E-invoice

Subject: Implementation of systems with open source code

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1. ABSTRACT

E-invoice is a digital process that allows companies to send and approve invoices online, replacing the tedious process of printing, stamping, mailing, waiting for the mail to arrive, approving and archiving the invoice. The process of sending an invoice online enables businesses to have a simple, fast, effective and efficient way of completing online transactions.

2. INTRODUCTION

This project report is on a system that allows companies to make mailing invoices a thing of the past. The standard approach to mailing an invoice is to use some kind of template or software to create the invoice, then print it, seal it, mail it and wait a couple of days for the recipient to receive the mail. After the recipient receives the mail he has to accept the invoice with the designated amount, clear it, and put it in the archive books.

E-invoice replaces the tedious process of mailing an invoice by digitalizing the process. The term digitalization is used to describe a scope of transformation that goes beyond simply substituting analog or physical resources for their digital or information counterparts. In this sense books do not simply become eBooks by night, but they become eBooks by complete interactive and multi-media experiences and processes that might become online dialogues between parties that were not previously directly connected.

Businesses in 2022 don't function like they did previously. They do not work from 9 to 5, Monday to Friday or Saturday. In the world we live in today business is getting done 24 hours a day, 7 days a week, 365 days a year. In order for a business to function in the world we live in today it requires a constant flow of funds so it doesn't rack up debt. That's why harnessing the power of technology is absolutely necessary in order to make a tedious and boring process that is slow more effective, and time efficient. This is a must for enterprise level companies and even for mid to small businesses.

F-invoice allows businesses through digitalization to replace the old and tedious methods of sending and approving an invoice to become a thing of the past. Simply put, thanks to digitalization the process is replaced with "the click of a button".

3. BENEFITS OF USING E-INVOICES

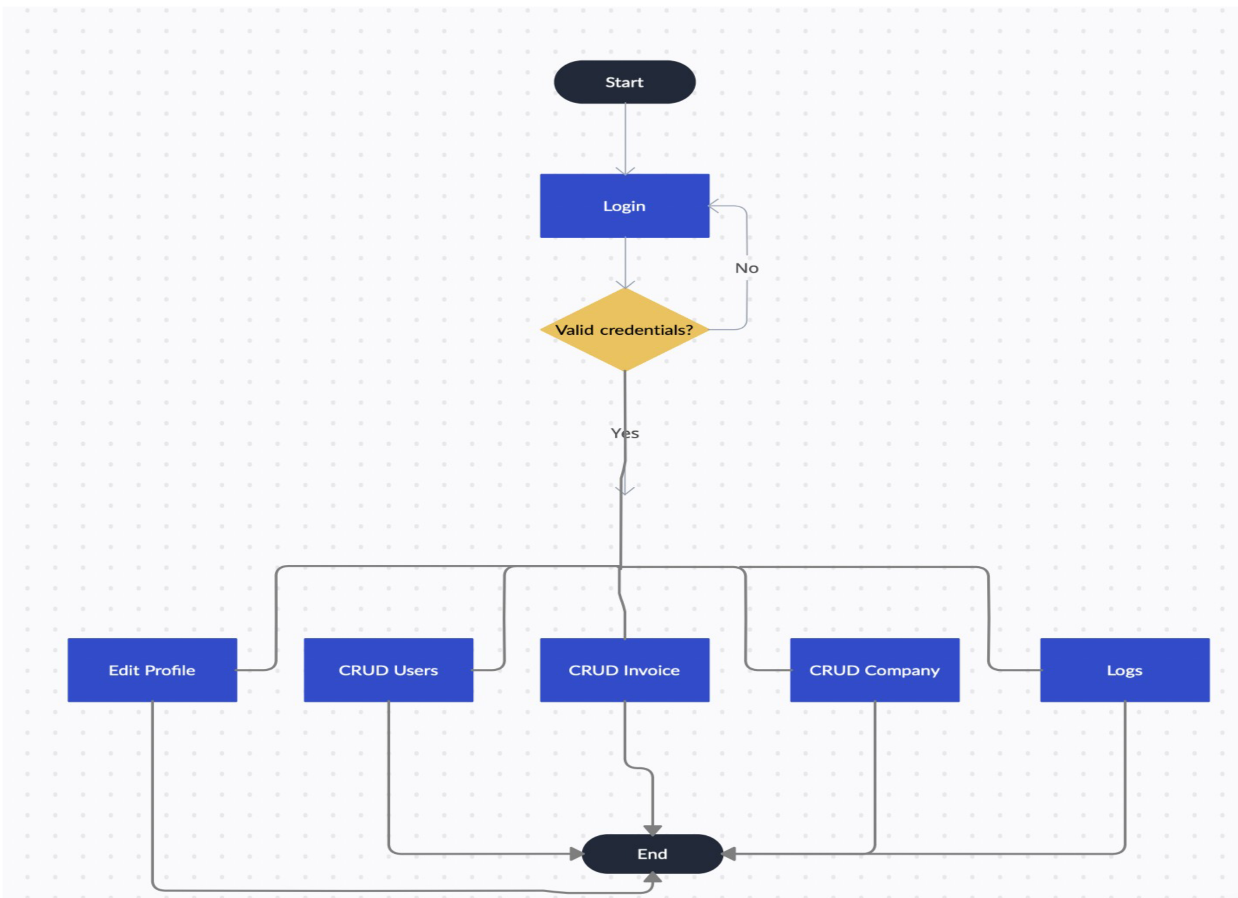
The system reduces much of human efforts in drafting and sending the conventional invoice, especially for a large quantity of invoices. The system also saves money and resources that are devoted to organization and it excludes the use of paper or sheets in making and sending the invoice. The system can detect if the product information and their price instantaneously using barcode technology. The system saves time. The system also provides accurate and faultless information. The system is designed having attractive GUI and with a detailed description. The system is flexible and user-friendly.

4. PROJECT PLANNING

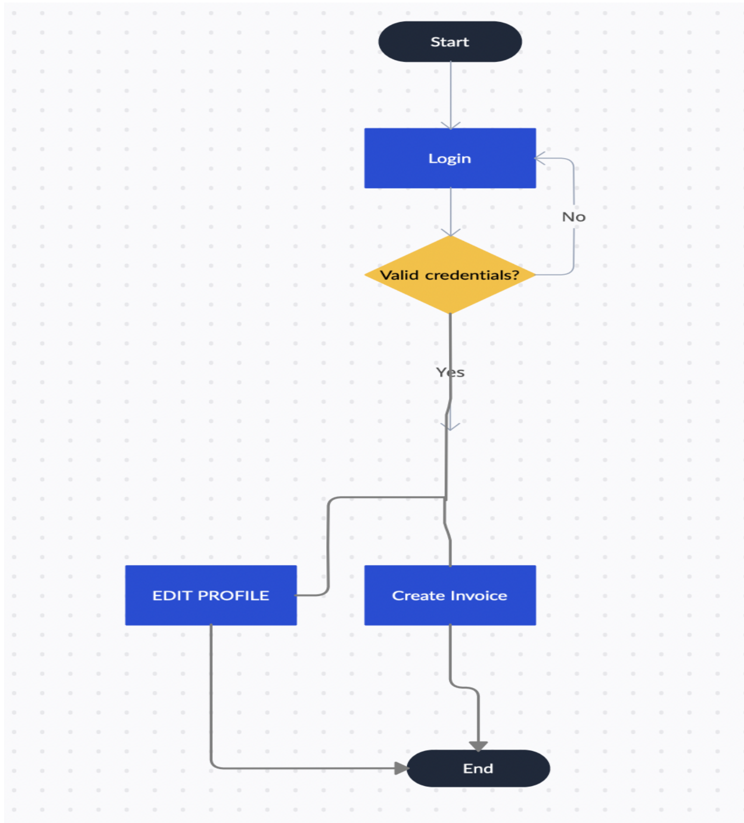
The project planning is the second phase in the system development life cycle. In this phase, the system is designed in detail from the system specification made in the SRS document. The activities performed during the design phase are assigning functions, identifying testing requirements, program design. In design phase, the analyst has the task of developing a detailed design of the system including layouts for all inputs, file and outputs.

In the design phase the detailed design of the system selected in the study phase is accomplished and user-oriented performance specification is converted into a technical design specification. The system design is the process of developing specification for the system that meets the criteria established in system analysis. The activities performed during design phase include the assigning functions, designing the database.

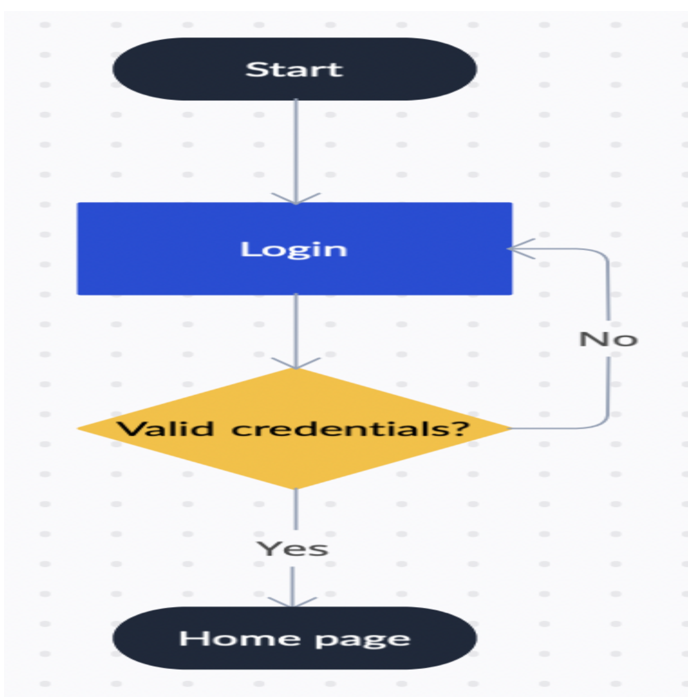
We wanted to show the functionalities of our system, we will show that using diagrams:



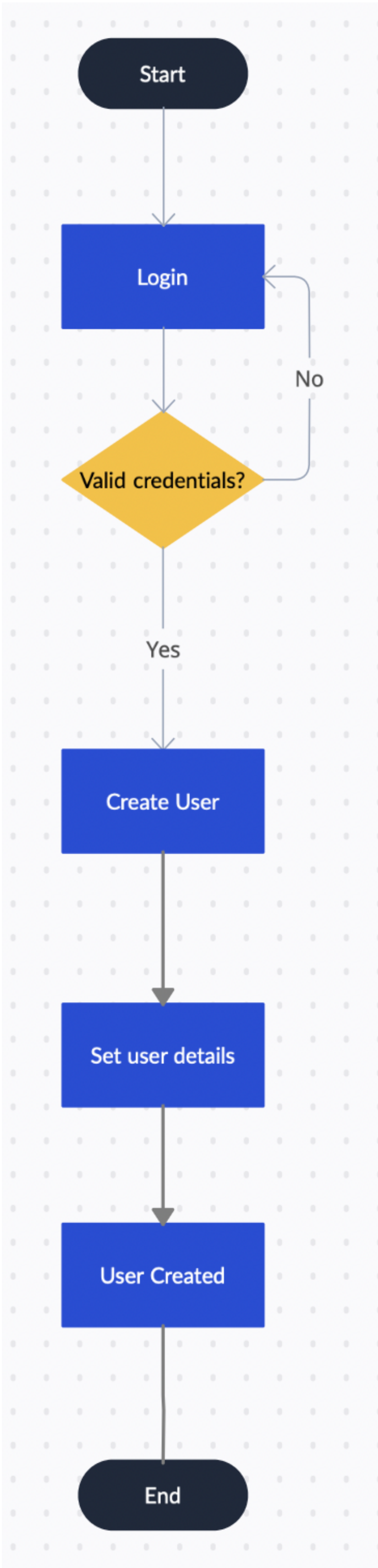
This image represents everything that the admin can do

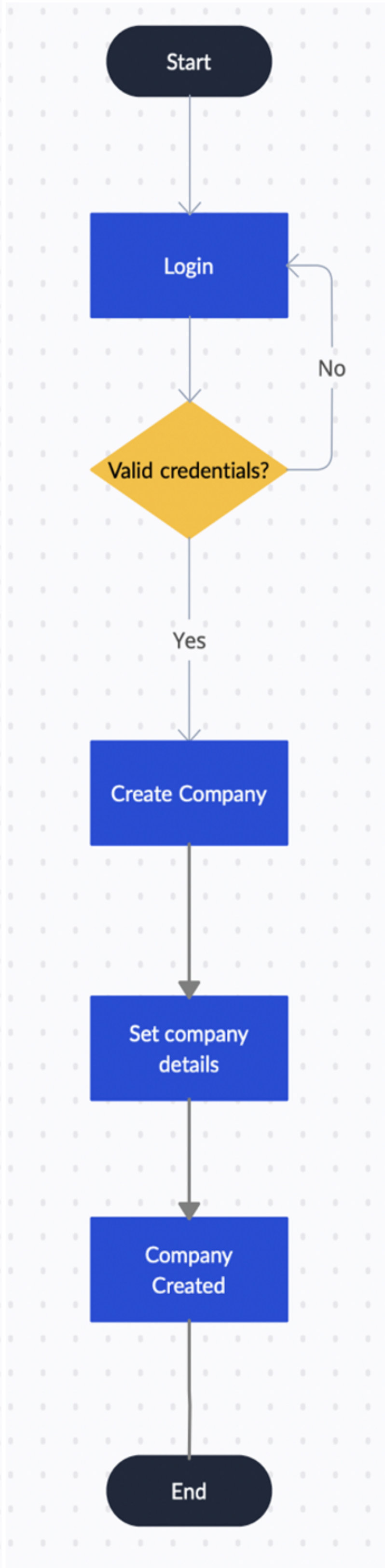


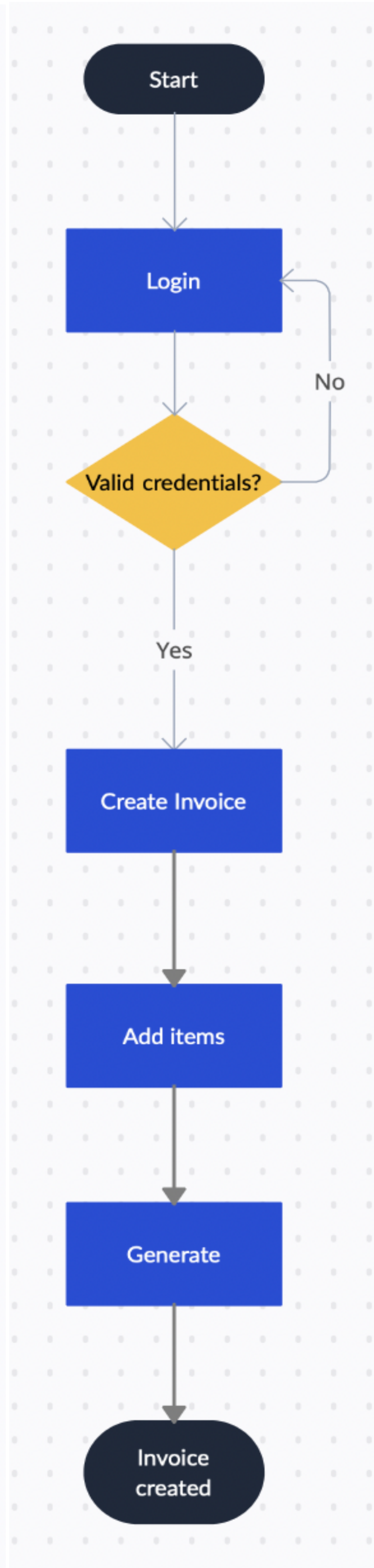
This image represents everything that the user can do



Check credential



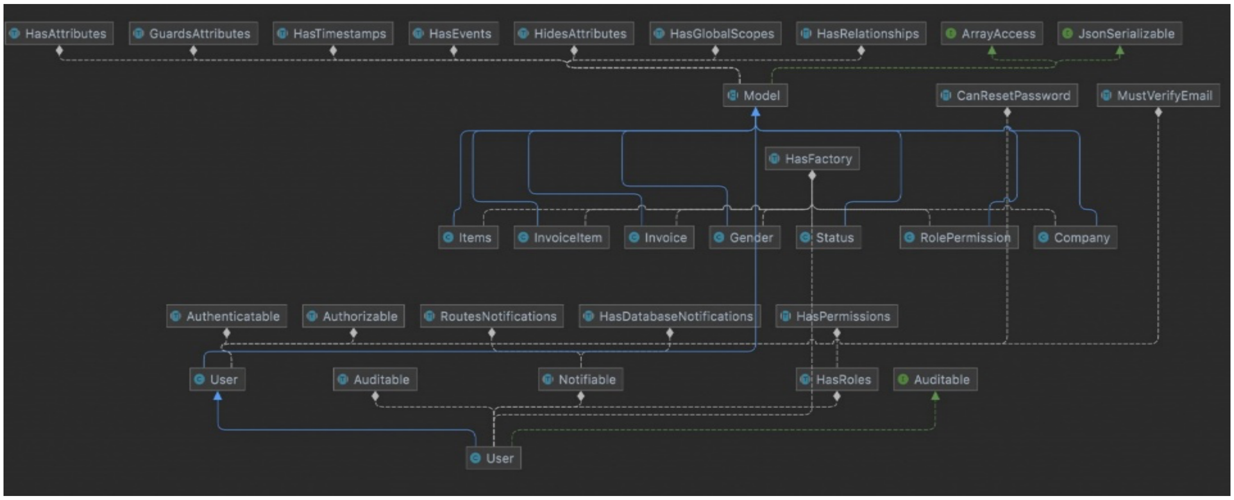




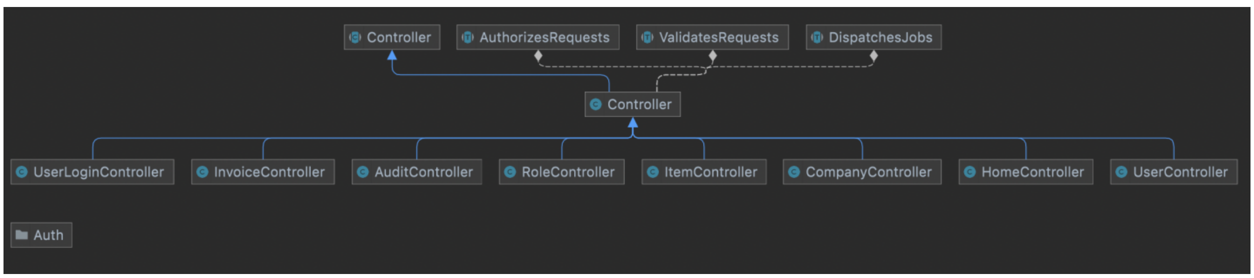
Create User

Create Company

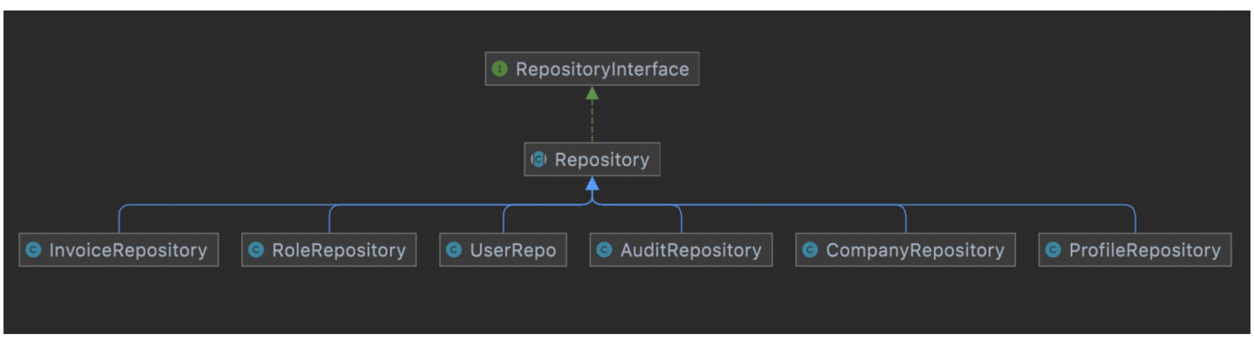
Create Invoice



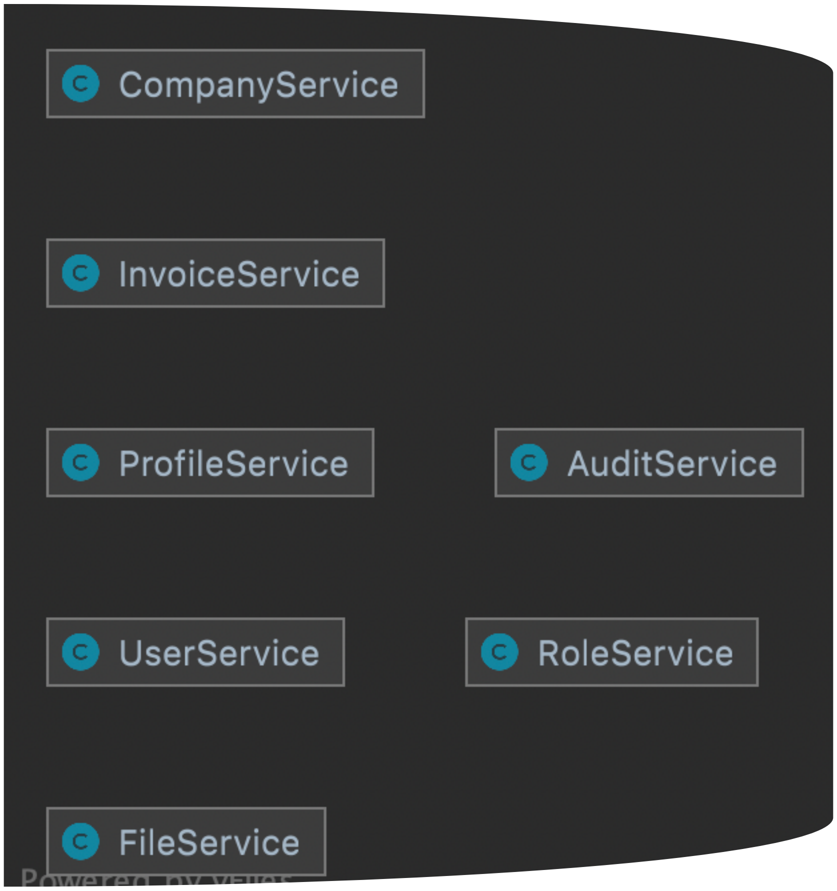
Models



Classes



Repository



Service

MODULE DESCRIPTION

The different modules included in the system are, Admin and User. Functions of the modules have been described.

Admin module

This module is mainly designed for the use of the admin. Which means the admin has the privilege to add or edit or even be delete the user, the company or any invoice in the system. Using the module, the admin can view the separate details of the various users in the system. Here the main functions of the admin is to create users emails, edit the details of the users, add companies and edit the invoices if needed.

User module

This module is mainly designed for the use of the user. The user can edit their informations and view and pay their invoices. The user cannot create it's own account., that can be done only be the user. After the admin creates the account, the user can access the page and pay the invoices.

5. PROJECT IMPLEMENTATION

During the verbal debate on how to make this project we were faced with the challenges of : how to implement the project; what is the most adequate technology in order to complete the project. Through using the method of analysis we were faced with additional challenges: how much time will be needed to finish the project; what are the requirements in order to have a functioning project.

In order to surpass the challenges stated above we made an SRS document and we used it as a base line. In order to tackle the issue at hand we divided our efforts to one of us working on the frontend and one of us working on the backend. This allowed us to start the implementation process.

The Implementation process involves placing the complete and tested system software into the actual work environment. Implementation is concerned with translating design specification with source code. The primary goal of implementation is to write the source code to its specification. Therefore the source code can easily be verified. After that the debugging, testing and modification can be eased. This goal can be achieved by making the source code clear and straight forward as possible.

The process of implementation is consisted of coding and the actual implementation of the software. The coding was done with the PHP in the framework Laravel, and MySQL as Database, which handled the backend. For the frontend we used HTML, CSS, Bootstrap and Blade Laravel.

PHP is a programming language. It stands for 'PHP: Hypertext Preprocessor', with the original PHP within this standing for 'Personal Home Page'. Since the release of PHP there have been 8 versions of this programming language and as of 2022, Version 8.1 is currently a popular choice among the users of this language.

In order to complete this Project PHP was used for sever-side scripting. Server-side scripting is the main strength of using this program language. In order to use PHP server-side scripting it is required to have a PHP parser, a web server and a web browser.

MySQL is a programming language that is a RDBMS system (relational database management system). This relational database management system is a digital store that collects data and it organizes that data according to the relational model that is used. This model is consisted of tables, rows and columns. These provide a relationship between data elements and they all follow a strict logical structure. MySQL was key to actually implement, manage and query the database in order to complete this project.

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript. CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts. This separation can improve content accessibility; provide more flexibility and control in the specification of presentation characteristics; enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, which reduces complexity and repetition in the structural content; and enable the .css file to be cached to improve the page load speed between the pages that share the file and its formatting.

HTML (HyperText Markup Language) is the code that is used to structure a web page and its content. For example, content could be structured within a set of paragraphs, a list of bulleted points, or using images and data tables. As the title suggests, this article will give you a basic understanding of HTML and its functions. HTML is a markup language that defines the structure of your content. HTML consists of a series of elements, which you use to enclose, or wrap, different parts of the content to make it appear a certain way, or act a certain way.

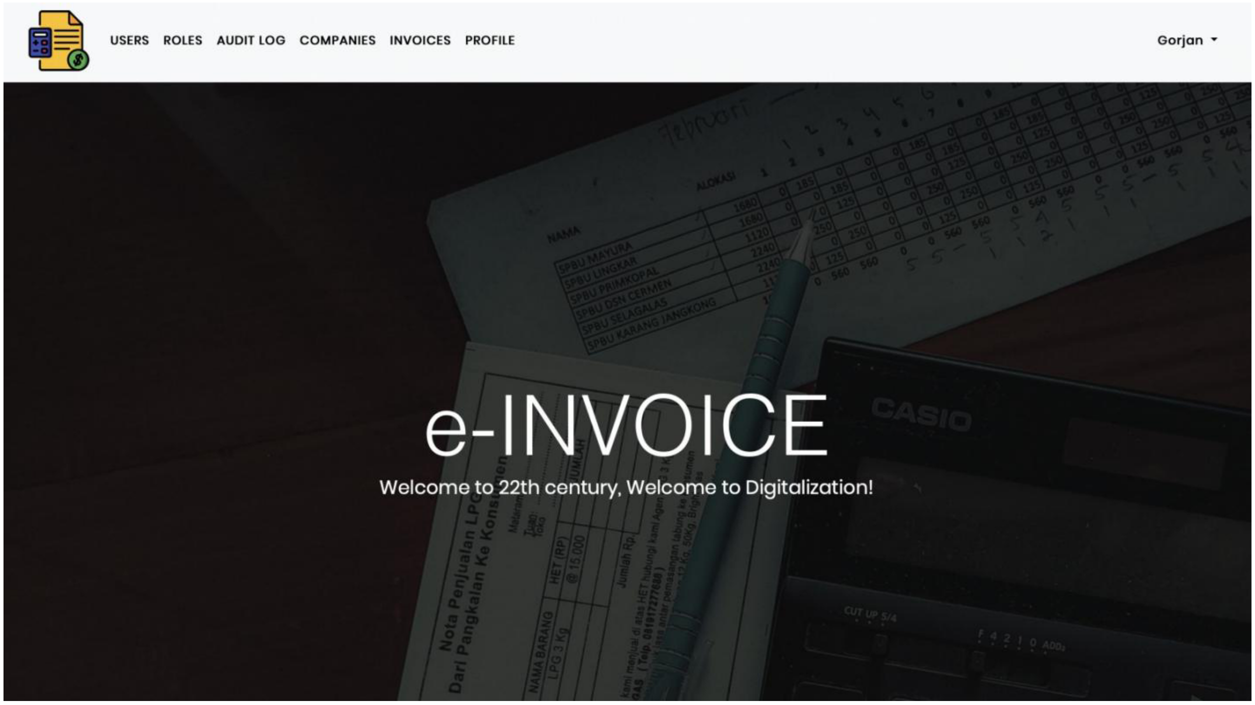
Blade is the simple, yet powerful templating engine that is included with Laravel. Unlike some PHP templating engines, Blade does not restrict you from using plain PHP code in your templates. In fact, all Blade templates are compiled into plain PHP code and cached until they are modified, meaning Blade adds essentially zero overhead to your application. Blade template files use the .blade.php file extension and are typically stored in the resources/views directory.

Bootstrap is an HTML, CSS & JS Library that focuses on simplifying the development of informative web pages (as opposed to web apps). The primary purpose of adding it to a web project is to apply Bootstrap's choices of color, size, font and layout to that project. As such, the primary factor is whether the developers in charge find those choices to their liking. Once added to a project, Bootstrap provides basic style definitions for all HTML elements. The result is a uniform appearance for prose, tables and form elements across web browsers. In addition, developers can take advantage of CSS classes defined in Bootstrap to further customize the appearance of their contents. For example, Bootstrap has provisioned for light- and dark-colored tables, page headings, more prominent pull quotes, and text with a highlight.

Laravel is a free and open-source PHP web framework, created by Taylor Otwell and intended for the development of web applications following the model–view–controller (MVC) architectural pattern and based on Symfony. Some of the features of Laravel are a modular packaging system with a dedicated dependency manager, different ways for accessing relational databases, utilities that aid in application deployment and maintenance, and its orientation toward syntactic sugar.

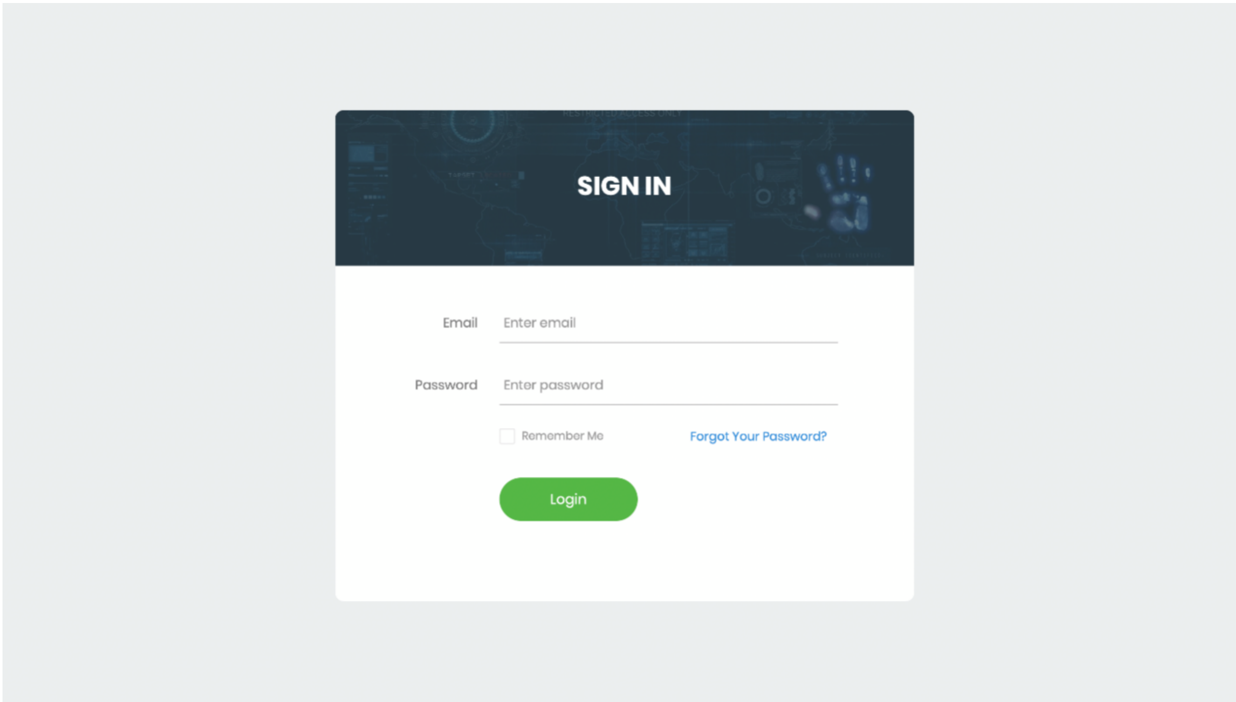
After completing the project we continued to interact in order to finalize it as a whole. After finalization the project and testing the final code, we pushed the project onto GitHub and onto GitLab.

5.1. DETAILED ANALYSIS OF THE FUNCTIONS



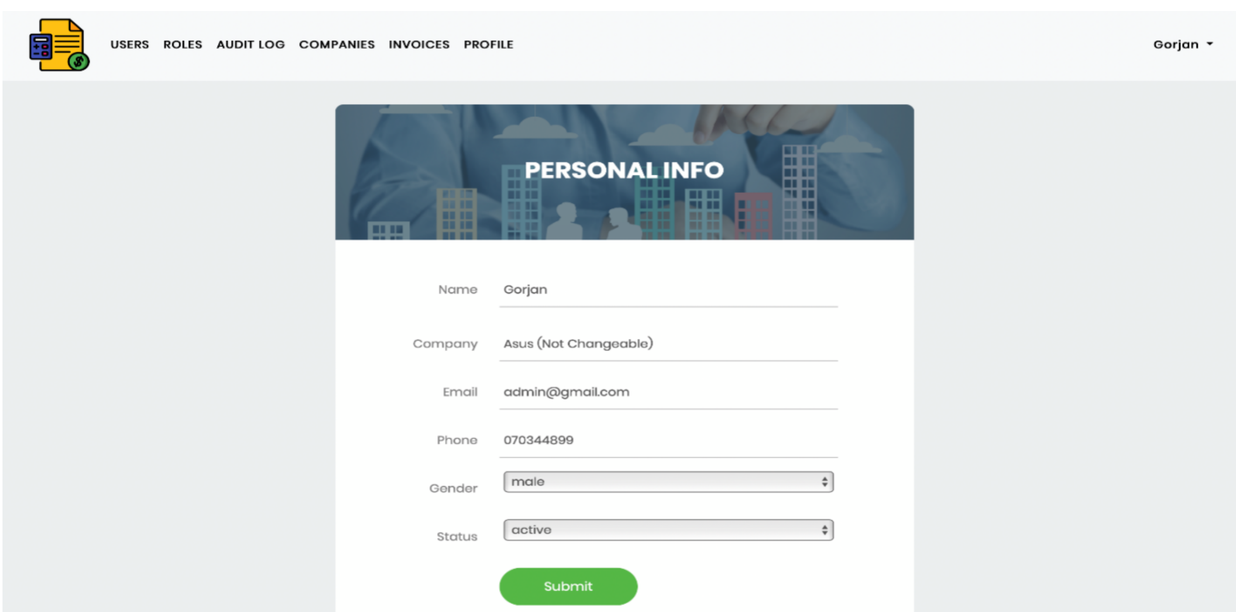
Description: This is the home page of our site, E-Invoice. In order to have access to any of the provided option, first you need to sign in. The sign in button is in the upper right corner. On the provided screenshot, you can't see that because we are already signed in, that is why you can see the name Gorjan, which in this case is the admin name.

Sign in page



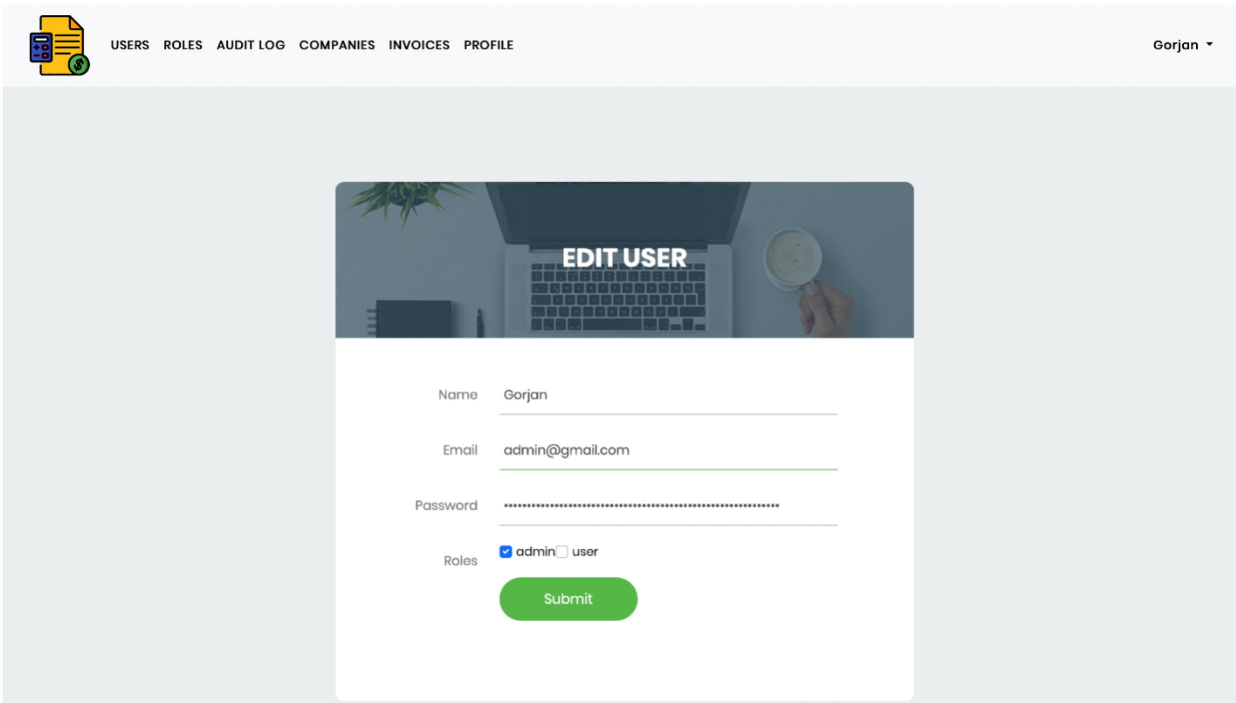
Description: This is the sign in page of E-Invoice. After signing in, the admin is entered into this page here. The links to various process are given so admin can direct to those pages.

Personal Info page



Description: This is the personal information page. On this page, the informations of the user are given, such as, name, company name, email account, personal phone number, gender and status of the user. All of these informations are implemented from the admin, but the user can change every information except the company name. When you are done with the changes, click on the submit button.

Edit User page

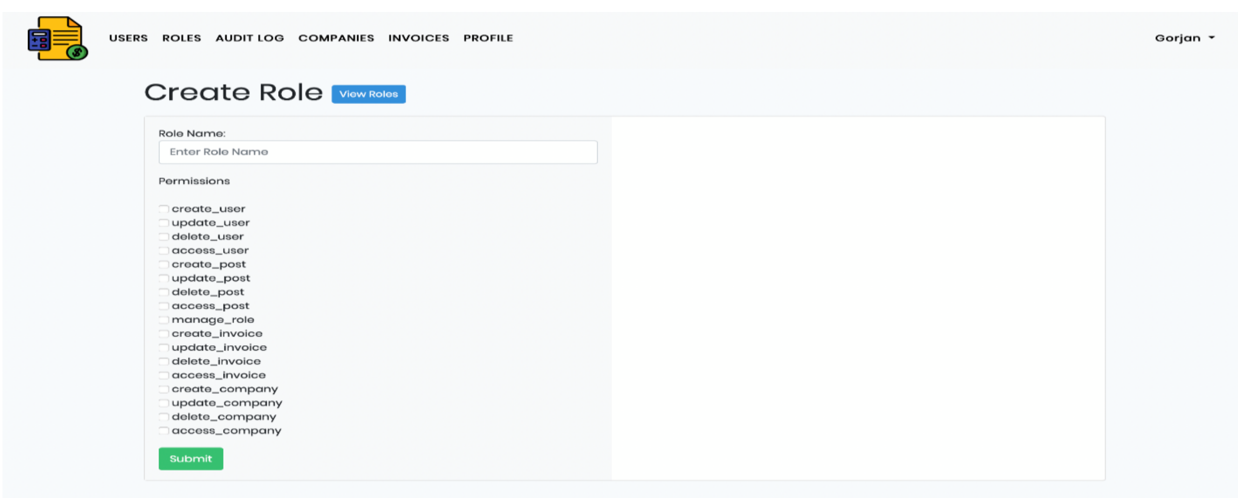


Description: This is the user edit page. On this page, only the admin can edit the information details of the user

Roles permission page

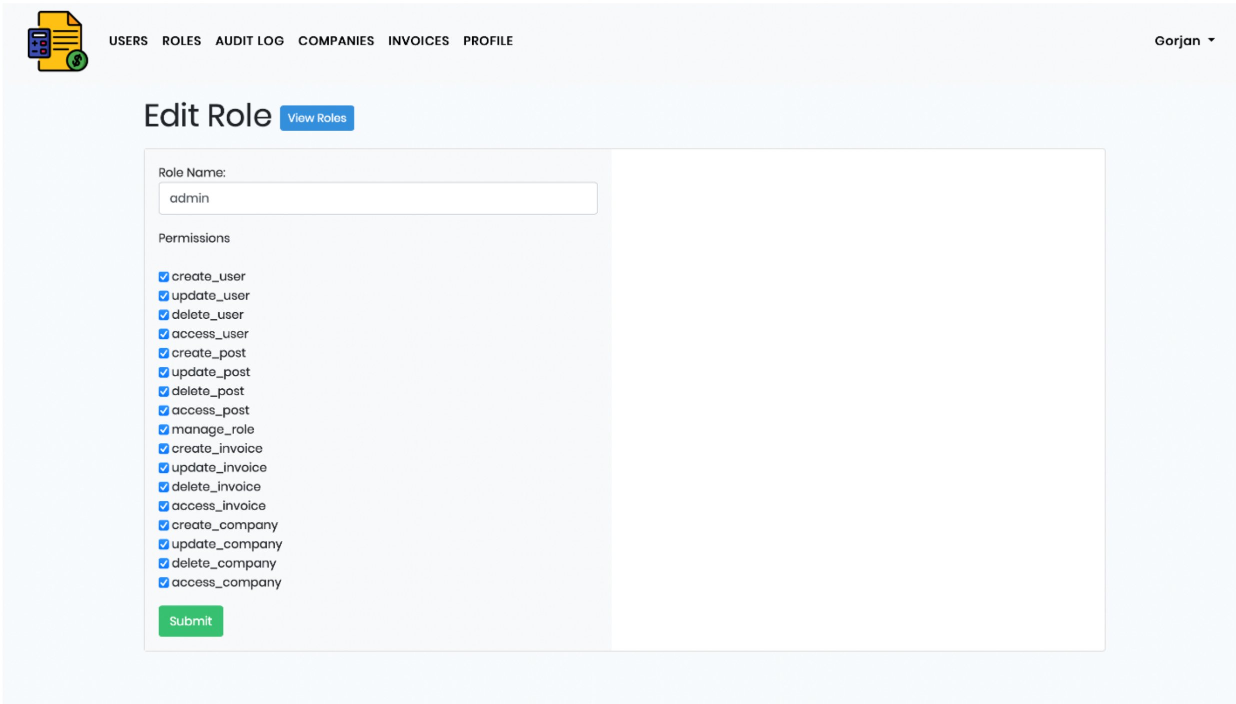
Description: This is the roles permission page. On this page, you can see, what kind of permissions does the user have. Only the admin can edit and delete the permission details of every user. On the upper left corner, there is an Add New Role button. With that button new roles are added.

Role Creation page



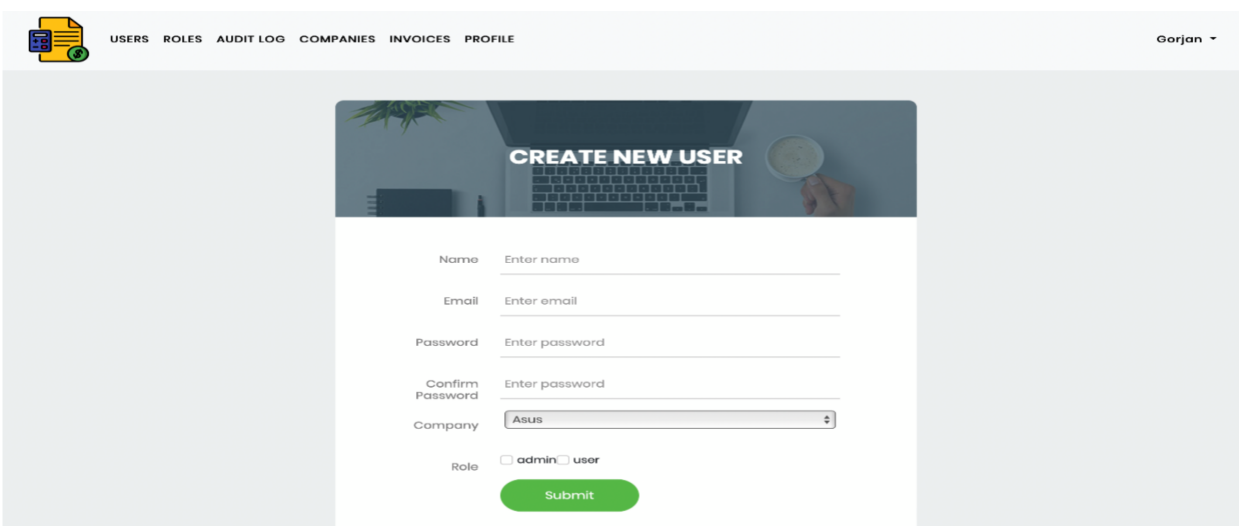
Description: This is the role creation page. On this page, only the admin can create roles.

Edit Role page



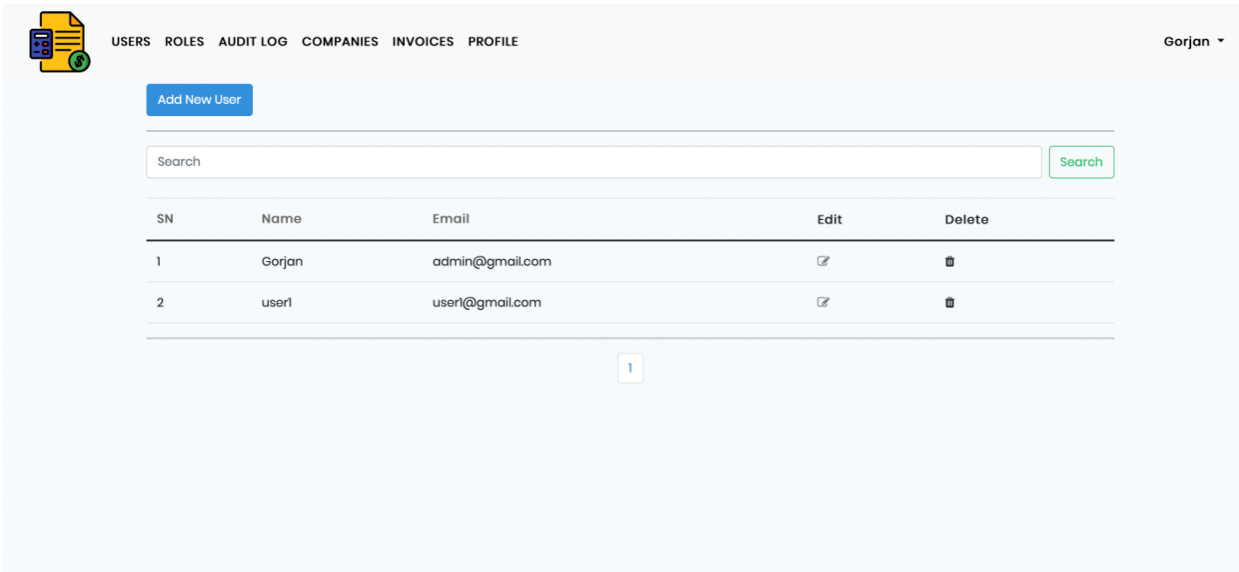
Description: This is the edit role page. On this page, only the admin can edit and change roles. As you can see, the options are: to create, update and delete users, posts, invoices, companies and to manage and access roles, invoices and companies.

New User page



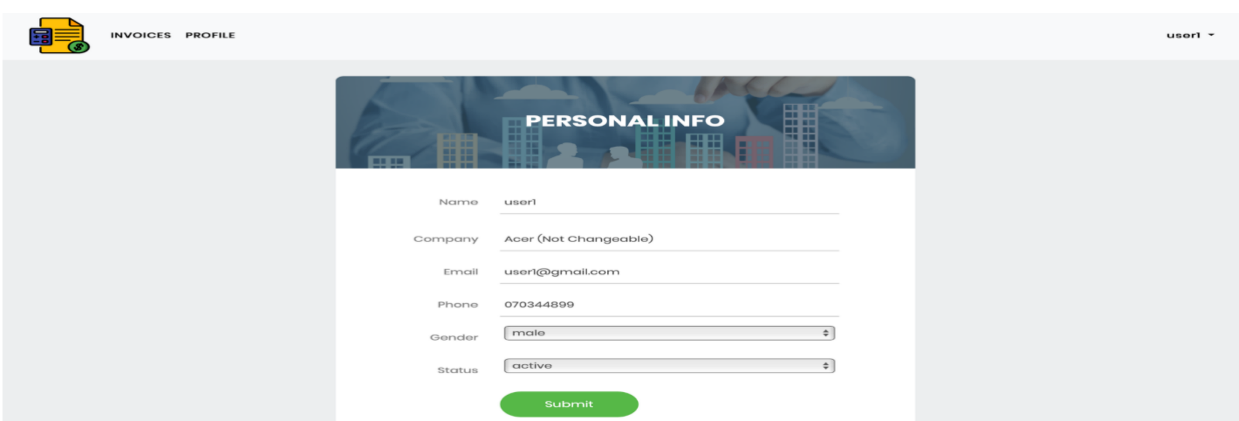
Description: This is the Create New User Page. Only the admin can create new users and after the admin creates the user, the sign in informations are send to the user. In order to create a new user, the admin needs to have the name of the user, user's email address and password. After that, the admin selects the company which the user wants to use and assigns a role to the user. As we can see, there are 2 options for a role: admin a a user.

User List page



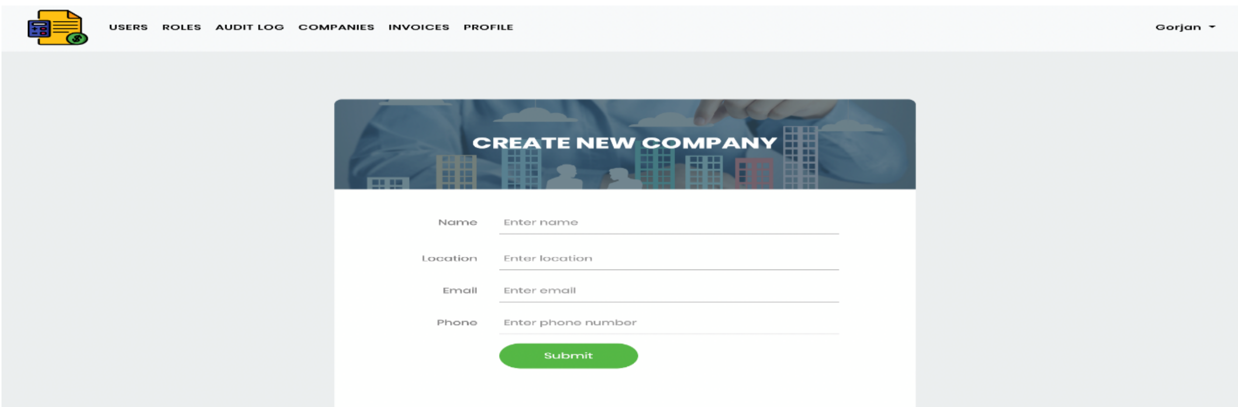
Description: This is the User List Page. Only the admin can create new users, and here is a list of every user. There is a search button to find the users by their name or email account. The admin can edit and delete the users and on the upper left corner there is a add new user button, which takes you to the create new user page.

Personal Info page



Description: This is the personal information page. On this page, the informations of the user are given, such as, name, company name, email account, personal phone number, gender and status of the user. All of these informations are implemented from the admin, but the user can change every information except the company name. When you are done with the changes, click on the submit button.

Create New Company page

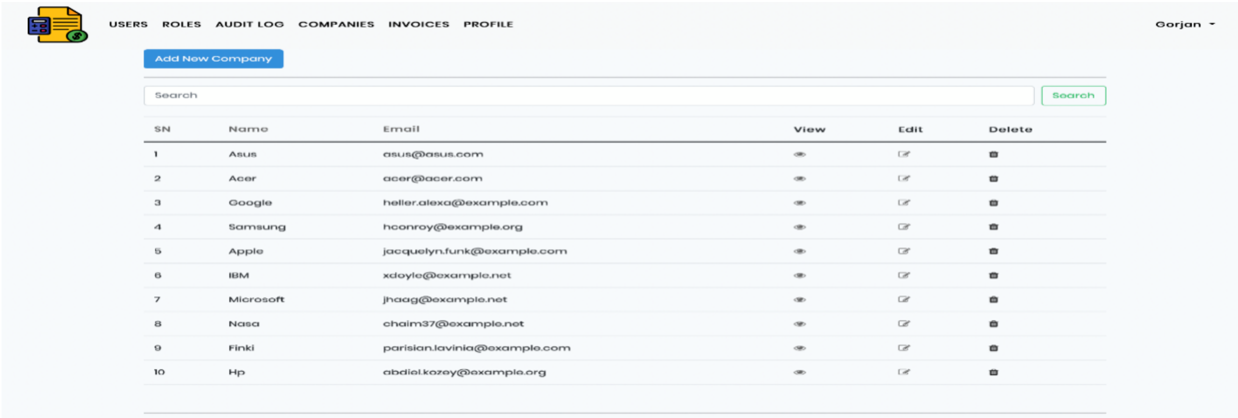


Description: this is the Create New Company Page. On this tab, the new company is been added. As you can see, in order the add the new company, it is necessary to provide the following information:

- name of company
- location/headquarters
- official email account
- official phone number

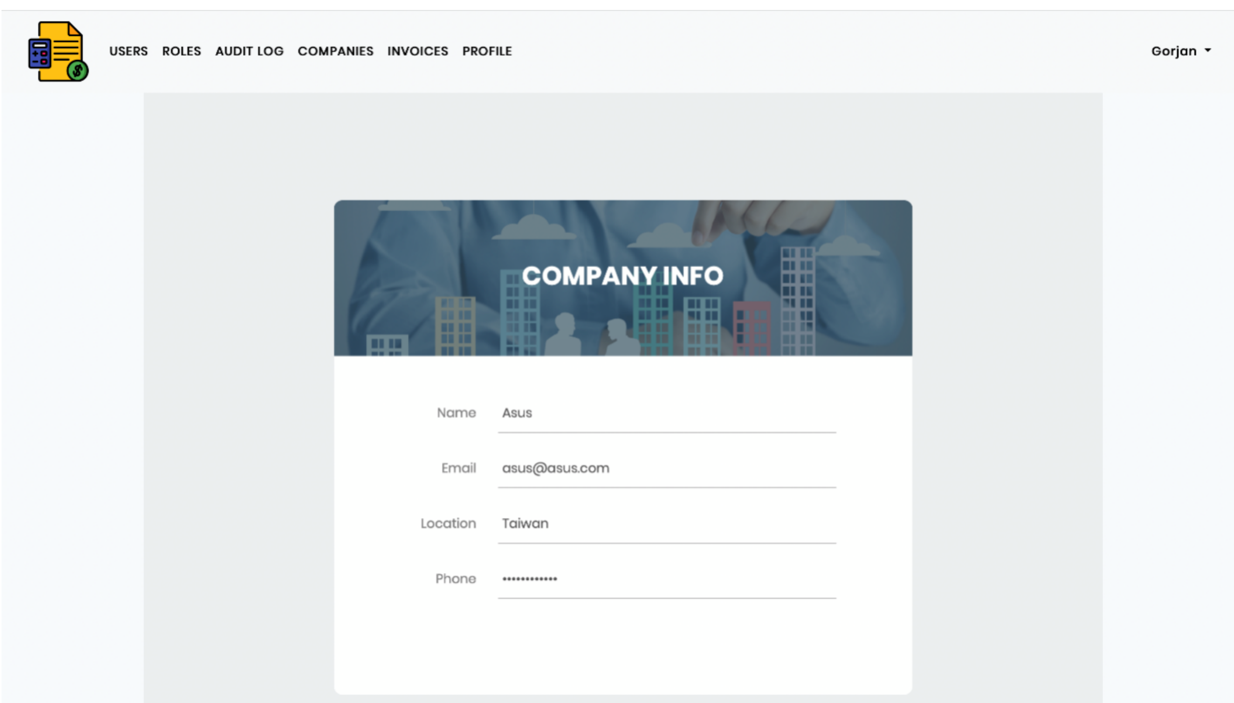
If the company is already registered, then an error will show that the company already exists.

Company List page

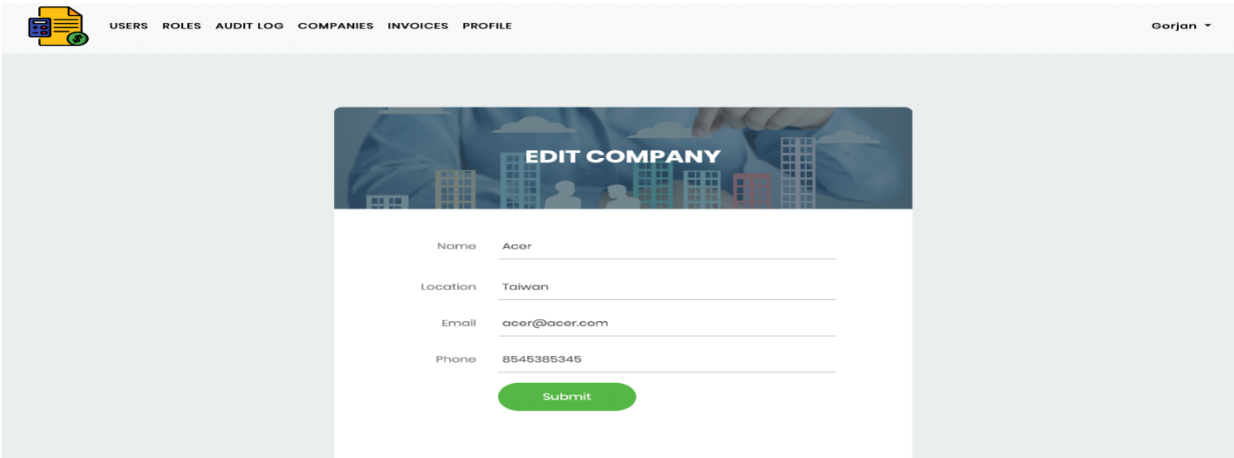


Description: This is the Company List page where you can see all the registered companies. The admin has an access to this page. Also, here you can see the official email account and other details of the company can be seen on this page. There is also an edit and delete button as well as a search button and a button for adding new companies.

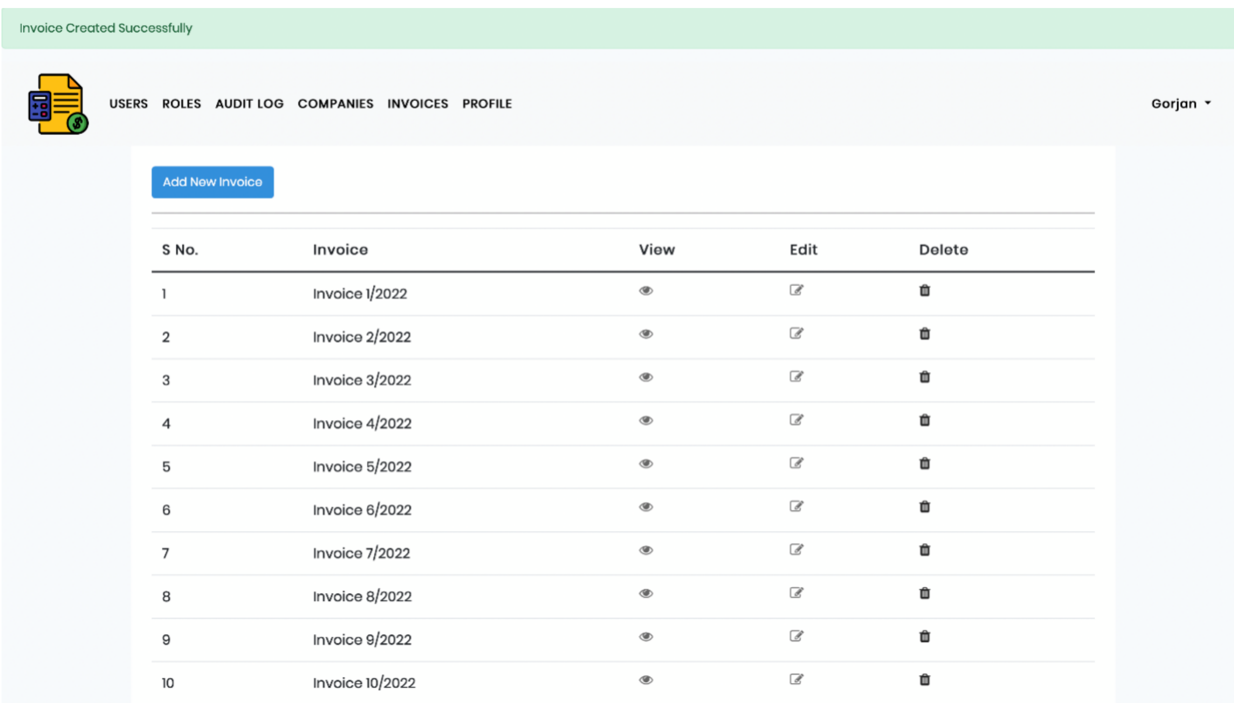
Company Info page



Company Edit page

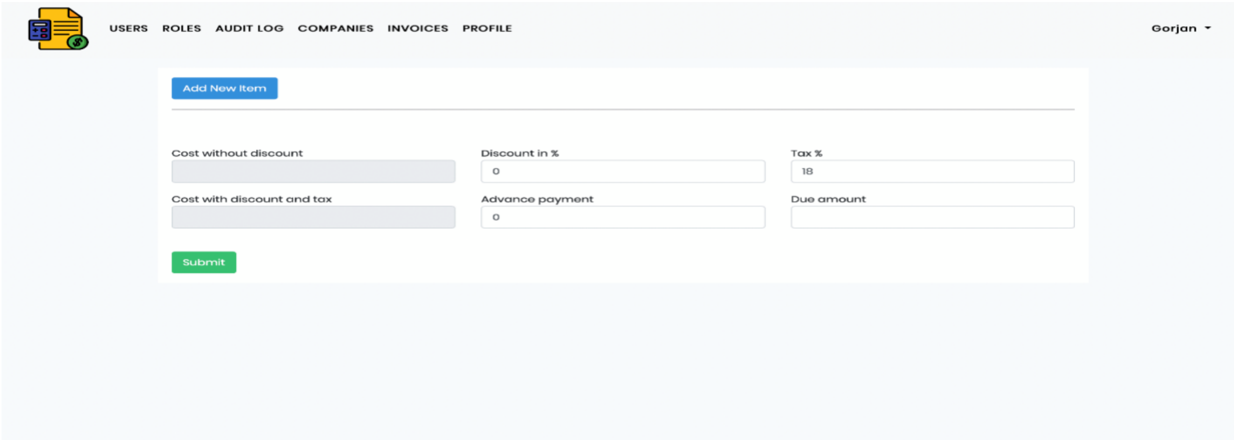


Description: This is the company edit page. On this page, only the admin can edit the information details of the company.**Invoice List page**



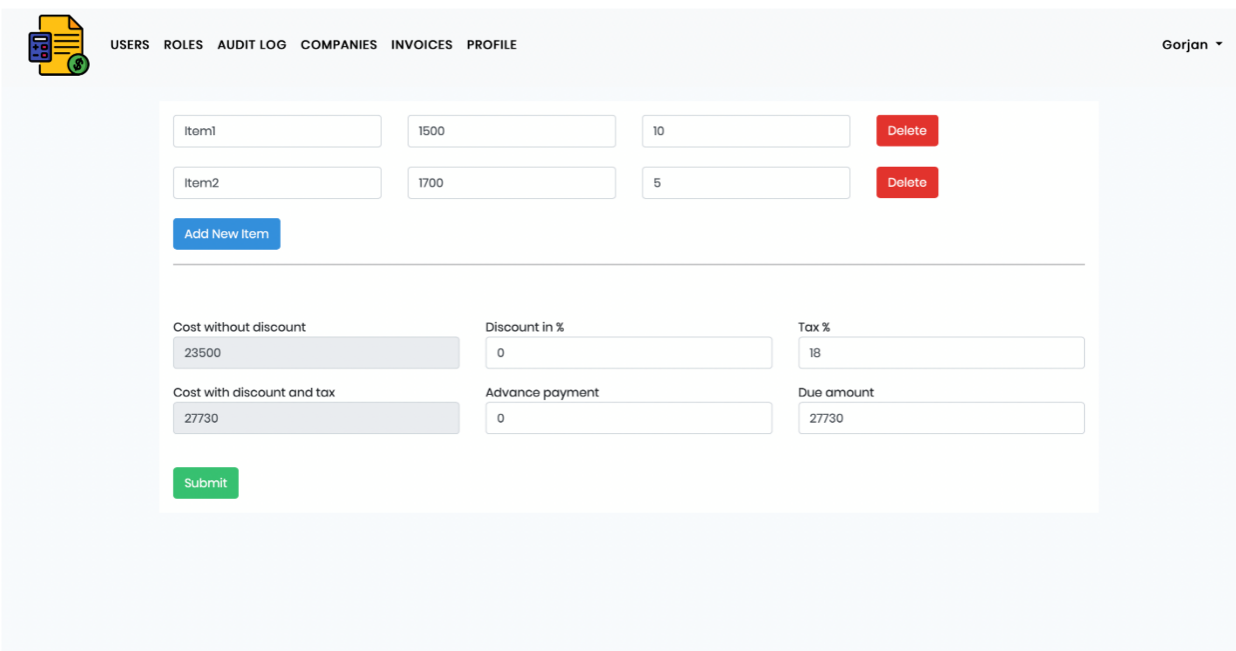
Description: this is the Invoice List page. On this page, the company puts the invoices of the user that needs to be paid. On the upper left corner there is the Add New Invoice button, with which you can add new invoices/bills.

Invoice creation page



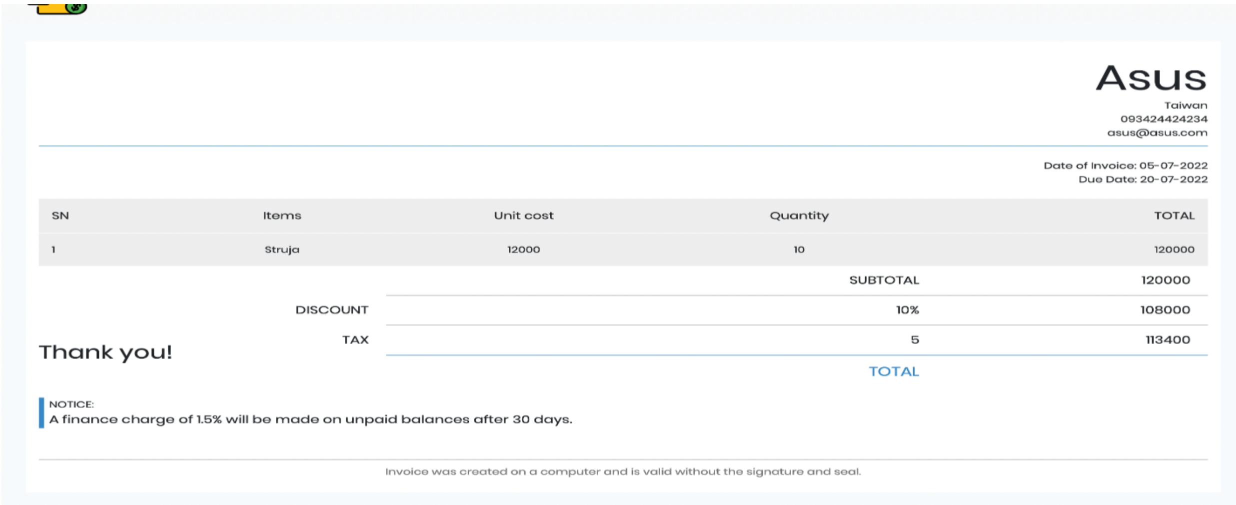
Description: This is the Invoice creation page. On this page, the user enters the info that is given in the invoices. If the user entered the right information, click on the submit button to go to the next step.

Invoice items adding page



Description: This is the second paying page. On this page, user is adding items and their details, prices, quantities.

Successful invoice creation page



Asus
Taiwan
093424424234
asus@asus.com

Date of Invoice: 05-07-2022
Due Date: 20-07-2022

SN	Items	Unit cost	Quantity	TOTAL
1	Struja	12000	10	120000

	SUBTOTAL	120000
DISCOUNT	10%	108000
TAX	5	113400
	TOTAL	

Thank you!

NOTICE:
A finance charge of 1.5% will be made on unpaid balances after 30 days.

Invoice was created on a computer and is valid without the signature and seal.

Description: This is the Successful invoice created page and also the last one. Over here you can see how a new invoice looks like.

CONSLUSION

Through our analysis we can conclude that with the implementation and usage of E-invoices, society has a tremendous benefit, both for the businesses and the customers as well. The transmission of invoices is seeming less and arrives to the recipients e-mail address or another designed destination. E-invoices provide reduction of transcriptional errors that are made by manually drafting an invoice. They also reduce the cost of sending a manual invoice through couriers. E-invoices are eco friendly too by reducing the amount of paper and envelopes needed to send a regular invoice.

As society progresses in the new era of digitalization, manually drafting and sending an invoice is expected to become a thing of a past and to be replaced by E-invoices. When the change occurs the entire world will have one unified standard of invoices. Even if the software used by the companies and consumers is different, both of these subjects will be able to read and decipher the invoices.

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4. https://core.ac.uk/download/pdf/301348408.pdf;
5. http://epub.lib.aalto.fi/en/ethesis/pdf/13186/hse_ethesis_13186.pdf;
6. https://www.billentis.com/The_einvoicing_journey_2019-2025.pdf;
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