

Audit Lens

A PROJECT REPORT

Submitted by

AGNA C ANTONY (TKM20MCA2003)

to

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In partial fulfillment of the requirements for the award of the degree of

MASTER OF COMPUTER APPLICATIONS



**Thangal Kunju Musaliar College of Engineering
Kerala**

DEPARTMENT OF COMPUTER APPLICATIONS

JULY 2022

DECLARATION

I undersigned hereby declare that the project report on **Audit Lens**, submitted for partial fulfillment of the requirements for the award of degree of Master of Computer Applications of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by me under supervision of Dr. Fousia M Shamsudeen. This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in our submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

Kollam

30-07-2022

AGNA C ANTONY

DEPT. OF COMPUTER APPLICATIONS TKM COLLEGE OF ENGINEERING

KOLLAM

2021 - 22



CERTIFICATE

This is to certify that the report entitled **Audit Lens** submitted by **AGNA C ANTONY** (TKM20MCA2003) to the APJ Abdul Kalam Technological University in partial fulfillment of the Masters degree in Computer Applications is a bonafide record of the project work carried out by him under our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor

Head of the Department

External Examiner

Date:19-07-2022

TO WHOM IT MAY CONCERN

This is to certify that Ms. Agna C Antony from TKM College of Engineering, Kollam is pursuing the internship on “AUDIT LENS” project at **Knowledge Lens Pvt Ltd** starting from 2nd May 2022 to till 22nd July 2022. During the period of her training with us she is found punctual, hardworking, and inquisitive.

We wish her all the success in future endeavors.

Yours Truly,

For **Knowledge Lens Pvt Ltd**.



JAYASREE S
HR Manager
hr@knowledgelens.com

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ABSTRACT

The term "audit" typically refers to an examination of financial statements. A financial audit is an independent review and assessment of an organization's financial statements to ensure that they fairly and accurately reflect the transactions they purport to represent. Employees of the organisation may conduct the audit internally, or an outside company of Certified Public Accountants may do it externally. External audits can be quite beneficial in removing any prejudice when examining the health of a company's finances. Financial audits look for any significant inaccuracies in the financial statements. Internal auditors work for the business or organisation they are auditing, and they deliver their audit report directly to management and the board of directors.

Auditor-friendly features in Excel are numerous. Excel is a potent audit tool since it allows for the input of data and the running of various tests and analyses. Most auditors can easily access it, and it is easy to use. There are numerous analytical tests that Excel is capable of doing. Numerous other sorts of data analysis can also be carried out with this tool, including append and merge, cross tabulation, pivot tables, gaps and duplication detection, extract and filter, connect and relate, sample, sort, summarise, and subtotal. A tool that aids auditees in better understanding audits is thus required which displays the progression of each section of the question using bar graphs and percentages. It saves the user time and permits the monitoring of the auditor's performance by avoiding the conventional Excel sheet appraisal. It also helps the user to quickly and easily determine the auditing's progress and track the efficiency of auditor.

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Chapter 1

Introduction

Audit Lens A progressive online application called Audit Lens was created for the UK government to make auditing more user-friendly. An audit often involves looking at a company's financial accounts, including the income statement, cash flow statement, and balance sheet. Audits give authorities and investors assurance that a company's financial reporting is accurate. Internal auditing and external auditing are the two basic forms of auditing. Employees within the organization conduct internal audits. Internal audit reports, which give an overview of the organization's performance in several areas but are not made public, are sent to a company's management and audit committee. Compliance, internal controls, and risk management are a few examples of these topics. Independent auditors who are employed to provide an opinion on the veracity of a corporation's financial reporting are involved in external audits. We can put both auditing into practise using this project. In this case, instead of utilising word parsing, which is typically used for auditing, users can attempt questions and answers as part of a survey using excel parsing. The Excel Parser feature gives applicants the ability to complete their budgets using the Microsoft Excel application offline, and then the applicant can upload the completed Excel spreadsheet into your system later. The spreadsheet's data will be used to fill custom fields in your system or it may be used to trigger a number of activities.

1.1 Objective

The goal is to accomplish the following:

- Resolves difficulty to identify the progress in auditing for each section.
- It mainly aims to provide user friendly UI.
- Helps to find details of auditee for future auditing.
- Increasing the scalability and robustness of audit process
- Increase productivity

1.2 Company Profile

Knowledge Lens provides a collection of Lens that automates and simplifies the discovery of hidden insights from Big Data .Our mission is to turn the dark data to meaningful business insights. We are Big Data Technology Geeks with extensive Industry expertise and a wide range of Big Data Projects ranging from Big Data Engineering to Data Science.

1.2.1 Products

- **iLens(Intelligent Lens)**

iLens provides a single platform for smart integration with various devices or sensors in large enterprises, manufacturing industry, home, commercial properties etc.

iLens provides an MQTT interface for seamless integration of various sensor devices in the field to capture time series data in real time. Based on pre-configured rules, iLens is able to generate alerts, alarms based on the rules.

- **MLens**

MLens is a one-step solution which enables you to manage disaster recovery for your big data and platforms

Features of MLens :

1. Big Data Backup Migration
2. Automated Disaster Recovery

3. Data Encryption, compression Archival
4. High Speed Batch Data Ingestion
5. Monitoring Scheduling
6. Secured Access controls

- **AiLens**

Next Generation Ai platform that offers a collaborative workspace with experiment designer, modelling feature engineering work bench, AI/ML assets repository integrations for enterprise security and DevOps.

AiLens is an intelligent assistant for Artificial Intelligence crafted with a unified graphical interface for building Data Engineering and AI/ML pipelines. AiLens includes a unified AI Orchestrator which triggers model execution runs on any runtimes like Tensorflow, SparkML, H2O, MxNet, Theano, PyTorch, AWS / Azure from a console. AiLens is quite flexible as the user experience will be the same.

Irrespective of any new technological advancements because of the meta model-driven platform. Intuitive job submission and monitoring framework, secured integration with external entities and inbuilt encryption and rolebased access control support make our product stand out with a huge margin.

Key features are:

1. Any AI Stack, Any AI Algorithm, Anywhere
2. Unified AI Orchestrator
3. Simplified User Experience
4. Intelligent Assistant for AI
5. Integrated Data Preparation AI Modelling Environment
6. Seamless Enterprise Security Integration

- **GLens**

GLens is a Real-Time Data Acquisition, Monitoring and Analytics suite of Products for Industrial Emissions, Effluent Discharges and Ambient Air Monitoring. GLens DAS Software, GLens Server Platform, GLens Environ Data Logger provides a comprehensive solution for all Industry Environmental needs. The platform connects to any analyser,

sensor or device in a plug and play model acquiring data in real time.

The key features of GLens are::

1. Rest based open protocol for multi-client deployment.
2. Real time alerts and alarms with SMS and Email integration.
3. Remote calibration and configuration of analyzers.
4. Plug and play complete protocol integration with any analyzer make and model. – Integrated and data quality codes as per ISO 7168.
5. Integrated analytics and predictive models for effective pollution control.
6. Live consolidated industry dashboards.

1.2.2 Services

- **Big Data Engineering Services**

We provide end to end Architecture, Design, Development, Testing and Deployment of Big Data Protects.

- **Big Data Security Services**

We are one of the niche consulting companies to provide specialized Big Data Services.

- **Big Data Analytics Services**

We deliver hidden insights from a wide variety of data sources using our pre-build analytical Lens.

- **Big Data Competency Development**

Without unique Big Data expertise, we provide one of the best Big Data Competency Development programs for the enterprise.

Chapter 2

Literature Survey

An analysis of scholarly sources on a particular subject is known as a literature survey. By giving you a broad view of the state of the field, it enables you to spot pertinent theories, approaches, and gaps in the body of knowledge. In a literature review for an audit lens, the evaluation of the pertinent literature is a main focus. A literature review covers information that has been published in a specific field of study, and occasionally information that has been published within a specific time frame.

Although a literature review might just be a list of the sources, it often follows an organisational structure and combines summary and synthesis. A synthesis is a reorganisation or reshuffle of the material in a summary, which is a recap of the key points from the source. It could provide a fresh interpretation of dated information or blend fresh and outdated perspectives. Or it could outline the field's intellectual history, including significant arguments. The literature review may also assess the sources and advise the reader on which are the most topical or relevant, depending on the circumstances.

2.1 Purpose of the Literature Review

1. Show that you are knowledgeable about the subject and its scholarly background.
2. Create a theoretical framework and research technique. your study in connection to those of other scholars and theories.
3. Describe how your study fills a gap or advances a discussion. Assess the research's current state and show that you are knowledgeable about the scholarly discussions

surrounding your subject.

2.2 Related Works

2.2.1 Exploration of Enterprise Audit Information Management System

According to contemporary enterprise management theory, the audit management holds a crucial position. By performing efficient audit management tasks, an enterprise can strengthen its self-control awareness, standardise the responsibility and behaviour of its departments, and effectively realise the benefits of incentives. This article focuses on exploring the enterprise audit information management system's mode and approach using data flow diagrams. The internal and external audit system's design approach makes use of the MVC model to determine each component's responsibilities based on a decrease in the connection between both the models and view components. The system's implementation provides an efficient and useful method for such audit management platform, can standardise the enterprise's internal audit management system, and enables the completion of audit management tasks for each department in line with a common standard. Additionally, it aids in enhancing the company's internal self-control, departmental assessment, and efficiently maintaining the virtuous cycle condition.

The hazards that businesses are facing have grown more complicated as a result of the widespread use of information technology in all spheres of society and the advancement of the informatization of firm management. Studying the enhancement of internal audit work in an IT environment is also very important practically. This essay examines how the IT environment affects the goals and practises of internal auditing. Additionally, it suggests that in order to effectively involve internal audit in risk management in the IT environment, it is important to take into account the new risks that businesses are encountering there and actively use technology to make changes and innovations to the established internal audit methodologies and tools. Then, it is advantageous to boost enterprise risk management and improve the calibre and effectiveness of internal audit in the IT environment.[1]

2.2.2 Audit application for building of small and medium enterprise

The excessive energy use in homes, businesses, and industries, as well as the equipment used, forces the decision-maker to constantly consider how efficiently the energy is being used. Due to the competition to produce better products at lower costs, industrial sectors will receive more attention in the workplace. The tiny percentage of reduced energy use has an impact on product costs and profit margins. Therefore, it is critical for an industry or enterprise's energy auditor to have a systematic approach for auditing the business/factory and energy utilised by the equipment in order to create the practical steps required to reduce energy usage and increase comfort and product quality.[2]

2.2.3 REACT: Runtime Environment

Currently available frameworks for creating self-adaptive software can aid in lowering overall development effort. But neither are they designed specifically for use in communication systems nor are they simple to employ without a thorough understanding of the creation of self-adaptive systems. Herein lies the function of REACT, a model-based, reusable runtime environment that adds adaptive behaviour to communication systems. It lessens development effort while addressing the heterogeneity and distribution elements of networks. Without prior knowledge of creating self-adaptive systems, REACT enables communication system developers to include adaptive behaviour. Due to the React application's use of virtual DOM that is rendered and ReactJS's superior performance than Javascript in high traffic conditions, there is a significant performance difference between the two applications. Because of this, React should be taken into consideration when creating apps.

REACT is a Runtime Environment for Adapting Communication Systems. With Clafer and UML, REACT enables domain experts to design adaption behaviour in a model-based manner. The language-independent interfaces that REACT implements and the deployment settings that are chosen allow it to connect to the target system and automatically deploy its integrated feedback loop. It can therefore be used with legacy systems as well. While meeting the unique needs of adaptive communication systems, REACT is compact and simple to use. Implement REACT, make it a publicly accessible open source project, and provide domain experts with a clear development methodology to help close the current gap between research and practise on self-adaptive systems. By contrasting REACT with the cutting-edge

Rainbow framework in a cloud resource management scenario and putting it to use in a real-world use case, we evaluate REACT.[3].

2.2.4 Strategic audit of infrastructure projects

Research domain, models, methodologies, and procedures of the strategic audit of infrastructure projects and programmes are taken into consideration. Complex infrastructure projects and programmes that are implemented in the face of uncertainty often have issues related to the strategy's development and modification as a result of important external and internal factors. The connection between the ideas of "organisational development strategy" and "strategic audit of infrastructure projects and programmes" is established. approved methods for the auditor to evaluate the capacity of a management system for infrastructure projects to respond to uncertainty factors, changes in the external environment, and the degree to which organisational and financial components of the management system are adequate to ensure the achievement of strategic goals.[4]

2.2.5 Responsive Web Page Based on HTML5 and CSS3

Cascading Style Sheets (CSS) is a core W3C standard for creating online applications (CSS) In order to specify the positioning, layout, colour, and typefaces of HTML components, a language called CSS must be used. Separating structure from presentation has been the primary impetus for the adoption of CSS. The CSS code itself is difficult to maintain, despite the fact that this separation of concerns aids in the expansion of a web application in terms of structure and content.

Typical webpages are created for personal computers. Such websites' designs are incompatible with the user interfaces of mobile phones and other mobile devices. Special web pages are typically built in accordance with the display characteristics of the device itself in order to make mobile application devices obtain the optimum display impact. The responsive business created using HTML5 and CSS3 can instantly adjust to different PC resolutions and mobile device sizes, perfectly exemplifying the principles of "one-time design, universal use." Updates are more effective and convenient for developers, which can significantly cut the cost of time and labour. Users may view websites with the same layout and content on PCs, tablets, and mobile phones, providing a better user experience.Cascading Style Sheets (CSS) is one of

the core W3C standards for creating online applications (CSS) The display semantics of HTML components, such as their placement, organisation, colour, and fonts, are defined by the CSS language. The division of structure and presentation has been the primary motivation for the adoption of CSS. Although this division of labour aids in the creation of a web application's structure and content, the CSS code itself is difficult to maintain [5].

2.2.6 User Experience design in web applications

Typical webpages are created for personal computers. Such websites' designs are incompatible with the user interfaces of mobile phones and other mobile devices. Special web pages are typically built in accordance with the display characteristics of the device itself in order to make mobile application devices obtain the optimum display impact. The responsive business created using HTML5 and CSS3 can instantly adjust to different PC resolutions and mobile device sizes, perfectly exemplifying the principles of "one-time design, universal use." Updates are more effective and convenient for developers, which can significantly cut the cost of time and labour. Users may view websites with the same layout and content on PCs, tablets, and mobile phones, providing a better user experience.

The fact that web applications include a wide range of interactive features and functionalities as well as dynamic material sets them apart from websites. The size, structure, and visual design of content supplied using server-driven or thin client architecture vary. Care should be given while creating the user interface to support such extensive content. To efficiently provide content to users, various approaches are available. The emphasis is now on user happiness because of how adaptable and varied the information that may be supplied through web apps. Therefore, the primary goal of such programmes is to create a user experience that maximises user pleasure. In order to develop web apps that are effective, this article examines a few design-related difficulties and makes design recommendations. Due to the increasing automation of products and the integration of machine learning into apps, businesses are placing more emphasis on user experience (UX). Before branding their product and creating a customer experience framework, businesses invest their funds in UX research to ensure that the least amount of resources are used for assistance [6]

2.2.7 Implementation Of Ant Design In React-JS

Ant design is an additional react UI framework . It is acknowledged as being the second most popular UI framework for React. It is well documented and has strong community support. Ant Design established their design values in the official documentation, which enables the designer to choose a better user-friendly design and reduces thinking-related stress. They have a broad component base and offer features like data visualisations in addition to standard buttons. Due to this, Ant has an advantage over competing frameworks and libraries. Other front end frameworks, such as Angular and Vue, can be supported besides React. However, there is a minor problem with the size of the bundle because it is on the heavy side, which may affect those with slow internet speeds. Its ability for different languages will be helpful to developers from nations where English is not their primary language. Furthermore, it includes effective theme modification options.

This essay focuses on the advantages of Ant design frameworks and their significance in the current web development environment. React js and Material UI are used to do this. There are many different frameworks, but Ant design continues to advance in the field of technology, which is constantly evolving for the benefit of the web. The minimal learning curve of Ant Design makes it easy to get started quickly and get results right away. Since April 2015, a large number of Ant Financial products—including numerous business lines and more over eighty applications—have complied with Ant Design standards. utilised by both expert and amateur designers, designed for enterprise-class sophisticated UIs. An abundance of simple-to-use components that may be used to create beautiful user interfaces are available in the Ant Design React UI package.[7]

2.2.8 Analysis of Relational Database Management Systems

These days, databases are employed extensively in the field of information systems. Databases, as opposed to traditional programming languages, allow working with several levels of data. Database usage is increasing, which has made it possible to create dependable and high-quality apps. A database, by definition, is a group of connected data that is kept in a computer's external memory. The database management system is a piece of software that makes it simpler to interact with databases, including defining database structure, retrieving stored data, entering data into the database, and processing data that has already been stored there. Comparing three

relational database management systems (RDBMS) - Oracle 11g, MySQL, and PostgreSQL - based on predefined, straightforward criteria such fundamental data, syntax, data types, and speed performance The comparison of three distinct RDBMSs according to specific criteria is the article's main contribution.[8]

2.2.9 Relational Database Management System Approach for Data Integration

An open source database management system of the highest calibre is PostgreSQL. For flexibility and SQL compliance, it enables relational and non-relational queries in both JSON and SQL. Only pricey commercial databases like Oracle and SQL Server offer extensive data types and performance enhancement tools that PostgreSQL supports. One advantage of PostgreSQL is that it works with many platforms and all popular middleware and programming languages. Many web apps, as well as mobile and analytics applications, use PostgreSQL as their primary database. By integrating a function into the PostgreSQL environment, we introduce a data integration system in this work. The purpose of this work is to gather files from two separate data sources (a platform for physical testing software (PTS) and another for physical simulation software (PSS)) for processing in order to integrate them and obtain particular records via a query. Both of these platforms have a substantial number of files in semi- or unstructured format. With this method, data may be analysed from several sources while a database is being created, always remaining in the PostgreSQL context. [9]

2.2.10 Performance Analysis of PostgreSQL

Transactions with Atomicity, Consistency, Isolation, and Durability (ACID) characteristics, automatically updating views, materialised views, triggers, foreign keys, and stored procedures are all aspects of PostgreSQL. It is made to manage a variety of workloads, including those for single computers, data warehouses, and Web applications with numerous concurrent users. The most significant and well-liked technologies for data durability are Relation Database Management Systems due to the massive amount of data flow. Although proprietary RDBMS systems like Oracle databases are more prevalent, open-source RDBMS systems like PostgreSQL have become extremely popular over time. High-availability database clusters, sometimes referred to as HA clusters or failover clusters, are collections of computers that host server

applications that may be dependably used with little downtime. The outcome demonstrates that cross-containment HAProxy-PgBouncer still outperforms keepalived-repmgr in terms of load balancing, healthcheck, and throughputs, which have increased from 0.346 percent to 9.454 percent. Additionally, we'd like to compare the CPU and I/O activity across the two types of PostgreSQL HA clusters.[10].

Chapter 3

Methodology

Audit Lens UK government software called Audit Lens helps auditees better comprehend audits. Using bar graphs and percentages, it shows how each question part is progressing. By bypassing the typical Excel sheet appraisal, it saves time for the user and also allows for the monitoring of the auditor's performance. As a result of the information provided about the auditors and their progress, the auditee can select the best one and assign them to work on subsequent projects. Users are the auditee, auditors, and admins are the matching government officials assigned by the UK government and the system administrators. We have a dashboard in audit lens that provides details about the monthly audit, such as the number of audits that have already been finished, are still in the pipeline, and have not yet begun. A page dedicated to audits, which provided details on numerous organisations and companies planning audits. The user can tackle the questions on the survey page and provide answers that are based on a variety of sections, or levels, as we might say. Next, there is a section called "To Do List" that includes details like the number of tasks allocated to auditors and the number of significant items that were audited.

3.1 Module Description

3.1.1 Super Admin Module

- A Super Admin is a user with full access to all system objects, directories, role templates, and groups.
- A super admin has the authority to create other super administrators and Admin.

- A Super Administrator has complete administrative control.

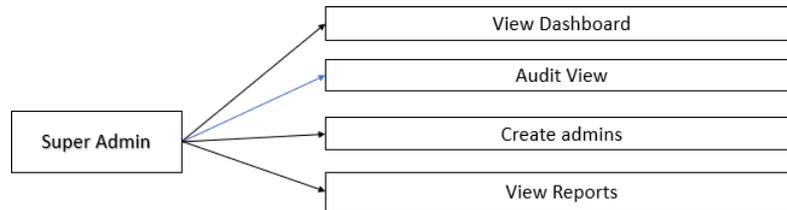


Figure 3.1: Super Admin Module

3.1.2 Admin Module

- A super admin is the only one who can assign an admin.
- An admin is only permitted to oversee users under the agreements that the super admin has given them.
- Admins have the ability to create, modify, and delete user roles.
- Admins have access to user profiles
- Admin declares the audit type.
- Admin is the only person who can create templates.
- Admin can add todo task either to auditee or auditor

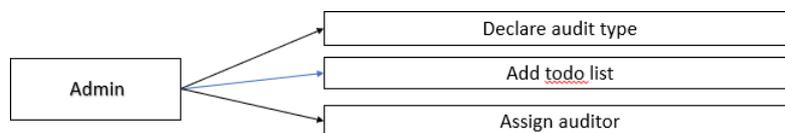


Figure 3.2: Admin Module

3.1.3 Auditee Module

The application's user is the auditee.

- Auditee gives the administrator the excel spreadsheet.

- The auditee may choose the auditor
- Auditee can see how things are going

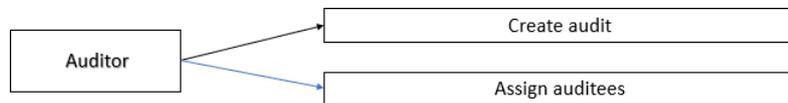


Figure 3.3: Auditee Module

3.1.4 Auditor Module

- compiling, verifying, and analysing data from spreadsheets
- determining the financial risk levels in organisations
- Verifying the dependability and accuracy of financial data and reports
- creating financial statements, reports, and commentary

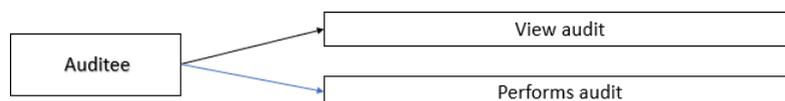


Figure 3.4: Auditor Module

3.2 System Specifications

The application development architecture recognized for this project is specified in this section on the basis of requirements.

3.2.1 Software Specification

- Programming Language : Python

- Designing tools : React Js
- Web server : Apache
- Web Browser : Any web browser
- Database : PostgreSQL
- Backend: Python FastAPI

3.2.2 Hardware Specification

- Processor: 64-bit, four-core, 2.5 GHz minimum per core
- RAM: 24 GB for developer and evaluation use

3.2.3 Software Description

- **Python**

Python is a general-purpose, high-level programming language that is interpreted. Code readability is a priority in its design philosophy, which uses substantial indentation. Both Python's types and trash collection are dynamic. It supports a variety of paradigms for programming, such as structured (especially procedural), object-oriented, and functional programming. Considering its extensive standard library, it is frequently called a "batteries included" language. Python was created by Guido van Rossum in the late 1980s to replace the ABC programming language, and it was originally made available as Python 0.9.0 in 1991. New features like list comprehensions, cycle-detecting garbage collection, reference counting, and support for Unicode were added to Python 2.0, which was published in 2000. The 2008 release of Python 3.0 was a significant update that is not entirely backwards compatible with previous iterations. With version 2.7.18, Python 2 was abandoned in 2020. Python is a good choice because:

- Compatibility
- Readability
- Maintainability

- Interactive
- Robust and Standard library
- **FAST API**

With Python 3.6+ and based on typical Python type hints, FastAPI is a cutting-edge, quick (high-performance), online framework for developing APIs.

Features:

- Fast: Exceptionally fast performance, comparable to NodeJS and Go. of the quickest Python frameworks on the market.
 - Fast to code: Increase the speed to develop features by about 200 percent to 300 percent.
 - Fewer bugs: less bugs Errors caused by humans (developers) should be reduced by roughly 40
 - Intelligent: Excellent editor support. everywhere the completion. less time spent debugging.
 - Simple: Created to be simple to use and to learn. reading documents will take less time. Reduce code duplication, in brief. features out of each parameter declaration in multiples. less insects.
 - Robust: Get code that is strong enough for production. accompanied by automatic interactive documentation.
 - Standards-based: based on the open API standards and completely compatible with them: JSON Schema and the OpenAPI
- **React JS**

React, sometimes referred to as React.js or ReactJS, is a front-end JavaScript toolkit that is free and open-source[3] for creating user interfaces based on UI components. It is supported by Meta (formerly Facebook) and a group of independent developers and businesses. With frameworks like Next.js, single-page, mobile, or server-rendered applications can be built using React as a base. However, because React primarily cares about managing state and rendering it to the DOM, developing React apps typically

necessitates the usage of other libraries for routing as well as specific client-side functionality.

- **JSX:** JavaScript XML is referred to as JSX. It is an addition to the JavaScript syntax. It is a syntax used by ReactJS that resembles XML or HTML. This syntax is converted into calls for the React Framework in JavaScript. It expands ES6 to let JavaScript react code and text that looks like HTML to coexist. Although it is not required, using JSX with ReactJS is advised.
- **Components:** Components are the core of ReactJS. Each of the various components that make up a ReactJS application has its own logic and controls. When working on more complex projects, these reusable components make it easier to maintain the code.
- **One-way Data Binding:** One-way data binding, often known as unidirectional data flow, is a design principle used in the creation of ReactJS. The benefits of one-way data binding provide you greater control over the whole application. More features are required if the flow of data is the other way around. This ensures that the components' data, which is intended to be irreversible, cannot be changed. Your data's unidirectionality is maintained via a pattern known as flux. As a result, the application is more flexible, which improves efficiency.
- **Virtual DOM:** A virtual Doc object is a representation of the actual DOM object. It performs similarly to one-way data binding. The whole user interface is rebuilt using a virtual DOM model each time a modification is performed to the web application. Next, it is determined if there is a difference here between old and new DOM representations. After that, only items that have genuinely changed will be updated by the real DOM. The programme runs faster as a result, and memory waste is avoided.
- **Simplicity:** ReactJS uses JSX files to simplify the application and make it easier to comprehend and code. We are aware that ReactJS uses a component-based approach, allowing you to reuse the code as needed. This makes using and learning it straightforward.
- **Performance:** ReactJS is renowned for being a powerful performer. This feature makes it significantly superior to other frameworks currently in use. This is due to the fact that

it controls a virtual DOM. HTML, XML, and XHTML are all dealt with via the cross-platform DOM programming API. The DOM is a memory-only structure. We did not write directly to the DOM while creating a component as a result. Instead, we're creating virtual components that will be converted into the DOM, which will result in a smoother and quicker performance.

PostgreSQL

The robust, free PostgreSQL object-relational database system combines the SQL language with a number of capabilities to reliably store and scale even the most challenging data demands. PostgreSQL has been actively developed on the core platform for more than 30 years and has its roots in the University of California, Berkeley's POSTGRES project from 1986.

Because of its well-proven architecture, dependability, data integrity, extensive feature set, extensibility, and the commitment of the open source community behind the software to continually delivering performant and cutting-edge solutions, PostgreSQL has established a solid reputation. Since 2001, PostgreSQL has been ACID-compliant and is compatible with all popular operating systems. It also features robust add-ons like the well-liked PostGIS geographical database extender. The database management system is outdated. PostgreSQL may be integrated with any programming language, including Java, C, and C++. We are able to define our own special functions thanks to this capability. The Postgre structured query language contains many components that are also present in other databases. This database is quite old. Therefore, we can see that troubleshooting using this database is simple. The PostgreSQL community is very large. The work is flexible. Along with primitive data types, it supports user-defined ones. Primitive refers to a person who was born along with the language. One system that uses multi-version concurrency management is the Postgre Structured Query Language (MVCC). PostgreSQL has its own commands, much like any other language. Typically, distinct projects receive their own database server. It is not surprising that many individuals and organisations now favour PostgreSQL as their open source relational database of choice.

3.3 System Design

The phase of system design efficiently bridges the chasm between the issue area and the existing system. The solution area—more precisely, "how to implement? During this stage, the SRS documentation is converted it in to an effective implementation format that also establishes how the will operate. During this stage, the intricate task of system development is broken down into a number of more manageable sub-activities that work in concert to accomplish the overall goal of system development. A good design is one that enables the production of efficient code and whose implementation is as compact as possible, depending on the applications and project needs.

There are two levels of system design:

- Logical design
- Physical design

An abstract illustration of the system's inputs, outputs, and data flow is referred to as logical design. It provides a format that satisfies the needs of the user when describing inputs (sources), outputs (destinations), databases (data storage), and processes (data flows). For a corporate database to be implemented successfully, logical design is essential. The methods of data collecting, storage, and protection may need to be changed later at a significant expense due to a defective or incomplete logical design. An effective preliminary design will make it simple to develop and evaluate a database. Therefore, a good logical design contributes to successful execution. The system analyst specifies the user requirements at a degree of detail that essentially dictates the information flow into and out of the system as well as the necessary data sources when creating the logical design of a system.

When developing a system's logical design, the system analyst specifies the user needs to such a level of specificity that it effectively determines how information enters and leaves the system as well as the necessary data sources. Diagrams of the data flow are used, as well as E-R diagram modelling.

- Specifying the input/output media, designing the database, and specifying backup procedures.
- Planning system implementation.

- Devising a test and implementation plan, and specifying any new hardware and software.
- Updating costs, benefits, conversion dates, and system constraints.
- **Design Concept**

The design concepts provide the software designer with a foundation from which more sophisticated methods can be applied. A set of fundamental design concepts has evolved. Major Activities Carried out during Design Phase includes the following:

– Logical Design

The inputs, outputs, and data flow of the system are all abstractly represented in logical design. It provides information on the databases (data stores), procedures (data flows), inputs (sources), outputs (destinations), and all of these in a way that satisfies user needs. The system analyst specifies the user requirements in such depth while creating a system's logical architecture that it practically determines how information enters and leaves the system as well as the sources of data that are needed. It uses E-R diagram modelling and data flow diagrams.

– UML Diagrams

The elements are comparable to components that can be connected in various ways to form a complete UML diagram, or picture. Therefore, it is crucial to comprehend the various diagrams in order to apply the information in systems that are used in real life. The best way to comprehend any complex system is to create some type of diagram or image. These illustrations have a stronger effect on our comprehension. If we take a closer look, we will see that the use of diagrams is widespread and takes many different shapes across a variety of industries.

– Architectural Design

The concentration on system architecture design is also referred to as high level design. It provides an explanation of the system's behaviour and structure. It outlines the hierarchy and connections between the various system development process modules.

– Database Design

A general definition of database design is a group of activities or procedures that improve the planning, creation, implementation, and upkeep of an enterprise data

management system. A good database design improves data consistency while lowering maintenance costs. It also has a significant impact on cost-effective measures in terms of disc storage. The creation of physical and logical design models of the suggested database system is the primary goal of database designing.

– User Interface Design

The front-end application view known as the user interface is where a user interacts with the software to use it. Through the use of a user interface, users can alter and control both software and hardware. The user interface is a component of software and is created with the expectation that it will give the user knowledge of the product. Human-computer interaction has a fundamental platform thanks to UI. The underlying hardware and software configuration will determine whether the UI is graphical, text-based, or audio-video based. UI might be software, hardware, or a combination of the two.

– Input Design

These are the inputs that system design uses

- * Proposed system requirements
- * comprising a conceptual model
- * modified DFDs, and metadata, include a statement of work
- * a requirement determination strategy
- * an analysis of the current situation

– Output Design

System design gives the following outputs

- * Infrastructure and organizational changes for the proposed system.
- * A data schema, often a relational schema.
- * Metadata to define the tables/files and columns/data-items
- * A function hierarchy diagram or web page map that graphically describes the program structure.
- * Actual or pseudocode for each module in the program.
- * A prototype for the proposed system

3.4 System Design Model

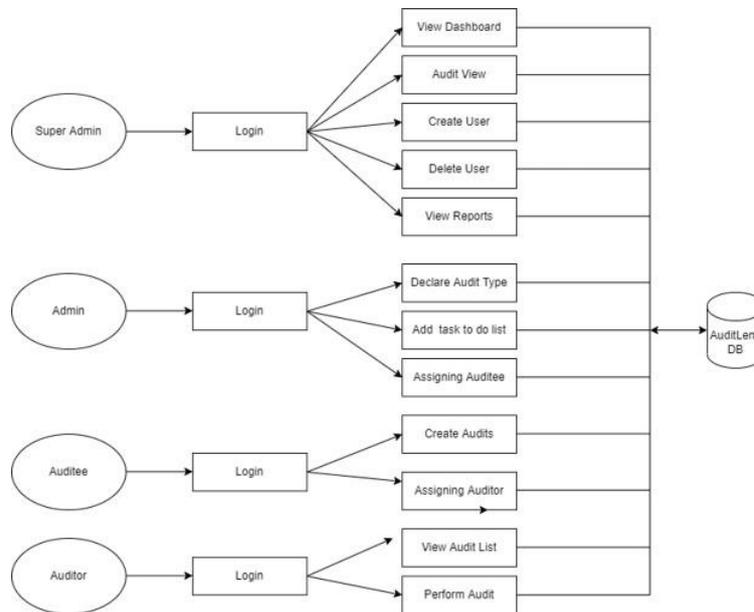


Figure 3.5: Workflow

3.5 Component level Design

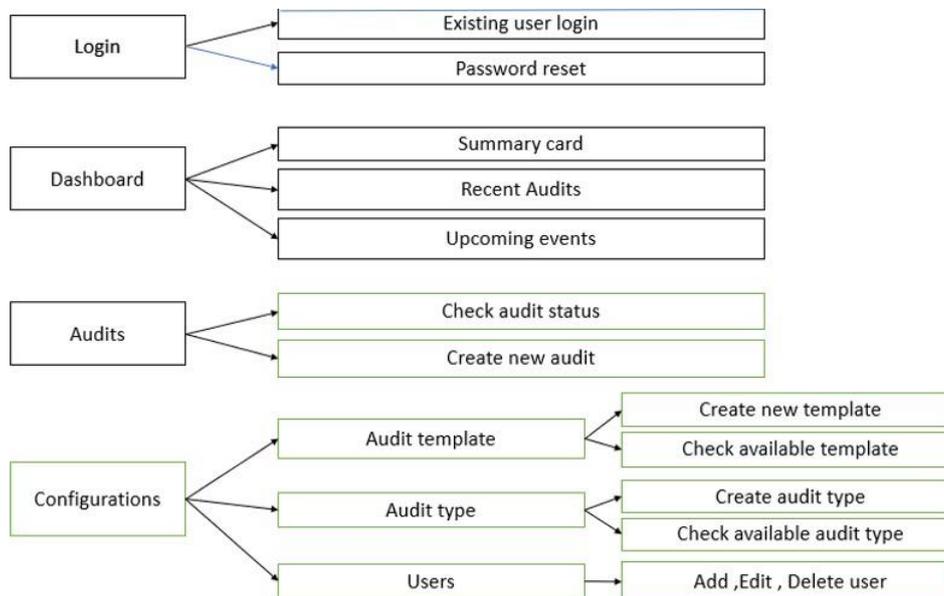


Figure 3.6: Component level Design

Chapter 4

RESULT AND DISCUSSION

Application testing is a technique for determining if the actual software application complies with expectations and is error-free. It entails the use of manual or automation devices to execute the system or software components in order to review one or more properties of interest. In contrast to real requirements, the goal of software testing is to find flaws, gaps, or missing requirements. The main objective is to ensure quality. Testing is done, and the outcomes are compared to the anticipated document. Debugging is carried out when results are inaccurate. The dependability, privacy, and high performance of tested software products further contribute to time and money savings as well as customer pleasure. The creation of a churn forecasting model is the primary objective of this project phase. Experts often train a large number of models, adjust, assess, then test them to determine which one accurately identifies probable churners on training data. To test customer behavior prediction, the following test methodologies are employed:

4.1 Testing methods

There are different types of testing methods available. In this project we used following methods

4.1.1 4.1.1 Manual Testing

One of the most essential testing techniques is manual testing since it can identify both obvious and subtle software flaws. A fault is defined as the discrepancy between the output that was anticipated and the output that the software produced. Every freshly developed piece of software must undergo manual testing first. Although it takes a lot of time and work, this

testing ensures that the programme is bug-free. However, knowledge of any automated testing technology is not necessary for manual testing.

As we were creating it, we repaired the flaws and gave it to the tester to retest. According to the viewpoint of the end user, the tester manually completed all test cases. It confirms whether or not the application functions as specified in the requirement document. Planning and execution of test cases allows for nearly complete software application completion. Additionally, manual reports for test cases were produced.

4.1.2 Integration Testing

Integration testing, sometimes referred to as string testing or thread testing, entails merging the individual modules of an application before assessing how they behave as a single, integrated entity. It is crucial to check that the various parts are functioning effectively and appropriately interacting with one another after integration. The software application's interface is tested during integration testing. The test's findings were encouraging. Before being merged to create a system, the various components are tested separately first. Integration testing examines how the interfaces of the little pieces or modules work. It is typically carried out in conjunction with development by a software integration tester. There is a standard for system development, and all developers adhere to it.

4.2 Test plan

A test plan is a methodical way to evaluate a system. A thorough understanding of the ultimate workflow is often included in the strategy. Any substantial system will typically undergo two phases of testing.

- Verifying and validating functionality in accordance with the required specification
- Evaluation of performance in relation to the specified requirements.

4.3 Test cases

A series of procedures known as a test case is used to verify a certain functionality or way of working of your software programme. To verify any requirement, a test case is utilised. It

contains test procedures, diagnostic tests, pre- and post-conditions. If a software programme is meeting the demands of the client, it may be assessed by a testing engineer by comparing expected and actual outcomes.

4.3.1 Formal Test Case

With these kinds of test cases, the tester creates a test in which the inputs, for example the pre-conditions and test data, are all known and specifically described. Formal tests use specified input, which means that the inputs deliver an anticipated output that the test then tries to verify. We got the predicted results as a result of that.

4.3.2 Informal Test Case

Informal test cases, on the other hand, lack known inputs and outputs. These kinds of test cases are carried out by testers to learn and record the results, which can provide intriguing conclusions about digital quality. We got the predicted results as a result of that.

4.3.3 Functionality Test Case

These evaluations show if the system's target feature accomplishes its task successfully or not. These test cases are created by the QA team using requirements, and they are then executed once the development team has completed the task. Unit tests, which examine the tiniest, most isolated functional units, are just one sort of functional test that can verify an app's functioning. Functional test cases ought to contain::

- a description of the function being tested and/or its name.
- prerequisites
- procedures for testing
- a predicted outcome

4.3.4 UI Test Case

These tests show the user interface—the part of the system the end user encounters with—works as intended. UI tests typically concentrate on the visual components of an app or website

to ensure they work and behave as expected. UI tests frequently check the legibility and consistency of display elements such as menus, sub-menus, buttons, tables, and columns. UIs are constantly changing. This is why performing UI testing may also involve verifying a speech or video interface. Accessibility issues, such as determining whether a client application can recognise a button on a page, should be tested as part of UI tests. Results were as anticipated.

4.3.5 Integration Test Case

These tests examine how the bundled functionality functions after being incorporated into the application. As vital as it is to test individual software modules, it's also crucial to ensure that various systems can properly communicate with one another. To create successful integration tests, the tester needs a solid understanding of the application flows. One component of integration testing is API testing. Applications in today's mobile-centric world interact with one another via APIs, especially as products become more interconnected. Integrative test cases must include API testing as a critical exercise.

4.3.6 Performance Test Case

If an application is functional, it has passed functional testing. Performance testing and other non-functional tests look at how the application performs under various workload circumstances. So that the tester can reliably evaluate how the system operates under the specified circumstances, a testing procedure must be detailed, with each step and intended outcome being recorded, in addition to the input data being explicitly stated. Each every test and each performance testing type gives distinct details concerning how the system reacts to varying application loads. We got the predicted results as a result of that.

4.3.7 Security Test Case

These examinations reveal weaknesses in a network or item. Security tests are a different kind of nonfunctional testing that look for ways to safeguard software assets more effectively. They also determine how well the system stands up to typical forms of attacks and quantify the risk involved with the product. Penetration testing, also known as invasive testing, configuration scanning, and vulnerability scanning are a few examples of security tests. The ultimate goal of security screening is to produce useful information that the company may utilise to address

vulnerabilities. We upheld the user-provided security, including authentication and integrity, through these test cases.

4.3.8 Usability Test Case

Usability studies look at the opinions of potential end users, not testers, as opposed to testing the functionality or performance of an application. UX researchers set up tests for users outside the company to determine how simple or complex the item is to use. Organizations can test usability in a number of ways, including remotely or in-person, moderated or unmoderated. The objective is to leverage an end user's perspective to pinpoint features of the application that would make users cease using them. Depending on the objective and approach of UX research, viability tests can be formalized or informal.

4.3.9 Database Test Case

The capabilities, user interaction, and APIs of an app do not automatically imply also that data is being stored correctly. Database tests confirm that application data is kept up to date in accordance with policies and requirements. Its scope can vary, much like functionality tests, from straightforward operations that involve just one application component to complex actions involving several programme components. Database tests may assess factors such as how securely the data is maintained, whether it is accessible to unauthorised parties, and whether it is stored consistently. Database tests assist in achieving this goal because reliable and secure data ought to be top priority for every firm, regardless of the compliance criteria of the sector. Thus, all user data is preserved safely and checked.

4.3.10 User Acceptance Test Case

These test cases validate the products from the viewpoint of the final consumer. An end user or customer conducts acceptance testing checks in a testing environment to confirm the product's end-to-end flow. When business needs change while a project is being developed, user acceptance testing can be useful. Stakeholders frequently fail to appropriately inform the development team of these changes. The organisation can record entrance and exit criteria that fill in the gaps in earlier testing through UAT test cases. The test's findings were encouraging.

4.4 Validation

The purpose of validation is to ascertain whether the system conforms with the specifications, carries out the tasks for which it was designed, and satisfies the demands of both the company and the users. Verification is finished before validation, which happens at the end of the development phase. It provides an answer to queries like, "Am I creating the proper product?" It is an activity of a high level. performed to make sure a work product integrates properly with the environment after it is generated based on predetermined criteria. a development project's assessment of the final software product's conformity to user needs and requirements.

If any errors are ignored during verification, the validation process may reveal them as failures. If during verification any specification is misinterpreted and development has occurred, the gap between the real outcome and the intended result could be comprehended all across the verification process when running that capability. Validation assists in developing the finest product to satisfy client requests and specifications.

4.5 Output Screens and Results

1. Login page:

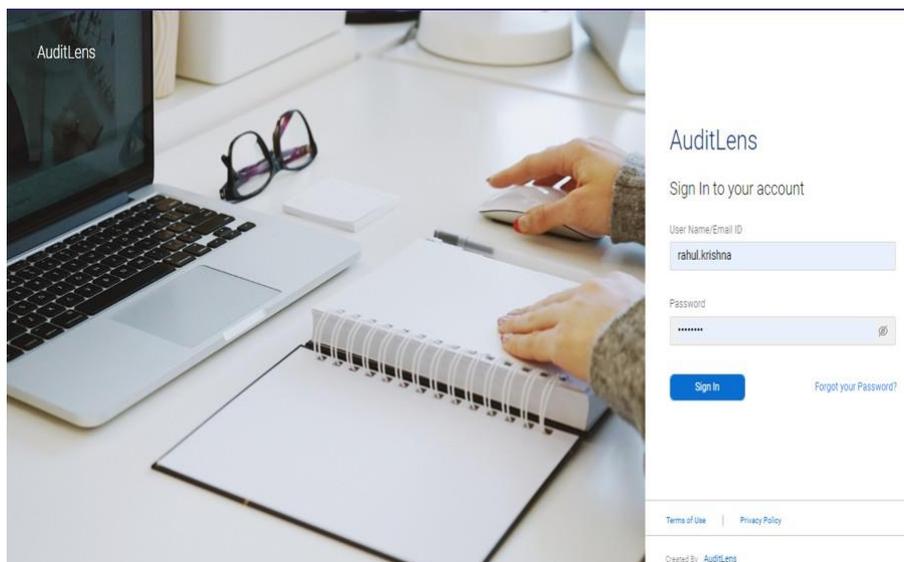


Figure 4.1: Login Page

2. Landing page

Landing page is divided into Two parts:

- Dashboard
- Audits

Both this contains progress of each audit with auditor details

Sl. No.	Audit Name	Company	Audit Type	Auditor(s)	Description	Created on	Created by	Status
1	Software Lifecycle	L&T	Environmental	[Avatar]		09/05/2022	James	In Progress
2	Software Development	Pfizer	CO2	[Avatar]		09/05/2022	James	On Hold
3	Software Module Design	Bosch	Environmental	[Avatar]		09/05/2022	Max	Completed
4	Software Module Test Log	Bosch	ESG	[Avatar]		09/05/2022	Billy	Completed
5	Software Development Log	Rockwell	ISO 14001	[Avatar]		09/05/2022	James	In Progress
6	Software Module	Wipro	MCERTS	[Avatar]		09/05/2022	Martin	On Hold
7	Software Module Test Log	Wipro	ISO 27001	[Avatar]		09/05/2022	Heinz	In Progress
8	Software Development	Wipro	MCERTS	[Avatar]		09/05/2022	Rose	Not Started

Figure 4.2: Dashboard

3. Template creation Page

- Chose the Excel file which you want to upload
- Once the Excel is uploaded the system will check for the validation
- Once it is uploaded and validated it will show the number of Parts, Section and Question with respect to that Template

← Add Template

1 Upload File 2 Validation 3 Review & Update 4 Rules 5 Submit

Template Name:

Audit type:

Version:

Description:

Attachment: Upload only excel

Click or drag file to this area to upload file

Figure 4.3: Template creation

4. User Creation Page

- App admins have the access to create user
- User must give basic details of the new user and will show a popup User created Successfully

The screenshot shows a web interface for adding a new user. On the left, there is a sidebar menu with options: 'Audit Template', 'Audit Types', and 'Users'. The 'Users' option is selected. The main area contains a form with the following fields:

- First Name: Sanju
- Last Name: Jayachandran
- Email: sanju@kl.com
- User Name: sanjuj
- Phone Number: 7012227850
- User Role: Auditor (dropdown menu)
- Country: India
- State: Karnataka
- City: Banglore
- Zip Code: 123456
- Password: [masked]

 At the bottom left of the form, there are 'Save' and 'Cancel' buttons.

Figure 4.4: User Creation

5. Audit type declaration Page

- Enter basic details of the Audit type (Audit Type, Publication Date, Version, Description)
- Successfully added audit type which will result in pop up
- List of types will be displayed

The screenshot shows a web interface for adding a new audit type. On the left, there is a sidebar menu with options: 'Audit Template', 'Audit Types', and 'Users'. The 'Audit Types' option is selected. The main area contains a form with the following fields:

- Audit Type: Enter Audit Type
- Publication Date: Select Publication Date
- Version: Enter vers...
- Description: Enter Description

 At the bottom left of the form, there are 'Save' and 'Cancel' buttons.

Figure 4.5: Audit type declaration

6. Create Task to Auditee/Auditor Page

- From action “assign to” the Auditor can select the auditee and auditors whom he wants to assigns the task

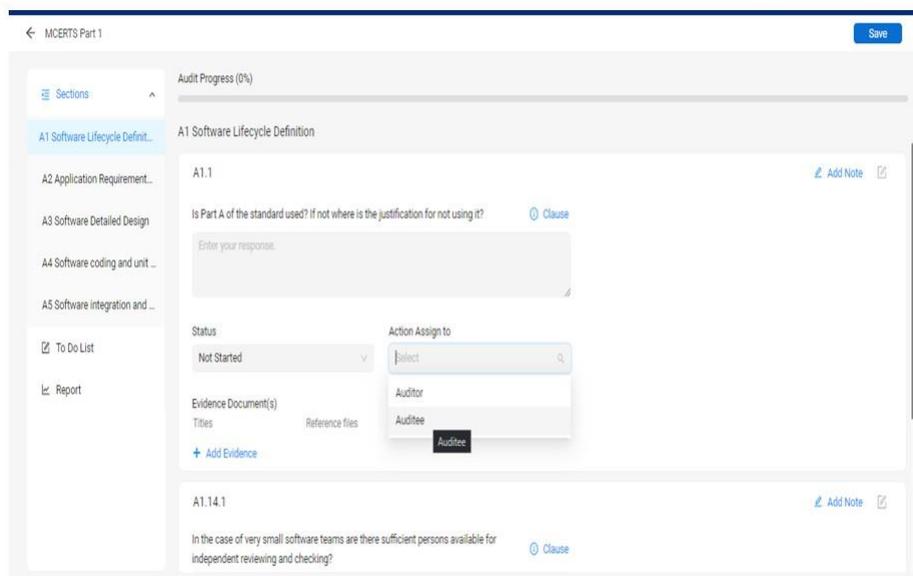


Figure 4.6: Todo task

7. Audit Report Page

- The auditor has the access to See and Download the Progress report of that part Of that audit

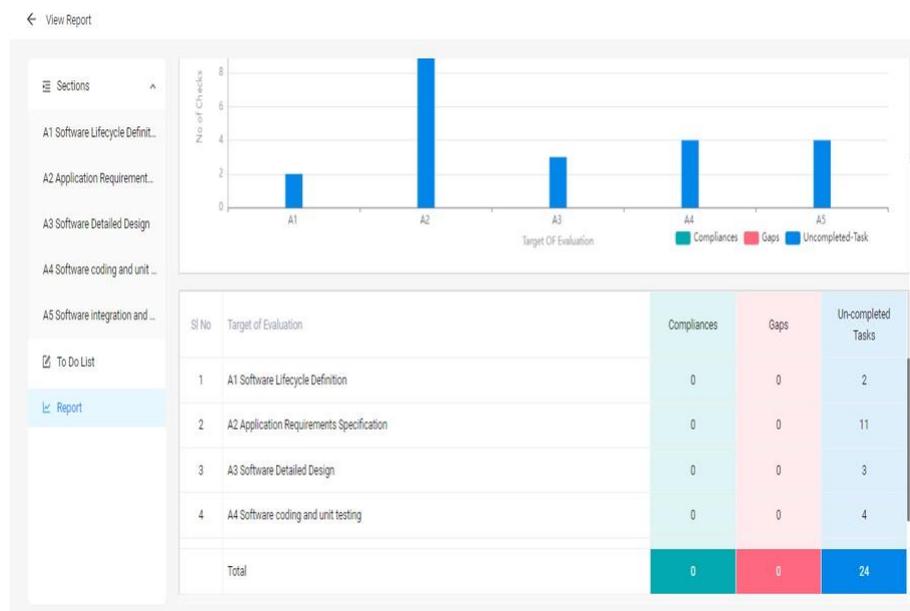


Figure 4.7: Audit Report

Compliances -Will be the count of completed questions

Gasp – Will be the count of Partially completed question

Un-Completed task – Will be the count of quest which is not started

Chapter 5

CONCLUSION

The initiative aims to reduce user effort required to track auditing progress. A thorough study has been created to satisfy user needs in a way that is user-friendly and simple to use. This particular system has been created in an appealing way so that even a person with very little experience might utilise it. Since this system employs cutting-edge real-time high-tech methods, it can be used anywhere in the world. Organizations can utilise this technique to find the best auditor out of the ones already in place.

Since it includes a section-by-section progress bar, the auditee can designate more auditors to expedite the auditing process as needed. Large organisations can benefit from it, and it is faster than a manual procedure because it requires less time. It is quite trustworthy and produces effective financial reports, which are crucial for government concerns. There is proper database administration even though databases are managed manually maybe sometimes inaccurate and can even be misplaced, which could pose serious problems in the near future.

5.1 Future Enhancement

The system is constructed so that adding additional modules can always be done with little difficulty. The system's adaptability will be improved by the reconstruction. Keeping in mind the cutting-edge capabilities of this technology, In order to be as flexible and user-friendly as possible, the system has been developed.

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APPENDIX

Screenshots

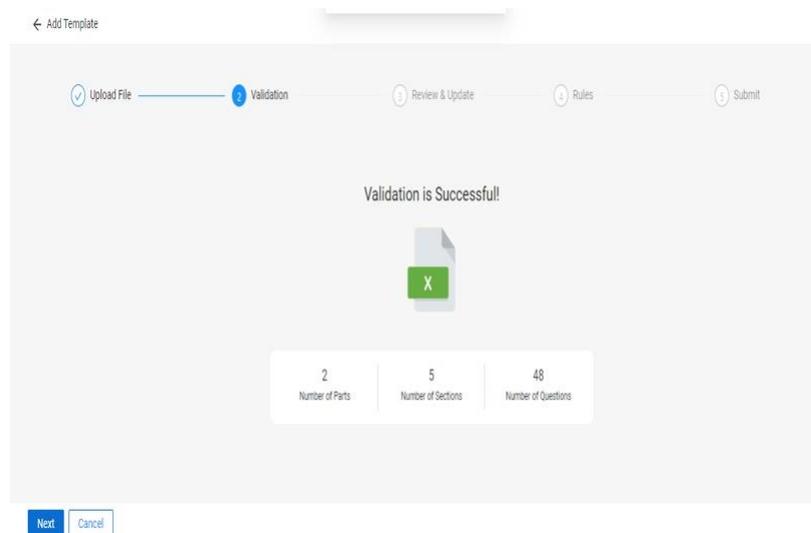


Figure A.1: Validation Page for excel page upload

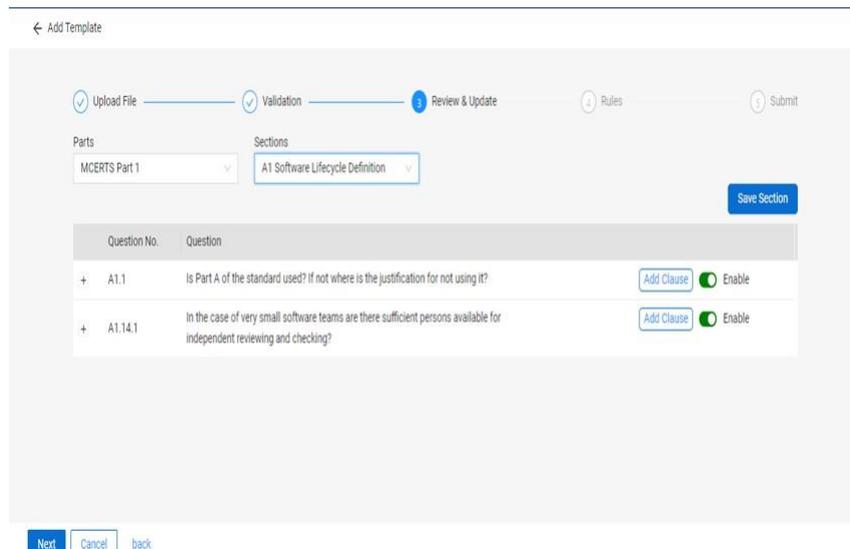


Figure A.2: Section wise questions for Template

A user registration form with the following fields:

- First Name: Enter First Name
- Last Name: Enter the last Name
- Email: Enter Email
- User Name: Enter User Name
- Phone Number: Enter phone number
- User Role: Select (dropdown menu)
- Country: Enter
- State: Enter
- City: Enter
- Zip Code: Enter the Zip Code
- Password: Enter Password (with a strength indicator icon)

Figure A.3: Dashboard Daily Resource Usage

Audit Template

Search Add Template

Sl No	Template Name	Audit Type	Description	Uploaded on	Uploaded by	
1	Excel Audit Template	ISO 140008	Excel Audit Template Description	15/07/2022	admin	

Figure A.4: List of Audit template

Users

Search Add User

User ID	User Role	First Name	Last Name	Email	Phone Number	
1	Super Admin	admin		test@123	41243412	
3	App Admin	Prithi	Shankar	prithi@kl.com	7812345671	
2	Auditor	Sanju	Jayachandran	sj@kl.com	7012227850	
5	Auditee	Jaya	Krishna	jk@gmail.com	7012226548	
4	Auditee	Liju	Samuel	lj@kl.com	6783451232	

Figure A.5: List of users

← To do List

Assigned to Auditors Sort ↓

Parts of Audits	Section Name	Question No	Assigned to	Assigned by	Priority	Due Date	Status
MCERTS Part 1	A1 Software Lifecycle Definition	A1.1	Prithi Shankar	Prithi Shankar	High Priority	07/19/2022	Closed
★ MCERTS Part 1	A1 Software Lifecycle Definition	A1.1	Prithi Shankar	Prithi Shankar	High Priority	07/28/2022	Open
★ MCERTS Part 1	A3 Software Detailed Design	A3.1	Prithi Shankar	Prithi Shankar	High Priority	07/30/2022	Open

Figure A.6: Assigned task to auditor listing

← To do List

- All Tasks
- Important
- Assigned to Me
- Assigned by Me
- Assigned to Auditee**
- Assigned to Auditors
- Completed Tasks

Assigned to Auditee Sort ↓

Parts of Audits	Section Name	Question No	Assigned to	Assigned by	Priority	Due Date	Status
MCERTS Part 1	A1 Software Lifecycle Definition	A1.1	Jaya Krishna	Priti Shankar	Low Priority	07/22/2022	Open
MCERTS Part 1	A1 Software Lifecycle Definition	A1.14.1	Jaya Krishna	Priti Shankar	Low Priority	07/20/2022	Open

A1 Software Lifecycle Definition

Figure A.7: Assigned task to auditee listing