
ADDIS ABABA UNIVERISITY

ADDIS ABABA INSTITUTE OF TECHNOLOGY

CENTER OF INFORMATION TECHNOLOGY AND SCIENTIFIC COMPUTING

DEPARTMENT OF SOFTWARE ENGINEERING

# TAX PAYMENT SYSTEM

## System Requirements Specification

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## Revision History

| Date | Description | Author | Comments |
|---|---|---|---|
| April 4, 2018 | Version 1.0 | All group members | First Revision |
| April 10, 2018 | Version 2.0 | All group members | Second Revision |
| April 16, 2018 | Version 3.0 | All Group members | Final version |

## Document Approval

The following Software Requirements Specification has been accepted and approved by:

| Signature | Name | Title | Date |
|---|---|---|---|
| | Mr. Fitsum Alemu | Instructor | |

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# Acronyms

**CSS**: Cascading Style Sheet

**EFTPS**: The Electronic Federal Tax Payment System

**ERCA**: Ethiopian Revenue and Custom Authority

**HTML**: Hyper Text Mark-up Language

**PHP:** Hyper Text Pre-processor

**USA**: United States of America

**WWW**: World Wide Web

## DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented, fabricated or falsified any idea, data, fact or source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Team Four  April 2018

# 1 Introduction

## 1.1Purpose

The purpose of this document is to give a detailed description of the requirements for the "tax payment" software. It will illustrate the purpose and complete declaration for the development of system. It will also explain system constraints, interface and interactions with other external applications. This document is primarily intended to be proposed to a customer for its approval and a reference for developing the system for the development team and will be proposed to the project advisors for its approval.

## 1.2 Scope

The tax payment system delivers all the information needed from the tax payer to the agency by submitting the registry form filled by the tax payer when registering to the system. Provides a list of tax payer with their filled information by alphabetical order on the back end. Enables the agency to send a confirmation message to the tax payer for payment done by the tax payer and a warning letter as well for the tax payer.

As for the user the system provides a log in form with user name and password whenever any tax payer wants to get to his/her account. Enables the tax payer to upload photos and edit his/her profile information and photo when needed. Notifies the tax payer when is the time for paying his/her tax on the notification section. Enables the tax payer to appeal to the agency whenever he/she thinks that the tax levied on him/her is not fair or has any other problems. Enables the tax payer to store all his documents and recites in the form of images or pdf formats.

Furthermore, the software updates the tax payer on any new news from the agency on the news feed section. Enables the tax payer to receive and view his/her message from the agency.

## 1.3 Overview

The remainder of this document includes three sections and appendixes. The first section provides an overview of the system functionality and system interaction with other systems. This chapter also introduces different types of stakeholders and their interaction with the system. Further, the section also mentions the system constraints and assumptions about the product.

The second section provides the requirements specification in detailed terms and a description of the different system interfaces. Different specification techniques are used in order to specify the requirements more precisely for different audiences.

The third section deals with the prioritization of the requirements. It includes a motivation for the chosen prioritization methods and discusses why other alternatives were not chosen.

The Appendixes in the end of the document include the all results of the requirement prioritization and a release plan based on them.

## 2. General Description

### 2.1 Product Perspective

Almost all countries on the world use online tax payment system. Developed countries like USA (United States of America). Each have their own online tax payment system. In case of USA, EFTPS (The Electronic Federal Tax Payment System) is a service provided freely by the USA department of treasure. After one have enrolled and receive one's credentials one can pay the federal taxes electronically using EFTPS voice response system.

There are also some systems that are for specific taxes. The Indian e-payment system 'parivahan' is an online payment system for vehicles registered in different states of the country. The owner of these vehicles can log onto the portal from any internet access point and deposit their due taxes through net banking facility. Once the user logs on to the system and provides the required information about the vehicles, the software calculates and displays the tax amount payable. If the user accepts to make the payment, the portal redirect him to selected bank's internet banking site. The user then makes the makes the payment from his bank account through secure internet banking. Once the transaction is complete the system generates a detailed receipt, which can be printed by the user for his record.

For checking the authenticity of the receipt, the transport department officials will be able to cross-check the payment details by logging on to the portal using this web based software.

Despite the fact that it is only for vehicles and redirects to online banking site, the parivahan web site has many similarities with the tax payment system we are going to developed in many ways.

The tax payment system to be developed is a web based online tax paying system to pay tax online. Ethiopia so far been using the manual system to collect tax. Even though there is a plan to change it to online system as the ERCA (Ethiopian Revenue and Customs Authority) announced on April, 2016 it is still working manually.

Most available tax payment systems including the above EFTPS are mobile applications also use other technologies like voice activation. But our tax payment system is a web-based application. The system that used all over the world are mostly successful and satisfying. Even though our system is not a mobile application we will try to let Ethiopian tax payers pay tax without being present at tax stations by providing this system.

### 2.2 Product Functions

After this system is fully developed and implemented tax payers will be able to pay their tax using this system by the time payment have been announced. The payers can see the amount levied on them and pay the money to the nearest bank accordingly. After making the transaction they ought to attach the receipt to the system. Payers are also able to address compliment to the Authority.

The tax officer will be able to manage the process of the taxation though the system and announce any news possibly existing. Also view and responding to the compliments aroused by the payers.

### 2.3 User Characteristics

A slight experience of computer usage is necessary to operate the software properly. Each employee in tax payment office have been already using computer for other tasks, which makes usage of the new software much simpler. Generally, an employee can master the software after a short training session for about half a day.

In the case of customers who use this software a simple guideline will be prepared to show every step needed to use the software. The authority will take the rest responsibility in creating awareness and publishing and distributing contents of the guideline.

### 2.4 General constraints

While developing the system, the constraints listed below may limit the functions from full implementation.

- **Infrastructure constraint** – limited bandwidth of the internet in the country and blockades that are implemented by the government may hinder the system from serving the users at all times.
- **Language constraint** – the system will be developed in English language. This might pose a problem related to the full understanding of the users though there are things proposed to soothe the problem.

### 2.5 Assumptions and Dependencies

A basic knowledge of using a website and also understanding of the basic reading and writing skill of English language is an assumption considered while developing the product.

There should be an internet connection in the office for the system to function.

It is assumed that the computers in the office should have a browser application installed and it should support HTML5, CSS3 and JavaScript.

# 3. Specific Requirements

## 3.1 External Interface Requirements

### 3.1.1 User Interfaces

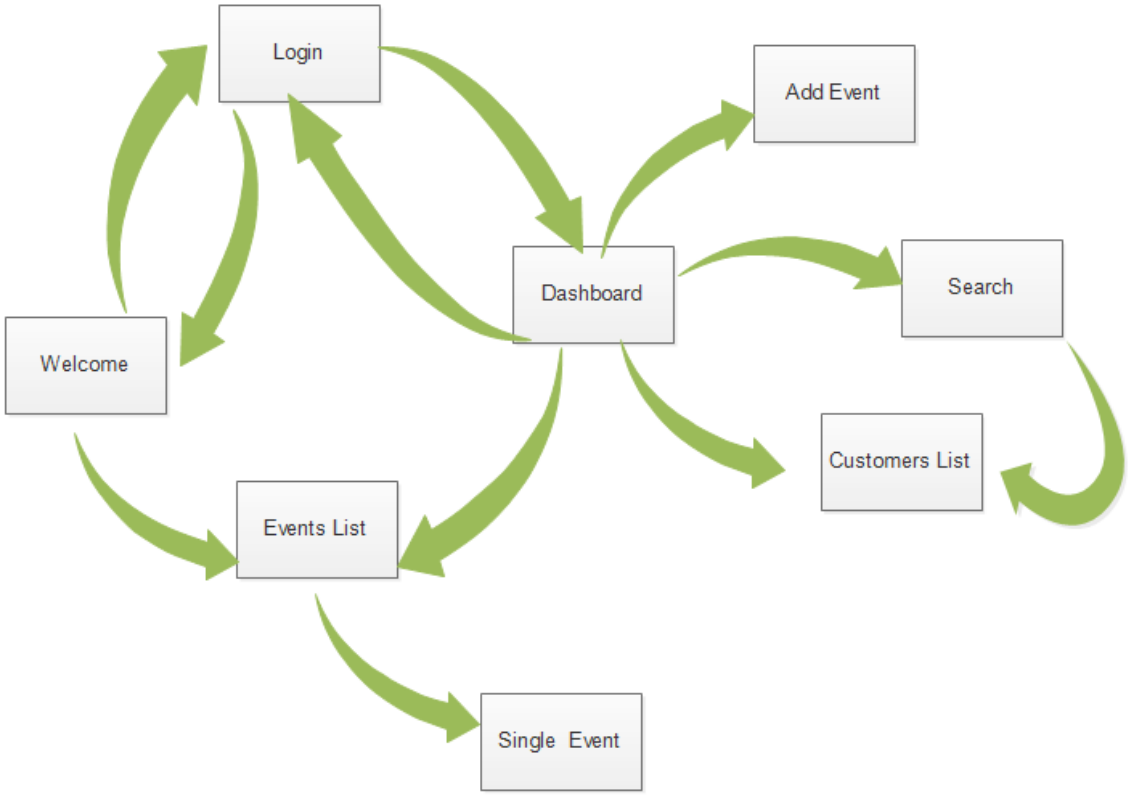


Figure 1 Flow Diagram 1

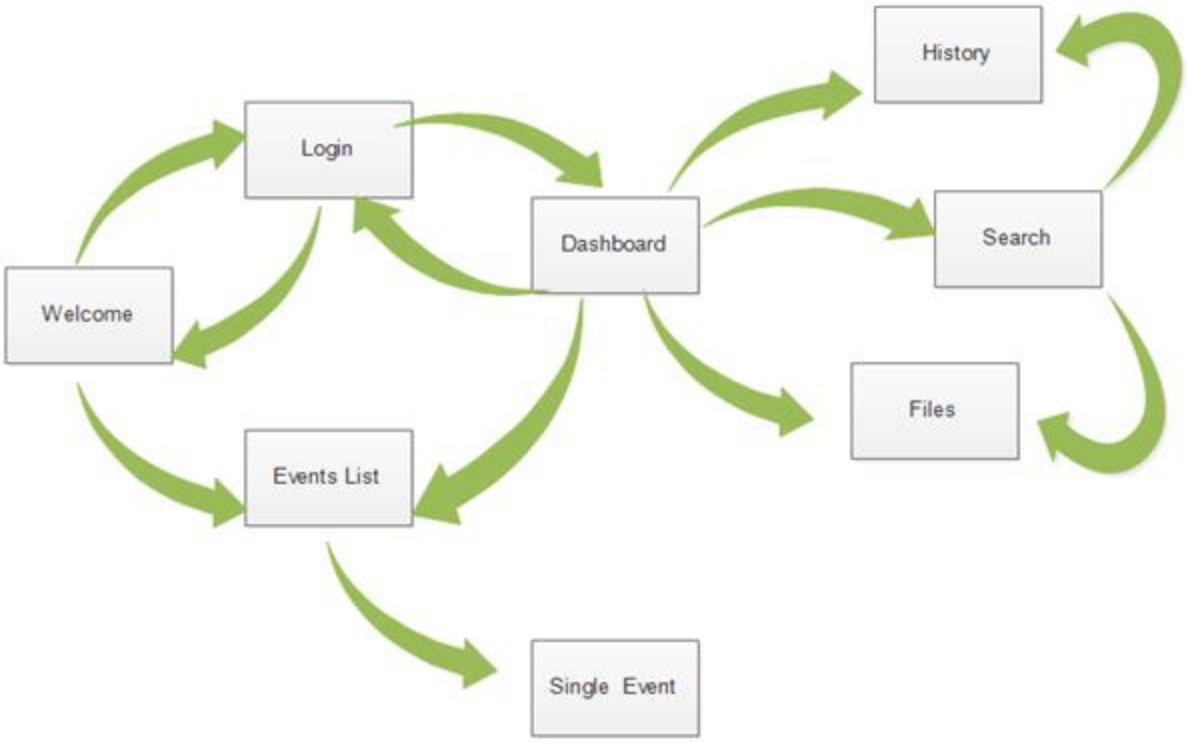


Figure 2 Flow Diagram 2

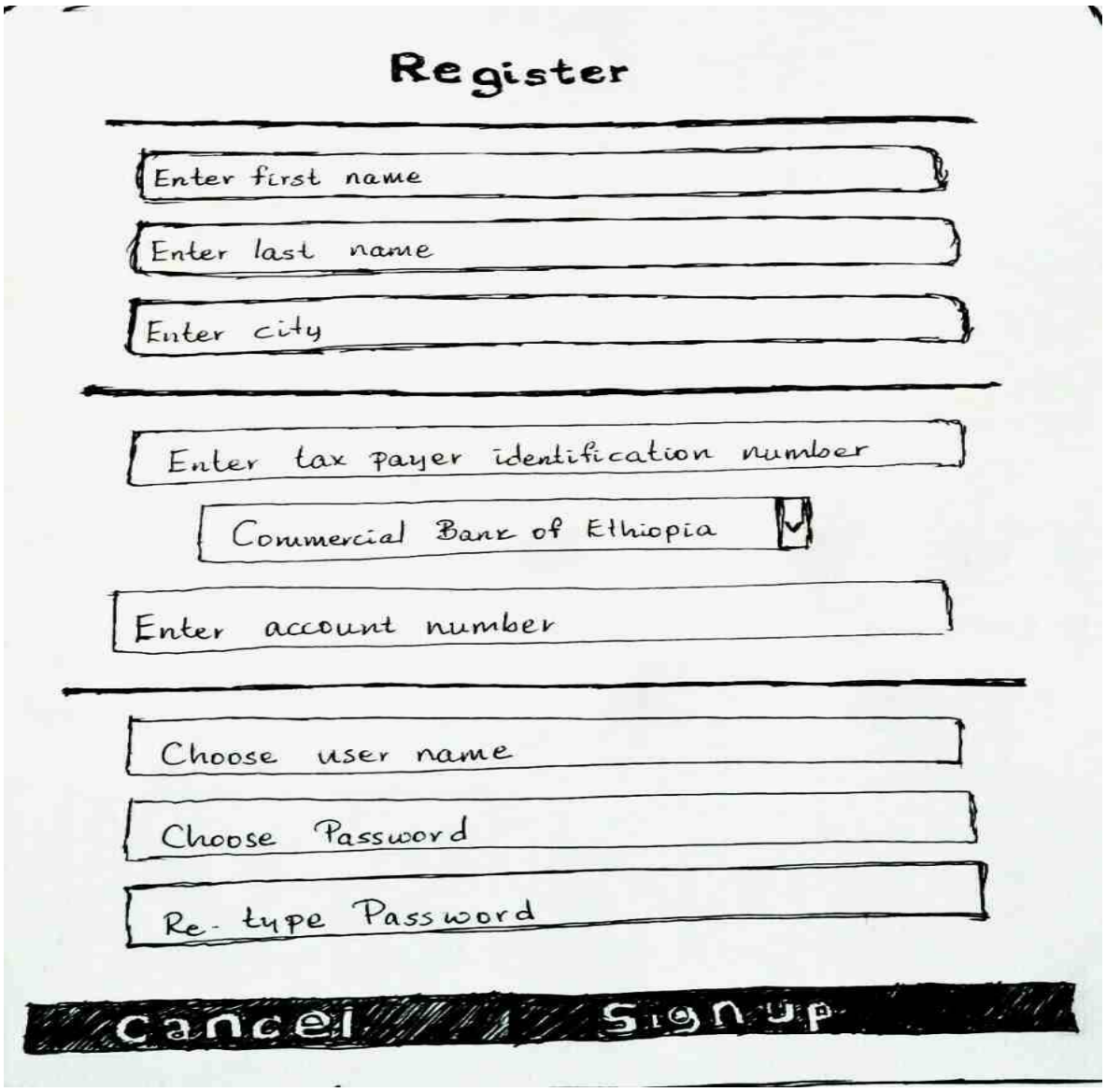


Figure 3 Register Page

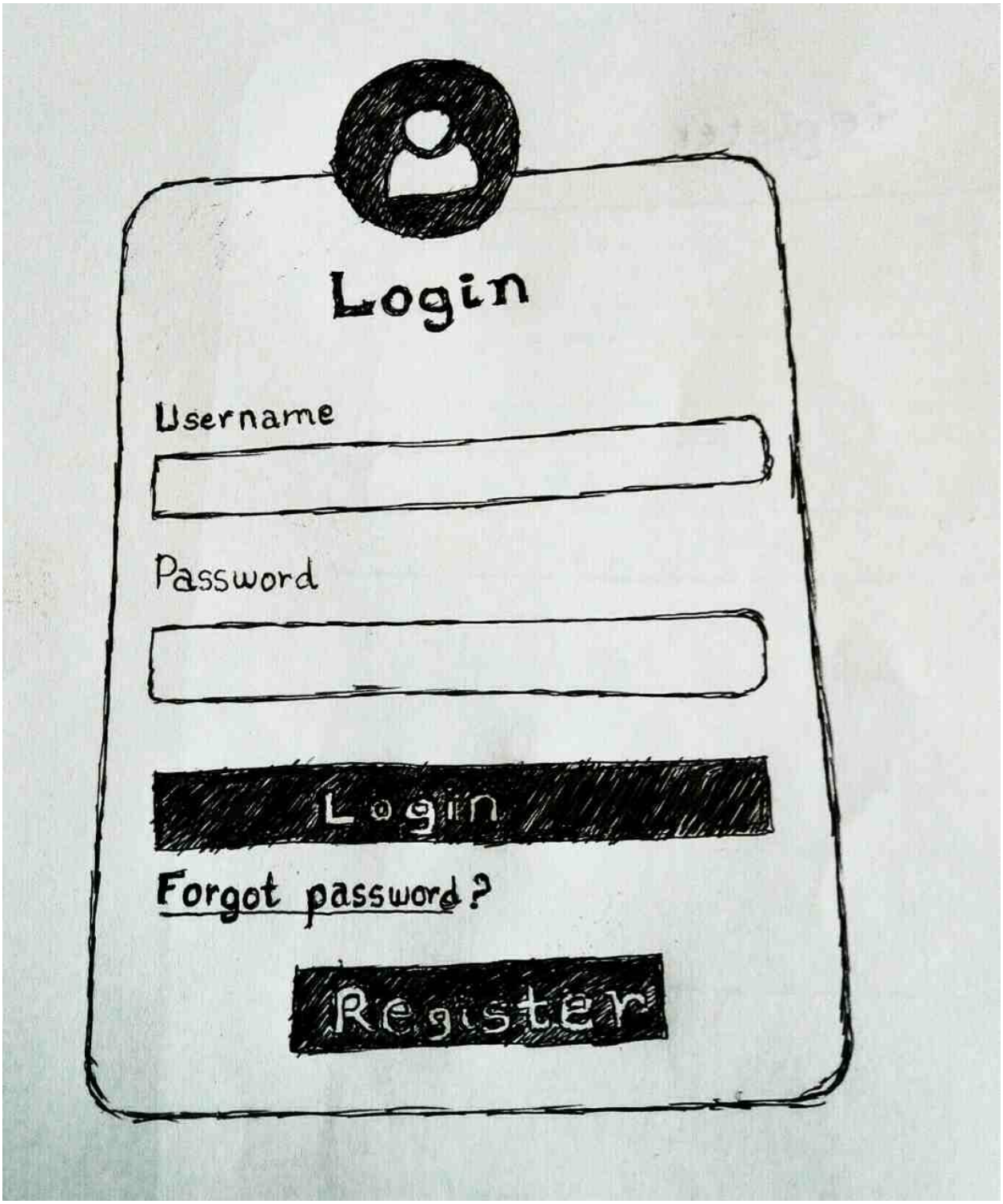


Figure 4 Log in Page

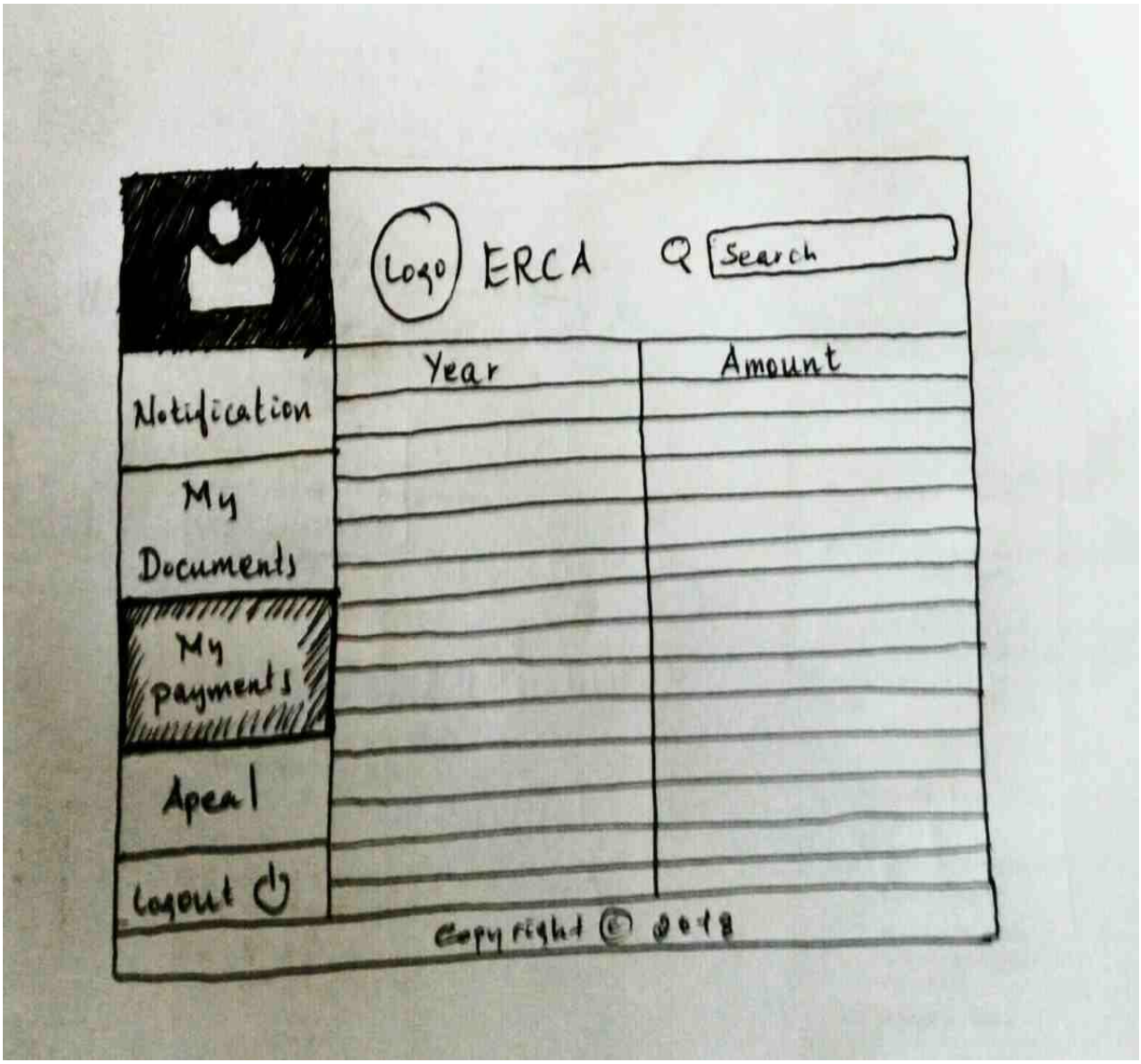


Figure 5 Payment Page

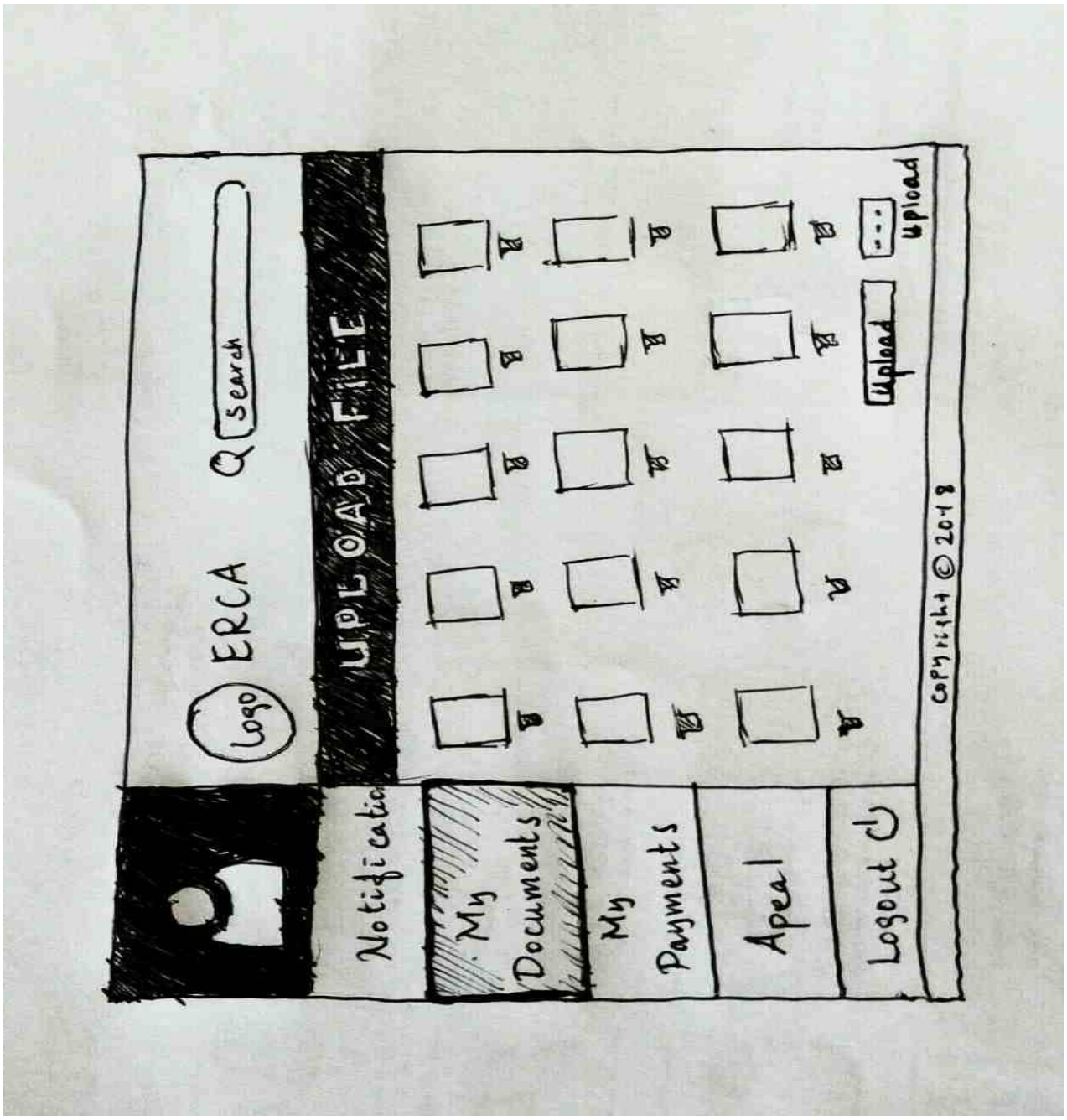


Figure 6 Upload File

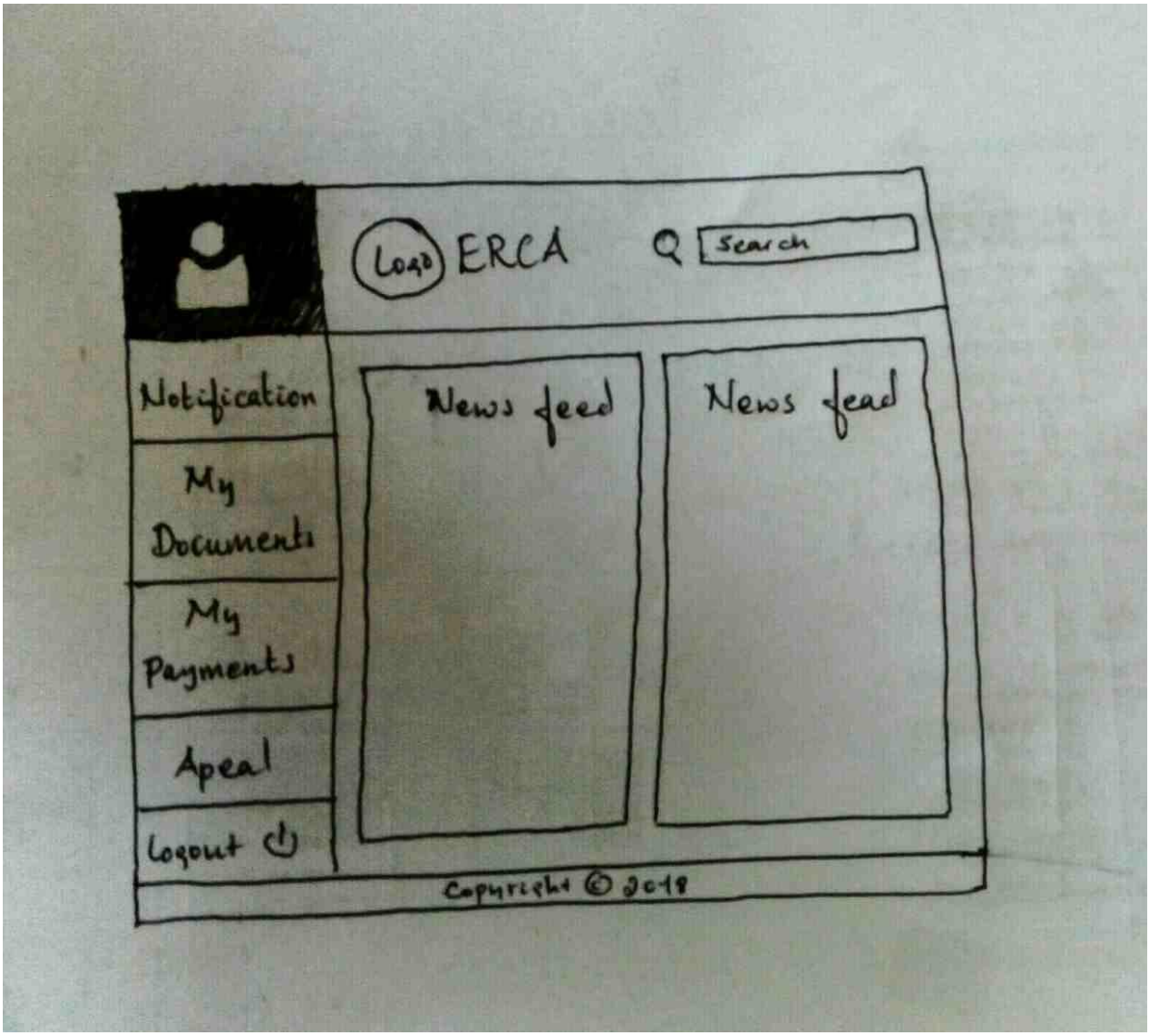


Figure 7 Home Page

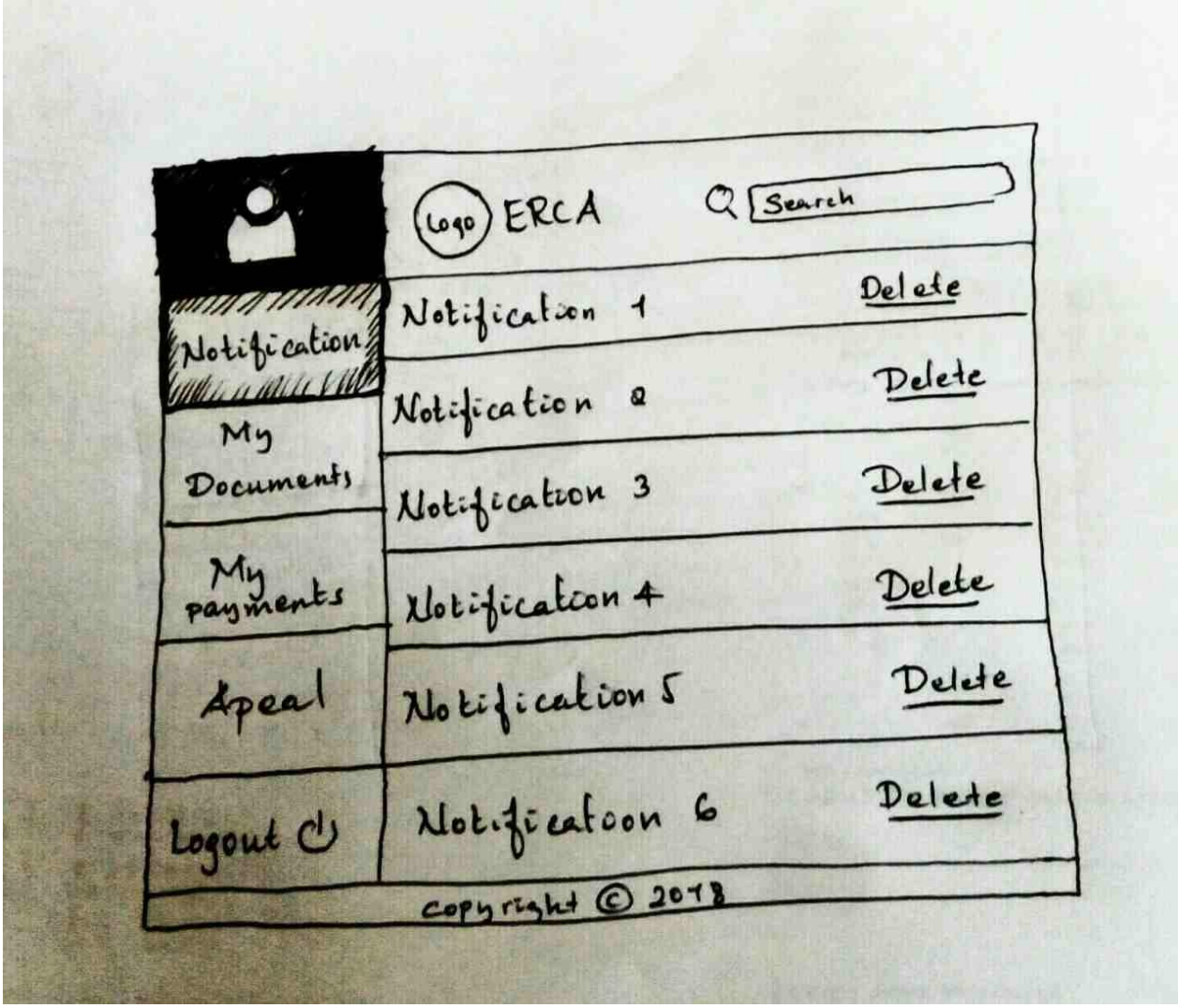


Figure 8 Notification Page

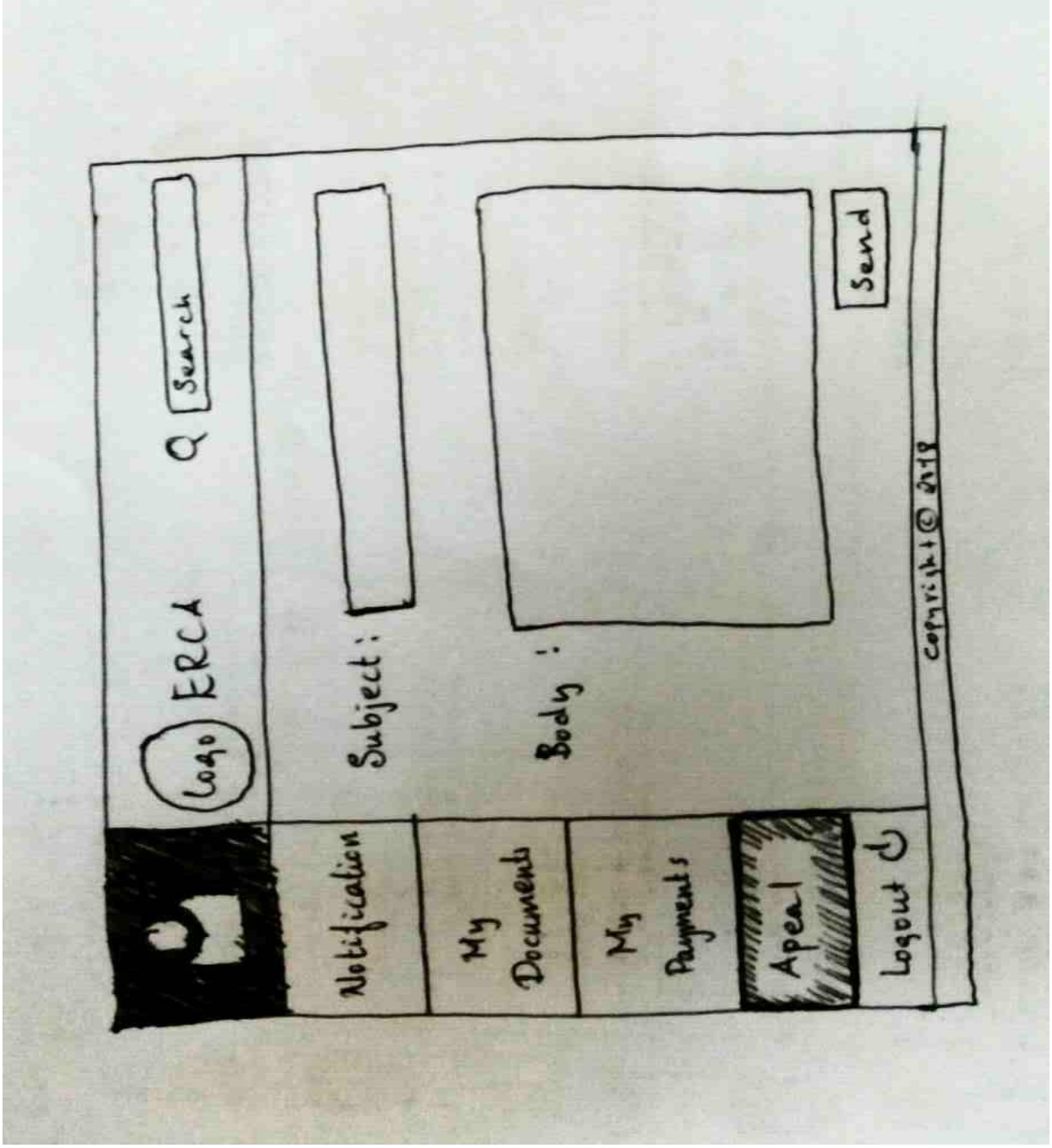


Figure 9 Appeal Page

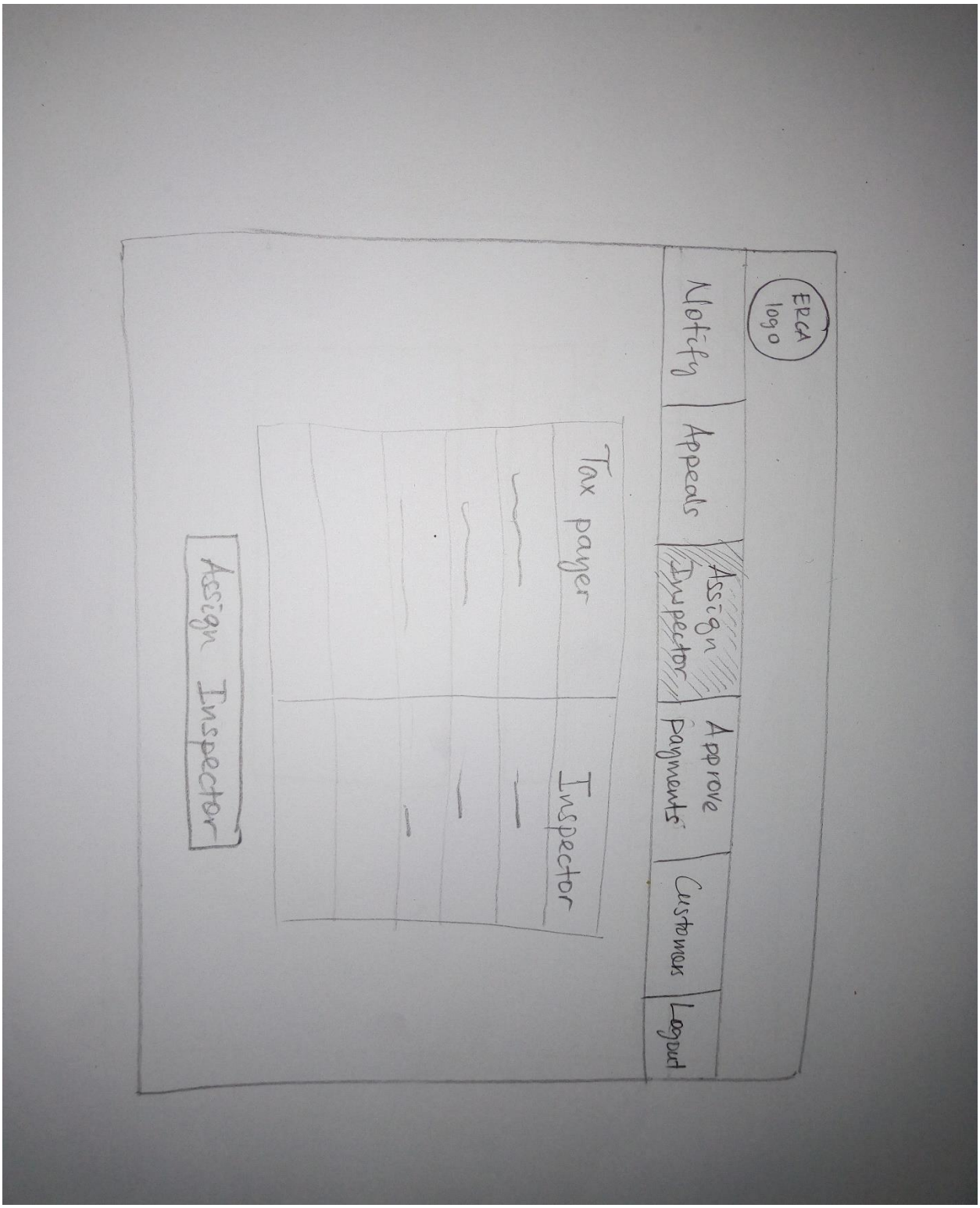


Figure 10 Assign Inspector

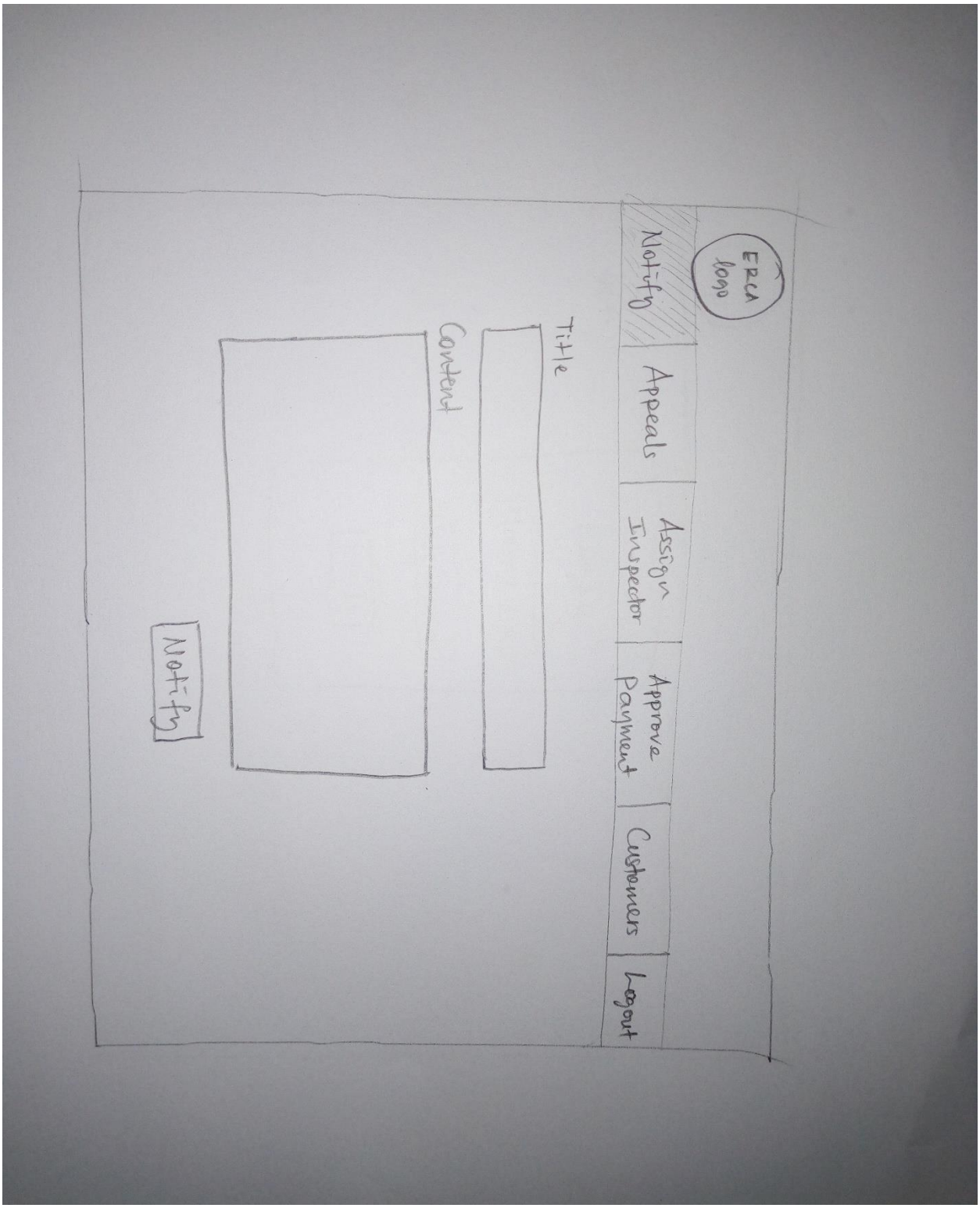


Figure 11 Notify Page

### 3.1.2 Hardware Interfaces

The system requires no external hardware as long as a user is able to browse through a mobile phone

### 3.1.3 Software Interfaces

Since the system is intended as a web-based system, it is dependent on specifications of the device the user uses to access it. The browser should be able to run JavaScript and should support HTML5 as well.

### 3.1.3 Communication Interfaces

The system will use the internet protocol hyper-text transfer protocol (HTTP) as for all communications over the internet.

## 3.2 Functional requirements

*Table 1 FR 01*

| | |
|---|---|
| ID | FR 01 |
| Name | Upload Files |
| Summary | The system shall allow taxpayer keeps record of his/her files |
| Description | The user will be provided with an option to take record of his files in a different file formats |
| Dependency | None |
| Reference | UC 01 |

*Table 2 FR 02*

| | |
|---|---|
| ID | FR 02 |
| Name | Approve Payment |
| Summary | An employee should be able to approve a taxpayer paid tax |

| | |
|---|---|
| Description | An authorized person selects a taxpayer from a list and mark him/her as paid and the system register the taxpayer as paid status |
| Dependency | FR 05 |
| Reference | UC 05 |

*Table 3 FR 03*

| | |
|---|---|
| ID | FR 03 |
| Name | Notify |
| Summary | Employee should be able to notify news and updates |
| Description | The user will be notified of new policies and other tax related issues, and amount of tax levied for the year. |
| Dependency | None |
| Reference | UC 07 |

*Table 4 FR 04*

| | |
|---|---|
| ID | FR 04 |
| Name | Add Event |
| Summary | Employee should be able to add event list |
| Description | An authorized person will fill all the necessary information about a notification or update events then post it to the users. |
| Dependency | None |
| | UC 14 |

*Table 5 FR 05*

| | |
|---|---|
| ID | FR 05 |
| Name | View Taxpayer |
| Summary | The system shall display taxpayers list. |
| Description | Employee navigates to view taxpayers' page. The system displays the list of all registered taxpayers. |
| Dependency | FR 10 |
| Reference | UC 11 |

*Table 6 FR 06*

| | |
|---|---|
| ID | FR 06 |
| Name | Appeal |
| Summary | The system shall allow taxpayers present their appeal on the levied tax |
| Description | If the users do not agree with the amount of tax levied on them the will presented their appeal and wait for response from the authority. |
| Dependency | None |
| Reference | UC 02 |

*Table 7 FR 07*

| | |
|---|---|
| ID | FR 07 |
| Name | Upload Files |
| Summary | The system shall allow taxpayer keeps record of his/her files |

| | |
|---|---|
| Description | The user will be provided with an option to take record of his files in a different file formats |
| Dependency | None |
| Reference | UC 01 |

*Table 8 FR 08*

| | |
|---|---|
| ID | FR 08 |
| Name | Reply Appeals |
| Summary | The system should provide a view of appeals from tax payers . |
| Description | The system will allow authorized tax officer to view details of appeals from tax payers and respond accordingly. |
| Dependency | None |
| Reference | UC 06 |

*Table 9 FR 09*

| | |
|---|---|
| ID | FR 09 |
| Name | View files |
| Summary | The system shall allow taxpayers view their uploaded files |

| | |
|---|---|
| Description | After the user logs in to his/her account and select the choice to view documents and the system will provide a list of all uploaded files. |
| Dependency | FR 10 |
| Reference | UC 03 |

*Table 10 FR 10*

| | |
|---|---|
| ID | FR 10 |
| Name | Search |
| Summary | The system shall allow searching of files and news |
| Description | User enters a keyword on the field and click search. The system searches for result and display. |
| Dependency | None |
| Reference | UC 12 |

*Table 11 FR 11*

| | |
|---|---|
| ID | FR 11 |
| Name | Register Taxpayer |
| Summary | The system shall provide taxpayer registration field. |

| | |
|---|---|
| Description | Employee fills all the required information about a taxpayer and submit. System validates and save it. |
| Dependency | None |
| Reference | UC 13 |

*Table 12 FR 12*

| | |
|---|---|
| ID | FR 12 |
| Name | Add Employee |
| Summary | The system shall provide employee registration field. |
| Description | Employee fills all the required information about an employee and submit. System validates and save it. |
| Dependency | |
| Reference | UC 08 |

*Table 13 FR 13*

| | |
|---|---|
| ID | FR 13 |
| Name | Remove Employee |
| Summary | The system shall provide an option to remove an employee. |

| | |
|---|---|
| Description | Employee search and select an employee and press the remove option. The system removes the employee from the database. |
| Dependency | FR 05 |
| Reference | UC 09 |

Table 14 FR 14

| | |
|---|---|
| ID | FR 14 |
| Name | View Payment |
| Summary | The system shall provide an option to display taxpayer's payment record |
| Description | Taxpayer select view payment choice. The system displays payment history |
| Dependency | |
| Reference | UC 04 |

## 3.3 Use Case

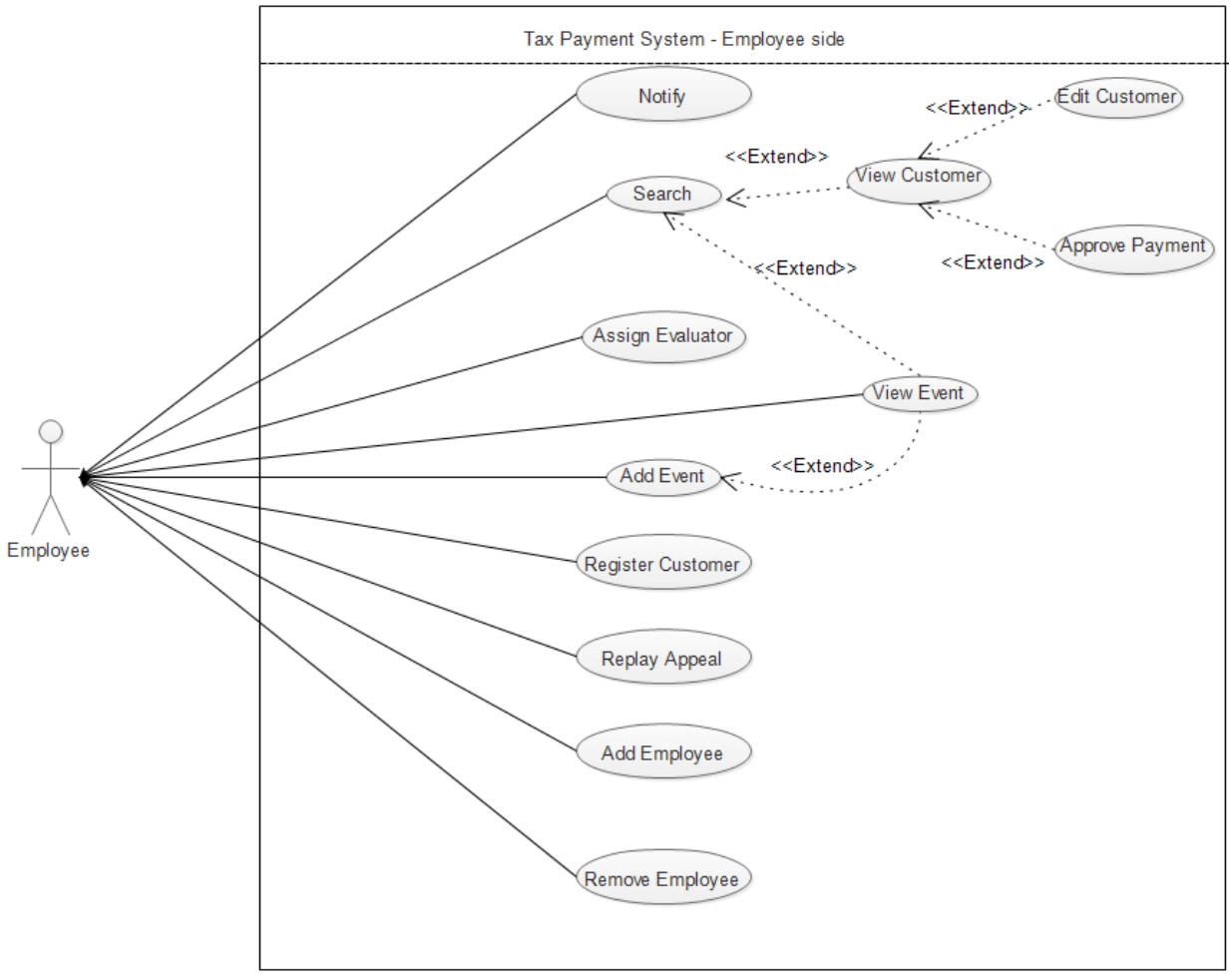


*Figure 12: Use case diagram 1*

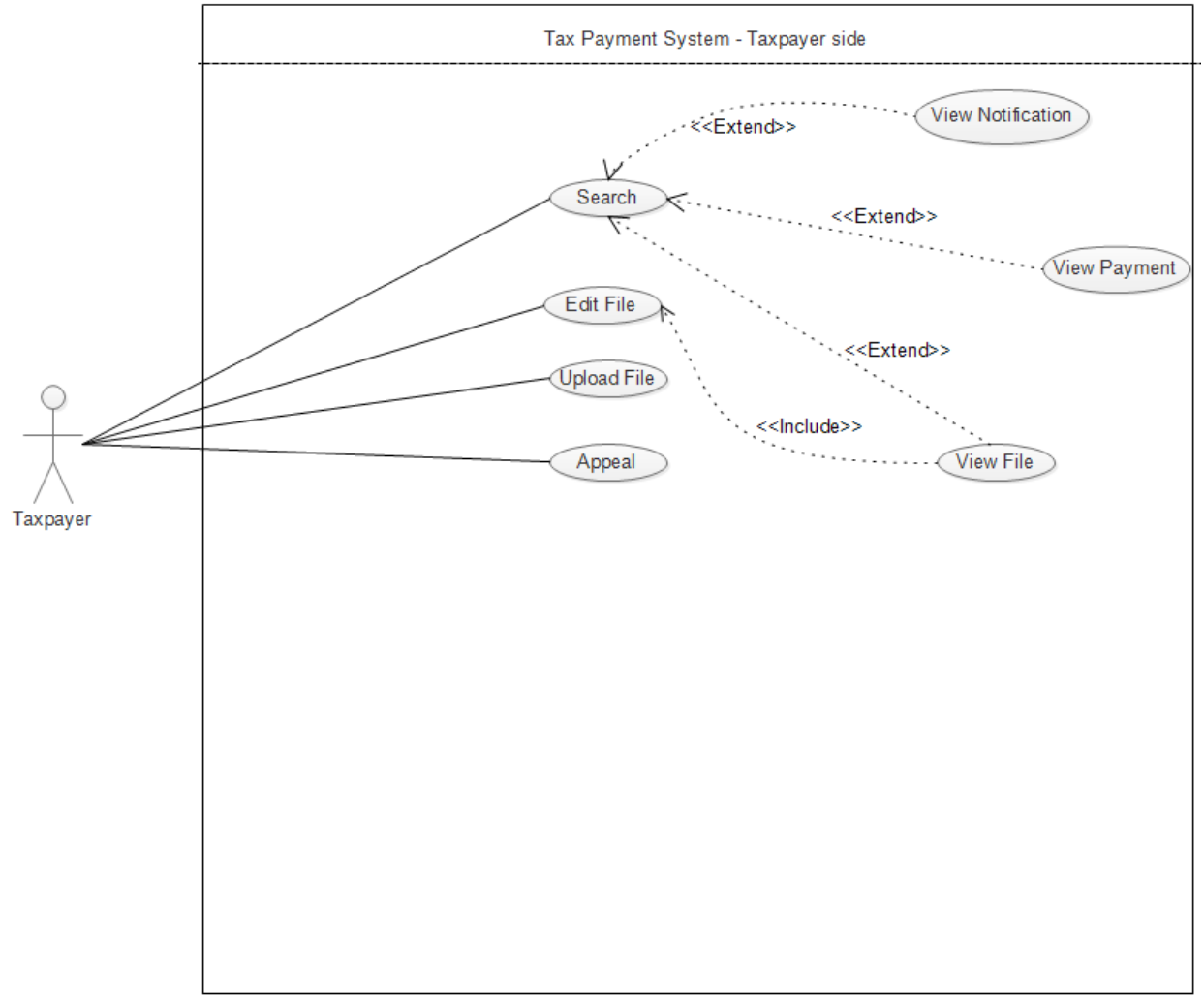


*Figure 13 Use case diagram 2*

### 3.3.1 UC: 01 Upload File

**Goal:** Upload files.

**Primary Actor:** Taxpayer

**Scope:** Tax payment system

**Level:** User

**Precondition:** Taxpayer should log in.

**Success End:** Tax payer uploads files.

**Failure:** Taxpayer does not upload files.

**Trigger:** uploading files.

**Success scenarios**

1. Tax payer selects upload option.
2. System displays the uploading page.
3. Tax payer uploads files.
4. System shows success of submission.

**Extensions**

3a. Invalid file format

3a.1 User will be alerted with error messages

3a.2 System returns to step 2.

### 3.3.2 UC: 02 Appeal

**Goal:** Tax payer appeals for exaggerated tax levies.

**Primary Actor:** Taxpayer

**Scope:** Tax payment system

**Level:** User

**Precondition:** Taxpayer should log in.

**Success End:** Tax payer appeals for exaggerated tax levies.

**Failure:** Tax payer couldn't appeal.

**Trigger:** appealing for exaggerated tax levies.

**Success scenarios**

1. Tax payer selects appeal option.
2. System displays the appealing page.
3. Tax payer fills required information, his/her appealing text and hit submit.
4. System shows success of submission.

**Extensions**

3a. Invalid information

3a.1 User will be alerted with error messages

3a.2 System returns to step 2.

### 3.3.3 UC: 03 View Files

**Goal:** Taxpayer views file for case of emergencies

**Primary Actor:** Taxpayer

**Scope:** Tax payment system

**Level:** User

**Precondition:** Taxpayer should log in.

**Success End:** Taxpayer view file

**Failure:** Taxpayer cannot view file

**Trigger:** View file.

**Success scenarios**

1. Taxpayer select view file option.
2. System searches for uploaded files.
3. System displays uploaded file.

**Extensions**

**3a** No uploaded file

3a.1 System displays No files massage

### 3.3.4 UC: 04 View Payment

**Goal:** Taxpayer view tax payment

**Primary Actor:** Taxpayer

**Scope:** Tax payment system

**Level:** User

**Precondition:** Taxpayer should log in.

**Success End:** Taxpayer views tax payment

**Failure:** Taxpayer cannot view tax payment

**Trigger:** View payment.

**Success scenarios**

1. Taxpayer select view payment option.
2. System searches for payment history.
3. System displays payment history.

**Extensions**

**3a** No payment

3a.1 System displays No payment history massage

**3.3.5 UC: 05 Approve Payment**

**Goal:** Administrator approves tax payment

**Primary Actor:** Administrator

**Scope:** Tax payment system

**Level:** User

**Precondition:** Administrator should log in.

**Success End:** Administrator approve user tax payment.

**Failure:** Administrator does not approve user tax payment

**Trigger:** Approve tax payment.

**Success scenarios**

1. Administrator selects approve option.
2. System displays Taxpayers list.
3. Administrator selects Tax payer and approves payment.

**3.3.6 UC: 06 Reply Appeal**

**Goal:** Administrator replay for taxpayers' appeal.

**Primary Actor:** Administrator.

**Scope:** Tax payment system

**Level:** User

**Precondition:** Administrator should log in.

**Success End:** Administrator replay for taxpayers' appeal.

**Failure:** Administrator does not replay for taxpayers' appeal.

**Trigger:** replay for taxpayers' appeal

**Success scenarios**

1. Administrator select appeal from appeals list.
2. System display field to write message.
2. Administrator write message and send.

**3.3.7 UC: 07 Notify**

**Goal:** Administrator notifies taxpayers about events.

**Primary Actor:** Administrator

**Scope:** Tax payment system

**Level:** User

**Precondition:** Administrator should log in.

**Success End:** Administrator notifies tax payers.

**Failure:** Administrator couldn't notify.

**Trigger:** Notifying tax payers.

**Success scenarios**

1. Administrator selects notify taxpayer option.
2. System displays the page for posting notification.
3. Administrator writes notifications for tax payers and submit.
4. System shows success of notification post.

**Extensions**

3a. Invalid information

3a.1 User will be alerted with error messages

3a.2 System returns to step 2.

### 3.3.8 UC: 08 Add Employee

**Goal:** Authorized person wants to add employee.

**Primary Actor:** Employee

**Scope:** Tax payment system

**Level:** User

**Precondition:** Employee should log in.

**Success End:** Employee adds employee.

**Failure:** Employee couldn't add employee.

**Trigger:** adding employee.

**Success scenarios**

1. Employee selects add employee option.
2. System displays the page for adding employee.
3. Employee fills information required about employee.
4. System shows success of adding employee.

**Extensions**

3a incorrect information

3a.1 the system displays error messages for incorrectly filled information.

3a.2 System returns to step 2.

### 3.3.9 UC: 09 Remove Employee

**Goal:** Administrator wishes to remove an officer.

**Primary Actor:** Administrator

**Scope:** Tax payment system

**Level:** User

**Precondition:** Administrator is logged in.

**Success End:** Administrator removes officer.

**Failure:** Administrator couldn't remove officer.

**Trigger:** removing officer.

**Success scenarios**

1. Administrator selects delete employee option.
2. System displays the page deleting officer.
3. Administrator fills name and id of officer he/she want to remove and hits delete.
4. System verifies officer deletion.
5. System shows up officer removed message.

### 3.3.10 UC: 10 Assignment

**Goal:** Administrator assigns tax inspector for taxpayers.

**Primary Actor:** Administrator

**Scope:** Tax payment system

**Level:** User

**Precondition:** Administrator should log in.

**Success End:** Administrator assigns tax inspector for taxpayers.

**Failure:** Administrator couldn't assign tax inspector for taxpayers.

**Trigger:** Assign tax inspector.

**Success scenarios**

1. Administrator selects assign inspector option.
2. System displays a page with inspector-taxpayer pair.

### 3.3.11 UC: 11 View Taxpayers

**Goal:** Employee view taxpayers list.

**Primary Actor:** Employee

**Scope:** Tax payment system

**Level:** User

**Precondition:** Employee should log in.

**Success End:** Employee view taxpayers list

**Failure:** Employee cannot view taxpayers list

**Trigger:** View taxpayers.

### 3.3.12 UC: 12 Search

**Goal:** Employee search database

**Primary Actor:** Employee

**Scope:** Tax payment system

**Level:** User

**Precondition:** Employee should log in.

**Success End:** Employee searches.

**Failure:** Employee unable to searches.

**Trigger:** Search.

**Success scenarios**

1. Employee enter a keyword and submit.
2. System searches for the keyword.
3. System display search result.

### 3.3.13 UC: 13 Register Taxpayer

**Goal:** Employee register taxpayer

**Primary Actor:** Employee

**Scope:** Tax payment system

**Level:** User

**Precondition:** Employee should log in.

**Success End:** Employee register taxpayer.

**Failure:** Employee cannot register taxpayer.

**Trigger:** Register taxpayer.

**Success scenarios**

1. Employee select Register Taxpayers option.
2. System displays a page to fill taxpayer's information.
3. Employee fill all the necessary information.
4. System validates the information and register.

**Extensions**

4a Invalid information

4a.1 System prompts with error message.

4a.2 System returns to step 2.

**Success scenarios**

1. Taxpayer select view taxpayer option.
3. System displays all taxpayers.

**3.3.14 UC: 14 Add Event**

**Goal:** Employee add event

**Primary Actor:** employee

**Scope:** Tax payment system

**Level:** User

**Precondition:** Employee should log in.

**Success End:** Employee adds event

**Failure:** Employee cannot add event

**Trigger:** Add event.

**Success scenarios**

1. Taxpayer select Add event option.
2. System provides fields to enter event information.

3. Employee fill the form and submit

3. System validates the input and add event to database.

**Extensions**

**4a** Invalid input

4a.1 System displays error massage

4a.2 System returns to step 2

## 3.4 Non Functional Requirements

**Localization**

The proposed system should consider the flow of current working system. The system should provide a mechanism to be localized to the current working system. For example, Ethiopian calendar is used as official working calendar in the current system and the proposed system is obliged to work with Ethiopian calendar.

**Security**

Users' information and credential should be kept private. The system will provide an encryption method to protect sensitive users' information. Every user is authenticated before accessing any information with username and password to log in to his/her account. If suspicious activities is noticed, the user will be notified.

**Usability**

The system's user interface should be interactive and straight forward considering all the users with different experience on using computer. A simple user guide that is published and distributed by the authority should be helpful in creating the awareness and providing guidance for the mass community.

**Performance**

Each operation the system perform should have a maximum of 2 seconds response time on a local computer at test time. The one thing that should be taken in consideration is the mentioned

response time is measured excluding all the delays occurred due to internet connection. Moreover, the system tries to get the maximum efficiency with limiting heavy background tasks.

**Reliability**

In case of errors and system malfunction recovery of corrupt information and handling such issues are the work of the database management system we use.

**Accessibility**

The system is presented in a responsive manner and users can access it on any device of their choice like mobile phone, tablet or PC.

## 3.5 Inverse Requirements

Ethiopian taxation system software doesn't support any money transaction between the tax payer and the Ethiopian Revenue and Custom Authority.

## 3.6 Design Constraints

Simplicity was a basic constraint for us as it is an accepted modern-day policy of a design and most importantly, since most users of the taxation system software are merchants with low experience with computers, the taxation system software has to be simple to understand and operate by its users. As a result, we have been trying to reach an optimum between all the functional requirements of a certain page and the principle of simplicity alongside. A balance between the two is expected to be seen in the user interface design of the system.

### 3.7 Logical Database Requirements

*Table 15 Database Requirements Table*

| | | |
|---|---|---|
| Customer Service Personal | CS_ID<br>First name<br>Last name<br>Gender<br>Email address<br>User name | This data consists of all the information needed about the Customer Service employee. is used to authenticate whenever a Customer Service Personal wants to log in and whenever higher authority wants to get information about the employees. |

| | | |
|---|---|---|
| | Password | |
| Tax Payer | TP_ID<br>First name<br>Last name<br>Gender<br>Bank account number<br>Phone number<br>Email address(optional)<br>TIN number<br>Address<br>User name<br>Password | This data consists of all the information about tax payer. It is used to authenticate whenever a tax payer wants to log in. It is also used when a Customer Service Personal wants to access information about the tax payer. |
| Paid List | Year<br>TP_ID<br>TP_name | This data is a list of tax payers who have paid their yearly tax. It used for identifying who paid his/her yearly levied tax. |
| News feed | N_ID<br>Date<br>Content | This data consists all the news and announcement from ERCA. It is used to update the tax payer about any new announcement from the ERCA. |
| Messages | M_ID<br>Date<br>Content | This data is used by the tax pater for appealing about the yearly levied tax. |
| Document_Store | D_ID<br>Date<br>Content | This is used by the tax payers to store their Documents. |

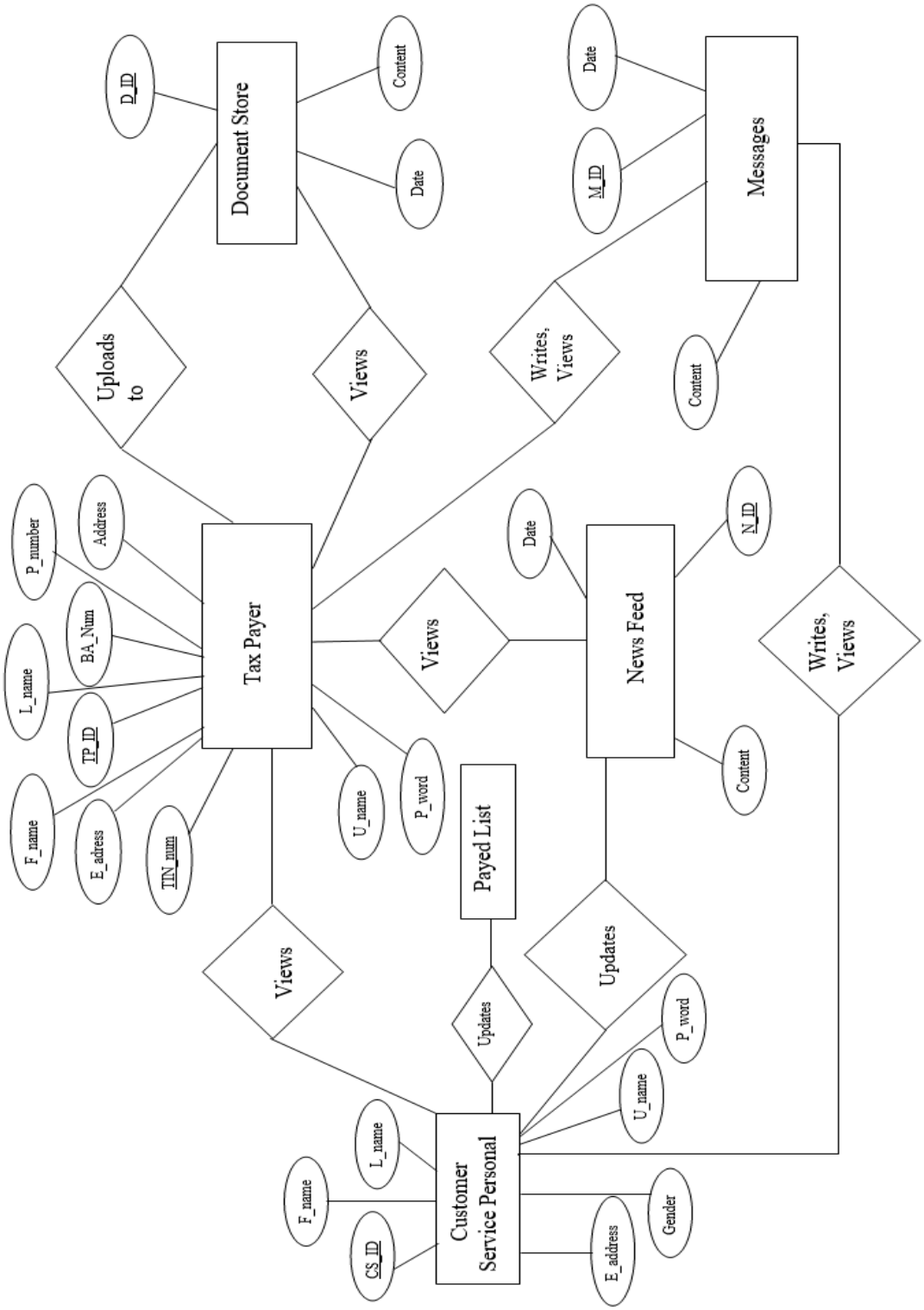


*Figure 14 ER diagram*

## 3.8 Other Requirements

### Training Related Requirements

There will be a short training program for the tax payers to create awareness and how to use the taxation software system by the ERCA before deploying the software.

### Packaging Requirements

The system is delivered as a web-based platform. This means it has to be loaded in a central server that can be accessed anywhere where there is internet connection. HTML, CSS, JavaScript and PHP files will be organized and uploaded on the server. Any user of the system will not be required to use extra software other than a simple internet browser that supports HTML5(The fifth version of HTML) and JavaScript and its frameworks.

### Legal Requirements

ERCA will have the full copy right patent over the taxation software system.

# 4. Change Management Process

Any requests to change the project scope and requirements shall be discussed by all the members of the team and consult our adviser Mr.Fitsum. A change will be made only when the majority of the team agrees on the change. In this case, the SRS document shall be updated by the team members in order to reflect the changes, and a date of change shall be noted in the file. If this change request is made by the client or anyone outside of the team, he or she will have to contact the team. If a change request is made by a team member, he or she can raise it during the weekly team meeting or contact other team members via email. During any of these requests, the team will assess the feasibility of the proposed changes considering the time constraints and structural constraints of the implemented modules and develop an implementation strategy. A change plan will be created for the implementation of the change. The team will then continue implementing the new requirements.

# REFERENCES


- Parivahan, https://parivahan.gov.in/index.php, April 10, 2018
- ERCA, http://www.erca.gov.et/index.php/anout-us, April 3, 2018