

Enhanced School Management System using Progressive Web Application

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and Applied Sciences, Lead City University, Ibadan, Oyo State, Nigeria**

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Certification

This is to certify that this thesis report was written by Emmanuel Adebowale ADEDIRAN with matriculation number LCU/PG/001921 of the Department of Computer and Information Science, Faculty of Natural and Applied Sciences, Lead City University, Ibadan, Oyo State, Nigeria, for the award of Master Degree (MSc) in Software Engineering on Progressive Web Application in School Management System and that this has not been previously submitted.

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Dedication

This thesis work is dedicated to Almighty God.

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Acknowledgement

I want to thank the prestigious institution Lead City University for the opportunity to learn and complete my Master's Program and to the University Library for provision of adequate materials needed.

I am grateful to the Department of Computer Science for giving me the privileged and opportunity to study and to learn, my appreciation goes to my supervisor Dr. W. Ajayi, I also like to acknowledge my lecturers, Prof. S. Akinola, Dr. W. Sakpere, Dr. A Waheed, Dr. R. Badru for their supports and always ensuring that things are done rightly.

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“Even though the above-mentioned institutions and persons have assisted in the process of this research work, I alone stand responsible for the errors, if any, found in the work.”

Abstract

School Management System using Progressive Web Application is aimed at Network Independent for Student Management system which allows the students to check through their details awithout necessary using data logging-in via their matriculation number, since the developed System will not allow matriculation numbers outside Lead City University. The main goal of this thesis is to develop a Progressive Web Application School Management System and provide an interface that will be used for all the necessary details of School Management. The objectives in achieving the set goal are: Designing of the database, designing of the design of the progressive web application school management system and the development of the whole system with HTML, CSS, PHP, JavaScript, React, Xamp Server. The system is targeted to helping students take their studies in a more advanced fashion breaking away from the conventional way of using papers and manual processing of doing their registration all the time. The School Management System using Progressive Web Application makes use of features such as service workers, push notification, indexedDB, Background sync is deployed for the implementation of the system. The system will give a more developed and user-friendly access as well as it will take less time to complete its execution. The cost of implementing the system is minimal compared to the cost of other development of other School Management System. The system is deployed into the Department of Computer Science in Lead City University.

Keywords: Progressive Web Application, , School Management System.

Word Count: 238

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Chapter 1

Introduction

1.1 Background to the Study

Each country's foundation is shaped by its educational system. As a result, it is vital to provide a good educational foundation to children at a young age in order to ensure the development of responsive global citizens who will secure the future for all. Today's cutting-edge innovation may play a critical role in smoothing out training-related cycles to improve fortitude among students, instructors, parents, and school employees. The importance of instruction in the improvement process cannot be overstated. It is one of the most effective tools for reducing poverty and imbalance, as well as laying the framework for supported monetary development. Our administration has placed a strong emphasis on the educational field, and school improvement activities such as continuous professional development for instructors, preparing and overhauling educators, and equipping schools with labor supply and materials are among the major moves that have been made in both essential and auxiliary schools, even at the tertiary levels. One of the most important instruments for working with and on these tasks is to have an automated school management system.

Because of its productivity and suitability, the application of data innovation in educational administration has exploded¹. PCs are seen to have the potential to make a significant contribution to classroom educating, learning, and organizing. Equipment, programming, systems administration, and staff development that have gone into bringing data and communication technology (ICT) into schools will be seen as beneficial if there is confirmation that it has an equal

impact on school execution and adequacy². Because of its efficacy and suitability, the application of data innovation in educational administration has exploded. School administrators who previously expended a great deal of time and effort dealing with perplexing assignment difficulties (e.g., staffing, asset allocation, and timetabling) and monitoring school duties now have more options thanks to enhanced innovation³. With the decentralization of work projects and their coordination in an intelligent correspondence structure, data advances work.

Fast technological alterations are influencing how goods and administrations are planned all the time. The turn of events rehearses for apps have been developed since the introduction of cell phones. Because engineers must write, test, and maintain programs for each of the numerous phases and devices, traditional portable application development has been described as a time-consuming and costly process⁴. As a result, most adaptable programming engineers are employing a variety of strategies to improve the progression of applications from local to half-breed programs⁵. Furthermore, a few ways for cross-stage development have been given out as an optional path for long-term local progress.

The portable web is based on a web application that is typically cross-platform. This type of software adheres to industry-standard languages like HTML5, CSS3, and JavaScript, which provide full app portability between platforms like Android and Apple⁶. The arrival of cross-stage development frameworks like Cordova, PhoneGap, and Ionic has made the construction of applications for many platforms a lot easier⁷. It also reduces the cost and effort of marketing and allows for a faster time to market. Crossplatform techniques, on the other hand, don't always succeed because of their dependency on a WebView (an in-app included program portion)⁸ and program constraints, which results in substandard execution and client experience.

Progressive Web Apps (PWA) is another web innovation pushed by Google as a unique approach to create, as they promise to combine web innovations' simplicity of advancement with the adaptability of local applications and bits of knowledge to overcome the constraints of portable web applications by trying to present elements such as unconnected help (offline support), pop-up message, background synchronization, and home-screen establishment to the web⁹. Furthermore, PWA has been updated with a few enhancements that take into consideration localized behaviors in a mobile phone while still operating in a web application⁹. However, because of the intriguing, logical inclusion of PWA as a cross-stage improvement strategy was less certain. As a result, until now, PWA has mostly been evaluated in the Android domain, as well as in the current area¹⁰. Furthermore, a few studies¹¹ show how PWA might be a viable combining technology for online and mobile development.

1.2 Statement of the Problem

Based on the existing platforms used, the cost, as well as resources for a website application for a school management system to be designed could be channeled towards other things instead of spending time on developing its Mobile Application. Due to the inefficiency of the current manual system, it is necessary to automate SMS in order to efficiently handle students' attendance, produce transcripts, report cards, and other reports that satisfy users and customers, and create a timetable that can schedule courses for teachers and classes of students.

1.3 Aim and Objectives

The Aim of this study is to automate the application of Progressive Web Application in School Management System.

The specific objectives include:

- To design the Interface for the System.
- To design the database for the System.
- To evaluate the implementation as compared to existing platforms.

1.4 Justification of the Study

This study aims to bridge the gap of having to build a different code for a Mobile App besides the already developed Web application using Progressive Web Application mostly on Network independent.

1.5 Significance of Study

The major purpose is that it has made all transactions including student registration virtual and it will also open doors for the school having international student online not coming down even reducing the spread of this global pandemic which means students could receive lectures virtually. This design brings a more easier way and simple which simply supports the interbank transfer for the school account by making use of either interswitch as financial partner or webpay on the Designed application itself. Making it mobile.

It has a registration column where you can easily register your courses online as well as getting your matric number, knowing your lecturers and automatically allocate you to hostels. The design is to have a detailed database information of every student as well as lecturers to enhance a well dynamic relationship. Easy search for the name of student or lecturer brings up all details about him or her, achieving the purpose of timing and attending to other complainants in quick time fix. Lecturers cheating on working hours is also curbed where they sign in and out virtually for the work done. The end goal of all of these is to provide a highly structured disciplinary accountability scheme for the use of the entire school which could help our dwindling educational sector.

1.6 Scope of the Study

The developed system is a web-based system which is convertible to Mobile Application using this technique. It has a centralized database where all the documents are stored. As well as the main features of the School Management System written in Php.

1.7 Limitation of the Study

The limitation of the thesis is as follows:

- i. The system would not check results for students without logging in as well as without matriculation number.
- ii. The system would not accept students with matriculation numbers outside Lead City University.

1.8 Operational Definition of Terms

HTML: The preferred markup language for documents intended to be viewed in a web browser is HTML, or HyperText Markup Language.

CSS: A language called Cascading Style Sheet (CSS) is used to describe how documents are presented to users, including how they should be formatted and organized..

PWA: Progressive Web Apps (PWAs) offer cross-platform compatibility by granting access to open web technologies. PWAs give your End-users an app-like experience that is tailored to their individual devices..

TWA: Traditional Web Application an Internet browser on the client side and of (ii) an Internet server, for instance, Apache HTTP Server by Apache Programming Groundwork of Web Data

Administrations by Microsoft. The application in the program speaks with the server in a coordinated manner: at whatever point a client requests something, a HTTP demand sent by the program and the answer is gotten from the server.

ECMAScript: is a JavaScript specification designed to guarantee the compatibility of online pages with various browsers. On the Internet, ECMAScript is frequently used for client-side scripting, and it is rapidly being utilized to create server-side programs and services that run on Node.js and other runtimes. ECMA stands for European Computer Manufacturers Association.

Javascript: Along with HTML and CSS, the computer language known as JavaScript, or JS, is one of the foundational elements of the World Wide Web. A dedicated JavaScript engine is available in every major web browser and is used to run the code on users' devices.

Php: A general-purpose programming language designed specifically for web development is PHP. A PHP interpreter, which can be implemented as a module, daemon, or Common Gateway Interface (CGI) executable, typically processes PHP code on a web server.

Endnotes

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Chapter Two

Literature Review

2. 1 Conceptual Framework

A design showing automated results, fees, presents and absents students. The system works over the internet. Students get alerts without any delay. The information present in the database is accessible anytime, anywhere. So, paper wastage is reduced. There is no need to keep track of records manually. ManasiKawathekar, Kirti K. Bhate developed an application that contains Event, Attendance, Notices, Report, age which is the online applications. The application is used by understudies, educators².

A system was developed called College Management System. This system used for creating applications to track attendance, viewing results. Students, parents will also see the attendance, results and syllabus. Also students can see alerts or notifications anytime. This speed up the result management process³.

2.1.1 Umaru Musa YarAdua University Information Management System.

The Researcher was privileged to be part of the team that built this registration system for the University, I will highlight some of the Application's features. The application was designed in 2018 and released in 2019. The application is user-friendly and it was designed to have students register for their courses online, with all their information registered, it also has some spaces where lecturers too could enter their various information as well as communicate well with not just the students but also with their parents.

Below are its Advantages

- User friendlier
- Storage enlarged
- Well secured information of students and lecturers
- Chat section between students and their lecturers
- Result checking made easier.

Its disadvantages also includes

- It is highly expensive in making
- It does not have a video section to see the users
- It is not fast because of the local data it has
- It is not compatible with all mobile phones but with only Android and iOS, it cant work with Microsoft

2.1.2 SchoolTool

SchoolTool is another example though not Nigerian based but A related work. SchoolTool is a cloud based open source school administrative software made for schools in the developing world. It is licensed under the Ge aNU (GNUs Not Unix) general public license, version 2 and it is written in python using the Zope 3 framework. It is made up of features like customizable demographics, calendars for the school, resource booking, teacher grade books, class attendance and report card generation. SchoolTool was made with Python, is largely secure, and is run on Linux Ubuntu.

Advantages of SchoolTool

- SchoolTool has a ton of features that largely appeal to teachers.

- It provides educators with what they need to run their classrooms (grade books, skill assessment documents, class attendance sheets, and daily participation journals), strong organization features (including a calendar that plugs in with popular calendar applications like Google Calendar), and a great report card generator.

Limitations of SchoolTool

- SchoolTool is a great starting software for smaller schools, but it isn't an all-inclusive piece of software. For example, schools will have to find other applications to do human resources, reporting, and financial management.
- SchoolTool is only available in Linux while the vast majority of schools do not use Linux which is a challenge to many.
- Installing SchoolTool to a computer is another hard task since it requires internet yet most administrative computers in schools are not connected on the internet.
- SchoolTool cannot be used effectively by schools across Africa since customizations for different education systems have not been completed yet.

2.1.3 School Information Management System (SIMS)

School information management system (SIMS) uses a client-server architecture; the backend service is based around Microsoft SQL server with some business logic handled by a custom .NET Framework module. The client application is also built with .NET, and handles almost all of the data manipulation and reporting workload. It is a totally web based systems. Some legacy components (notably Nova-T6, the timetabling package included with SIMS) are Windows Application Program Interface (API) applications and store data in flat binary files. SIMS is a modular application, the core offering covering storing basic school data with modules available

to handle (among other things) legal registration, the recording of achievements and sanctions and the management and documentation of public examinations.

Advantages of SIMS

- Instant access to required information and activities of the school.
- It can do just about anything you may want them to do for example can read and write files, send e-mail, print files.
- Better management of school academic process and administration.
- It runs on minimal hardware that is desktop and laptop computers.

Limitations of SIMS

- They cannot be able to readily substitute a desktop application with a Web-based one.
- It can be easily implemented in a two-tier client-server desktop application but not on a Web application.
- It limits students and parents or guardians from accessing students' information.
- It is costly because many schools cannot afford buying the required hardware.

A study on the peculiarities of mobile learning for elderly people was carried out⁴. Mobile phones are a technology that has become a part of everyday life; it improves the effectiveness and accessibility of learning. Another research analyzed the scientific, methodological and educational literature, standards and programs related to the problem of remote management of the educational process, developed software, and academic and organization⁵.

2.2 Theoretical Framework

2.2.1 What is Progressive Web Application

Site pages today are more than just static HTML markup. We've progressed from a Web without JavaScript, where all connections should have been handled by the server, to using JavaScript just for activities and minor convenience features, to developing entire applications in JavaScript that mostly communicate with servers behind the scenes. When JavaScript gained the ability to execute HTTP requests and retrieve or save data in the foundation, a technology known as AJAX at the time, it was only used for minor purposes. Single Page Applications (SPAs) were developed later, with the application being layered once at the start and then transmitted in JSON or XML later. This presented additional hurdles to JavaScript developers, such as delivering layouts in a timely manner. This presented new hurdles to JavaScript developers, such as supplying layouts in the program, monitoring application state, and steering (the planning between application state and the URL showed in the location bar of a program). In addition to Web development, cell phones and associated applications, often known as local applications nowadays, were developed (instead of web applications). These programs used the full capabilities of the devices they were running on and could accomplish a lot more than a web application in the beginning. This meant that a company that wanted to reach as many customers as possible had to produce many versions of the same app: for the web, the workplace, and a few other platforms. Later efforts like Cordova and Electron made it possible to use JavaScript and other web developments in programs as well as local mobile and desktop applications, but the goal of making the web the most widely used application platform remained.

Several additional JavaScript augmentations were produced under the Web Platform project, interfaces that give JavaScript access to various features of the device on which the program runs. The Location API, which allows a site to access a device's GPS location, and the Screen Capture API, which allows a site to capture the screen of a program or another application, are two examples.

The term Progressive Web Application (PWA) refers to a number of very recent, closely related developments. While many of them are useful on many devices, the most common interest category is flexible Web apps⁶. The PWA project's goal is to allow designers to create Web apps that are equally helpful as local ones in a variety of areas, such as commerce and efficiency. The innovations that include the term PWA enable applications to be installed directly from an internet browser to a device, to become ready for working without an internet connection, and to use some of the device's foundation administrations, all of which were previously only available to portable applications. To use advertising jargon, converting a web application to a PWA improves the client experience while also increasing customer commitment and upkeep.

2.2.2 Mobile Native to Hybrid

Designing for mobile devices initially and gradually transitioning to larger devices is known as the "mobile-first" approach to design and content. It is a reaction to the expanding need for better mobile experiences. A major factor in the rise of mobile-first design was Google's announcement at the 2010 Mobile World Congress that they would be adopting the strategy and urged other designers to follow suit: "I think it's now the collaborative mission of all of us to make mobile the answer to pretty much everything"⁷.

2.2.2.1 History of Mobile-first

Progressive enhancement advocates putting mobile users first. A tactic that developed from graceful deterioration is the viewpoint of progressive enhancement. The tactic of maintaining functioning when parts of a system malfunction is known as graceful degradation. According to this viewpoint, the website is designed to work with the most sophisticated and capable browsers, but it also allows the page to decline or remain functional on older and less capable ones. The major goal is to deliver the best experience to the most competent browsers while anticipating poor, but tolerable experience from these browsers⁸.

A replacement for graceful decline is progressive enhancement. It differs from the earlier method in that it places more emphasis on the content. Any browser or internet connection can view the basic information and features on a web page, while those with more advanced browsers or larger bandwidth can access an improved version of the website.

The baseline of support is determined by the developer in progressive enhancement. The website or application need not, for instance, be able to function without JavaScript⁹.

An application can be broken down into smaller subgroups to describe the layers of progressive enhancement. It must begin with the core, the framework, and the foundation. A HTML-only application that would run on any browser or mobile platform may be used for this. The styling, in this case via adding CSS, would be the application's next layer. Since a browser ignores a CSS attribute when it doesn't comprehend it, CSS is gradually improved by default¹⁰.

JavaScript would be the final layer. It is crucial to take into account browser language and API support while implementing this layer and to include appropriate error handling to prevent the

website from becoming unavailable¹¹. As previously mentioned, it is still up to the developer to establish the requirements for the minimum level of support.

Progressive enhancement, though an earlier theory, shares the same principles as mobile-first in that content is the most crucial aspect of a website and must be available on all devices. Push notifications and other PWA concepts like service workers are additional methods of progressive upgrading¹².

2.2.2.2 Reasons for Mobile First

The user experience and accessibility are enhanced through mobile-first design. Instead than focusing on the visual characteristics that could be used on desktop, for example, while designing for mobile, the content is the main consideration. The demands and wants of the user are given more consideration. Additionally, since the constraints of mobile networks are taken into account before implementation, it's expected that loading times will also be sped up, providing access to users in locations with insufficient coverage. The fact that Google officially began indexing and ranking websites based on their mobile versions in March 2018 serves as additional evidence of the necessity of adhering to the mobile-first philosophy¹³. In the past, websites were scored based on their desktop versions and received bonus points if they also included mobile designs. Sites that are not mobile-friendly may still be ranked, although their rankings may drop, especially on mobile search engine results pages¹⁴. The reality of our surfing behaviors, which are now heavily centered on mobile, is what gives rise to the term "mobile-first index," which was not invented by Google.

2.2.3 Native Applications

Both the use of mobile devices and native applications has grown. Applications created specifically for a platform or device are known as native applications. They have certain definite advantages because they are created on a particular hardware and operating system¹⁵.

Users receive the quickest, most dependable, most responsive experience from native applications. They can make advantage of hardware and software designed specifically for the smartphone, like the camera, microphone, and push notifications. Because designing for a certain platform is simpler, platform conventions can be incorporated into the UI/UX¹⁶.

It is not surprising that native applications are replacing time spent in browsers because of their exceptionally quick loading times and offline accessibility, to mention a couple of reasons. It was further established in development of mobile applications in 2017, and as can be seen, mobile app usage has increased by 6% yearly¹⁷. Particularly when buying, users spend more time on apps and less time on browsers. Diverse research shows that as consumers continue to transfer their purchasing to e-commerce through mobile shopping apps, the amount of time spent in e-commerce applications has significantly increased (54%) as can be observed¹⁸.

Nevertheless, the reach of mobile websites is almost three times greater than that of native apps. Most users aren't paying attention and only utilize their top three apps for 80% of their time. The typical user installs zero native programs in a month, indicating that users generally dislike installing them¹⁹. One explanation could be because they require frequent user updates and take up storage space on their devices.

Other drawbacks to native programs exist as well. They require distinct development for every operating system, each of which has its own codebase, and are more difficult to grow. They

typically require a team with these kinds of skill sets and take longer to develop than online or hybrid applications.

2.2.4 Hybrid Applications

Applications that are hybrid operate on various platforms and behave like native apps. They are created utilizing a mix of native and web technologies. In a native application container, they are technically web applications. A mobile device can execute applications that have access to the device's functions, such as the camera and GPS. They are released through a native application store, much like native programs. Examples of application stores that assess these programs are Apple and Google. The most well-known hybrid applications right now include, to mention a couple, Netflix and Amazon. These applications can be created in a variety of methods, including using the React Native or Apache Cordova frameworks²⁰.

The cost-effectiveness and speed of delivery of hybrid applications built with frameworks are two distinct advantages. The UX experience of an application created using this kind of framework is still inferior to that of native apps and has various disadvantages, such as slowness and phantom clicking while scrolling, lack of offline functionality, and the potential for the application to execute slowly depending on its complexity²¹. Because, for instance, the Apache Cordova framework does not by default allow fingerprint scanning, capabilities may also be somewhat constrained²².

One of the most recent developments in the field of hybrid apps is React Native. A mobile application using native components of a smartphone's operating system can be created by quickly migrating from an existing web app built on React. Since the source code is converted into a native mobile app rather than running in a built-in browser window, performance is also good²³. Hybrid

applications must be deployed on the end devices, just as native programs. Developers have devised new web development opportunities, such as the idea of PWAs, to target this population that does not want to install applications on their smartphones. This topic will be covered in more detail in the following section.

2.3 PWA Features

2.3.1 Application Manifest

The PWAs technologies include the web application manifest as a key component. To provide the browser with further details about the application, a single JSON text file is added to the project. The browser advances the application features by using the corresponding data, namely it

- Displays the application differently.
- Grants application permission for automatic installation on the home screen of the users' device.
- Provides a native application look to the web application.

A basic piece called an application manifest is used in the root project folder, which also contains the index.html page. Installing a web app on the home screen of the device enables direct web app launch, boosts user engagement, and provides a more similar native software experience.

In order to apply the manifest rules across the whole application, it is typically advised to import the manifest file into every HTML page. It is also deployed using the `link` tag element in the page's `head` section.

Link: `"/manifest.json"` with `rel="manifest"`

In fact, the application manifest has shown to be a potent tool for fabricating the appearance of web applications and offering richer offline experiences.

2.3.1.1 Application manifest properties

There are various components in the application manifest.

1. Name: executes the application by its readable name.

```
"name": " "
```

2. When there is not enough room to display the full name of the application, a legible short name of the application is displayed.

```
brief name: " "
```

3. When a browser needs to utilize an icon, it can choose from a variety of image/icon files. Typically, the same icon is specified with various scales in mind; as a result, the browser chooses the best icon size for the relevant purpose.

```
'icons': ['src:',
```

```
"type": " ",
```

```
"sizes": " " },]
```

4. Start url designates the URL that loads initially when the application is launched.

```
begin url: " "
```

5. The scope: limits the manifest file's use to either the full project or a subset of its pages.

"scope": " "

6. The application's display style is specified by the display parameter.

displayed: "

7. Display orientation: Describes how the application is oriented.

to "orient": " "

The backdrop definition loads before the stylesheet, resulting in a seamless transition between starting the application and loading its content.

8. Main background color: Pre-defines the background that is mentioned in the CSS file.

Backdrop Color: " "

9. Main theme color: Defines the application's primary theme color.

: "theme color"

10. Description: Gives the application's description.

: "description"

11. Text direction is highlighted for the name, short name, and description object elements.

"dir": " "

12. Language: Highlights the language of the name, short name, and description object elements in the text key.

"lang": " "

2.3.1.2 Manifest browser support

Many browsers accept the JSON file used by the applications' manifest, and this support is likely to continue expanding as browsers evolve in response to the new manifest approach. Despite the fact that many browsers do not yet support application manifests, this does not seem to be a problem because such browsers should behave normally and ignore the manifest file.

Only Google Chrome currently provides total support for the application manifest. The manifest browser support as of this writing is shown in Figure 2.1.



Figure 2.1 Manifest Browser Support, (<https://caniuse.com/#feat=web-app-manifest>, 2019)

However, when developing a web application, it is possible to define similar properties for the use of non-supportive browsers, and meta tags are added to the web application to provide a closer experience of a PWA. As mentioned above, not all versions of Safari and Explorer support the progressive application manifest.

1. Safari's browser attributes:

1.1 The tag "apple-mobile-web-app-capable" with the value "yes"

When an application is supported by WebKit, the safari browser is instructed to treat it like a web application, allowing it to be launched from the device's home screen.

1.2 The tag with the content "black" in it's name is "apple-mobile-web-app-status-bar-style". specifies how the status bar will appear.

1.3 The tag with the content "PWAMorad" in it is called "apple-mobile-web-app-title." gives the name of the application.

1.4 The following link with the attributes apple-touch-icon, sizes57x57, and src="images/icons/appleicon-57x57.png">

Specifies the application icon and can include any number of icon sizes.

2. Online Explorer settings

2.1 The meta name="msapplication-TileImage" content="/src/images/icons/app-icon-144x144.png"> tag contains the app icon.

defines the icon for the program.

2.2 The tag "msapplication-TileColor" with the value "#fff" determines the icon's backdrop color..

2.3.2 Service workers

An essential component of PWA technology is the service worker. In addition to discussing the functionality and implementation of the service worker in the web application that is currently

being developed, this project gives an overview of service workers. The service provider works in the background. It enhances the web application's offline user experience and offers access to native application features including using the device's camera, integrating with its GPS, and enabling push notifications.

2.3.2.1 Service worker code

The service worker, which is a JavaScript file, operates independently in the background and offers further functionality with access to other features. Typical JavaScript code is tied to an HTML page and runs on a single thread. Even if the page contains numerous JavaScript files, all of the files still run on the same thread as the loaded JavaScript code. The DOM (Document Object Model) of the sites is accessed by the standard JavaScript code, which can also access alerts, change the DOM, show or hide items, and other DOM-related operations.

Additionally, JavaScript frameworks behave similarly in that the code is transformed to JavaScript code, allowing for the same level of DOM manipulation.

Because a service worker runs in the background and is detached from the application HTML pages, even though it is a JavaScript file that runs on a single thread, it does so on a different thread than regular JavaScript code. In contrast to typical JavaScript code, a service worker registers initially through the index HTML page but later becomes accessible across all pages (for example, all pages of a domain). Even after the pages have been closed, the service worker is still there in the browser. It functions differently from a typical JavaScript file, operates in the background, and employs JavaScript code. Additionally, the service worker responds quickly to events; it runs in the background and does things like display user notifications in response to various incoming events.

2.3.2.2 Service worker events

Fetch Event

Every single HTTP request is sent with the fetch method, which can be triggered by the browser or by JavaScript code connected to the page itself; for instance, an image tag that points to the image resource. The browser will issue a request to fetch the file whenever it makes an attempt to display the image.

The service worker file processes a fetch request, and the service worker acts as a network proxy. Every HTTP request is submitted via fetch; as a result, the service workers are consulted.

Additionally, a retrieve request is sent when loading a CSS or JavaScript file that has been imported into an HTML file. An HTTP request can be controlled, blocked, cached, and managed through the service worker because fetch is not initiated by standard AJAX requests.

Push Notifications

In essence, the browser renderer has its own web-push server and may transmit push notifications from the application server to the browser server, which then forwarded it to the client application. Push notifications are delivered by another server.

Even when the application is offline, the service worker listens for such push events because it runs in the background. After the session has finished, a push notification seeks to bring the user back to the application. A potent mechanism for influencing push notification events is the service worker. The service provider pays attention to and responds to user interactions using push notifications.

Background Synchronization

When a data transmission fails because of a bad connection, background synchronization synchronizes the data to prevent its loss. In the event that a post is unable to be sent because of a bad internet connection, the event will be saved by the background synchronization and will be resent once a connection to the internet has been restored. Background synchronization is available in Google Chrome.

Since the service worker is still active after exiting the application, it will respond if an internet connection is reestablished by carrying out the action it has been programmed to take.

Service worker life-cycle

Although the service worker file is programmed in JavaScript, it is registered as a background process file and doesn't run normally like a JavaScript file would. Two life-cycle phases are committed when a service worker registers.

1. When a service worker is installed by a browser, the browser produces an install event that is used to run the service worker's code and cache its initial assets. The service worker is updated/reinstalled upon page reloading if the presently installed version changes by 1 bite or more.

2. When the service worker is activated, it grants the application power over the pages of the scope.

After that, the background process where the service worker is handling events enters an idle mode, and if no events are triggered, it does nothing. Additionally, it switches to a terminated mode when inactive and reactivates when an event occurs.

2.3.2.3 Service worker browser support

Although many browsers, including Safari, Chrome, Firefox, and Edge, offer support, most browsers generally recognise that service workers and browser support are developing. However, certain browsers do not. The service worker browser support as of right now is shown in Figure 2.2.



Figure 2.2 Service worker browser support (<https://caniuse.com/#feat=serviceworkers>, 2019)

2.3.3 Promise and Fetch API

Older browsers do not support the native fetch API or promise API because they are both native technologies. The capabilities of promises, the retrieve API, and comparisons of promises with conventional AJAX requests are covered in the parts that follow. They also go into promise implementation in PWAs and promise interpretation in service workers.

As was already established, JavaScript is a single-threaded language that runs code by initiating asynchronous activities while anticipating responses. Callbacks are used to run additional functions in between the jobs. JavaScript code starts asynchronous tasks and waits for future answers for those tasks, rather than waiting for earlier processes to finish before executing later

code. “An asynchronous function is a function which operates asynchronously via the event loop, using an implicit Promise to return its result. But the syntax and structure of your code using async functions is much more like using standard synchronous functions.”²⁴

2.3.3.1 Promises

Since callbacks are unable to handle complicated asynchronous code, promises are utilized when the code becomes too complex for callbacks to handle. Promises are a relatively new feature that some browsers support. An asynchronous process's end state and value are indicated via a promise object.

A resolved function and a rejected function are required for the function that the promise constructor accepts as an argument. The promise constructor only accepts one function argument that is instantly executed.

Promises always deliver one of two outcomes: either they resolve the value or they reject the value (return an error).

```
Var promise = new Promise(function(resolve, reject){ }
```

2.3.3.2 Fetch and CORS

Fetch() is a JavaScript method that generates network HTTP requests and returns promises; as a result, it provides a clear and simple way to obtain, transfer, and read data from an external source, like a web page.

"Cross-origin resource sharing (CORS) is a method that permits constrained resources on a web page to be requested from a domain other than the domain from which the first resource was

served. Cross-origin pictures, stylesheets, scripts, iframes, and videos can all be freely inserted into web pages. The same-origin security policy by default forbids some "cross-domain" requests, most notably Ajax queries

▼ Response Headers

Access-Control-Allow-Credentials: true

Access-Control-Allow-Origin: http://127.0.0.1:8080

2.3.3.3 Fetch vs Ajax

AJAX stands for Asynchronous JavaScript And XML, and the process of sending a fetch request involves using an AJAX method.

1. configures the XHR object (an XML http request). the new XMLHttpRequest () function;
2. connects a Get request to a new connection. GET, "https://httpbin.org/post," xhr.open;
3. Specifies JSON as the response type. responseType = "json" for xhr;
4. returns the load-related response. xhr.onload = console.log(xhr.response), function();
5. Corrects mistakes. Console.log('Error!'); xhr.onerror = function();
6. the request is sent. xhr.send();

The AJAX process functions well, however it operates in a different way in the background. AJAX uses synchronous code, which makes it incompatible with service workers because they use asynchronous code instead. The fetch() API syntax is simpler than the AJAX syntax, which is more complicated. The service workers retain the fetch API, which has a straightforward implementation and unambiguous syntax.

2.3.4 Caching service workers

For example, requested data from a visited web page is kept in the cache storage for subsequent visits of the same web page. Caching is the process of storing data in a temporary storage. Instead of re-requesting the data from the web page server, the browser utilizes the cache storage data, which reduces loading time and reduces server traffic. Additionally, it provides offline access to cached pages, which is helpful when a connection is unreliable or unavailable. There are numerous cache storage options for web application installation.

1. Since the browser manages its own automatic cache, which was previously disabled in the application being developed, it is unreliable and the application has no control over the browser cache or the data stored in it.
2. Although it is a distinct cache that resides in the browser, Cache API is controlled by the developer. The URL/HTTP request is stored in the cache API, which also delivers values as responses. Since caching involves a one-time connection that gives access to the data to be cached, a response necessitates a page reload. The service worker uses JavaScript to access the Cache API. When the connection is down, the caching API offers a way to get data without making network calls.

2.3.4.1 Support for cache browsers

Figure 2.3 lists the cache browsers that are now supported, showing that not all browsers support the caching method..

	Desktop						Mobile						
	43 *	e	39 *	e	30 *	No	43 *	43 *	e	39	30 *	No	4.0
Basic support	43 *	Yes	39 *	No	30 *	No	43 *	43 *	No	39	30 *	No	4.0
add	44 *	16	39 *	No	31 *	No	44 *	44 *	No	39	31 *	No	4.0
addAll	46 *	16	39 *	No	33 *	No	46 *	46 *	No	39	33 *	No	5.0
delete	43	16	39 *	No	30	No	43	43	No	39	30	No	4.0
keys	43	16	39 *	No	30	No	43	43	No	39	30	No	4.0
match	43	16	39 *	No	30	No	43	43	No	39	30	No	4.0
matchAll	47	16	39 *	No	34 *	No	47	47	No	39	34	No	5.0
put	43 *	16	39 *	No	30 *	No	43 *	43 *	No	39	30 *	No	4.0

Figure 2.3 Cache browser support (<https://developer.mozilla.org/en-US/docs/Web/API/Cache>, 2019)

PWA technology is an incrementally improving technology, and while it does work in the browsers that support it, nothing will change or be affected in the browsers that do not support it. This is an important point to emphasize once more. Browsers that are not supported continue to operate normally without taking use of PWAs technology.

2.3.5 Dynamic data

The Google Firebase database, a backend server solution run by Google, is used in this project to establish a real-time data source: <https://firebase.google.com/>.

Leveraging on JSON, the Firebase storage provides a distinctive structure. It connects to the front end of the application to fetch data from the database via HTTP requests after constructing a straightforward database to hold the created posts assets (which stores the id, image, location, and title).

2.3.5.1 Dynamic caching vs caching dynamic content

Caching dynamic content and dynamic caching are two distinct ideas. The following is how dynamic caching is implemented.

1. The service worker intercepts a network request sent by the application.
2. The customer support representative contacts the network.
3. After receiving the request from the network, the program saves it in the cache and then reloads the web page.

Dynamic caching immediately stores the assets that were requested in the cache after they were received. After pre-caching the static data, dynamic caching takes place. After attempting to connect to the network and receiving a response from it, the application caches dynamic data. Data addition to the cache on a dynamic basis is known as dynamic caching.

Contrarily, dynamic content caching is distinct. The indexedDB will take care of caching instead of the cache API (a key-value database). Although no files or assets are saved in the cache storage, the indexedDB runs in the browser and helps to store both structured and unstructured data, such as JSON and XML data. Dynamic data that is often modified is stored using IndexedDB.

2.3.5.2 IndexedDB

A transactional key-value database running in the browser is called IndexedDB. Dependent activities are necessary for the indexedDB conduction. The failure of one action to complete within an indexedDB transaction results in the failure of all subsequent actions; hence, the failure of one entry to reach the database precludes the database from digesting more entries. Because it holds a lot of unstructured data, including files, IndexedDB is regarded as a JavaScript object and may

store a variety of data. IndexedDB is accessible using JavaScript, has the ability to contain numerous objects, and may be accessed asynchronously. As a result, it can be utilized in service workers.

2.3.5.3 IndexedDB browser support



Figure 2.4 IndexedDB browser support (<https://caniuse.com/#feat=indexeddb> , 2019)

Figure 2.4 specifies the IndexedDB browser support up to this date. IndexedDB is well supported by browsers, it is safe and secure..

2.3.6 Background sync

Background synchronization is used by PWA. It is a significant, recent feature that facilitates offline access. Even during offline access, background synchronization keeps the sent data up to date. The program should theoretically be able to send data when offline and navigate through

sites following the caching process. Utilizing background sync, the application has been improved to store requests sent while offline access.

2.3.6.1 Sending data while offline

After sending data to the server in the background synchronization process when the connection is not available, the application then receives the data from the server as soon as an internet connection is established, but only after it has cached the response to the requested data through its service workers. The service worker will register a sync task to be sent when the connection is available. The data that is supplied will be saved in the indexedDB. As a result, the application will send the data when the connection is re-established, even if the application has been stopped. This process will run in the background. Regarding the state of internet access, background synchronisation works perfectly.

2.3.6.2 Sync manager browser support

Figure 2.5 specifies the sync manager browser support.

	Desktop						Mobile						
	Chromium	Edge	Firefox	Opera	Safari	WebView	Android	Chrome	Firefox	Edge	Opera	Safari	WebView
Basic support	49	No	No	No	No	No	49	49	No	No	No	No	No
Available in workers	61	No	No	No	No	No	61	61	No	No	No	No	No
register	49	No	No	No	No	No	49	49	No	No	No	No	No
getTags	49	No	No	No	?	No	49	49	No	No	?	No	No

Full support No support
 Compatibility unknown

Figure 2.5 Sync manager browser support, (<https://developer.mozilla.org/en-US/docs/Web/API/Cache>, 2019)

2.3.7 Web push notifications

The native applications' push notifications feature is a potent tool that allows for real-time interactions and re-engages users with the application. The service worker assists the web application in enabling web push notifications.

2.3.7.1 Overview of push notifications

The program promotes real-time user engagement and offers a mobile app-like experience by using push notifications to direct the user into the application even when it is closed. Push notifications tell the user when they are needed and push data information into the program. Because the program asks for permission from the user, it displays notifications on demand and autonomously.

JavaScript is used to trigger notifications, and in order to do so, it needs authorization from the browser's push subscription feature. The service worker manages push subscriptions, which are interactions between a browser and a device via which a notification is sent to a web application.

Each browser has a push server of its own, which is controlled by the browser. In addition, the application creates a new subscription using JavaScript, which immediately contacts the push server and retrieves an application endpoint following authentication. The browser server sends new push messages to the app via the URL associated with the fetched database end-point.

The service worker creates a new subscription storing information from the endpoint retrieved from the browser servers, and then stores the new subscription data on the application backend server. The service worker then uses the stored data to push messages to the application's front end. Then, without using push events, notifications are created and shown using simple JavaScript and the notification API.

2.3.7.2 Push notifications browser support

Figure 2.6 specifies the push notifications browser support.

	🖥️						📱						
	🦖	🦘	🦉	🦊	🦆	🦄	🦟	🦕	🦘	🦉	🦊	🦆	🦄
Basic support	22 *	Yes	22	No	25	6	No	Yes	?	22	Yes	No	?
Available in workers	45	Yes	41	No	32	?	No	45	Yes	41	32	No	?
Secure contexts only	62	?	?	No	49	?	No	62	?	?	49	No	?
Notification() constructor	22	Yes	22	No	25	6	No	Yes	?	22	Yes	No	?
actions	53	No	No	No	39	?	No	53	No	No	39	No	?
badge	53	No	No	No	39	?	No	53	No	No	39	No	?
body	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
data	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
dir	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
icon	22	?	22	No	25	No	No	Yes	?	22	Yes	No	?
image	53	?	No	No	40	?	No	53	?	No	40	No	?
lang	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
maxActions	Yes	?	No	No	?	?	No	Yes	?	No	?	No	?
onclick	Yes	?	No	No	?	?	No	Yes	?	No	?	No	?
onclose	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
onerror	Yes	?	No	No	?	?	No	Yes	?	No	?	No	?
onshow	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
permission	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
renotify	50	No	No	No	37	No	No	50	No	No	37	No	?
requireInteraction	Yes	17	No	No	?	?	No	Yes	17	No	?	No	?
silent	43	17	No	No	30	No	No	43	17	No	30	No	?
tag	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
timestamp	Yes	17	No	No	?	?	No	Yes	17	No	?	No	?
title	Yes	?	No	No	?	?	No	Yes	?	No	?	No	?
vibrate	53	No	No	No	39	?	No	53	No	No	39	No	?
close	Yes	?	Yes	No	?	?	No	Yes	?	Yes	?	No	?
requestPermission	46	?	47	No	40	?	No	46	?	Yes	40	No	?

Figure 2.6 push notifications browser support

(<https://developer.mozilla.org/en-US/docs/Web/API/SyncManager>, 2019)

Application requirements

The PWA that is currently being developed has to have multiple different idea implementations completed before it can function like a native mobile application. If the device has a camera, the program created for this project allows users to capture images with it; if not, it activates a file uploader to enable file uploads. The user's photos are uploaded to the application's feed page where they are displayed alongside the title and the location information. The program is also anticipated to provide a number of essential native application functionalities.

1. The application must have an application icon and be installable from the home screen.
2. Creates a native application appearance.
3. Provides a front end-user interface that is completely functional.
4. Establishes a database as a back end.
5. Allows users to interact in real time.
6. Allows for dynamic data updating.
7. Provides offline features by caching and retrieving data as needed.
8. Supports both dynamic and static caching.
9. Re-engages the user with the application by using push notifications.
10. Uses features of the gadget (Camera of the device).
11. Perfectly functional across all browsers.

This chapter provided an introduction to the fundamental ideas utilized to create the PWA, detailed the various functionalities and implementation strategies for the technologies employed, and concentrated on browser support for the various technologies.

The following chapters of this thesis continue to implement the functional components after providing a full theoretical introduction. The developed application is anticipated to stand as a fully functional PWA at the conclusion of this thesis.

2.3.8 Manifest Implementation

By constructing the application manifest file and providing an application install banner, this brief explanation implements the first step toward transforming the built web application into a native program.

2.3.8.1 Implementing the manifest properties

The manifest file contains metadata that enhances the web applications' front-end to look like a native application.

```
"name": "A Progressive Web App".  
  
"short_name": "PWAMorad".  
  
"icons": [ { "src": "/src/images/icons/app-icon-48x48.png",  
"type": "image/png", "sizes": "48x48" }, ],  
  
"start_url": "/index.html".  
  
"scope": "."  
  
"display": "standalone" "orientation": "portrait-primary"  
  
"background_color": "#fff"
```

```
"theme_color": "#3f51b5"
```

```
"description": " implementing PWA technologies." "dir": "ltr",
```

```
"lang": "en-US"
```

2.3.8.2 Application install banner

An "add to home screen" option is visible in the manifest tool when the application developers' tools are opened on an Android device.

An ideal moment to show the install banner, according to Google Chrome, is when the program has been visited at least twice and at least five minutes have passed between each visit.

```
window.addEventListener('beforeinstallprompt',  
    function(event));  
console.log('beforeinstallprompt fired! ');  
event.preventDefault(); );
```

preventDefault() method in event listener can be used to stop this.

For this project, pushing the add button on the home page will use a custom event named deferredPrompt to launch the application install banner. The add button event handler implements this.

```
addEventListener('click', openCreatePostModal);  
for the shareImageButton () If (deferredPrompt) deferredPrompt.prompt();  
    deferredPrompt.userChoice.then;  
    createPostArea.style.display = "block"  
    (function(choiceResult));  
    console.log(choiceResult.outCome););
```

The aforementioned function determines whether the `deferredPrompt` is set before calling `deferredPrompt.prompt()`, displaying the banner, and saving the user's selection. The banner is only shown once; it is not necessary to show it again if the user installs the application. However, if the user chooses not to use the install banner, they still have the option to manually add the application to their home screen.

2.3.8.3 Asking for approval

An "enable notifications" button is developed to allow access to display notifications once the application requests the user's permission to enable push notifications. The "enable-notifications" class is required by the `enable-notifications` method, which is used to respond to events in the `feed.js` file as explained in the steps that follow.

1. A new variable is added so that you may access the activate notifications button.

The document's `enableNotificationsButtons` variable is set to `document.querySelectorAll(".enable-notifications");`

2. When the browser supports are accessible, the application shows the button. The code is altered as shown below.

- 2.1 The button is disabled by default in the `app.css`.

```
.enable-notifications  
    displays nothing;
```

- 2.2 The button in `app.js` implements a click event listener to enable notifications when clicked and is activated when browser support is present. The program cycles through the buttons inside the program that allow notifications (two buttons are used in the application).

If "Notification" is present in the window, perform the following formula: `if ('Notification' in window)` for

```
(var i=0; ienableNotificationsButtons.length ;i++)
enableNotificationsButtons[i].style.display = "inlineblock";
enableNotificationsButtons[i].addEventListener('click', askForNotificationPermission);
```

3. The function askForNotification() is developed.

Notification.requestPermission's askForNotificationPermission() function

```
(function(result) console.log('User Choice', result);
otherwise; if (result!== 'granted') console.log('No notification permission granted! '); );
```

Regardless of whether it is considered a different technology, the application inherently requests push permissions when the user accepts the push notifications.

2.3.8.4 Presenting alerts.

1. To confirm getting the user's consent, the program adds a new function. The function is carried out inside the askForNotificationPermission() method's else block.

new Notification ("Successfully subscribed!"); in the method displayConfirmNotification();

2. A JavaScript object is used to pass options to the function. Within the new Notification, the options argument is supplied as a new argument.

```
options is var;
```

3. Information is added to the choices object.

```
body: "You have successfully subscribed to our Notification Service!" var options =;
```

2.3.8.5 Notifications for service providers

When a connection is unavailable, notifications must be displayed using service workers; as a result, the program has been changed to do so when the service worker browser is supported. The program is altered as follows.

1. The application validates the navigator's support for service workers inside the `displayConfirmNotification()` function.

```
when ('serviceWorker' in navigator)
```

2. It then has access to the service worker object and navigator. By invoking the `ready` method, it also has access to the active service worker registration.

```
navigator.serviceWorker.ready
```

3. The function produces a promise that may be used to get the most recent service worker registration.

4. Next, it runs the `showNotification()` function, passing the options object and the title.

You have successfully subscribed to our notification service, says the body of the function `displayConfirmNotification()`,

```
if ('serviceWorker' in navigator), and navigator.serviceWorker.ready.
```

```
Then (swreg.showNotification ('Successfully subscribed! (From SW)', options);  
swreg.function(swreg););
```

To improve the push notifications, more options are added to the options object.

1. Icon: `"/src/images/icons/app-icon-96x96.png"`
2. A Picture: `"/src/images/3.jpg"`
3. The text direction is `"ltr"` (left to right text direction)
4. Language: `'en-US'`
5. The vibrating command is `[100, 50, 200]`. defines a vibration pattern that consists of a 100-ms vibration, a 50-ms pause, and a 200-ms repeat.
6. The badge option places the application icon in the top bar of the mobile display screen next to the hostname of the phone, the battery level, and the wifi indicator.

'/src/images/icons/app-icon-96x96.png' as the badge

a JavaScript-written Progressive Web Application with an HTML User Interface (UI) and CSS styling. The user can manipulate tasks by using a graphical user interface provided by the Progressive Web Application (PWA). JavaScript is used to build the functionality in PWAs, and HTML and CSS are used to design the structure and styling of the graphical user interface.

The module or disclosing module pattern is a solid option for libraries where reusability and an expandable interface to build upon are sought. Modules are limited to their own scope, which prevents contamination of the global namespace.

As the view in the browser or in the interface that the browser provides already acts as a passive view, the graphical task manager application will use a pattern resembling MVP (Model-View-Presenter), rendering the output in a presenter using templates and from HTML generated in a model containing the business logic.

both ECMAScript and JavaScript

Traditionally, desktop and mobile applications have been created by compiling source code into binary executables. Binary executables are only compatible with a single platform and a select few devices or operating systems.

The European Computer Manufacturers Association (ECMA), which was renamed Ecma international in 1994, is the organization that standardizes the ECMAScript (ES) specification, and JavaScript is a scripting language that adheres to that specification²⁵. Rather than being executed from binary executables, scripting languages are interpreted at runtime in a host environment.

Initially, JavaScript was intended to be a scripting language for the web that would provide functionality for elements defined inside the markup language of web pages, such as the functionality of a button element in a form using the onclick property. Over time, JavaScript has

developed into a general-purpose language with several applications. While still frequently seen operating inside web browsers²⁶, JavaScript is now also widely found operating on desktops, servers, cellphones, and embedded devices. Espruino is an example of an interpreter for running JavaScript on microcontrollers, and the Node.js runtime environment runs JavaScript on servers without the requirement for graphical environments²⁷. It's safe to state that JavaScript is widely used these days.”

2. 4 Review of Empirical Studies

Lead City University records attendance on paper which is a manual method of school management, does allocation to hostels manually, and a host of other registration processes. Additionally, the results are pasted on the notice board, causing a host of students to watch which at times due to the ranging population might lead to stampede, and also bringing the global pandemic into limelight, there is need for social distancing. The new Web-based application system has not fully encompassed all these features in them, it is still limited to a very large extent as one of the key reason or factors there is that it is not user friendly, it poses a delay in getting information sent to the host server. This system is also thought to waste man power and time unnecessarily and therefore, the need arises to develop a mobile application that will put registration, fees payment, creation of student identity cards, result checking, room allocation and timetabling in one place to help lecturers and school administrators manage their day to day activities more effortlessly.

2.5 Summary of Gaps

2.5.1 Availability of Local data

With local data, M-SIS only needs to perform authentication once. The user does not need to login every time the application is opened. M-SIS also requires loading the module once. If the user wishes to display the same module again at a later time, it does not need to run another loading sequence since the modules are stored offline in a secondary memory.

Reliability

- **Push:** M-SIS adopted the push service technology which will provide notifications every time new information is available.
- **Web mobile:** Most of the content modules in the M-SIS can be used by mobile applications from other platforms, because the contents are stored in the web.

Security

- **Encryption:** The web encryption uses algorithms that are recognized only by web service, web mobile and M-SIS.
- **Authentication:** Prior to using M-SIS, a user is prompted to enter his/her ID and password.
- **Authorization:** Users with different status have access to different levels of information.

Safety

- **Error handling:** Pop-up error message and automatic email notification to developers every time an error is encountered during M-SIS usage.²⁸

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Chapter 3

Methodology

3.1 Introduction

react.js

React is a JavaScript library, used for building UI. Facebook first introduced React in the year 2013. It was made open source two years later. React uses the virtual DOM for manipulating the UI as a result it gives blazing fast performance and making site most interactive as shown in figure 7¹.

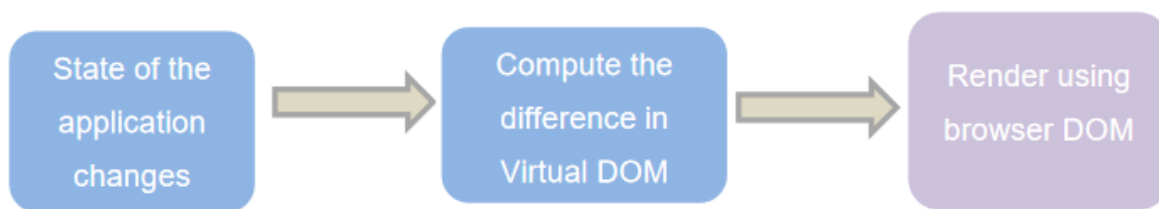


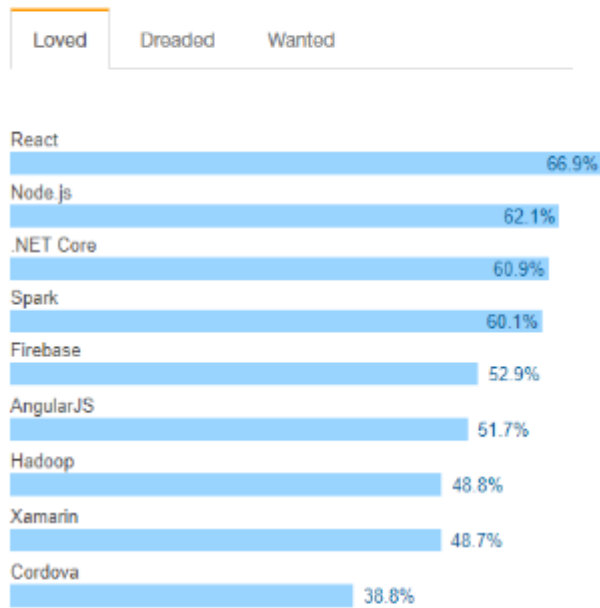
Figure 3.1 Rendering with the Virtual DOM in React. (Facebook.Inc, 2018)

As illustrated in figure 3.1, React keeps good track of an in-memory Virtual DOM. Facebook developed React specifically to solve one problem: building large application with data that changes over time. Thus, React adopted the declarative, Component-Based, Learn Once and Write Anywhere strategy. React makes it seamlessly easy to create interactive UIs. Designing simple views for each state in application, React smoothly updates and renders just the needed components when the data changes. Declarative views in React make code easy to predict and debug.²

React uses component-based structure. Component logic are written in JavaScript instead of templates which makes the easy passage of rich data through the web app and keeping state out of the DOM. Problems are solved by creating reusable components and when components get complex, they are broken down into smaller and simpler ones. React components are similar to JavaScript function³

As previously explained, the application uses push notifications to re-engage the user with the application even when the application is closed. It enhances user real-time interactions and provides a native application experience. React is also used in the server side using NodeJs and power mobile apps using React Native. All these features collectively make React the most loved one among the developers compared to other frameworks and libraries. It has outdone its competitors AngularJs, Angular 2 and Ember within three years of its release as seen in Figure 3.2. Now, React is taken as a paradigm in the world of front-end web development.

Most Loved, Dreaded, and Wanted Frameworks, Libraries and Other Technologies



% of developers who are developing with the language or technology and have expressed interest in continuing to develop with it

React is the most loved among developers, whereas Cordova is the most dreaded. However, Node.js is the most wanted.

Figure 3.2 Most loved technologies of 2017 in web development (Facebook Inc, 2019)

As shown in Figure 3.2, React was the most loved technology in 2017 at 66.9% whereas the least loved one is Cordova with 38.8% only. React uses an XML-like syntax JSX, a syntax extension to the ECMAScript to describe the component's DOM representation. It looks similar to that of the mark-up language HTML or XML but it is JavaScript centric. It makes code more readable and writing JSX gives the feel of writing HTML. It is based on separation of concerns rather than technology as it combines mark-up, style and behaviour of components in one file rather than having each separate files. However, it is not compulsory to use JSX in React application but the use of JSX helps for easy development, error handling and increase performance of React application.⁴

3.1.1 Functional Requirements

The functional requirements describes the basic functions that the system must be able to perform.

The functional requirements of the Developed system are:

- User registration page
- User login page
- Result checking
- Attendance signing
- Admin login page

3.1.2 Non Functional Requirements

Nonfunctional requirements are the functions that are not compulsory to be performed by the system, but if the system performs these functions, it will help to enhance the performance of the system and it will also help to make the system more secured. Some of the nonfunctional requirements includes:

- Security
- Reliability
- Usability
- User friendliness
- Fast performance

3.2 Research Approach

The Research approach is diversified, into two parts the first part, then the later part

Components are like JavaScript functions, which allow splitting the UI into independent and reusable pieces. Components are the building blocks in a React application. React components are created with a method `React.createClass()`. Components accept arbitrary inputs called props and state. Props is the communication channel, which acts as a bridge between parent and child components. Props is used to display static immutable data while state data type is used to dynamic data. State is private and fully controlled by the component⁵. Figure 3.2 depicts the representation of components, props and state in React.

```
import React from 'react';

class App extends React.Component

{ constructor(props) { super(props);

title: Title from props, content:

Content from props" }

render(){ return( <div> <Title titleProp={this.state.header}/> <Content
ContentProp={this.state.content}/> ); }

class Title extends React.Component(){ render(){ return( <div>
<h1>{this.props.titleProp}</h1> </div> ); } }

class Content extends React.Component(){ render(){ return( <div>
<h1>{this.props.contentProp}</h1> </div>

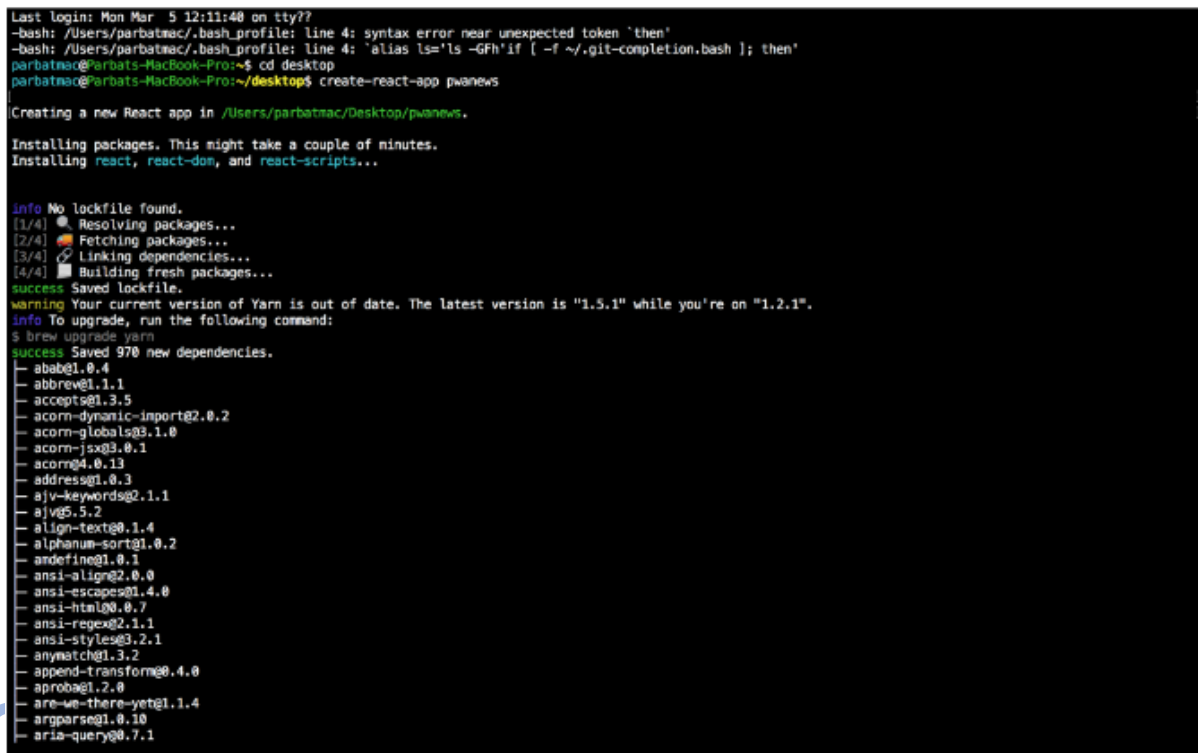
); } }
```

```
} export default App;3
```

Listing, Representation of components, props and state in React

3.2.1 Creating the React App

Create react app is a tool to get started with React.js app development. Create react app with pre-configured Webpack, Babel and other necessary tools makes an app development process smooth, and hassle free. It also comes pre-configured with Service Worker, which is one of the key components of PWA. Create react app can be easily installed from the terminal with the command: `npm install -g create-react-app`, as shown in Figure 3.3.



```
Last login: Mon Mar  5 12:11:48 on tty??
-bash: /Users/parbatmac/.bash_profile: line 4: syntax error near unexpected token `then'
-bash: /Users/parbatmac/.bash_profile: line 4: `alias ls='ls -GH'if [ -f ~/.git-completion.bash ]; then'
parbatmac@parbats-MacBook-Pro:~$ cd desktop
parbatmac@parbats-MacBook-Pro:~/desktop$ create-react-app pwanews

Creating a new React app in /Users/parbatmac/Desktop/pwanews.

Installing packages. This might take a couple of minutes.
Installing react, react-dom, and react-scripts...

info No lockfile found.
[1/4] 🔍 Resolving packages...
[2/4] 📦 Fetching packages...
[3/4] 🔗 Linking dependencies...
[4/4] 🏗 Building fresh packages...
success Saved lockfile.
warning Your current version of Yarn is out of date. The latest version is "1.5.1" while you're on "1.2.1".
info To upgrade, run the following command:
$ brew upgrade yarn
success Saved 970 new dependencies.
├─ abab@1.0.4
├─ abbrev@1.1.1
├─ accepts@1.3.5
├─ acorn-dynamic-import@2.0.2
├─ acorn-globals@3.1.0
├─ acorn-jsx@3.0.1
├─ acorn@4.0.13
├─ address@1.0.3
├─ ajv-keywords@2.1.1
├─ ajv@5.5.2
├─ align-text@0.1.4
├─ alphanum-sort@1.0.2
├─ andefine@1.0.1
├─ ansi-align@2.0.0
├─ ansi-escapes@1.4.0
├─ ansi-html@0.0.7
├─ ansi-regex@2.1.1
├─ ansi-styles@3.2.1
├─ anymatch@1.3.2
├─ append-transform@0.4.0
├─ aproba@1.2.0
├─ are-we-there-yet@1.1.4
├─ argparse@1.0.10
├─ aria-query@0.7.1
```

Figure 3.3 Installing create-react-app project (Researcher, Adediran E. 2022)

As illustrated in figure 3.3, create-react-app pwa-news creates a new React app in pwa-news. Changing directory to pwa-news and running npm start runs react script starting the development server.”

```
Compiled successfully!  
  
You can now view      in the browser.  
  
    http://localhost:    /  
    http://10.112.194.139:    /  
  
Note that the development build is not optimized.  
To create a production build, use yarn build.
```

Figure 3.4 Create-react-app compiled successfully (Researcher, Adediran E. 2022)

As shown in figure 3.4, after the successful compilation of create-react-app, it can be viewed in the browser by visiting <http://localhost:3000>.

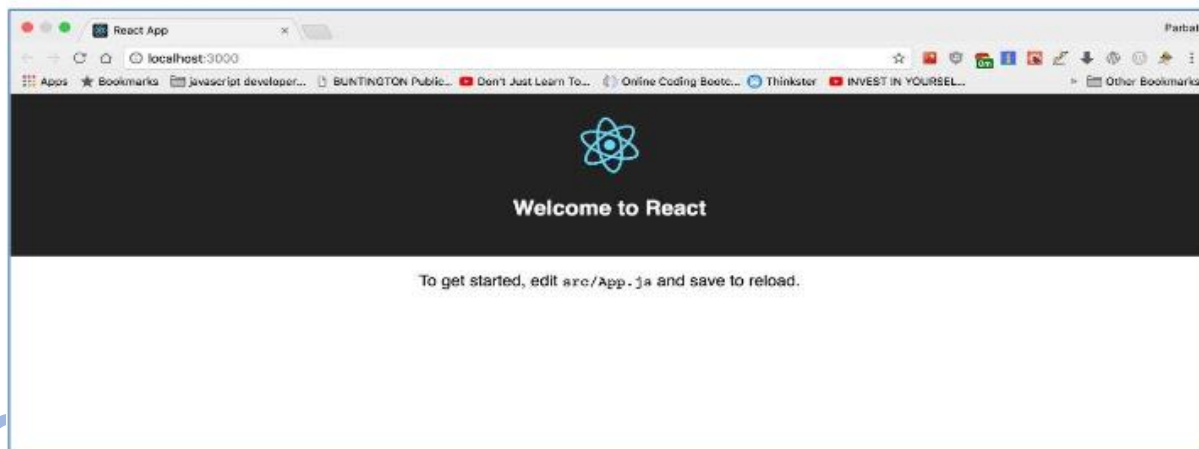


Figure 3.5 Default create-react-app project in local host (Researcher, Adediran E. 2022)

Web Pack: Webpack is a static module bundler for modern JavaScript applications. Modern JavaScript applications have various modules and stylesheets. These modules and stylesheets make the development process easy. However, during the time of deployment it creates hassle. When webpack is used, it processes the app and recursively builds a dependency graph, which includes every module needed by the application and packs all those modules into one or more bundles. Webpack improves the performance of the application⁶.

Babel : Babel is a JavaScript compiler. It transforms the new version of JavaScript code to the older version. In conjunction with Webpack, Babel trans piles ES6 and JSX to ES5. It is done to support the maximum number of users possible.

3.2.2 Other Online Services

RSS to JSON

It is an online service to convert an RSS feed into a REST API which then can be consumed by any applications which support fetching content from such API. The News app developed in the project receives its data from this service. The use of this service has allowed the app to run only as a Frontend web app.

Cloudinary: Cloudinary is the media management platform for web and mobile developers. Cloudinary is used as an image and video optimizing platform. Cloudinary played an important role in increasing the performance of PWA by optimizing the image size. One Signal and Zapier are used for implementing push notification.

3.2.3 Serializing todo.txt into JSON

Representing data as attributes with values for use in communication or storage can be done by using several different standardized formats. Common formats are Extensible Markup Language (XML) and the open and in comparison somewhat relaxed standard JavaScript Object Notation (JSON) (ECMA, 2017). Not exclusively used by JavaScript (although the syntax resembles JavaScript and is the origin of its name), JSON is considered the standard format for web applications⁷.

3.2.4 Software requirements

The following includes the later part;

1. SQL: A structured query language is a standard language for storing, manipulating, and retrieving data in a database. Using SQL involves changing the database table and index structure. Add, update, and delete rows of data. Gets a subset of information from the database for transaction processing and analysis applications⁸.
2. HTML: Known as the hypertext markup language, it is the standard language used to create web pages. HTML can embed programs written in scripting languages such as JavaScript and affect the behavior and content of web pages. CSS integration defines the appearance and layout of web pages⁹.
3. CSS: Cascade Style Sheet (CSS) is a style sheet language used to describe the display of documents written in markup languages such as HTML. CSS, along with HTML and JavaScript, is the underlying technology of the World Wide Web. CSS is designed to separate presentation

and content, such as layout, colors, and fonts. This separation gives you greater accessibility to your content, greater flexibility and control in specifying the characteristics of your presentation, and allows you to share the format across multiple web pages by specifying the relevant CSS in a separate CSS file. And can reduce the complexity and repetition of structural content¹⁰.

4. PHP: Hypertext Preprocessor is a server scripting language and a powerful tool for creating dynamic and interactive web pages. This is a general-purpose programming language originally designed for web development¹¹.

5. JavaScript is a prototype based, multi paradigm, dynamic language, supporting object oriented, imperative, and declarative (e.g. functional programming) styles. JavaScript supports event driven, functional, and imperative (including object oriented and prototype based) programming styles¹².

3.3 Class Diagram

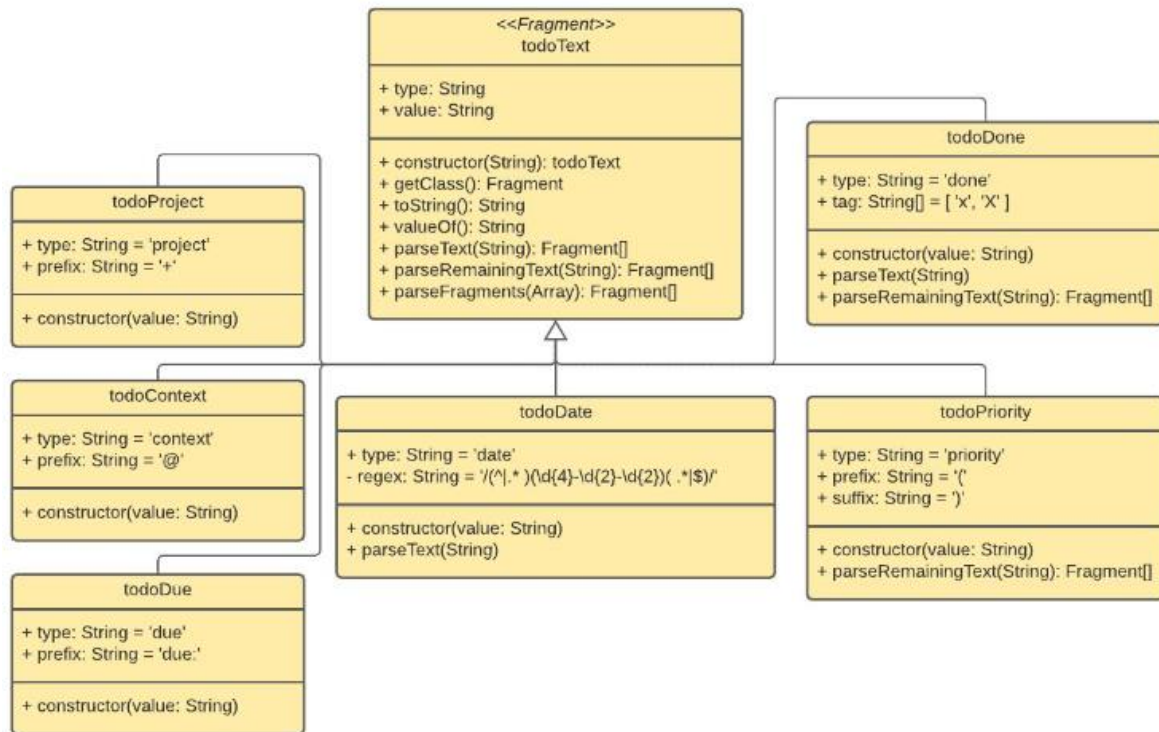


Figure 3.6 Class diagram (Researcher, Adediran E. 2022)

After development and testing of the library yielded a usable result Roll up was used to create several JavaScript bundles compatible with multiple targets (ESM Common JS and Universal Module Definition formats). The bundles were then compressed into a distributable archive.

Using a modular design implies components or parts that need to communicate data between the graphical JavaScript frontend, the data model and the server PHP backend. Using JSON as a standardized format for representing data makes this a standardized procedure.

Endnotes

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Chapter Four

Result and Discussion Findings

4.1 Introduction

This Chapter shows the result of the Progressive Web Application for Schools Management System for both the Web Application and the Mobile App using php and css as well as react.

4.1 Login Page

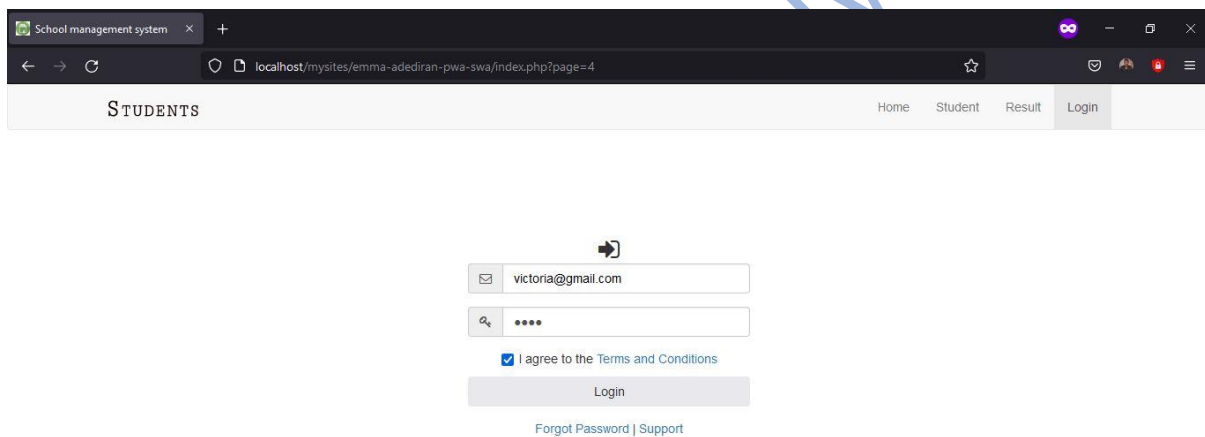
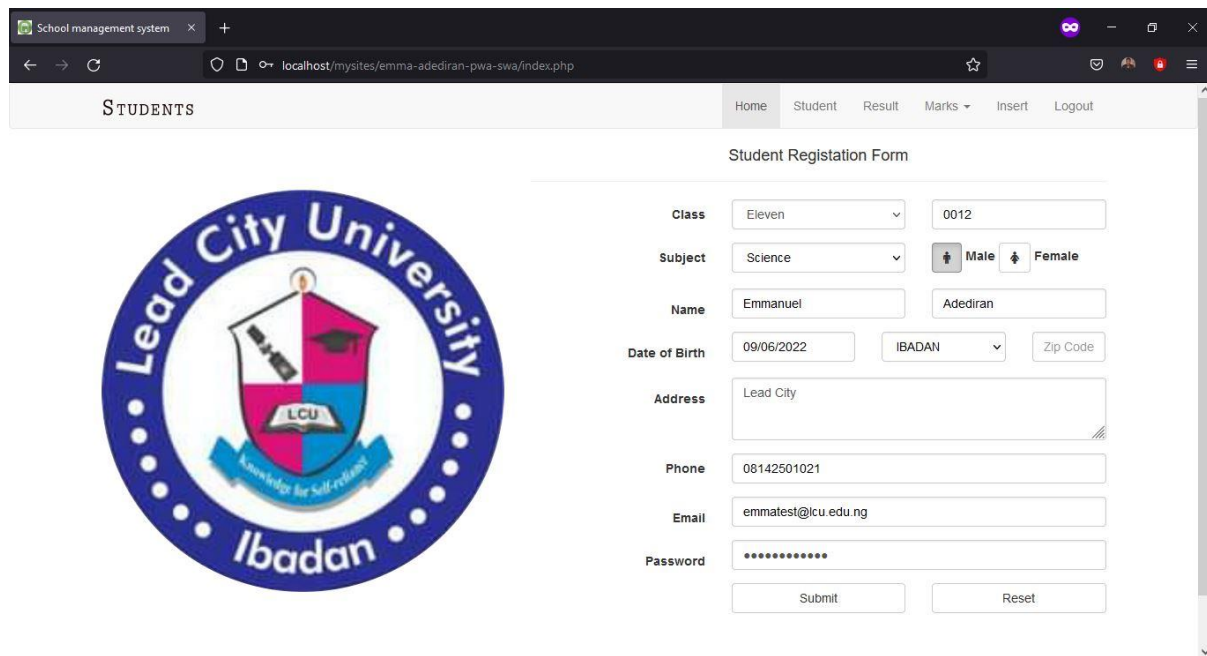


Figure 4.1 Login page (Researcher, Adediran, E. 2022)

The snapshot in figure 4.1 is the login in page of the School Management system. The login page displays how the users get access to the system. The users can log in with their email or Matriculation number to the system. The database can be cleared by the admin.

4.2 Student Registration Page



The screenshot displays a web browser window with the following details:

- Browser tab: School management system
- Address bar: localhost/mysites/emma-adediran-pwa-swa/index.php
- Page title: STUDENTS
- Navigation menu: Home, Student, Result, Marks, Insert, Logout
- Form title: Student Registration Form
- Form fields:
 - Class: Eleven (dropdown)
 - Subject: Science (dropdown)
 - Name: Emmanuel Adediran (text input)
 - Date of Birth: 09/06/2022 (text input)
 - Address: Lead City (text input)
 - Phone: 08142501021 (text input)
 - Email: emmatest@lcu.edu.ng (text input)
 - Password: [masked]
- Buttons: Submit, Reset
- Logo: Lead City University Ibadan

Figure 4.2 Student Registration page (Researcher, Adediran, E. 2022)

The snapshot in figure 4.2 is the Student Registration page of the Progressive Web Application School Management System. The Student Registration page displays the activities that can be performed by the users on the system. The users can fill in their details as it were on the screen. The database can be cleared by the admin.

4.3 Student Result Page

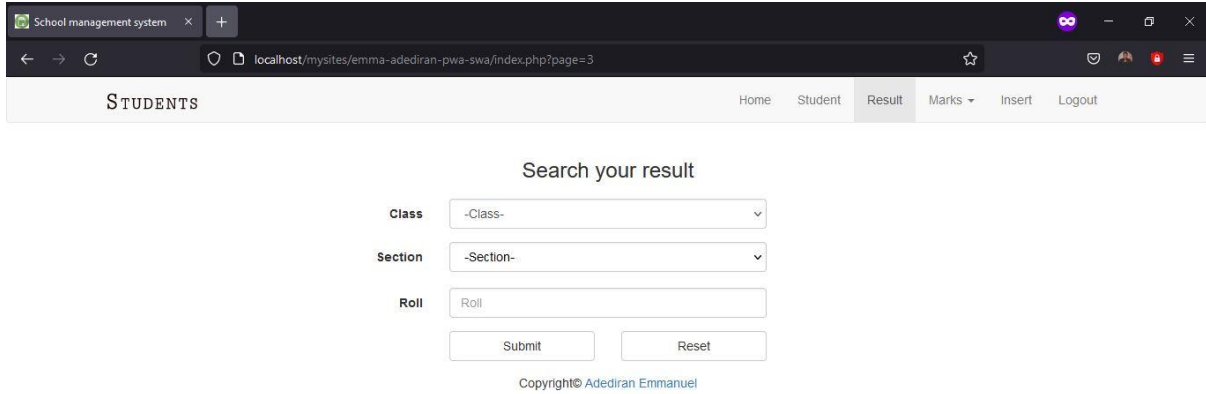


Figure 4.3a Student Result page (Researcher, Adediran, E. 2022)

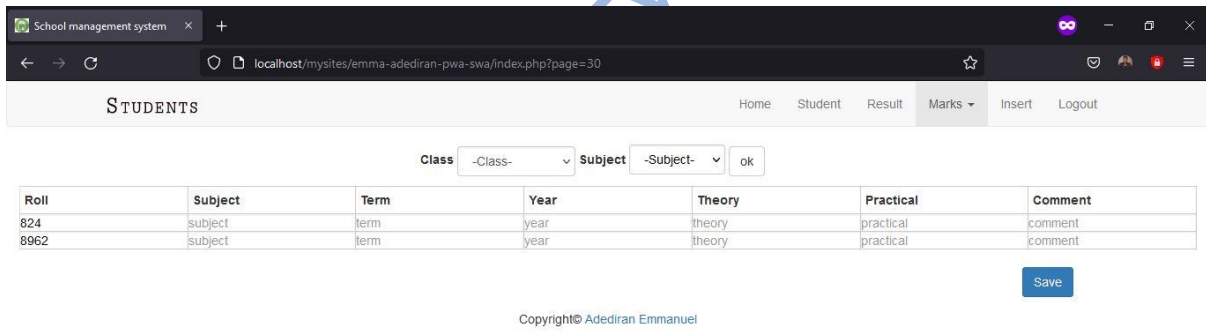


Figure 4.3b Student Result page (Researcher, Adediran, E. 2022)

The snapshot in figure 4.3a is the Student Result page of the Progressive Web Application School Management System. The Student Result page displays the activities that can be performed by the users on the system. The users can fill in their details as it were on the screen. The Snapshot on Figure 4.3b is the result of the student viewed which also has space for comment by the lecturers taking the various courses. The database can be cleared by the admin.

4.4 Student Attendance Page

SIN	Name	Class	Roll	Section	Gender	Birth Day	Address	City	Zip	Phone	Email	Action
1	Jahana Codeam	Twelve	5552	Science	Female	06/06/2017	gffswfsqgg	SIRAJGANJ	1230	2147483647	serakib@gmail.com	
2	Rakib Code	Eleven	824	Science	Male	12/03/1996	dbn	SIRAJGANJ	1400	34570000	fgsdfgd@vdsddd.com	
3	Shahana Khandokar	Hons. Prof.	2000	BSc in CSE	Female	30/05/1996	reretrd	BARGUNA	1234	1667543456	admin@gmail.com	
4	Abdul Karim	Hons. Prof.	8960	BSc in CSE	Male	06/13/1996	Kazipura, Sirajganj	SIRAJGANJ	6700	1889653236	admin@gmail.com	
5	Shahana Khandokar	Hons. Prof.	23	BSc in CSE	Female	30/05/1996		GAIBANDHA	1234	1773259875	admin@gmail.com	
6	Jahana Code	Hons.	2412	BENGALI	Female	06/06/1996	Talbagan, India.	SIRAJGANJ	1225	1773259875	admin@gmail.com	
7	Jahana Kamal	Hons.	1478	BENGALI	Female	12/03/1996	Talhati, Gujrat	SIRAJGANJ	1245	1889653236	admin@gmail.com	
8	Jahana Kamal	Hons.	2311	BENGALI	Female	06/06/1996	wqww	SIRAJGANJ	3432	1773259875	fgsdfgd@vdsddd.com	
9	Jahana Code	Eleven	8962	Science	Female	06/05/2017	23e3e4qq	SIRAJGANJ	3432	2147483647	fgsdfgd@vdsddd.com	
10		Degree Pass	0	BSc	Male			IBADAN	0	0	victoria@gmail.com	

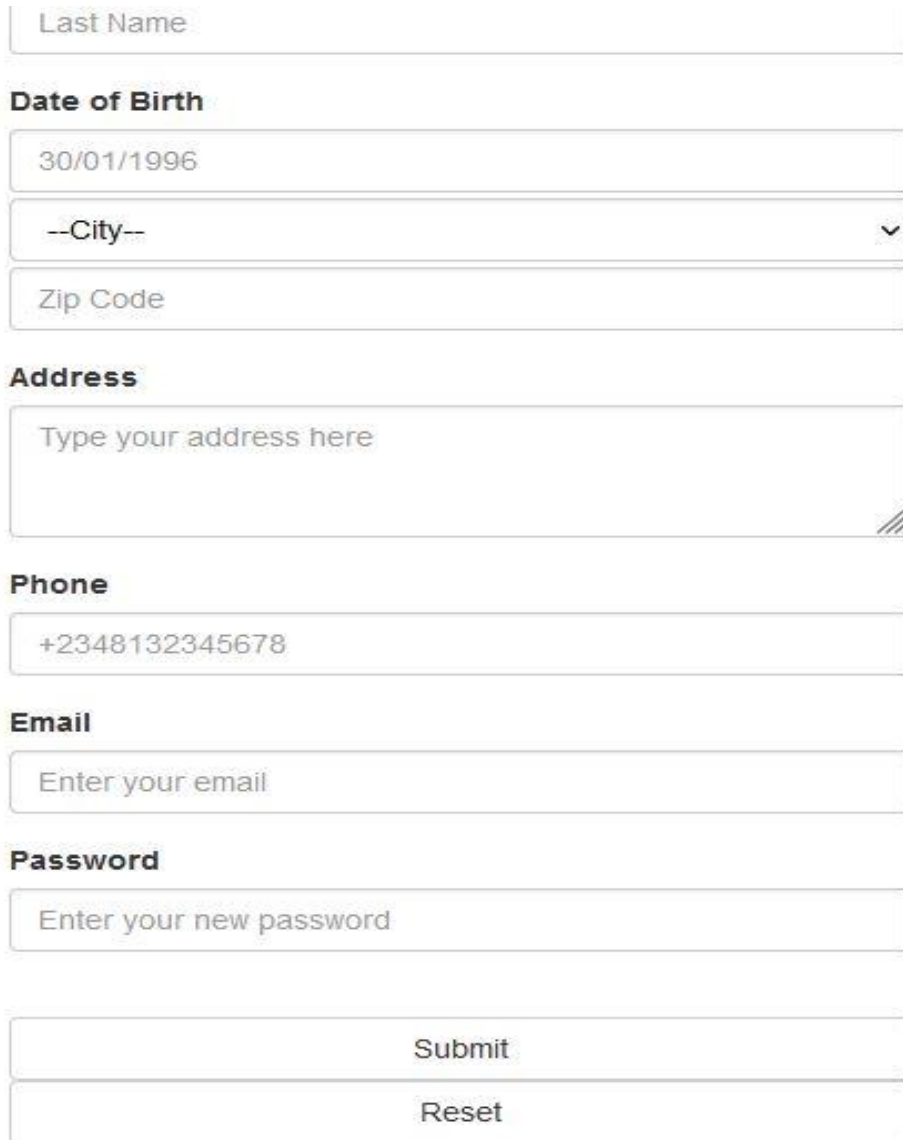
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Figure 4.4 Student Attendance page (Researcher, Adediran, E. 2022)

The snapshot in figure 4.4 is the Student Attendance page of the Progressive Web Application School Management System. The Student Attendance page displays the list of students in the class per subject. This occurs after students have signed in for the various classes. The database can be cleared by the admin.

4.5 Mobile View

Due to the style of technology used, the developed software automatically converts the web-based system into a Mobile app which also has the following images.




The image shows a mobile login form with the following fields and buttons:


- Last Name**: A text input field.
- Date of Birth**: A date input field containing "30/01/1996".
- City**: A dropdown menu showing "--City--".
- Zip Code**: A text input field.
- Address**: A large text area with the placeholder "Type your address here".
- Phone**: A text input field containing "+2348132345678".
- Email**: A text input field with the placeholder "Enter your email".
- Password**: A text input field with the placeholder "Enter your new password".
- Submit**: A button.
- Reset**: A button.



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Figure 4.5 Mobile View Login page (Researcher, Adediran, E. 2022)

STUDENTS 


- Home
- Student**
- Result
- Marks ▾
- Insert
- Logout

Type to search... 

S/N	Name	Class	Roll	Section
1	Jahana Codeam	Twelve	5552	Science
2	Rakib Code	Eleven	824	Science
3	Shahana Khandokar	Hons. Prof.	2000	BSc in CS
4	Abdul Karim	Hons. Prof.	8960	BSc in CS
5	Shahana Khandokar	Hons. Prof.	23	BSc in CS

Figure 4.6 Mobile View Attendance page (Researcher, Adediran, E. 2022)

STUDENTS 


Student Registration Form

Class

-Class- 

Roll / ID

Subject

-Subject- 

Male Female


Name

First Name

Last Name

Date of Birth

30/01/1996

--City-- 

Zip Code

Address

Figure 4.7 Mobile View Registration page (Researcher, Adediran, E. 2022)

4.6 Admin Page

STUDENTS

Home Student Result Marks Insert Logout

Data Upload From Excel(.xlsx) Type to search...

File
 Browse... No file selected.
 insert update

Student Table

Roll	Class	Subject	First Name	Last Name	Male	Female	Birth Day	City	Zip	Address	Phone	Email	Password
5552	Twelve	Science	Jahana	Codeam	<input type="radio"/>	<input checked="" type="radio"/>	06/06/2017	SIRAJGA	1230	gftswfsqgg	2147483647	serakib@gmail.com	cotyrryr
824	Eleven	Science	Rakib	Code	<input checked="" type="radio"/>	<input type="radio"/>	12/03/1996	SIRAJGA	1400	dbn	34570000	fgsdfgd@vdsddd	
2000	Hons. Prof.	BSc in CSE	Shahana	Khandokar	<input type="radio"/>	<input checked="" type="radio"/>	30/05/1996	BARGUN	1234	reretrd	1667543456	admin@gmail.com	coradmin
8960	Hons. Prof.	BSc in CSE	Abdul	Karim	<input checked="" type="radio"/>	<input type="radio"/>	06/13/1996	SIRAJGA	6700	Kazipura, Sirajganj	1889653236	admin@gmail.com	corroot
23	Hons. Prof.	BSc in CSE	Shahana	Khandokar	<input type="radio"/>	<input checked="" type="radio"/>	30/05/1996	GAIBANI	1234	Your address	1773259875	admin@gmail.com	corroot
2412	Hons.	BENGALI	Jahana	Code	<input type="radio"/>	<input checked="" type="radio"/>	06/06/1996	SIRAJGA	1225	Talbagan, India	1773259875	admin@gmail.com	coradmin
1478	Hons.	BENGALI	Jahana	Kamal	<input type="radio"/>	<input checked="" type="radio"/>	12/03/1996	SIRAJGA	1245	Talhati, Gujrat	1889653236	admin@gmail.com	coradmin
2311	Hons.	BENGALI	Jahana	Kamal	<input type="radio"/>	<input checked="" type="radio"/>	06/06/1996	SIRAJGA	3432	wqww	1773259875	fgsdfgd@vdsddd	weeeeeeere
8962	Eleven	Science	Jahana	Code	<input type="radio"/>	<input checked="" type="radio"/>	06/05/2017	SIRAJGA	3432	23e3e4qq	2147483647	fgsdfgd@vdsddd	33444444
0	Degree Pass	BSc	First Name	Last Name	<input checked="" type="radio"/>	<input type="radio"/>	30/01/1996	IBADAN	0	Your address	0	victoria@gmail.com	cc1234

Save changes

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Figure 4.8 Admin page (Researcher, Adediran, E. 2022)

The snapshot in figure 4.6 is the Admin page of the Progressive Web Application School Management System. The Admin page displays the list of students with their details. This occurs after students have taken various and necessary steps. The database can be cleared by the admin.

Chapter Five

Conclusion

5.1 Summary

By providing teachers with a convenient location to find and categorize details, student management solutions enable faculty members' jobs. Instructors and college administrators can monitor their students' participation thanks to this technology. This innovation is of immense help to the school, faculty, department which embodies members of the academic staff and students.

5.2 Conclusion

In conclusion, Instructive organizations can basically keep their understudy records by utilizing understudy the board frameworks. The manual framework makes it hard to achieve this objective on the grounds that the data is scattered, frequently excess, and social event relevant information could take a ton of time. This undertaking settle every one of these issues. This framework supports safeguarding the association's understudy data set. The supervisor may promptly get to it and keep it secure for quite a while without making any changes.

5.3 Contribution to Knowledge

In this research explore the problem of Network Independence was solved. In view of this, techniques and approaches to make applications function offline have been introduced. A combination of technologies is used to accomplish this: Service Workers to manage page requests (for instance, by storing them offline), the Cache API to store network request responses offline (which is very helpful for storing site assets), and client-side data storage technologies like Web Storage and IndexedDB to store application data offline. Modern web apps can be created to offer

a great user experience to browsers with all the necessary capabilities, and a passable (although less flashy) experience to browsers with less capability which was done in this project. Best practices like progressive enhancement was used. PWAs are cross-browser due to the progressive improvement they use. Researchers should therefore consider how various browser implementations of some PWA features and technologies differ from one another.

5.4 Recommendation

This research has added to the public understanding of PWA and can be useful to lecturers in higher education as well as the industry of application developers. The researcher aim to push the technology to be improved even further by emphasizing the current problems with PWA and the opinions of the technology in the industry. A brief checklist of the greatest problems has been supplied and is arranged in accordance with the perceived severity of the issues in order to make the necessary solutions more concrete significance of each issue.

5.5 Area of Further Studies

It could likewise be fascinating to direct research that rather has the emphasis on the actual innovation. This exploration could for example meet with a portion of the people associated with the improvement of PWA to accumulate their viewpoints and considerations on the tech and its current limitations. Posing the inquiry of regardless of whether they think PWA is the future could yield immeasurably various outcomes from these people than what was acquired from reviewing the business.

An idea is to likewise do a review that is only about the schooling area to reveal more about assuming there is as of now a botched an open door to furnish understudies with the information they need when they enter the business. At long last, a review could be led about PWA according

to the viewpoint of a client that is requesting a versatile application from a designer since this study had no indisputable outcomes about this subject. It very well may intrigue to get the full image of the trade to check whether maybe there is a need to change how choices about which tech to utilize are made.

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Appendix

```
<?php
$user=0;
$login=0;
session_start();

function login($nm,$vl){
    $_SESSION[$nm] = $vl;

    if ($_SESSION['xbpqwe']=='xbbpqf72cabzc4ryun') header('Location: index.php');
}

if (isset($_SESSION['xbpqwe'])) {
    $login=1;
    $user=1;
}
?>

<!DOCTYPE html>

<html lang="en">

<head>

    <meta charset="utf-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1">

    <!-- The above 3 meta tags *must* come first in the head; any other head content must come
    *after* these tags -->

    <title>School management system</title>
```

```
<link rel="icon" href="images/favicon.ico">
```

```
<link rel="shortcut icon" href="images/favicon.ico" />
```

```
<!-- Bootstrap -->
```

```
<link href="css/bootstrap.min.css" rel="stylesheet">
```

```
<link href="css/font-awesome.min.css" rel="stylesheet">
```

```
<link href="css/jquery-ui.css" rel="stylesheet">
```

```
<link href="css/jquery.dataTables.min.css" rel="stylesheet">
```

```
<link href="images/favicon.ico" rel="shortcut icon" type="image/vnd.microsoft.icon" />
```

```
<script src="js/jquery.min.js"></script>
```

```
<script src="js/jquery.dataTables.min.js"></script>
```

```
<script src="js/bootstrap.min.js"></script>
```

```
<link rel="stylesheet" href="css/style.css">
```

```
<link rel="stylesheet" href="css/responsive.css">
```

```
<!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
```

```
<!-- WARNING: Respond.js doesn't work if you view the page via file:// -->
```

```
<!--[if lt IE 9]>
```

```
<script src="https://oss.maxcdn.com/html5shiv/3.7.3/html5shiv.min.js"></script>
<script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
<![endif-->
```

JERIA

```
</head>
<body>
<!--
=====header=====
>
<header>
<nav class="navbar navbar-default fixed-top">
<div class="container">
<!-- Brand and toggle get grouped for better mobile display -->
<div class="navbar-header">
<button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-
target="#bs-example-navbar-collapse-1" aria-expanded="false">
<span class="sr-only">Toggle navigation</span>
<span class="icon-bar"></span>
<span class="icon-bar"></span>
<span class="icon-bar"></span>
</button>
```

DO NOT

```
<a class="navbar-brand" href="#"></a>
</div>
```

```
<!-- Collect the nav links, forms, and other content for toggling -->
```

```
<div class="collapse navbar-collapse" id="bs-example-navbar-collapse-1">
```

```
<!-- <ul class="nav navbar-nav navbar-right">
```

```
<li><a href="index.php">Home <span class="sr-only">(current)</span></a></li>
```

```
<li><a href="about.html">Result</a></li>
```

```
<li class="active"><a href="#">Student</a></li>
```

```
<li><a href="news.html">News</a></li>
```

```
<li><a href="contact.html">Contacts</a></li>
```

```
</ul> -->
```

```
<ul class="nav navbar-nav navbar-right">
```

```
<li <?php if ((!isset($_GET['page']))||(isset($_GET['page']) && $_GET['page'] == '1')) echo
'class="active"'?>><a href="?page=1">Home</a></li>
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '2') echo 'class="active"'?>><a
href="?page=2">Student</a></li>
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '3') echo 'class="active"'?>><a
href="?page=3">Result</a></li>
```

```
<?php if ($user==1) { ?>
```

```
<li class="dropdown <?php if (isset($_GET['page']) && ($_GET['page'] == '30' || $_GET['page']  
== '31')) echo 'active'?>">
```

```
<a class="dropdown-toggle" data-toggle="dropdown" href="#">Marks
```

```
<span class="caret"></span></a>
```

```
<ul class="dropdown-menu">
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '30') echo 'class="active"'?><a  
href="?page=30">Marks Entry</a></li>
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '31') echo 'class="active"'?><a  
href="?page=31">View Marks</a></li>
```

```
</ul>
```

```
</li>
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '5') echo 'class="active"'?><a  
href="?page=5">Insert</a></li>
```

```
<?php } if ($login==1) { ?>
```

```
<li><a href="?page=6">Logout</a></li>
```

```
<?php }else{ ?>
```

```
<li <?php if (isset($_GET['page']) && $_GET['page'] == '4') echo 'class="active"'?><a href="?page=4">Login</a></li>
```

```
<?php } ?>
```

```
</ul>
```

```
</div><!-- /.navbar-collapse -->
```

```
</div><!-- /.container-fluid -->
```

```
</nav>
```

```
</header>
```

```
<?php
```

```
if (!isset($_GET['page'])) include 'pages/registation.php';
```

```
if(isset($_GET['page'])) {
```

```
    $page=$_GET['page'];
```

```
    if ($page == '1'){
```

```
        include 'pages/registation.php';
```

```
    }
```

```
    if ($page == '2'){
```

```
        include 'pages/student.php';
```

```
    }
```

```
    if ($page == '3'){
```

```
    include 'pages/result.php';
}
if ($page == '30'){
    include 'admin/marks_entry.php';
}
if ($page == '31'){
    include 'admin/marks_view.php';
}
if ($page == '4'){
    include 'pages/login.php';
}
if ($page == '5'){
    include 'admin/insert.php';
}
if ($page == '6'){
    session_unset();
    session_destroy();
    header('Location: index.php');
}
}
?>
```

school-management-web-app

School management web application using php,msqli

Features:

1. Multiple user
2. Add student
3. delete student
4. update student profile
5. marks entry
6. update marks
7. Search result
8. Search student
9. Data download in pdf & excel format
10. Upload Student data from excel file
11. Update Data from excel file.
12. Dynamically load subject from database using ajax method
13. Subject load dynamically

Installation:

1. Create a database 'school'
2. Open \core\init.php & replace info with yours.

-- phpMyAdmin SQL Dump

```
-- version 4.6.4
-- https://www.phpmyadmin.net/
--
-- Host: 127.0.0.1
-- Generation Time: Jun 26, 2017 at 10:59 AM
-- Server version: 5.7.14
-- PHP Version: 5.6.25
```

```
SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
```

```
SET time_zone = "+00:00";
```

```
/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
```

```
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS
*/;
```

```
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
```

```
/*!40101 SET NAMES utf8mb4 */;
```

```
--
```

```
-- Database: `school`
```

```
--
```

```
-----
```

```
--  
-- Table structure for table `city`  
--  
  
CREATE TABLE `city` (  
  `code` int(4) NOT NULL,  
  `name` varchar(25) NOT NULL  
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

```
--  
-- Dumping data for table `city`  
--  
  
INSERT INTO `city` (`code`, `name`) VALUES  
(1, 'IBADAN'),  
(3, 'ILESA'),  
(4, 'IGBOHO'),  
(6, 'OSOGBO'),  
(9, 'AGEGE'),  
(10, 'BOGRA'),  
(12, 'BRAHMANBARIA'),  
(13, 'CHANDPUR'),  
(70, 'CHAPAINAWABGANJ'),
```

- (15, 'CHITTAGONG'),
(18, 'CHUADANGA'),
(19, 'COMILLA'),
(22, 'COX\S BAZAR'),
(26, 'DHAKA'),
(27, 'DINAJPUR'),
(29, 'FARIDPUR'),
(30, 'FENI'),
(32, 'GAIBANDHA'),
(33, 'GAZIPUR'),
(35, 'GOPALGANJ'),
(36, 'HABIGANJ'),
(39, 'JAMALPUR'),
(41, 'JESSORE'),
(42, 'JHALAKATI'),
(44, 'JHENAIDAH'),
(38, 'JOYPURHAT'),
(46, 'KHAGRACHHARI'),
(47, 'KHULNA'),
(48, 'KISHOREGANJ'),
(49, 'KURIGRAM'),
(50, 'KUSHTIA'),
(51, 'LAKSHMIPUR'),

(52, 'LALMONIRHAT'),
(54, 'MADARIPUR'),
(55, 'MAGURA'),
(56, 'MANIKGANJ'),
(57, 'MEHERPUR'),
(58, 'MOULVIBAZAR'),
(59, 'MUNSHIGANJ'),
(61, 'MYMENSINGH'),
(64, 'NAOGAON'),
(65, 'NARAIL'),
(67, 'NARAYANGANJ'),
(68, 'NARSINGDI'),
(69, 'NATORE'),
(72, 'NETROKONA'),
(73, 'NILPHAMARI'),
(75, 'NOAKHALI'),
(76, 'PABNA'),
(77, 'PANCHAGARH'),
(78, 'PATUAKHALI'),
(79, 'PIROJPUR'),
(82, 'RAJBARI'),
(81, 'RAJSHAHI'),
(84, 'RANGAMATI'),

(85, 'RANGPUR'),
(87, 'SATKHIRA'),
(86, 'SHARIATPUR'),
(89, 'SHERPUR'),
(88, 'SIRAJGANJ'),
(90, 'SUNAMGANJ'),
(91, 'SYLHET'),
(93, 'TANGAIL'),
(94, 'THAKURGAON');

--

-- Table structure for table `mark`

--

```
CREATE TABLE `mark` (  
  `id` int(10) NOT NULL,  
  `roll` int(10) NOT NULL,  
  `subject` varchar(25) NOT NULL,  
  `term` varchar(25) NOT NULL,  
  `year` int(5) NOT NULL,  
  `theory` int(5) NOT NULL,
```

```
`practical` int(5) NOT NULL,  
`comment` varchar(255) DEFAULT NULL  
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

```
--
```

```
-- Dumping data for table `mark`
```

```
--
```

```
INSERT INTO `mark` (`id`, `roll`, `subject`, `term`, `year`, `theory`, `practical`, `comment`)
```

```
VALUES
```

```
(16, 8999, 'Physics', '1st', 2016, 75, 18, 'good'),
```

```
(15, 555, 'Physics', '1st', 2014, 57, 0, ""),
```

```
(14, 824, 'Physics', '1st', 2014, 57, 17, ""),
```

```
(13, 8999, 'Physics', '1st', 2014, 75, 0, 'good'),
```

```
(11, 2410, 'Math', '1st', 2016, 67, 0, 'well'),
```

```
(12, 23, 'Math', '1st', 2016, 57, 0, 'good'),
```

```
(10, 2400, 'Math', '1st', 2016, 57, 0, 'nice'),
```

```
(9, 2000, 'Math', '1st', 2016, 75, 0, 'good'),
```

```
(17, 824, 'Physics', '1st', 2016, 57, 20, 'good');
```

```
-----
```

```
--
```

```
-- Table structure for table `student`
--

CREATE TABLE `student` (
  `id` int(10) NOT NULL,
  `roll` int(10) NOT NULL,
  `f_name` varchar(15) NOT NULL,
  `l_name` varchar(15) NOT NULL,
  `class` varchar(100) NOT NULL,
  `section` varchar(100) DEFAULT NULL,
  `gender` varchar(7) NOT NULL,
  `b_date` text NOT NULL,
  `city` varchar(15) NOT NULL,
  `zip` int(10) DEFAULT NULL,
  `address` text NOT NULL,
  `phone` int(12) NOT NULL,
  `email` varchar(20) DEFAULT NULL,
  `password` varchar(10) DEFAULT NULL
) ENGINE=MyISAM DEFAULT CHARSET=latin1;

--
-- Dumping data for table `student`
--
```

INSERT INTO `student` (`id`, `roll`, `f_name`, `l_name`, `class`, `section`, `gender`, `b_date`,
`city`, `zip`, `address`, `phone`, `email`, `password`) VALUES
(78, 5552, 'Jahana', 'Codeam', 'Twelve', 'Science', 'Female', '06/06/2017', 'SIRAJGANJ', 1230,
'gffswfsqgg', 2147483647, 'serakib@gmail.com', 'ytyrryr'),
(71, 824, 'Rakib', 'Code', 'Eleven', 'Science', 'Male', '12/03/1996', 'SIRAJGANJ', 1400, 'dbn',
34570000, 'fgsdfgd@vdsddd.com', ''),
(66, 2000, 'Shahana', 'Khandokar', 'Hons. Prof.', 'BSc in CSE', 'Female', '30/05/1996',
'BARGUNA', 1234, 'reretr', 1667543456, 'admin@gmail.com', 'admin'),
(82, 8960, 'Abdul', 'Karim', 'Hons. Prof.', 'BSc in CSE', 'Male', '06/13/1996', 'SIRAJGANJ', 6700,
'Kazipura, Sirajganj', 1889653236, 'admin@gmail.com', 'root'),
(60, 23, 'Shahana', 'Khandokar', 'Hons. Prof.', 'BSc in CSE', 'Female', '30/05/1996',
'GAIBANDHA', 1234, '', 1773259875, 'admin@gmail.com', 'root'),
(76, 2412, 'Jahana', 'Code', 'Hons.', 'BENGALI', 'Female', '06/06/1996', 'SIRAJGANJ', 1225,
'Talbagan, India.', 1773259875, 'admin@gmail.com', 'admin'),
(77, 1478, 'Jahana', 'Kamal', 'Hons.', 'BENGALI', 'Female', '12/03/1996', 'SIRAJGANJ', 1245,
'Talhati, Gujrat', 1889653236, 'admin@gmail.com', 'admin'),
(80, 2311, 'Jahana', 'Kamal', 'Hons.', 'BENGALI', 'Female', '06/06/1996', 'SIRAJGANJ', 3432,
'wqww', 1773259875, 'fgsdfgd@vdsddd.com', 'weeeeeere'),
(81, 8962, 'Jahana', 'Code', 'Eleven', 'Science', 'Female', '06/05/2017', 'SIRAJGANJ', 3432,
'23e3e4qq', 2147483647, 'fgsdfgd@vdsddd.com', '33444444');

```
--  
-- Table structure for table `subject`  
--  
  
CREATE TABLE `subject` (  
  `id` int(10) NOT NULL,  
  `sub_code` varchar(100) NOT NULL,  
  `sub_name` varchar(100) NOT NULL,  
  `sub_class` varchar(100) DEFAULT NULL,  
  `sub_group` varchar(100) DEFAULT NULL  
) ENGINE=MyISAM DEFAULT CHARSET=latin1;  
  
--  
-- Dumping data for table `subject`  
--  
  
INSERT INTO `subject` (`id`, `sub_code`, `sub_name`, `sub_class`, `sub_group`) VALUES  
(10, '1001', 'BENGALI', 'HONOURS', NULL),  
(11, '1101', 'ENGLISH', 'HONOURS', NULL),  
(12, '1201', 'ARABIC', 'HONOURS', NULL),  
(13, '1501', 'HISTORY', 'HONOURS', NULL),  
(14, '1601', 'ISLAMIC HISTORY & CULTURE', 'HONOURS', NULL),
```

- (15, '1701', 'PHILOSOPHY', 'HONOURS', NULL),
(16, '1801', 'ISLAMIC STUDIES', 'HONOURS', NULL),
(17, '1901', 'POLITICAL SCIENCE', 'HONOURS', NULL),
(18, '2001', 'SOCIOLOGY', 'HONOURS', NULL),
(19, '2101', 'SOCIAL WORK', 'HONOURS', NULL),
(20, '2201', 'ECONOMICS', 'HONOURS', NULL),
(21, '2301', 'MARKETING', 'HONOURS', NULL),
(22, '2401', 'FINANCE & BANKING', 'HONOURS', NULL),
(23, '2501', 'ACCOUNTING', 'HONOURS', NULL),
(24, '2601', 'MANAGEMENT', 'HONOURS', NULL),
(25, '2701', 'PHYSICS', 'HONOURS', NULL),
(26, '2801', 'CHEMISTRY', 'HONOURS', NULL),
(27, '2901', 'BIO CHEMISTRY', 'HONOURS', NULL),
(28, '3001', 'BOTANY', 'HONOURS', NULL),
(29, '3101', 'ZOOLOGY', 'HONOURS', NULL),
(30, '3201', 'GEOGRAPHY', 'HONOURS', NULL),
(31, '3301', 'SOIL SCIENCE', 'HONOURS', NULL),
(32, '3401', 'PSYCHOLOGY', 'HONOURS', NULL),
(33, '3501', 'HOME ECONOMICS', 'HONOURS', NULL),
(34, '3601', 'STATISTICS', 'HONOURS', NULL),
(35, '3701', 'ATHEMATICS', 'HONOURS', NULL),
(36, '3801', 'BRARY AND INFORMATION SCIENCE', 'HONOURS', NULL),
(37, '3901', 'ACHELOR OF EDUCATION', 'HONOURS', NULL),

```
(38, '4001', 'ANTHROPOLOGY', 'HONOURS', NULL),
(39, '4101', 'PUBLIC ADMINISTRATION', 'HONOURS', NULL),
(40, '4201', 'COMPUTER SCIENCE', 'HONOURS', NULL),
(41, '4301', 'BUSINESS ADMINISTRATION', 'HONOURS', NULL),
(42, '4401', 'ENVIRONMENTAL SCIENCES', 'HONOURS', NULL);
```

```
-----
```

```
--
```

```
-- Table structure for table `user`
```

```
--
```

```
CREATE TABLE `user` (
  `id` int(10) NOT NULL,
  `f_name` varchar(15) NOT NULL,
  `l_name` varchar(15) NOT NULL,
  `email` varchar(25) NOT NULL,
  `phone` int(13) NOT NULL,
  `role` varchar(20) NOT NULL,
  `password` varchar(20) NOT NULL
) ENGINE=MyISAM DEFAULT CHARSET=latin1;
```

```
--
```

```
-- Indexes for dumped tables
```

```
--
```

```
--
```

```
-- Indexes for table `city`
```

```
--
```

```
ALTER TABLE `city`
```

```
  ADD PRIMARY KEY (`code`);
```

```
--
```

```
-- Indexes for table `mark`
```

```
--
```

```
ALTER TABLE `mark`
```

```
  ADD PRIMARY KEY (`id`);
```

```
--
```

```
-- Indexes for table `student`
```

```
--
```

```
ALTER TABLE `student`
```

```
  ADD PRIMARY KEY (`id`),
```

```
  ADD UNIQUE KEY `roll` (`roll`),
```

```
  ADD UNIQUE KEY `roll_2` (`roll`);
```

```
--
-- Indexes for table `subject`
--
ALTER TABLE `subject`
  ADD PRIMARY KEY (`id`),
  ADD UNIQUE KEY `sub_code` (`sub_code`);
--
-- Indexes for table `user`
--
ALTER TABLE `user`
  ADD PRIMARY KEY (`id`);
--
-- AUTO_INCREMENT for dumped tables
--
--
-- AUTO_INCREMENT for table `mark`
--
ALTER TABLE `mark`
  MODIFY `id` int(10) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=18;
--
-- AUTO_INCREMENT for table `student`
--
ALTER TABLE `student`
```

```
MODIFY `id` int(10) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=84;
--
-- AUTO_INCREMENT for table `subject`
--
ALTER TABLE `subject`
  MODIFY `id` int(10) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=43;
--
-- AUTO_INCREMENT for table `user`
--
ALTER TABLE `user`
  MODIFY `id` int(10) NOT NULL AUTO_INCREMENT;
/*!40101 SET CHARACTER_SET_CLIENT=@OLD_CHARACTER_SET_CLIENT */;
/*!40101 SET CHARACTER_SET_RESULTS=@OLD_CHARACTER_SET_RESULTS */;
/*!40101 SET COLLATION_CONNECTION=@OLD_COLLATION_CONNECTION */;
```

```
<script src="js/jquery-ui-1.9.2.datepicker.min.js"></script>
```

```
<script src="js/jquery.reject.js"></script>
```

```
<script src="js/utills.js"></script>
```

```
<script>
```

```
$(document).ready(function(){
    $(".city").mousedown(function(){
        _this=this;
        $.post("include/city.php",
            function(data,status){
                $(_this).html(data);
            });
    });
});
```

// Write on keyup event of keyword input element

```
$("#search").keyup(function(){
    _this = this;
    // Show only matching TR, hide rest of them
    $.each($("#table tbody tr"), function() {
        if($(this).text().toLowerCase().indexOf($_this.val().toLowerCase()) === -1)
            $(this).hide();
        else
            $(this).show();
    });
});

$(function() {
```

```
$("#md").click(function(){
    $("#myModal").modal('show');
});

$(".datepicker").datepicker({
    changeMonth: true,
    changeYear: true
});
});

$("[data-toggle="popover"]').hover(function(){
    $(this).popover("toggle");

    $(this).mouseleave(function(){
        $(this).popover("hide");
    })
})

// jquery end
});

</script>

</body>

<footer>

    <p class="text-center Copyright">Copyright&copy; <a href="#">Adediran Emmanuel</a></p>

</footer>

</html>

<?php
```

```
if (isset($_SESSION['xbpqwe'])) {
    $key=$_SESSION['xbpqwe'];
    if ($key=='xbbpqf72cabzc4ryun') {
        header('Location: index.php');
    }
}

$error_message="";

if(isset($_POST['s_login']))
{
    try {
        if(empty($_POST['email'])) {
            throw new Exception('Email can not be empty');
        }

        if(empty($_POST['pass'])) {
            throw new Exception('Password can not be empty');
        }
        if(empty($_POST['condition'])) {
            throw new Exception('Please select terms & Conditions');
        }

        $email = $_POST['email'];
        $pass = $_POST['pass']; // admin
        $condition = $_POST['condition'];
    }
}
```

```

include('core/connect.php');

// $sql = "SELECT * FROM student WHERE password = ".$pass."";
// $sql = "SELECT * FROM student WHERE email = ".$email."";

$sql = "SELECT * FROM student WHERE email = ".$email." AND password = ".$pass."";

$result = $conn->query($sql);

if ($result->num_rows >0) {
echo $email;echo "<br>".$pass." <br> ".$condition;

login('xbpqwe','xbbpqf72cabzc4ryun');

} else {

echo $result->num_rows;

echo "Password not match";

}

$conn->close();

}

catch(Exception $e) {

$error_message = $e->getMessage();

}

}

echo $error_message;

?>

<section id="content">

```

```

<div class="container relative">
<div class="row">
  <!-- <div class="Absolute-Center is-Responsive"></div> -->
  <div class="col-sm-12 col-md-10 col-md-offset-1">
    <div class="vcen">
      <div id="logo-container"><i class="fa fa-2x fa-sign-in"></i></div>
      <form name="login" method="post">
        <div class="form-group input-group">
          <span class="input-group-addon"><i class="fa fa-envelope-o"></i></span>
            <input type="email" class="form-control" placeholder="Email address"
name="email">
        </div>
        <div class="form-group input-group">
          <span class="input-group-addon"><i class="fa fa-key"></i></span>
            <input type="password" class="form-control" placeholder="Password" name="pass">
        </div>
        <div class="checkbox">
          <label>
            <input type="checkbox" name="condition" value="yes"> I agree to the <a href="#">Terms
and Conditions</a>
          </label>
        </div>
        <div class="form-group">

```

```
<button type="submit" name="s_login" class="btn btn-def btn-block">Login</button>
</div>
<div class="form-group text-center">
  <a href="#">Forgot Password</a>&nbsp;&nbsp;&nbsp;<a href="#">Support</a>
</div>
</form>
</div>
</div>
</div>
</div>
</div>
</section>
```

```
<?php // require "pages/footer.php"; ?>
```

```
<?php
```

```
//
```

```
$class=$roll=$first_name=$last_name=$gender=$b_date=$address=$city=$zip=$country=$phone=$email=$password=$r_password=$photo="";
```

```
$s_class=$s_id=$section=$gender=$f_name=$l_name=$b_date=$city=$zip=$address=$phone=
```

```
$email=$password="";
```

```
$error_msg="";
```

```
if(isset($_POST['s_reg']))
```

```
{
```

```
try {  
    if(empty($_POST['s_class'])) {  
        throw new Exception('Class can not be empty');  
    }  
}
```

```
$password = $_POST['s_password'];
```

```
$s_id = $_POST['s_id'];
```

```
$f_name = $_POST['f_name'];
```

```
$l_name = $_POST['l_name'];
```

```
$s_class = $_POST['s_class'];
```

```
$section = $_POST['section'];
```

```
$gender = $_POST['gender'];
```

```
$b_date = $_POST['b_date'];
```

```
$city = $_POST['city'];
```

```
$zip = $_POST['zip'];
```

```
$address = $_POST['address'];
```

```
$phone = $_POST['phone'];
```

```
$email = $_POST['s_email'];
```

```
include "core/connect.php";
```

```
                $stmt = $conn->prepare("INSERT INTO student  
(roll,f_name,l_name,class,section,gender,b_date,city,zip,address,phone,email,password)  
VALUES (?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?)");
```

```

$stmt->bind_param("issssssisiss", $s_id, $f_name, $l_name, $s_class, $section, $gender,
$b_date, $city, $zip, $address, $phone, $email,
$password);
$stmt->execute();
printf("%d Row inserted.\n", $stmt->affected_rows);
echo "New records created successfully";
$stmt->close();
$conn->close();
}
catch(Exception $e) {
$error_msg = $e->getMessage();
}
}
?>

```

```

<section id="content">
<div class="container">
<div class="row">
<div class="col-md-5">
<div class="bcon">

</div>

```

```

</div>
<div class="col-md-7">
  <div class="reg page-header">
    <h4 class="text-center">Student Registration Form</h4>
  </div>
  <!-- Form start here --><?php echo $_SERVER['PHP_SELF'];?> -->
  <form class="form-horizontal custom-form" name="s_form" method="post">
    <div class="form-group">
      <label class="col-sm-4 control-label" for="stc_1">Class</label>
      <div class="col-sm-4">
        <select class="form-control" id="stc_1" name="s_class"
style="width:100%;" onchange="subject_list(this.value);">
          <option value="">-Class-</option>
          <!-- Data load from ajax method-->
        </select>
      </div>
      <div class="col-sm-4 input-column">
        <input class="form-control"
id="roll" name="s_id" placeholder="Roll / ID" type="text">
      </div>
    </div>
    <div class="form-group">
      <label class="col-sm-4 control-label" for="section_1">Subject</label>

```

```
<!-- <div class="col-sm-4 input-column">
  <input class="form-control" id="roll" name="S_id" placeholder="ID" type="text">
</div> -->
```

```
<div class="col-sm-4">
  <select class="form-control col-sm-4" name="section" id="section">
    <option value="">-Subject-</option>
  </select>
</div>
```

```
<div class="col-sm-4">
  <div data-toggle="buttons">
    <label class="btn btn-default btn-circle active"><input id="male" type="radio"
name="gender" checked value="Male"><i class="fa fa-male" aria-hidden="true"></i></label>
    <label for="male"> Male</label>
    <label class="btn btn-default btn-circle"><input id="fe-male" type="radio"
name="gender" value="Female"><i class="fa fa-female" aria-hidden="true"></i></label>
    <label for="fe-male"> Female</label>
  </div>
</div>
```

```
</div>
<div class="form-group">
  <div class="col-sm-4 control-label">
    <label class="control-label" for="name-input-field">Name</label>
```

```

</div>

<div class="col-sm-4 input-column">

  <input class="form-control" name="f_name" placeholder="First Name" id="name-
input-field" type="text">

</div>

<div class="col-sm-4 input-column">

<input class="form-control" name="l_name" placeholder="Last Name" type="text">

</div>

</div>

<div class="form-group">

  <div class="col-sm-4 control-label">

    <label class="control-label" for="datepicker">Date of Birth</label>

  </div>

  <div class="col-sm-3 input-column">

    <input class="form-control datepicker" id="datepicker" name="b_date"
placeholder="30/01/1996" type="text">

  </div>

  <div class="col-sm-3">

    <select class="form-control col-sm-4" id="city" name="city" placeholder="Enter
City">

      <option selected="selected" value="">-City-</option>

      <!-- Update from ajay database -->

```

```
        </select>

    </div>

    <div class="col-sm-2 input-column">

        <input class="form-control" placeholder="Zip Code" name="zip" type="text">

    </div>

</div>

<div class="form-group">

    <div class="col-sm-4 control-label">

        <label class="control-label" for="address">Address</label>

    </div>

    <div class="col-sm-8 input-column">

        <textarea class="form-control" id="address" name="address" placeholder="Type
your address here"></textarea>

    </div>

</div>

<div class="form-group">

    <label class="col-sm-4 control-label" for="phone">Phone</label>

    <div class="col-sm-8 input-column">

        <input class="form-control" id="phone" name="phone" placeholder="+2348132345678"
type="text">

    </div>

</div>

</div>
```

```
        </div>
    </div>
    <div class="form-group">
        <div class="col-sm-4 control-label">
            <label class="control-label" for="email">Email </label>
        </div>
        <div class="col-sm-8 input-column">
            <input class="form-control" id="email" placeholder="Enter your email" name="s_email"
            type="email" >
                </div>
        </div>
        <div class="form-group">
            <div class="col-sm-4 control-label">
                <label class="control-label" for="password">Password </label>
            </div>
            <div class="col-sm-8 input-column">
                <input class="form-control" id="password" placeholder="Enter your new password"
                name="s_password" type="password">
                    </div>
            </div>
            <div class="form-group">
                <label class="col-sm-4 control-label"></label>
                <div class="col-sm-4">
```

```
<button class="btn btn-default btn-block submit-button" type="submit"
name="s_reg">Submit</button>

</div>

<div class="col-sm-4">

<button class="btn btn-default btn-block submit-button" type="reset">Reset</button>

</div>

</div>

</form>

</div>

</div>

</div>

</div>

</section>
```

```
<script type="text/javascript">

function subject_list(val)

{

$.ajax({

type: 'post',

url: 'include/subject_list.php',

data: {

get_subject:val

},

success: function (response) {
```

```
document.getElementById("section").innerHTML=response;
}
});
}
```

```
$( function() {
$.ajax({
type: 'post',
url: 'include/class_list.php',
success: function (response) {
document.getElementById("stc_1").innerHTML=response;
}
});
$.ajax({
type: 'post',
url: 'include/city.php',
success: function (response) {
document.getElementById("city").innerHTML=response;
}
});
});
</script>
```

```
<?php include('footer.php'); ?>
```

```
<section id="nav-after">
```

```
<div class="container-fluid">
```

```
<div class="row">
```

```
<div class="col-md-12 text-center">
```

```
<h3>Search your result</h3>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
</section>
```

```
<section class="src">
```

```
<div class="container">
```

```
<div class="row">
```

```
<div class="col-md-offset-3 col-md-6">
```

```
<div class="result_search">
```

```
<form class="form-horizontal custom-form" method="post">
```

```
<div class="form-group">
```

```
<label class="col-sm-2 col-md-2 control-label" for="stc_1">Class</label>
```

```
<div class="col-md-8 col-sm-6">
```

```
<select class="form-control" id="stc_1" name="s_class"
```

```
style="width:100%;" onchange="subject_list(this.value);">
```

```
<option value="">-Class-</option>
```

```

        <!-- Data load from ajax method-->
    </select>
</div>
</div>
<div class="form-group">
    <label class="col-sm-2 control-label" for="section">Section</label>
    <div class="col-md-8 col-sm-6">
        <select class="form-control" id="section" name="section" style="width:100%;">
            <option value="">-Section-</option>
            <!-- Data load from ajax method-->
        </select>
    </div>
</div>
<div class="form-group">
    <label class="col-sm-2 control-label" for="roll">Roll</label>
    <div class="col-md-8 col-sm-6 input-column">
        <input class="form-control" id="roll" name="roll" placeholder="Roll" type="text">
    </div>
</div>
<div class="form-group">
    <label class="col-sm-2 control-label"></label>
    <div class="col-md-4 col-sm-3">

```

```
<button class="btn btn-default btn-block submit-button" type="submit"
name="mark_wh">Submit</button>

</div>

<div class="col-md-4 col-sm-3">

<button class="btn btn-default btn-block submit-button" type="reset">Reset</button>

</div>

</div>

</form>

</div>

</div>

</div>

</div>

</section>
```

```
<?php
if(isset($_POST['mark_wh']))
{
    $class = $_POST['s_class'];
    $section = $_POST['section'];
    $roll = $_POST['roll'];
    include "core/connect.php";
```

```
$sql = "SELECT mark.subject,mark.term,mark.year,mark.theory,mark.practical,mark.comment
FROM mark INNER JOIN student ON mark.roll=student.roll WHERE student.class='$class'
AND student.section='$section' AND mark.roll='$roll'";
```

```
// $sql = "SELECT mark.roll AS roll,mark.subject AS subject,mark.term AS term,mark.year AS
year,mark.theory AS theory,mark.practical AS practical,mark.comment AS comment FROM
mark INNER JOIN student ON mark.roll=student.roll WHERE student.class='$class' AND
student.section='$section' AND mark.roll='$roll'";
```

```
$result = $conn->query($sql);
```

```
if ($result->num_rows > 0) {
```

```
    $info_sql = "SELECT f_name, l_name, roll, class, section FROM student WHERE roll='$roll'";
```

```
    $information = $conn->query($info_sql);
```

```
    if ($information->num_rows > 0) {
```

```
        $info = $information->fetch_assoc();
```

```
    }
```

```
?>
```

```
<section id="result_box">
```

```
<div class="container">
```

```
<div class="row">
```

```
<div class="col-md-12">
```

```
<?php $info; ?>
```

```
<div class="sc_logo"></div>
```

```
<div><h2>Institute</h2></div>
```

```
</div>
```

```
<div class="col-md-12">
```

```
<div class="col-md-2">
```

```
<p><b>Name: </b><?php echo $info['f_name']. " ".$info['l_name']; ?></td></p>
```

```
<p><b>Roll: </b><?php echo $info['roll']; ?></p>
```

```
</div>
```

```
<div class="col-md-2 col-md-offset-8">
```

```
<p><b>Class: </b><?php echo $info['class']; ?></p>
```

```
<p><b>Section: </b><?php echo $info['section']; ?></p>
```

```
</div>
```

```
</div>
```

```
<div class="col-md-12">
```

```
<div class="table-responsive">
```

```
<table id="table" class="table table-bordered table-condensed" cellpadding="0" cellspacing="0">
```

```
<thead>
```

```
<?php $names=array(); ?>
```

```
<tr>
```

```
<?php $i=0; while($title = $result->fetch_field()) { $th=$title->name; $names[$i]=$th;
echo "<th class='$th'>".$th."</th>"; $i++; } ?>
```

```
</tr>
```

```

        </thead>

        <tbody>

        <?php while($row = $result->fetch_assoc()) { ?>
<tr>

        <?php $length = count($names); for ($i=0; $i < $length ; $i++) { ?>

        <td><?php echo $row[$names[$i]]; ?></td>

        <?php } ?>
</tr> <?php } ?>

        </tbody>

        <tfoot>

        </tfoot>

</table>

        </div>

        </div>

        </div>

</div>

</section>

<?php
    }else{
        echo "No Result Found";
    }
    $conn->close();
}

```

?>

```
<script type="text/javascript">
```

```
    function subject_list(val)
```

```
    {
```

```
        $.ajax({
```

```
            type: 'post',
```

```
            url: 'include/subject_list.php',
```

```
            data: {
```

```
                get_subject:val
```

```
            },
```

```
            success: function (response) {
```

```
                document.getElementById("section").innerHTML=response;
```

```
            }
```

```
        });
```

```
    }
```

```
$( function() {
```

```
    $.ajax({
```

```
        type: 'post',
```

```
        url: 'include/class_list.php',
```

```
        success: function (response) {
```

```
            document.getElementById("stc_1").innerHTML=response;
```

```
        }
```

```
    });
```

```
});
    $("th").css("text-transform", "capitalize");
</script>
<?php require "pages/footer.php"; ?>

<?php
include "core/connect.php";

$cls="";
$sub="";

// DELETE

// View

if(isset($_GET['action'])) {
    $action=$_GET['action'];
    $id=$_GET['id'];
    if ($action == 'del'){
if($user!=1){ header('Location: ?page=2'); return;}

    $sql="DELETE FROM student WHERE id='$id'";

    if ($conn->query($sql) === TRUE) {
        echo "Record deleted successfully";

        header('Location: ?page=2');
    } else {
        echo "Error deleting record: " . $conn->error;
    }
}
```

```

}

if ($action == 'view'){

    // include "core/connect.php";

    $sql = "SELECT * FROM student WHERE id='$id'";

    $result = $conn->query($sql);

    if ($result->num_rows > 0) {

        // while($row = $result->fetch_assoc()) {

            $row = $result->fetch_assoc();

            $cls=$row['class'];

            $sub=$row['section'];

        ?>

```

```

<div class="container-fluid">

```

```

<!-- Modal -->

```

```

<div class="modal fade" id="myModal" tabindex="-1" role="dialog" aria-
labelledby="exampleModalLabel" aria-hidden="true">

```

```

<div class="modal-dialog" role="document">

```

```

<div class="modal-content">

```

```

<div class="modal-header">

```

```

<h3 class="modal-title text-center" >Student Profile</h3>

```

```

<button type="button" class="close" data-dismiss="modal" aria-label="Close">

```

```

<span aria-hidden="true">&times;</span>

```

```

</button>

```

```

    </div>

    <div class="modal-body">

<?php
    if(isset($_POST['update']))
    {
        $u_id  = $_POST['s_id'];
        $u_f_name = $_POST['f_name'];
        $u_l_name = $_POST['l_name'];
        $u_class = $_POST['class'];
        $u_section = $_POST['section'];
        $u_gender = $_POST['gender'];
        $u_b_date = $_POST['b_date'];
        $u_city = $_POST['city'];
        $u_zip = $_POST['zip'];
        $u_address = $_POST['address'];
        $u_phone = $_POST['phone'];
        $u_email = $_POST['s_email'];

        $cls = $u_class;

        $stmt = $conn->prepare("UPDATE student SET roll = ?,f_name = ?,l_name = ?,class = ?,section
= ?,gender = ?,b_date = ?,city = ?,
zip = ?,address = ?,phone = ?,email = ? WHERE id=?");

        $stmt->bind_param("issssssisisi", $u_id, $u_f_name, $u_l_name, $u_class, $u_section,
$u_gender, $u_b_date, $u_city, $u_zip, $u_address,

```

```

    $u_phone, $u_email, $id);

$stmt->execute();

$stmt->close();

header("Location: ?page=2&id=".$id."&action=view&success=1");
}

if(isset($_GET['success'])) {

    $success=$_GET['success'];

    if ($success == 1){

        ?>

<div class="container">

    <div class="row">

        <div class="col-sm-6 col-md-6">

            <div class="alert alert-success">

                <button type="button" class="close" data-dismiss="alert" aria-hidden="true">

                    ×</button>

                    <span><i class="fa fa-check" aria-hidden="true"></i></span> <strong>Update

Success</strong>

                </div>

            </div>

        </div>

    </div>

</div>

<?php

}

```

```

    }
    ?>

    <form class="form-horizontal custom-form" id="s_update" method="post">
        <div class="form-group">
            <label class="col-sm-3 control-label" for="stc">Class</label>

            <div class="col-sm-4">
                <div class="form-group input-group">
                    <span class="input-group-addon">Class</span>
                    <select class="form-control" id="stc" name="class" onchange="subject_list(this.value);">
                        <option selected value="<?php echo $row['class']; ?>"><?php echo $row['class']; ?></option>
                    </select>
                </div>
            </div>
            <div class="col-sm-4 input-group">
                <span class="input-group-addon">Roll</span>
                <input class="form-control" id="roll" name="s_id" placeholder="Roll / ID"
type="text" value="<?php echo $row['roll']; ?>">
            </div>
        </div>

        <div class="form-group">
            <label class="col-sm-3 control-label" for="section">Section</label>

```

```

        <div class="col-sm-4">
            <select class="form-control" name="section" id="section">
                <option selected value="<?php echo $row['section']; ?>"><?php echo $row['section'];
                ?></option>
            </select>
        </div>

        <div class="col-sm-4">
            <?php $s_gen=$row['gender']; ?>
            <div data-toggle="buttons">
                <label class="btn btn-default btn-circle <?php if($s_gen=='Male') echo "active";?>">
                    <input id="male" type="radio" name="gender"
                <?php if($s_gen=='Male') echo 'checked';?> value="Male"><i class="fa fa-male" aria-
                hidden="true"></i>
            </label>
            <label for="male"> Male</label>
                <label class="btn btn-default btn-circle <?php if($s_gen=='Female') echo "active";?>">
                    <input id="fe-male" type="radio" name="gender"
                <?php if($s_gen=='Female') echo 'checked';?> value="Female"><i class="fa fa-female" aria-
                hidden="true"></i></label>
            <label for="fe-male"> Female</label>
        </div>
    </div>
</div>

```

```
<div class="form-group">
  <div class="col-sm-3 control-label">
    <label class="control-label" for="name-input-field">Name</label>
  </div>
  <div class="col-sm-4 input-column">
    <input class="form-control" name="f_name" placeholder="First Name" id="name-
input-field" type="text" value="<?php echo $row['f_name'];?>">
  </div>
  <div class="col-sm-4 input-column">
<input class="form-control" data-toggle="popover" title="Last Name" data-content=""
name="l_name" placeholder="Last Name" type="text" value="<?php echo $row['l_name'];?>">
  </div>
</div>

<div class="form-group">
  <div class="col-sm-3 control-label">
    <label class="control-label" for="datepicker">Date of Birth</label>
  </div>
  <div class="col-sm-3 input-column">
<input class="form-control datepicker" id="datepicker" name="b_date"
placeholder="30/01/1996" type="text" value="<?php echo $row['b_date'];?>">
  </div>
</div>
```

```

<div class="col-sm-3">
    <select class="city form-control col-sm-4" id="city" name="city">
        <option selected="selected" value="">-City-</option>
        <option value="<?php echo $row["city"]; ?>" selected ><?php echo $row["city"];
?></option>
    </select>
</div>
<div class="col-sm-2 input-column">
    <input class="form-control" placeholder="Zip Code" name="zip" type="text"
value="<?php echo $row['zip'];?>">
</div>
</div>
<div class="form-group">
    <div class="col-sm-3 control-label">
        <label class="control-label" for="address">Address</label>
    </div>
    <div class="col-sm-8 input-column">
        <textarea class="form-control" id="address" name="address" placeholder="Your
address type hear!"><?php echo $row['address'];?></textarea>
    </div>
</div>
<div class="form-group">
    <label class="col-sm-3 control-label" for="phone">Phone</label>

```

```
<div class="col-sm-8 input-column">
    <input class="form-control" id="phone" name="phone"
placeholder="+8801234567890" type="text" value="<?php echo $row['phone'];?>">
</div>
</div>
```

```
<div class="form-group">
    <div class="col-sm-3 control-label">
        <label class="control-label" for="email">Email </label>
    </div>
    <div class="col-sm-8 input-column">
        <input class="form-control" id="email" placeholder="Enter your email"
name="s_email" type="email" value="<?php echo $row['email'];?>">
    </div>
</div>
```

```
<div class="form-group">
    <div class="col-sm-3 control-label">
        <label class="control-label" for="password">Password </label>
    </div>
    <div class="col-sm-8 input-column">
        <input class="form-control" id="password" placeholder="*****" disabled
name="s_password" type="password">
    </div>
</div>
```

```

        </div>
    </div>
    <div class="modal-footer">
        <button type="button" class="btn btn-secondary" data-dismiss="modal">Close</button>
        <?php if ($user==1) {
            echo '<button type="submit button" class="btn btn-primary submit-button"
name="update">Save changes</button>';
        }
    ?>
    </div>
</form>
</div>
</div>
</div>
</div>
</div>
</div>
    <script type="text/javascript">
class_list("<?php echo $cls;?>");
function class_list(val)
{
$.ajax({
type: 'post',
url: 'include/up_class.php',
data: {

```

```
get_class:val
},
success: function (response) {
    document.getElementById("stc").innerHTML=response;
}
});
}
function subject_list(val)
{
$.ajax({
type: 'post',
url: 'include/subject_list.php',
data: {
    get_subject:val
},
success: function (response) {
    document.getElementById("section").innerHTML=response;
}
});
}
$('#myModal').modal('show');
</script>
<?php
```

```

    // }
} else {
    echo "0 results";
}
// $conn->close();
}
}
?>
<section id="nav-after">
<div class="container-fluid">
<div class="row">
<div class="col-md-offset-4 col-md-3 col-sm-12">
<div id="search-box">
<input type="search" id="search" placeholder="Type to search..." />
<span class="search"><i class="fa fa-search" aria-hidden="true"></i></span>
</div>
</div>
<div class="col-sm-12 col-md-offset-2 col-md-3">
<button onclick="window.location='include/pdf/student.php'" class="exel_dl_btn"></button>

```

```
<button          onclick="window.location='include/exel/downloader/public_student.php'"
class="exel_dl_btn"></button>
```

```
</div>
```

```
</div>
```

```
</div>
```

```
</section>
```

```
<section id="content">
```

```
<div class="container-fluid">
```

```
<div class="row">
```

```
<div class="col-md-12">
```

```
<div class="table-responsive">
```

```
<table id="table" class="table">
```

```
<!-- <caption class="text-center">Student Table</caption> -->
```

```
<thead>
```

```
<tr><th style="width:
```

```
30px;">S\N</th><th>Name</th><th>Class</th><th>Roll</th><th>Section</th><th class="col-
```

```
md-1">Gender</th><th>Birth
```

```
Day</th><th>Address</th><th>City</th><th>Zip</th><th>Phone</th><th>Email</th><th
```

```
style="width: 65px;">Action</th></tr>
```

```
</thead>
```

```
<tbody>
```

```

<?php
// include "core/connect.php";

$sql = "SELECT * FROM student";

$result = $conn->query($sql);

if ($result->num_rows > 0) {

// output data of each row

    $n=1;

while($row = $result->fetch_assoc()) {

    ?>

    <tr>

        <td><?php echo $n; ?></td>

        <td><?php echo $row["f_name"];?>

        <?php echo $row["l_name"]; ?></td>

        <td><?php echo $row["class"]; ?></td>

        <td><?php echo $row["roll"]; ?></td>

        <td><?php echo $row["section"]; ?></td>

        <td><?php echo $row["gender"]; ?></td>

        <td><?php echo $row["b_date"]; ?></td>

        <td><?php echo $row["address"]; ?></td>

        <td><?php echo $row["city"]; ?></td>

        <td><?php echo $row["zip"]; ?></td>

        <td><?php echo $row["phone"]; ?></td>

```

```

        <td><?php echo $row["email"]; ?></td>
    </td>
    <?php $cls = $row["class"]; ?>
    <?php if ($user==1) {
        echo '<a href="?page=2&id='.$row['id'].'&action=del"; ?> onclick="return confirm('Are
you sure?');" ><i class="fa fa-lg fa-trash-o" aria-hidden="true"></i></a>&nbsp;&nbsp; ';
    <?php } ?>
        <a href="?page=2&id=<?php echo $row['id'];?>&action=view"><i class="fa fa-lg fa-eye"
aria-hidden="true"></i></a>
    </td>
</tr>
<?php
    $n++;
}
} else {
    echo "0 results";
}
$conn->close();
?>
</tbody>
<tfoot>
</tfoot>

```

```

</table>
</div>
</div>
</div>
</section>

```

```
<?php require "pages/footer.php"; ?>
```

```
/*!
```

```
* Bootstrap v3.3.7 (http://getbootstrap.com)
```

```
* Copyright 2011-2016 Twitter, Inc.
```

```
* Licensed under the MIT license
```

```
*/
```

```

if("undefined"===typeof jQuery)throw new Error("Bootstrap's JavaScript requires
jQuery");+function(a){"use strict";var b=a.fn.jquery.split("
")[0].split(".");if(b[0]<2&&b[1]<9||1===b[0]&&9===b[1]&&b[2]<1||b[0]>3)throw new
Error("Bootstrap's JavaScript requires jQuery version 1.9.1 or higher, but lower than version
4")(jQuery),+function(a){"use strict";function b(){var
a=document.createElement("bootstrap"),b={WebkitTransition:"webkitTransitionEnd",MozTrans
ition:"transitionend",OTransition:"oTransitionEnd
otransitionend",transition:"transitionend"};for(var c in b)if(void
0!==a.style[c])return{end:b[c]};return!1}a.fn.emulateTransitionEnd=function(b){var
c=!1,d=this;a(this).one("bsTransitionEnd",function(){c=!0});var
e=function(){c||a(d).trigger(a.support.transition.end)};return

```

```

setTimeout(e,b),this },a(function(){a.support.transition=b(),a.support.transition&&(a.event.specia
l.bsTransitionEnd={ bindType:a.support.transition.end,delegateType:a.support.transition.end,han
dle:function(b){if(a(b.target).is(this))return
b.handleObj.handler.apply(this,arguments) } } } } (jQuery),+function(a){ "use strict";function
b(b){return this.each(function(){ var c=a(this),e=c.data("bs.alert");e||c.data("bs.alert",e=new
d(this)), "string"==typeof b&&e[b].call(c) } } var c='[data-
dismiss="alert"]',d=function(b){a(b).on("click",c,this.close)};d.VERSION="3.3.7",d.TRANSITI
ON_DURATION=150,d.prototype.close=function(b){ function
c(){g.detach().trigger("closed.bs.alert").remove()} var e=a(this),f=e.attr("data-
target");f||(f=e.attr("href"),f=f&&f.replace(/.*(?=#[\s]*$)/,""));var
g=a("#"===f?[]:f);b&&b.preventDefault(),g.length||(g=e.closest(".alert")),g.trigger(b=a.Event("c
lose.bs.alert")),b.isDefaultPrevented()||(g.removeClass("in"),a.support.transition&&g.hasClass("f
ade")?g.one("bsTransitionEnd",c).emulateTransitionEnd(d.TRANSITION_DURATION):c());v
ar e=a.fn.alert;a.fn.alert=b,a.fn.alert.Constructor=d,a.fn.alert.noConflict=function(){return
a.fn.alert=e,this },a(document).on("click.bs.alert.data-
api",c,d.prototype.close) } (jQuery),+function(a){ "use strict";function
b(b){return
this.each(function(){ var d=a(this),e=d.data("bs.button"),f="object"==typeof
b&&b;e||d.data("bs.button",e=new c(this,f)), "toggle"===b?e.toggle():b&&e.setState(b) } } var
c=function(b,d){ this.$element=a(b),this.options=a.extend({ },c.DEFAULTS,d),this.isLoading=!1
};c.VERSION="3.3.7",c.DEFAULTS={loadingText:"loading..."},c.prototype.setState=function(
b){ var
c="disabled",d=this.$element,e=d.is("input")?"val":"html",f=d.data();b+="Text",null==f.resetTe
xt&&d.data("resetText",d[e]()),setTimeout(a.proxy(function(){d[e](null==f[b]?this.options[b]:f[

```

```

b]),"loadingText"==b?(this.isLoading=!0,d.addClass(c).attr(c,c).prop(c,!0)):this.isLoading&&(th
is.isLoading=!1,d.removeClass(c).removeAttr(c).prop(c,!1)),this,0)},c.prototype.toggle=functi
on(){var a=!0,b=this.$element.closest('[data-toggle="buttons"]');if(b.length){var
c=this.$element.find("input");"radio"==c.prop("type")?(c.prop("checked")&&(a=!1),b.find(".acti
ve").removeClass("active"),this.$element.addClass("active")):"checkbox"==c.prop("type")&&(c
.prop("checked")!==(this.$element.hasClass("active")&&(a=!1)),this.$element.toggleClass("active
"),c.prop("checked",this.$element.hasClass("active")),a&&c.trigger("change"))}else
this.$element.attr("aria-
pressed",!this.$element.hasClass("active")),this.$element.toggleClass("active"));var
d=a.fn.button;a.fn.button=b,a.fn.button.Constructor=c,a.fn.button.noConflict=function(){return
a.fn.button=d,this},a(document).on("click.bs.button.data-api",[data-
toggle^="button"],function(c){var
d=a(c.target).closest(".btn");b.call(d,"toggle"),a(c.target).is('input[type="radio"],
input[type="checkbox"])||(c.preventDefault(),d.is("input,button"?d.trigger("focus"):d.find("input:
visible,button:visible").first().trigger("focus"))).on("focus.bs.button.data-api
blur.bs.button.data-api",[data-
toggle^="button"],function(b){a(b.target).closest(".btn").toggleClass("focus",/^focus(in)?$/
.test(b.type))})}(jQuery),+function(a){"use strict";function b(b){return this.each(function(){var
d=a(this),e=d.data("bs.carousel"),f=a.extend({},c.DEFAULTS,d.data(),"object"==typeof
b&&b),g="string"==typeof b?b:f.slide;e||d.data("bs.carousel",e=new c(this,f)),"number"==typeof
b?e.to(b):g?e[g]():(f.interval&&e.pause().cycle())})}var
c=function(b,c){this.$element=a(b),this.$indicators=this.$element.find(".carousel-
indicators"),this.options=c,this.paused=null,this.sliding=null,this.interval=null,this.$active=null,t

```

```

his.$items=null,this.options.keyboard&&this.$element.on("keydown.bs.carousel",a.proxy(this.k
eydown,this)), "hover"==this.options.pause&&!("ontouchstart"in
document.documentElement)&&this.$element.on("mouseenter.bs.carousel",a.proxy(this.pause,t
his)).on("mouseleave.bs.carousel",a.proxy(this.cycle,this));c.VERSION="3.3.7",c.TRANSITIO
N_DURATION=600,c.DEFAULTS={interval:5e3,pause:"hover",wrap:!0,keyboard:!0},c.protot
ype.keydown=function(a){if(!/input|textarea/i.test(a.target.tagName)){switch(a.which){case
37:this.prev();break;case
39:this.next();break;default:return}a.preventDefault()}},c.prototype.cycle=function(b){return
b||(this.paused=!1),this.interval&&clearInterval(this.interval),this.options.interval&&!this.pause
d&&(this.interval=setInterval(a.proxy(this.next,this),this.options.interval)),this},c.prototype.getIt
emIndex=function(a){return
this.$items=a.parent().children(".item"),this.$items.index(a||this.$active)},c.prototype.getItemFor
Direction=function(a,b){var
c=this.getItemIndex(b),d="prev"==a&&0===c||"next"==a&&c==this.$items.length-
1;if(d&&!this.options.wrap)return b;var e="prev"==a?-1:1,f=(c+e)%this.$items.length;return
this.$items.eq(f)},c.prototype.to=function(a){var
b=this,c=this.getItemIndex(this.$active=this.$element.find(".item.active"));if(!(a>this.$items.len
gth-1||a<0))return
this.sliding?this.$element.one("slid.bs.carousel",function(){b.to(a)}):c==a?this.pause().cycle():th
is.slide(a>c?"next":"prev",this.$items.eq(a)),c.prototype.pause=function(b){return
b||(this.paused=!0),this.$element.find(".next,
.prev").length&&a.support.transition&&(this.$element.trigger(a.support.transition.end),this.cycl
e(!0)),this.interval=clearInterval(this.interval),this},c.prototype.next=function(){if(!this.sliding)r

```

```

return this.slide("next"),c.prototype.prev=function(){if(!this.sliding)return
this.slide("prev")},c.prototype.slide=function(b,d){var
e=this.$element.find(".item.active"),f=d||this.getItemForDirection(b,e),g=this.interval,h="next"=
=b?"left":"right",i=this;if(f.hasClass("active"))return this.sliding=!1;var
j=f[0],k=a.Event("slide.bs.carousel",{relatedTarget:j,direction:h});if(this.$element.trigger(k),!k.isDefaultPrevented()){if(this.sliding=!0,g&&this.pause(),this.$indicators.length){this.$indicators.
find(".active").removeClass("active");var
l=a(this.$indicators.children()[this.getItemIndex(f)]);l&&l.addClass("active")}var
m=a.Event("slid.bs.carousel",{relatedTarget:j,direction:h});return
a.support.transition&&this.$element.hasClass("slide")?(f.addClass(b),f[0].offsetWidth,e.addClas
s(h),f.addClass(h),e.one("bsTransitionEnd",function(){f.removeClass([b,h].join("
")).addClass("active"),e.removeClass(["active",h].join("
")),i.sliding=!1,setTimeout(function(){i.$element.trigger(m)},0)).emulateTransitionEnd(c.TRA
NSITION_DURATION):(e.removeClass("active"),f.addClass("active"),this.sliding=!1,this.$ele
ment.trigger(m)),g&&this.cycle(),this)};var
d=a.fn.carousel;a.fn.carousel=b,a.fn.carousel.Constructor=c,a.fn.carousel.noConflict=function(){
return a.fn.carousel=d,this};var e=function(c){var d,e=a(this),f=a(e.attr("data-
target"))||(d=e.attr("href"))&&d.replace(/.*(?:#\^[^s]+$)/,"");if(f.hasClass("carousel")){var
g=a.extend({},f.data(),e.data()),h=e.attr("data-slide-
to");h&&(g.interval=!1),b.call(f,g),h&&f.data("bs.carousel").to(h),c.preventDefault()};a(docum
ent).on("click.bs.carousel.data-api",[data-slide],e).on("click.bs.carousel.data-api",[data-slide-
to],e),a(window).on("load",function(){a("[data-ride="carousel]").each(function(){var
c=a(this);b.call(c,c.data())}})}(jQuery),+function(a){"use strict";function b(b){var

```

```

c,d=b.attr("data-target")||(c=b.attr("href"))&&c.replace(/.*(?=#[^\s]+$)/,"");return a(d)}function
c(b){return this.each(function(){var
c=a(this),e=c.data("bs.collapse"),f=a.extend({},d.DEFAULTS,c.data(),"object"===typeof
b&&b);!e&&f.toggle&&/show|hide/.test(b)&&(f.toggle=!1),e||c.data("bs.collapse",e=new
d(this,f),"string"===typeof b&&e[b]()))}var
d=function(b,c){this.$element=a(b),this.options=a.extend({},d.DEFAULTS,c),this.$trigger=a("[d
ata-toggle="collapse"])[href="#" + b.id + "],[data-toggle="collapse"]][data-
target="#" + b.id + "]),this.transitioning=null,this.options.parent?this.$parent=this.getParent():this.
addAriaAndCollapsedClass(this.$element,this.$trigger),this.options.toggle&&this.toggle();d.V
ERSION="3.3.7",d.TRANSITION_DURATION=350,d.DEFAULTS={toggle:!0},d.prototype.di
mension=function(){var a=this.$element.hasClass("width");return
a?"width":"height"},d.prototype.show=function(){if(!this.transitioning&&!this.$element.hasClas
s("in")){var b,e=this.$parent&&this.$parent.children(".panel").children(".in,
.collapsing");if(!(e&&e.length&&(b=e.data("bs.collapse"),b&&b.transitioning))){var
f=a.Event("show.bs.collapse");if(this.$element.trigger(f),!f.isDefaultPrevented()){e&&e.length&
&(c.call(e,"hide"),b||e.data("bs.collapse",null));var
g=this.dimension();this.$element.removeClass("collapse").addClass("collapsing")[g](0).attr("ari
a-expanded",!0),this.$trigger.removeClass("collapsed").attr("aria-
expanded",!0),this.transitioning=1;var
h=function(){this.$element.removeClass("collapsing").addClass("collapse
in")[g](""),this.transitioning=0,this.$element.trigger("shown.bs.collapse")};if(!a.support.transitio
n)return h.call(this);var i=a.camelCase(["scroll",g].join("-
"));this.$element.one("bsTransitionEnd",a.proxy(h,this)).emulateTransitionEnd(d.TRANSITION

```

```

_DURATION)[g](this.$element[0][i])} } } ,d.prototype.hide=function(){if(!this.transitioning&&t
his.$element.hasClass("in")){var
b=a.Event("hide.bs.collapse");if(this.$element.trigger(b),!b.isDefaultPrevented()){var
c=this.dimension();this.$element[c](this.$element[c]())[0].offsetHeight,this.$element.addClass("
collapsing").removeClass("collapse" in").attr("aria-
expanded",!1),this.$trigger.addClass("collapsed").attr("aria-
expanded",!1),this.transitioning=1;var
e=function(){this.transitioning=0,this.$element.removeClass("collapsing").addClass("collapse").
trigger("hidden.bs.collapse")};return a.support.transition?void
this.$element[c](0).one("bsTransitionEnd",a.proxy(e,this)).emulateTransitionEnd(d.TRANSITI
ON_DURATION):e.call(this)} } } ,d.prototype.toggle=function(){this[this.$element.hasClass("in"
)]?"hide":"show"}(),d.prototype.getParent=function(){return a(this.options.parent).find("[data-
toggle="collapse"][data-parent="" +this.options.parent+""]).each(a.proxy(function(c,d){var
e=a(d);this.addAriaAndCollapsedClass(b(e),e),this)).end()},d.prototype.addAriaAndCollapsed
Class=function(a,b){var c=a.hasClass("in");a.attr("aria-
expanded",c),b.toggleClass("collapsed",!c).attr("aria-expanded",c)};var
e=a.fn.collapse;a.fn.collapse=c,a.fn.collapse.Constructor=d,a.fn.collapse.noConflict=function(){r
eturn a.fn.collapse=e,this},a(document).on("click.bs.collapse.data-api", "[data-
toggle="collapse"]",function(d){var e=a(this);e.attr("data-target")||d.preventDefault();var
f=b(e),g=f.data("bs.collapse"),h=g?"toggle":e.data();c.call(f,h)})(jQuery),+function(a){ "use
strict";function b(b){var c=b.attr("data-target");c||(c=b.attr("href"),c=c&&/#[A-Za-
z]/.test(c)&&c.replace(/.(?=#[^\s]*$)/,""));var d=c&&a(c);return
d&&d.length?d:b.parent()}function

```

```

c(c){c&&3===c.which||(a(e).remove(),a(f).each(function(){var
d=a(this),e=b(d),f={relatedTarget:this};e.hasClass("open")&&(c&&"click"===c.type&&/input|te
xtarea/i.test(c.target.tagName)&&a.contains(e[0],c.target))||(e.trigger(c=a.Event("hide.bs.dropdo
wn",f)),c.isDefaultPrevented())||(d.attr("aria-
expanded","false"),e.removeClass("open").trigger(a.Event("hidden.bs.dropdown",f))))))}functi
on
d(b){return
this.each(function(){var
c=a(this),d=c.data("bs.dropdown");d||c.data("bs.dropdown",d=new
g(this),"string"===typeof
b&&d[b].call(c))}var
e=".dropdown-backdrop",f='[data-
toggle="dropdown"]',g=function(b){a(b).on("click.bs.dropdown",this.toggle)};g.VERSION="3.3
.7",g.prototype.toggle=function(d){var
e=a(this);if(!e.is(".disabled",
:disabled")){var
f=b(e),g=f.hasClass("open");if(c(),!g){ontouchstart"in
document.documentElement&&!f.closest(".navbar-
nav").length&&a(document.createElement("div")).addClass("dropdown-
backdrop").insertAfter(a(this)).on("click",c);var
h={relatedTarget:this};if(f.trigger(d=a.Event("show.bs.dropdown",h)),d.isDefaultPrevented())ret
urn;e.trigger("focus").attr("aria-
expanded","true"),f.toggleClass("open").trigger(a.Event("shown.bs.dropdown",h))}return!1}},g.
prototype.keydown=function(c){if(/(38|40|27|32)/.test(c.which)&&/input|textarea/i.test(c.target.
tagName)){var
d=a(this);if(c.preventDefault(),c.stopPropagation(),!d.is(".disabled",
:disabled")){var
e=b(d),g=e.hasClass("open");if(!g&&27!=c.which||g&&27==c.which)return
27==c.which&&e.find(f).trigger("focus"),d.trigger("click");var
h="
li:not(.disabled):visible
a",i=e.find(".dropdown-menu"+h);if(i.length){var
j=i.index(c.target);38==c.which&&j>0&&j--
,40==c.which&&j<i.length-1&&j++,~j||(j=0),i.eq(j).trigger("focus")}}};var

```

```

h=a.fn.dropdown;a.fn.dropdown=d,a.fn.dropdown.Constructor=g,a.fn.dropdown.noConflict=function(){return
a.fn.dropdown=h,this },a(document).on("click.bs.dropdown.data-api",c).on("click.bs.dropdown.data-api", ".dropdown-
form",function(a){a.stopPropagation()}).on("click.bs.dropdown.data-
api",f,g.prototype.toggle).on("keydown.bs.dropdown.data-
api",f,g.prototype.keydown).on("keydown.bs.dropdown.data-api", ".dropdown-
menu",g.prototype.keydown)}(jQuery),+function(a){ "use strict";function b(b,d){return
this.each(function(){ var
e=a(this),f=e.data("bs.modal"),g=a.extend({},c.DEFAULTS,e.data(),"object"===typeof
b&&b);f||e.data("bs.modal",f=new c(this,g),"string"===typeof
b?f[b](d):g.show&&f.show(d))}var
c=function(b,c){ this.options=c,this.$body=a(document.body),this.$element=a(b),this.$dialog=thi
s.$element.find(".modal-
dialog"),this.$backdrop=null,this.isShown=null,this.originalBodyPad=null,this.scrollbarWidth=0
,this.ignoreBackdropClick=!1,this.options.remote&&this.$element.find(".modal-
content").load(this.options.remote,a.proxy(function(){ this.$element.trigger("loaded.bs.modal")},
this))};c.VERSION="3.3.7",c.TRANSITION_DURATION=300,c.BACKDROP_TRANSITION
_DURATION=150,c.DEFAULTS={backdrop:!0,keyboard:!0,show:!0},c.prototype.toggle=function(a){ return
this.isShown?this.hide():this.show(a)},c.prototype.show=function(b){ var
d=this,e=a.Event("show.bs.modal",{relatedTarget:b});this.$element.trigger(e),this.isShown||e.is
DefaultPrevented()||(this.isShown=!0,this.checkScrollbar(),this.setScrollbar(),this.$body.addClas
s("modal-open"),this.escape(),this.resize(),this.$element.on("click.dismiss.bs.modal",[data-
dismiss="modal"],a.proxy(this.hide,this)),this.$dialog.on("mousedown.dismiss.bs.modal",functi

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on(){d.$element.one("mouseup.dismiss.bs.modal",function(b){a(b.target).is(d.$element)&&(d.ignoreBackdropClick=!0)})),this.backdrop(function(){var
e=a.support.transition&&d.$element.hasClass("fade");d.$element.parent().length||d.$element.appendTo(d.$body),d.$element.show().scrollTop(0),d.adjustDialog(),e&&d.$element[0].offsetWidth,d.$element.addClass("in"),d.enforceFocus();var
f=a.Event("shown.bs.modal",{relatedTarget:b});e?d.$dialog.one("bsTransitionEnd",function(){d.$element.trigger("focus").trigger(f)}.emulateTransitionEnd(c.TRANSITION_DURATION):d.$element.trigger("focus").trigger(f)}),c.prototype.hide=function(b){b&&b.preventDefault(),b=a.Event("hide.bs.modal"),this.$element.trigger(b),this.isShown&&!b.isDefaultPrevented()&&(this.isShown=!1,this.escape(),this.resize(),a(document).off("focusin.bs.modal"),this.$element.removeClass("in").off("click.dismiss.bs.modal").off("mouseup.dismiss.bs.modal"),this.$dialog.off("mousedown.dismiss.bs.modal"),a.support.transition&&this.$element.hasClass("fade"?this.$element.one("bsTransitionEnd",a.proxy(this.hideModal,this)).emulateTransitionEnd(c.TRANSITION_DURATION):this.hideModal()),c.prototype.enforceFocus=function(){a(document).off("focusin.bs.modal").on("focusin.bs.modal",a.proxy(function(a){document===a.target||this.$element[0]===a.target||this.$element.has(a.target).length||this.$element.trigger("focus")},this)),c.prototype.escape=function(){this.isShown&&this.options.keyboard?this.$element.on("keydown.dismiss.bs.modal",a.proxy(function(a){27===a.which&&this.hide()},this)):this.isShown||this.$element.off("keydown.dismiss.bs.modal")},c.prototype.resize=function(){this.isShown?a(window).on("resize.bs.modal",a.proxy(this.handleUpdate,this)):a(window).off("resize.bs.modal")},c.prototype.hideModal=function(){var
a=this;this.$element.hide(),this.backdrop(function(){a.$body.removeClass("modal-open"),a.resetAdjustments(),a.resetScrollbar(),a.$element.trigger("hidden.bs.modal")}),c.protot

```

```

ype.removeBackdrop=function(){this.$backdrop&&this.$backdrop.remove(),this.$backdrop=null},c.prototype.backdrop=function(b){var
d=this,e=this.$element.hasClass("fade")?"fade":"";if(this.isShown&&this.options.backdrop){var
f=a.support.transition&&e;if(this.$backdrop=a(document.createElement("div")).addClass("modal-backdrop
"+e).appendTo(this.$body),this.$element.on("click.dismiss.bs.modal",a.proxy(function(a){return
this.ignoreBackdropClick?void(this.ignoreBackdropClick=!1):void(a.target===a.currentTarget&&
("static"===this.options.backdrop?this.$element[0].focus():this.hide()))},this)),f&&this.$backdr
op[0].offsetWidth,this.$backdrop.addClass("in"),!b)return;f?this.$backdrop.one("bsTransitionEn
d",b).emulateTransitionEnd(c.BACKDROP_TRANSITION_DURATION):b()}else
if(!this.isShown&&this.$backdrop){this.$backdrop.removeClass("in");var
g=function(){d.removeBackdrop(),b&&b()};a.support.transition&&this.$element.hasClass("fade
")?this.$backdrop.one("bsTransitionEnd",g).emulateTransitionEnd(c.BACKDROP_TRANSITI
ON_DURATION):g()}else
b&&b(),c.prototype.handleUpdate=function(){this.adjustDialog(),c.prototype.adjustDialog=fun
ction(){var
a=this.$element[0].scrollHeight>document.documentElement.clientHeight;this.$element.css({pa
ddingLeft:!this.bodyIsOverflowing&&a?this.scrollbarWidth:"",paddingRight:this.bodyIsOverflo
wing&&!a?this.scrollbarWidth:""}),c.prototype.resetAdjustments=function(){this.$element.css
({paddingLeft:"",paddingRight:""}),c.prototype.checkScrollbar=function(){var
a=window.innerWidth;if(!a){var
b=document.documentElement.getBoundingClientRect();a=b.right-
Math.abs(b.left)}this.bodyIsOverflowing=document.body.clientWidth<a,this.scrollbarWidth=thi

```

```

s.measureScrollbar(),c.prototype.setScrollbar=function(){var
a=parseInt(this.$body.css("padding-
right"))||0,10);this.originalBodyPad=document.body.style.paddingRight||"",this.bodyIsOverflowin
g&&this.$body.css("padding-
right",a+this.scrollbarWidth)},c.prototype.resetScrollbar=function(){this.$body.css("padding-
right",this.originalBodyPad)},c.prototype.measureScrollbar=function(){var
a=document.createElement("div");a.className="modal-scrollbar-
measure",this.$body.append(a);var b=a.offsetWidth-a.clientWidth;return
this.$body[0].removeChild(a,b);var
d=a.fn.modal;a.fn.modal=b,a.fn.modal.Constructor=c,a.fn.modal.noConflict=function(){return
a.fn.modal=d,this},a(document).on("click.bs.modal.data-api",[data-
toggle="modal"],function(c){var d=a(this),e=d.attr("href"),f=a(d.attr("data-
target"))||e&&e.replace(/.*(?:#\s+)$/,""),g=f.data("bs.modal")?"toggle":a.extend({remote:!/#/
test(e)&&e},f.data(),d.data());d.is("a")&&c.preventDefault(),f.one("show.bs.modal",function(a){
a.isDefaultPrevented()||f.one("hidden.bs.modal",function(){d.is(":visible")&&d.trigger("focus")
}))},b.call(f,g,this))}(jQuery),+function(a){"use strict";function b(b){return
this.each(function(){var d=a(this),e=d.data("bs.tooltip"),f="object"===typeof
b&&b;!e&&/destroy|hide/.test(b)||e||d.data("bs.tooltip",e=new c(this,f)),"string"===typeof
b&&e[b]())}}var
c=function(a,b){this.type=null,this.options=null,this.enabled=null,this.timeout=null,this.hoverSt
ate=null,this.$element=null,this.inState=null,this.init("tooltip",a,b)};c.VERSION="3.3.7",c.TRA
NSITION_DURATION=150,c.DEFAULTS={animation:!0,placement:"top",selector:!1,template
:'<div class="tooltip" role="tooltip"><div class="tooltip-arrow"></div><div class="tooltip-

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inner"></div></div>',trigger:"hover
focus",title:"",delay:0,html:!1,container:!1,viewport:{selector:"body",padding:0}},c.prototype.ini
t=function(b,c,d){if(this.enabled=!0,this.type=b,this.$element=a(c),this.options=this.getOptions(
d),this.$viewport=this.options.viewport&&a(a.isFunction(this.options.viewport)?this.options.vie
wport.call(this,this.$element):this.options.viewport.selector||this.options.viewport),this.inState={
click:!1,hover:!1,focus:!1},this.$element[0]instanceof
document.constructor&&!this.options.selector)throw new Error("`selector` option must be
specified when initializing "+this.type+" on the window.document object!");for(var
e=this.options.trigger.split("                "),f=e.length;f--;){ var
g=e[f];if("click"==g)this.$element.on("click."+this.type,this.options.selector,a.proxy(this.toggle,t
his));else                                if("manual"!=g){ var
h="hover"==g?"mouseenter":"focusin",i="hover"==g?"mouseleave":"focusout";this.$element.on
(h+"."+this.type,this.options.selector,a.proxy(this.enter,this)),this.$element.on(i+"."+this.type,thi
s.options.selector,a.proxy(this.leave,this))} }this.options.selector?this._options=a.extend({},this.o
ptions,{trigger:"manual",selector:""}):this.fixTitle(),c.prototype.getDefaults=function(){return
c.DEFAULTS},c.prototype.getOptions=function(b){return
b=a.extend({},this.getDefaults(),this.$element.data(),b),b.delay&&"number"==typeof
b.delay&&(b.delay={show:b.delay,hide:b.delay}),b},c.prototype.getDelegateOptions=function()
{ var                                b={},c=this.getDefaults();return
this._options&&a.each(this._options,function(a,d){c[a]!=d&&(b[a]=d)}),b},c.prototype.enter=fun
ction(b){var c=b instanceof this.constructor?b:a(b.currentTarget).data("bs."+this.type);return
c||(c=new
this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+this.typ

```

```

e,c)),b                                     instanceof
a.Event&&(c.inState["focusin"]==b.type?"focus":"hover"]!=0),c.tip().hasClass("in")||"in"==c.hov
erState?void(c.hoverState="in):(clearTimeout(c.timeout),c.hoverState="in",c.options.delay&&c.o
ptions.delay.show?void(c.timeout=setTimeout(function(){ "in"==c.hoverState&&c.show() },c.o
ptions.delay.show)):c.show()),c.prototype.isInStateTrue=function(){ for(var a in
this.inState)if(this.inState[a])return!0;return!1 },c.prototype.leave=function(b){ var c=b instanceof
this.constructor?b:a(b.currentTarget).data("bs."+this.type);if(c||(c=new
this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+this.typ
e,c)),b                                     instanceof
a.Event&&(c.inState["focusout"]==b.type?"focus":"hover"]!=1),!c.isInStateTrue())return
clearTimeout(c.timeout),c.hoverState="out",c.options.delay&&c.options.delay.hide?void(c.time
out=setTimeout(function(){ "out"==c.hoverState&&c.hide() },c.options.delay.hide)):c.hide(),c.p
rototype.show=function(){ var
b=a.Event("show.bs."+this.type);if(this.hasContent()&&this.enabled){ this.$element.trigger(b);var
r
d=a.contains(this.$element[0].ownerDocument.documentElement,this.$element[0]);if(b.isDefaul
tPrevented()||!d)return;var
e=this,f=this.tip(),g=this.getUID(this.type);this.setContent(),f.attr("id",g),this.$element.attr("aria-
describedby",g),this.options.animation&&f.addClass("fade");var h="function"==typeof
this.options.placement?this.options.placement.call(this,f[0],this.$element[0]):this.options.placem
ent,i=\\s?auto?\\s?/i,j=i.test(h);j&&(h=h.replace(i,"")||"top"),f.detach().css({ top:0,left:0,display:"b
lock }).addClass(h).data("bs."+this.type,this),this.options.container?f.appendTo(this.options.con
tainer):f.insertAfter(this.$element),this.$element.trigger("inserted.bs."+this.type);var

```

```

k=this.getPosition(),l=f[0].offsetWidth,m=f[0].offsetHeight;if(j){ var
n=h,o=this.getPosition(this.$viewport);h="bottom"==h&&k.bottom+m>o.bottom?"top":"top"==
h&&k.top-m<o.top?"bottom":"right"==h&&k.right+l>o.width?"left":"left"==h&&k.left-
l<o.left?"right":h,f.removeClass(n).addClass(h)} var
p=this.getCalculatedOffset(h,k,l,m);this.applyPlacement(p,h);var q=function(){ var
a=e.hoverState;e.$element.trigger("shown.bs."+e.type),e.hoverState=null,"out"==a&&e.leave(e)
};a.support.transition&&this.$tip.hasClass("fade")?f.one("bsTransitionEnd",q).emulateTransitio
nEnd(c.TRANSITION_DURATION):q() },c.prototype.applyPlacement=function(b,c){ var
d=this.tip(),e=d[0].offsetWidth,f=d[0].offsetHeight,g=parseInt(d.css("margin-
top"),10),h=parseInt(d.css("margin-
left"),10);isNaN(g)&&(g=0),isNaN(h)&&(h=0),b.top+=g,b.left+=h,a.offset.setOffset(d[0],a.exte
nd({ using:function(a){ d.css({ top:Math.round(a.top),left:Math.round(a.left) }) },b),0),d.addClass(
"in");var i=d[0].offsetWidth,j=d[0].offsetHeight;"top"==c&&j!=f&&(b.top=b.top+f-j);var
k=this.getViewportAdjustedDelta(c,b,i,j);k.left?b.left+=k.left:b.top+=k.top;var
l=/top|bottom/.test(c),m=l?2*k.left-e+i:2*k.top-
f+j,n=l?"offsetWidth":"offsetHeight";d.offset(b),this.replaceArrow(m,d[0][n],l)},c.prototype.repl
aceArrow=function(a,b,c){ this.arrow().css(c?"left":"top",50*(1-
a/b)+"%").css(c?"top":"left",""),c.prototype.setContent=function(){ var
a=this.tip(),b=this.getTitle();a.find(".tooltip-
inner")[this.options.html?"html":"text"](b),a.removeClass("fade in top bottom left
right")},c.prototype.hide=function(b){ function
d(){ "in"!=e.hoverState&&f.detach(),e.$element&&e.$element.removeAttr("aria-
describedby").trigger("hidden.bs."+e.type),b&&b())} var

```

```

e=this,f=a(this.$tip),g=a.Event("hide.bs."+this.type);if(this.$element.trigger(g),!g.isDefaultPrevented())return
f.removeClass("in"),a.support.transition&&f.hasClass("fade")?f.one("bsTransitionEnd",d).emulateTransitionEnd(c.TRANSITION_DURATION):d(),this.hoverState=null,this},c.prototype.fixTitle=function(){var a=this.$element;(a.attr("title")||"string"!==typeof a.attr("data-original-title"))&&a.attr("data-original-title",a.attr("title")||"").attr("title",""),c.prototype.hasContent=function(){return this.getTitle()},c.prototype.getPosition=function(b){b=b||this.$element;var c=b[0],d="BODY"===c.tagName,e=c.getBoundingClientRect();null===e.width&&(e=a.extend({},e,{width:e.right-e.left,height:e.bottom-e.top}));var f=window.SVGElement&&c instanceof window.SVGElement,g=d?{top:0,left:0}:f?null:b.offset(),h={scroll:d?document.documentElement.scrollTop||document.body.scrollTop:b.scrollTop},i=d?{width:a(window).width(),height:a(window).height():null;return a.extend({},e,h,i,g)},c.prototype.getCalculatedOffset=function(a,b,c,d){return"bottom"===a?{top:b.top+b.height,left:b.left+b.width/2-c/2}:"top"===a?{top:b.top-d,left:b.left+b.width/2-c/2}:"left"===a?{top:b.top+b.height/2-d/2,left:b.left-c}:{top:b.top+b.height/2-d/2,left:b.left+b.width}},c.prototype.getViewportAdjustedDelta=function(a,b,c,d){var e={top:0,left:0};if(!this.$viewport)return e;var f=this.options.viewport&&this.options.viewport.padding||0,g=this.getPosition(this.$viewport);if(/right|left/.test(a)){var h=b.top-f-g.scroll,i=b.top+f-g.scroll+d;h<g.top?e.top=g.top-h:i>g.top+g.height&&(e.top=g.top+g.height-i)}else{var j=b.left-f,k=b.left+f+c;j<g.left?e.left=g.left-j:k>g.right&&(e.left=g.left+g.width-k)}return e},c.prototype.getTitle=function(){var a,b=this.$element,c=this.options;return a=b.attr("data-

```

```

original-title")||("function"===typeof
c.title?c.title.call(b[0]):c.title)},c.prototype.getUID=function(a){do
a+=~~(1e6*Math.random());while(document.getElementById(a));return
a},c.prototype.tip=function(){if(!this.$tip&&(this.$tip=a(this.options.template),1!==this.$tip.length))throw new Error(this.type+" `template` option must consist of exactly 1 top-level element!");return this.$tip},c.prototype.arrow=function(){return this.$arrow=this.$arrow||this.tip().find(".tooltip-arrow")},c.prototype.enable=function(){this.enabled=!0},c.prototype.disable=function(){this.enabled=!1},c.prototype.toggleEnabled=function(){this.enabled=!this.enabled},c.prototype.toggle=function(b){var c=this;b&&(c=a(b.currentTarget).data("bs."+this.type),c||(c=new this.constructor(b.currentTarget,this.getDelegateOptions()),a(b.currentTarget).data("bs."+this.type,c))),b?(c.inState.click=!c.inState.click,c.isInStateTrue()?c.enter(c):c.leave(c)):c.tip().hasClass("in")?c.leave(c):c.enter(c)},c.prototype.destroy=function(){var a=this;clearTimeout(this.timeout),this.hide(function(){a.$element.off(". "+a.type).removeData("bs."+a.type),a.$tip&&a.$tip.detach(),a.$tip=null,a.$arrow=null,a.$viewport=null,a.$element=null});var d=a.fn.tooltip;a.fn.tooltip=b,a.fn.tooltip.Constructor=c,a.fn.tooltip.noConflict=function(){return a.fn.tooltip=d,this}}(jQuery),+function(a){"use strict";function b(b){return this.each(function(){var d=a(this),e=d.data("bs.popover"),f="object"===typeof b&&b;!e&&/destroy|hide/.test(b)||(e||d.data("bs.popover",e=new c(this,f)),"string"===typeof b&&e[b]()))}var c=function(a,b){this.init("popover",a,b)};if(!a.fn.tooltip)throw new Error("Popover requires tooltip.js");c.VERSION="3.3.7",c.DEFAULTS=a.extend({},a.fn.tooltip.Constructor.DEFAULTS

```

```

S,{placement:"right",trigger:"click",content:"",template:'<div
class="popover"
role="tooltip"><div class="arrow"></div><h3 class="popover-title"></h3><div class="popover-
content"></div></div>'},c.prototype=a.extend({},a.fn.tooltip.Constructor.prototype),c.prototype
e.constructor=c,c.prototype.getDefaults=function(){return
c.DEFAULTS},c.prototype.setContent=function(){var
a=this.tip(),b=this.getTitle(),c=this.getContent();a.find(".popover-
title")[this.options.html?"html":"text"](b),a.find(".popover-
content").children().detach().end()[this.options.html?"string"==typeof
c?"html":"append":"text"](c),a.removeClass("fade top bottom left right in"),a.find(".popover-
title").html()||a.find(".popover-title").hide()},c.prototype.hasContent=function(){return
this.getTitle()||this.getContent()},c.prototype.getContent=function(){var
a=this.$element,b=this.options;return
a.attr("data-content")||("function"==typeof
b.content?b.content.call(a[0]):b.content)},c.prototype.arrow=function(){return
this.$arrow=this.$arrow||this.tip().find(".arrow");var
d=a.fn.popover;a.fn.popover=b,a.fn.popover.Constructor=c,a.fn.popover.noConflict=function(){
return
a.fn.popover=d,this}}(jQuery),+function(a){"use
strict";function
b(c,d){this.$body=a(document.body),this.$scrollElement=a(a(c).is(document.body)?window:c),t
his.options=a.extend({},b.DEFAULTS,d),this.selector=(this.options.target||"")+
".nav li >
a",this.offsets=[],this.targets=[],this.activeTarget=null,this.scrollHeight=0,this.$scrollElement.on
("scroll.bs.scrollspy",a.proxy(this.process,this)),this.refresh(),this.process()}function
c(c){return
this.each(function(){var
d=a(this),e=d.data("bs.scrollspy"),f="object"==typeof
e?e||d.data("bs.scrollspy",e=new
b(this,f)),"string"==typeof
c&&e[c]()}})b.VERSION="3.3.7",b.DEFAULTS={offset:10},b.prototype.getScrollHeight=func

```

```

tion(){return
this.$scrollElement[0].scrollHeight||Math.max(this.$body[0].scrollHeight,document.documentEl
ement.scrollHeight)},b.prototype.refresh=function(){var
b=this,c="offset",d=0;this.offsets=[],this.targets=[],this.scrollHeight=this.getScrollHeight(),a.is
Window(this.$scrollElement[0])|(c="position",d=this.$scrollElement.scrollTop()),this.$body.fin
d(this.selector).map(function(){var
b=a(this),e=b.data("target")||b.attr("href"),f=/^#/.test(e)&&a(e);return
f&&f.length&&f.is(":visible")&&[[f[c]().top+d,e]]||null}).sort(function(a,b){return
a[0]-
b[0]}).each(function(){b.offsets.push(this[0]),b.targets.push(this[1])}),b.prototype.process=fun
ction(){var
a,b=this.$scrollElement.scrollTop()+this.options.offset,c=this.getScrollHeight(),d=this.options.of
fset+c-
this.$scrollElement.height(),e=this.offsets,f=this.targets,g=this.activeTarget;if(this.scrollHeight!
=c&&this.refresh(),b>=d)return
g!=(a=f[f.length-1])&&this.activate(a);if(g&&b<e[0])return
this.activeTarget=null,this.clear();for(a=e.length;a--;)g!=f[a]&&b>=e[a]&&(void
0===e[a+1]||b<e[a+1])&&this.activate(f[a])},b.prototype.activate=function(b){
this.activeTarget=b,this.clear();var
c=this.selector+'[data-
target="'+b+'"]','+this.selector+'[href="'+b+'"]',d=a(c).parents("li").addClass("active");d.parent(".
dropdown-
menu").length&&(d=d.closest("li.dropdown").addClass("active")),d.trigger("activate.bs.scrollsp
y")},b.prototype.clear=function(){a(this.selector).parentsUntil(this.options.target,".active").remo
veClass("active");var
d=a.fn.scrollspy;a.fn.scrollspy=c,a.fn.scrollspy.Constructor=b,a.fn.scrollspy.noConflict=function

```

```

() { return a.fn.scrollspy=d,this },a(window).on("load.bs.scrollspy.data-api",function(){a("[data-
spy="scroll"]').each(function(){var b=a(this);c.call(b,b.data())}})}(jQuery),+function(a){"use
strict";function b(b){return this.each(function(){var
d=a(this),e=d.data("bs.tab");e||d.data("bs.tab",e=new c(this)),"string"===typeof b&&e[b]()}})var
c=function(b){this.element=a(b)};c.VERSION="3.3.7",c.TRANSITION_DURATION=150,c.pr
ototype.show=function(){var b=this.element,c=b.closest("ul:not(.dropdown-
menu)",d=b.data("target"));if(d||(d=b.attr("href"),d=d&&d.replace(/.*(?=#[^\s]*$)/,"")),!b.parent(
"li").hasClass("active")){var e=c.find(".active:last
a"),f=a.Event("hide.bs.tab",{relatedTarget:b[0]}),g=a.Event("show.bs.tab",{relatedTarget:e[0]});
if(e.trigger(f),b.trigger(g),!g.isDefaultPrevented()&&!f.isDefaultPrevented()){var
h=a(d);this.activate(b.closest("li"),c),this.activate(h,h.parent(),function(){e.trigger({type:"hidden.
bs.tab",relatedTarget:b[0]}),b.trigger({type:"shown.bs.tab",relatedTarget:e[0]})}})}},c.prototype
.activate=function(b,d,e){function f(){g.removeClass("active").find("> .dropdown-menu >
.active").removeClass("active").end().find("[data-toggle="tab"]').attr("aria-
expanded",!1),b.addClass("active").find("[data-toggle="tab"]').attr("aria-
expanded",!0),h?(b[0].offsetWidth,b.addClass("in")):b.removeClass("fade"),b.parent(".dropdow
n-menu").length&&b.closest("li.dropdown").addClass("active").end().find("[data-
toggle="tab"]').attr("aria-expanded",!0),e&&e()}var g=d.find(">
.active"),h=e&&a.support.transition&&(g.length&&g.hasClass("fade"))?!d.find(">
.fade").length):g.length&&h?g.one("bsTransitionEnd",f).emulateTransitionEnd(c.TRANSITION
_DURATION):f(),g.removeClass("in");var
d=a.fn.tab;a.fn.tab=b,a.fn.tab.Constructor=c,a.fn.tab.noConflict=function(){return
a.fn.tab=d,this};var

```

```

e=function(c){c.preventDefault(),b.call(a(this),"show");a(document).on("click.bs.tab.data-
api",[data-toggle="tab"],e).on("click.bs.tab.data-api",[data-
toggle="pill"],e)}(jQuery),+function(a){"use strict";function b(b){return this.each(function(){var
d=a(this),e=d.data("bs.affix"),f="object"===typeof b&&b;e||d.data("bs.affix",e=new
c(this,f),"string"===typeof b&&e[b]())}})var
c=function(b,d){this.options=a.extend({},c.DEFAULTS,d),this.$target=a(this.options.target).on(
"scroll.bs.affix.data-api",a.proxy(this.checkPosition,this)).on("click.bs.affix.data-
api",a.proxy(this.checkPositionWithEventLoop,this)),this.$element=a(b),this.affixed=null,this.un-
pin=null,this.pinnedOffset=null,this.checkPosition();c.VERSION="3.3.7",c.RESET="affix
affix-top affix-
bottom",c.DEFAULTS={offset:0,target:window},c.prototype.getState=function(a,b,c,d){var
e=this.$target.scrollTop(),f=this.$element.offset(),g=this.$target.height();if(null!=c&&"top"===th-
is.affixed)return e<c&&"top";if("bottom"===this.affixed)return
null!=c?!(e+this.unpin<=f.top)&&"bottom":!(e+g<=a-d)&&"bottom";var
h=null===this.affixed,i=h?e:f.top,j=h?g:b;return null!=c&&e<=c?"top":null!=d&&i+j>=a-
d&&"bottom"},c.prototype.getPinnedOffset=function(){if(this.pinnedOffset)return
this.pinnedOffset;this.$element.removeClass(c.RESET).addClass("affix");var
a=this.$target.scrollTop(),b=this.$element.offset();return this.pinnedOffset=b.top-
a},c.prototype.checkPositionWithEventLoop=function(){setTimeout(a.proxy(this.checkPosition,
this),1)},c.prototype.checkPosition=function(){if(this.$element.is(":visible")){var
b=this.$element.height(),d=this.options.offset,e=d.top,f=d.bottom,g=Math.max(a(document).hei-
ght(),a(document.body).height());"object"!==typeof d&&(f=e+d),"function"===typeof
e&&(e=d.top(this.$element)),"function"===typeof f&&(f=d.bottom(this.$element));var

```

```
h=this.getState(g,b,e,f);if(this.affixed!=h){null!=this.unpin&&this.$element.css("top","");var
i="affix"+(h?"-
"+h:""),j=a.Event(i+".bs.affix");if(this.$element.trigger(j),j.isDefaultPrevented())return;this.affix
ed=h,this.unpin="bottom"==h?this.getPinnedOffset():null,this.$element.removeClass(c.RESET).
addClass(i).trigger(i.replace("affix","affixed")+".bs.affix")} "bottom"==h&&this.$element.offset
({top:g-b-f}});var
d=a.fn.affix;a.fn.affix=b,a.fn.affix.Constructor=c,a.fn.affix.noConflict=function(){return
a.fn.affix=d,this},a(window).on("load",function(){a('[data-spy="affix"]').each(function(){var
c=a(this),d=c.data();d.offset=d.offset||{ },null!=d.offsetBottom&&(d.offset.bottom=d.offsetBotto
m),null!=d.offsetTop&&(d.offset.top=d.offsetTop),b.call(c,d)}})}(jQuery);
```

Biodata

Personal Data:

Surname: ADEDIRAN

Other Names: EMMANUEL A.

Date of Birth: 28th September, 1997

Gender: Male

Local Government Area: Itesiwaju

State of Origin: Oyo State

Nationality: Nigerian

Marital Status: Single

Religion: Christianity

Next of Kin: Dr. Stephen Adediran

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Educational Background:

Institutions attended with Dates and Qualification:

Lead City University, Toll Gate, Ibadan, Oyo State: 2020 till date (MSc. Software Engineering)

Lead City University, Toll Gate, Ibadan, Oyo State: 2015-2019 (BSc. Computer and Information Sciences)

Baptist Model High School, Sanngo, Eruwa, Oyo state, Nigeria: 2009-20115 (WAEC O'Level, NECO O'Level)

Oore-ofe Baptist Day-care Nursery and Primary School, IsaleTogun, Lanlate: 2003-2009 (First School Leaving Certificate)

Awards and Fellowship

Most Outstanding Student 200L Computer Science department, 2017, Lead City University.

ISGPP Mathematical Representation Award, 2017, Bodija Ibadan

Royal Ambassadors of Nigeria Ambassador Plenipotentiary, 2019

Work Experience with Dates

Sales Representative, Amazing Grace Ventures, Lanlate, Oyo state. 2011 - 2015

GEDU Technologies, City Business Computers CBC, Lekki, Lagos State SIWES Trainee (6 Months) 2018

Office of the Head of Office of Service, Anambra State Government, Anambra State. NYSC 2020

South Eastern Regional Representative, City Business Computers CBC, Lagos, Awka, Anambra State 2019 - 2020

Lead City University, Ibadan. Oyo State. 2021 till date

Courses Taught

MTH 102: Calculus

CSC 102: Introduction to Web Computing

ISM 209: Web based Technologies

CSC 219: Introduction to Web Computing

HIM 304: Computer Software packages

IFT 311: Web Server Administrator

ISM 401: 3D Animation

ISM 404: Digital Speech rendering

CSC 404: Computer Simulation

CSC/SEN/CYB 402: Introduction to Web computing II

Membership of Academic Professional Bodies

Associate member: Institute of personality development and customer relationship management ID-CRM

Graduate Member: Nigerian Computer Society, no: 123456

Academic Papers (Unpublished Thesis and Projects):

Mobile News Application, Case Study: Lead City University. B.Sc. Thesis, 2019.

Mobile Devices, Uses, Application and Health Challenges. Google. 2021.

Published Journal Articles

Ayemowa Matthew, Dr. W. Ajayi, **Emmanuel Adediran**, Iyanuoluwa Fatoki and Alonge Opeyemi “Testing of embedded system with a slight look at mobile devices” American

Skills

- Computer networking and maintenance
- System analysis and design
- Quality Assurance
- Quality Testing
- Programming (HTML, CSS, Javascript, Java, Python, C++, C, C#)
- Computer hardware maintenance
- Software engineering

Referees

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University Compliance Form

This is to certify that this thesis by Adediran Emmanuel Adebowale with Matriculation Number LCU/PG/001921 in the Department of Computer Science, Faculty of Natural and Applied Sciences, Lead City University, Ibadan is in full compliance with the approval of the University's format and style.

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Signature

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Date

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