1FA (ONE FOR ALL)

Project report in partial fulfillment of the requirement for the award of the degree of

Bachelor of Technology

In

Computer Science and Engineering

Submitted By

Name : Debmalya Sarkar	Enrollment No. 12021002001065
Name : Arpan Ghosh	Enrollment No. 12021002001056
Name : Satwik Das	Enrollment No. 12021002001077
Name : Arghadeep Paul	Enrollment No. 12021002001087
Name : Arkabrata Basu	Enrollment No. 12021002001078
Name : Manvi Kumari	Enrollment No. 12021002001085
Name : Debayudh Roy	Enrollment No. 12021002001079
Name : Anushka De	Enrollment No. 12021002001049
Name : Soham Datta	Enrollment No. 12021002001133
Name : Souvik Ghosh	Enrollment No. 12021002001068

Under the guidance of

Prof. Nilanjan Chatterjee

&

Prof. Anay Ghosh

Department of Computer Science and Engineering

UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA

University Area, Plot No. III – B/5, New Town, Action Area – III, Kolkata – 700160.

CERTIFICATE

This is to certify that the project titled **1FA(ONE FOR ALL)** submitted by Name : Debmalya Sarkar **(University Roll No.**12021002001065**)**, Name : Arpan Ghosh **(University Roll No.**12021002001056**)**, Name : Satwik Das **(University Roll No.**12021002001077**)**, Name : Arghadeep Paul **(University Roll No.** 12021002001087**)**, Name : Arkabrata Basu **(University Roll No.**12021002001078**)**, Name : Manvi Kumari **(University Roll No.**12021002001085**)**, Name : Debayudh Roy **(University Roll No.**12021002001079**)**, Name : Anushka De **(University Roll No.**12021002001049**)**, Name : Soham Datta **(University Roll No.** 12021002001133**)** and Name : Souvik Ghosh **(University Roll No.** 12021002001068**)**, student of UNIVERSITY OF ENGINEERING & MANAGEMENT, KOLKATA, in partial fulfillment of requirement for the degree of Bachelor of Computer Science and Engineering, is a bonafide work carried out by them under the supervision and guidance of Prof. Nilanjan Chatterjee & Prof. Anay Ghosh during 5th Semester of academic session of 2023 - 2024. The content of this report has not been submitted to any other university or institute. I am glad to inform that the work is entirely original and its performance is found to be quite satisfactory.

_____ _____

Signature of Guide Signature of Guide

_____

Signature of Head of the Department

ACKNOWLEDGEMENT

We would like to take this opportunity to thank everyone whose cooperation and encouragement throughout the ongoing course of this project remains invaluable to us.

We are sincerely grateful to our guide Prof. Nilanjan Chatterjee and Prof. Anay Ghosh of the Department of Computer Science and Engineering, UEM, Kolkata, for his wisdom, guidance and inspiration that helped us to go through with this project and take it to where it stands now.

Last but not the least, we would like to extend our warm regards to our families and peers who have kept supporting us and always had faith in our work.

Name: Debmalya Sarkar

Name: Arpan Ghosh

Name: Satwik Das

Name: Arghadeep Paul

Name: Arkabrata Basu

Name: Manvi Kumari

Name: Debayudh Roy

Name: Anushka Dey

Name: Souvik Ghosh

Name: Soham Datta

1.Abstract

The Smart Identity Card project addresses the inefficiencies and security concerns associated with traditional methods of carrying identification documents. Focused solely on consolidating essential identification data, this physical smart card introduces a secure and convenient alternative to carrying multiple forms of identification. Employing advanced encryption techniques, the card ensures the confidentiality of stored information. A user-friendly scanning mechanism allows for quick retrieval of identification data, eliminating the need to carry multiple physical documents. This abstract outlines the development and implementation of the Smart Identity Card, emphasizing its potential to enhance user convenience and improve the security of personal identification.

2. Introduction

In a world where the convergence of technology and everyday life is increasingly evident, the traditional methods of managing personal identification documents are facing challenges related to security, convenience, and environmental sustainability. The Smart Identity Card project emerges as a visionary response to these challenges, offering a cutting-edge solution designed to simplify and enhance the way individuals handle their identification needs.

This innovative project centers on the development of a physical smart card, meticulously engineered to securely consolidate various identification documents onto a single platform. By seamlessly integrating advanced encryption technologies and a user-friendly interface, the Smart Identity Card aims to provide a secure and efficient alternative to the conventional practice of carrying multiple physical identification documents. The card's capabilities extend beyond mere consolidation, offering a streamlined process for updating, modifying, and accessing personal identification information.

As we navigate an era characterized by rapid technological advancements, the Smart Identity Card project not only addresses the immediate concerns of security and convenience but also aligns with the broader objectives of modernizing identification practices and reducing the environmental impact associated with paper-based systems. This introduction sets the stage for an exploration into the development, challenges, and potential transformative impact of the Smart Identity Card on the landscape of identification management.

3.Literature Survey

Flutter:

The literature study for this paper serves to provide readers with a comprehensive understanding of cross-platform and native applications, specifically examining development and compilation processes for Swift/iOS, Kotlin/Android, and Dart/Flutter. Drawing on earlier studies, the research incorporates peer-reviewed publications sourced from databases including Google Scholar, Diva, IEEE, and BTH Summon. The chosen keywords such as "Cross-platform vs native," "Google Flutter," and "Mobile application performance" guide the investigation, while "PhoneGap performance" is included due to its relevance in comparative studies found in previous research.
Primary information about documentation and code standards is gathered from the official pages of the respective tools. To supplement this, online technology articles are consulted to explore general differences in application creation methodologies. The use of multiple articles ensures a robust understanding, reinforcing information obtained from online sources. Considering Flutter's relative newness, the challenge of finding an ample number of publications is acknowledged. Consequently, a substantial portion of the studies and articles related to Flutter are derived from non-peer-reviewed publications. Despite this, the research prioritizes peer-reviewed sources, emphasizing the credibility of information.

Information on cross-platform versus native approaches and books about Flutter is extracted from the previously mentioned databases, enriching the study with diverse perspectives.
To enhance the depth of the literature study, snowball sampling is employed on the initial scholarly database results obtained through the chosen search words. All types of papers identified in the scholarly databases contribute to the comprehensive exploration of cross-platform and native application development, making the study methodically robust and inclusive.

RFID:

Radio Frequency Identification (RFID) technology, with its potential to enhance library management and services, is analyzed within a formal innovation-decision framework. Despite its diverse applications globally, RFID adoption in libraries has faced obstacles. This study aims to identify common applications, benefits, barriers, and critical success factors by examining peer-reviewed publications from databases like Google Scholar, Diva, IEEE, and BTH Summon. While earlier adopters found RFID functional in areas such as asset tracking, barriers include technological limitations, interference concerns, prohibitive costs, lack of global standards, and privacy issues. A better-designed, cost-effective RFID system addressing privacy concerns is deemed crucial for wider library adoption. The study provides valuable insights for researchers and practitioners, offering a quick assessment of RFID in libraries and a framework for its effective implementation.

RFID technology is extensively used in various applications worldwide, from library management to supply chain tracking. This paper reviews RFID's application in library management, addressing challenges and potential benefits. Despite successful implementations in countries like Singapore, Australia, the United States, the United Kingdom, Canada, South Korea, and New Zealand, the number of published papers on RFID in libraries lags behind supply chain applications. The study discusses RFID's overview, its technological aspects, and its advantages over traditional barcode technology. The research also delves into RFID's common methods of identification and categorization based on power supply. The introduction sets the stage for a detailed analysis of RFID's applications, benefits, and barriers in library management, providing guidance for librarians and researchers.

4.Problem Statement:

4.1 Challenges :

1. Integration of Multiple Document Types:

- Developing a smart card that accommodates various identification documents while maintaining a secure and standardized format poses a significant technological challenge.

2. Data Security and Encryption:

- Ensuring the secure storage of sensitive identification information on a smart card requires robust encryption measures to protect against unauthorized access and data breaches.

3. User-Friendly Interface:

- Designing an intuitive and user-friendly interface for updating, modifying, and accessing information on the smart card is essential for widespread adoption and usability.

4. Interoperability with Existing Systems:

- Integrating the Smart Identity Card with existing identification and verification systems poses challenges in ensuring seamless interoperability without disruptions.

5. Technological Advancements:

- Keeping the smart card technology up-to-date and adaptable to future advancements is crucial for its long-term relevance and effectiveness.

6. Privacy Concerns:

- Addressing concerns related to user privacy and data protection is paramount to building trust in the adoption of smart identification cards.

7. Regulatory Compliance:

- Adhering to local and international regulations governing identification standards and data protection adds complexity to the development and implementation of the Smart Identity Card.

8. Public Awareness and Acceptance:

- Promoting awareness about the benefits of the Smart Identity Card and gaining public acceptance are critical factors influencing the success of the project.

4.2 Problem Statement :

1. Multiplicity of Physical Documents:

- Individuals are burdened with the need to carry and manage a multitude of physical identification documents such as passports, driver's licenses, and national ID cards for various transactions and services.
- The current approach leads to inconvenience, bulkiness, and an increased risk of document loss or theft.

2. Security Concerns:

- Carrying multiple physical identification documents raises security concerns, exposing individuals to the risk of identity theft and fraud.
- Existing identification systems lack a unified and secure solution for the comprehensive management of personal identification data.

3. Inefficiencies in Document Handling:

- Traditional identification systems lack a streamlined approach, resulting in inefficiencies during document verification processes.
- Cumbersome procedures can lead to delays, affecting user experience and the efficiency of services relying on accurate identification.

4. <u>Environmental Impact</u>:

- The prevalent reliance on paper-based identification contributes to environmental degradation through deforestation and resource-intensive production processes.
- The current paper-centric approach contradicts contemporary efforts towards sustainability and environmental responsibility.

5. Proposed Solution:

- We are using various technique to solve this problem
  Like we have used:

1. **Arduino Uno:** To scan the one for all card using Arduino Uno, we used an RFID (Radio-Frequency Identification) module. Connected the RFID module to the Arduino Uno, power it, install and use relevant libraries to read card data. Write a simple Arduino sketch to handle the RFID data and upload and test the performed actions based on card information.

2. **Dart:** Dart is a programming language developed by Google. It was first introduced in 2011 and has since been used for a variety of applications, including web development, server-side scripting, and mobile app development. Key features of Dart include:

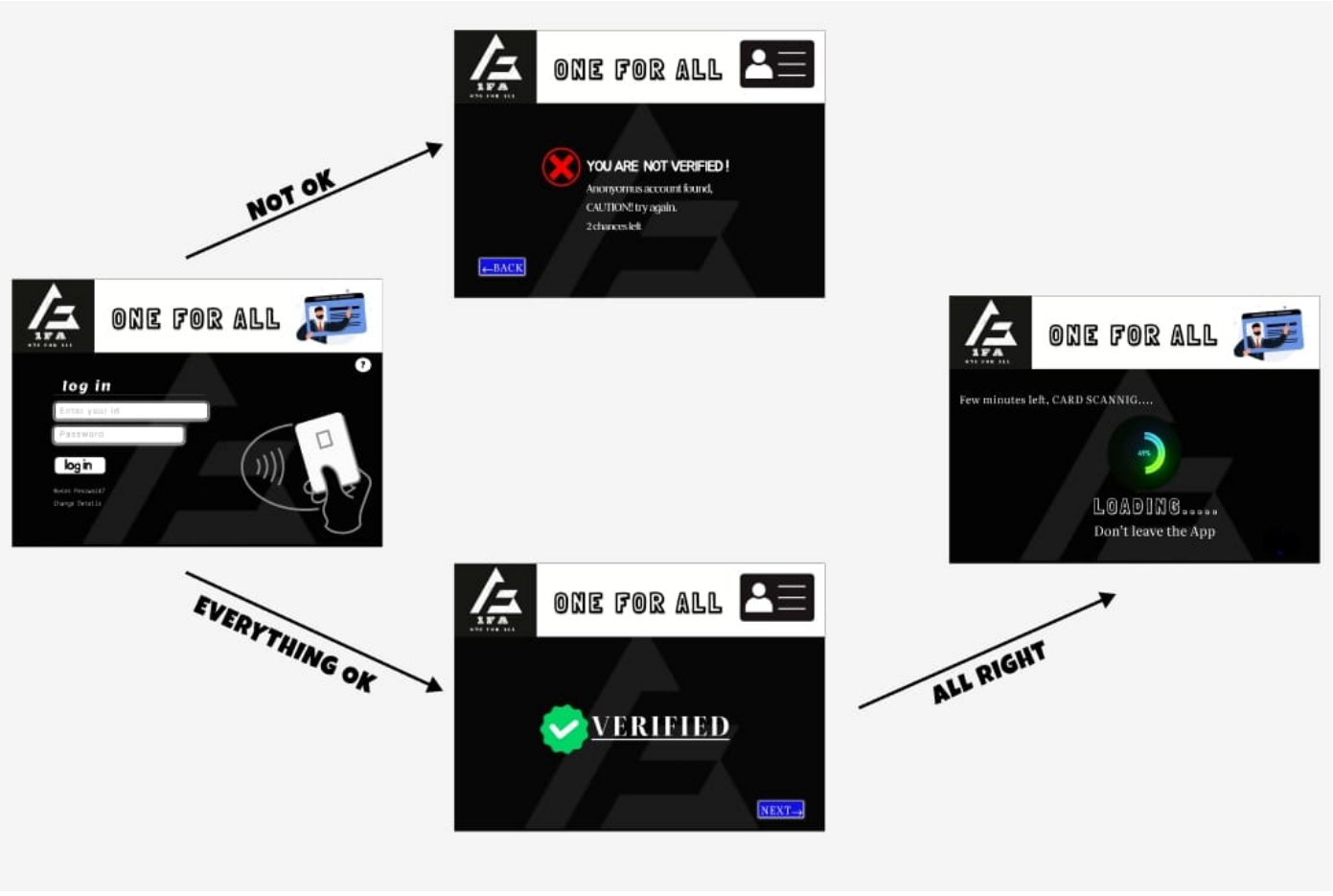
   - **Object Oriented:** Dart is class based, object oriented language. Dart supports features like encapsulation, polymorphism and inheritance.
   - **Cross Platform:** Dart can be used to build applications that run on various platforms, including the web, mobile(with flutter), and desktop.
   - **Open source:** Dart is an open source language and its development is open to contributions from the community.
   - **Garbage Collection:** Dart uses automatic garbage collection to manage memory, making it more developer friendly by handling memory management tasks.

3. **Flutter:** To create the desktop application, we used the flutter framework. Flutter is a UI toolkit by google for building natively compiled applications for mobile, web, and desktop from a single codebase. In flutter, we used

dart to implement the UI. Flutter allows developers to write code once and run it on multiple platforms, including iOS, Android, Web, and desktop. This helps in reducing development time and effort. Flutter provides a rich set of customizable widgets for creating complex UIs. Flutter allows us to create visually appealing and expressive UIs. Flutter has high performance in every different platforms. Flutter ecosystem is growing continuously. Flutter project allows developers to build flutter application for Windows, macOS, and Linux.

4. **MongoDB:** For maintaining the database of our users, we used MongoDB. MongoDB is a NoSQL database that stores data in flexible, JSON like documents. MongoDB stores data in BSON (Binary JSON) documents, which are flexible and schema less data structures. MongoDB allows flexibility of data. MongoDB assign a unique object id to each document within a collection and the field serves as a primary key. MongoDB supports query language for retrieving and manipulating data. Queries can include conditions, projection, sorting and more operation. MongoDB sharding distribute data across multiple machines. Its allows the database to handle large amount of data and high throughput. MongoDB provides ACID properties (Atomicity, Consistency, Isolation, Durability). We used MongoDB to store data and it is flexible and give us security of data.

6: EXPERIMENTAL SETUP AND RESULT ANALYSIS:-



A) First of all we need to login the website from the operator side
B) If login is not successful then an error will be thrown
C) If login is confirmed then you can start your operation.
D) After clicking on the scan button your software is ready to operate.

7: BIBLIOGRAPHY:-

https://github.com/miguelbalboa/rfid