

Intelligent Transportation System Based on Fingerprint Biometric in Cloud Systems

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Abstract—Fingerprint identification is one of the oldest method that has been successfully used in numerous applications. Each of our ten fingerprints is different from one another and from those of every other person. Even identical twins have unique fingerprints. That makes them ideal for personal identification. A fingerprint is made of a series of ridges and furrows on the surface of the finger. The uniqueness of a fingerprint is determined by the pattern of ridges and furrows as well as the minutiae points. Minutiae points are local ridge characteristics that occur when a ridge splits apart or a ridge ends. The biometric based authentication believes it has come up with the best way to take attendance in college buses. College system will use fingerprint scanners that log everyone as they step off the bus. The fingerprint system already uses scanners inside the college, but their location makes it difficult to keep track of every student. So, the colleges will begin installing the scanners on select buses. If this initial trial goes as well as expected, the scanners will be installed on the college's entire buses. When the student returns to be identified, the finger scanner again scans the finger. The computer software now compares the new template with the other templates in the database. When a matching template is found, the student is identified. This identification and matching process takes under one second to complete. And to send the intimation to parents about their students whether he/she reach save destinations through SMS alerts.

Index Terms—Biometric, Fingerprint, SMS alert

I. INTRODUCTION

More customary methods for access control incorporate token-based recognizable proof frameworks, for example, a driver's permit or visa, and learning based distinguishing proof frameworks, for example, a secret word or individual ID number. Since biometric identifiers are one of a kind to people, they are more dependable in checking character than token and learning based techniques; notwithstanding, the gathering of biometric identifiers raises protection worries about a definitive utilization of this data.

Biometrics alludes to system identified with human qualities. Biometrics validation is utilized in software engineering as a type of recognizable proof and access control. Biometric identifiers are regularly classified as physiological versus conduct attributes. Physiological attributes are identified with the state of the body. Social attributes are identified with the example of conduct of a man, including yet not restricted to composing mood, stride, and voice. A few analysts have instituted the term conduct measurements to portray the last

class of biometrics.

Many different aspects of human physiology, chemistry or behavior can be used for biometric authentication. The selection of a particular biometric for use in a specific application involves a weighting of several factors and identified seven such factors to be used when assessing the suitability of any quality for use in biometric authentication.

- Universality implies that each individual utilizing a framework ought to have the quality.
- Uniqueness implies the quality ought to be adequately extraordinary for people in the significant populace with the end goal that they can be recognized from each other.
- Permanence identifies with the way in which a quality changes after some time.
- Measurability (collectability) identifies with the simplicity of securing or estimation of the quality. What's more, procured information ought to be in a shape that licenses consequent preparing and extraction of the important capabilities.
- Performance identifies with the exactness, speed, and vigor of innovation utilized (see execution segment for more points of interest).
- Acceptability identifies with how well people in the applicable populace acknowledge the innovation to such an extent that they will have their biometric quality caught and evaluated.

II. EXISTING SYSTEM

In the present system no work is done related to transport attendance. In some institutions it may be done orally. If this system is not implemented then many student may cheat their parents to get money for transport. Also parents may expect some acknowledgment weather their ward has got bus properly. Disadvantages of present Working System

- Leads to unwanted expenses towards transport.
- Leads to accident if they use two wheelers.
- Leads to depression to parents about their ward safety.
- Difficult to track the students to enter the bus or not

III. PROPOSED SYSTEM

In proposed system, there is no system for students who are

entering into college bus or not. And also implement GPS based bus tracking system which is a cost expensive and efficient system. Using this system four application will be developed. First application is establishing communication between college server and bus system which is capable of providing real-time data regarding the current location of buses. Second application is sending a group messages i.e. alert messages to the students waiting at the next stop, changes in current route, bus number, etc., hence it saves the time of students. Third application is generation of e- bus pass system which is an eco-friendly as there is no need of generation of plastic bus passes. Last application is developing an emergency handling system which will send alert messages simultaneously to college, police and ambulance in case of accidents. In existing system it is difficult to send alert about students whether he is enter into the bus or not. The parents can't be track the students details and need manual inception for tracking the students.

Advantages of proposed system

- There is no need to sensors or advance GPS devices
- Easily know the status of students
- Cost effective and time consuming process
- Real time attendance alert system
- Efficient notification system

IV. SYSTEM REQUIREMENTS

Software Requirements

Operating system	: Windows OS
Front End	: .NET (C#)
Back End	: SQL SERVER
Application	: Web application

Hardware Requirements

Processor	: Dual core processor 2.6.0 GHZ
RAM	: 1GB
Hard disk	: 160 GB
Compact Disk	: 650 Mb
Keyboard	: Standard keyboard
Monitor	: 15 inch color monitor

V. SYSTEM ARCHITECTURE

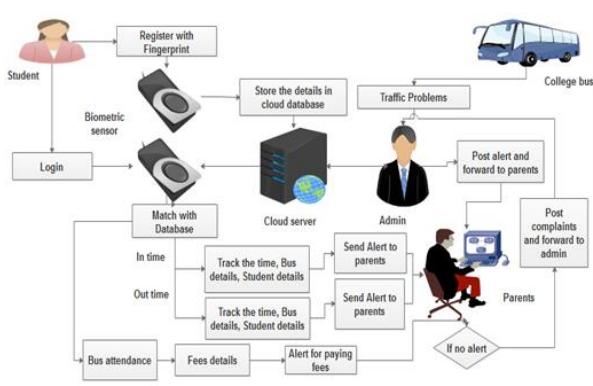


Fig. 1. System architecture

VI. UML DIAGRAMS

A. UML Diagrams

Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable result to the actors or other stakeholders of the system.

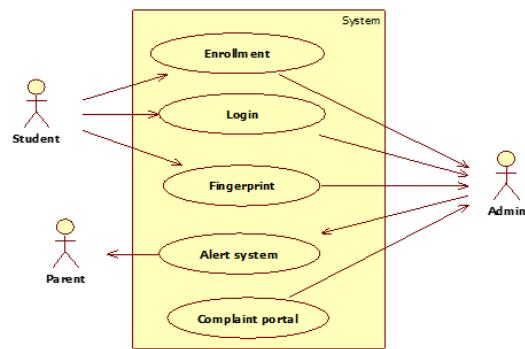


Fig. 2. UML diagram

B. Sequence Diagram

A Sequence outline is a connection chart that shows how questions work with each other and in what arrange. It is a build of a message succession graph. A grouping chart indicates protest cooperations organized in time arrangement. It portrays the items and classes associated with the situation and the succession of messages traded between the articles expected to do the usefulness of the situation. Grouping graphs are commonly connected with utilize case acknowledge in the Logical View of the framework being worked on. Arrangement charts are now and then called occasion outlines or occasion situations.

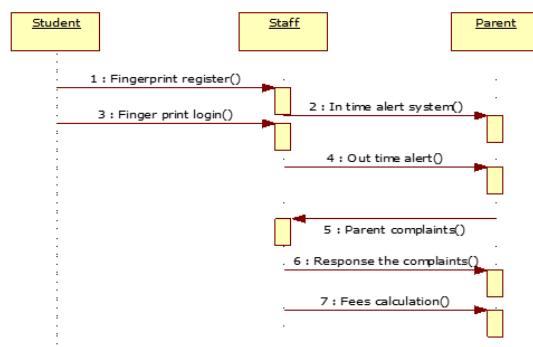


Fig. 3. Sequence diagrams

C. Activity Diagrams

Activity diagram is another important diagram in UML to describe dynamic aspects of the system. Activity diagram is basically a flow chart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. So the control flow is drawn from one operation to another. This flow can be sequential, branched or concurrent.

Activity diagrams deals with all type of flow control by using different elements like fork, join etc.

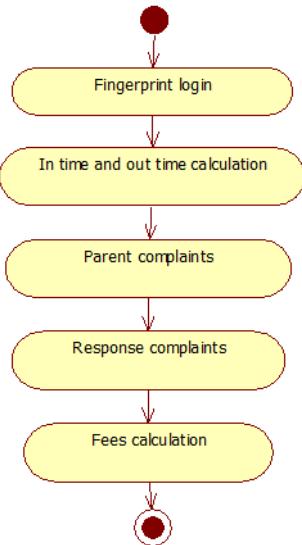


Fig. 4. Activity diagram

VII. DATA FLOW DIAGRAM

A two-dimensional chart clarifies how information is handled and moved in a framework. The graphical portrayal recognizes each wellspring of information and how it cooperates with other information sources to achieve a typical yield. People looking to draft an information stream chart must distinguish outer data sources and yields, decide how the data sources and yields identify with one another, and clarify with illustrations how these associations relate and what they result in. This kind of outline helps business advancement and configuration groups imagine how information is handled and distinguish or enhance certain angles.

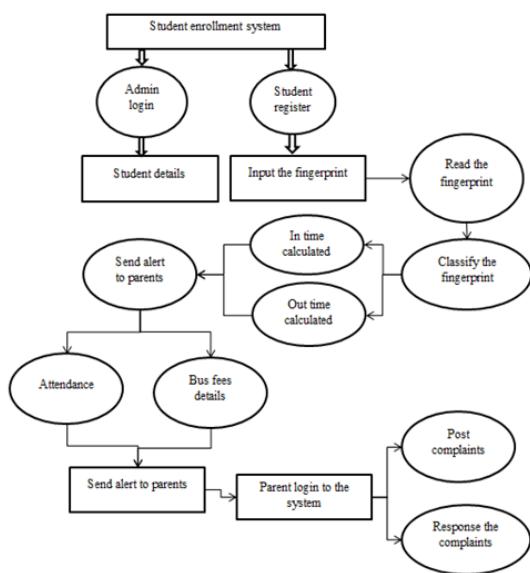


Fig. 5. Overall data flow diagram

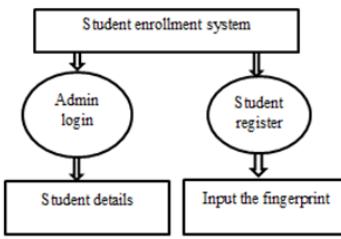


Fig. 6. Level 0

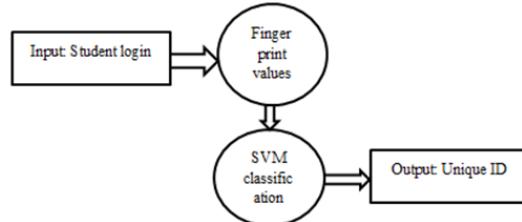


Fig. 7. Level 1

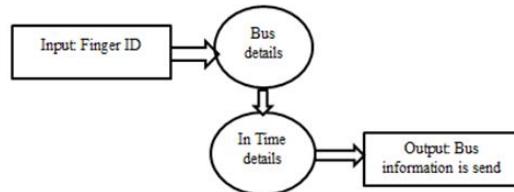


Fig. 8. Level 2

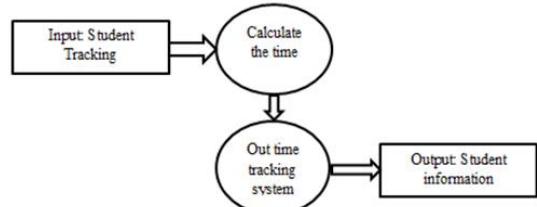


Fig. 9. Level 3

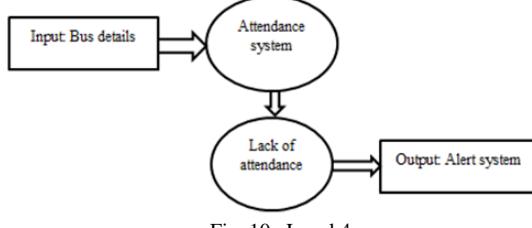


Fig. 10. Level 4

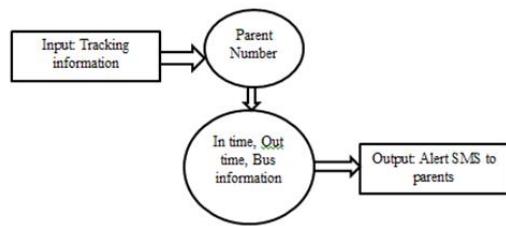


Fig. 11. Level 5

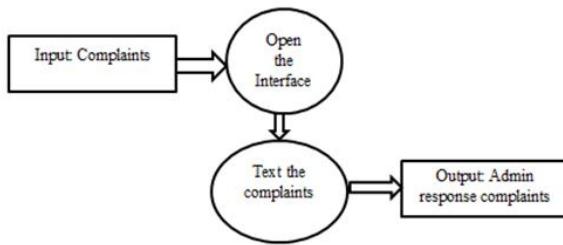


Fig. 12. Level 6

VIII. SYSTEM IMPLEMENTATION

Modules

- Student enrollment
- Student login
- Bus details with attendance
- Student tracking
- Notification and Post Complaints

Modules Description

• Student enrollment:

In this module, student registers their details with fingerprint using fingerprint sensor. Fingerprint feature details are extracted and stored in admin database. Each student has unique fingerprint identity for future purpose. Fingerprint can be detected using binarization and minuatiue extraction algorithm. Fingerprint features are stored in database.

• Student login:

After registration, he can get login information to enter into the system. Then implement fingerprint sensing system to extract fingerprint from students. Fingerprint features are matched with database for authentication. We can implement Support Vector machine algorithm to classify the fingerprint features.

• Bus details with attendance:

Admin can be login to the system to enter bus details and student details and stored in database with updated manner. He can enter all student details with fingerprint information with corresponding bus details. Based on these details provide attendance to each students with proper reports

• Student tracking:

Student can be login to the system and calculate at the time of first capture the fingerprint. And also calculate the time of second time that is student leaving from bus. Based on two times, we can calculate the time interval.

• Notification system and post complaints

Based on first time fingerprint login, alert can be send to parents according student registration number to know about the status of student that is he can enter into the system. After

that, second time fingerprint login, parents know about students safely reached into the college. In this module, parent interface is creating for post complaints. If the out time intimation does not send to parents means, parents open the interface to post the complaints about student delay time. This complaint automatically forward to admin and he can provide response to parents with proper intimation.

IX. SCREENSHOTS



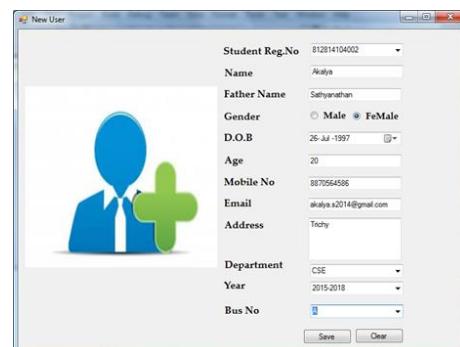
Fig. 13. Home

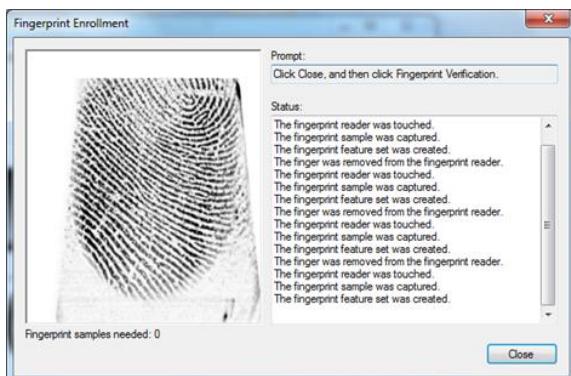


Fig. 14. Login



Fig. 15. Admin Home page





[Script Enrollment](#)

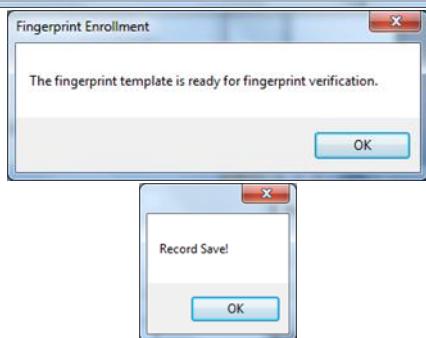


Fig. 16. New Student Enrollment

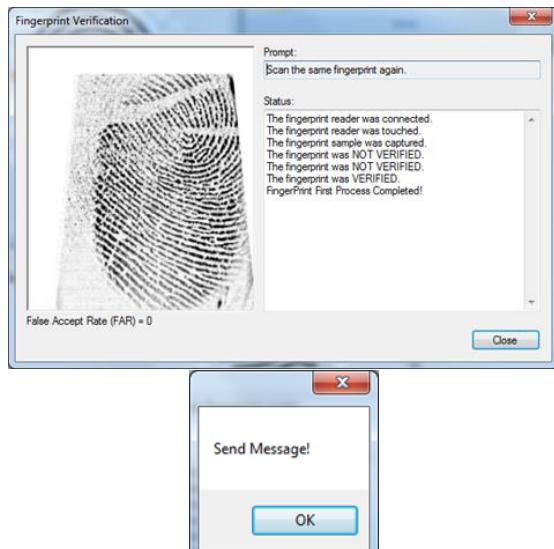


Fig. 17. Student In/Out verification

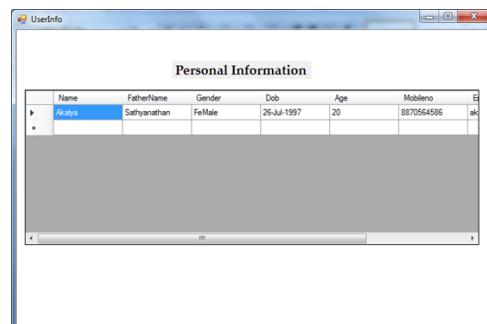


Fig. 19. User Info



Fig. 20. Emergency alert sent to parent and institution

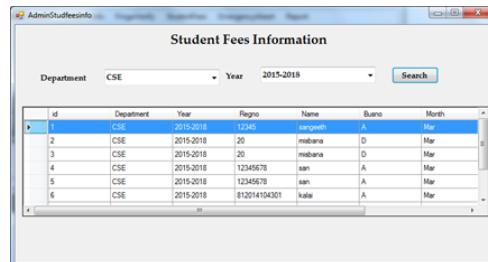


Fig. 21. Admin students fee information

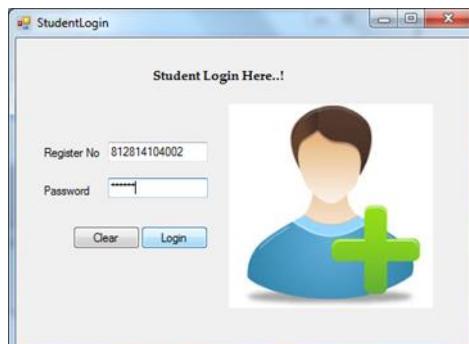


Fig. 22. Students Login

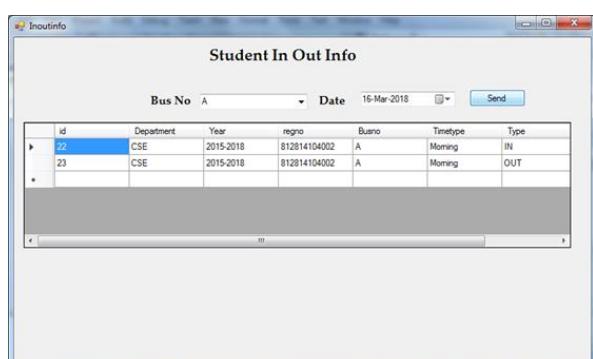


Fig. 18. Students In/Out Information

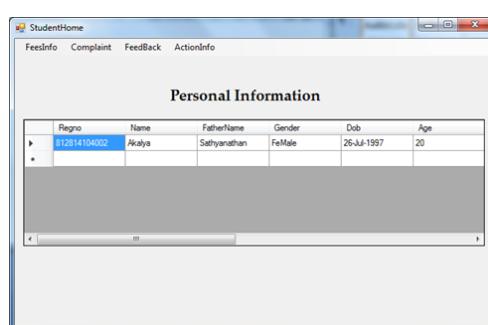


Fig. 23. Students Home Page



Fig. 23. Feedback Page

X. CONCLUSION

The Online transport management system is a window based system aimed at students, college administration to maintain bus facility. The system takes student information as input source and attempts to maintain the bus services. It allows flexibility during these processes. The system generates exhaustive reports related to the Bus Management i.e. Fees

paid, dues, rout no. & bus stop. The reports highlight various bus services and features of the bus, which can be subjected to improvements especially for the college administration to improve bus transport system. The system requires comparatively small amount of resources such as memory, input/output devices and disk space. And to provide fingerprint based authentication system to know the details about student in and out time details. A Transportation Management System is a software system designed to manage transportation operations and ensure better service, decrease routing time with optimized cost and fuel efficiency.

XI. FUTURE ENHANCEMENT

As part of future work, to implement GPS based on fingerprint system to track the student and also bus details. We can extend the framework to implement the system with Android based applications.

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