Designing and Development of ClassTask using Web Development Techniques

A PROJECT REPORT

Submitted in partial fulfilment of the requirements for the award of the degree

of

BACHELOR OF TECHNOLOGY
in
ELECTRICAL ENGINEERING

Submitted by:

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INDIAN INSTITUTE OF TECHNOLOGY INDORE

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CANDIDATE'S DECLARATION

I hereby declare that the project entitled "**Designing and Development of ClassTask using Web Development Techniques**" submitted in partial fulfillment for the award of the degree of Bachelor of Technology in Electrical Engineering completed under the supervision of **"Dr. Srivathsan Vasudevan"**, Associate Professor in Discipline of Electrical Engineering, IIT Indore" is an authentic work.

Further, I declare that I have not submitted this work for the award of any other degree elsewhere.

Shubham Gupta
(150002035)

Certificate by BTP Guide

It is certified that the above statement made by the student is correct to the best of my knowledge.

Dr. Srivathsan Vasudevan
Associate Professor
Discipline of Electrical Engineering Indian Institute of Technology Indore
(Project Guide)

PREFACE

This report on **"Designing and Development of ClassTask using Web Development Techniques"** is prepared under the supervision of **Dr. Srivathsan Vasudevan**, Associate Professor, Electrical Engineering, IIT Indore.

Throughout this report, detailed description of the theoretical concepts used to develop and implement the web pages and the portals for various processes are provided. The implemented algorithm and the code are tested and the results are presented in a clear and concise manner.

Shubham Gupta
B.Tech IV year
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ACKNOWLEDGEMENTS

I would like to thank my B.Tech Project supervisor **Dr. Srivathsan Vasudevan** for his constant support in structuring the project and his valuable feedback throughout the course of this project. He gave me an opportunity to discover and work in such an interesting domain which I always wanted to explore.

I am thankful to Mr. Pankaj Manchanda and Mr Aman Soni, Senior Full Stack Developer at VisionArch Technologies Pvt. Ltd. in Gurugram for giving me proper guidance wherever required. They guided me at every stage of this project. Their guidance proved very valuable and helped me in completion of this project.

I am also thankful to my family members, friends and colleagues who were a constant source of motivation. I am really grateful to Dept. of Electrical Engineering, IIT Indore for allowing me to pursue the project as an internship in VisionArch Technologies Pvt. Ltd. and providing with the necessary utilities to complete the project. I offer sincere thanks to everyone who else who knowingly or unknowingly helped me complete this project.

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ABSTRACT

The ClassTask is a new venture by VisionArch Technologies which enables users (mainly the student-teacher community) to have various projects and the thesis work, already done by the students and professionals across the globe, right on their screens. ClassTask enables the sharing of the architectural projects and thesis among various users.

The project will have the use of the development languages: HTML, CSS and JavaScript. HTML has been used to build the web pages and linking the web pages together. CSS has been used to define styles for web pages. JavaScript has been used to give functionality to the different processes in the website.

The team has tried to build the whole interface and the website functionality so as the users can have the best experience while going through the processes such as login, uploading and downloading. The *ClassTask* has a basic flow of the process of uploading a thesis file onto the server. Being a team member the website should be optimized and user friendly, the process should be handy, and that's what our team did with it. I designed a drag and drop uploader for the website and also worked on the format verifying code. The inputs taken by the input field has to be verified so as to maintain the standard of the paid content provided by the company. As an intern developer I was asked to help the core team with the add-ons that will be applied once the whole flow is set into action.

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Introduction

As a student of Electrical Engineering at Indian Institute of Technology, Indore I decided to undertake a semester of my forth year studies at VisionArch Technology Private Limited as a Web Development internee as a part of my B.Tech project. Since I find myself more interested in the area of web development and design, I was happy to be assigned the position of an internee in web development in the core development team of VisionArch. I had some of the knowledge of the work I was supposed to do at the firm and a lot to learn about Web Development in a mere time of 6 months. The main segments of the project that I have covered include the thesis uploading and verification process of the formats and the extensions of the files uploaded on the database. Being a Front end developer, I have worked the file upload process with a drag and drop uploader. The *ClassTask* is a new venture by the *VISIONARCH TECHNOLOGIES PVT. LTD* and had a great deal of work related to web development and web designing. I have contributed to the core team coders with their work in creating a web page and portals using the three languages as stated above. This was very beneficial for me at the end as I could compare what I've learnt with what I already knew and find a connection between the two.

About VisionArch:

The firm works in the field of Virtual Reality. The company OutsiteVR venture mainly works in the field of travels and tours. The company is also having some major tie ups with the holiday planner giants like "Make My Trip" to give people a better experience of on what they are investing their time and money and if it's worth it. The firm has 2 projects- *OutsiteVR and ClassTask.* Where OutsiteVR mainly focuses on the travel and the virtual reality thing, ClassTask is a platform for sharing the thesis work by people so as to spread it and earn through it. ClassTask is mainly concerned with the community involved in architecture as the thesis and the project files available on the website are related to the architectural projects. The students can have a demo view of the files and the reports and can buy the paid works at the price stated by the website. The company is also having some major tie ups with the holiday planner giants like "Make My Trip" to give people a better experience of on what they are investing their time and money and if it's worth it.

Motivation

The company is associated with Virtual Reality which is fascinating in itself. I developed interest for web-development 2 years back and the project offered by the firm was appropriate for my growth. I was asked to work in their new project named *ClassTask* which needed work in HTML, CSS and JavaScript. I was quite comfortable with these languages but still there was a lot to learn. To enhance my abilities in the web developing field, I had the best of the opportunity to work with the developers in a fresh project. To get exposure to the technical world is what that makes this intern worth it. There's always something to learn as a developer and I just grabbed the opportunity. I look forward to contribute my part in the progress of the firm and to develop better skill sets of mine.

Concept Design

Introduction to web-development

Web development broadly refers to the tasks associated with developing websites for hosting via intranet or internet. The web development process includes web design, web content development, client-side/server-side scripting and network security configuration, among other tasks.

There are two broad divisions of web development – *front-end development* (also called client-side development) and *back-end development* (also called server-side development).

- **Front-end development**: - Front-end development involves the building of web pages and user interfaces for web applications. Front-end developers implement the structure, design, behaviour, and animation of everything you see on the screen when you open up websites, web applications, or mobile apps. The front-end is the "client-side", which refers to the browser and the user interacting with that browser. Front end developers write code that the browser interprets and then responds by rendering the page to reflect the intended design.
- **Back-end development**: -The back-end or “server-side” is the portion of the website you don’t see. It’s responsible for storing and organizing data, and ensuring everything on the client-side actually works. The backend communicates with the front-end, sending and receiving information to be displayed as a web page. Whenever you fill out a contact form, type in a web address, or make a purchase (any user interaction on the client-side), and your browser sends a request to the server-side, which returns information in the form of frontend code that the browser can interpret and display.

Role of a front-end developer

Some concerns that a Front End developer has to deal with are:

- Writing code that renders and behaves the same from browser to browser (Chrome, Firefox, Safari, Opera, etc., as well as their various versions) and from device to device (iPad, iPhone, Android, PC, Mac, Linux, etc.).

- Making sure that the user experience is relatively consistent /pleasant regardless of the screen size of their device.
- Staying abreast of the latest innovating technologies, standards, and best practices in the industry.
- Grasping important design concepts such as User Interface/User Experience design. (UI/UX). While they may not master these concepts on the same level as someone who is a full time designer, they do at least need to have a good foundation in them.
- Understanding things like Browser Rendering Performance and optimizing for the critical rendering path.
- Making sure that one is not overusing images in the page, since they tend to be the largest files. There are design alternatives to using an image, instead of always thinking that you need to include one. But if you must include some images, you have to know how to compress and optimize them enough so that you don't serve the user unnecessarily large files, thus slowing down load time, eating up user data, or running down the battery of someone's phone or iPad.
- Provide meaningful UI motion (animations) without distracting the user or getting in their way. You must also keep in mind how too much animation could bog down the experience of a mobile user or burn through their battery quickly.

Razorpay Payment Gateway

Razorpay API can be used for authorizing, capturing, refunding a payment as well as getting information of previous payments.

To start accepting payments using Razorpay, you need:

1. API keys that are generated through Razorpay's dashboard.
2. Checkout form is integrated in the website.
3. Payment capturing process is performed in backend.

Technologies used in *front-end development*:-

The website development consist of two parts- Front-end and Back-end development. The front-end is the part of the web that you can see and interact with. While front-end code interacts with the user in real time, the back-end interacts with

a server to return user ready results. The front-end is a combination of HTML, CSS and JavaScript coding. As I have minimal experience with back-end programming, I have initially focused on the front-end development as a part of my B.Tech Project. The brief descriptions of the languages are described here:

- **HTML5:** HTML stands for **Hypertext Markup Language**, and it is the most widely used language to write Web Pages. Hypertext refers to the way in which Web pages (HTML documents) are linked together. Thus, the link available on a webpage is called Hypertext. As its name suggests, HTML is a Markup Language which means you use HTML to simply "mark-up" a text document with tags that tell a Web browser how to structure it to display.

  Originally, HTML was developed with the intent of defining the structure of documents like headings, paragraphs, lists, and so forth to facilitate the sharing of scientific information between researchers.

  Now, HTML5 is being widely used to format web pages with the help of different tags available in HTML language.

- **CSS:** CSS stands for **Cascading Style Sheets** is a stylesheet language used to describe the presentation of a document written in HTML. CSS describes how HTML elements are to be displayed on screen, paper, or in other media. CSS is used to define styles for web pages, including the design, layout and variations in display for different devices and screen sizes. But why CSS? Because it saves a lot of work and time and makes our website more presentable. It can control the layout of multiple web pages all at once. With an external style sheet file, you can change the look of an entire website by changing just one file! The style definitions are normally saved in external .css files.
- **SASS:** CSS on its own can be fun, but stylesheets are getting larger, more complex, and harder to maintain. This is where a preprocessor can help. Sass lets you use features that don't exist in CSS yet like variables, nesting, mixins, inheritance and other nifty goodies that make writing CSS fun again. Once you start tinkering with Sass, it will take your preprocessed Sass file and save it as a normal CSS file that you can use in your website.

- **Susy**

  Susy is a lightweight grid-layout engine for Sass, designed to simplify and clarify responsive grid layouts without ever getting in your way. This can use Susy with flex box, tables, or any other CSS technique.

  Context Syntax: `[of <columns> <container-spread>]`

  This describes the grid-**context** – available columns, container-spread and optional gutter override – in any order. All of these settings have globally-defined defaults:

  - `span(2 of 6)` will set the context to a slice of 6 columns from the global grid.
  - `span(2 of 12 wide)` changes the container-spread as well as the column-context.

  Why we use this?

  Because it is lightweight and open source and we have our own platform and design se we used this grid structure for device responsiveness.

- **JavaScript:** JavaScript (JS) is a scripting language, primarily used on the Web. It is used to enhance HTML pages and is commonly found embedded in HTML code. JavaScript is an interpreted language. Thus, it doesn't need to be compiled. JavaScript renders web pages in an interactive and dynamic fashion. This allowing the pages to react to events, exhibit special effects, accept variable text, validate data, create cookies, detect a user's browser, etc. HTML pages are fine for displaying static content, e.g. a simple image or text. However, most pages nowadays are rarely static. Many of today's pages have menus, forms, slideshows and even images that provide user interaction. JavaScript is the language employed by web developers to provide such interaction. Since JavaScript works with HTML pages, a developer needs to know HTML to harness this scripting language's full potential. While there are other languages that can be used for scripting on the Web, in practice it is essentially all JavaScript.

There are two ways to use JavaScript in an HTML file. The first one involves embedding all the JavaScript code in the HTML code, while the second method makes use of a separate JavaScript file that's called from within a Script element, i.e., enclosed by Script tags. JavaScript files are identified by the .js extension. Although JavaScript is mostly used to interact with HTML objects, it can also be made to interact with other non-HTML objects such as browser plug-in, CSS (Cascading Style Sheets) properties, the current date, or the browser itself.

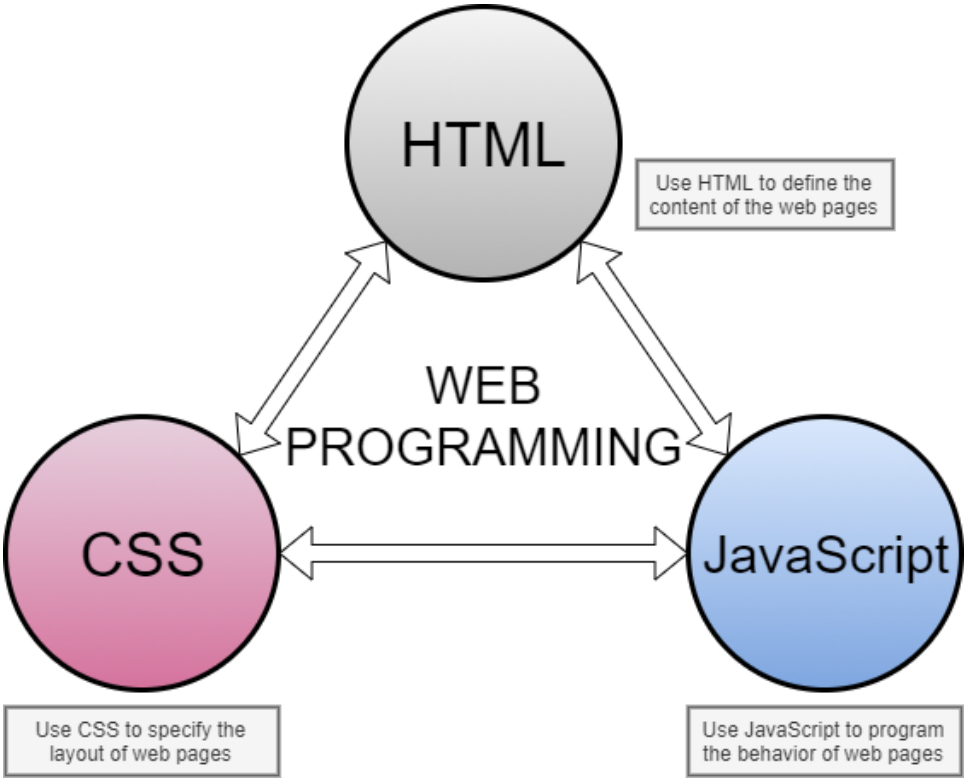


Figure 2.1 Web development triangle

Figure drawn using the draw.io tool.

What's ClassTask and why we need it?

The ClassTask is a new venture by VisionArch Technologies which enables users (mainly the student-teacher community) to have various projects and the thesis work, already done by the students and professionals across the globe, right on their screens. The site can be viewed in two ways; the uploader and the downloader. The user who uploads the thesis details and other documents has some steps and verification process of the details he enters in order to have his/her thesis material uploaded onto the site. The content gets verified by the content verification team and

is published to the thesis section. The content is categorized as per the value and the information it carries and that too is decided by the owner of the thesis project i.e. the uploader. The user can select one price band like INR 1000. / 1500. / 2500. / 3500.

But, why we need ClassTask and how it's helpful to the community?

- ClassTask is the world's first online portal for sharing & exploring Architecture thesis & Case Studies.
- The thesis and the case studies can be uploaded and accessed from different parts of the world.
- The experts, who have already done a good amount of work for a particular type of project, allow rest of the community to have access to their projects and reports.
- It encourages students to go through amazing case studies and projects for their reference.
- The uploaders get to earn for the work done by them and of course, the community people are benefitted with their project reports and research process.

Proposed work

User Experience

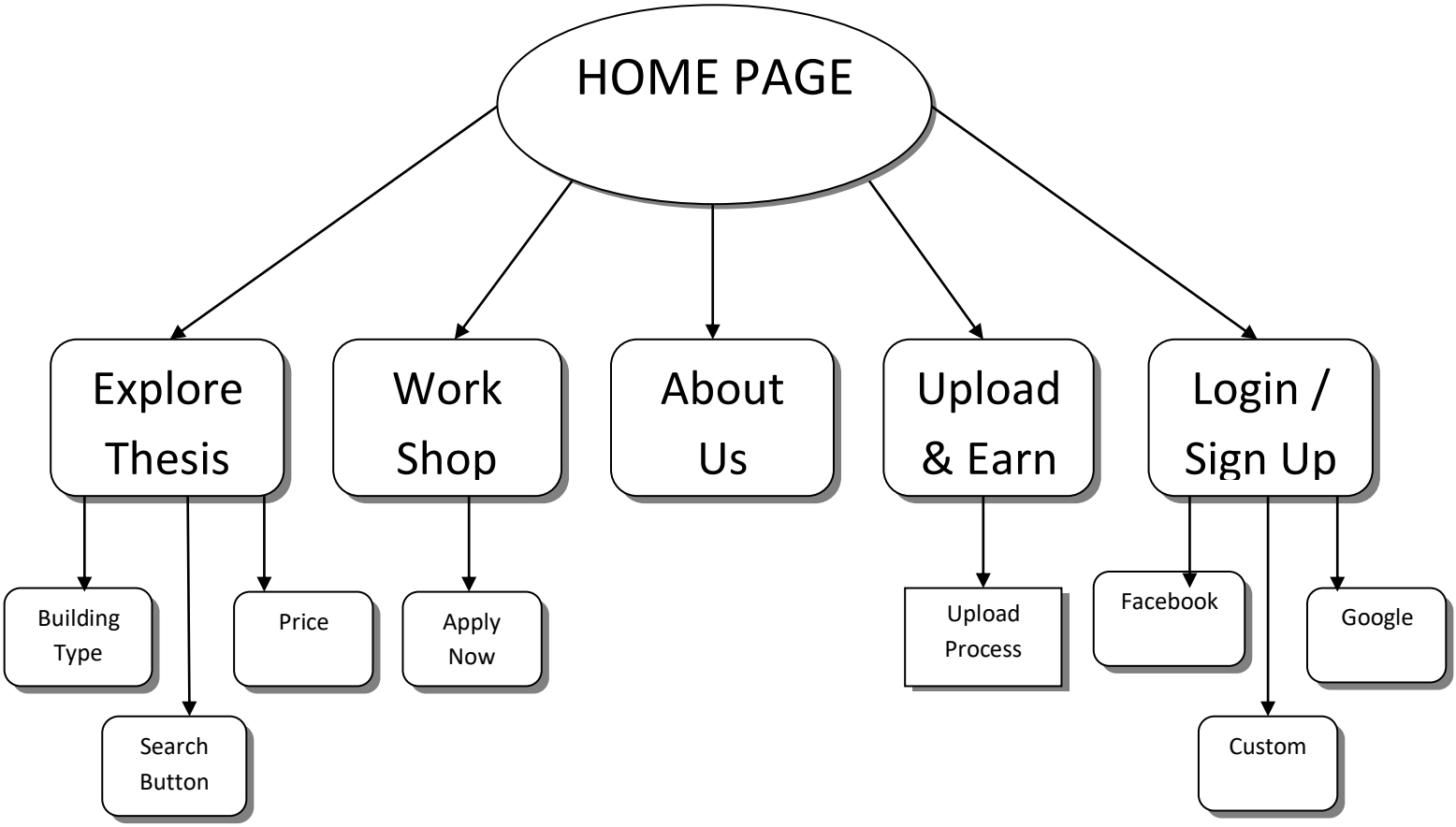


Figure 3.1 Home page functionality

Home Page

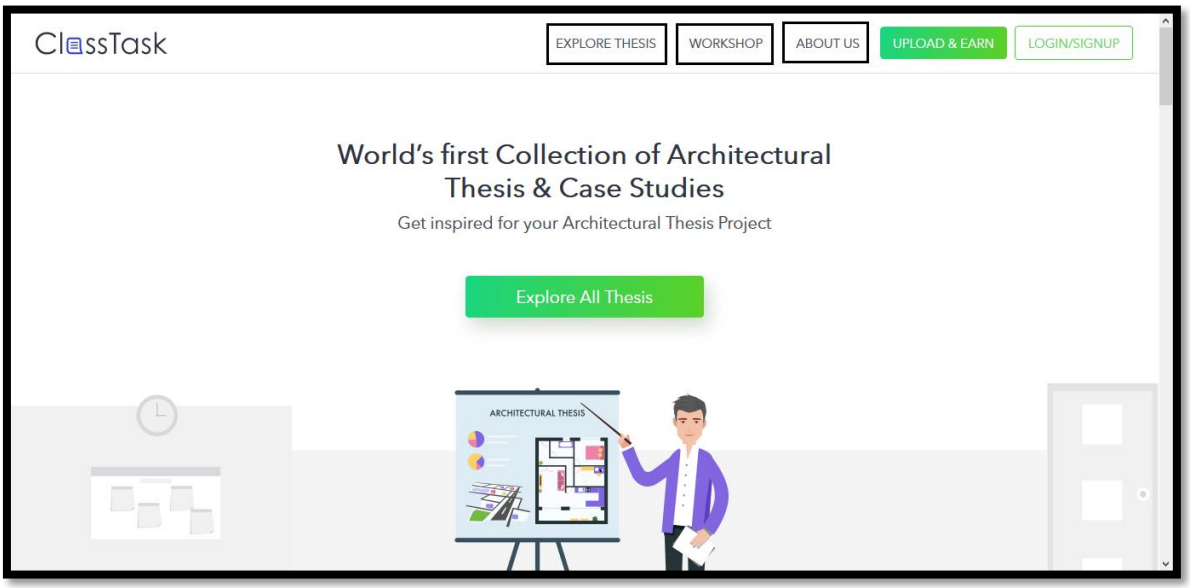


Figure 3.2 Home page

Integration of Susy

The web pages used in ClassTask are divided in 1x12 grid using **susy**, grid-layout engine for scss. A specific amount of columns are allotted to various parts of the web page. **Susy** is used to give defined screen size ratio to all the html5 elements on any device.

Let's say, we have given 2 of the 12 columns to a button on our screen. As per susy grid-layout, irrespective of the screen size, the screen will be divided into 12 parts horizontally and 2 of the parts will be allotted to the button unless we apply certain other condition for different screen sizes.

Given below is a snippet of susy.

main.scss

```
82  body{
83      margin: 0;
84      font-family: $AvenirNext-Regular;
85      background-color: #fafafa;
86  }
87
88  div, h1, h2, a, input, select{
89      box-sizing: border-box;
90  }
91
92  a{
93      text-decoration: none;
94      display: block;
95  }
96
97  .green-cta{
98      background-color: #8dc711;
99      display: inline-block;
100     color: $white;
101     font-size:16px;
102     font-family: $AvenirNext-Regular;
103     letter-spacing: 1.2px;
104     padding: 15px 50px;
105     margin-bottom: 25px;
106     border-radius: 20px;
107     box-shadow: 0px 3px 6px 0 rgba(0, 0, 0, 0.2);
108
109     @media only screen and (max-width: $mobile-width){
110         font-size: 19px;
111     }
112 }
113
114 .wrapper{
115     @include container(1920px);
116
117     .overlay-banner-container{
118         @include span(12 of 12);
119         background: linear-gradient(to right, rgba(0,0,0,0.5), rgba(0,0,0,0.5)), url('../assets/images/teleport2.png');
120         background-size: cover;
121     }
122
123     .other-banner-container{
124         // background: linear-gradient(to right, rgba(6,198,210, 0.95), rgba(141,199,17, 0.95)), url('../assets/images/teleport2.png');
125         background: url('../assets/images/banner-new.png');
126         background-size: cover;
127         background-position: bottom;
128     }
129
130     .tour-banner-container{
131         @include span(12 of 12);
132         // background: rgba(0,0,0,0.4);
```

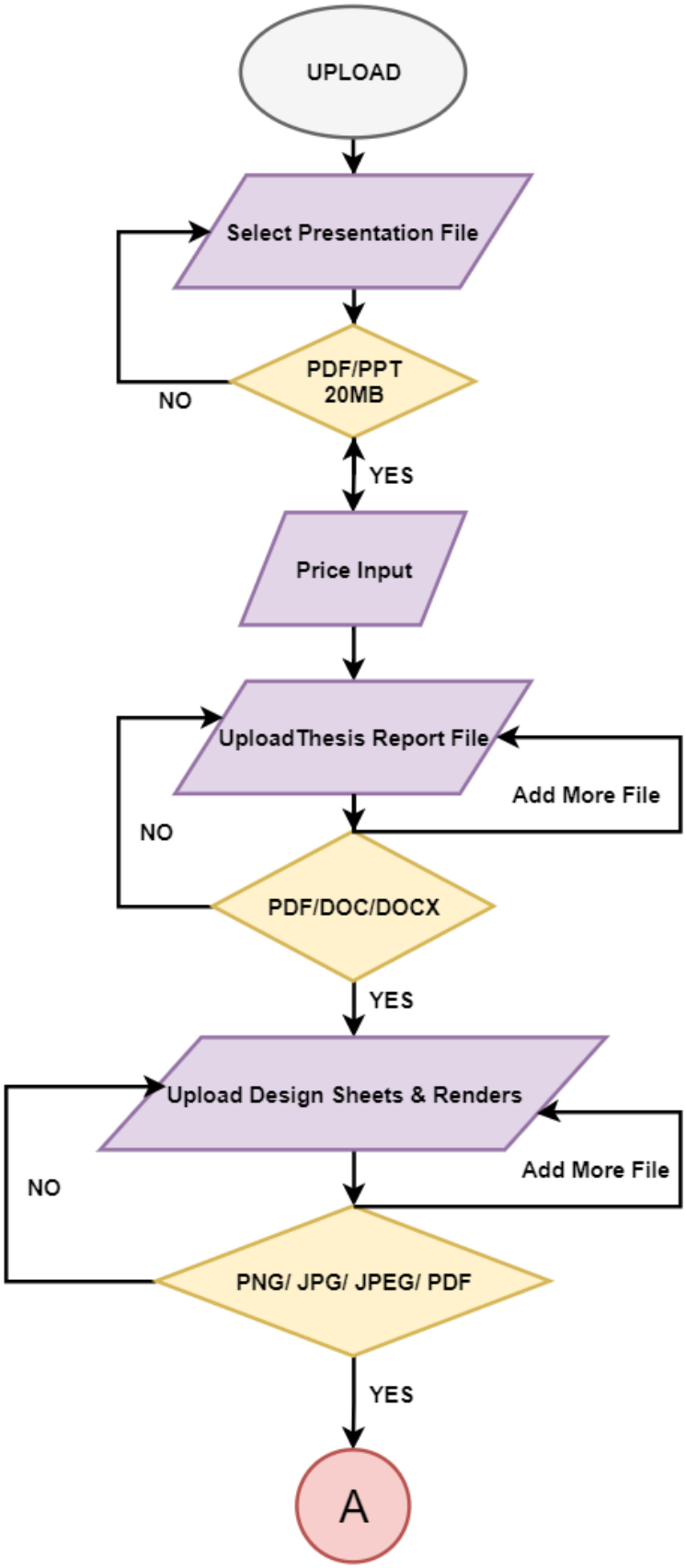
Figure 3.3 Susy snippet 1

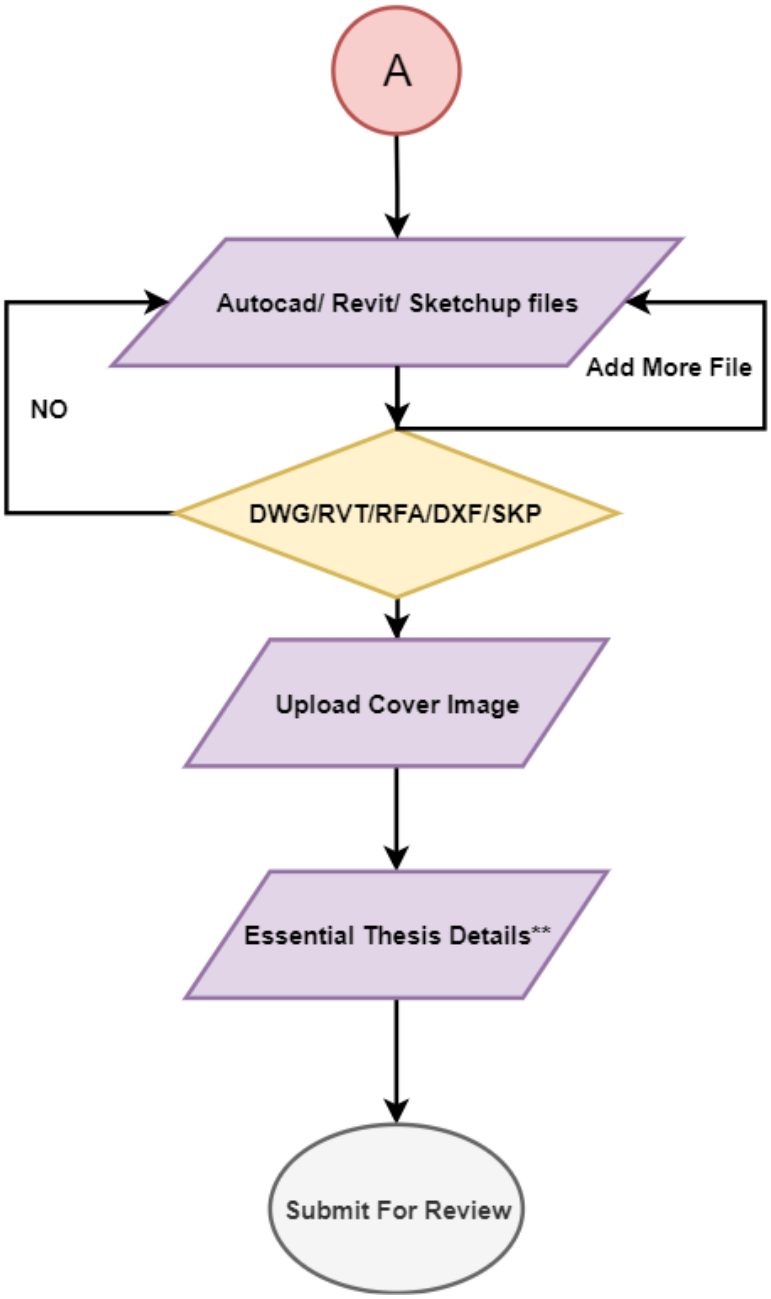
main.scss

```
@mixin vertical-align {
    position: relative;
    top: 50%;
    -webkit-transform: translateY(-50%);
    -ms-transform: translateY(-50%);
    transform: translateY(-50%);
}

@font-face {
    font-family: AvenirNext-Medium;
    src: url(../assets/fonts/AvenirNext-Medium.ttf);
}

@font-face {
    font-family: AvenirNext-Regular;
    src: url(../assets/fonts/AvenirNext-Regular.otf);
}

@font-face {
    font-family: AvenirNext-Demi;
    src: url(../assets/fonts/AvenirNext-Demi.otf);
}

@font-face {
    font-family: Garamond_Regular;
    src: url(../assets/fonts/Garamond-Regular.ttf);
}

$primary-color: #8dc711;
$white: #ffffff;
$black: #000000;
$grey-background: #fafafa;

$AvenirNext-Regular: AvenirNext-Regular;
$AvenirNext-Medium: AvenirNext-Medium;
$AvenirNext-Demi: AvenirNext-Demi;
$Garamond_Regular: Garamond_Regular;

$mobile-width: 480px;

$susy: (
    columns: 12,
    gutters: .41,
    math: fluid,
    );

@import "_workshop";
@import "_blog";
@import "_dashboard";
@import "_about";
```

Figure 3.4 Susy snippet 2

Uploading Process Flow





** Title of the Thesis, Location of the Project, Year of Doing Thesis etc.

Figure 3.5 Uploading Process Flow
Figure drawn using the draw.io tool.

- The user clicks on upload button.

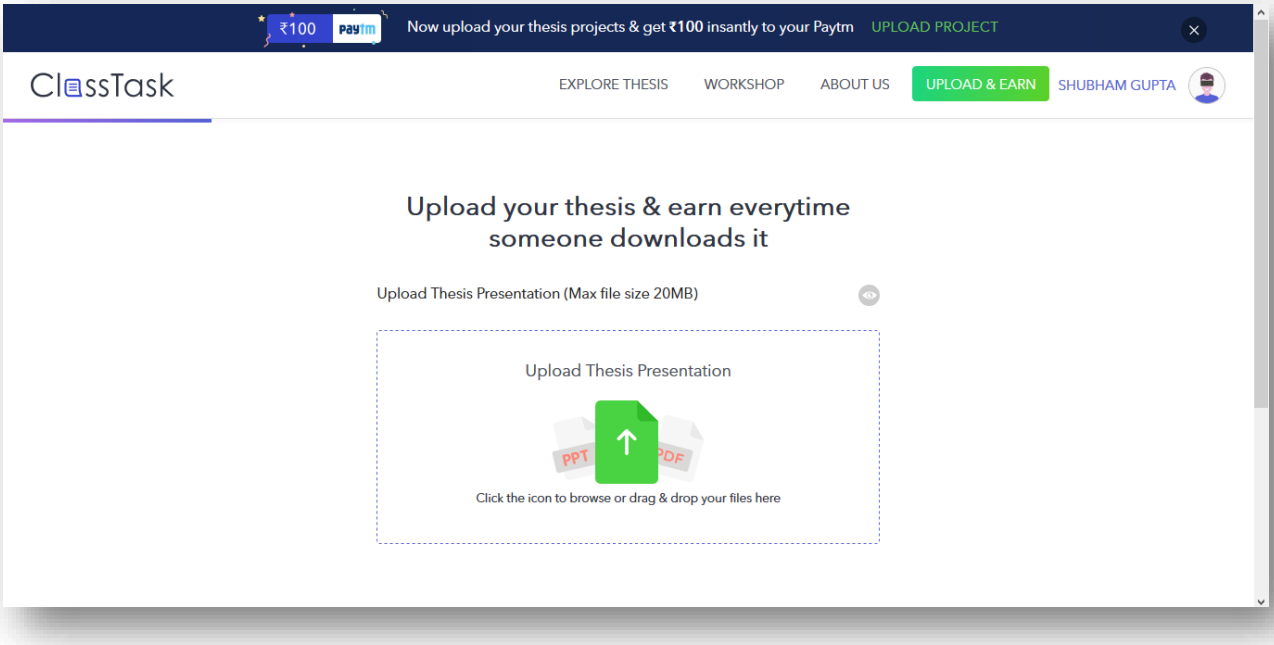


Figure 3.6 Thesis presentation upload page

- The user selects the presentation file or drags the presentation file in drag and drop box.
- The file is verified, as the file of the format .pdf/.ppt is only supported. The below picture depicts the error as I tried uploading a word file here.

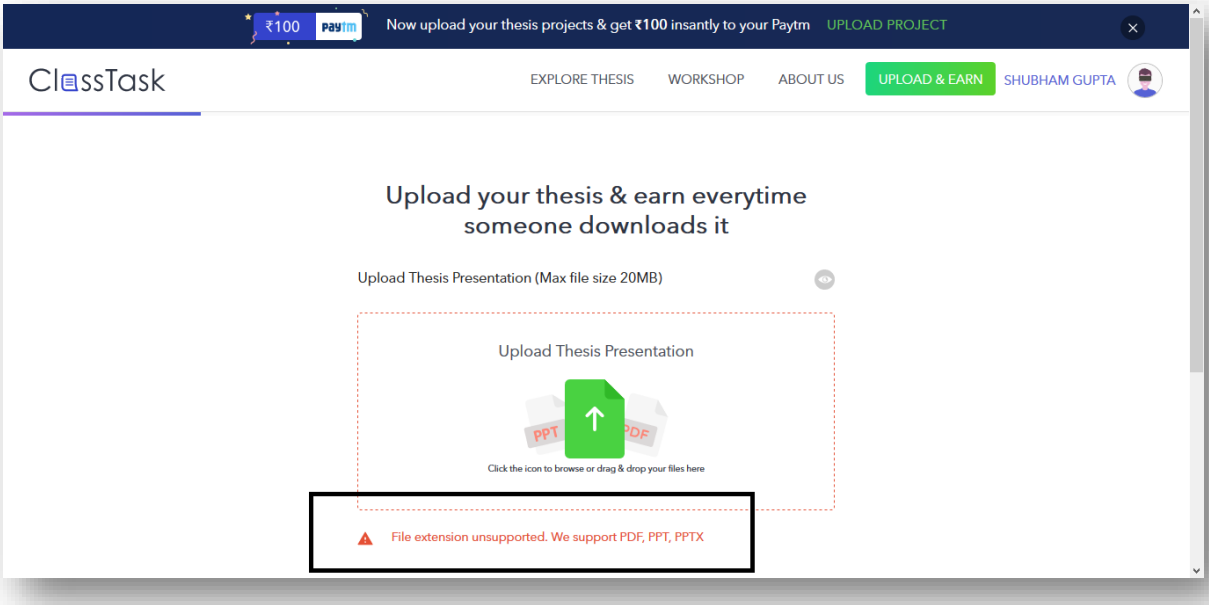


Figure 3.7 Extension verifying for .pdf/.ppt

- The user adds the price tag.

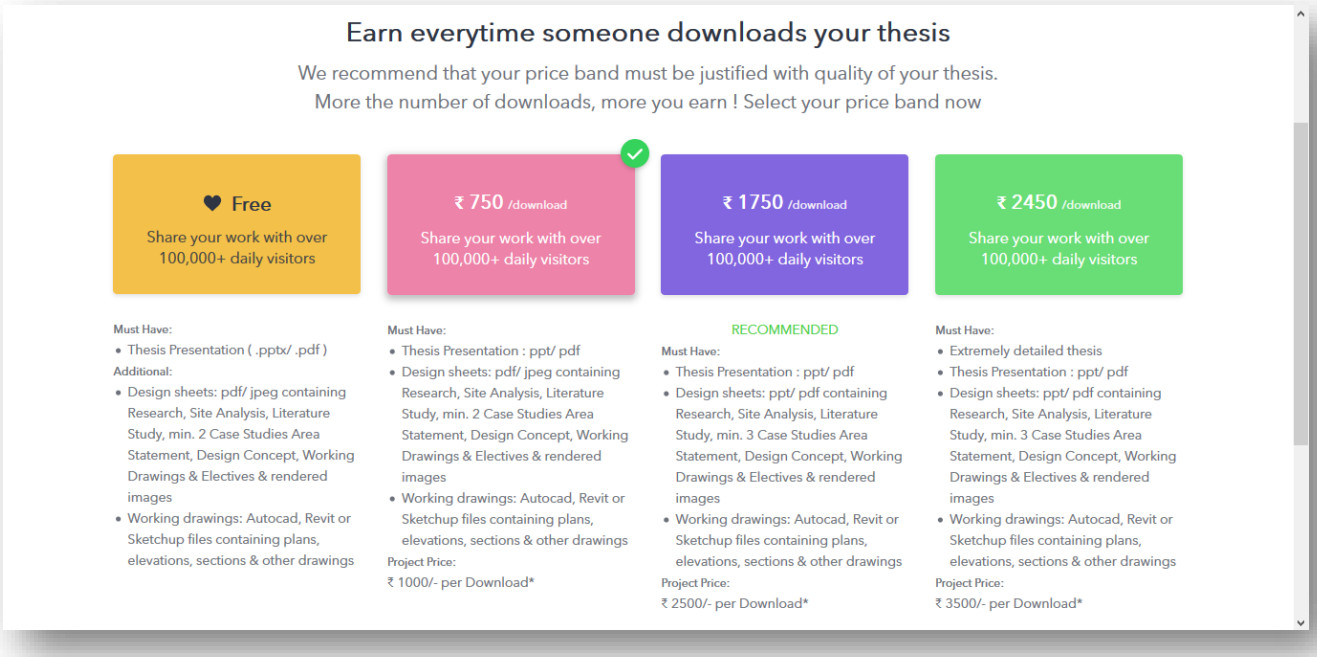


Figure 3.8 Price selection page

- The user uploads the Thesis report files.

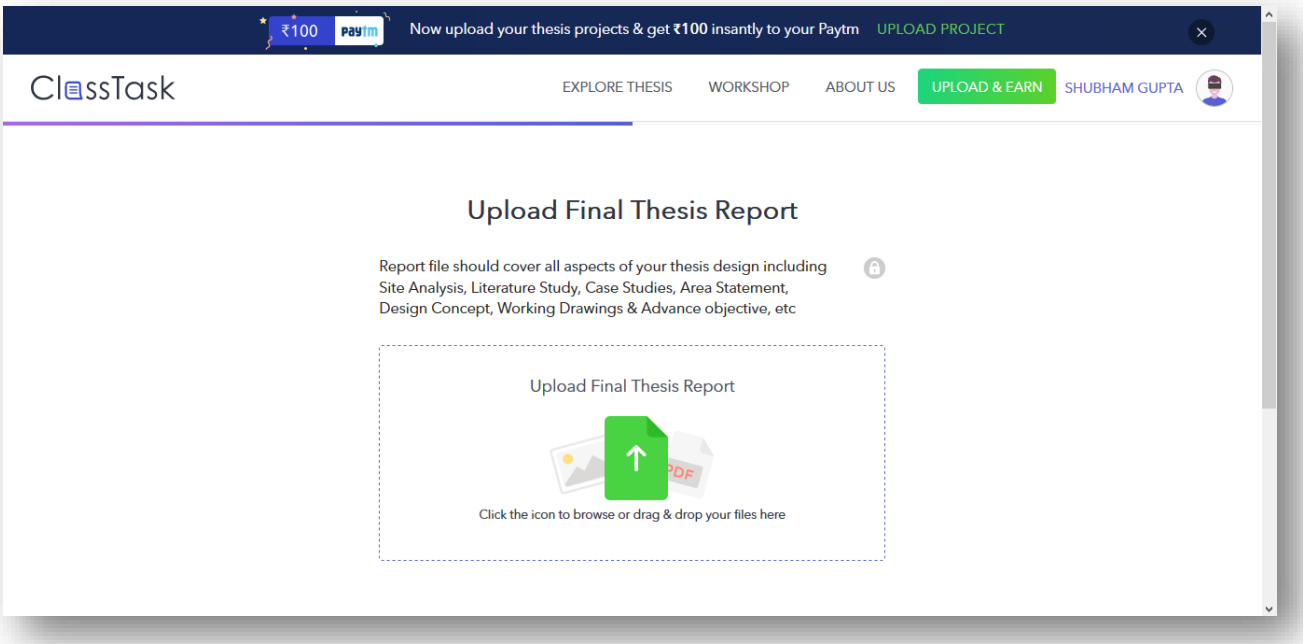


Figure 3.9 Uploading final thesis report page

- The file is verified, as the file of the format .pdf/.doc/.docx is only supported.

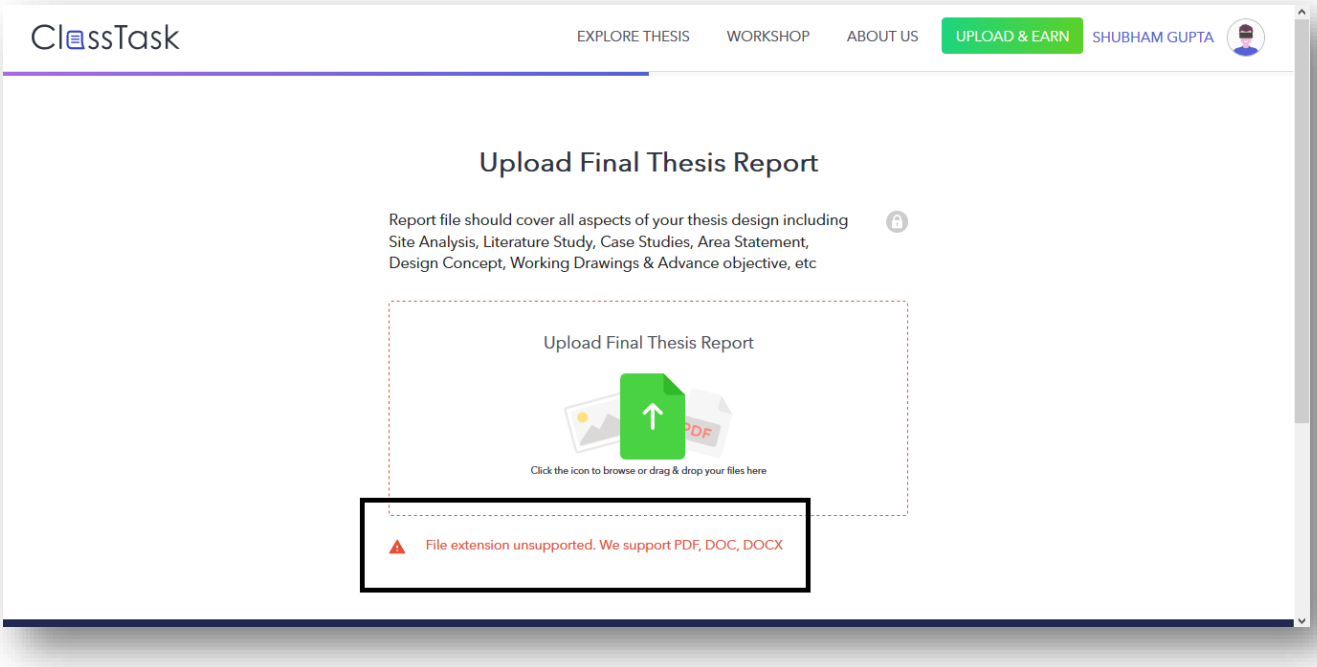


Figure 3.10 Extension verifying for .pdf/.doc/.docx

- The user uploads the Design sheets and renders files.

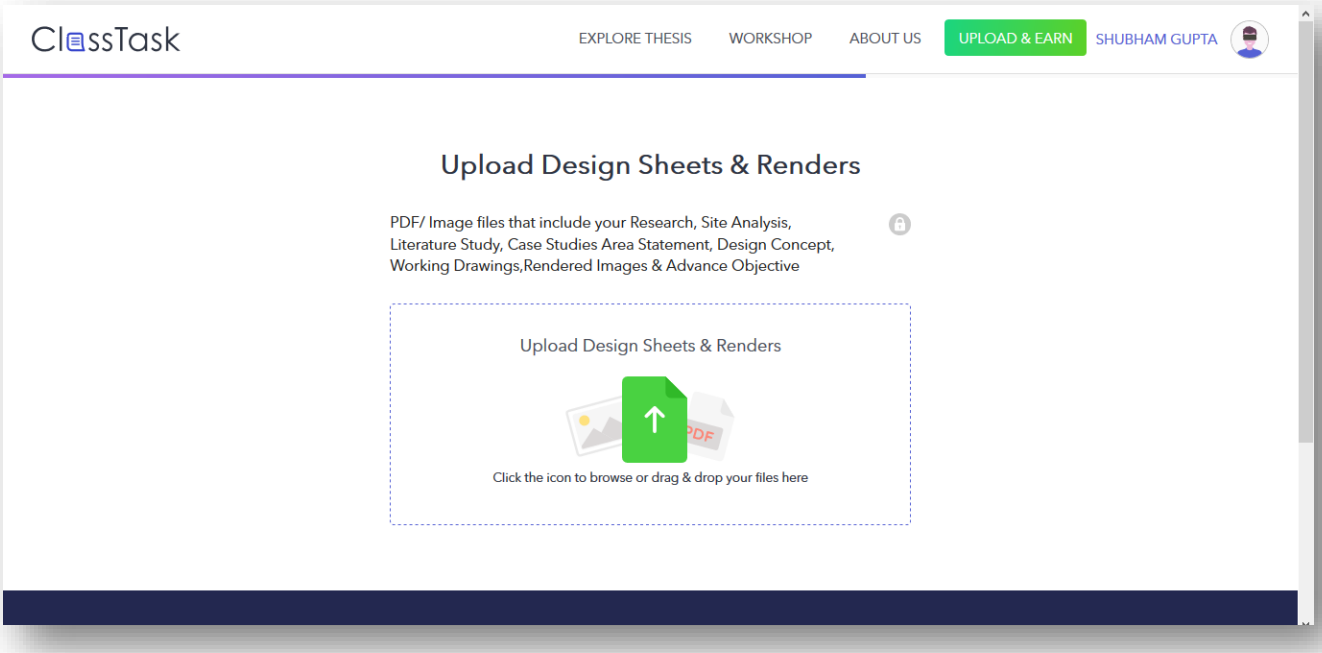


Figure 3.11 Uploading Design Sheets & Renders page

- The file is verified, as the file of the format .pdf/.png/.jpeg/.jpg is only supported.

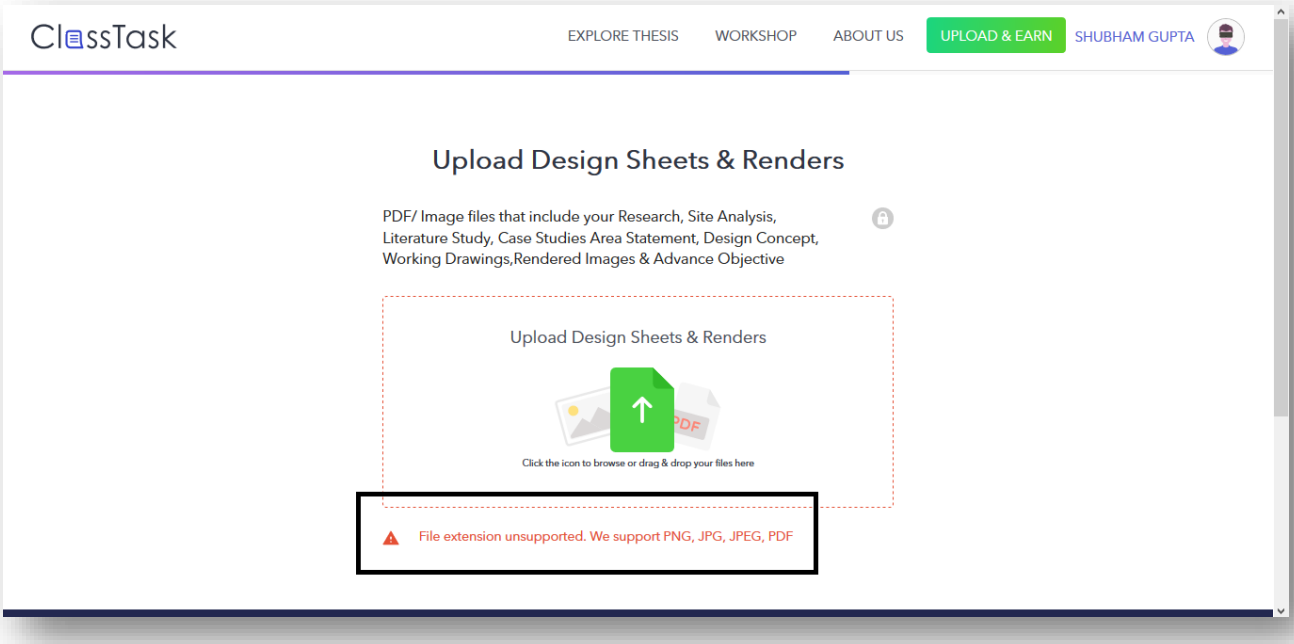


Figure 3.12 Extension verifying for .pdf/.png/.jpg/.jpeg

- The user uploads the Autocad/ Revit/ SketchUp files.

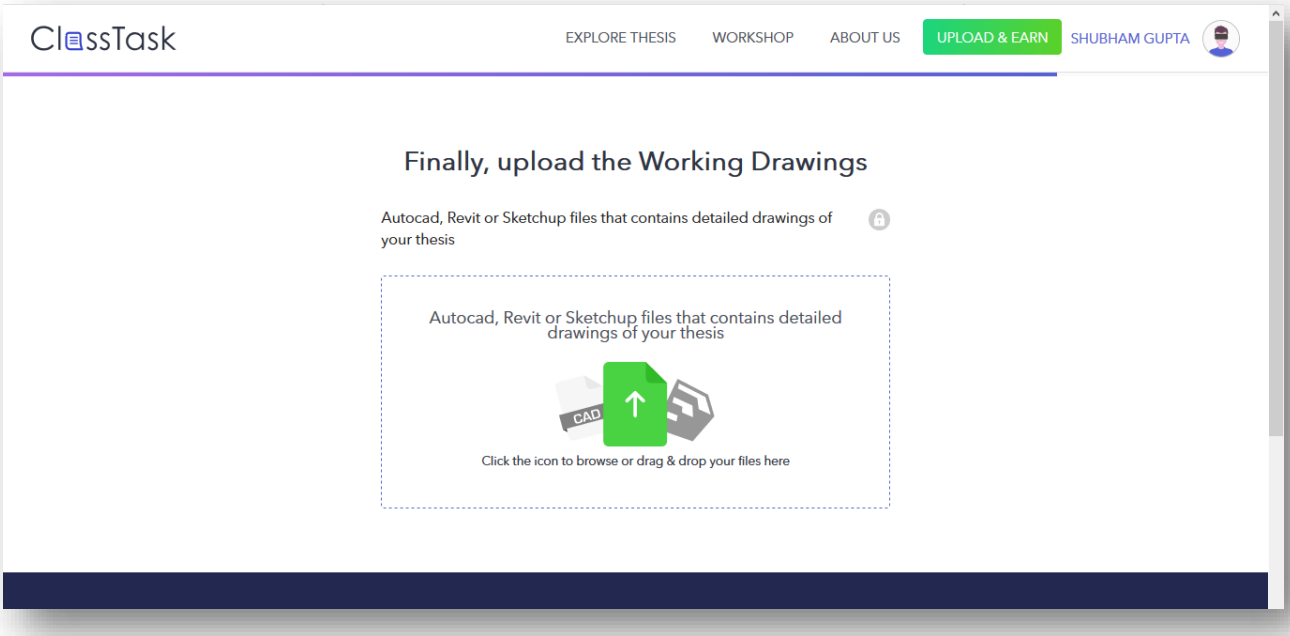


Figure 3.13 Uploading Work Drawings page

- The file is verified, as the file of the format .dwg/.rvt/.rfa/.dxf/.skp is only supported.

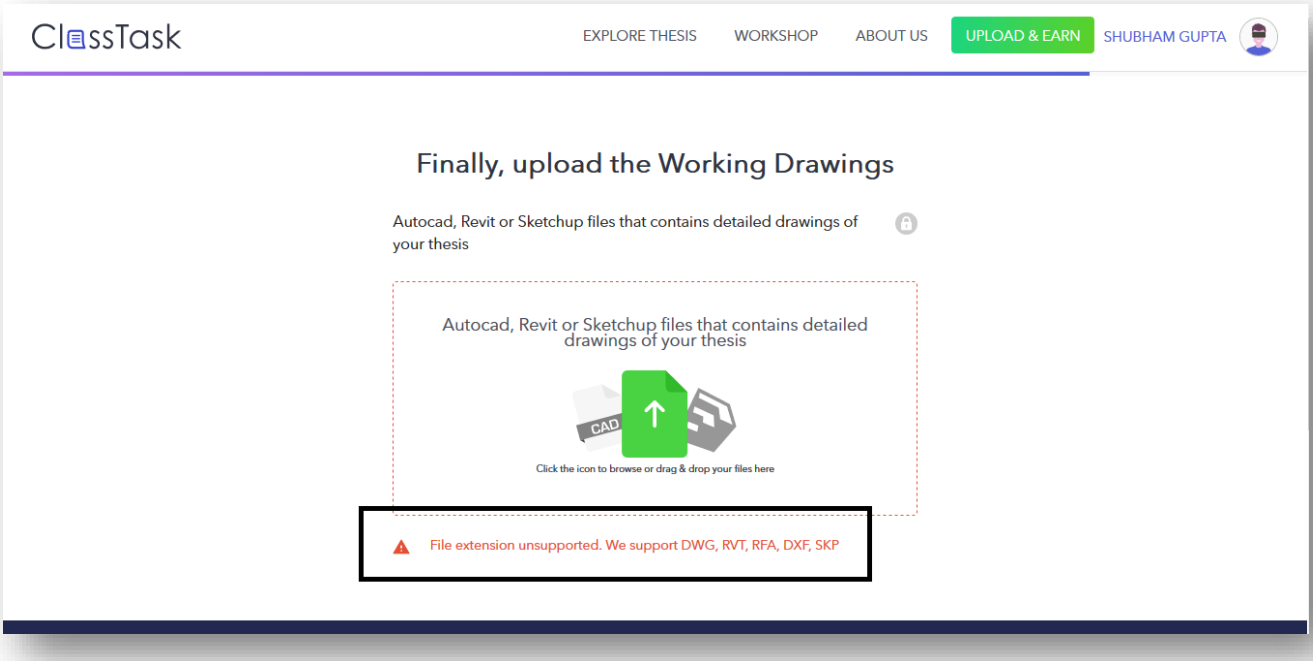


Figure 3.14 Extension verifying for .dwg/.rvt/.rfa/.dxf/.skp

- The user uploads the cover image.
- The user fills up other important detail required.

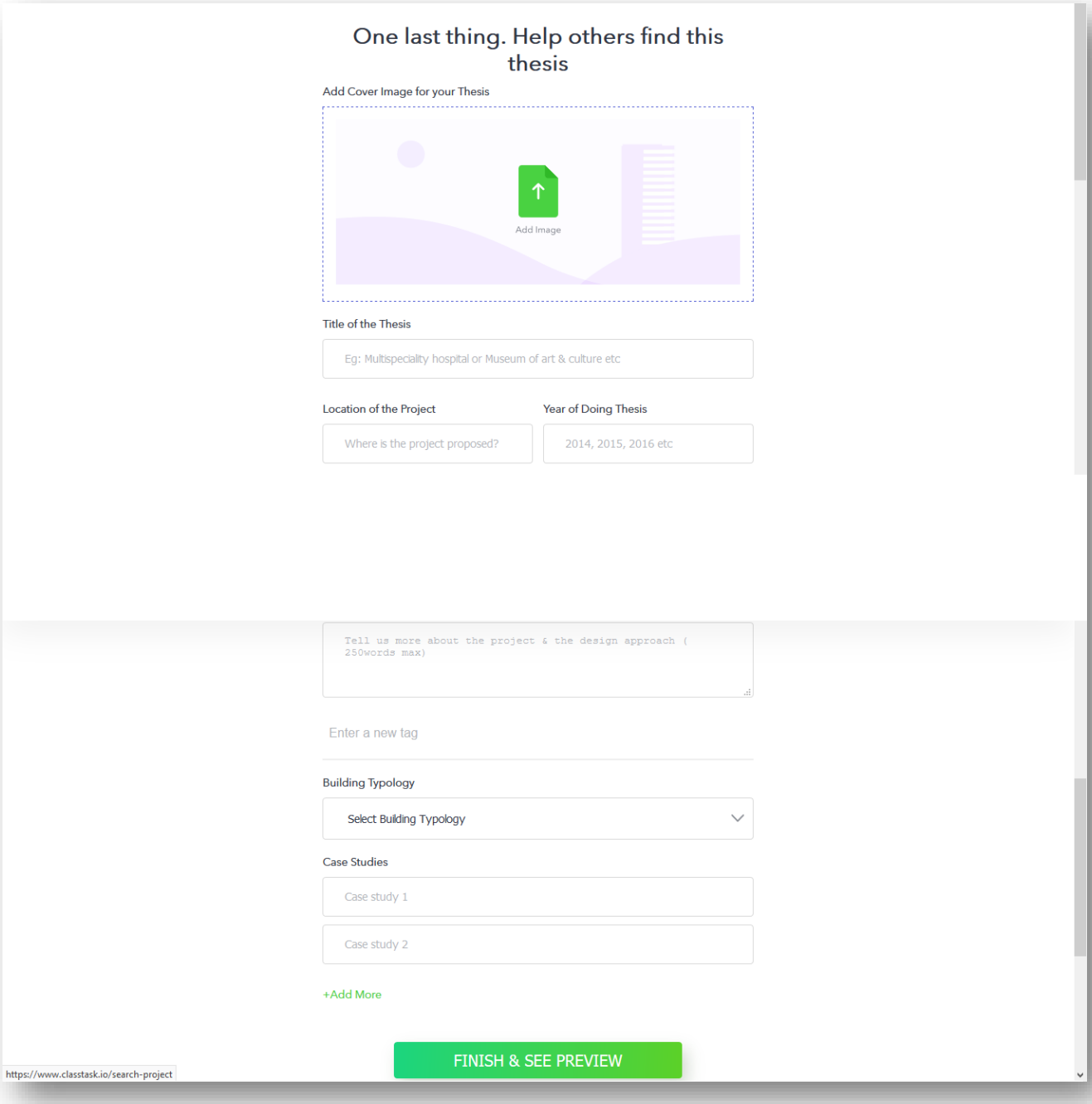


Figure 3.15 Cover picture and other essential details uploading page

- The thesis gets uploaded and is held for the review.

User-login

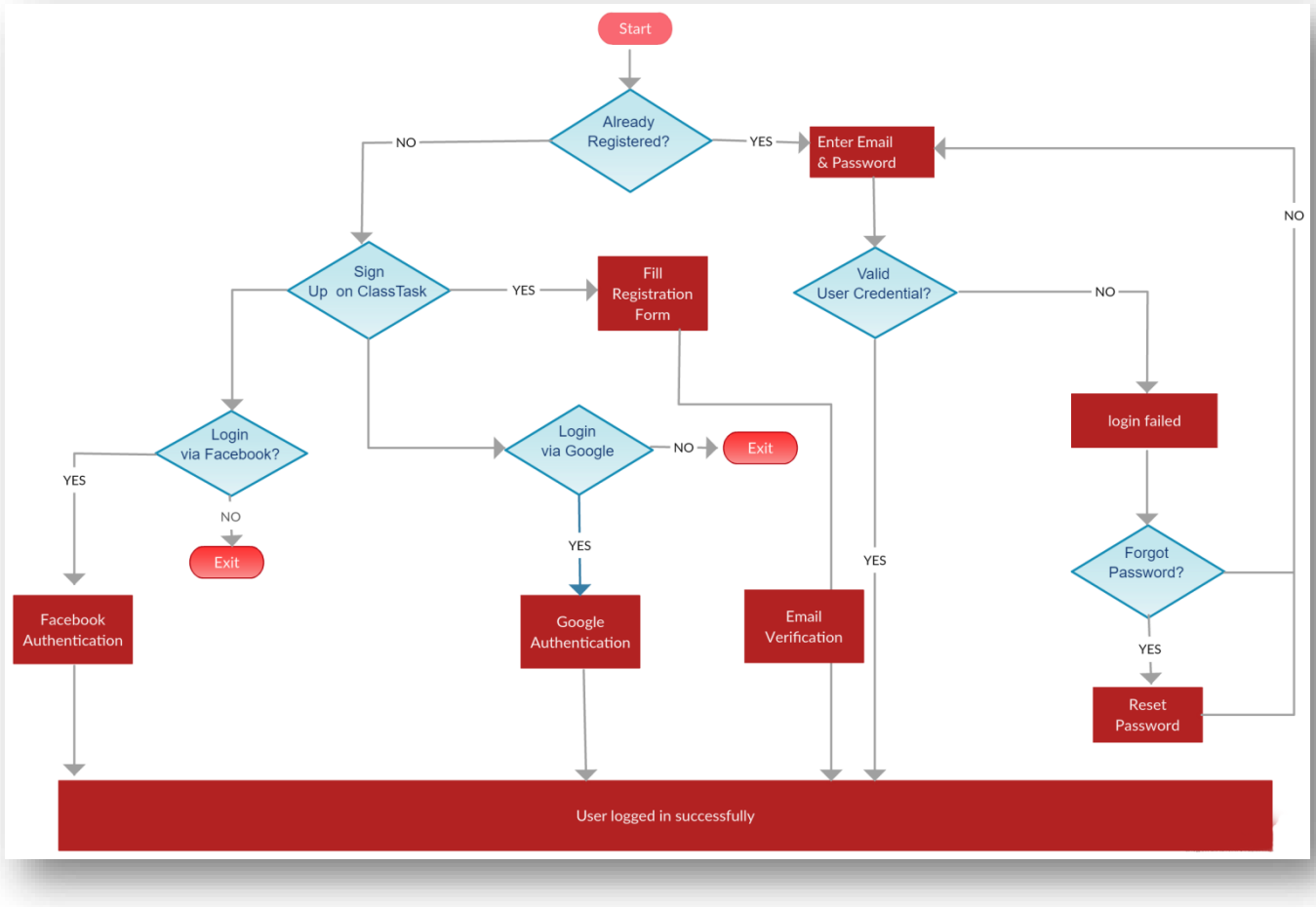


Figure 3.16 User-login Flow diagram

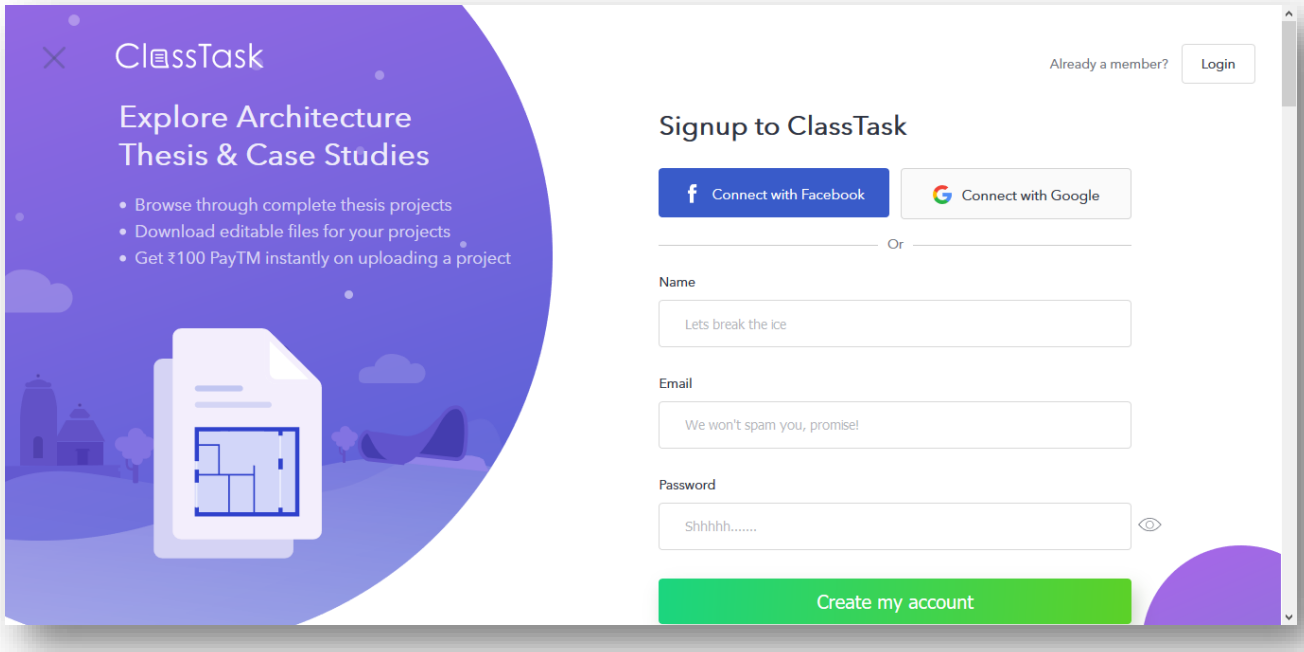


Figure 3.17 The login/ Sign Up page.

Payment Gateway

The approved thesis are available for the downloading purpose by the users of which some are paid according to the price set by the user who has uploaded the thesis project. The payment system has been developed using a Razorpay API. The interface for payment gateway is as follows.

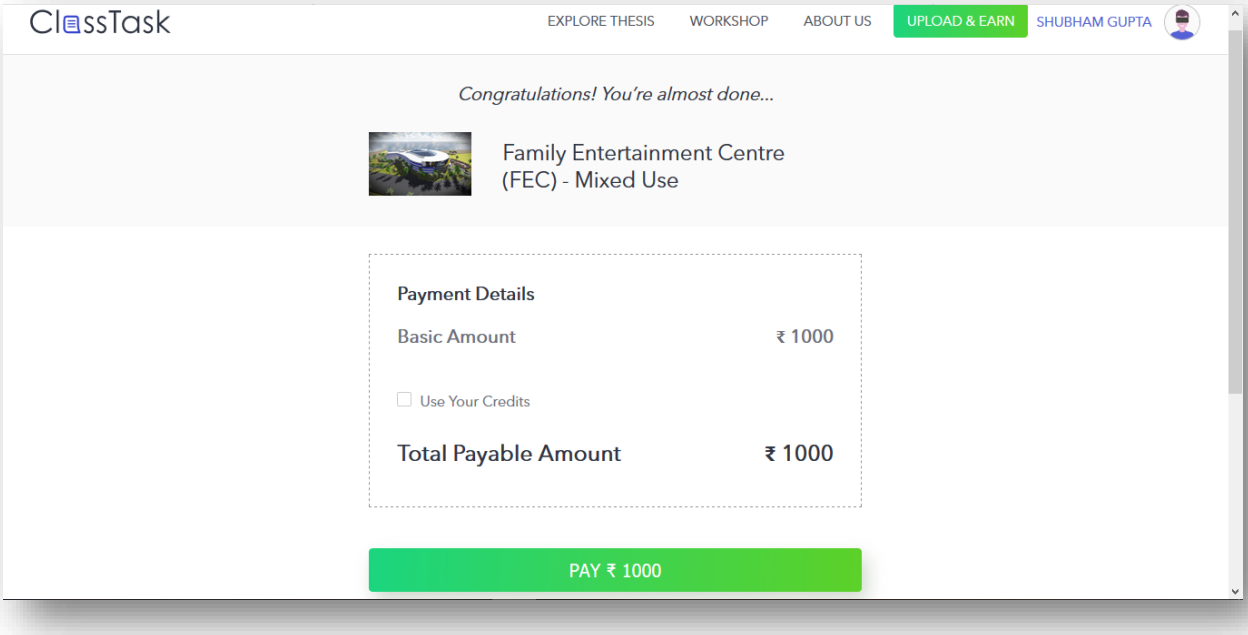


Figure 3.18 The payment page.

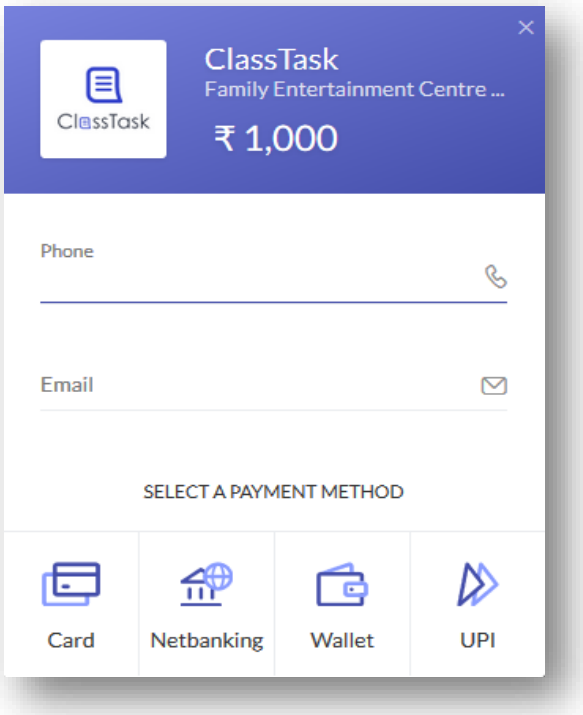


Figure 3.19 Razorpay Payment Gateway

The JavaScript code for Razorpay API

```
<button id="rzp-button1">Pay</button>
<script src="https://checkout.razorpay.com/v1/checkout.js"></script>
<script>
var options = {
    "key": "YOUR_KEY_ID",
    "amount": "2000", // 2000 paise = INR 20
    "name": "Merchant Name",
    "description": "Purchase Description",
    "image": "/your_logo.png",
    "handler": function (response){
        alert(response.razorpay_payment_id);
    },
    "prefill": {
        "name": "Shubham Gupta",
        "email": "test@test.com"
    },
    "notes": {
        "address": "Hello World"
    },
    "theme": {
        "color": "#F37254"
    }
};
var rzp1 = new Razorpay(options);

document.getElementById('rzp-button1').onclick = function(e){
    rzp1.open();
    e.preventDefault();
}
</script>
```

Conclusion and Results

The website is functional and can be found on www.classtask.com currently the website has following features.

- The website home page with various redirection buttons.
- The login/sign up portal page.
- Various thesis and report uploading processes.
- The Razorpay payment gateway implemented.

References

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