

**Automatic exam marks input for DIU faculty members**

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This Report Presented in Partial Fulfillment of the Requirements for the Degree  
of Bachelor of Science in Computer Science and Engineering

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**DAFFODIL INTERNATIONAL UNIVERSITY**

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## **APPROVAL**

This project titled “**Automatic exam mark input for DIU faculty members**”, submitted by Amir Sohel, Almabud Juwal and Mahbub Al Hassan to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on November, 2019.

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## DECLARATION

We hereby declare that this project has been done by us under the supervision of **Dr. S. M. Aminul Haque, Associate Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

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## **ABSTRACT**

“Automatic exam mark input for DIU faculty members” is a Mobile Application for teachers of DIU. This mobile application will help teachers to entry exam marks of students into DIU portal on two click only. They need not input marks manually by typing ID anymore. It’s only two click away to update exam marks to portal. It will save a lot of time of teachers. To use this app teachers must login first with their portal ID and Password given by DIU. After that it will provide a mobile interface where teacher will just scan the cover page of exam paper and upload it to the system and system will automatically detect the Student ID, Course Code, Semester Name and Marks obtained then system will return processed data to another interface and teacher can be recheck it whether information are correct or not. If there is something mistake then teacher can be edit information. By clicking upload button system will update the marks of students automatically to DIU portal. We processed image using Microsoft Vision API that return text from image. Then system will send student marks and information to portal using API given by DIU. It’s totally secure and simple to entry marks.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

“Automatic exam mark input for DIU faculty members” is a Mobile Application for teachers of DIU. This mobile application will help teachers to entry exam marks of students into DIU portal on two click only. They need not input marks manually by typing ID anymore. It’s only two click away to update exam marks to portal. It will save a lot of time of teachers. To use this app teachers must login first with their portal ID and Password given by DIU. After that it will provide a mobile interface where teacher will just scan the exam paper and upload it to the system and system will automatically detect the Student ID, Course Code , Semester Name and Marks obtained then system will return processed data to another interface and teacher can be recheck it whether information are correct or not. If there is something mistake then teacher can be edit information. By clicking upload button system will update the marks of students automatically to DIU portal. We processed image using Microsoft Vision API that return text from image. Then system will send student marks and information to portal using API given by DIU. It’s totally secure and simple to entry marks. Meanwhile our system is additionally cost-effective, convenient and efficient methods of correspondence

### 1.2 Motivation

DIU has its own ERP system. According to the system, after every examination the teachers have to entry all the students achieved marks to the ERP. The teacher needs to input the student ID and obtained mark by typing manually. It kills a lot of valuable time of teachers. Previous it was boring and time killing. So, we designed an Android Application where it makes so simple to entry marks to ERP on two clicks. In this system teacher will just scan the cover page of exam paper and then check the information then click upload. System will detect all the required information and upload it to the DIU ERP automatically. I’s total secure, simple and hassle free and it will save times of teachers.



### **1.3 Objectives**

Our interest to make entry marks hassle free to ERP utilizing our application. Which is a stage for continuous correspondence without thinking about any kind of interruption. Meanwhile our system is additionally cost-effective, convenient and efficient methods of correspondence. Our key objectives are given below.

- Hassle free exam marks input to ERP.
- Reduce time consumption
- Reduce error scope
- Make easy to use

### **1.4 Expected Outcome**

Effectively and simply input marks to DIU ERP.

#### **1.4.1 Simple Entry Marks to ERP**

The teacher needs to input the student ID and obtained mark by typing manually. So, we designed an Android Application where it makes so simple to entry marks to ERP on two clicks. In this system teacher will just scan the cover page of exam paper and then check the information then click upload. System will detect all the required information and upload it to the DIU ERP automatically.

#### **1.4.2 Save Time**

Previous system used by teacher was boring and time killing needed to type information again and again, it kills a lot of valuable time of teachers. Our system will reduce time consumption to Entry marks to portal.

### **1.5 Report Layout**

We designed this project report on the basis of six layouts. All of them are discussed below.

The first chapter discusses about Introduction, Motivation, Objectives and expected outcomes all these four themes are discussed in this layout. The second chapter explores the context of the web application, comparative studies, the nature of the issues, challenges of all these five topics. Third chapter discusses business processing model, requirements, case modeling, logical data model and description of all these five topics. In the fourth chapter format, Front & Back End development, interface and UX design, implementation specifications are addressed. Implementations of Database, Front-end interactions, test output and reports all these five themes are discussed in fifth chapter. In sixth chapter conclusion, discussion and scope for future work are discussed.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

After every examination of DIU the teachers have to entry all the students achieved marks to the ERP. The teacher needs to input the student ID and obtained mark by typing manually. It kills a lot of valuable time of teachers. Previous it was boring and time killing. So, we designed an Android Application where it makes so simple to entry marks to ERP on two clicks. In this system teacher will just scan the cover page of exam paper and then check the information then click upload. System will detect all the required information and upload it to the DIU ERP automatically. It's total secure, simple and hassle free and it will save times of teachers.

#### **2.2 Related Works**

##### **2.2.1 UAS - Mark Entry App**

This is Android mobile application. Using this App Teachers can do mark entry online. Here teacher should be register to use this App. After login Teacher will upload marks.

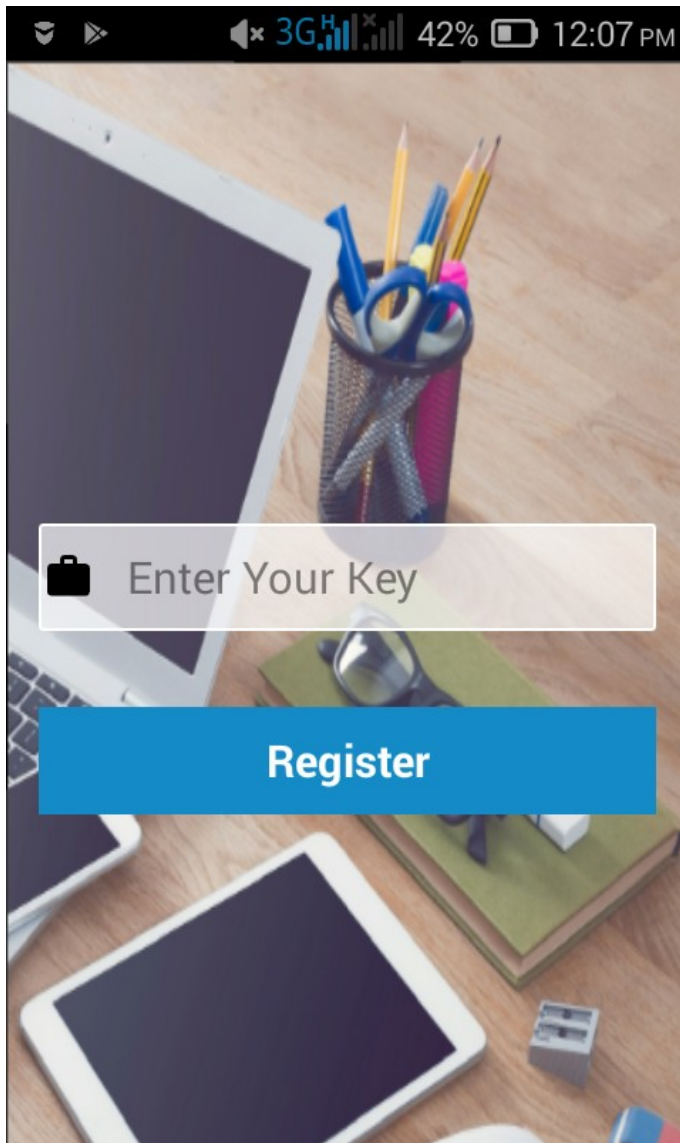


Figure 2.1:UAS Register

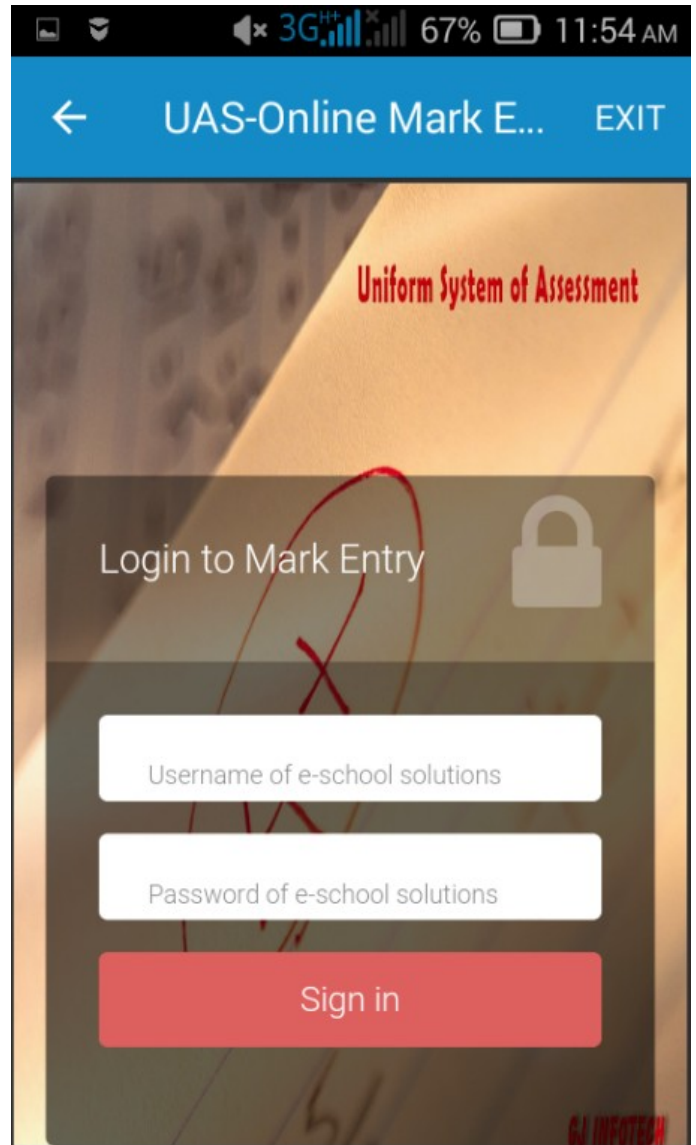


Figure 2.2: UAS login

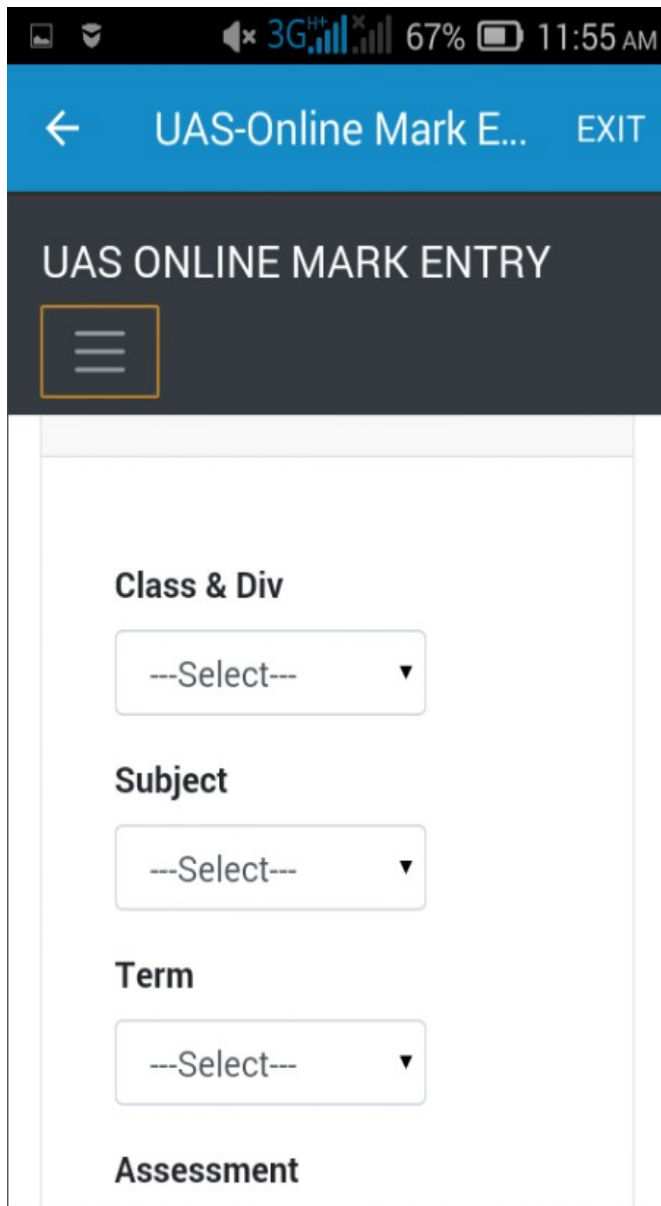


Figure 2.3: UAS Marks Entry

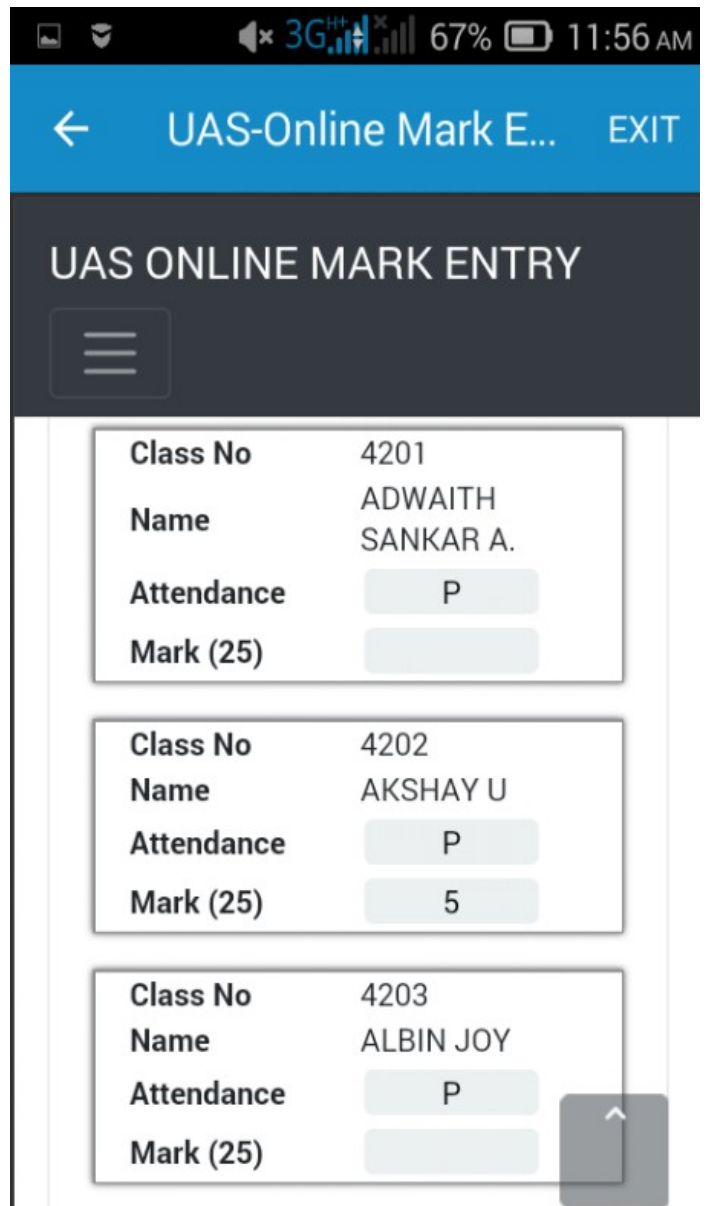


Figure 2.4 UAS Show marks

## 2.3 Comparative Studies

We analyzed some Online marks apps which are pretty good app but a bit complex to use. We didn't find any app online like ours. From surfing those apps, we gained ideas and analyzed how to make a simpler electronic meeting system which will be more user friendly.

Table 2.3: Comparative Studies

<b>Mobile-Application</b>	<b>Name</b>	<b>Key Features</b>	<b>Pros &amp; Cons</b>
Related	UAS - Mark Entry App	Manually choose class, subject, Term, Entry marks by type	It covers all necessary features but all of them in a complex way.
Our System	Automatic exam marks input for DIU faculty members	Implement Handwriting text recognition to detect student id ,marks and automatic upload marks to portal. Integrate University API.	Our system is focused on reducing time consumption. It's simple to use.

## 2.4 Scope of the Problem

“Automatic exam marks input for DIU faculty members” is mainly focused on hosting meeting, while making this app we have to face many troubles and problem given below.

- Making User Friendly
- Implementing Microsoft vision API.
- Detect handwriting text
- Convert handwriting to text.
- Logical implement of extract data from API.
- Send data to university ERP system by API.

## **2.5 Challenges**

We analyze before building this application to find out the challenges.

### **2.5.1 Handwriting recognition and extraction:**

Identifying and extracting handwritten information is still a challenge in the scanning process. The reasons for that are plenty: original documents may have poor quality as paper deteriorates easily; notes may have been written on the fly; signatures are almost always unreadable (not to mention that half of the population writes "1" as if it were "7" and the other half writes "7" as if it were "4"!)

All jokes aside, let's face it – we don't concentrate on having good handwriting when filling in forms, and most of the time we don't write within the text fields on the document.

### **2.5.2 User friendly and lite UI**

Our focus to make our application user friendly and simple. Our system has only 3 windows. Teacher will just login, scan image, upload marks. Making simple app was our first priority. We tried to make our system as simple as we can.

### **2.5.3 Reducing bugs**

As we just completed building the first version. Still there are some bugs which needed to be fixed.

We'll work on these issues as much as we can.

### **2.5.4 Including new features & Technology**

We couldn't complete all the features as we thought to implement initially due to some boundaries. But we're focusing on how to recover from this challenge.

### **2.5.5 Security**

It's 100% secure and trusted to use this app.

## CHAPTER 3

### REQUIREMENT COLLECTION AND ANALYSIS

#### 3.1 Business Process Modeling

Business procedure modeling speaks to the business procedure or work process as a method for recognizing potential enhancements. The business process modeling is given below:

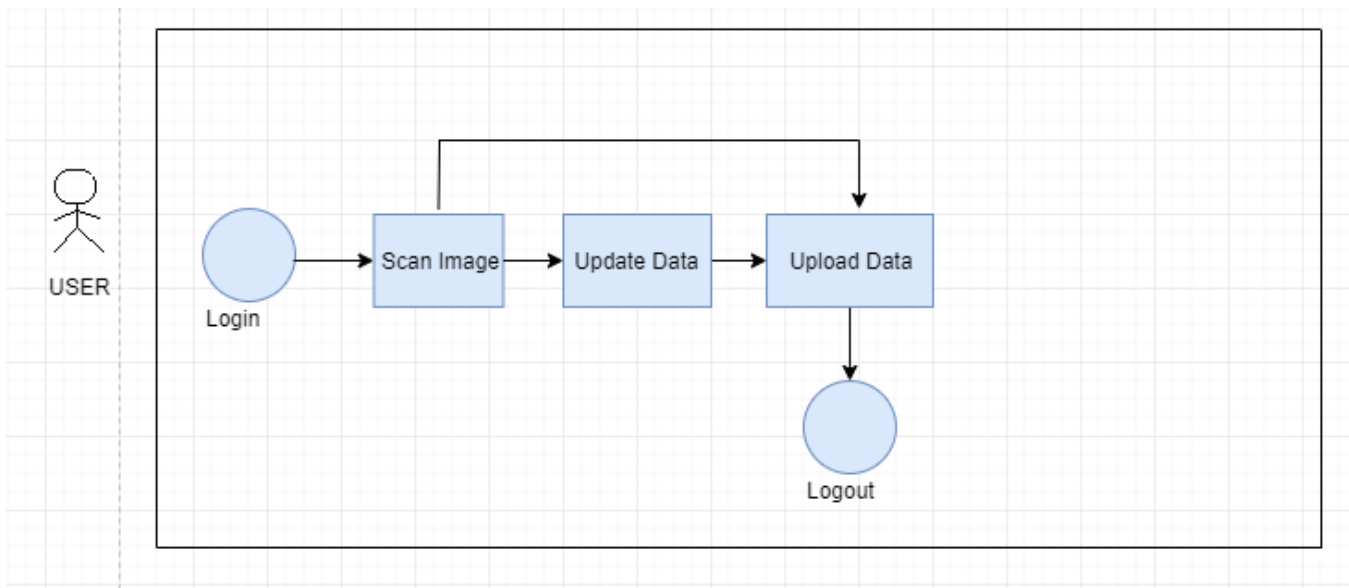


Figure 3.1: Business Process Modeling

#### 3.2 Requirement Collection and Analysis

“Automatic exam marks input for DIU faculty members” can streamline the whole marks entry process.

##### 3.2.1 Login to Apps

- Teacher must have employee id and password given by DIU

##### 3.2.2 Scan Image

- Choose Assigned course for teacher
- Choose Section

##### 3.2.3 Upload Data to server

- Confirm correct information



### 3.3 Use Case Modeling and Description

By drawing this diagram, we showed the activities of a client. We implemented use case diagram because of it can find out what are the framework requirements are and utilize them.

#### 3.3.1 Use Case of Teacher

The use case diagram of an admin is given below:

<b>Use case name</b>	Use Case of Teacher
<b>Actor</b>	Teacher
<b>Description</b>	Teacher will handle all the work procedures.
<b>Pre-conditions</b>	Must have an ID and password.
<b>Standard flow</b>	<ol style="list-style-type: none"><li>1. Have to log in first.</li><li>2. Choose assigned course to input marks</li><li>3. Choose Section</li><li>4. Scan exam cover page</li><li>5. Update data if required</li><li>6. Upload data to ERP</li><li>7. Log Out</li></ol>

Table 3.1: Use Case of Teacher

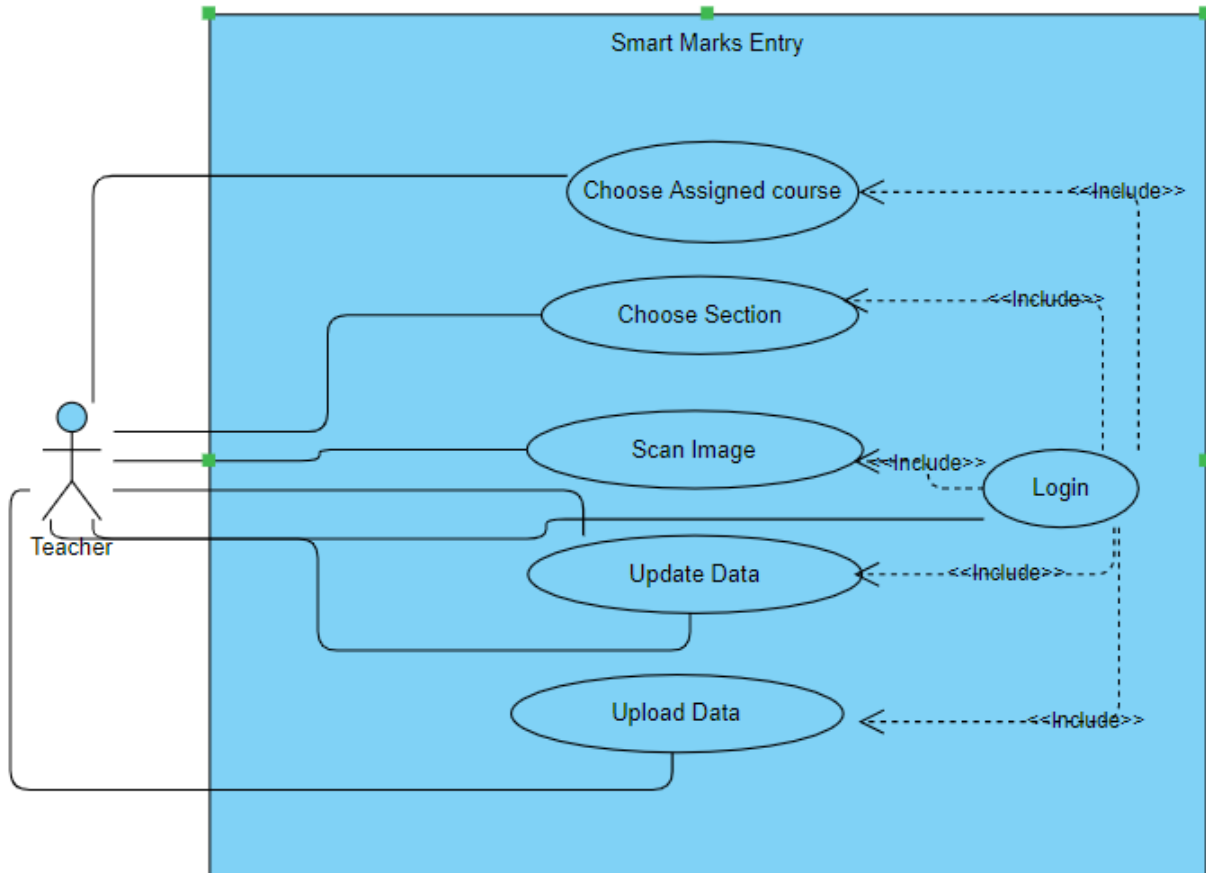


Figure 3.2: Use case of Admin

### 3.4 Logical Data Model

Logical data model portrays the information however much detail as could reasonably be expected. The Entity Relationship diagram and the Logical Schema are the logical data model which includes attributes, entity, tables and relationships.

#### 3.4.1 Entity Relationship Diagram

There is no database in “Automatic exam marks input for DIU faculty members” Application.

### **3.5 Design Requirements**

Initially we were fixed the following requirements to implement in our project.

1. User friendly App.
2. Pleasant dashboard.
3. Easy way teacher can Login.
4. Easy way to choose assigned course.
5. Easy way to scan exam cover page.
6. Easy to use Application.

## **CHAPTER 4**

### **DESIGN SPECIFICATION**

#### **4.1 Front-end Design**

Basic requirement of digital meeting front end design contains 4 webpage which are designed initially by sketching and we implemented them later where we used ionic 4 frameworks components and then developed implementing in angular framework. After then we used Cordova for producing android application.

##### **4.1.1 HTML**

To implement user interface of our app we written web pages using html to build the basic structure of our app as html is the skeleton of any web app. We optimized the html codes in a way that is completely readable to anyone.

##### **4.1.2 CSS**

We implemented CSS to transform our page basic design. Which described the presentation of an html codes and the documents in a page including colors, layout and fonts. Which allows presentation in different types of devices.

##### **4.1.3 Angular**

Angular is a JavaScript framework for building mobile and desktop web application. This is mostly used for developing SPA and Progressive app. This framework is developed by Google.

##### **4.1.4 JavaScript**

JavaScript allows to create highly responsive user interfaces which lets dynamic functionality as we don't need to wait for the server to react to show another task. Besides containing better functionality and libraries it made our task easy to implement.

### **4.1.5 Ionic**

Ionic is the app development platform for web developers. Build amazing cross platform mobile, web, and desktop app. Ionic Framework is free, open source mobile UI tool for developing high-quality cross-platform apps for native IOS, Android, and the web – all from single code base. Mainly ionic is created based on Angular frame work and apache cordova. Now in latest update it is also available for ReactJs. So developer who are developing the app in ReactJs and want to build a native app from that app now they can using ionic. This framework is created by Max Lynch, Ben Sperry, and Adam Bradley of Drifty co.

## **4.2 Back-end Design**

Apache Cordova enables software programmers to build app devices using CSS3, HTML5, and JavaScript instead of relying on platform-specific APIs like those in android, ios, or windows phone. It enables wrapping up of CSS, HTML, and JavaScript code depending upon the platform of the device.

### **4.2.1 NODE.JS**

We implemented Node.JS as for angular, ionic need node js . AS Node.JS uses v11 engine which compile js into native machine code which made our app very fast and increased productivity. Besides it energizes imparting to nearness of the npm which let us refresh, share and reuse code. Another important thing is we wrote js for server and client which made easy to send data between the server and the client.[8][16]

### **4.2.2 Backend**

As we used Microsof azure vision api for extracting handwritten and printed data form the picture and therefore we uploaded the data to the Daffodil International University student portal. Here we conducted all of these stuff using api. So we handled all of our logical operation using typescript so no backend is needed for these purpose.

## **4.3 Interaction Design and UX**

User Interface (UI) design is the method of making interfaces in programming or modernized gadgets with an attention on looks or style. UI design usually refers to graphical user interfaces. It is the most significant part for any site for guaranteeing better client experience.

### 4.3.1 Login Page

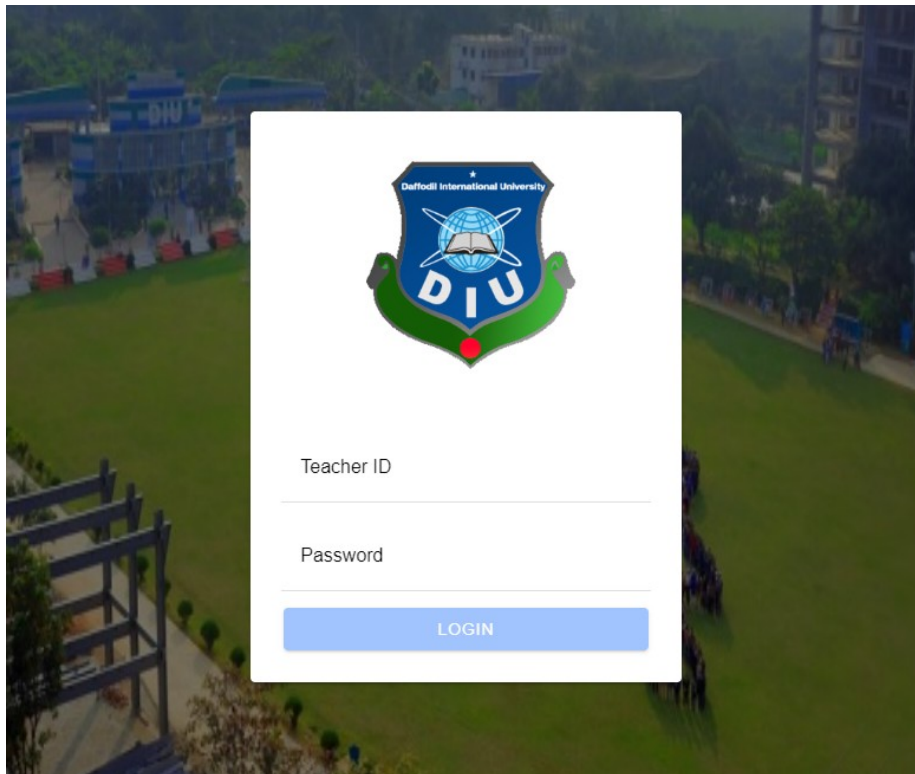


Figure 4.3.1: Login Page

### 4.3.2 Home page

Smart marks entry

Semester	Select Semester ▼
Exam	Select exam ▼
Section	Select Section ▼

SCAN SCRIPT

Figure 4.3.2: Home page

### 4.3.3 Choose option page

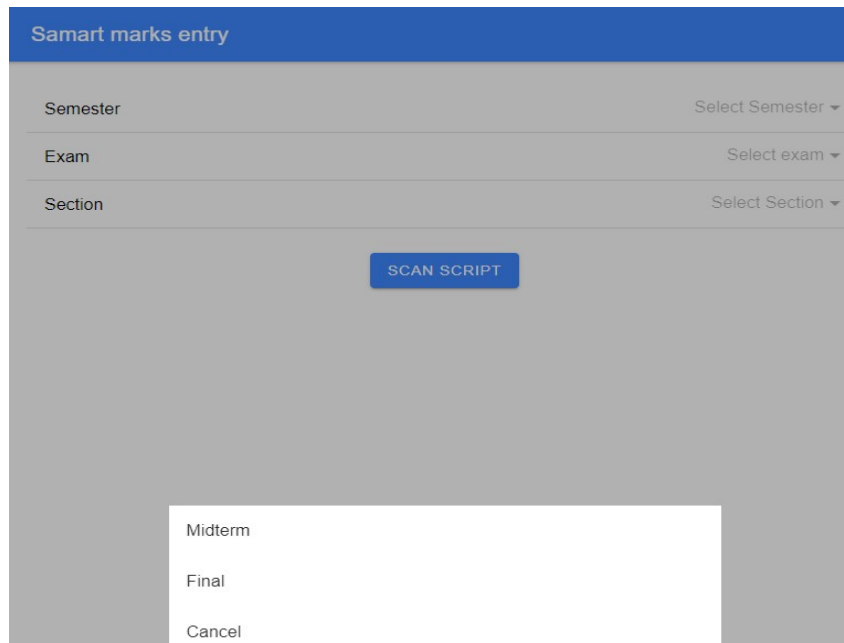


Figure 4.3.3: Choose option Page

### 4.3.4 Choose Image source page

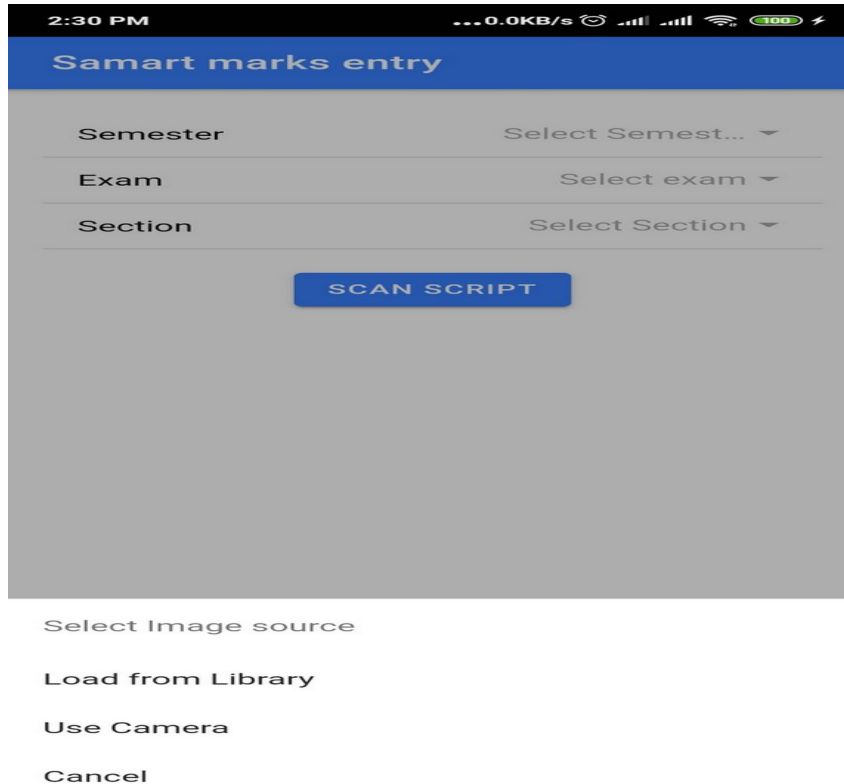


Figure 4.3.4 choose image source

4.3.5 Scanning Page

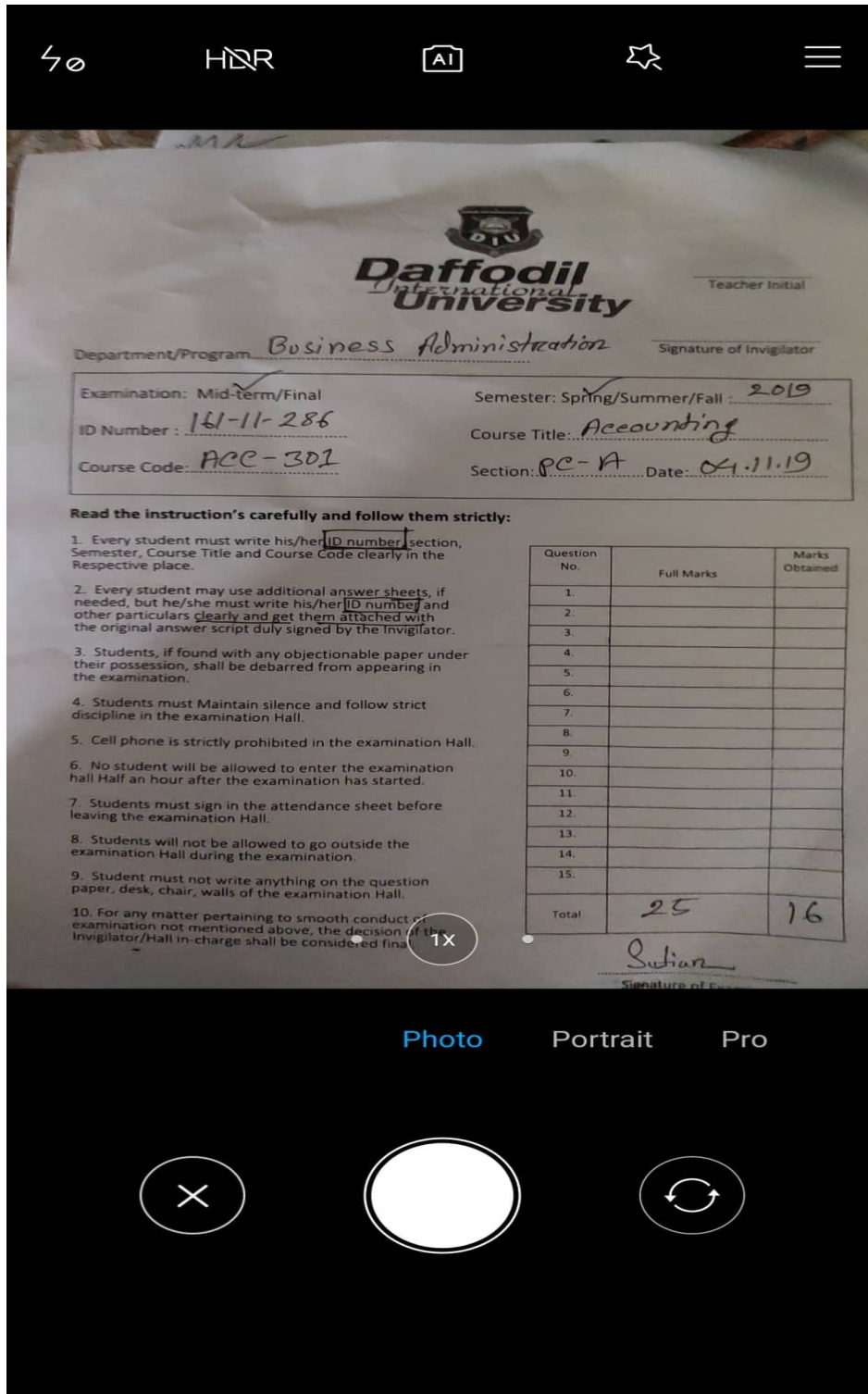


Figure 4.3.5 scanning page



### 4.3.6 Show result, Update and Upload page

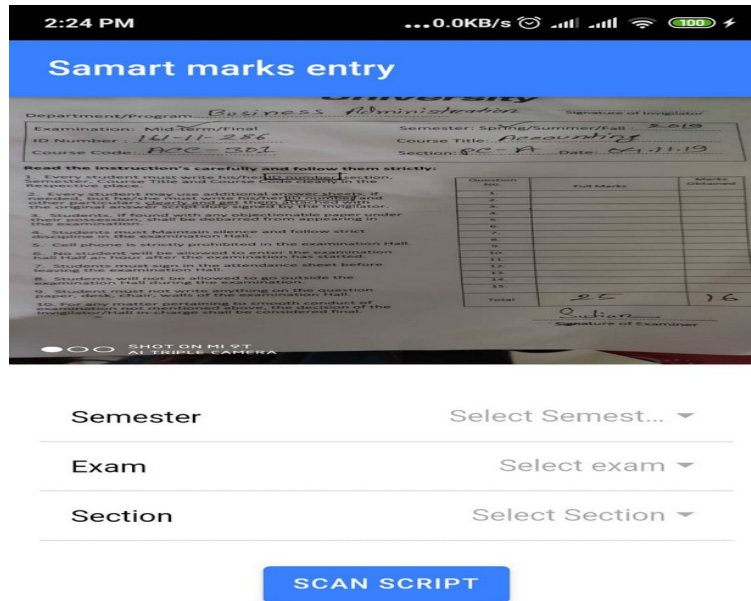


Figure 4.3.6: Result page

## 4.4 Implementation Requirements

Following technologies used in my project.

1. HTML 5 and CSS
2. Angular
3. JavaScript
4. Ionic 4
5. Node.js
6. Microsoft Azure vision API

The following software used to implement the application:

1. Visual Studio Code
2. Git

## **CHAPTER 5**

### **IMPLEMENTATION AND TESTING**

#### **5.1 Implementation of Database**

There is no database in “Automatic exam marks input for DIU faculty members” Application.

#### **5.2 Implementation of Front-end Design**

Our initial goal to implement it in Daffodil International University. We designed the whole system according to the department's needs. We have login page where teachers can be login with their employee id and password. If authentication is successful then only teacher can be able to choose course that he assigned. Then he can be able to scan exam cover page. Integrated Image processing API will process the image and automatically detect the student ID, Marks. Teacher can be able to edit the detected information if they want. If they confirm the information then it will update the student marks to DIU ERP. Integrated DIU API will process with secure token all the request sent and receive.

#### **5.3 Implementation of Interactions**

The main goal was to reduce human effort. That’s why we implement the OCR in application. For good quality and high accuracy character recognition, OCR techniques expect high quality or high-resolution images with some basic structural properties such as high differentiating text and background. The way images are generated is an important and determining factor in the accuracy and success of OCR, since this often affects the quality of images dramatically. Usually OCR with images produced by scanners gives high accuracy and good performance. In contrast, images produced by cameras usually are not as good of an input as scanned images to be used for OCR due to the environmental or camera related factors.

## 5.4 Testing Implementation

We run our project through some testing procedure to check if it works properly or not. Several tests are presented below to indicate the absolute readiness of the application to function.

No	Tested Case	Tested Input	Expected Outcome	Actual Outcome	Result
1	Sign in	Provide id, password and sign in.	Dashboard comes up if authentic user.	. Dashboard comes up if authentic user	Passed
2	Click Dropdown Button	Click on the Dropdown Button then choose Course	Selected Course show.	Selected Course show.	Passed
3	Scan Image	Click on Scan Image button.	Open Camera of mobile.	Open Camera of mobile.	Passed
4	Capture Image	Click to capture image button	Capture the image by mobile camera	Capture the image by mobile camera	Passed
5	Done	Click Done button.	Show the processed information on another interface	Show the processed information on another interface	Passed
6	Update	Click on update button to edit information	Updated successfully	Updated Successfully	Passed
7	Upload Data	Click upload button	Data uploaded to server successfully	Data uploaded to server successfully	Passed

Table 5.1: Testing Implementation

## 5.5 Test Results and Reports

### 5.5.1 Functionality Testing

We run this test to verify our product is as fulfil the specifications and it fulfil the basic requirements as still a few features need to add.

### 5.5.2 Usability testing

#### 5.5.2.1 Test the site Navigation

Table 5.2: Test the site Navigation

Test Case	Test Data	Result
Menus	Check in different device	Easily visible and consistent
Buttons	Check in different device	Easily visible and consistent
Links	Check in different device	Consistent

#### 5.5.2.2 Test the Content

Table 5.3: Test the Content

Test Case	Test Data	Output
Content	Readable content without errors	Passed
Images	contain an "alt" text	Passed

### 5.5.3 Interface Testing

In this section we tested integrated API. It's working properly.

#### 5.5.3.1 Application

Table 5.4: Application

<b>Test Case</b>	<b>Test Data</b>	<b>Output</b>
From Client Side	Test request correctly sent to the server	Passed
To Client Side	The data on the client-side is displayed accurately	Passed
Error in Application	Should be shown to the administrator only	Passed
Error in Application	Should not be shown to the administrator only	Failed

### 5.5.5 Crowd Testing

Table 5.5: Crowd Testing

<b>Test Case</b>	<b>Test Data</b>	<b>Output</b>
Application	Response times at different connection speeds	Partially Passed
Crash occurrence	Does Not occur Due to peak load	Failed

## **CHAPTER 6**

### **CONCLUSION AND FUTURE SCOPE**

#### **6.1 Discussion and Conclusion**

“Automatic exam marks input for DIU faculty members” is created to make DIU exam marks entry system simple. When teacher will use this application, it will make teacher’s life hassle free. They can be easily input mid-term/final exam marks to ERP. We tried to make this app as simple as we can. We release beta version. We will update our version as per feedback and required of department. We applied Handwriting recognition that was so much challenging. Extracting data from image and logical implement was also challenging.

#### **6.2 Scope for Further Developments**

As “Automatic exam marks input for DIU faculty members” app in its initial phase it does have lots of area to develop. We will implement it in Daffodil International University. Initially teacher can be upload mid-term/final exam marks only. Further we will implement more features. Teacher can be able entry presentation, quiz, assignment, attendance marks also.

•

## **APPENDIX**

### **APPENDIX A: PROJECT REFLECTION**

Implementing this project, we introduced with a number of new and updated technology and system which left us with excellent experience and grown our thirst to learn more technology and work with more web-based work. In brief this whole journey was fantastic and helping and working altogether made us complete our project this much.

## References:

- [1] Boardable, available at <<<https://boardable.com/>>>, last accessed on 16-10-2019 at 10:00 PM.
- [2] iBabs, available at <<<https://www.ibabs.eu/>>>, last accessed on 16-10-2019 at 10:50 PM.
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