

WEB APPLICATION FOR SURVEY AND PUBLIC OPINION

BY

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

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APPROVAL

This Project is titled “**Web Application for Survey and Public Opinion**”, submitted by **Md. Abdullah Al Mehedi**, ID No: **212-15-4168** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 16.07.2024.

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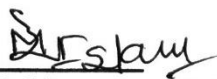
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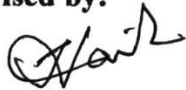
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I hereby declare that, this project has been done by **Md. Abdullah Al Mehedi**, ID No: 212-15-4168 under the supervision of **Dr. Sheak Rashed Haider Noori, Professor & Head, Department of CSE**, Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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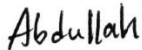
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ABSTRACT

Survey generates information and that is absolutely useful data. This project is built from the urgency of providing a good reliable platform to operate the survey in very basic level and also offer to some useful feature which is really required in real life. It could not take part any technical survey, but it allows the social survey like public opinion type. When I begin the development of this application then, I add some necessary and some unique features into the application. The necessary feature is survey create, user registration, user login, export survey result to excel sheet, added dedicated user dashboard and admin dashboard and some other also. In admin dashboard admin can manage the survey request, review the survey request, delete survey and also approve or reject survey. But the unique or key feature that create difference from other survey tools, these feature which I implement into the application they are ‘Voice Recognition: for Reading the question text by device itself and respondent can select the option by voice command’, ‘Real Time Stat Visualization: It shows the others response as percentage in a pie chart on every particular question, it helps participant to make decision’, ‘Enhanced Question and Option Suggestion: It helps during creation of survey question and option by suggesting full question or word’, ‘Survey Validation: I implement survey validation by participant limit and survey end date, it provide faster response from audience’, and lastly ‘Using Next.js and Firebase: Next.js is a latest framework based on React, it have many benefit. It has built in routing system so that to design and develop the navigation system are more efficient and comfortable for developers. It has also Enhanced Search Engine Optimization and It rendering as Server side, and for using react component base web development tool it load more and more faster’, And firebase is a self-hosted backend developed by google, it provide many facilities like provide google analytics, shows database health and more important it provide high level security.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The title of our project is web application for survey and public opinion. Every website has its unique name for its identity and for this reason we give the name of the application is quickSurvey.

A day was existing when we do things manually, not dynamically. Such as we write essay by hand, work something without helps of machine, send letter instead of mailing. But now days we work many things smartly. As I mentioned many things are already go under automation or under the modern technology. Like that survey of social and technical things are already go for modernization. Developers are doing works for providing the best environment to the surveyors and the participants of the surveys. For modernization of this survey method or tool of collecting data are very important for now. Because people are gradually use to the online technology or digitalization.

So, for that purpose we need to develop an application system for all section of people to fulfill their survey requirement, if it match with their needs with the workings of the application. We are hopeful that it will provide service to all general people and also different discipline because its basic service providing nature.

1.2 Motivation

In recent days, technological advancement is growing rapidly, with every sector introducing different types of advanced technology. Surveys are a powerful tool for gathering opinions and making informed decisions, but I believe these tools also need development to be more useful for the audience. There are also many sector in this tools that would need to be improvement. If it implement the development rapidly it will be a good sector to provide survey operation to the people.

My goal is to create a survey platform that's clean, intuitive, and easy to use, so anyone can access it, no matter their technical skills, while incorporating some advanced technological improvements. Driven by this vision, I am motivated to create a survey application that meets the needs of users looking for functionality, technology, features, and ease of use.

1.3 Objective

We know there are an objective would be present in every project. As every project our work also has objectives. The objectives of this particular project mentioned in the below:

- Make a website that's easy for surveys
- Introduce new technology into the website along with new feature
- Make surveys run smoother
- Reach more people when operating survey
- Admin checked then release survey for better security and avoiding controversy.
- To make sure the survey data is correct and reliable
- Helping users to understand survey data, and make a good decision
- Give more security
- Provide good working environment
- Reach more or more participants

If we are able to do all of this, we hope to make a website that's really helpful for arrange a good survey. It should meet the needs different people and help them collect, understand, and use data.

1.4 Expected Outcomes

Our project aimed to create a web app that makes managing surveys easy and effective. Here's what we achieved.

- Easy-to-use web app
- Smooth survey process

- Engaging more people
- Ensuring produce quality data
- Provide better security
- Improving technical and managerial skill

These are the expected outcome that we wish to achieve.

1.5 Project Management and Finance

Project management are given below:

- Ready project objective, goal and project scope.
- Divide the project is some part and develop and solve them step by step.
- Use Agile methodology to testing and updating.

1.6 Report Layout

We know the project organization structures the report. So, we need to define the structure of the project in below:

The report structure of this project is very simple. We make the report of the project with seven chapters. They each describe their particular topic.

Chapter 1

Title is Introduction and it consists for describing introduction, motivation, objectives and other criteria.

Chapter 2

Title is Background and it describe terminologies, related Works, comparative analysis, scope of the problem and Challenges.

Chapter 3

Title is Requirement Specification that consists of requirement collection and analysis, use case modeling and description, logical data model and design requirement.

Chapter 4

Title is Design Specification and the chapter contains front-end design, back-end design, interaction design and user experience (UX) and implementation requirements.

Chapter 5

Title is Implementation and it cover the full implementation of the project.

Chapter 6

Title is Impact on Society, Environment and Sustainability consists of impact of society, impact on environment, ethical aspects and sustainability plan.

Chapter 7

Title of the chapter is Conclusion and Future Scope. It has two topic and they are discussion and conclusion.

CHAPTER 2

BACKGROUND STUDY

2.1 Terminologies

Some technologies and term are used in this project. They are mention in table in below:

- **Web Application:** It is an Interactive program that uses web browsers and web-based technology to render the interface and provide the functionality.
- **Frontend:** That part of the website user can directly interact is known as frontend of the website. Other way, we can say that, frontend is user interface that give user to interacting facility is called frontend.
- **Backend:** The part of website which manages server side and interaction and other operation is known as backend. It would be intrigate with the frontend of the website.
- **Database:** Collection of data that stored in cloud storage. Most important element of the website. Absence of it we cannot show any data in the site. There are many type of database are available like MySQL, Maria dB, Mongoddb, Orient, SQLite, firebase real-time database etc.
- **Firebase:** A platform that developed by google for providing many type of services like authentication, database support, payment gateway with stripe etc.
- **React:** React is a JavaScript library developed by Facebook. It is a content based JavaScript library. Where the web page has no need to refresh. If developers make a component, it can reuse in required page. As example, if make a sidebar component, then no need to make another sidebar component for other page, just import the component is enough.
- **Next.js:** Next.js is a framework based on react developed by Vercel. It has several facility, like enhanced search engine optimization, server side rendering, built in routing and so on.

- Survey: Survey is a tools to gathering public opinion and thoughts for make or convert statistical data or information and it is very important information.
- This kind of statistical information need in the business, dataset collection, artificial intelligence training, make decision, experiment, industrial work, experiment, analysis, get feedback and response.
- There are some also terminologies are exists like the functionalities into the website. I also discuss them in the below:
- Dashboard: Dashboard is a page where user and admin monitor and manage their activity. There are two different dashboard are exist in a web application. They are Admin dashboard where admin see the activity and also manage the necessary action if needed. Then the user dashboard where user can see the activity of them.
- Authentication: In recent times, authenticate the user is a very important part of the system. Manage user information and authenticate them as they are the registered user of the system it is important. But in our system, registered user and also unregistered user are important.
- Deploy: Make the application available for the user. For that it need to publish in the online by hosting the site.
- Vercel: Vercel is developer company who developed the next.js and it also provide the facilities like deployment of the site into the online.
- Real-Time Stats: It is a mechanism that show the updated of stats if any changes occur in the database for response of participants. It has many benefits. We implement that technology for ensure that the user can get help form it during make response.
- Voice Recognition: It is a technology that capture the voice command and process it then take necessary action.
- Suggestion Tools: During creation of survey form, the website suggest surveyor question and word.

2.2 Related Works

Here I mentioned some related works.

- Qualtrics
- QuestionPro (Free, Paid)
- SurveyMonkey
- QuickTapSurvey
- Checkbox Survey
- SurveyPocket (Free, Paid)
- Google Forms

2.3 Comparative Analysis

In below I make a comparison of related existing work of this survey topic. It would be cover the name, services they offer, service type, developing technology though most of them are not reveal their technology but I try to cover out them, customization and customer support.

Table 2.1: Comparative analysis with previous work

Site Name	Services Offer	Service Type	Developing Technology	Customization	Customer Support
Toluna [1]	Invitation-only survey panel, Paid surveys for members, Opportunities for product testing.	paid	Proprietary technology/Not an open source	Branding and theme customization.	Through email and online help resources.
Pinecone Research [2]	Invitation-only survey panel, Paid Opportunities for product testing. Emphasis on privacy.	Paid	Proprietary technology/Not an open source	Limited customization options.	Limited customer support options.

Opinion Outpost [3]	Paid surveys, Points system, User-Friendly interface, Diverse survey opportunities and Community engagement.	Paid	Proprietary technology/Not an open source	Limited customization options.	Through email and online help resources.
Prize Rebel [4]	Rewards points for completion, Diverse survey opportunities, Paid service, Good UI.	Paid	Proprietary technology/Not an open source	Limited customization options.	From email and online help resources.
Marketagent [5]	Provides paid surveys, rewards points for completion, targeted audience selection, reporting, provide bonus points, offers widget, Challenges, Chance to win the rewards and utilize them when need.	Paid	Proprietary technology/Not an open source	Limited customization options.	By email.
Google Forms [6]	Theme customizations, File upload, Reporting and analytics, split a form into sections, quiz features, Share the form, Collaborate on forms, Language of the form.	Free	Not specified (likely various web technologies)	Basic customization options such as themes and colors.	Limited customer support options.
MyPoints [7]	Offers paid surveys, rewards points for completion, cashback for online purchases, and a	Paid	Not specified	N/A	For survey creation and management.

	variety of redemption options.				
Qualtrics [8]	Customizable surveys with various question types, Advanced survey logic and branching, Rich media and multimedia support, Collaboration tools, Real-time analytics and reporting, Integration with other software and platforms, , Security and compliance features for data protection, Scalability for large-scale survey projects.	Paid	Proprietary technology/Not an open source	Allowing users to create highly customized surveys with branding.	Through email, phone, live chat, article.
Zoho Survey [9]	Variety of question types, Easy-to-use survey builder with drag-and-drop functionality, Multi-language support.	Paid	Not specified (likely various web technologies)	Allowing users to personalize the appearance of their surveys.	Through email, phone, and online help resources
QuestionPro [10]	Customizable surveys, Advanced logic and branching, Real-time reporting, Mobile-friendly design, Collaboration tools, Integration options, Panel management, Data security, Branding customization.	Paid	Proprietary technology/Not an open source	Offers extensive customization options including branding, themes, and custom templates.	Through email, phone, and live chat, online help resources.

LimeSurvey [11]	Customizable surveys, Multiple question types, Advanced survey logic, Real-time analytics, Mobile-responsive design, Collaboration tools, Integration options, Panel management, Data security, Open-source framework.	Paid	PHP, MySQL	Allowing users to create highly customized surveys.	Through email and online help resources.
Survey Monkey [12]	Customizable surveys, Various question types, Analytical tools, Collaboration options, Integration capabilities, Mobile-friendly design.	Paid	Proprietary technology/Not an open source	Provides a range of customization options, including branding, themes, and templates.	Through email and online help resources.
Checkbox Survey [13]	Customizable surveys, Advanced question logic, Real-time reporting, Mobile-friendly, Collaboration features, Integration options.	Paid	Proprietary technology/Not an open source	Provides customization options for branding and themes.	Through email and online help resources.
Survey Methods [14]	Customizable surveys, Advanced question types, Analytics and reporting, Mobile compatibility, Collaboration tools, Integration capabilities.	Paid	Proprietary technology/Not an open source	Provides customization options for branding and themes.	By email, phone, and online help resources

Survey Pocket [15]	Mobile survey app, Offline data collection, Customizable surveys, Real-time reporting, GPS tracking, Photo and audio capture.	Free	Proprietary technology/Not an open source	Offers basic customization options for branding.	Support through email and online help resources.
QuickTap Survey [16]	Mobile survey app, Offline data collection, Customizable surveys, Real-time reporting, GPS tracking, Integration options.	Paid	Proprietary technology/Not an open source	Provides customization options for branding and themes.	Offers support by email, phone, and online help resources.

Some other comparison for feature and type of existing works are given below:

Table 2.2: Extended Comparative analysis with previous work

Site Name	Login Type	Integration Capabilities	Mobile Responsiveness	Data Analysis/Reporting
Toluna	Email-Password	Moderate	Yes	Yes
Pinecone Research	Email-Password, SSO	Limited	Yes	Limited
Opinion Outpost	Email-Password	Limited	Yes	Limited
Prize Rebel	Email-Password	Limited	Yes	Limited
Marketagent	Email-Password	Moderate	Yes	Yes
Google Forms	Email-Password	Limited	Yes	Limited
MyPoints	Email-Password	Limited	Yes	Limited
Qualtrics	Email-Password, SSO	Extensive	Yes	Extensive
Zoho Survey	Email,Password	Moderate	Yes	Moderate

QuestionPro	Email-password	Moderate	Yes	Moderate
LimeSurvey	Email-password	Limited	Yes	Moderate
Survey Monkey	Email-password, SSO	Extensive	Yes	Extensive
Checkbox Survey	Email-Password	Moderate	Yes	Moderate
Survey Methods	Email-Password	Moderate	Yes	Moderate
Survey Pocket	Email-Password	Limited	Yes	Limited
QuickTap Survey	Email-Password, SSO	Moderate	Yes	Moderate

2.4 Scope of the Problem

As our main goal is to develop this survey application but here are some key scopes of problem which can we overcome:

- Long time to take a survey
- High subscription cost
- Complex navigation system
- Data are not enough accurate

2.5 Challenges

Technologies changes day by day. It is hard to cope up with the update and make a useful, user satisfying web application. There are several challenges are come out in the development phase. Collection of user requirements, design the user interface and UX, develop and implement the frontend design and then intrigate the sequential backend process is not easy. It can be challenging and difficult also. But by following the process of development in proper way we can be achieve our desired goal. When decided to go for development of web application on this particular topic, it need to find out the objective

and proper necessity of this application in the society. Its requirement, usefulness, objectives and many more element can be find out in very short time. Proper planning of doing is mostly needed when go for a system development. Next come forward to choose the technology in which I can implement the system development work. There are lot of language and technology available to contribute into the development process. I face the challenge to find out the exact language which is suitable for my project. There are some issue to look at. They are the language framework facility, library improvement, proper documentation support, future scope and its contributors designation. By considering these elements I choose the language of JavaScript. Which is more and more popular now because of its facility and library improvement and efficiency which it offers. Now it has tremendous development which is in front of us as React.js and Next.js[21]. After that I face challenge about the ui and database. Most of the people are want a good ui which has proper navigation and it is very interactful to the user as it provide proper frontend facility. For solve the issue I use flowbite and daisyui[20] which is tailwind[19] based component library to implement web design in the application. Then it has a challenge to make full website to mobile, laptop and desktop responsive as small, medium and large screen. Tailwind css framework provide some class to build the element responsive, so I use those class to make it full responsive. To implement database, it would be MySQL, mongodb, Maria dB, Orient etc. It is little bit difficult to find out the proper database technology for the application system and implement it. So that I use here firebase which developed by google and it is self-hosted backend database which is very suitable for beginners. It also provide facility like authentication of the user.

These technological and design based challenges are come during development and planning of the project.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Requirement Collection and Analysis

Here we discuss and analysis about functional and non-functional requirements. Functional requirements describe the specific functions and features that means it tells us how the function works, such as, login, registration, response etc. Non-functional requirements explain the attribute of the application. Performance, usability, security, scalability etc. is the example of the non-functional requirements. When a system plan for developing, it need to discover the requirement of it as its functionality, how it work, where it work, for whom it work and how service it can be provide. So, find out the answer of this question is important and then if we figure out these answer then we can go through with this. Our planning of development are more easy and we have clear vision for that what we are developing and what kind of audience will beneficial for the development.

Now we are sharing in the below two informative table. That are titled as Table 5. Functional Requirement that describes all functional requirement and other titled Table 6. Non-Functional Requirements that describe our projects non-functional requirements.

Table 3.1: Functional Requirement

Requirements	Requirements Description
Informative landing Page	When hit the website URL then user reach the landing page. In the landing page it has just some welcome notes, website icons, and login and register button at the top and learn more button in the middle. By tap learn more button it take the user to an informative page where some important information are contain, which can be useful for users when they survey.

User registration	At landing page at the top right corner register button are located. A popup window is come when user click the button and can register himself/herself to the site with share some basic information.
User login	At top right corner, beside registration button, the Login button are located. If it clicked, same a modal open as registration. In login option we are go for just two ways login. Simple email and password login and login with Google account.
Survey form create	By entering the survey create page user can built survey form.
Invitation to attend the survey	It would be done with the help of e-mail, message on the phone or social media.
Response collection	The application should collect and store responses securely.
Data analysis	Users should be able to analyze survey responses through graphical representations.
User management	Admins have the ability to manage user accounts, roles, and permissions.
Acceptability check	When user create a survey form and submit it to publish for survey operation, the survey form should go for its acceptability checking. During this time user see the state of publishing the form as pending to go online the survey. After admins acceptability checkup it will go online.

Timeframes	Every survey form that go at online, it should have a certain timeframe. After that timeframe the survey are no longer in the operation.
Survey form design	Survey form design is not very colorful. It made of just combination of white and deep gray.
Dashboard management	In dash board, the contents are existing are given below: 1. User information 2. Surveys that user posted in the site. 3. Progress bar of time that indicate how long user stay in the site. 4. User points
Result export into excel sheet	By accessing the survey result page user can export result into excel sheet.
Voice Recognition	To read the question text and answer the question by selecting the checkbox option by voice command it is necessary.
Real Time Analytics	Show the response ratio of other participants into the survey and their response into the percentage. If we visualize the stats during answering the question then they are get help to provide response easily.
Implement Graph	Implement graph into the result and other section is improve understanding of the report or statistics or result. I use in this application pie chart and bar chart and provide good color for the background of these graph.

In above I discuss about the functional requirement which cover the explanation of functional requirements and now I am going to discuss about the non-functional requirements which is describe the performance facility of the application as expected from user. It bring out the discussion of the performance related requirement as we get from user, they want more performance from the software, good usability, scalability, security, compatibility, accessibility and many more. Most important non-fictional requirement is that to run the system smoothly as the audience are easily access and get their desired service without any difficulties and also feel safe during use of the website. We need to ensure that kind of requirement so that we gather the information and store it to the documents. The non-functional requirements is given in the table below:

Table 3.2: Non-Functional Requirements

Requirements	Requirements Description
Performance	The app needs to open fast and react quickly.
Usability	The user interface should be easy to understand and user-friendly, with clear and proper navigation and responsive design for mobile devices.
Security	In login authentication, we should use the Google authentication as log in with Google with the help of firebase auth system. For that we can apply the security of Google standard when login. Overall other security of the site are also maintained. The data of the inside of the site are not go to outside.
Scalability	The application should be able to handle at least enough users and survey responses without compromising performance. It should be not very small platform.

Reliability	The application should be available and reliable, with minimal downtime or errors. We know in website has some error exists. It is not possible to make an error free website. Frontend, backend, server etc. various sector are involved with it. So it is the concern that how much error can be reduced.
Compatibility	It should be compatible with modern web browsers and devices.
Accessibility	The application should be accessible to users with disabilities, following WCAG guidelines.
Legal Compliance	The application should comply with data protection regulations such as GDPR and it need follow the legal rules of the government.

3.2 Use Case Modeling and Description

A use case modeling is a that type of element or thing it describes the advertised functionality of the offering application system. It can describe how user and admin are work in the system. The working of admin and the working of user, their entrance into the application, get service and provide service, relation between the component or entity to admin and user. Suppose admin manage the work as manage the survey and review the survey. Admin also manage the user or participant if necessity comes.

We know every application or system has its own use case. In my application I divide it two sector as they are admin and user. Admin login to the admin panel where they have authority to manage the survey as if need to delete and reject the survey and if it has no problem to accept the survey and publish into the online then approve the survey. On other side the user also login the site as user and can create survey for other user and also outside other participants. They also view the survey and participate the survey and share the

survey link in the other social group or social site for more response. If there are any people here who don't register into the site but want to participate the survey or those people who come from the invite link they are also participate the survey, their response are recorded but they cannot access into the site and cannot use another feature of the system application. application has also some use case. That use case of the web application for survey and public opinion are show in the table no 3.3

Table 3.3: Use case modeling and description

Use cases	Works for	Description of use cases
Sign up	User/Admin	User can register themselves to the website.
Login/Sign in	User	After registration user can login to the website by entering the user ID and password what he input during registration.
Create survey form	User	By entering the create survey page user can create the survey form
Show the survey	User/Admin	By entering the dashboard user/admin can see the survey form and also response the survey.
Circulate survey link and see the result	User	User can circulate the survey link for other user and they can see the survey result in the dashboard.
Survey acceptance	Admin	Admin can accept and deny the survey form.

Export Result	User	User can export result into excel sheet by access the survey result page.
Logout	User/Admin	User and Admin can logout from the application by clicking the logout button.

I am already discussing the use cases of the system in the table 3.3 in the above. There are 3 actor here user, admin and third outside participant. These actor acts multiple use case and these use case has two relationship to each other. The mandatory to do use case before another use case is called include and optional use case are called as extend. Now I mention the use case diagram of this particular web application in the below:

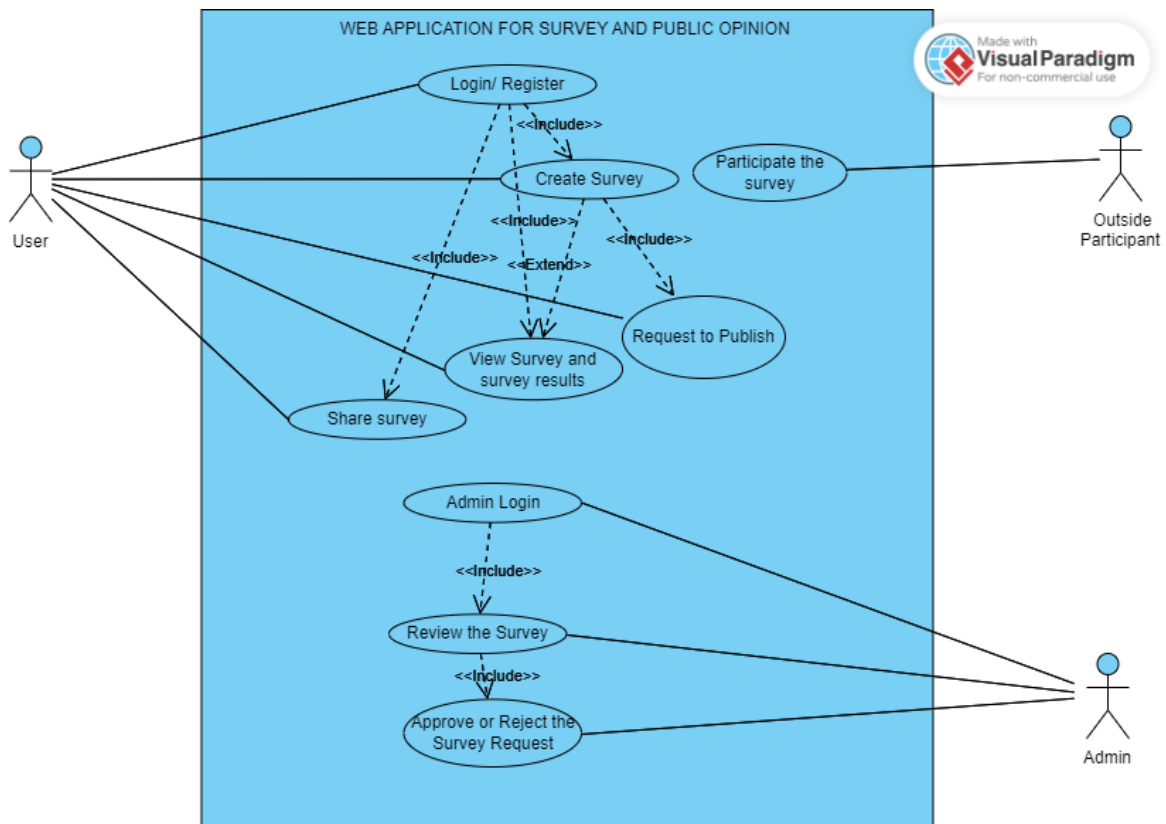


Figure 3.1: Use Case diagram

3.3 Logical Data Model

A logical data model is a thing or element that describe the structure of logical data or data elements and the relationship between them. Generally it mention the how the data will implement in the website and also describe physical database also. To present the logical data model we want to show the data flow diagram. First, we need to divide the entity, process and database.

External Entity:

- Admin
- User

Process:

- Create Survey
- Authentication
- Necessary action and ready survey page
- Showing survey form
- Survey result

Database/ Data storage:

- User Information
- Survey Information
- Result Information

Here we can also use the Entity Relationship Diagram (ERD) which is almost similar the Data flow diagram (DFD). Which is consists of entity, relationship and attribute. That describe the logical data model or data flow process.

The figure of Data Flow Diagram (DFD) is given below:

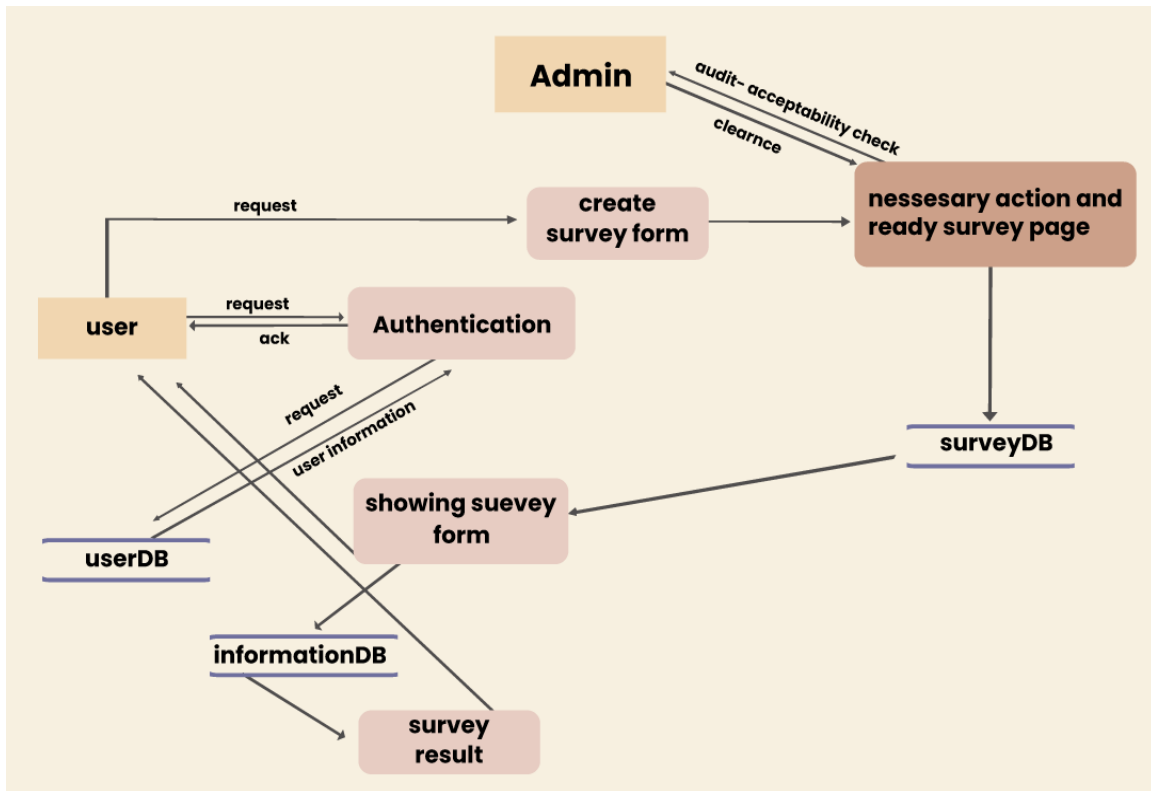


Figure 3.2: DFD level 0

3.4 Design Requirement

Here I mention some design requirements which is necessary for our project:

- Sign up and Sign in the people in the website.
- Homepage management
- Dashboard management
- Survey creation and management
- Participant limit management
- Time limit management
- Result of the survey
- Performance
- Provide Security
- Portability

- Reliability etc.

It is need to build a proper design on front-end and backend and also intrigate them to achieve all of them in the list mention in previous page last section.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Describing Front-End Design

I keep the design simple and minimal. When a website creates for provide service in a particular sector then it has needed some specific UI, which is not be avoided. We are try to keep that specific UI which is necessary for providing a smooth survey experience. Nearly all features which are necessary and some extra unique items are added in the design.

In some part of the frontend design, we take the help of Daisy UI. Daisy UI is a most popular component library based on tailwind CSS. The color theme of the design is mat black and white as we use this theme in the maximum portion of the design.

If we talk about responsiveness of the website, this is well responsive for mobile and desktop. We know many people are in recent times use mobile and they want to do their work with the help of mobile. So, considering this theory, we give more importance to apply responsiveness for mobile and desktop. If it hit @600 pixel in with then it will count as mobile device and if the resolution hit at @1020 pixel then it will response as desktop. But it will responsive also in tablet and other variable resolution device with some small issues also.

4.2 Describing Back-End Design

For the type of website it is, have not need very complex backend design. We design the backend of this website in three parts.

1. User Information
2. Survey Information
3. Survey Result

For User Information,

When user login with google, as a third-party authentication all the information of google user which is provide by google, we get. So, information is stored in the google database and just only apply google authentication by the help of firebase we can get and show information in the website where it needs.

For Survey Information,

We can get survey information when user fill-up these particular input field (Survey Title, Add Question, Add Option [Sub element in each question], Participant Limit and End of the Survey Session. After getting the information by user we store this information in the firebase cloud real-time database.

For Survey Result,

There is an input field(checkbox) in left side of each option. When respondent is checked the checkbox then it will count and the real-time database are storing the real counting number.

Here is the ER diagram of the database:

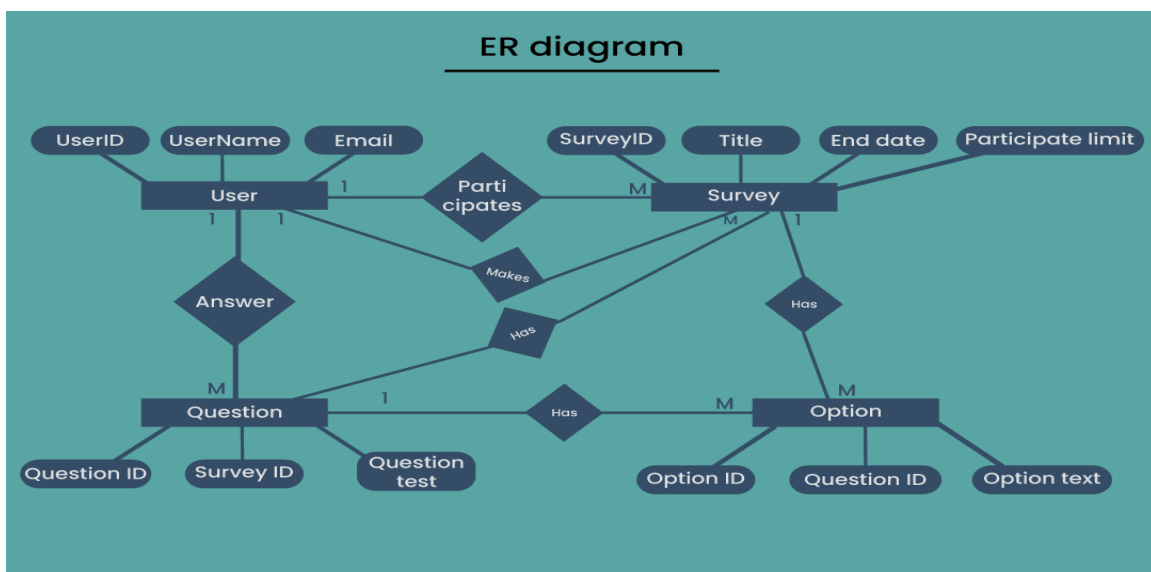


Figure 4.1: Entity Relationship Diagram

4.3 Interaction Design and User Experience (UX)

Interaction and user experience is a crucial part of any system. If a system not provide suitable or user connected interaction design then that cannot hold the user or audience base. So it is important to hold those user who are important for use. Basically all user are important for us. Firstly, if we talk about the user interface then we need to build these kind of interaction design in that user can connect their requirement and get satisfied. It provide the designing the way user interact with the application system and ensuring these interaction are butter smooth, easy to handle, relatable and user friendly. Design the navigation as, if the user go any page then he need to back the previous page. There is need to make a previous button to return back to the previous page. If this button are not exists in the website then user faces difficulties and the impression and performance will be hampered. Then it need to load faster the application during clicking a button and then showing any content. We use here component base web development library. So that it can load very faster, because it don't need to refresh to render any component. Just change the actual content which is need to change and show. So for this not very much thing are need to render from the online. For that the web application load very faster.

If we move the discussion toward the user experience then it will come some factor here. They are the component design, color palate, tools, button and many other thing we use. We try to develop the web site as attractive colored website by using tailwind. Tailwind offers many built in color palate. Pick the correct color for the component is difficult work for us as we are not a ui/ux designer. But I try our best to choose color from the tailwind and hope that it will good looked website and user are satisfied with the design. Then it comes the transition of the component. Some component need to transition effect, user love them if it work properly. I add sidebar where transition effect are working. When click the hamburger menu button then the sidebar slides to the right side and open the menu option and user can see the menu list. Menu list has option to clickable button. These button has named the page name and if click the button it takes the user to the page what write in this button. Add progress bar to the survey response page. The progress bar act as percentage and it functioning 0% to 100%. It calculate automatically and when user response any question then it progress and show the percentage of how many question in the are already

Answered in percentage form. Then in survey participate page I use checkbox to receive the response. If user click the checkbox which is left side of every option then the option will selected as answer and show a good transition effect. The effect also last little amount of time. Every button also has effect when it clicked. If any notice are need to show then we use a color that it can easily attract user because it is important to see the notice for any user. Then in the landing page and in the navigation bar I use logo and quick survey title that has special transition effect as it has rgb effect. I try to maintain the font size appropriately here it is required. That is the briefly discussion of the UX implementation in this web application.

User Activity

1. Survey creation
2. Survey response
3. Circulate survey form link

Admin Activity

1. Approve survey request
2. Reject survey request

Navigation System

1. Landing page
2. Login page
3. Home page
4. Survey creation page
5. Dashboard
6. Profile

Every system has particular flowchart. I also prepare a flowchart for the system to better understandings of the functionality and navigation. This diagram or this system are start from the start block then it move with the conditional way. The figure of the flowchart are given below:



Figure 4.2: Flowchart of the system

4.4 Implementation Requirements

Technological Requirements

1. HTML5
2. Tailwind
3. Firebase
4. Node.js
5. React.js
6. Daisy UI
7. Next.js

Software Requirements

1. Adobe Photoshop
2. Code Editor
3. Google Chrome dev.

4. GitHub

5. Netlify

These mentioned elements are commonly used in the development cycle randomly. But some more also elements are also used in the development phase. Here uses mainly the next.js which is a framework of react. Basically if we want to implement the next.js then we also learn or expert in the react. Tailwind is a css framework which is most popular framework of css right now. It offers many type of customization and built in design based on vanilla css. Other framework is also exist and that is bootstrap. But bootstrap offer less customization and facility than tailwind. For that we get advantage from tailwind and we prefer it for the development. Adobe Photoshop is an image editing or graphics design software. In this project, I need this software to make the template and for report It need to make the different kind of diagram and flow chart.

For coding I use the MS visual studio. It is a good code editor for web development work. Then the Github is a very good website for the developers to store and share their codes safely. Developers have fear to missing the code somehow or need to manage the code local machine to online cloud storage and online cloud storage to local machine. Github offers the facility to do manage the code properly. From Github user can download the code and also upload the code from the local machine by part by part as if they work some part then push in to Github. For that they save their work part by part. It has also some benefit and that is it can provide branching and merging. That is in a project not only single developer work. If multiple developer work in a project, then they need to merge the code of them. So they firstly push their code to the site and then merge the code. Then their code are join and convert the original code. That's why I choose to store my code in the Github.

Then for project show in the online website from it need to deploy the application to any website which provide a link and host the application to the online. There are many website available who provide this kind of service. Some of them are Surge, Netlify, Vercel, Firebase, AWS Amplify, Render etc. I choose Vercel to deploy my application. Because Vercel is a developer company of the next.js which is that language, I use for develop my application.

CHAPTER 5

IMPLEMENTATION

5.1 Database Implementation

We use to store our data in firebase cloud database. The purpose of using firebase Realtime database to show the updated data after any change are occur. Firebase is now popular database with offering distinct features, use cases. Store data as json file. Json file is an array like object which has different data store format but more similar to JavaScript object. We know every object has it properties and properties has its value. To store the object like data into the database then it need to convert to stringify as json format and store into the database. Then if need to show these data to the website then fetch the data from the database and get or do what need by crud operation. CRUD operation is the important term in the database sector. CRUD means create, read, update and delete and that are the most important operation for managing data to the database as inserting, fetching, deleting and modifying. In firebase real time database system it update the change immediately propagated to the website and the data are available to showing. It contains a very good security rules for that outsiders are not allow to access to the database. No outsiders are allow to delete, update or modify any data from the database. Firebase are suitable for real time application, that means those type of application which need to show their data when any change are occur to the website. That element also provide quick database setup to provide database data store service, so any developer need to quick setup the database facility to his project then he can go for the firebase cloud or firebase real-time database. It is designed for quick data synchronization for provide real time data showing capabilities. It has also built in offline support with automatic synchronization when the device come back online and switch on the data of the device. It developed by google so google analytics are available to the developer. If developer need the analytics then he can import the analytics data from firebase. The main structure of the database is given below:

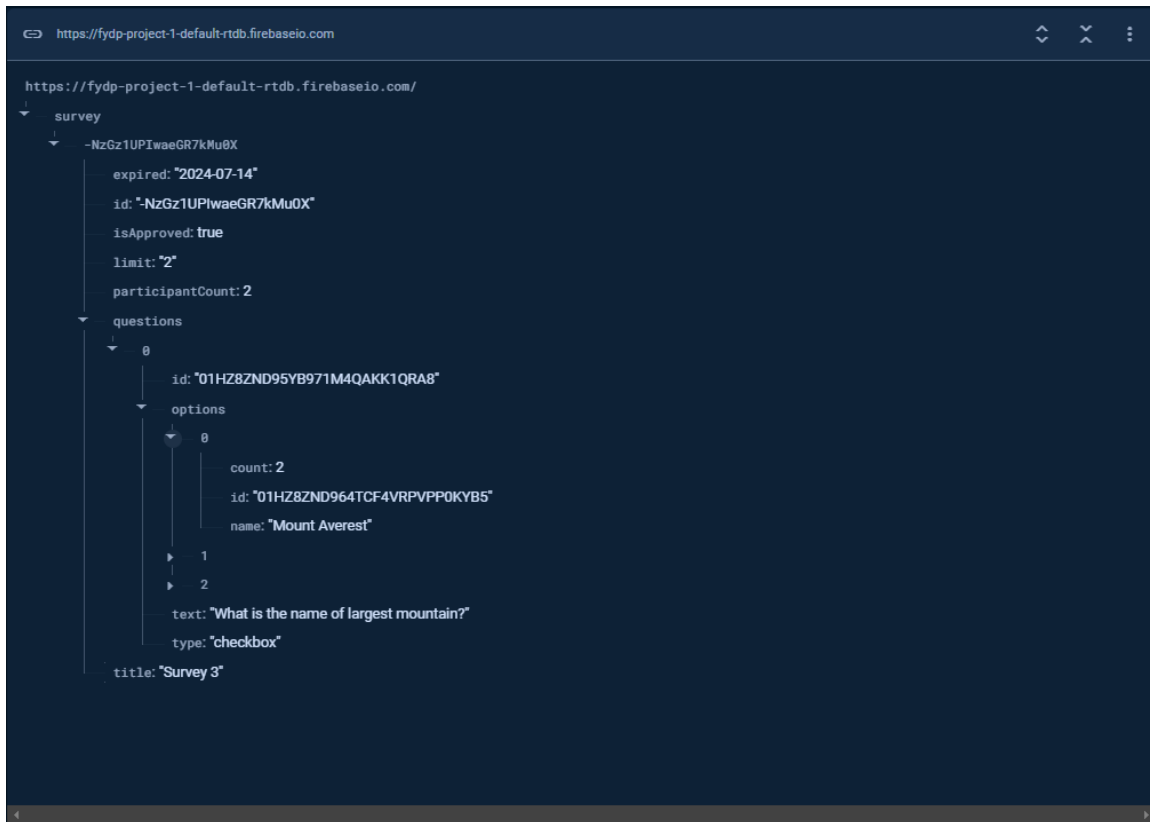


Figure 5.1: Firebase Real-time Database Structure

5.2 Front-end Design Implementation

Front-end design is simple and minimal. It need frontend implementation in some step. Firstly declare or initialize the next.js app by command prompt. Then need to install npm or node packet manager. There are some manager available. I install npm to setup the next.js environment or ready to develop the project. The it need to organize the all necessary package install to the next.js app. Then which image are use in this project store into the public folder. If it is not store in the public folder then when we build the next.js app then it not found that images. Then initialize the Github repository as private. Because if it is not private then it is accessible for every person and there no security exits. After create repository we pushed the content or code to the Github with the path which that site provide during the making of repository. To make the website responsive tailwind offer many class. We user that to make the website responsive for large device or desktop, medium device or laptop and lastly the small device or mobile. Then we make the reusable

components. It would user to that page which require that component. Suppose make a component like a table. Then we need a table in different page. Now we don't need to make different table for this page. We just import the table component form the component which we built before and apply to the page which we need to use it. Then the other things are also need to mention here. We fetch or get any value and store it to the variable. But we need to bring or take it to another page to show. For this, we need to use of context api. It is the concept of make the variable or value as like portable form or make it ready to send another page. Then if it ready the context api from sending page, we can receive the value by some coding. Landing page where logo and website message exist and from here user can go to login or registration page. The whole website is based on the same front-end structure and that is header, content, footer. In header All the navigation item are exists and the logo and website name also here. The main content of the page is located in the page content box. Finally in the footer copyright mark is located.

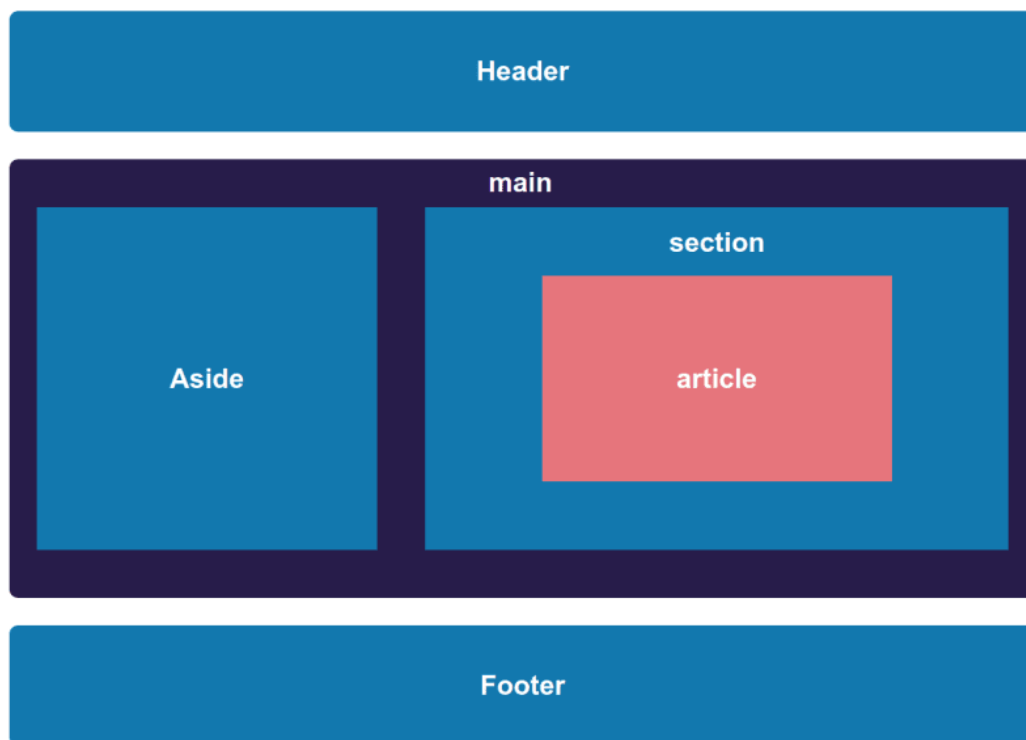


Figure 5.2: Front-end Structure

For implementing the Front-end structure, we use some technologies here. The website design and development by next.js which is a JavaScript library based on react.js. Some other element or technologies we use to build this front-end design given below:

- HTML 5 and CSS %
- Tailwind CSS
- Daisy UI
- Next.js



Figure 5.3: Front-end design technologies

5.3 Implementation Testing

Here we show and test the whole implementation of the website step by step. From login to publish result and show the result there are some useful function are here. There are some key features are here and others feature are as usual ordinary web application existing

in the market or internet. In below I show the key features of the website and explain briefly the functionalities of these steps. Every step has its screenshot to get better understandings. Now the steps are given below:

5.3.1 Landing page

In landing page, we can see the logo in middle and navigation to register and login the website in top right corner of the header. User can go to login page and registration page from here by clicking login and register button. When they click to the login button then the new window come to the screen for login and when click the register button the new window come for the register page. The logo and the message ‘Welcome to quickSurvey’ have rgb transition and it is a good design.

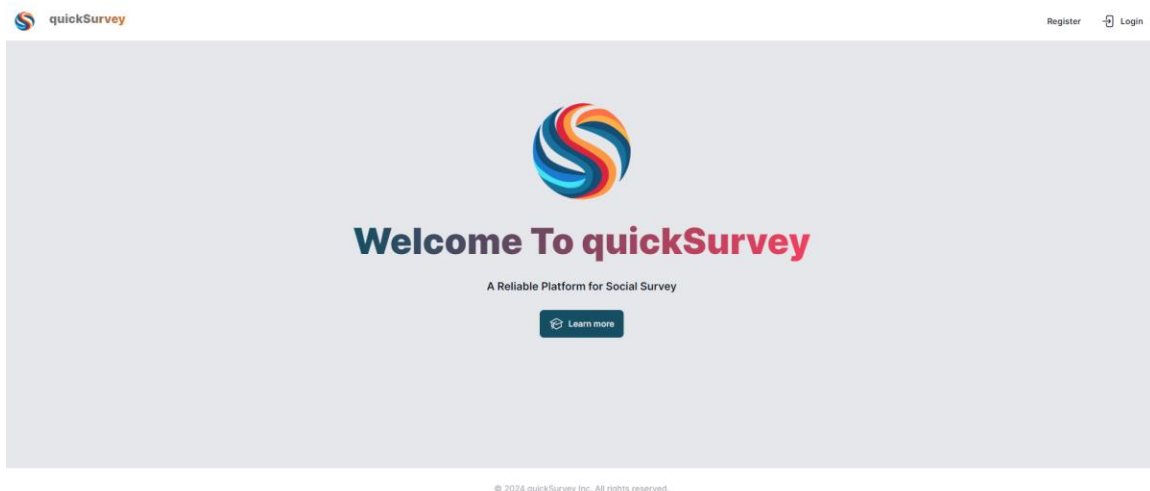
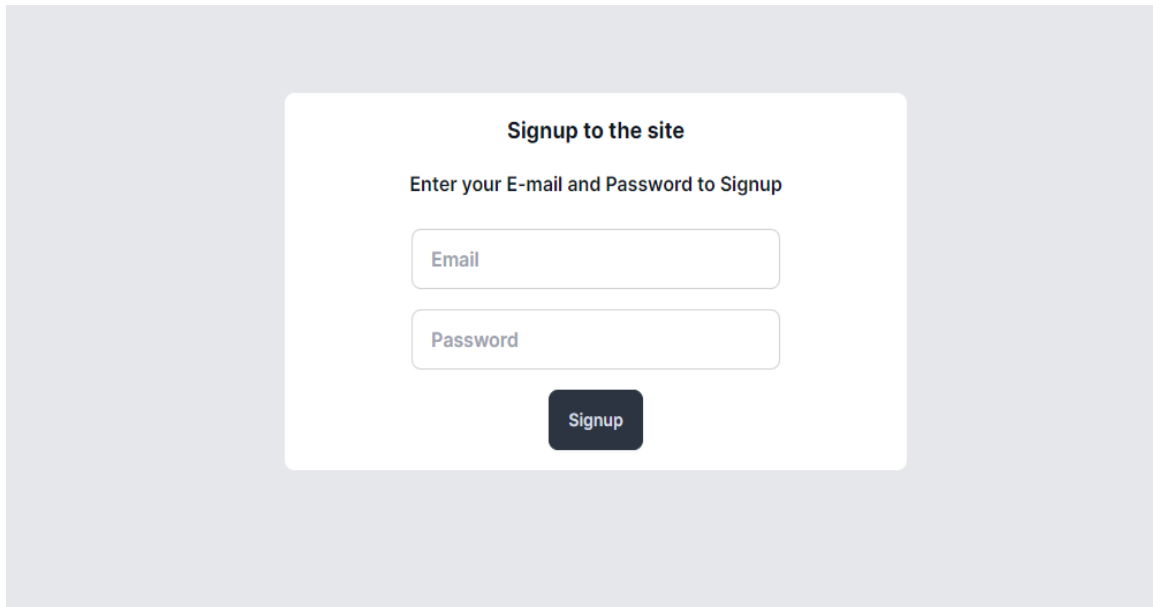


Figure 5.4: Landing Page

5.3.2 Registration

By providing valid E-mail address and strong password any user can create account to the website and then input these credentials to the login page, they can enter the application. Register by email and password the user information are stored in and show these information to the website. When user login to the website then they can see the information in the profile page and the dashboard page. The admin login also from this interface only for special Gmail account.

A registration form titled "Signup to the site" with the instruction "Enter your E-mail and Password to Signup". It features two input fields: "Email" and "Password", followed by a dark blue "Signup" button.

Signup to the site

Enter your E-mail and Password to Signup

Email

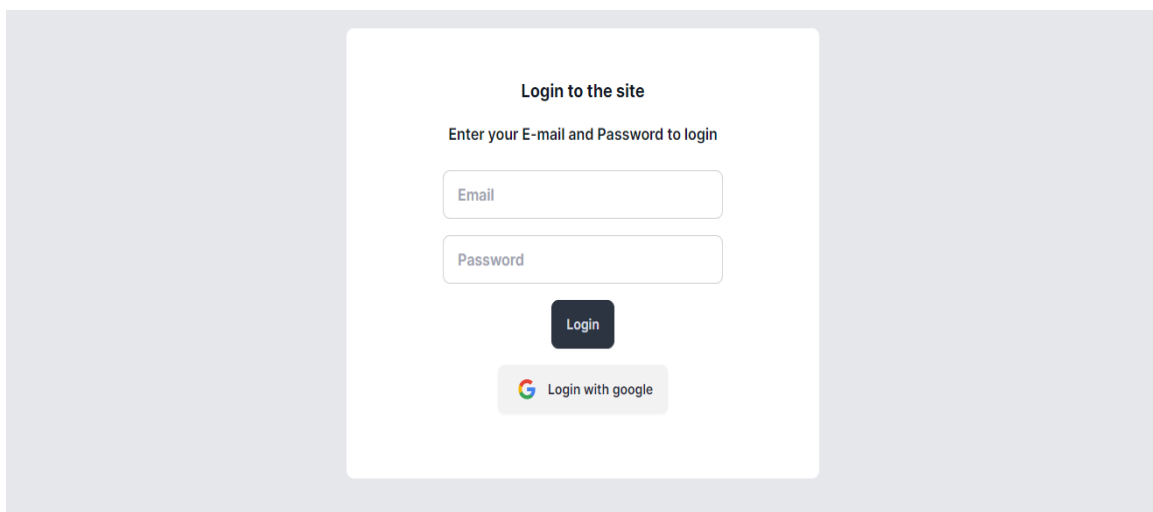
Password

Signup

Figure 5.5: Registration Page

5.3.3 Login page

Can access to the website by input E-mail and password or also by Gmail account. If user avoid login with email and password option for remembering password problem then they can go for login with Gmail. It is also secure as email login.

A login form titled "Login to the site" with the instruction "Enter your E-mail and Password to login". It features two input fields: "Email" and "Password", followed by a dark blue "Login" button and a "Login with google" button with the Google logo.

Login to the site

Enter your E-mail and Password to login

Email

Password

Login

 Login with google

Figure 5.6: Login Page

5.3.4 Home Page

It consists of header, footer and a sidebar. Top left corner of navbar, there is a menu button. By clicking it opens the drawer which has navigation on menu items.

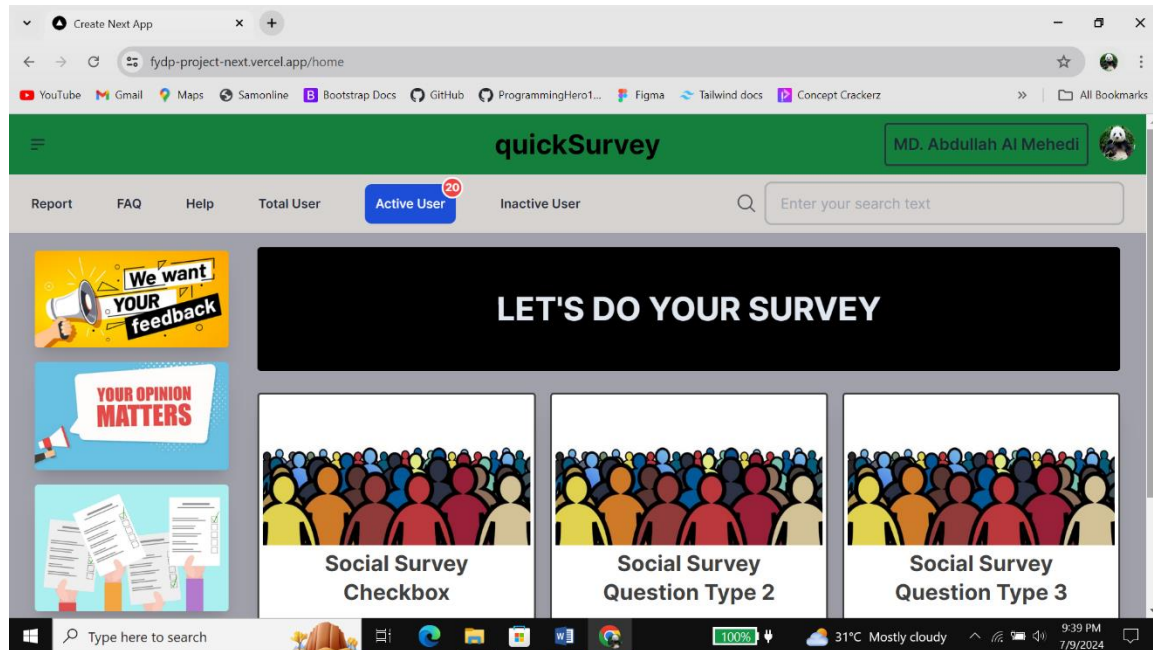


Figure 5.7: Home Page

5.3.5 Survey Create

In homepage at content box there survey card exits. By clicking create button the survey creating page are open. We can first set the survey name, then add question and option, then enter the participant limit and End date of the survey. We can add as much as question and option in the form as we need. There is a bit hard work for making question and also give some option for survey form. For solve this problem we introduce the enhanced full question and option suggestion that suggest the related question or word that would be helpful to the user who are want to build the survey form. When user click on the suggestion then the suggestion text will enter to the input field then if their question related to the suggestion then they can go forward.

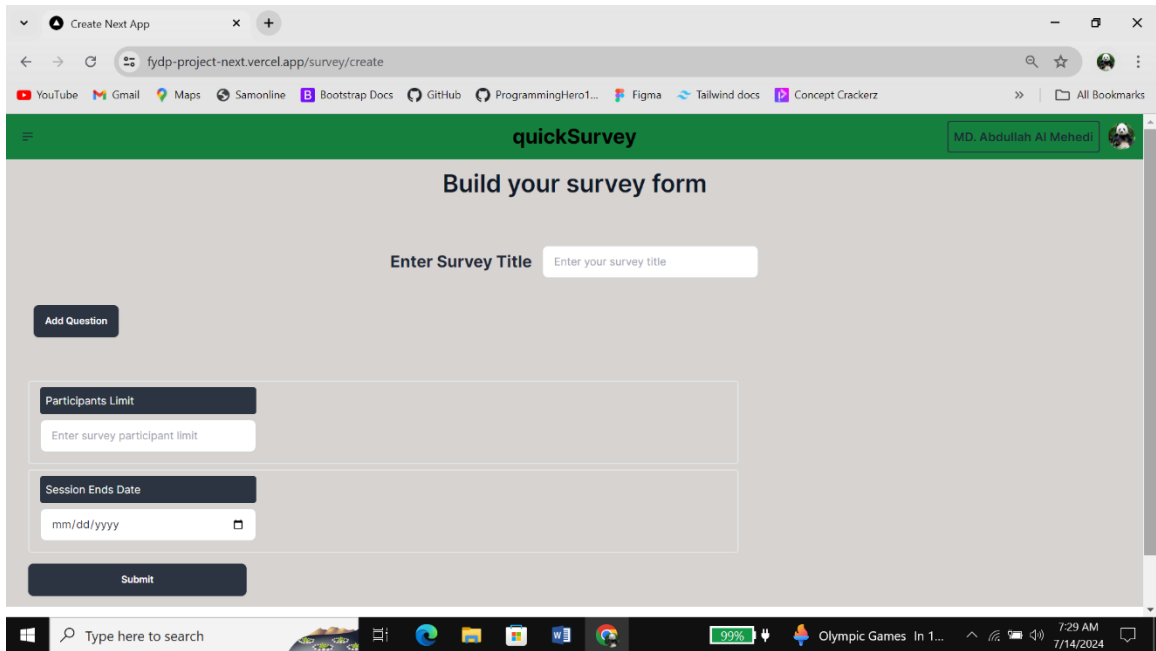


Figure 5.8: Initial Stage of Survey Creating Page

5.3.6 Suggestion During Making Form

Enhanced question and option suggestion from library to help to create question.

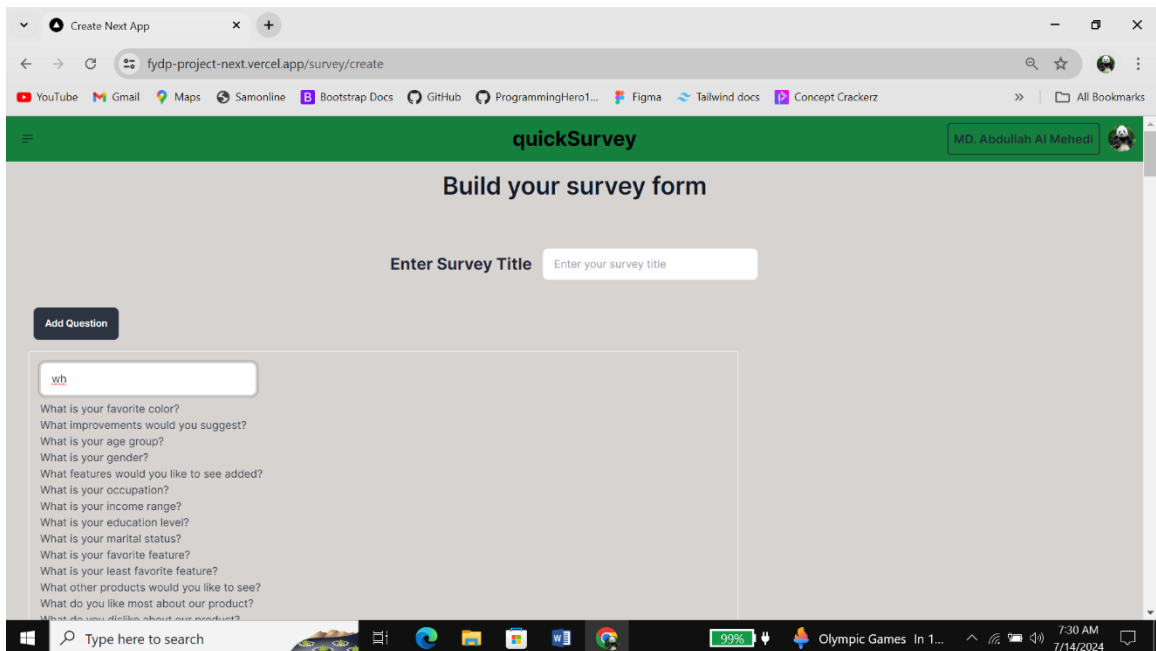


Figure 5.9: Provide suggestion during making survey form

5.3.7 Survey Form

When fill-up the survey create form then the survey it redirects to the dashboard and user can see the survey form, from ‘your activity’ section. It contain the real time stat beside of each question that is beneficial for the respondent. Because some participant are hesitate to give response as they want to know other response ratio. It gives the participant the courage and also help him to choose the best option for him from the question.

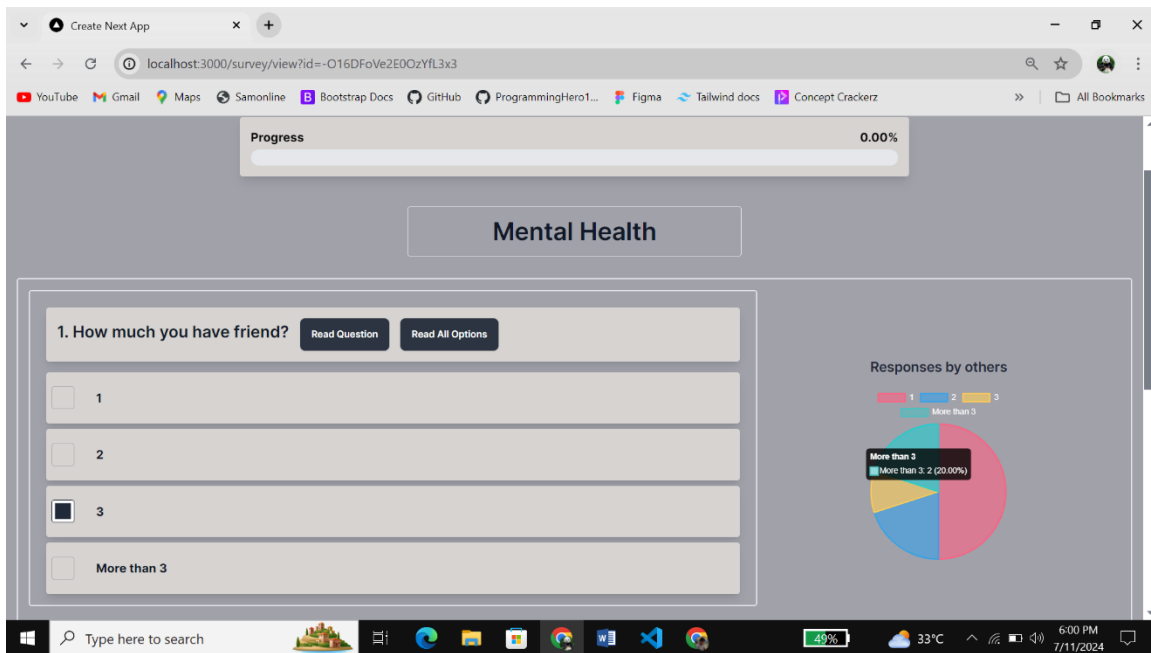


Figure 5.10: Ready Survey Form

5.3.8 Voice Command to Response

I added a feature in this section of the application and that is, participant can provide response by the voice without any touch activity. It is a useful feature and unique also for this sector that some time people are not ready for touching the screen or they face difficulties to touching the screen of smartphone for some issue like wet hands, with gloves, they have hurry and also doing another work. This feature is not for the mobile but also for the laptop and those pc what have mic and speaker also. There are another option here that it can read the question and answer by the local machine. Form that without touching the screen participant can answer the question.

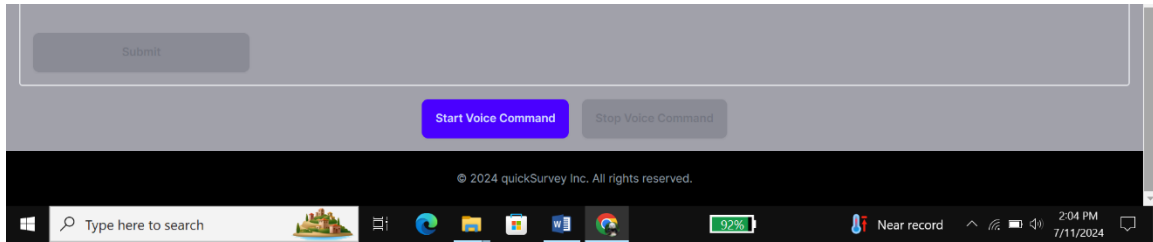


Figure 5.11: Voice Command Activation Button

5.3.9 Admin Dashboard

After create survey form the full operation can be run from here. This is divided into four sections. In sidebar, all information of user is here.

In Your Activity section, survey name, approve status are show. Other two option are viewing survey for entering the survey page and other for copy the link to clipboard to share the survey to participate. In Survey Information section, here show participant count and end date of the survey. The last section is the survey result, which for the showing the survey result by clicking the see result button.

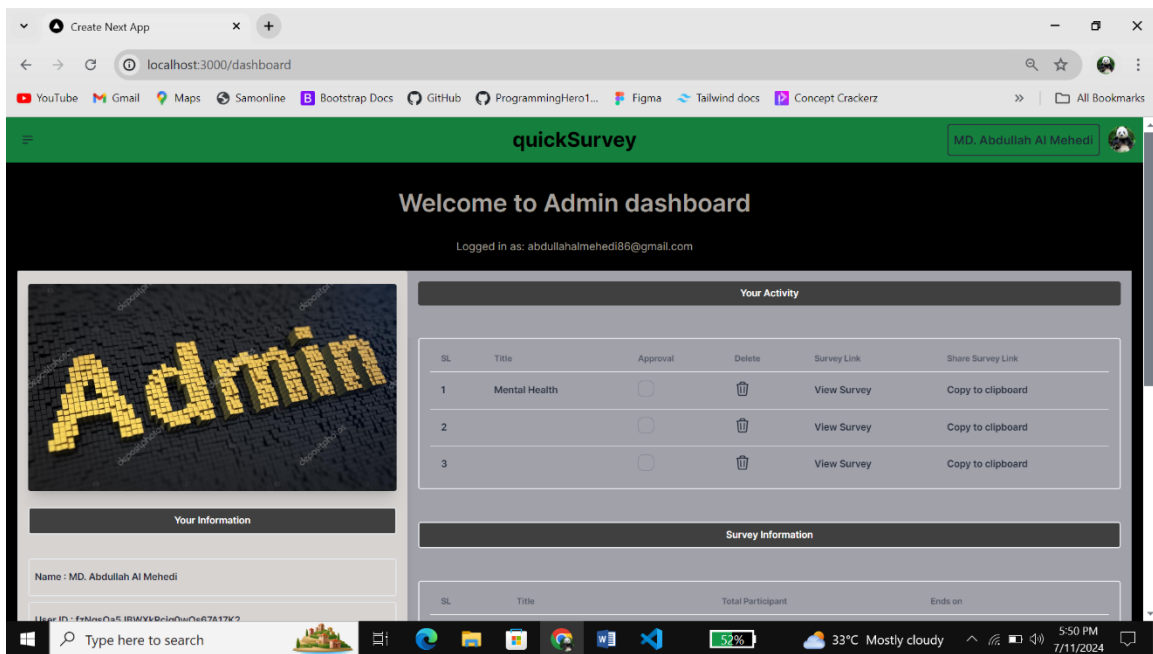


Figure 5.12: Admin Dashboard

5.3.10 User Dashboard

In user dashboard user can see the survey, response the survey and also copy the link to share the survey to more response. Firstly when user register to the application then they can access, after that their information is stored into the database and then after access the site it show in the user dashboard. Registered users dashboard divided into three tables. First table is your activity which contain survey name, status and viewing and sharing option. Next table is survey information, that provide the survey participating number and the session end date. The last table is the result table in which user can see the result of the survey.

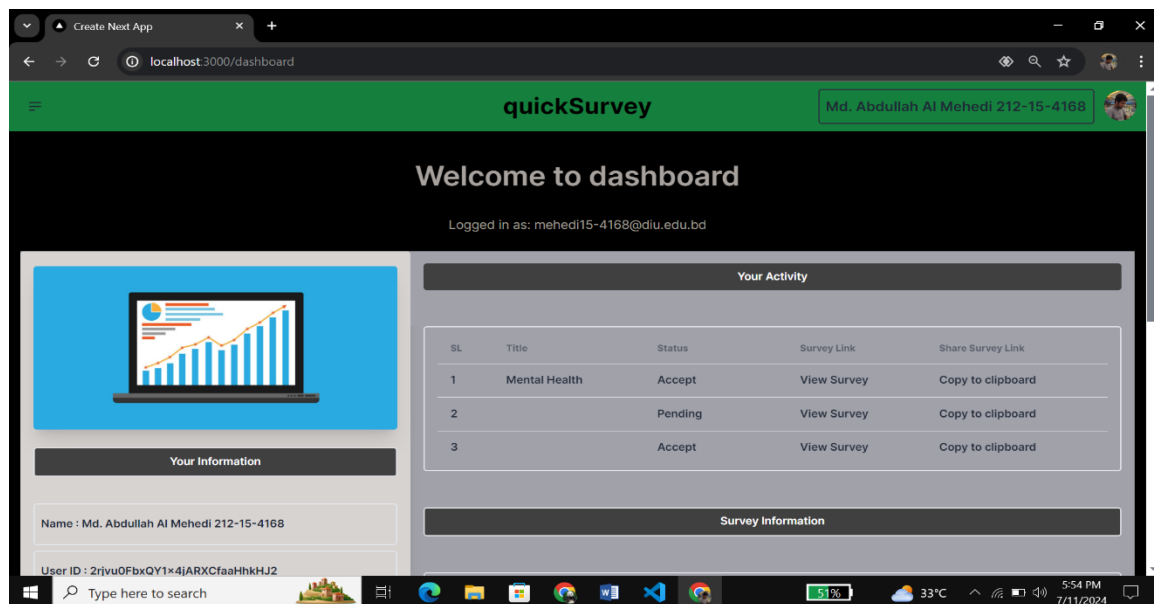


Figure 5.13: User Dashboard

5.3.11 Survey Result

From survey result table which is in dashboard user can go to survey result page. The survey result page are design with good background color and with the box of survey result along with the bar chart and pie chart. The bar chart directly show the numerical information and graphical information but pie chart directly show the graphical information but it don't directly show the numerical percentage information. If mouse hover to the pie chart then it show the percentage information. If any user want to get the survey result

information in the xlsx file format then they can click to the export to excel button. If clicked the button then the browser download the excel file of the result.

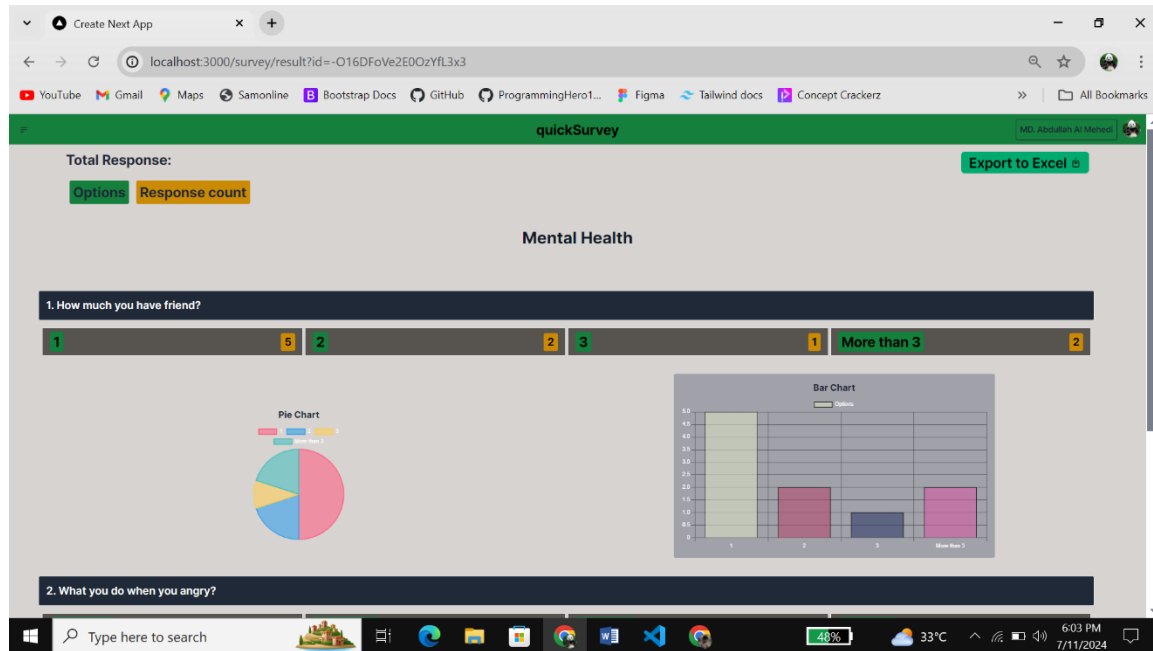


Figure 5.14: Result Page

5.3.12 Admin Operation

Admin can approve or reject the survey request from the Your Activity section. If admin not approve the survey, then no user can see the survey content of the survey page. Is the survey approved then the status will change to accept and if not approved the status will be pending.

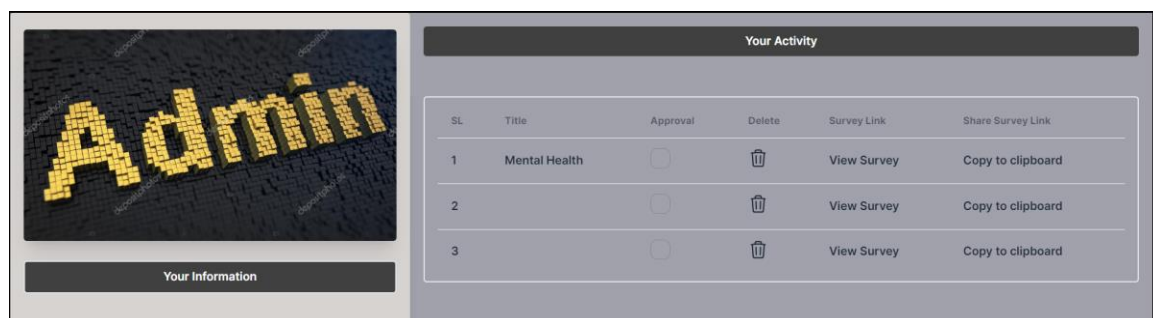


Figure 5.15: Admin Operation

5.3.13 Pending Survey

If any user wants to enter the pending survey page, then he can enter but just see a message which is ‘The survey is not Approved yet. Please contact your admin’.

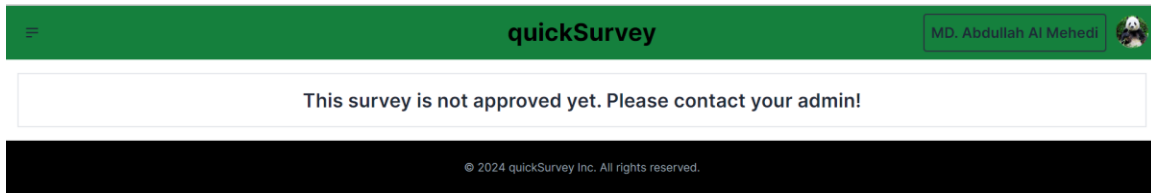


Figure 5.16: During Pending Survey

5.3.14 Participant Limit Exceed

When the participant limit is exceeded, it will not allow any user to respond to this particular survey. Then the page shows the message ‘This survey is exceeding participant limit’ and it’s submit button will be not available. When user make the survey form to survey then they need to fill up a section name is participant limit. They can input the participant limit. Because if any user think they want limited number of response, suppose if any person input 2000 then it is the participant limit for this particular survey. On this survey only 2000 person can response. If it reach the count to the 2000, the it don’t take any other participant to response the survey. In that case, if user want to give response then they see the message in red color that, ‘This survey has exceed the participant limit’.

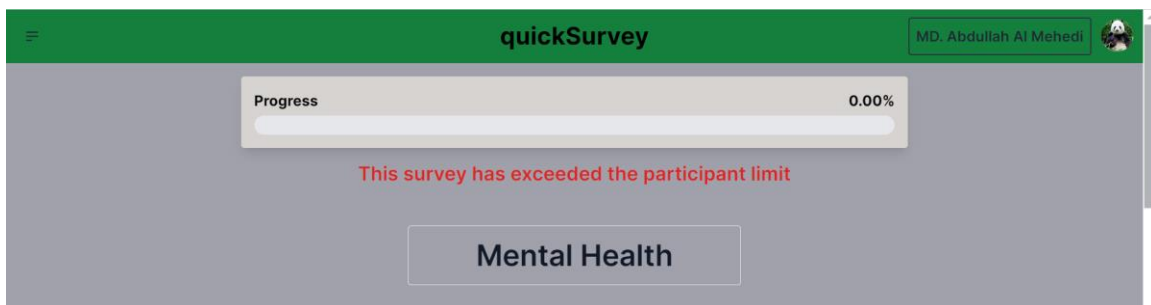


Figure 5.17: After Exceed Participant Limit

5.4 Test Result and Report

The test can be run for determine how efficient the application and how behave during provide performance. During testing most of the area of operation it acts really good. User Sign Up, Sign In, make survey form, see survey form, see result, admin work, participant limit count are run smoothly. Some responsiveness test for the large as desktop pc, medium as laptop and small as mobile devices also. User find difficulties if there are issue exist to response for these different devices. After test the responsiveness the result for these device are quite good.

The result of testing the application is ok. Hope that it can provide proper service which for it build and the user will be satisfied enough.

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

This project can put impact on the society in some ways such as provide an easy survey option, easily reach to mass population and it can provide freely its service.

As we mention earlier in the report it is a social survey platform, so it has also some impact on social people. If people know the mass opinion, then their decision-making activity can be easy. They can operate the survey in very low cost, so it will be providing the society economic efficiency on this sector. Survey is not a new element in the society. People, business, organization, analysis and many other site has need information to make decision. If anyone have so much enough amount of information then it help to make decision easily. For that information collecting is so much important. There are some method are here to gather information. Survey is more popular method from them. Because it don't consume more time, don't need lot money, can get more information in shortest period of time and it is user friendly also. There are no bound to give information. If people want to give information voluntarily then they can do that. They shell not bind for it. And also it has another feature that, it is keep confidential to the response of any participant. So for society needs and there are no harmful element in this survey method. It is for helping purpose and good to people.

6.2 Impact on Environment

If we analyze the impact of the web application on the environment then we found some positive impact.

It will be reducing the usage of paper and pen, because the older survey system is using paper and pen. But while using our system it no need of these items. We know that the process of the making paper and pen are not good for environment. For making pen tree are cut and making pen use the plastics, plastics are not good for soil. So, we need to reduce

the usage and making of these items like paper and pen. Our system doesn't need paper and pen. User can make and respond surveys by their computer, laptop, mobile or any other smart devices. We know paper made of wood, fabric, bamboo and many other things. To make paper there are a lot of trees are cut off. To reduce the usage of wood for making paper, we need to reduce the usage of paper. We know that for doing the survey, in old fashion it is paper and pencil or pen. If we choose the alternative of paper and pencil and pen then we would go to the electric things. Survey through online and usage of laptop, computer, mobile and electric device has some benefit. It would be to reduce usage of the paper and pencil or pen. Then if we reduce the usage of paper then the tree cutting is also reduced. Other side there are no harmful elements in this application.

6.3 Ethical Aspects

We operate our all operation in ethical way. There are some ethical topics need to bring in front. They are privacy, data transparency, non-discrimination, Avoiding harmful element, Proper usage of result.

User login information is safe in the application, we care the personal information of user. But which survey form are already gone online that are accessible for everyone. We add the admin acceptance option that admin can deny or reject any survey request to avoid the discrimination, harmful element or other usual event. I use here firebase authentication which is developed by google. So, there are more security which is provided by google. In firebase real time database, google has strong security rules to provide security to the data which is stored in the database.

So the security of user data from database or from the web application is top notch. We have user data like user login Gmail id and user name and profile picture registered and also unregistered in the database. But don't have any intention to get it from database for any reason. So, for that user can safely use the survey application as their requirement, there are ethical activities are here. All operations are for good purpose, to do something for the society, and give something special to the audience.

6.4 Sustainability Plan

To develop the user experience, we plan to get feedback in regular interval and get update the application where it needed.

To ensure sustainability, system need to fix the lacking and drawbacks. But how we know the drawback of this application. We need to launch a system survey form our own application that to user, which sector are not okay and which sector need to more development. We will gather their feedback and analyze them and bring a good improvement in future update. Before deploying any application, company or developers test the application or system several times by themselves and also another external test expert to find any bug is exists or not, it is ok or not, and test the web application work smoothly as industry or market grade or not. If this test is ok, the performance are good, then they launch the system for audience. But although these type of work, somehow there would be some issue find when user uses the application. Then if they feedback the issue then developer would be fix the problem in further update.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 Discussion and Conclusion

When we are planning the development of this project then we think to overcome some of the drawbacks of the traditional survey system. We know traditional system has several issues. They are huge usage of paper, much more costs, more time consuming, not reach enough people, people are not interested more. So, we try our best to overcome these drawbacks. There is no harmful element are use in this project.

There are several bug and incorrect appearances will be in this application. Because this is the first edition of the project. By time passes away, we will get the feedback and can understand what improvement should need to do. Then we can bring the latest update with the proper solution of the lacking if any exists.

In conclusion, there is need to a simple and minimal web application for web survey operation that is efficiently use to provide the survey operation and people are not hesitate to use the application because of its complex navigation and workings. We try to provide this kind of application which has no complex design, just included necessary survey elements.

7.2 Scope for Further development

This is the first appearance of this application. As we use the simple touch of the agile software development life cycle, so in future we collect the lacking's of this website from user in some way then we go for further development.

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