# GUJARAT TECHNICAL UNIVERSITY

SARVAJANIK COLLEGE OF ENGINEERING & TECHNOLOGY

(Faculty of Computer Engineering, Computer Department)

A
Project Report
On

# OBSCURE LOCK

Under the course of

**PROJECT-1(2170002)**

B. E. III, Semester – VII
(Computer Engineering)

***Submitted by:***

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**GUJARAT TECHNICAL UNIVERSITY**

## SARVAJANIK COLLEGE OF ENIGEERING & TECHNOLOGY

# CERTIFICATE

This is to certify that the students namely**, Mr. Darshit Akbari(160420107002), Mr. Keval Navadiya (160420107031), Mr Parth Roy(160420107046), Ms. Dhruvi Shah(160420107050) Ms. Shreya Bohra (160420107054) of B.E. 4rd Year (Computer engineering)** Semester 7 have successfully completed the course work and related tasks for the course of **Project-I (2170002)** during academic term ending in the month of October 2019.

Date:
Place:

# INDEX


| Sr. No. | Topic Name | Page No. |
|---|---|---|
| 1 | Introduction | 4 |
| 2 | Aim and objective | 4 |
| 3 | Brief literature review<br>Description<br>Features<br>Patent search<br>Assumptions and Dependencies<br>Constraints<br>Multiple lock mechanism<br>Working<br>Efficient users | 5<br>5<br>6<br>6<br>6<br>6<br>7<br>7<br>7 |
| 4 | Materials and Methods | 8 |
| 5 | Pre-design calculations | 9 |
| 6 | Prototype Model UML<br>Use-case model<br>Class diagram<br>Sequence diagram<br>Activity diagram | 10<br>10<br>10<br>11<br>11 |
| 7 | Ghant chart | 12 |
| 8 | Methodology of design driven innovation<br>AEIOU Summary sheet<br>Empathy canvas<br>Ideation canvas<br>PDC | 13<br>13<br>14<br>15<br>15 |
| 10 | Outcomes | 16 |
| 11 | Plagiarism report | 17 |
| 12 | Conclusion | 21 |
| 13 | References | 22 |

# INTRODUCTION

- In today's world security is one of biggest aspect people look forward to whether it's their family members protection or their precious valuables protection.
- After having so many elementary solutions to the security problems,(like Intrusion Alarm, Hold-n-panic Alarm, CCTV etc.) there are lot of robbery reports been filed daily.

HISTORY OF SECURITY SYSTEM

- Lock and Key (mid 1800's by Linus Rale)
- Electric locks (1976 by Tor Sornes)

CURRENT SCENARIO

- Intrusion Alarms
- Hold up/Panic Alarm
- Video Surveillance and Recording System
- Access Control System
- Door Sensors

- To improve the situations we have come up with new idea to protect your valuables.

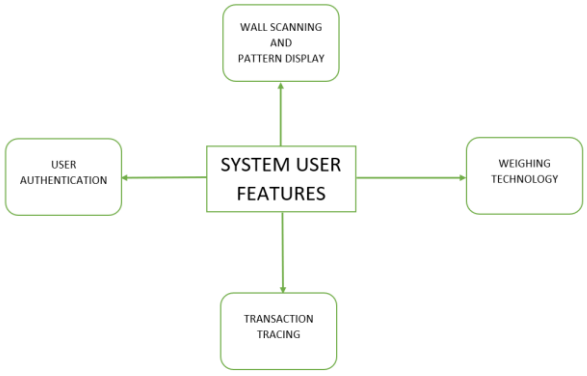
# AIMS AND OBJECTIVE

- We aim to create a system which is more safer than the existing systems. That leds the emporium to become a better and safer place that ensures complete safety of their valuables.
- We have come up with solution "OBSCURE LOCK"

# BRIEF LITERATURE REVIEW

DESCRIPTION

- Today, security is a major area of concern for people with a lot of precious elements, gems, jewels etc. Whether your company is a small local shop or a major international business, you must remain cognizant of the potential security issues facing your organization. To overcome these issues many security methods are designed and developed.
- For a better approach to the issue, the system “OBSCURE LOCK ” is designed and developed for the betterment of the jewellery showroom. This system will provide with virtual lock mechanism that can be used in any locker/safe/block of the showroom which will be operated using a Mobile Application with the concepts of augmented reality. The mobile application will use camera and will augment pattern dots or numeral while facing the objects. You have to draw/write the correct pattern/numeral to unlock the Locker/safe/block which is under the surveillance of the “ OBSCURE LOCK App ”.
- The block will open instinctively once the password/pattern is correctly entered. This functionality is performed using an IOT sensor and analyze weight inside the block/safe.
- Another sort of functionality that is provided by the system is a chain of blocks between the user. The authentication of each user is accomplished using blockchain notion.
- The top level diagram depicts the complete user features that are on their ways for users



FEATURES

- The fundamental attribute of our system which builds the system:

  - Obscure: The system is invisible to the surroundings. There are some particular users been defined by the owners of the emporium to whom this is visible through there gadgets .
  - User Authentication: Every individual who is a part of the system is provided with a user substantiation password which is noticeable only when user keep their mobile phones facing the walls.
  - Wall Scanning: When a particular individual whose is a responsible handler of the system keeps there mobile facing the walls a scanning takes place to examine the wall is under the surveillance of our system.
  - Weighing Technology: Once a user tries to keep something or take out anything from the safe weight of the safe is calculated and recorded each time.

PATENT SEARCH

- Relevant patents in regards of our project:
  - PATENT 1 : Augmented reality advanced security authentication methodologies
  - PATENT 2 : Intelligent door lock system
  - PATENT 3 : Wireless door lock mechanism
  - PATENT 4 : Embedded internet of things hub for integration with an appliance and association system and methods

ASSUMPTIONS AND DEPENDENCIES

- The assumption made to execute the core idea are:
  - The staff members will have a smart phone
  - The showroom/area where the locker is kept is having a Wi-Fi connection.

CONSTRAINTS

- The constraints that are required to efficiently run the system in any showrooms
  - Wi- Fi Routers
  - Data Analyst

MULTIPLE LOCKING MECHANISM

- Each safe has a separate lock mechanism system where each lock system is given a unique locker id and the system will analyse the locker id accordingly.
- The locker id respective to the locker will be consulted in the database and the pin in regards with that locker will be used to open that locker.
- Each safe is absolutely independent of the other accept the fact that they are assigned a locker id.

WORKING

- Face your mobile to the marker on the locker, the mobile camera will project to the marker and will check which locker id is corresponding to that locker and marker in the database.
- If the pin corresponding to the locker is correct then the locker will open inside the locker.
- Once the lock is open then the servo motor connected to the lock will rotate to 90 degree which will open the door of the locker.
- If you pick out or keep something from/in the locker the weight of the locker will be calculated and store in the database include the persons details who has opened the door.
- Once everything is done and you are about to close the locker with your phone the servo motor will again rotate its direction which will led to close the door of the locker.
- After door is completely closed the lock will again come out and the the door will protect with lock again.

EFICIENT USERS

- Data Analyst: These people are the one who operates the database of the system within the emporium.
- Showroom Executives: They handle the safe directly by their mobile phones which helps them open and close the safe.

# MATERIALS AND METHODS

OPERATING ENVIRONMENT

| Particulars | Client System | Server System |
|---|---|---|
| Operating System | Android<br>IOS | Platform independent(Web based) |

SOFTWARES REQUIRED

- Front end software's

| **Languages** | **Description** |
|---|---|
| Vuforia | For Augmented Reality |
| Ethereum IDE | Blockchain |
| Flutter | IOS and Android Apps |
| Deep Learning | Wall Scanning |

- Back end software's

| **Software Parts** | **Description** |
|---|---|
| Operating System | Windows/Linux |
| Database | Firebase |

HARDWARE REQUIRED

- Servo Motor
- Weight sensor(HX711)
- Load cell(1 kg)
- LOCK
    - Electric solenoid lock
    - Fire Walt 1mpr relay
- Node MCU(ESP 8266)
- Jumper wires

# PRE-DESIGN CALCULATIONS

ERGONOMICS

- Physical (Hardware Requires): (System) system requirements are several sensors, lock and a motor.
  (Users) They just require a smart phone.
- Cognitive : Basic knowledge of operating a smartphone will be required.

DESIGN COST

- Hardware cost
  Servo Motor : 140/-
  Weight Sensor : 150/-
  Load cell (1 kg) : 285/-
  Lock
  Electric solenoid lock : 481/-
  Fire wait 1mpr relay : 75/-
  Node MCU(ESP 8266) : 300/-
  Jumper wires and bread board : 160/-

  Total cost : 1591/-

RELIABILITY

- The system targets to fulfil the requirements that user didn't got in the earlier inventions.

SAFETY

- As this system is itself a security system so the security of system is really important.
- We are going to transfer data using AES encryption and going to store pins using hash values.

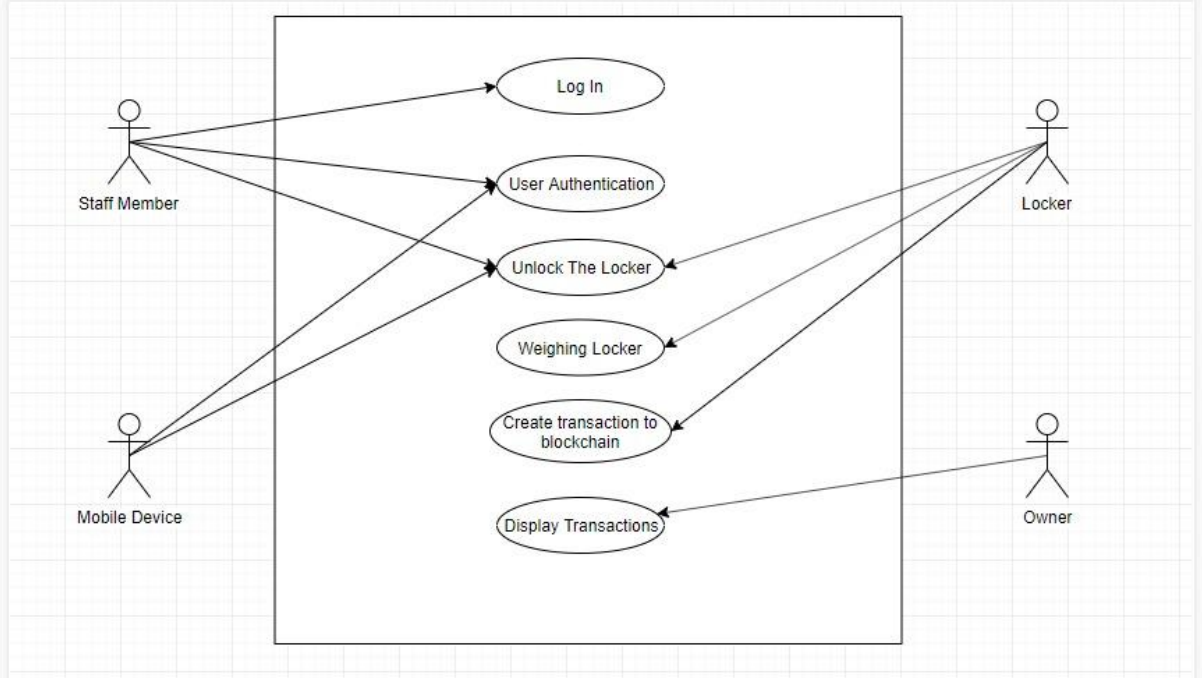
PERFORMANCE

- When all the components will be working properly at that time the product will be giving its best performance. The performance of the product can only be compromised if any component isn't working.

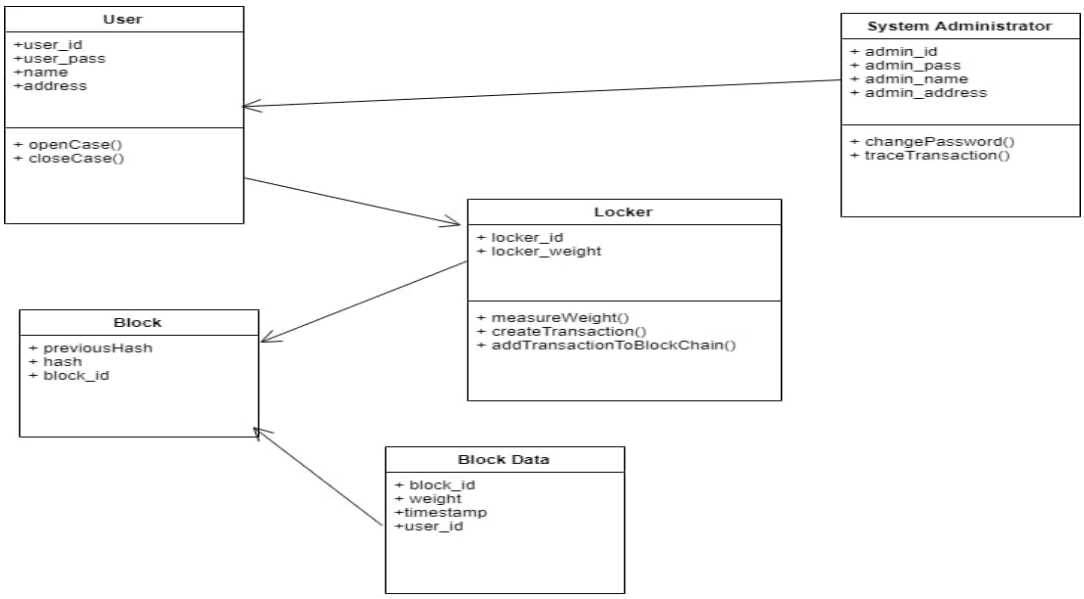
# UNIFIED MODELLING LANGUAGE

The **Unified Modelling Language** (**UML**) is a general-purpose, developmental, modelling language in the field of software engineering that is intended to provide a standard way to visualize the design of a system.

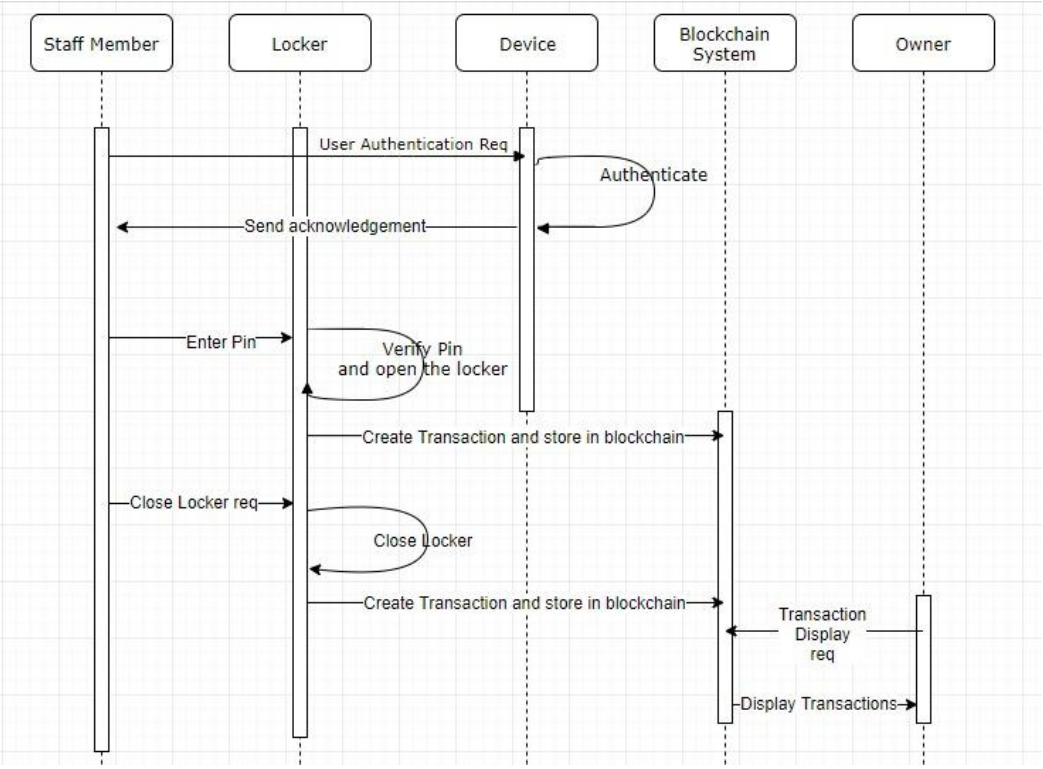
## USE-CASE



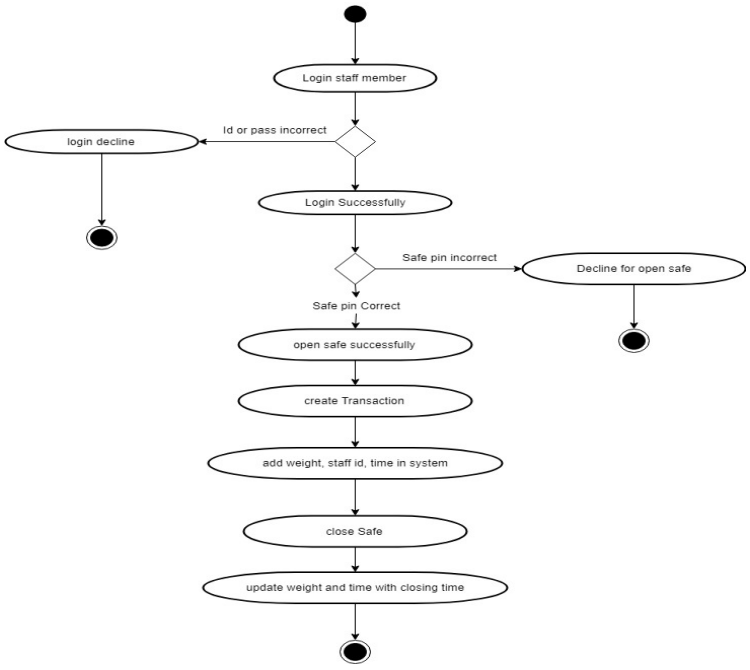

## CLASS DIAGRAM



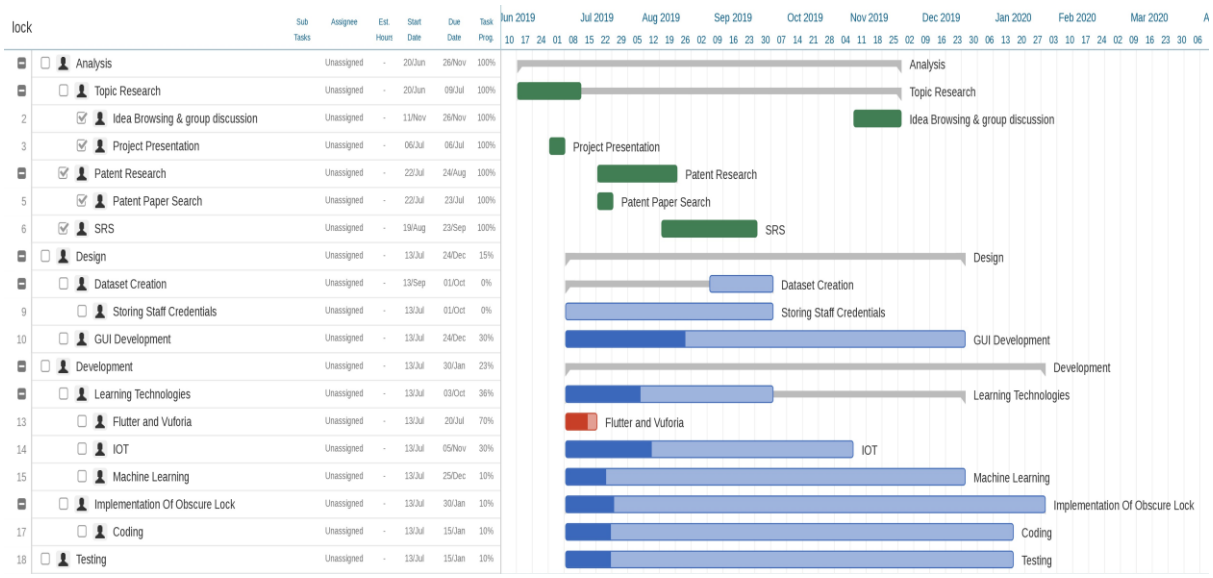
## SEQUENCE DIAGRAM




## ACTIVITY DIAGRAM



# GANTT CHART


lock
Sub Tasks
Assignee
Est. Hours
Start Date
Due Date
Task Prog.
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Analysis
Topic Research
Idea Browsing & group discussion
Project Presentation
Patent Research
Patent Paper Search
SRS
Design
Dataset Creation
Storing Staff Credentials
GUI Development
Development
Learning Technologies
Flutter and Vuforia
IOT
Machine Learning
Implementation Of Obscure Lock
Coding
Testing

# METHODOLOGY OF DESIGN DRIVEN INNOVATION

1. AEIOU Summary Sheet

## 2. EMPATHY CANVAS

**Design For** OBSCURE LOCK **Design By**

**Date** 30/09/2019 **Version**

### USER

- STAFF
- DATA ANALYST

### STAKEHOLDERS

- SHOWROOM OWNER
- MANAGER
- SECURITY GAURD

### ACTIVITIES

- OPEN LOCKER
- CLOSE LOCKER
- BUY GOLD
- KEEP/TAKE OUT ORNAMENTS IN SAFE

### STORY BOARDING

**HAPPY**

RAHUL A EXECUTIVE WORKING IN THE KALYAN JEWELLERS SHOWROOM WAS VERY HAPPY REGARDING THE SECURITY OF THE SHOWROOM AS THE GOLD WAS MAINTAIN PROPERLY AND WAS QUIET SECURE AS EVERY DAY THE KEEP ALL THE GOLD IN LOCKER

**HAPPY**

RONIT WAS A CUSTOMER AT A GOLD STORE LOCATED NEAR HIS HOUSE WAS KEEN IN BUYING JEWELLERY FROM THE STORE AS IT HAS SUFFICIENT FACILITY TO CHECK THE PURITY OF THE GOLD AND BUY ACCORDINGLY

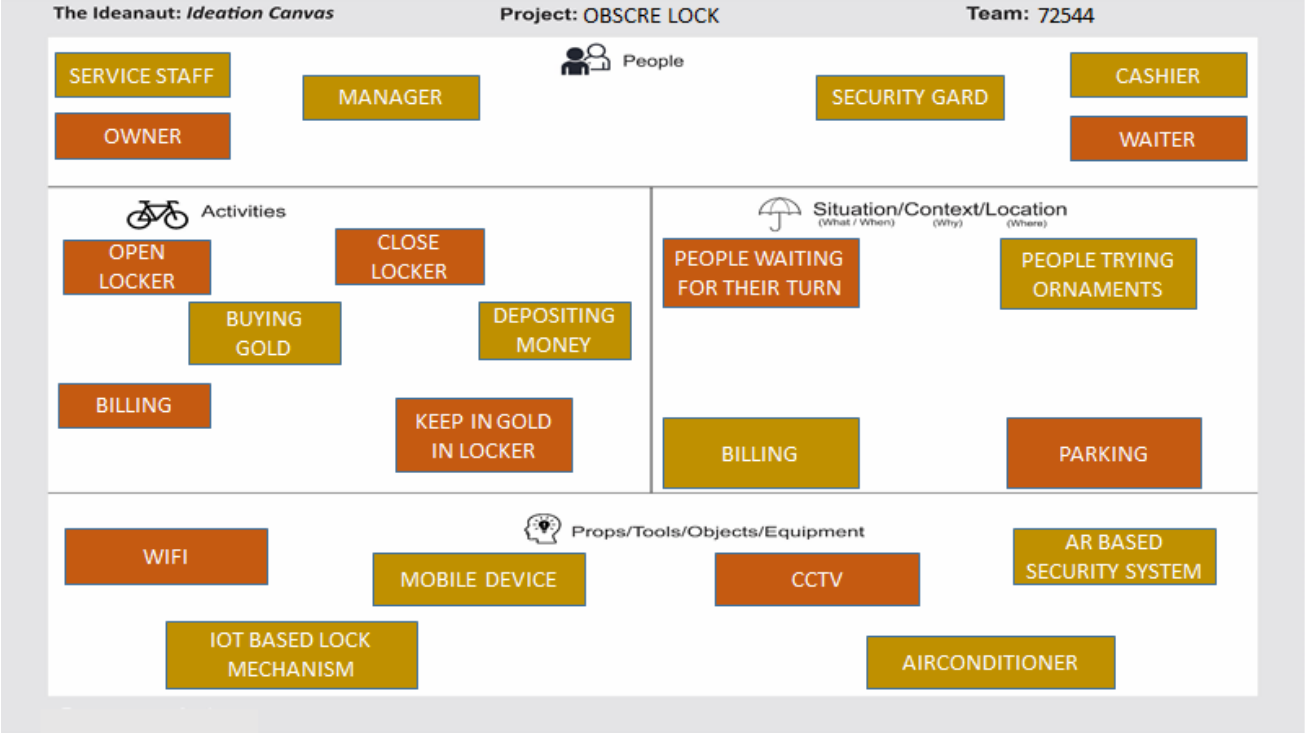
**SAD**

ROHIT A WORKER AT THE KALAMANDIR JEWELS WAS VERY UNHAPPY WITH THE IDEA OF SHIFTING THE GOLD DAILY IN AND OUT FROM THE LOCKER AS PER SAFETY NORMS OF THE SHOWROOM. IT TAKE A VERY LONG TIME TO SET UP THE STORE DAILY.

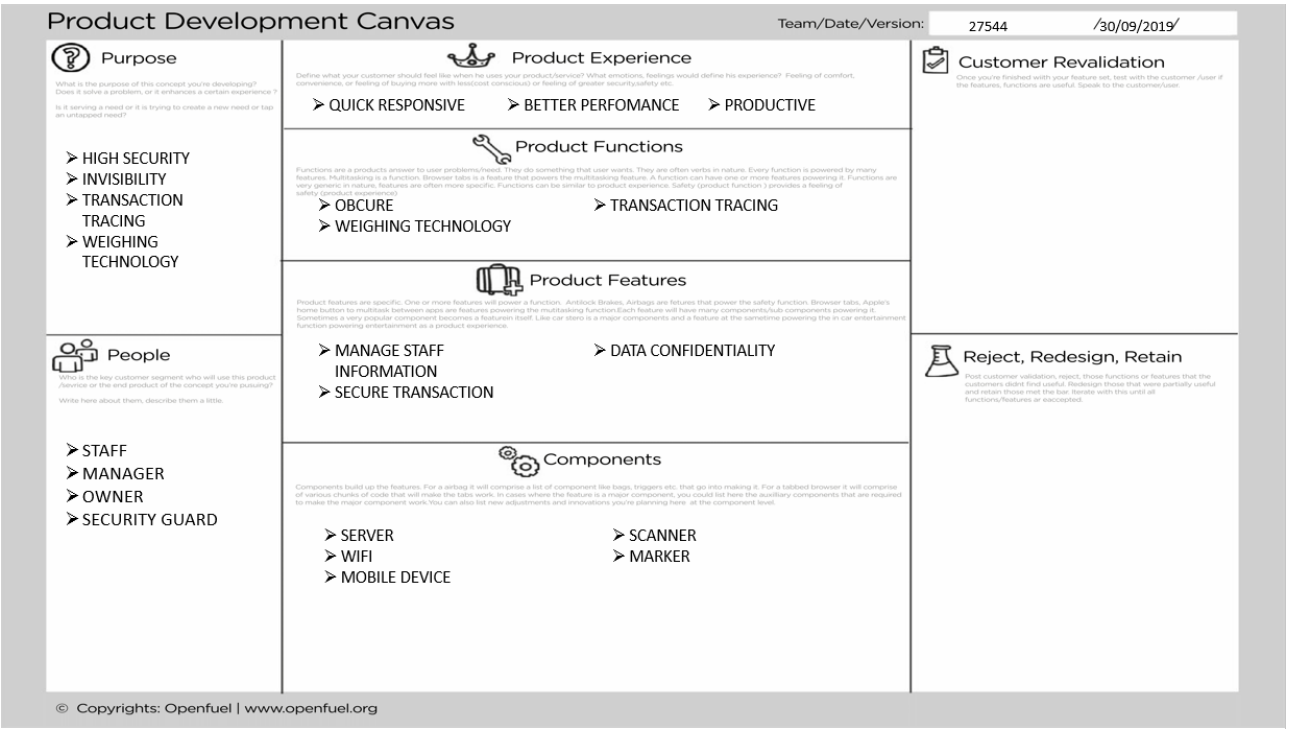
**SAD**

RONIL A CUSTOMER WAS VERY UNHAPPY WITH JEWELLERY STORE OWNER AS HE GOT A LOT OF OTHER ELEMENTS MIXED WITH THE GOLD AND THE PURITY WAS MISSING AND WEIGHTWAS ALSO LESS THEN SHOWN THOUGH BEEN ASSURED FOR THE QUALITY/ AND WEIGHT OF THE ORNAMENTS.

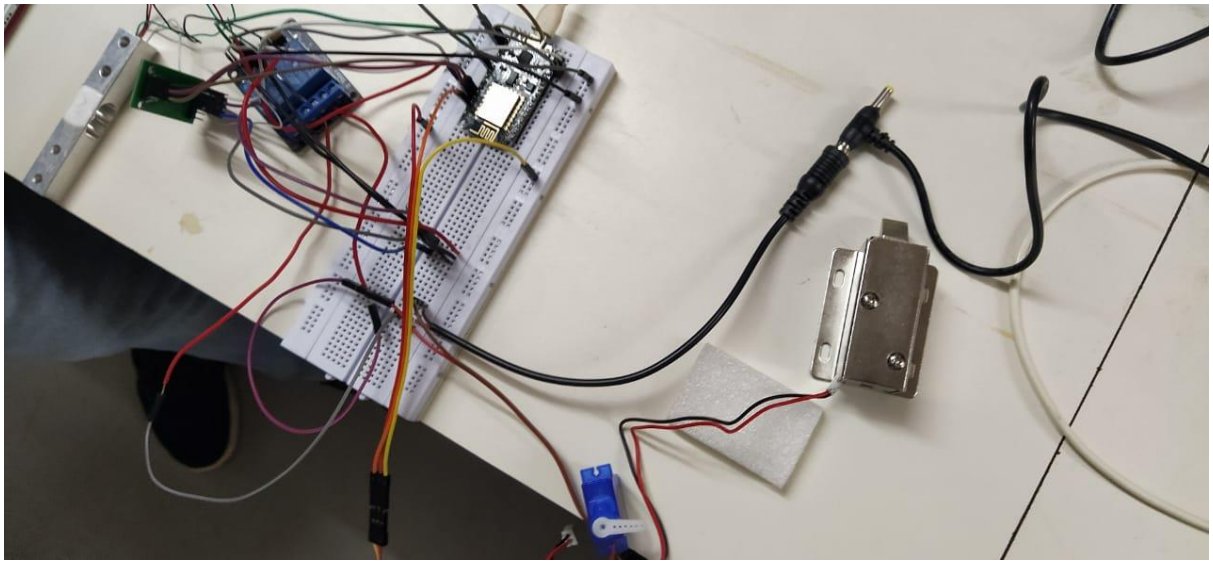
## 3. IDEATION CANVAS

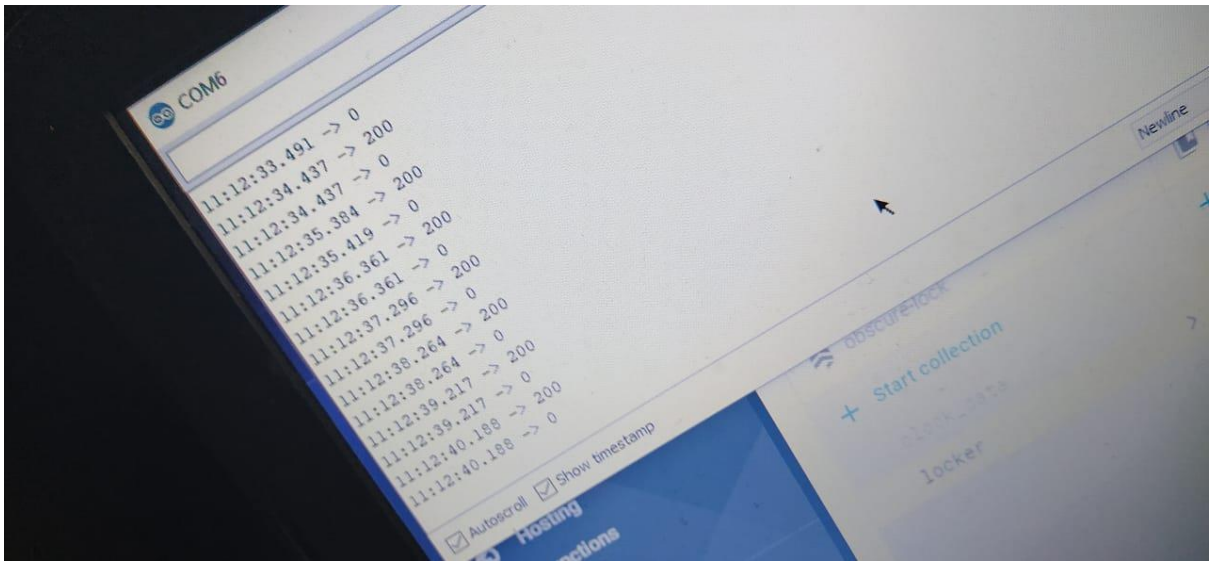



## 4. PDC CANVAS



# OUTCOMES




COM6
11:12:33.491 -> 0
11:12:34.437 -> 200
11:12:34.437 -> 0
11:12:34.437 -> 200
11:12:35.384 -> 0
11:12:35.419 -> 200
11:12:36.361 -> 0
11:12:36.361 -> 200
11:12:37.296 -> 0
11:12:37.296 -> 200
11:12:38.264 -> 0
11:12:38.264 -> 200
11:12:39.217 -> 0
11:12:39.217 -> 200
11:12:40.186 -> 0
11:12:40.186 -> 200
Autoscroll
Show timestamp
Newline
Start collection
locker

## PLAGIARISM REPORT

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GUJARAT TECHNICAL UNIVERSITY SARVAJANIK COLLEGE OF ENGINEERING & TECHNOLOGY (Faculty of Computer Engineering, Computer Department) A Project Report On OBSCURE LOCK Under the course of B. E. III, Semester VII (Computer Engineering) Submitted by: Sr. Name of student Enrolment No. 1 DARSHIT AKBARI 160420107002 2 KEVAL NAVADIYA 160420107031 3 PARTH ROY 160420107046 4 DHRUVI SHAH 160420107050 5 SHREYA BOHRA 160420107054
---------- Prof. Bhavesh Patel (Faculty Guide) ----------
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1 Introduction 4 2 Aim and objective 4 3 Brief literature review Description Features Patent search Assumptions and Dependencies Constraints Multiple lock me chanism Working Efficient users 5 4 Materials and Methods Operating environment Software required Hardware required 7 5 Prototype Model UML Use-case model Activity diagram Class diagram Sequence diagram 8 6 Ghant chart 10 7 Methodology of design driven innovation AEIOU Summary sheet Empathy canvas Ideation canvas PDC 11 8 Outcomes 14 9 Conclusion 14 10 References 15 Page | 3 INTRODUCTION • I toaso srity oe o btpt ppooa to wethseiraly mb pteco oeir pioslub protection.

• After having so many elementary solutions to the security problems,(like Intrusion Alarm, Hold-n-panic Alarm, CCTV etc.) there are lot of robbery reports been filed daily. • To improve the situations we have come up with new idea to protect your valuables. AIMS AND OBJECTIVE • We aim to create a system which is more safer than the existing systems.
That leds the emporium to become a better and safer place that ensures complete

safety of their valuables. • We have come up with solution OBSCURE LOCK BRIEF LITERATURE REVIEW DESCRIPTION Today, security is a major area of concern for people with a lot of precious elements, gems, jewels etc.

Whether your company is a small local shop or a major international business, you must remain cognizant of the potential security issues facing your organization. To overcome these issues many security methods are designed and developed. designed and developed for the betterment of the jewellery showroom. This system will provide with virtual lock mechanism that can be used in any locker/safe/block of the showroom which will be operated using a Mobile Application with the concepts of augmented reality. The mobile application will use camera and will augment pattern dots or numeral while facing the objects.

You have to draw/write the correct pattern/numeral to unlock the Locker/safe/block which is under the Page | 4 • The block will open instinctively once the password/pattern is correctly entered. This functionality is performed using an IOT sensor and analyze weight inside the block/safe. • Another sort of functionality that is provided by the system is a chain of blocks between the user.

The authentication of each user is accomplished using blockchain notion. • The top level diagram depicts the complete user features that are on their ways for users FEATURES • The fundamental attribute of our system which builds the system: Obscure: The system is invisible to the surroundings.
There are some particular users been defined by the owners of the emporium to whom this is visible through there gadgets . User Authentication: Every individual who is a part of the system is provided with a user substantiation password which is noticeable only when user keep their mobile phones facing the walls.

Wall Scanning: When a particular individual whose is a responsible handler of the system keeps there mobile facing the walls a scanning takes place to examine the wall is under the surveillance of our system. Page | 5 ? Weighing Technology: Once a user tries to keep something or take out anything from the safe weight of the safe is calculated and recorded each time.

PATENT SEARCH • Relevant patents in regards of our project: ? PATENT 1 : Augmented reality advanced security authentication methodologies ? PATENT 2 : Intelligent door lock system ? PATENT 3 : Wireless door lock mechanism ? PATENT 4 : Embedded internet of things hub for integration with an appliance and association system and methods ASSUMPTIONS AND DEPENDENCIES • The assumption made to execute the core idea are: ? The staff members will have a smart phone ? The showroom/area where the locker is kept is having a Wi-Fi connection.

CONSTRAINTS The constraints that are required to efficiently run the system in any showrooms Wi- Fi Routers Data Analyst MULTIPLE LOCKING MECHANISM Each safe has a separate lock mechanism system where each lock system is given a unique locker id and the system will analyse the locker id accordingly. The locker id respective to the locker will be consulted in the database and the pin in regards with that locker will be used to open that locker.

Each safe is absolutely independent of the other accept the fact that they are assigned a locker id. Page | 6 WORKING • Face your mobile to the marker on the locker, the mobile camera will project to the marker and will check which locker id is corresponding to that locker and marker in the database. • If the pin corresponding to the locker is correct then the locker will open inside the locker.

• Once the lock is open then the servo motor connected to the lock will rotate to 90 degree which will open the door of the locker. If you pick out or keep something from/in the locker the weight of the locker will be calculated and store in the database include the persons details who has opened the door.

Once everything is done and you are about to close the locker with your phone the servo motor will again rotate its direction which will led to close the door of the locker. • After door is completely closed the lock will again come out and the the door will protect with lock again. EFICIENT USERS • Data Analyst: These people are the one who operates the database of the system within the emporium.
• Showroom Executives: They handle the safe directly by their mobile phones which helps them open and close the safe. Page | 7 MATERIALS AND METHODS OPERATING ENVIRONMENT Particulars Client System Server System Operating System Android IOS Platform independent(Web based) SOFTWARES REQUIRED • Front end software ' s Languages Description Vuforia For Augmented Reality Ethereum IDE Blockchain Flutter IOS and Android Apps Deep Learning Wall Scanning • Back end software ' s Software Parts Description Operating System Windows/Linux Database Firebase HARDWARE REQUIRED • Servo Motor • Weight sensor(HX711) • Load cell(1 kg) • LOCK o Electric solenoid lock o Fire Walt 1mpr relay • Node MCU(ESP 8266) • Jumper wires Page | 8 UNIFIED MODELLING LANGUAGE The Unified Modeling Language (UML) is a

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In today s world, there is nobody trustworthy so keep your self away form any awful incident we have brought a much safer and healthier environment for your valuables this will help you keep an eye on the staff members of your emporium keeping a track of their activities regarding the safes and the gold they have taken out. Page | 16 REFERENCES • file:///C:/Users/SHREYA/Downloads/US9353551.pdf • https://instagantt.com/ • https://www.hackster.io/projects/tags/internet+of+things • https://www.connectbit.com/blockchain-applications/ • https://www.youtube.com/watch?v=W48_2ebuvv8

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0% - https://circuitdigest.com/microcontrolle

# CONCLUSION

The main objective behind this innovations was to take care of the your valuables and provide your with even safer environment.

In today's world, there is nobody trustworthy so keep your self away form any awful incident we have brought a much safer and healthier environment for your valuables this will help you keep an eye on the staff members of your emporium keeping a track of their activities regarding the safes and the gold they have taken out.

# REFERENCES


- file:///C:/Users/SHREYA/Downloads/US9353551.pdf
- https://instagantt.com/
- https://www.hackster.io/projects/tags/internet+of+things
- https://www.connectbit.com/blockchain-applications/
- https://www.youtube.com/watch?v=W48_2ebuvv8