Check N face.

YOUR FUTURE AI ASSISTANCE

By

Laith Zayed Mahmoud Zayed

Supervisor

أكاديمية البرمجة
Coding Academy
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Table of Content

Subject **page**

Chapter 1: Introduction

1.1 NOTATION

AI = Artificial Intelligence.

FR = Face Recognition.

ML = Machine Learning.

DL = Deep Learning.

CNN = Convolutional neural network.

OCR = Object character recognition

DB = Database.

1.2 ABSTRACT

The amount of companies and hyper markets waste a tons of money recording to inaccuracy in determining employee attendance or they checked-in by the change their exact time of attendance.

For this issue we are Check N Face and we produced a new attendance system depends on using face recognition to check (employees, students …etc.) with a high accurate and in short time then all of this data will stored will in our database with no way to change this data.

Especially in COVID-19 pandemic most of companies make a high restrictions and awareness's about how they can check attendance without touching any devices or for companies that choose to work remotely. This gave us the incentive to create our new attendance system using the latest technology in Artificial Intelligence and machine learning with neural network deeply in using the face recognition.

1.3 GENERAL

In this highly accelerated world with increased number of people in an unpredicted way, we need always a new system to check people attendance to their work, universities, schools, and markets …etc. We used alots of old method and they are all hard to collect data easily and accuretly, so we plan to take a good challenge in our market to make a new system that can check attendance without need any special device either your used camera, like laptops and so on. This new technology using AI, DL, and CNN to predict and choose what is the person name and time of check-in or check-out depend on saved data by management system in our database. Also, you can review all of this data easily, fastly and accurately anytime and anywhere.

1.4 System Goals

The main goal of this product is will help companies, markets and univirsity …etc. in their attendance system with cheap divices like daily webcam used in laptop or another used camera and it have a high accurecy to do functions like check-in and check-out then you review these stored data anythime and anywhere throw any devices that only connected to the browser to know how is your employees performance depend their time attendance and help your company to profisionlize the work and excel it by more comittmenet using the latest artificial intellgnece technologies and face recognition.

The goals of this project can mentioned like below:

1- Using face recognition for attencance system.

2- Check-in and check-out your users (employees, students and …etc.) without needs to touch any device.

3- The whole idea will help company to record attendance remotely not only for local use.

1.5 Fesibilty Study

a. Challenges:

Most of people not familier with new technology and its need more update depend on the new algorithm to make accurate nueral network to make a good desecsion when the machine need to predict the users depend on stored images.

b. Proposed Method:

Encourage people to use latest technology using AI without touching any device.

c. The Method Adopted in The System Design.

1- System Design: The system design depends on project needs with the complete architecture designed.

2- System design according to the system analysis model and the proposed system architecture.

d. Analysis The Requirements:

In the first week, The project analyzed and gather information to excute the project requirements.

1.6 Obstacles

A new technology need a high risk to go further choosing project like this with no much more details about how artificial intelligence work and used, especially it needs a high knowledge of python coding language from the first day. The main obstacles of building like these project you need a time to read more about the documentation and start gradually go throw image work starting from image classification going to face recognition to understand how machine work.

Although you should read a lots of scientific papers to understand the deep knowledge of this technology.

The development area in python need a high IDE and using libraries need to be familiar with it, so from the first day you need to initialize your development area for this new technology and read more about libraries because you will need it in your project.

Chapter 2: Requirements

2.1 Analysis

All project in the IT industries needs a requirements to execute the project to their stockholders scoop, and it needed to divide the project into small parts like: sprints, in agile methodology to have a more benefits when the team work with their scrum master and product owners belong to each developer (Front-End, Back-End, …etc.) and other parts to achieve the project goal. Also, it's called requirements engineering.

All project requirements must be quantifiable, relevant and detailed. The rules of engagements with a software project need to approach these things:

- Project Scope.
- Statement of work change.
- Test Plan.
- Test Process.
- Reporting.

On the other hand, in the field of software engineering, such requirements are often called functional specification. Finally, the requirements analysis declared as one of the important steps when any new project started because it will go far with each part in the project towards all goals to be done on the time and target the client requirements.

2.2 User Requirements

The user requirements refers to all services that let user can do services by just one click with viewing any error message if it appear later on to make the process more productive, easy to use, and make the process more interested to use website.

Note: All mentioned users it can be in any type of user in this project in our case we can say user for (Employees, Students, …etc.) and any kind of users need attendance system.

2.2.1 Front Website (Main website)

- Login page.

2- View the main website.

3- Check-in: the user start work at this exact (day and time).

4- Check-out: the user leave work at this exact (day and time).

2.2.2 Back Website (Dashboard)

1- Admin dashboard

The admin in the admin dashboard can do the following: add new user, edit user, view user data, delete user, review check-in and check-out users with their date and time.

Functional requirements.

1- Login / Register page.
2- Dashboard page to control the employee and review their check-in and check-out day and time.
3- Homepage to let new clients request a demo.
4- Attendance area, it make the reach to mark check-in and check-out for the users.
5- Contact page to let the new client do connection and question with admin.

Non-Functional Requirements.

1- External Requirements

The website has Admins to (add, edit, view, and delete users) and the can (read the data come from face recognition system to report check-in and check-out date and time from users).

2- Organizational Requirements

1- Require OS (Operating system): Windows (XP, 7, 8, 10) Linux and Mac.
2- Web browser: (Google Chrome, Microsoft Edge, Firefox and Opera).
3- Connected to the Internet.
4- For programmer and developer, this project used Django framework for Python and connect it with MySQL, The main website using HTML, CSS and JS in their code.

System Requirements.

1- The website must be compatible with pc's and mobile devices.

   a. It must be all devices are available and connected to the internet to achieve all functions.

   b. It need a web browser as mentioned above.

2- Programming languages used.

   a. **HTML** (Hypertext Markup Language) is the standard markup language for web pages and elements are the building blocks of html pages and elements are represented by tags (<>).

   b. **CSS** (Style Cascading Sheet) is describes how HTML element are displayed depending on their own (id and class), and it work more with how your website will look.

   c. **JavaScript**: is a scripting language that enables you to create dynamically updating content, control multimedia, animate images, and pretty much everything else.

   d. Python: is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together.

   e. Django: is a high-level Python Web framework that encourages rapid development and clean, pragmatic design.

   f. **SQL**: is the most popular language for adding, accessing and managing content in a database.

   g. **MYSQL:** is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL).

2.3 Use Case Description

1. Actors:

    a. Human actors: Admin and users.

Use Case Number	**1**
Use Case Name	Browsing
Participation Actor	1.User 2.Admin
Pre-Condition	Internet Connection
Flow of events	1.Open the main homepage website 2.Browser the website
Post-Condition	1.View and review information resources 2.Post by request a demo to order a demo system for a companies 3.Post by contact us page
Quality Requirements	Speed site browsing

Use Case Number	**2**
Use Case Name	Check-in attendance for users
Participation Actor	1.User
Pre-Condition	Internet Connection
Flow of events	1.Open the main homepage website 2. Go to attendance area and check-in by press on the button and let the webcam checked you by your face If you registered before by your HR or Admin.
Post-Condition	1. Post by user face as a face recognition with exact date and time for his taken check-in attendance.
Quality Requirements	Good webcam and looking direct to the camera help machine FR

Use Case Number	**3**
Use Case Name	Check-out attendance for users
Participation Actor	1.User
Pre-Condition	Internet Connection
Flow of events	1.Open the main homepage website 2. Go to attendance area and check-out by press on the button and let the webcam checked you by your face If you registered before by your HR or Admin.
Post-Condition	1. Post by user face as a face recognition with exact date and time for his taken check-out attendance.
Quality Requirements	Good webcam and looking direct to the camera to help machine to filter user faces with others stored in the attendance system.

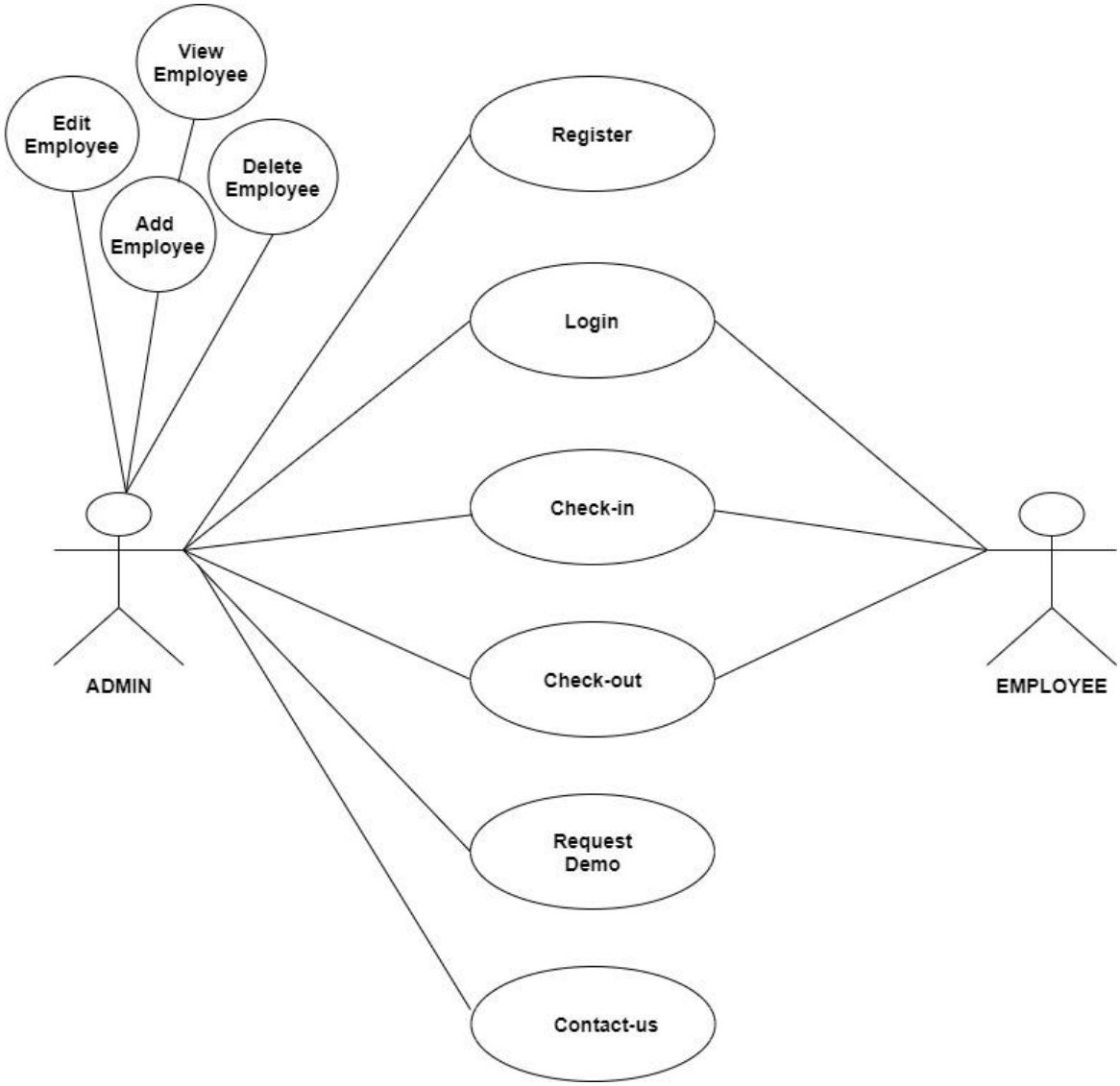
Use Case Number	**4**
Use Case Name	(Add, Edit, View and Delete) users.
Participation Actor	1.Admin
Pre-Condition	Admin Role
Flow of events	1.Open the dashboard website 2. Add, edit, view and delete any stored users depend on your project needs
Post-Condition	1. Create new employees to start check-in and check-out depend his/her attendance.
Quality Requirements	1. Admin can add users (Employees, Students, …etc.).

Use Case Number	5
Use Case Name	View report of the checked-in users with their date and time.
Participation Actor	1.Admin
Pre-Condition	Admin Role
Flow of events	1.Open the dashboard website 2. Using check-in page was shown all checked-in users.
Post-Condition	1. Retrieving data that was stored in database.
Quality Requirements	Admin Authorization to login and view stored users data.

Use Case Number	6
Use Case Name	View report of the checked-out users with their date and time.
Participation Actor	1.Admin
Pre-Condition	Admin Role
Flow of events	1.Open the dashboard website 2. Using check-out page was shown all checked-in users.
Post-Condition	1. Retrieving data that was stored in database.
Quality Requirements	Admin Authorization to login and view stored users data.

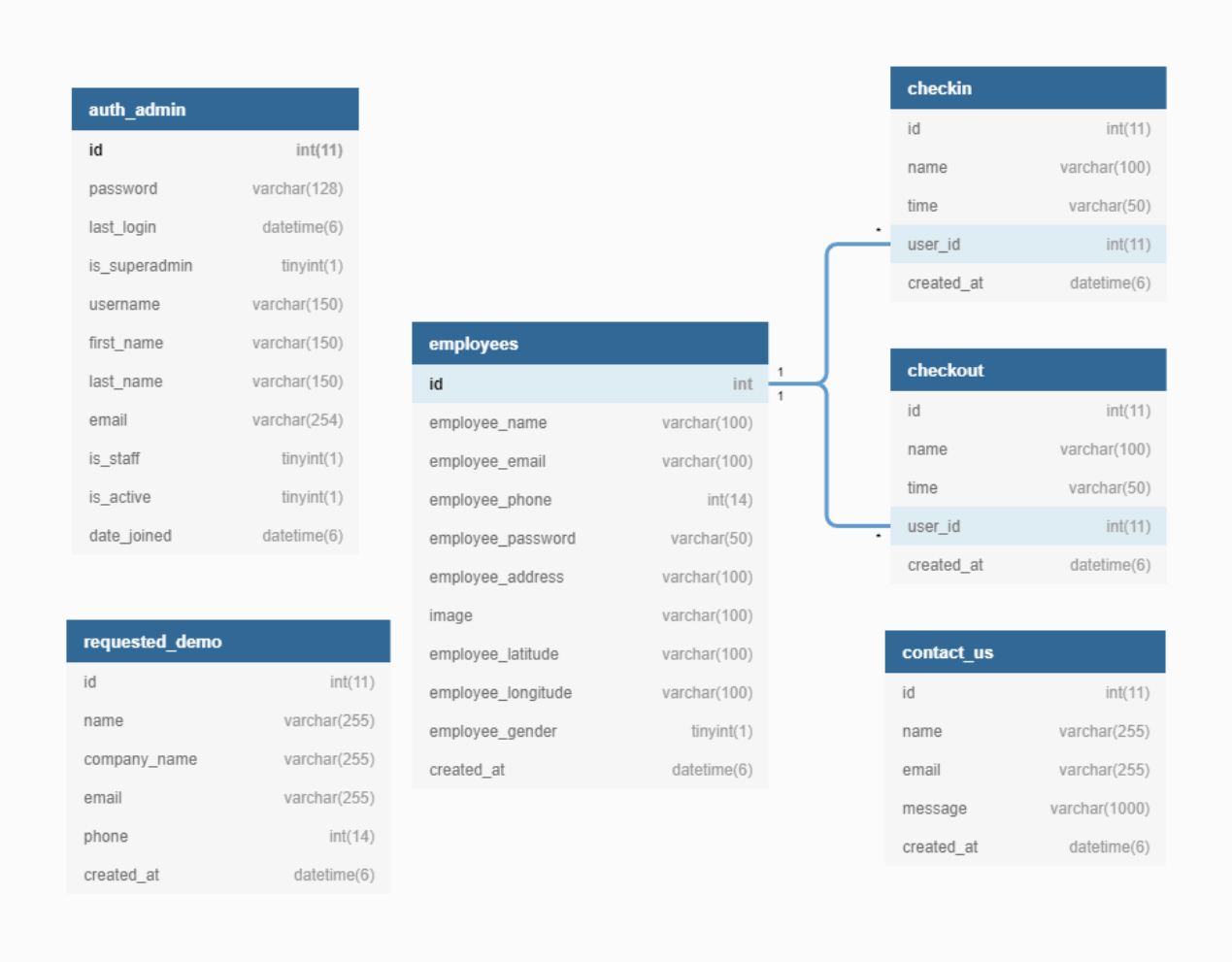
2.4 Use Case Diagram

This use case diagram was studied depending on the project requirements and it contain on two major classes (Admin and Employee).



Chapter 3: Design

3.1 Database Diagram



3.2 Database Tables Classification

The following tables shown each table name with each type and size depending on all requirements needs to achieve all parts of this project.

Admin Table (auth_admin):

auth_admin	Type
id	id int(11) [pk, increment]
password	varchar(128)
last_login	datetime(6)
is_superadmin	tinyint(1)
username	varchar(150)
first_name	varchar(150)
last_name	varchar(150)
email	varchar(254)
is_staff	tinyint(1)
is_active	tinyint(1)
date_joined	datetime(6)

Employees Table (employees):

employees	Type
id	id int(11) [pk, increment]
employee_name	varchar(100)
employee_email	varchar(100)
employee_phone	int(14)
employee_password	varchar(50)
employee_address	varchar(100)
image	varchar(50)
employee_latitude	varchar(100)
employee_longitude	varchar(100)
employee_gender	tinyint(1)
created_at	datetime(6)

Check-in Table (checkin):

checkin	Type
id	id int(11) [pk, increment]
name	varchar(100)
time	varchar(50)
user_id	int(11)
created_at	datetime(6)

Check-out Table (checkout):

checkout	Type
id	id int(11) [pk, increment]
name	varchar(100)
time	varchar(50)
user_id	int(11)
created_at	datetime(6)

Requested Demo Table (requested demo):

Requested_demo	Type
id	id int(11) [pk, increment]
name	varchar(255)
company_name	varchar(255)
email	varchar(255)
phone	int(14)
created_at	datetime(6)

Contact-us Table (contact us):

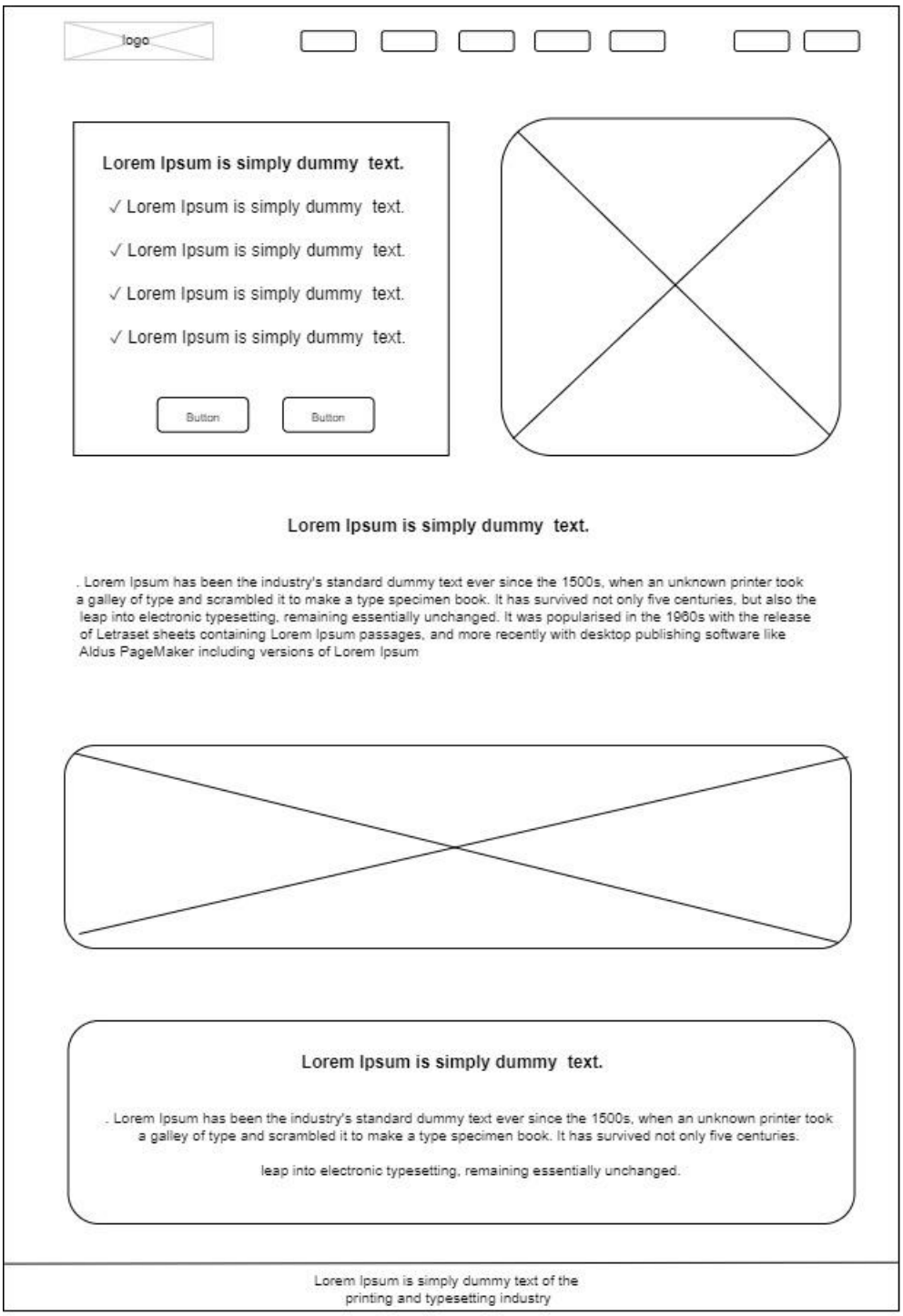
Contact_us	Type
id	id int(11) [pk, increment]
name	varchar(255)
email	varchar(255)
message	varchar(1000)
created_at	datetime(6)

Chapter 4: Wireframe and Mockup

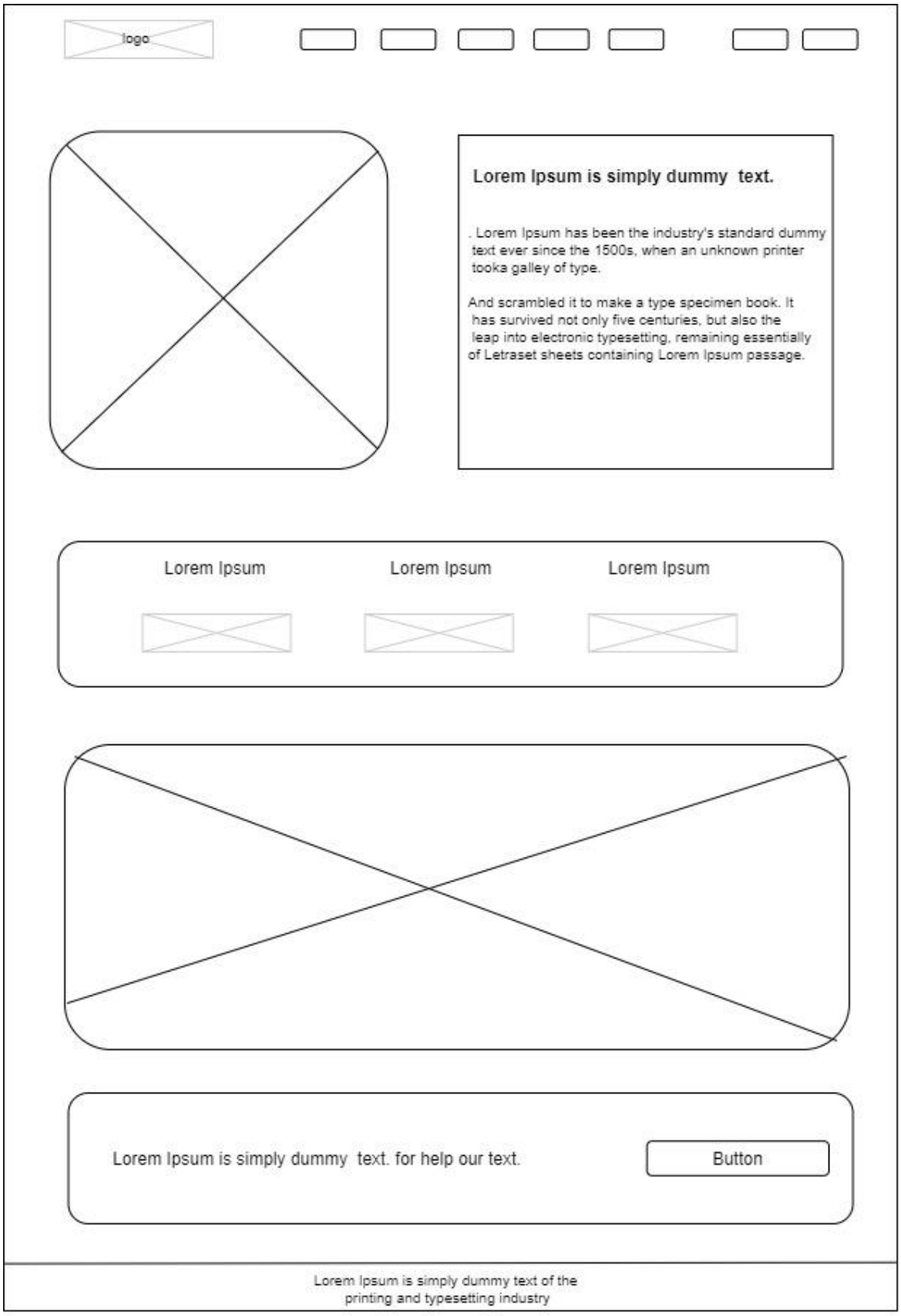
4.1 Wireframe

Website wireframe included all pages designed well in our website and they are eight pages (Homepage, about-us, attendance area, how it works, contact-us, request a demo, login and register). Also, we'll marked each page depend on its name on each attached wireframe below.

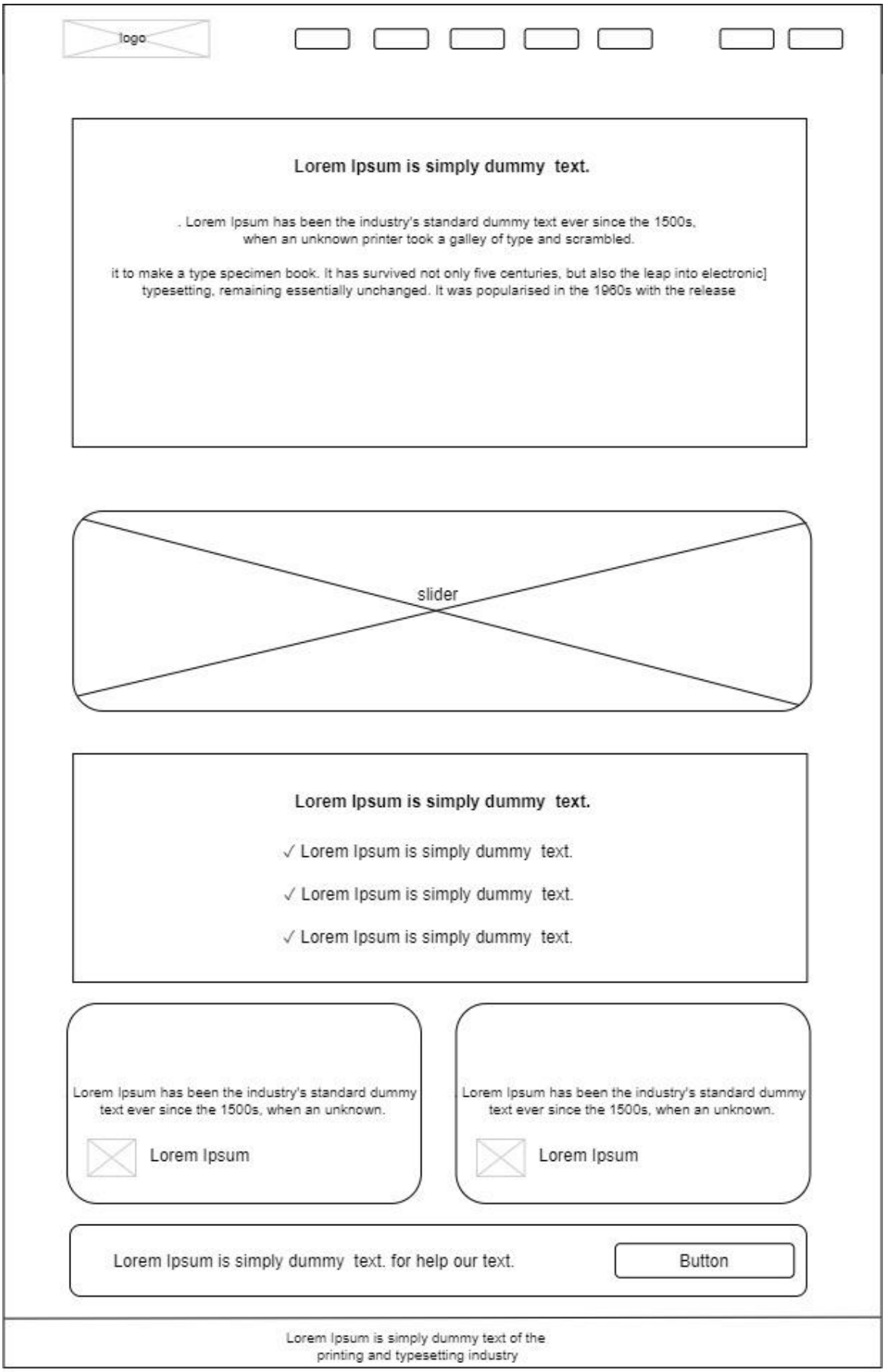
4.1.1.1 Homepage section 1.



4.1.1.2 Homepage section 2.



4.1.2 About-us.


logo
Lorem Ipsum is simply dummy text.
. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled.
it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic] typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release
slider
Lorem Ipsum is simply dummy text.
✓ Lorem Ipsum is simply dummy text.
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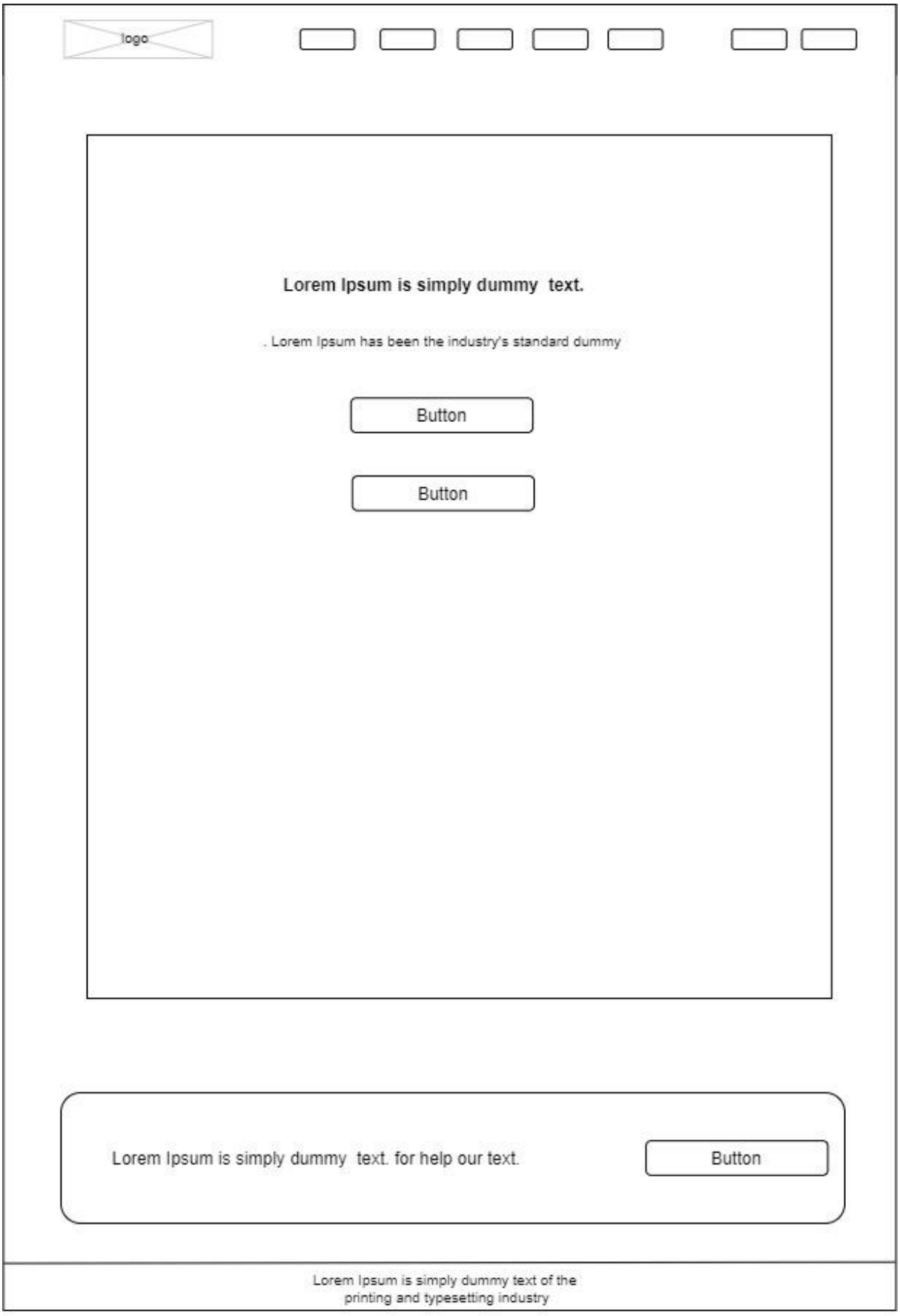
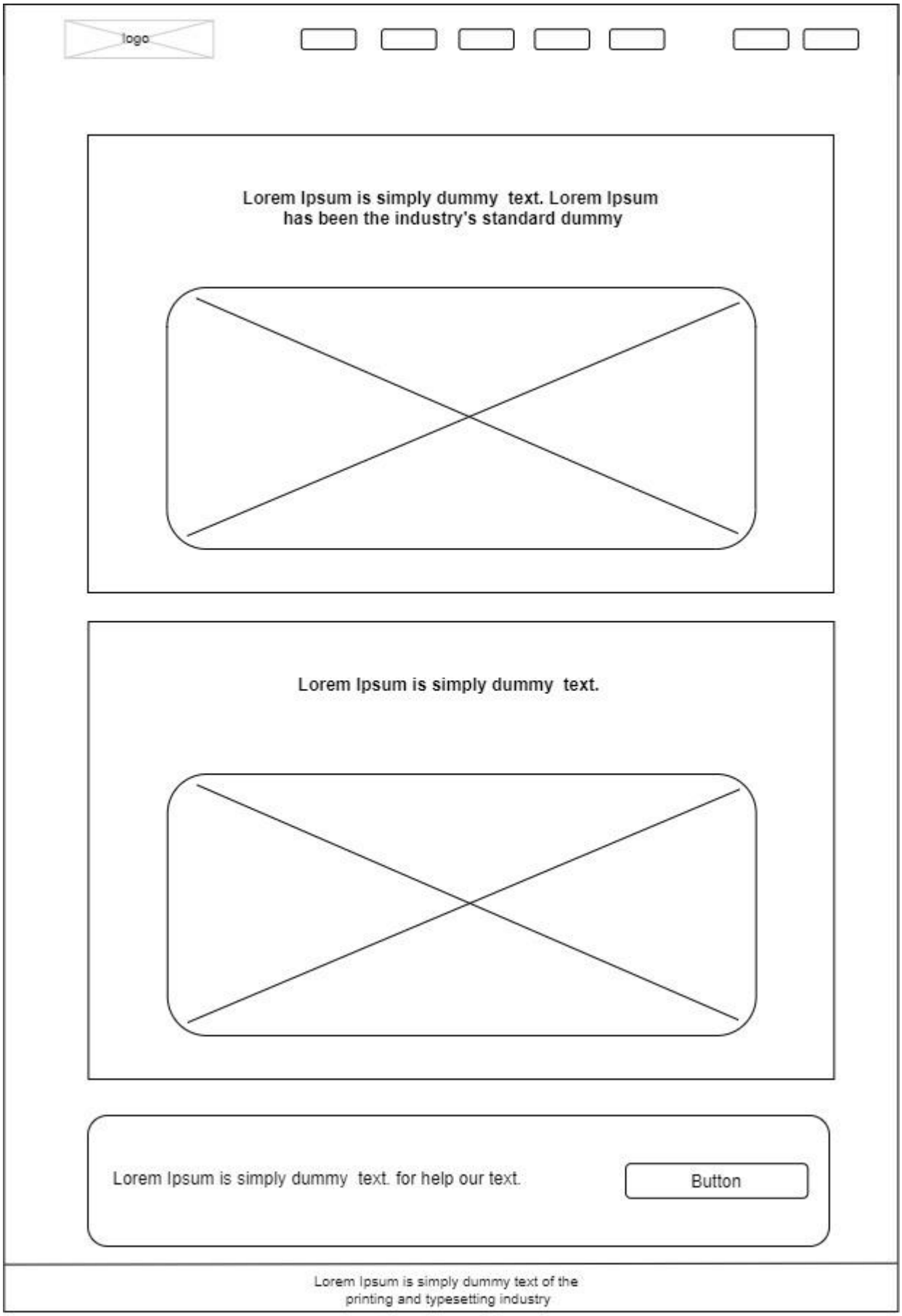
✓ Lorem Ipsum is simply dummy text.
Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown.
Lorem Ipsum
Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown.
Lorem Ipsum
Lorem Ipsum is simply dummy text. for help our text.
Button
Lorem Ipsum is simply dummy text of the printing and typesetting industry

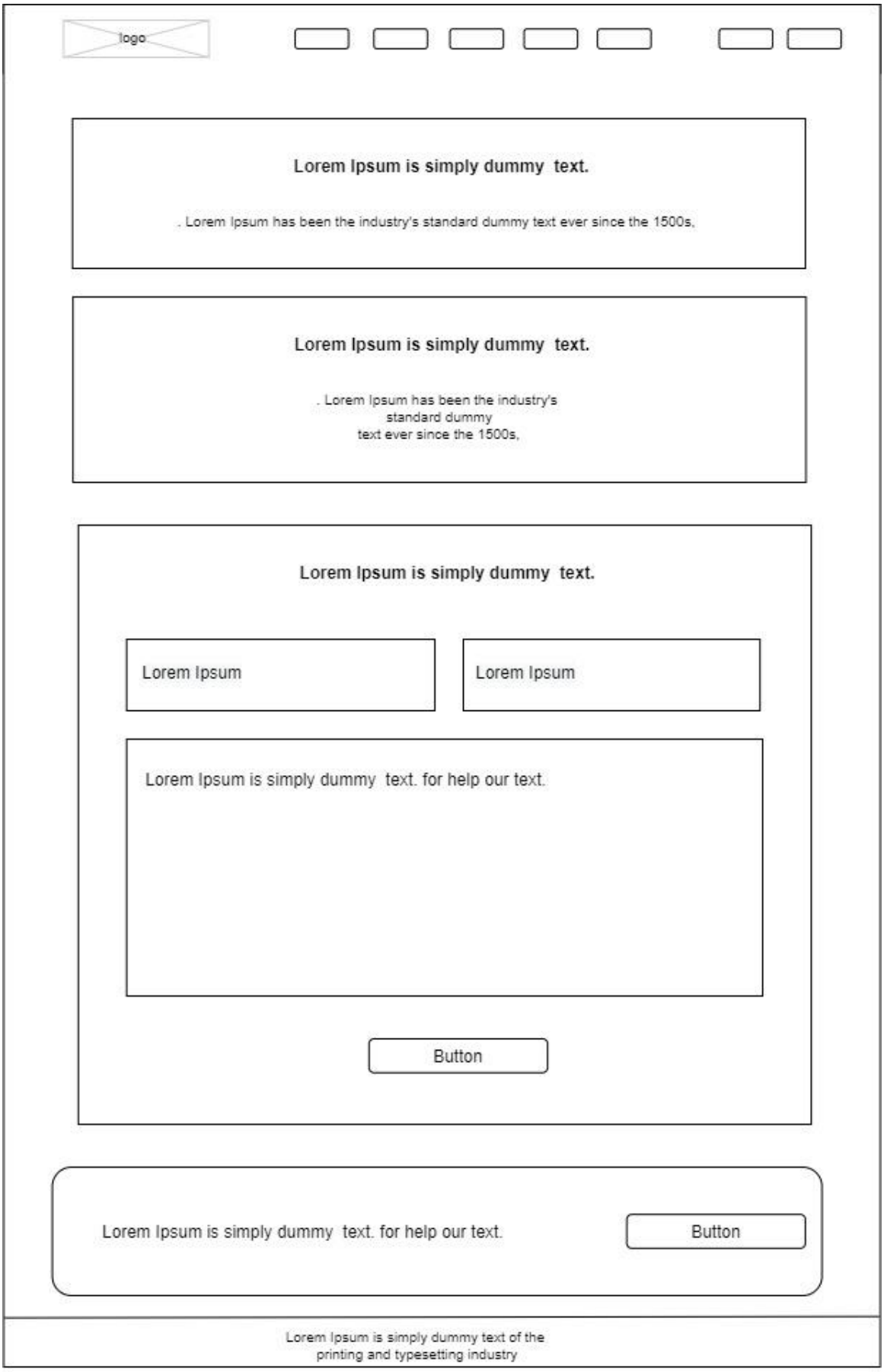
4.1.3 Attendance Area.



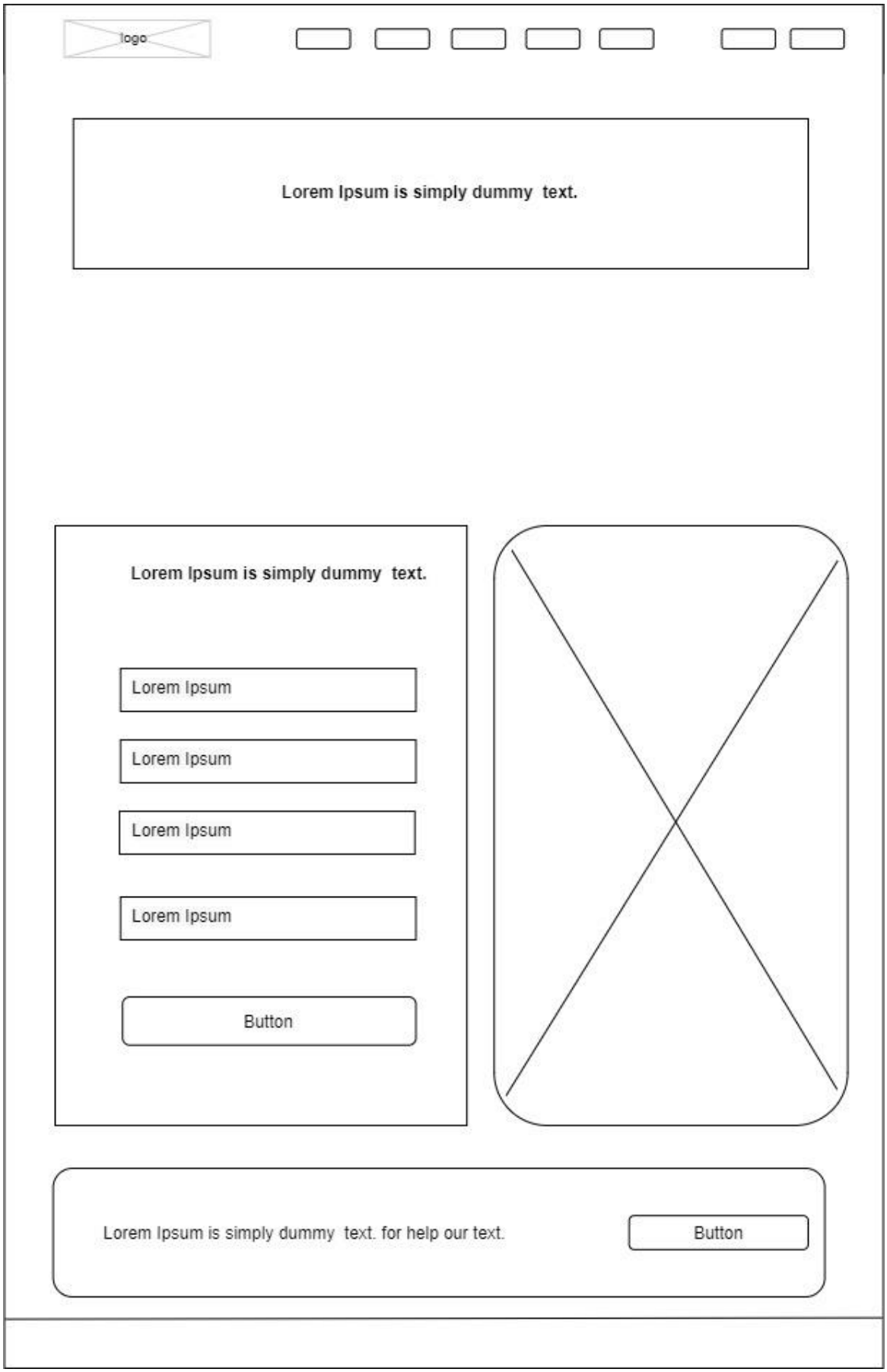
4.1.4 How it works.



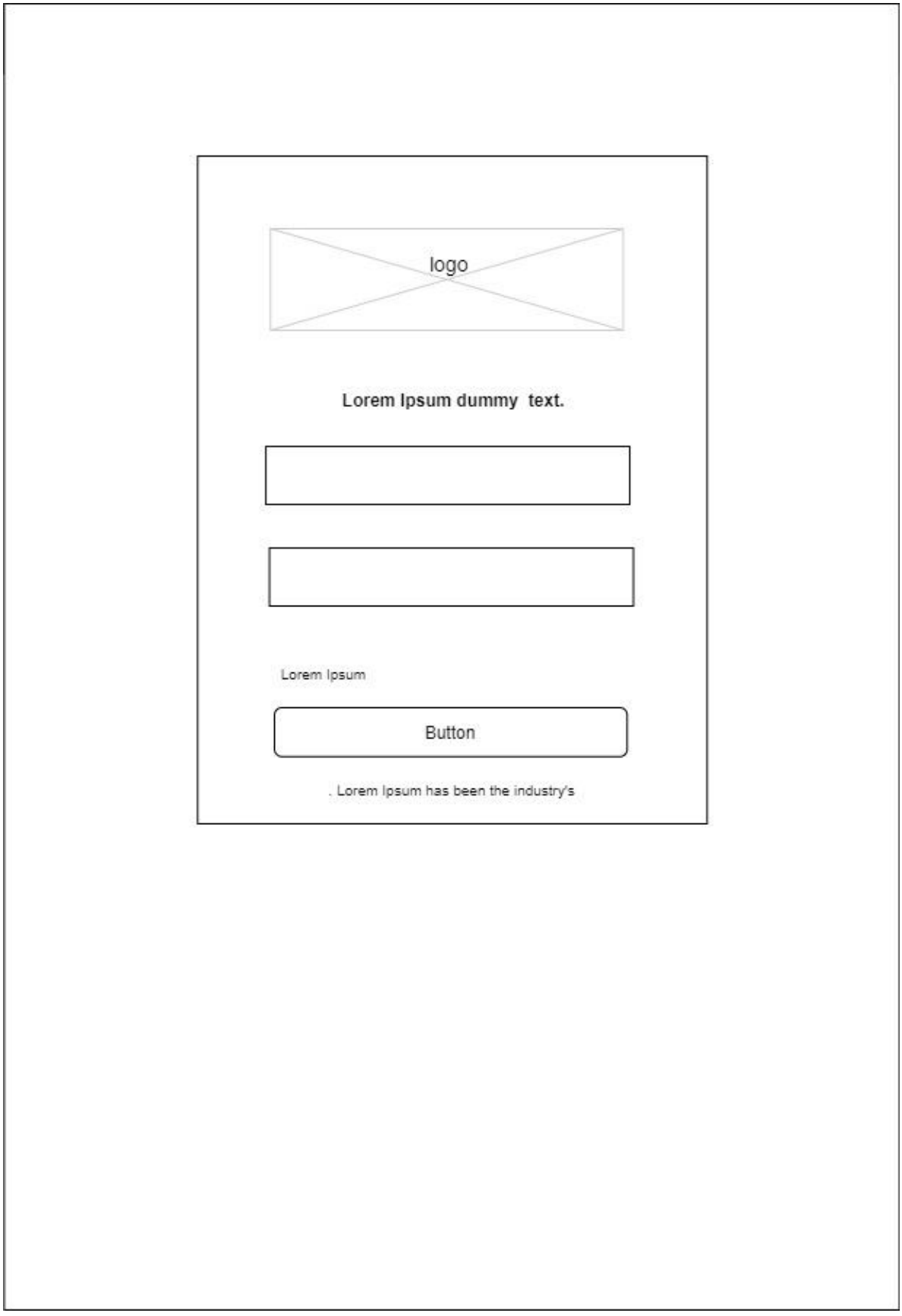
4.1.5 Contact-us.



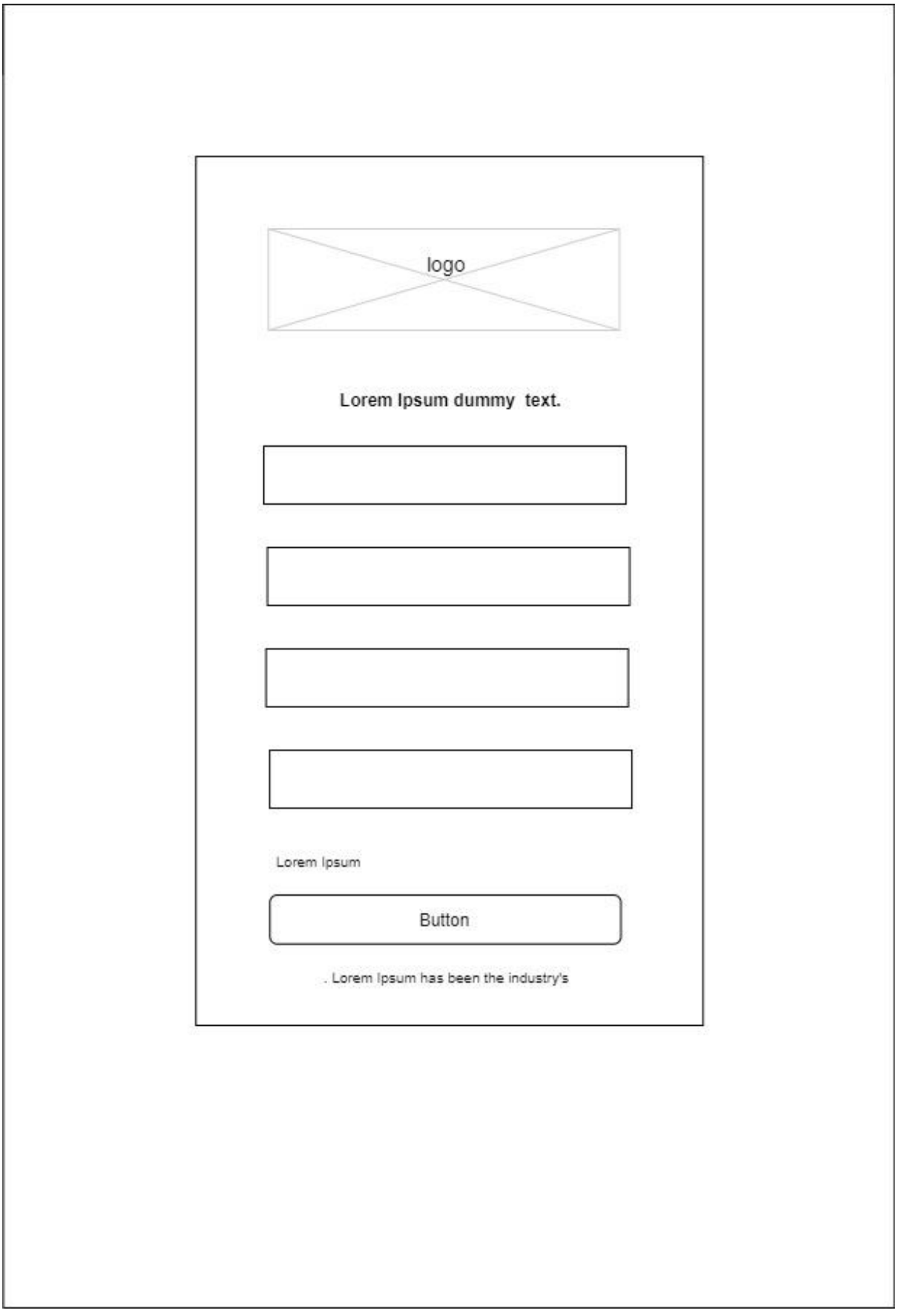
4.1.6 Request a Demo.



4.1.7 Login page.



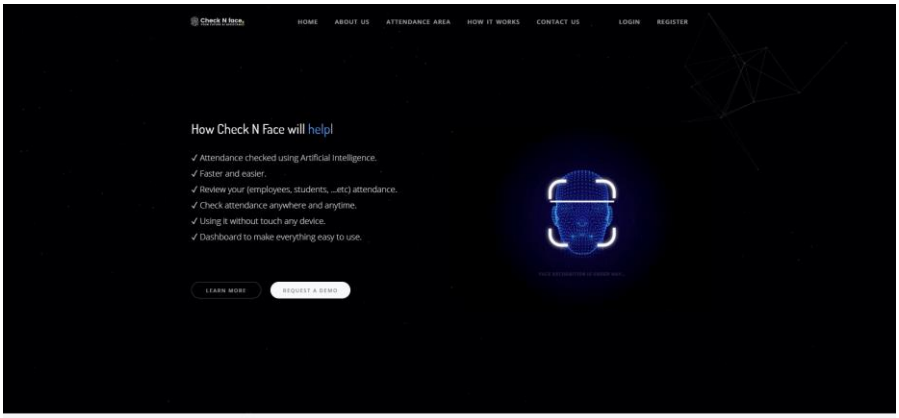
4.1.8 Register page.

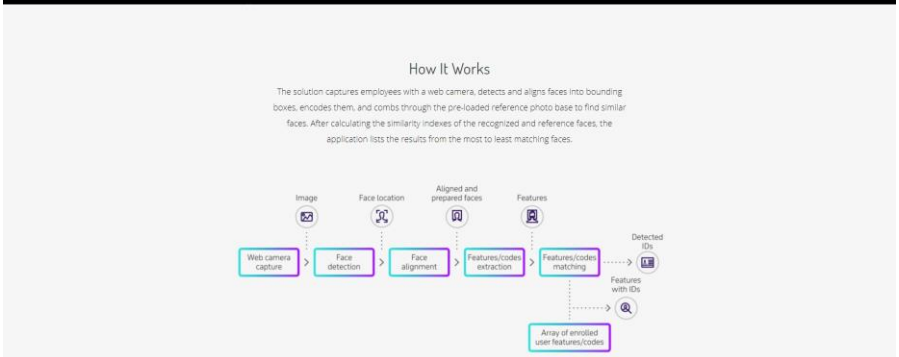


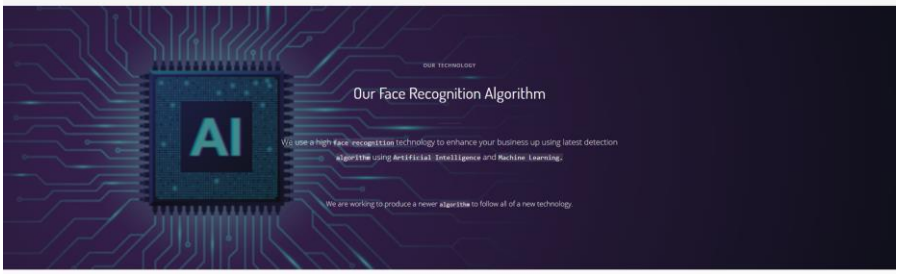
4.2 Mockup

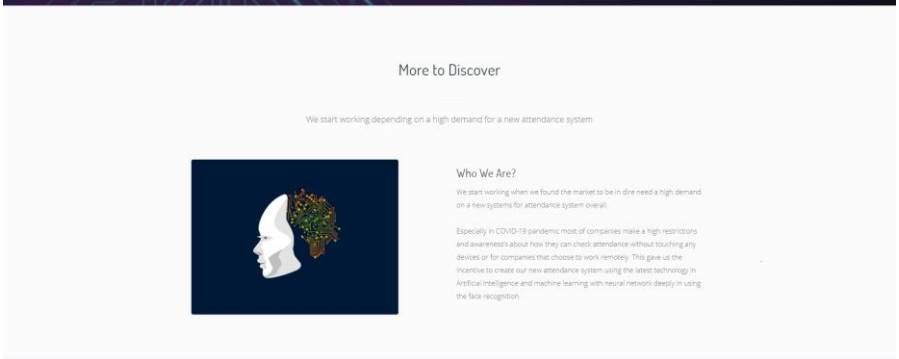
Website mockup included all pages designed well in our website and they are eight pages (Homepage, about-us, attendance area, how it works, contact-us, request a demo, login and register). Also, we'll marked each page depend on its name on each attached mockup below.

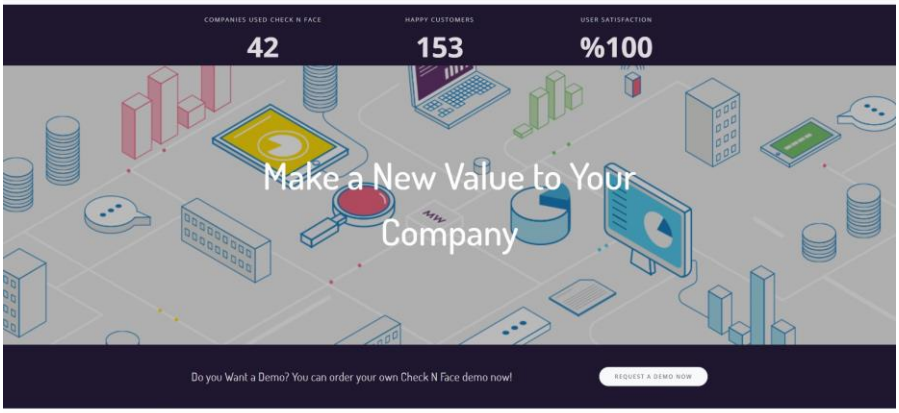
4.2.1 Homepage.



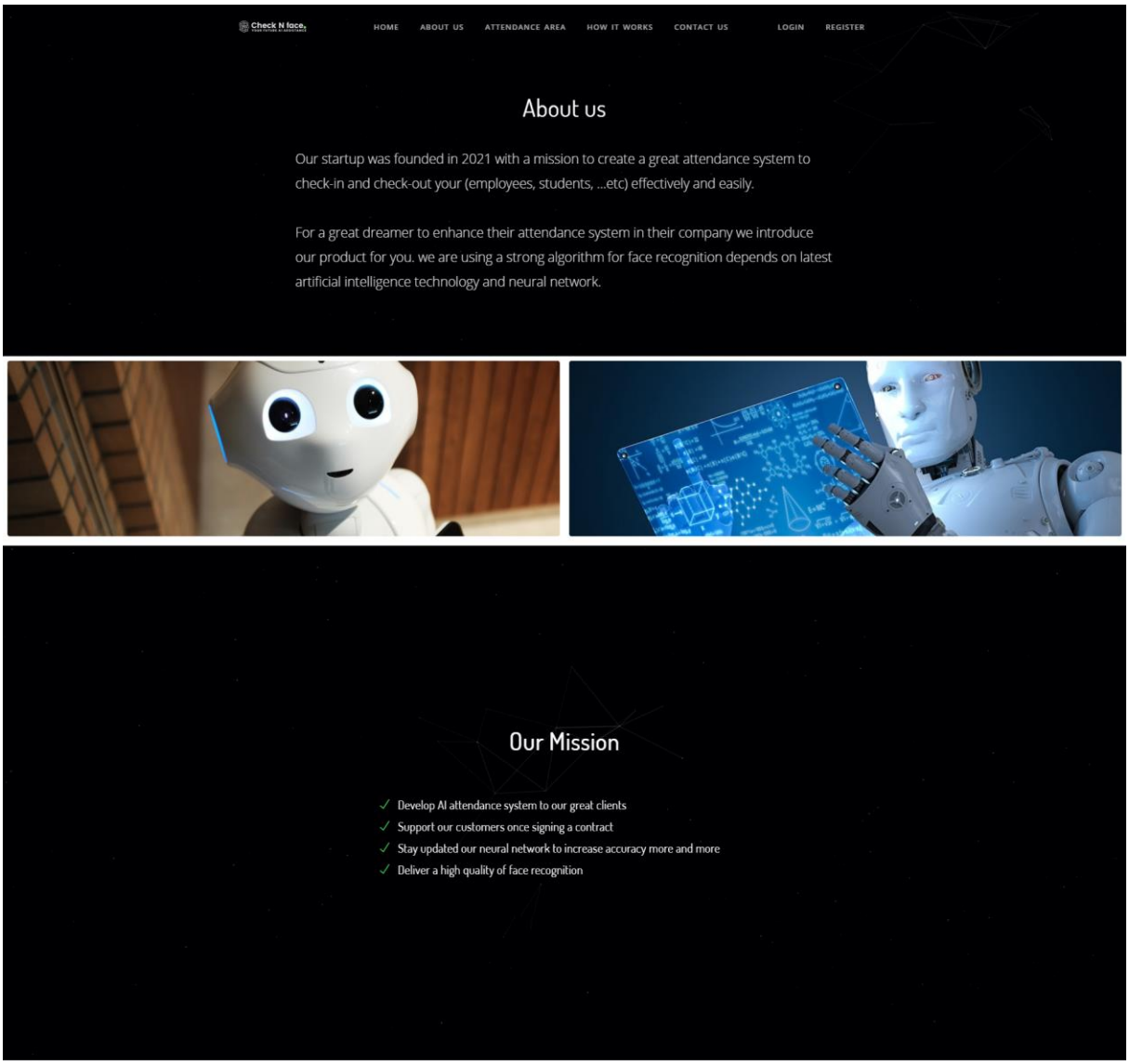


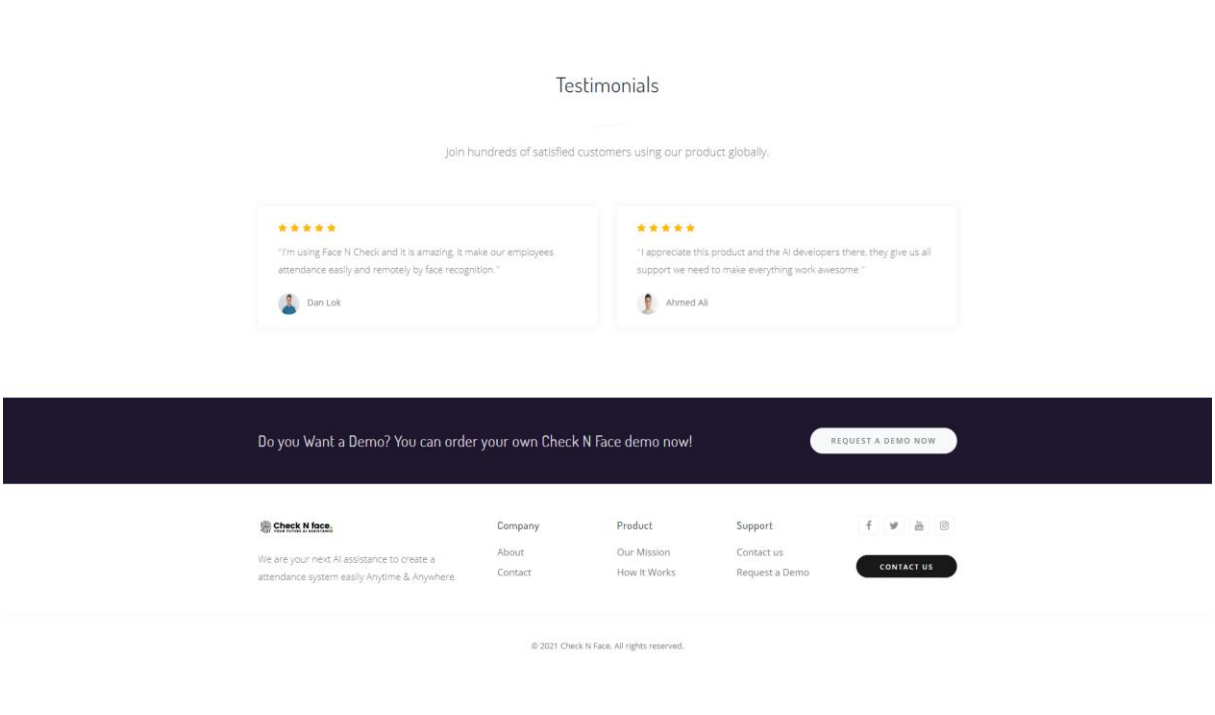




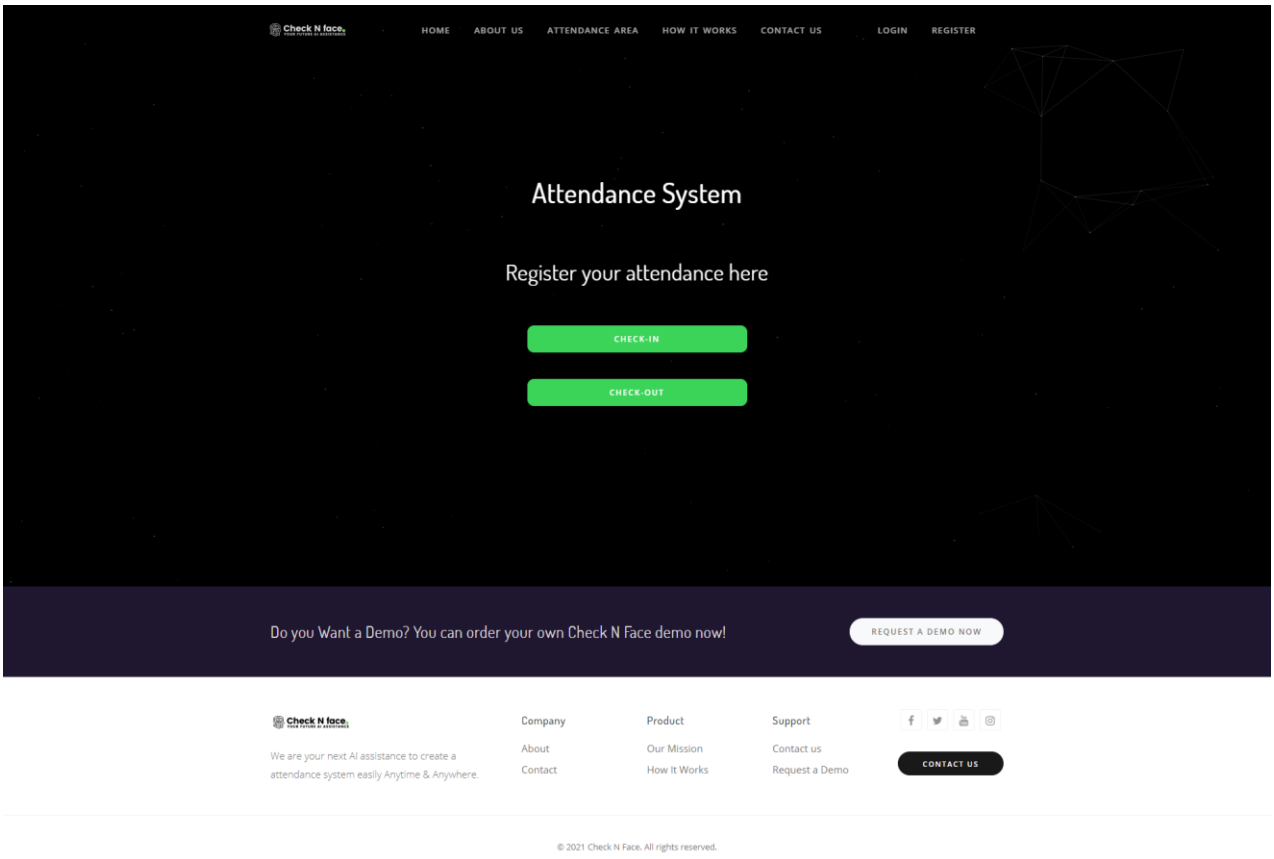


4.2.2 About-us.

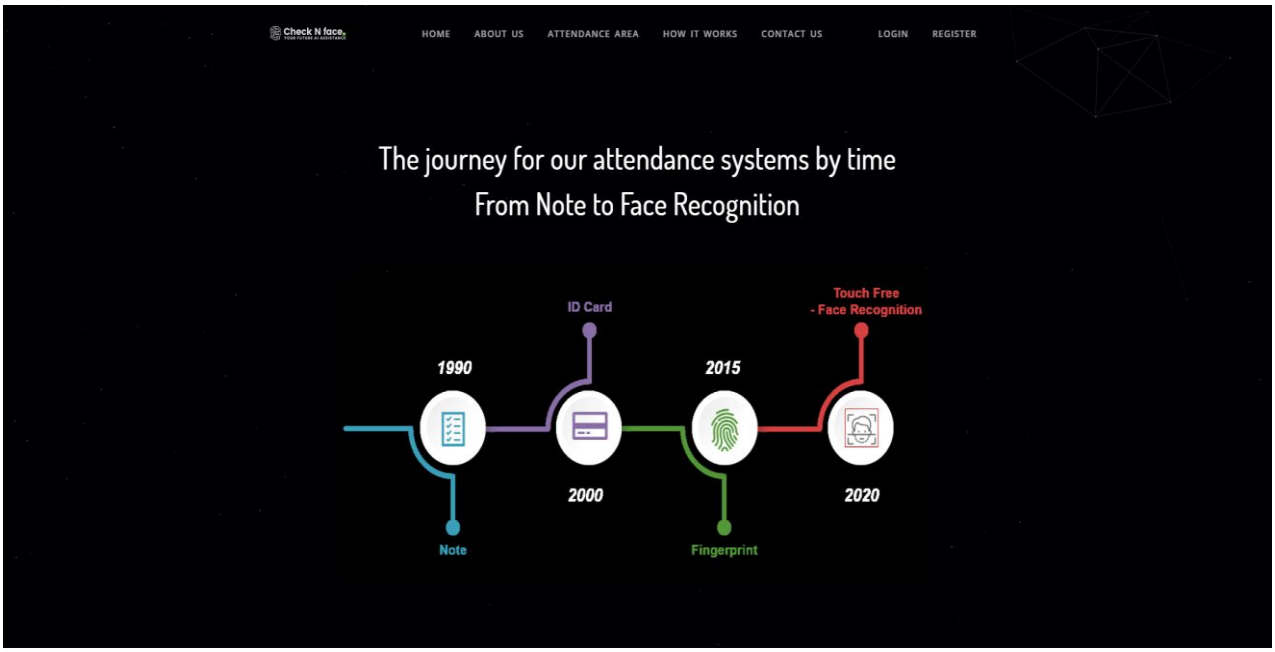

Check N face.
HOME
ABOUT US
ATTENDANCE AREA
HOW IT WORKS
CONTACT US
LOGIN
REGISTER
About us
Our startup was founded in 2021 with a mission to create a great attendance system to check-in and check-out your (employees, students, ...etc) effectively and easily.
For a great dreamer to enhance their attendance system in their company we introduce our product for you. we are using a strong algorithm for face recognition depends on latest artificial intelligence technology and neural network.
Our Mission
Develop AI attendance system to our great clients
Support our customers once signing a contract
Stay updated our neural network to increase accuracy more and more
Deliver a high quality of face recognition

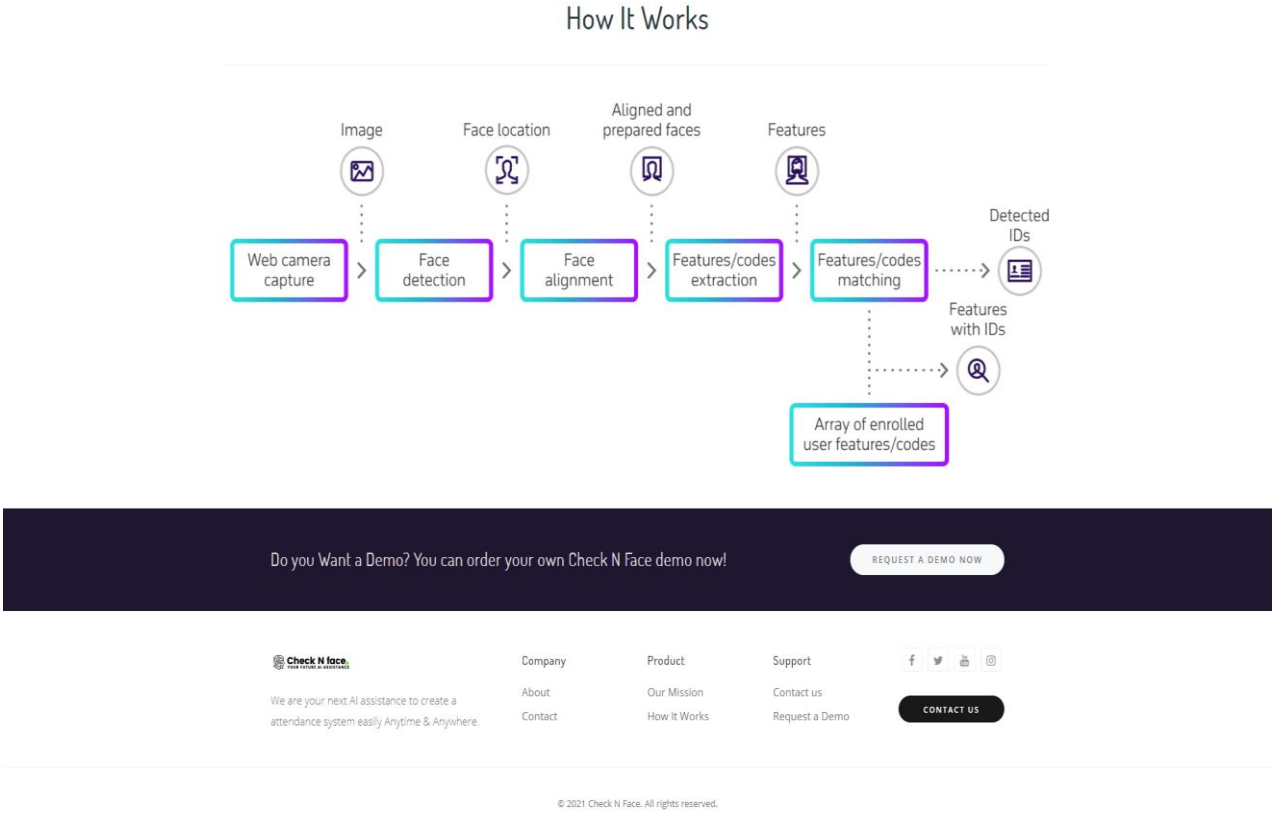

Testimonials
Join hundreds of satisfied customers using our product globally.
"I'm using Face N Check and it is amazing, It make our employees attendance easily and remotely by face recognition."
Dan Lok
"I appreciate this product and the AI developers there, they give us all support we need to make everything work awesome."
Ahmed Ali
Do you Want a Demo? You can order your own Check N Face demo now!
REQUEST A DEMO NOW
Check N face.
We are your next AI assistance to create a attendance system easily Anytime & Anywhere.
Company
About
Contact
Product
Our Mission
How It Works
Support
Contact us
Request a Demo
CONTACT US
© 2021 Check N Face. All rights reserved.

4.2.3 Attendance Area.

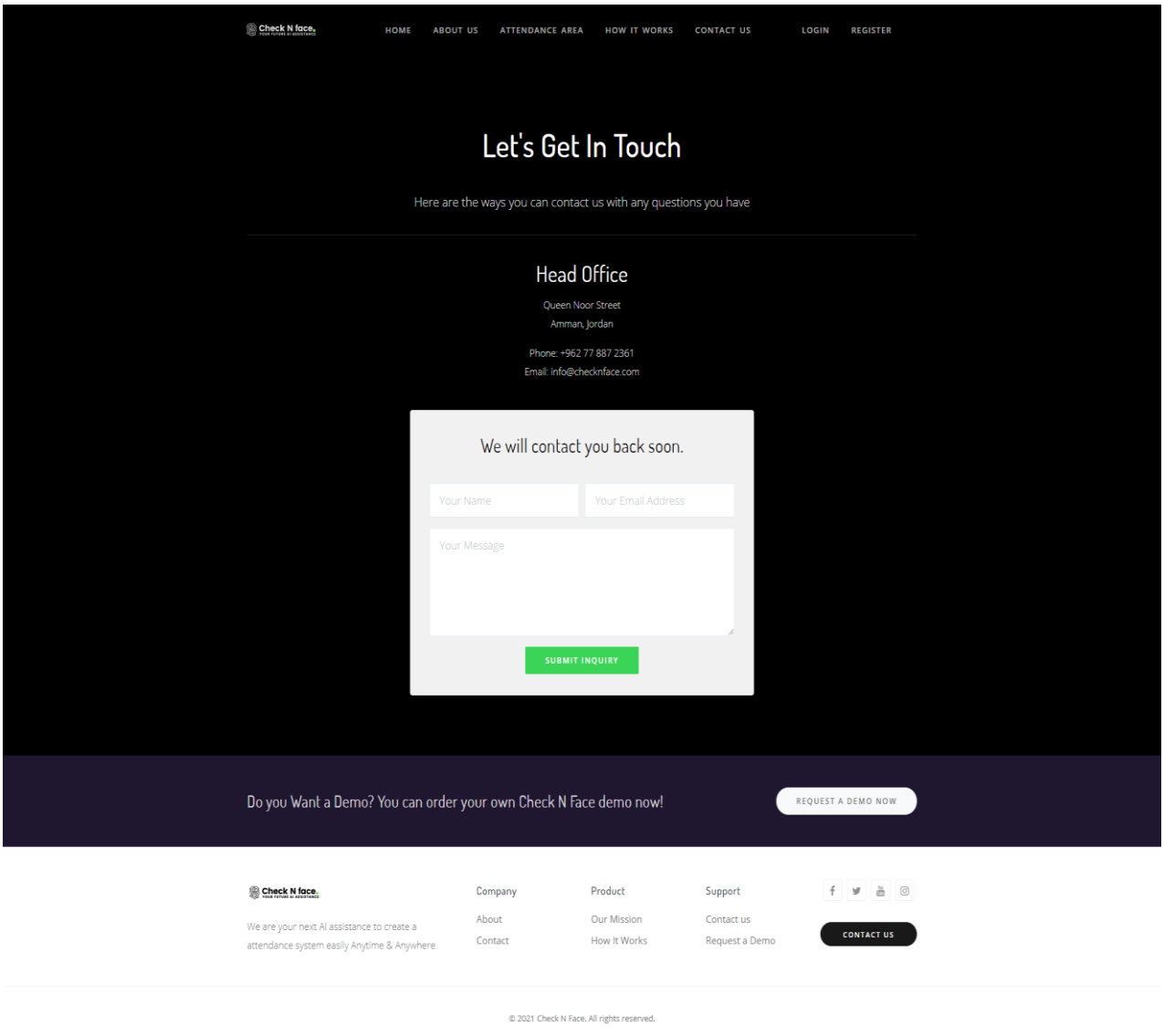


4.2.4 How it works.

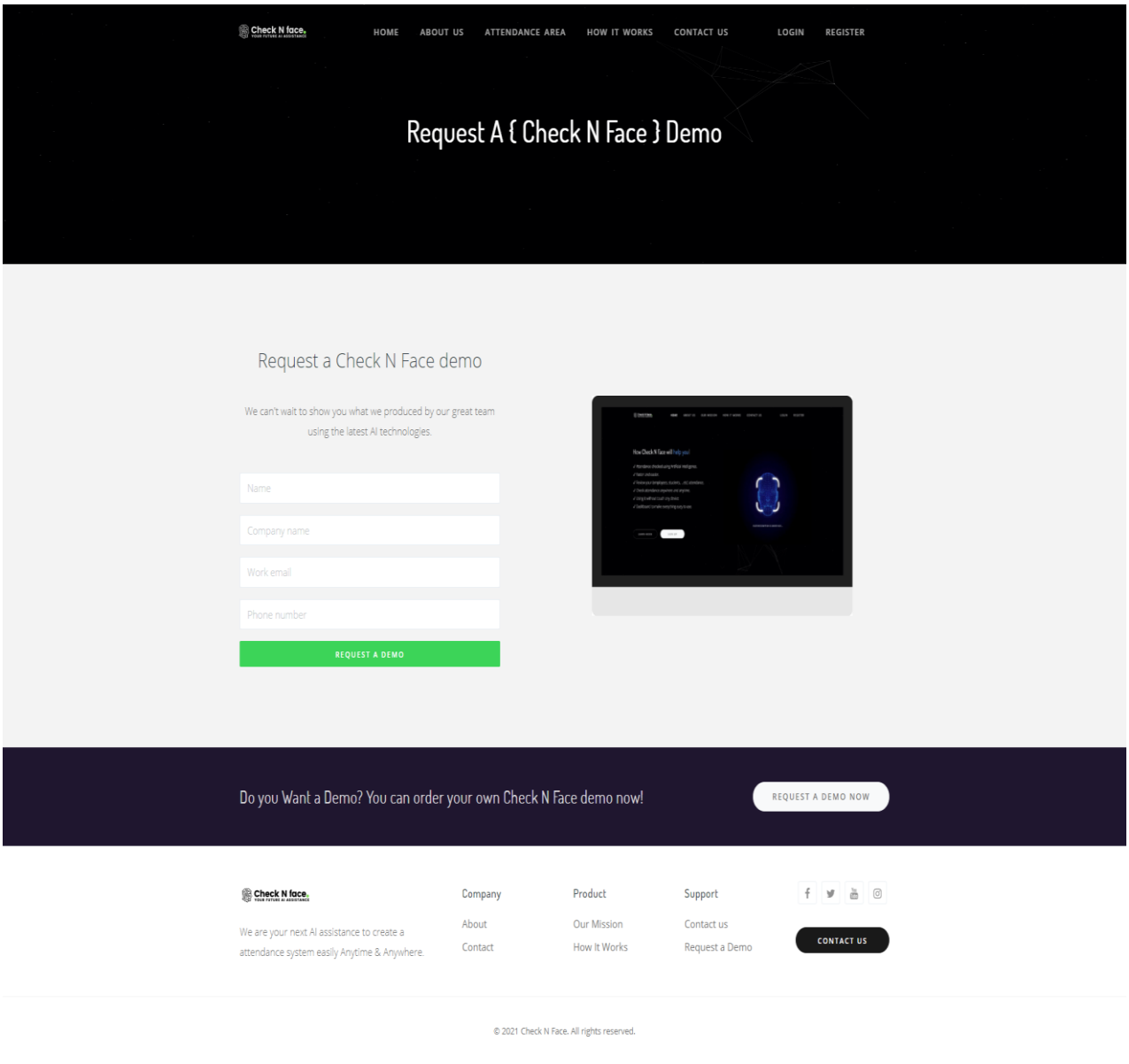




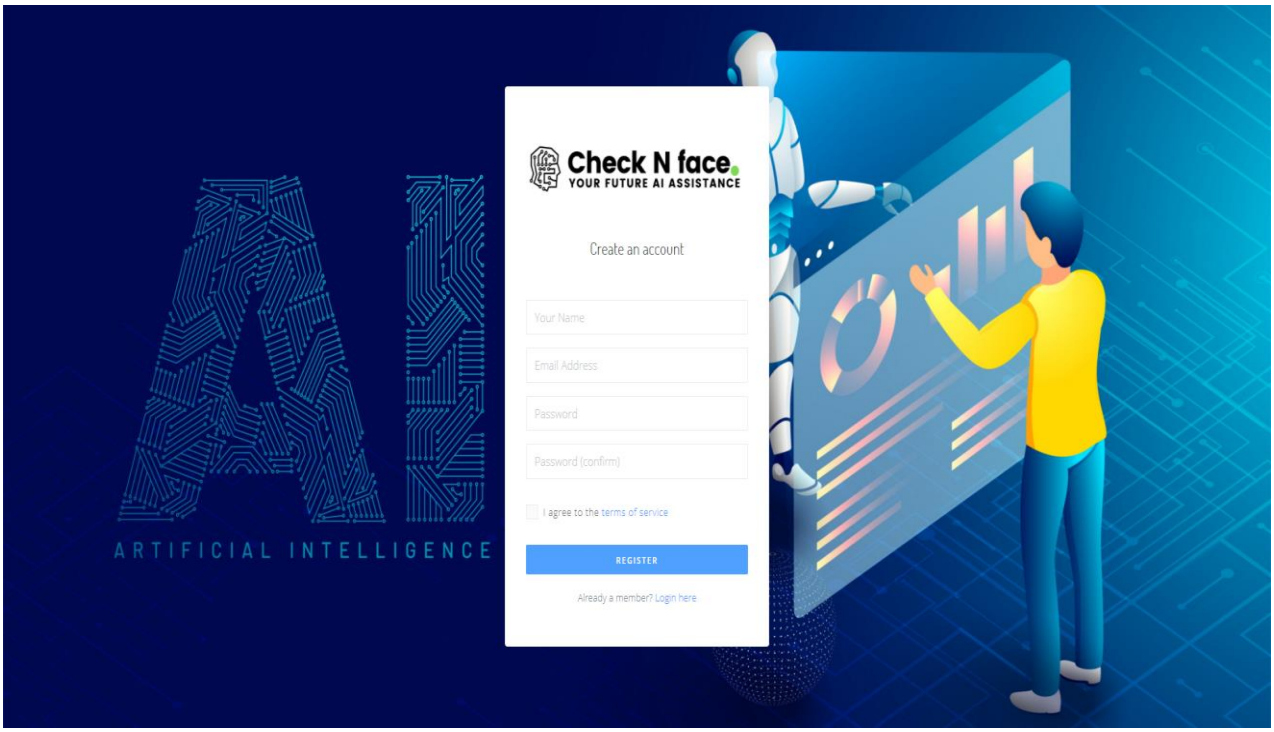
4.2.5 Contact-us.



4.2.6 Request a Demo.



4.2.7 Login page.



4.2.8 Register page.

Chapter 5: Technologies

5.1 Front-End

The Front-End coding language that used in this project as follows:

1- **HTML** (Hypertext Markup Language) is the standard markup language for web pages and elements are the building blocks of html pages and elements are represented by tags (<>).

2- **CSS** (Style Cascading Sheet) is describes how HTML element are displayed depending on their own (id and class), and it work more with how your website will look.

3- **JavaScript**: is a scripting language that enables you to create dynamically updating content, control multimedia, animate images, and pretty much everything else.

4- **Bootstrap**: is the most popular **CSS Framework** for developing responsive and mobile-first websites.

5.2 Back-End

The Back-End coding language that used in this project as follows:

1- **Python:** is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together.

2- **Django:** is a high-level Python Web framework that encourages rapid development and clean, pragmatic design.

5.3 Database

The Database services that used in this project as follows:

1- **SQL**: is the most popular language for adding, accessing and managing content in a database.

2- **MYSQL:** is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database.

5.4 Open Source

The open source services that used in this project as follows:

1- **OpenCV:** OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. This open source using some new technologies and it focused more on OCR and image classification.

5.5 Library

The most important reason of the simplicity and a high performance in Django and Python overall, it is using a library in their flow of work and it will help to make development time more faster and the performance is more higher than tradiotional code implementation.

So, this is the most libraries were used to achieve our project as follows:

1- CV2: It is refers to OpenCV open source, and you need to call it to start using the open source code and its deeply algorthim.

2- Face_Recognition: Recognize and manipulate faces from Python or from the command line with the world's simplest face recognition library.

Built using dlib's state-of-the-art face recognition built with deep learning. The model has an accuracy of 99.38% on the Labeled Faces in the Wild benchmark.

3- **Numpy:** is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

4- **Dlib:** is an open source C++ library implementing a variety of machine learning algorithms, including classification, regression, clustering, data transformation, and structured prediction.

5- **OS:** The OS module in Python provides functions for interacting with the operating system. OS comes under Python's standard utility modules. This module provides a portable way of using operating system-dependent functionality. The *os* and *os.path* modules include many functions to interact with the file system.

6- **Pillow:** Pillow is the friendly PIL fork by Alex Clark and Contributors. PIL is the Python Imaging Library by Fredrik Lundh and Contributors. The Python Imaging Library adds image processing capabilities to your Python interpreter.

7- **Datetime:** It is a library for a date and a time together, the date contains year, month, day, hour, minute, second, and microsecond. The datetime module has many methods to return information about the date object.

8- **MYSQL Connector/Python:** Library will enable Python programs to access MySQL databases, using an API

9- **Operating Environment:** PyCharm, Python, Django, MySQL, XAMP, and Windows 10.

5.6 Security

This project was used for Authentication: Django.contrib.auth and it have a high authentication to secure routes and website too. Also, the CSRF_TOKEN was used in forms when post data to DB.

5.7 Installation

To make all of the product was done by installation on your local machine, you need to install all files that containts on the devlopment code without change any of it or change any files places because the code specially the face recognition need the file root as what we coded the project.

To Follow the instruction as menthioned here:

1- Download all files and make sure the are extract well.

2- Create new MySQL database and change the it as we call it in this project (**master_django_v3**).

3- Create virtual environment beside the downloaded code files.

4- Make sure you have python on your computer.

5- Open the project file and run these two following code to make sure it connect with the right database:

   1- python manage.py makemigrations.

   2- python manage.py migrate.

   After that it should migrated well and you can use the app.