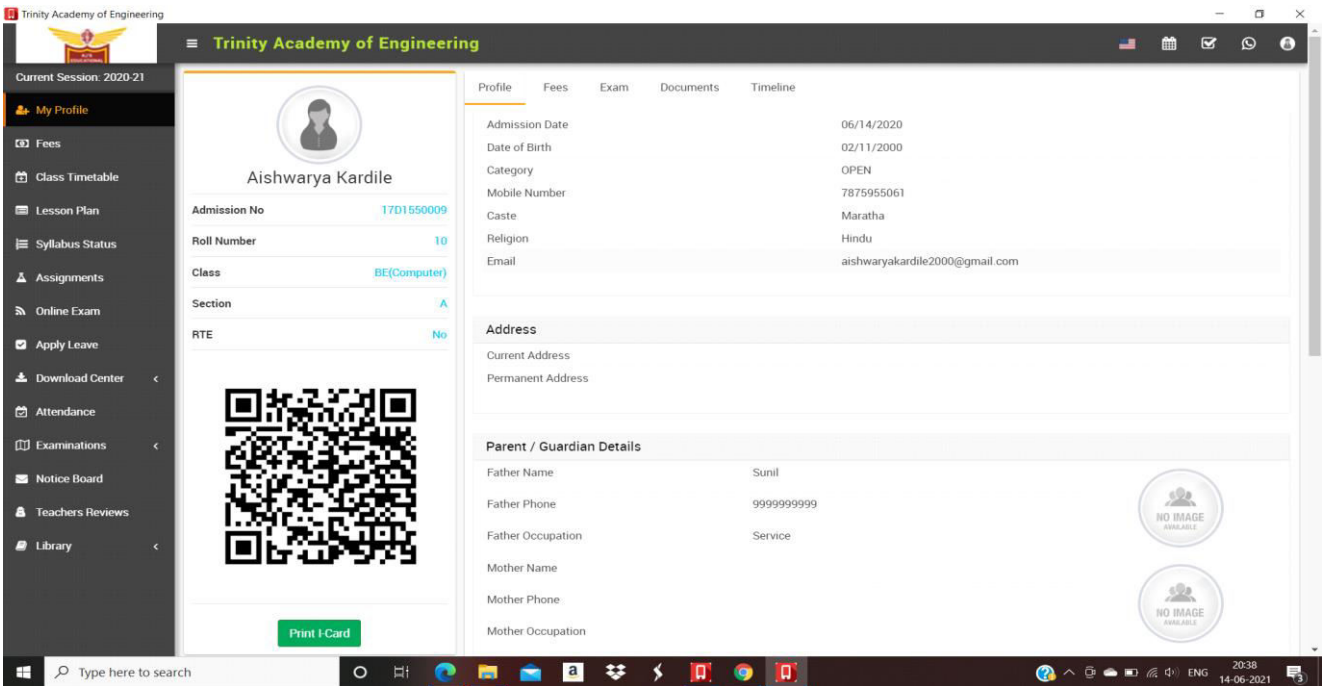
In student profile student is able to view his/her personal and academic details.

3)Admin module:
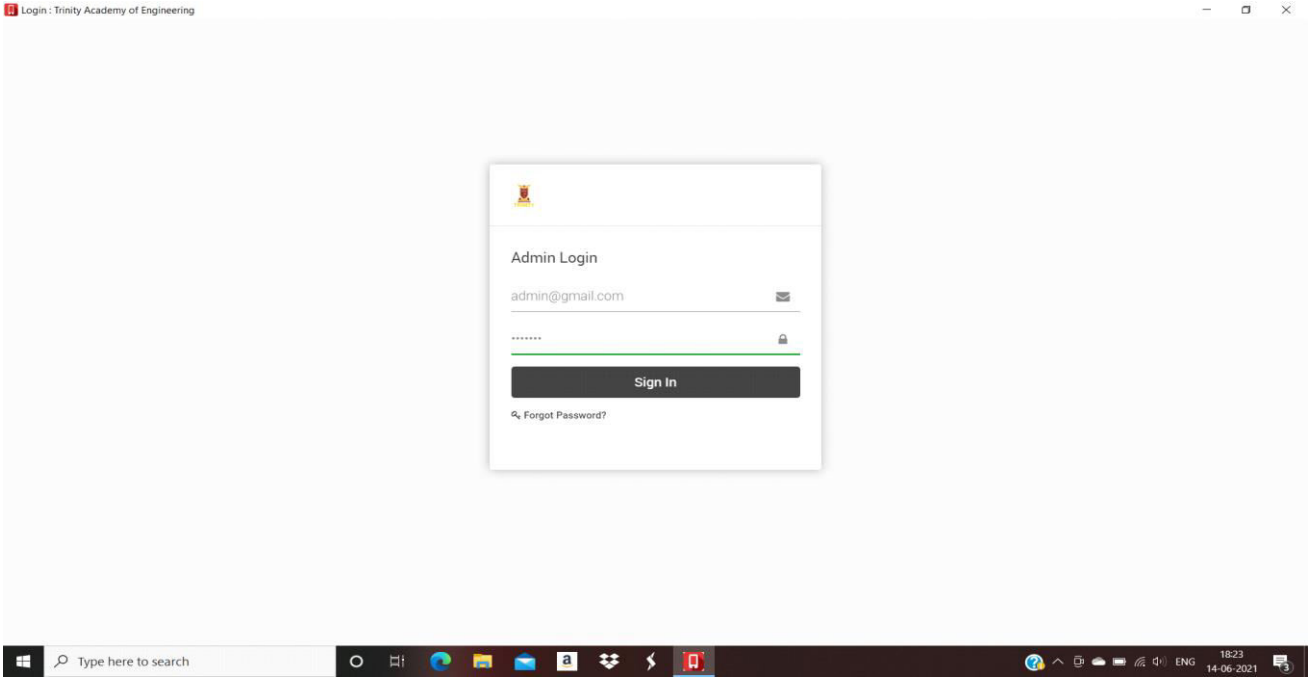
Admin/staff login are at same page with different credential access. He/she has to enter the asked details to have their login.
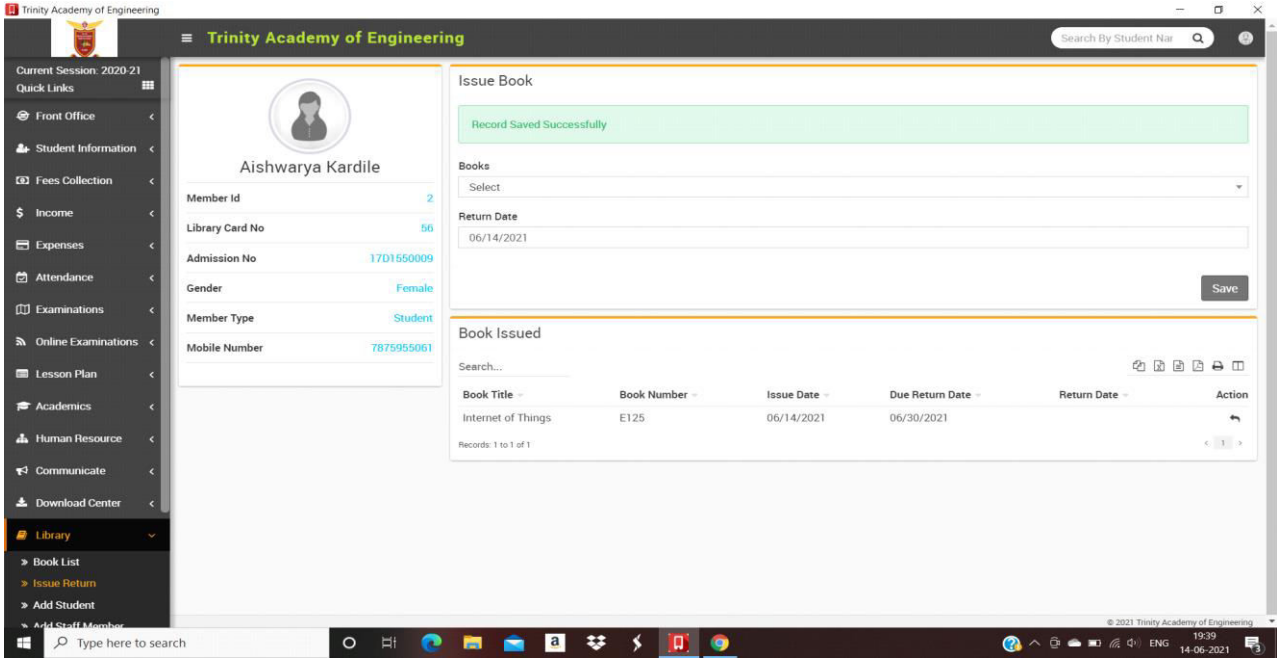
4)Library Module:

Book list:
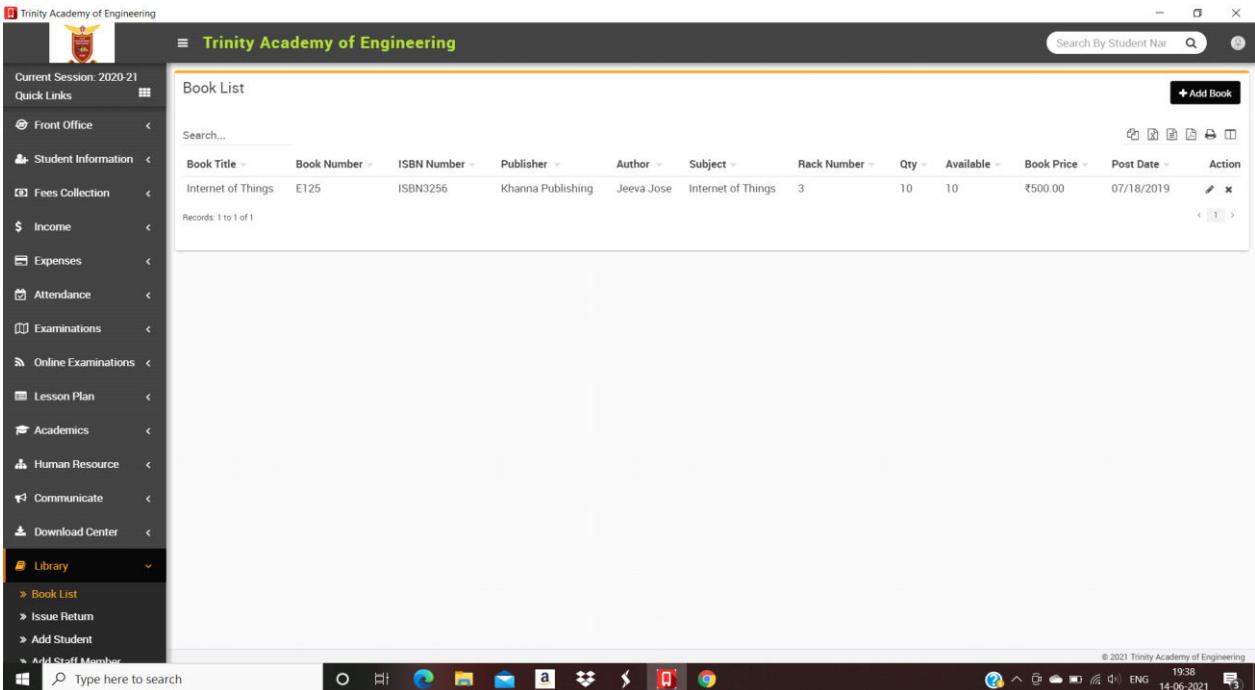
Students are able to view availability of books in library section.

Issue book details:

Books issue details are display here.

5)Exam Module:
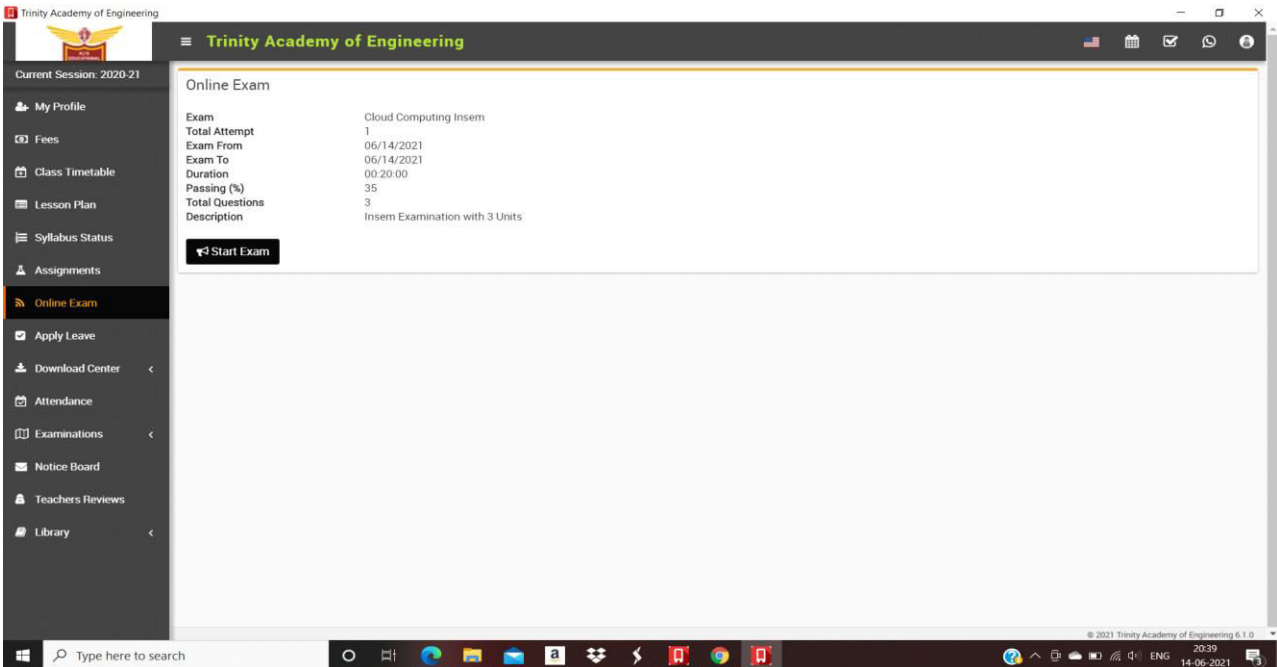
Staffs are able to conduct online exam through system.

6) Fees Details:

Student's fees details are display here.

7) Class timetable:

No handwritten copies of timetable. Manage your timetable with the smarter way. This page will show the weekly timetable of the particular class.

8)Attendance Monitoring:
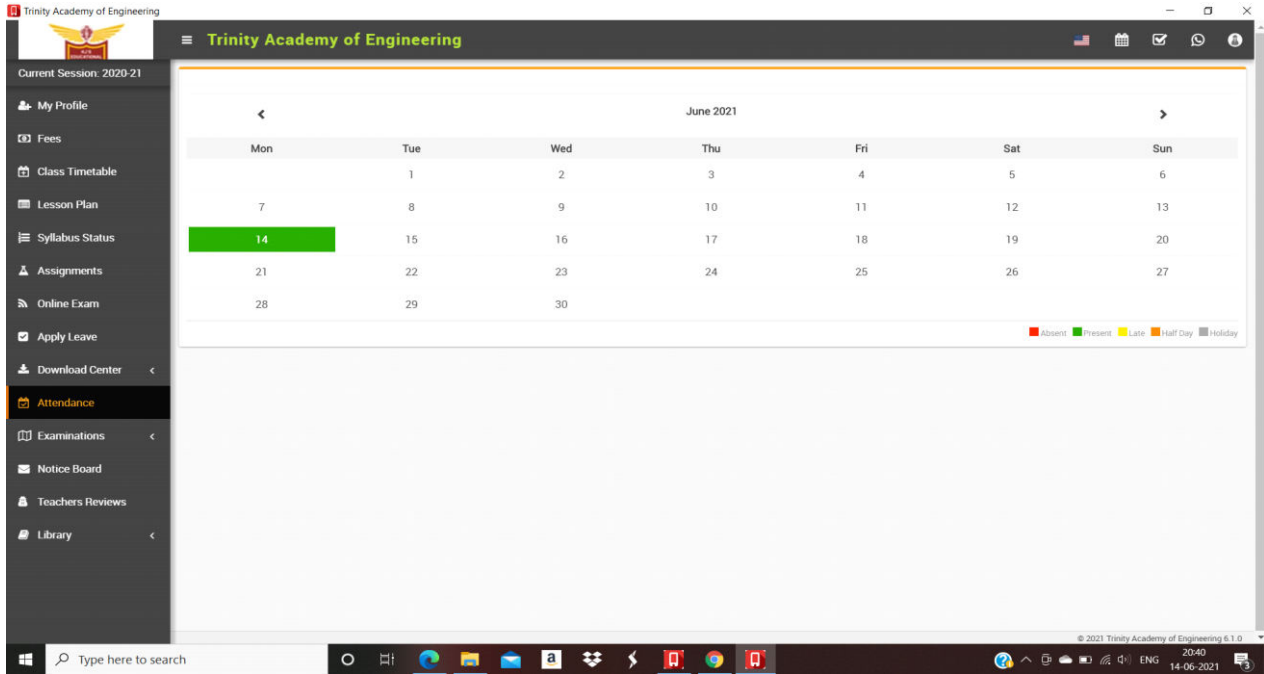
Teaching faculty will be able to mark the attendance which will be viewed by student in their profile.

Algorithm:

 Fuzzy matching is a technique used in computer-assisted translation as a special case of record linkage. It works with matches that may be less than 100% perfect when finding correspondences between segments of a text and entries in a database of previous translations. It usually operates at sentence-level segments, but some translation technology allows matching at a phrasal level. It is used when the translator is working with translation memory.

Given below is list of algorithms to implement fuzzy matching algorithms which themselves are available in many open source libraries:

Levenshtein distance Algorithm:

Levenshtein distance is a string metric for measuring the difference between two sequences. Informally, the Levenshtein distance between two words is the minimum number of single-character edits (i.e. insertions, deletions or substitutions) required to change one word into the other.

Damerau–Levenshtein distance:

Damerau–Levenshtein distance is a distance (string metric) between two strings, i.e., finite sequence of symbols, given by counting the minimum number of operations needed to transform one string into the other, where an operation is defined as an insertion, deletion, or substitution of a single character, or a transposition of two adjacent characters.

Bitap algorithm with modifications by Wu and Manber:

Bitmap algorithm is an approximate string matching algorithm. The algorithm tells whether a given text contains a substring which is "approximately equal" to a given pattern, where approximate equality is defined in terms of Levenshtein distance — if the substring and pattern are within a given distance k of each other, then the algorithm considers them equal.

n-gram:

n-gram is a contiguous sequence of n items from a given sequence of text or speech. The items can be phonemes, syllables, letters, words or base pairs according to the application. An n-gram model is a type of probabilistic language model for predicting the next item in such a sequence in the form of a $(n-1)$−order Markov model.

BK-tree:

A BK-tree is a metric tree suggested by Walter Austin Burkhard and Robert M. Keller specifically adapted to discrete metric spaces. To understand, let us consider integer discrete metric $d(x,y)$. Then, BK-tree is defined in the following way. An arbitrary element a is selected as root node. The root node may have zero or more subtrees. The k-th subtree is recursively built of all elements b such that $d(a,b) = k$. BK-trees can be used for approximate string matching in a dictionary

Benefits of this system:

Typing a URL is time consuming and consumers make errors while typing. As compared to this scanning a QR code is much faster and error-free process for people. QR -codes can be easily scanned with any smartphone and it will show the respective information. QR -code in students id card is a secure way to access student 's information like payment details.

Advantages Of QR code:

1)Provides ease to access student data.

2)Daily record maintenance would be done in just few steps.

3)QR code implementation would be cheaper as compared to other smart card technologies.

4)Data security will be maintained with the help of unique Id and password for user.

5)Less paper work hence environment friendly approach.

Drawbacks of QR code:

1) Desktop is must.

2) High-speed internet is required for the system.

3) Light in room should be sufficient for detection of QR code by scanner.

V. CONCLUSION

It is essential to keep up-to-date with latest technologies in education.by viewing all of the analysis the QR based smart identity card having features like it can store students personal information, students account details, payment and attendance details. QR code contain details information of student which can be scanned in a single second using the smartphone. Payment system can be easily update in each transaction and transactions are more secure with the help of QR code. QR -based smart id card is error-free, inexpensive and also reduces human stress.

Future scope:

1) Healthcare:

Smart health cards are useful for storing patients various information like patients personal information, test reports, pharmaceuticals records, etc. It also helps us to improve privacy and security of patient's data. Health cards help to reduce frauds in hospitals. Smart health cards help to simplify the administration process and allow doctors to access complete and comprehensive patient information.

2)Online Admission:

In future it is possible to provide online admission facility to student.

3)Online Payment:

Online payment method will include third party apps for ease in payment method.

4)Android based application:

Android based application for ease of handling system.

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