

Human Resource and Workflow Tracking System

¹Dr. Kiran Kumar Pulamolu, ²A S S M Pravallika, ³G. Vijaya Lakshmi

Sasi Institute of Technology & Engineering, Tadepalligudem, Andhra Pradesh, India – 534101

kiran@sasi.ac.in , pravallika@sasi.ac.in, vijayalakshmi@sasi.ac.in

Abstract—

In the IT industry, Project management is one of the critical parts. The project management aims at designing an application that helps an organization in handling the day-to-day activities of their employees such as task management, subtask handling, invoices as well as payroll generation etc. Many tools and software are available to effectively manage the projects. But these tools are specific to a particular purpose. Usage of different tools always leads to ambiguity during the monitoring of work progress and payroll management. It evaluates the features of an applicant tracking system but did not specify the required features and characteristics of employee management service. The existing system focuses solely on employee attendance but not on wiki and Task Management. The proposed system contains the complete implementation of the Employee Management System, which includes Authentication, Task Management, Employee Management, and Wiki. The end system will provide a facility to maintain Tasks and history performed by the employee during the whole month and will help us in calculating the salary based on his working hours and the number of days he worked. This helps the company in maintaining all the required data corresponding to employees. It will allow management to accurately track each employee's work hours by extracting the number of hours from the payroll database. This project aims at designing an application that helps the organization in handling their employees.

Keywords: Human Resource, Employee Management, Task Management, Tracking system, Authentication

I. Introduction

Website experts are essential for companies looking to build a strong online presence, such as with the Employee Management Service. To ensure a market-leading website, they collaborate closely with their client's internal team, sharing their expertise to foresee and prevent problems before they arise. To fill the gap in a company's in-house expertise, web marketing consultants are recruited. To accomplish these tasks, they rely on their knowledge and experience, which they put to good use in formulating strategies, organising projects, collecting data, writing analyses, and making suggestions. Experts in this field work with clients to assist them enhance brand awareness, gain more visibility, improve their search engine results, and increase their conversion rates. A wide range of businesses and industries can benefit from web consulting services. In order to have the best possible online presence, companies who are just getting started, those that are expanding, and those without an in-house web specialist should hire a web consultant. Many firms fail in today's digital market because of the fierce competition. This is due to a lack of marketing and appealing web design, as well as a superficial understanding of one's target. As a result, in order to succeed in the internet world, every firm requires a strategic partner who can offer valuable insight and advice.

In order to replace email as a means of communication and collaboration at work, the Employee Management System was developed. All work decisions and tasks were handled via email prior to the widespread adoption of project management systems. After setting up your project, the next step is to add tasks to it. A task is Employee Management's most granular component. It's important to note that a task contains a name, description, and deadline. It is possible to assign a job to a team member in order to keep an eye on their progress. Remote workers and others who operate from home can benefit greatly from using tasks to track their productivity. There must be a network in place that allows all employees, including those who work from home or anywhere in the world, to access the same data source and the same information. Consequently, this system is built to take advantage of current technology via the Internet. Database and webservers will be maintained by the main office in order to allow anyone with an Internet connection to access the database from anywhere in the world. A printer and fax machine aren't necessary for employees to be able to submit their time in this manner. A consultant's knowledge of the newest trends and advancements in their sector can help firms stay ahead of the curve and get the most out of new approaches and models, as they deal with a variety of clients. Thus, consultants can help their customers with immediate decision-making but also help develop a long-term structure that could lead to an increase in productivity and performance, and thus a quantifiable return on investment, in the long run,

They may agree to things just to impress their superiors, rather than because they are logical. On the other side, consultants offer a fresh viewpoint that could lead to a major shift in the way your company operates. An independent and impartial consultant is always able to focus solely on the agreed-upon goal/plan with their client, as they have no personal tie to the organisation and hence have no internal distractions. To-do lists aren't the only way to keep track of a task manager's progress. We understand that you and your team are constantly juggling a variety of projects. We could go on and on about what we have to do in terms of projects, HR, social media, and billing. In a recent survey by Click Up, 42 percent of employed Americans believe they lack the technology and skills they need to excel at work! Half of those

surveyed (45%) would be willing to give up 10% of their wage in order to have a better work environment. Managing your team and staying on top of every project job is impossible without a specialised tool. Fortunately, task management software is designed to prevent this from happening! You can use it to keep tabs on the status of your projects, delegate work, and keep track of deadlines. In order to fulfil your deadlines, it ensures that you can easily track tasks and subtasks. Using a task management application will help your team collaborate more effectively, whether you're in the office or working remotely. It's easier for your team to work together and consolidate information when each task has its own designated area. This work space is accessible to all assignees, so no one will be left in the dark. If you want to work together on a project and get things done quickly, your team may effortlessly share files, ideas, and feedback with one another. There is no such thing as a perfect job. Some tasks are more critical than others, and must be dealt with first. Then, how about you? You begin arranging your to-do list in order of importance. To put it another way, finishing a client's job is arguably more important than selecting what the theme of your company party should be. Task management software can help you prioritise your workload and focus on the most urgent matters first. When it comes to finishing jobs, setting priorities is a helpful tool. As long as you use a simple color-coding scheme, your team will have no problem prioritising and de-prioritizing work. It is the fundamental purpose of any firm to help customers and create revenue at the same time.

While designing and developing this system, significant reading was done to learn as much as possible about internet technology and related security challenges. Concerns about the security of an internet application occupied a large portion of the discussion. The security of a personal website may not be a major concern for an individual. A company, on the other hand, is concerned about the security of providing its employees or customers with internet access to mission-critical data. When it comes to putting information online, companies need to be extremely cautious. The data becomes inaccessible to the target user group if their security rules are too strict. Unauthorized users will be able to acquire access to more data if security rules are insufficient. An Internet site's hosting system must be properly structured so that the appropriate level of access to the relevant people can be provided to them in the most transparent manner possible. There are numerous typical security hazards that any system is subject to because of human error or a lack of attention. The system administrator is the first line of defence when it comes to security. System administrators who are sluggish or inexperienced may fail to deploy certain security measures. There may be a false impression of security for an administrator due to these conditions because of their intricacy, but in fact a skilled hacker could exploit these weaknesses mercilessly[1]. It is the obligation of another employee to obtain a password once the required security measures have been implemented to ensure system integrity. The name of a pet, a child's name, or even a phone number can be used as a password by many people. Using passwords like this can be compromised by anyone who knows the person, such as a coworker. Employees, on the other hand, will be sluggish and leave their workstations unattended. They are opening the door to anyone who happens to walk by. Hackers from the inside will be able to access the system most simply.

System analysis is essential for this project's success. An awareness of how the industry functions and how salaries are calculated is necessary. EMS necessitates a thorough understanding of both the backend and the frontend, and that understanding must be in perfect

harmony. We need to know how databases work and how to design them properly so that they meet all of the system's requirements. React framework and material design were employed in the creation of this web application. Redux is a tool for managing the state of a system. Firebase cloud storage is used to store data in the database. Firebase email authentication is used to create users, and Firebase Firestore is used to store data. Both are powered by Firebase. There are two sorts of users in the entire system. Admins and users are two different roles in this scenario: one is the CEO of the company, and the other is an employee. An employee, on the other hand, cannot register until the admin in his or her organisation has added him or her to the list of employees. Because of this, only the admin has access to most of the data; employees can make changes to their own information, but everything else must be handled by the admin.

2. Literature Survey

It was developed by Xiaobing Zhang et al. (2008) as an absorptive capability research model that integrates Human Resource Management System (HRMS) and organisational performance (OP). Based on theory development, they offer hypotheses about HRMS, absorptive capacity, and organisational performance. They collect 221 useful samples using a snowball sampling method and then use SEM to verify the sample data, which supports some of their assumptions in part. Organizational performance integration using HRMS and the absorptive capacity research model has received empirical support. The future of theory development research was discussed. [2].

Human resources (HR) records are kept in all kinds of workplaces, whether they're in the public or private sector. When it came to managing employees, planning for workforce needs, and tracking employee performance, organisations relied heavily on personnel records. When it comes down to it, a company's long-term viability and growth will be largely dependent on its ability to effectively manage its human resources. Records management was designed to make sure all of an employee's work history was accessible for as long as needed, and that the information contained in personnel records helps with staff management, deployment, payment and development. The creation and preservation of human resource records as verifiable evidence is also an important goal of personnel records management, as is promoting transparency and accountability within the organisation. According to their description, this module's goal was to provide guidance for those who produce and use paper and electronic personnel records. Human Resource Information Systems (HRIS) have revolutionised the way work gets done in the field of human resources (HRIS). Computers have replaced many of the manual processes that used to be the norm in the workplace. It is now possible for human resource managers to focus not only on administrative duties involving individual employees, but also on developing well-researched strategies and plans, allowing human resource planning to be directly aligned with overall company objectives. [3].

A recruiting software programme, according to Amy Kelsall et. al. (2013), should aid organisations' management, particularly the HR department, in tracking down job applications. By completing transactions and providing services more quickly and efficiently, an applicant tracking system can reduce an organization's overall recruitment costs, increase efficiency, and improve customer satisfaction. An applicant tracking system (ATS) is a tool used to keep track of candidates who have applied to a company. Capstone emphasises the importance of

increasing recruiting services for employees, managers, and applicants to achieve great success for a company. A well-run applicant tracking system can help you achieve this goal. [4].

According to Karen Becker et al. (2011), attracting, retaining, and motivating employees are critical objectives for non-profit organisations. There will always be a need for HR managers to keep an eye on employee performance as the competition for talent grows. An Australian non-profit organization's performance management system was the subject of this study. For both employees and the organisation, this study examines how performance management can be implemented in a nonprofit setting. In addition to these disadvantages, the study found that there was an increase in labour turnover as a result of performance management. As a result of these findings, it is possible for non-profit organisations to use performance management systems that are tailored to their unique contexts as well as their specific goals. This can be a useful tool for both managers and employees. [5].

Information systems and technology in human resource management have become increasingly important in today's highly competitive environment, according to Dr. Nisha Aggarwal et. al. (2012). Every aspect of human endeavour was impacted by the information technology revolution in a dramatic way. Strategic use of human capital and information technology was on the minds of many businesses. Systems for gathering, recording, storing, managing, delivering and displaying data on human resources are known as human resource information systems (HRIS). Human resource technology, also known as human resource information systems, has shaped the interface between HRM and IT. Many more organisations are using human resource information systems to gather, store, and evaluate information about their workforces. When it comes to keeping a company in the game and efficient, Human Resource Information Systems (HRIIS) are a must. The goal of this article was to examine the role and significance of HRIS in raising a company's level of efficiency and profitability. An HRIS system is necessary, as are the various components that make it up. [8].

HRIS use in Malaysia was examined by Normalini et al. (2012) to see if any effects or consequences could be traced back to its implementation. Based on a questionnaire gleaned from the literature, a purposeful sampling strategy was used to collect data from only those Penang, Malaysia-based companies that use HRIS. A partial least squares approach and structural equation modelling were used to analyse the data. Findings showed that four of the five antecedents predicted the extent of use, and all five outcome variables were strongly linked to the extent of use. Roger's innovation attributes, as well as Remenyi and Zuboff's IT framework, can be used in this study to assess several dimensions of attitudes toward the degree of HRIS use, as well as the consequences of HRIS use. For starters, the results of this study cannot be generalised to the general public because the sample size was limited to HR professionals employed by small local businesses and multinational corporations. As a result, no generalisations can be made to other professions. To begin with, the study made use of a new type of technological innovation, namely the HRIS system. Because of this, the study should be replicated so that the findings can be tested on a wider range of technologies and samples. Information technology (IT) appears to be an empowering function for human resources (HR) professionals, allowing them to contribute more value to their work, according to the findings. Implementing or deploying new IT products, systems, or processes will be made easier with this guide. The organisation now has a better strategy for implementing the innovation because it has addressed the concerns of its employees. To date, there has been little

research on the origins and outcomes of HRIS in developing countries. The amount of research done on the subject is negligible when compared to the wealthier countries' output. [9].

According to Shammy Shiri et al., (2016), HRM (human resource management) is essential in a knowledge-based economy, where the value of ideas and expertise is highly prized and the creative and imaginative staff is needed to address the challenges of this new economy. The management of human capital has grown in importance and complexity. There is a significant increase in the number of organisations using HRIS software to collect, store, and evaluate data on their human resources (human resource information system). As HR professionals increasingly realise the importance of integrating IT and IS with HR operations in order to develop and implement stronger HRM programmes, HRIS is gaining in importance. In light of the increasing sophistication of HRIS, HR professionals face new challenges that necessitate them taking an active role in their organisations as true strategic business partners. The goal of this research was to find out whether HR information systems (HRIS) are useful in the day-to-day operations of businesses. Human resources executives, managers, and upper-level managers from various industries are included. Results show that HRIS has a direct impact on the HR function's completeness while allowing HR professionals to contribute more to the firm's strategic direction, and this is supported by the findings of this study. [10].

HRIS was discussed by Ananya et al. (2013). According to the findings, HR planning became more efficient and effective because of the HRIS skills inventory, HRIS training requirements analysis, HRIS succession planning, and HRIS labour supply and demand analysis. The most often recognised HRIS feature, according to the findings, was the accurate identification of vacant employment opportunities. Organizations can improve HR planning efficiency and effectiveness by aligning their HR strategy with their information system strategy. For HRIS operations to be successful, they must be integrated with other business processes. HRIS systems, according to the findings, require more cognitive features in order to improve the efficiency of HR planning. [12].

The HRIS, according to Sabrina Jahan et al. (2014), is a critical tool in today's HR arsenal. Since the turn of the century, it has become increasingly popular in developed countries. The use of Human Resource Information Systems (HRIS) in Bangladesh has increased over the past five years. Even among large corporations, however, its use was still restricted to a select few. Despite the obvious advantages of HRIS, small businesses and government organisations have been slow to adopt it. The most significant impediment to HRIS effectiveness was the lack of management commitment. Constraint number one was the high purchase price. Even though there are some drawbacks to the HRIS, the benefits far outweigh them. The benefits have been accepted and realised by both employees and management in any organisation that has implemented it. Implementation, on the other hand, proved difficult. It is the goal of this study to conduct a theoretical investigation into the implementation of an HRIS, looking at its advantages, disadvantages, and potential snags. [14].

A discussion of human resources was given by Faruk Bhuiyan et al., (2014) (HR). In the twenty-first century, they were the most crucial factor in every company's success. As a result, they have played an important role in helping businesses gain an advantage in the marketplace and increase their profitability over their rivals. The current business climate was more vulnerable because of the increased empowerment of employees and the fierce competition in the market. Businesses have turned to information technology to improve their human

resources management processes. As a result, HR professionals must be well-versed in the development of HRM over time, as well as the increasing role played by technology in that process. This led to a critical evaluation of the emerging human resource information system (HRIS), a new technology in human resources management (HRM). A wide range of publicly and privately available data was analysed to meet the stated objective. The study found that HRIS emerged during both the low-cost and high-cost eras (1980-1990). (1990-2000). [17].

An ATS (Applicant Tracking System) could be designed to improve awareness, collaboration, and efficiency by Lundqvist et al. (2016) (ACE). As part of an HCD methodology, primary and secondary research was incorporated into the project along with implementation methods and assessments. In response to the investigation, the Honeycomb ATS prototype was created. The ACE pattern model and fourteen new design patterns based on the prototype have been developed to help CSCW teams collaborate and be more aware of one another. These results were compared and found to be mutually beneficial, but additional testing and verification of these patterns is needed in the future to ensure their validity. [19].

The Employee Management System was discussed by Sayali Pramod Dalke et al., (2017). Two applications were used: one for companies to keep track of employee information, and one for employees to keep track of their time. Every company, public or private, has an information system in place to store information about its employees. Pen and paper are used by many small businesses in India to keep track of their operations. High-tech solutions are available, but they were too expensive for these low-level businesses to afford. It is the goal of this research to devise a system that will allow them to do so at a lower cost. Using this system, the company can keep tabs on each employee's attendance and pay at the end of each month. It can also figure out how many hours an employee has worked in total, including any overtime. Employers and employees alike can focus on their work and grow their businesses as a result. Employees' attendance will be tracked and their pay calculated using this system at the end of each month. It can also figure out how many hours an employee has worked in total, including any overtime. [20].

The importance of cloud computing was discussed by Isaac U. et al., (2018). Companies began to adopt the concept's shared infrastructure and applications in a variety of industries. It was the goal of this study to provide a simple prototype of a cloud-based tool for small and medium-sized businesses to manage their human resources. EIMS was chosen by SMEs because human resource management and how to effectively handle employee information were two of the most pressing concerns. Specifically, the SaaS (Software as a Service) layer of the cloud framework was the focus of this prototype. Managing payroll, records, leave requests, and employee evaluations are all made possible through the use of existing cloud platform providers. We wanted to find a less expensive and more cost-effective solution to some of the most fundamental issues affecting human resource management in small and medium-sized enterprises. [21].

3. Proposed Methodology

Authentication, Task Management, Wiki, and Profile are all part of the Employee Management System presented in this system. In comparison to our method, there are a number

of Employee Management solutions to choose from. User interface screens can be created using the React technology and Firebase's cloud-based Firestore.

A. Employee Management

Listed here is a list of employees who are connected to the company. Active, inactive, and suspended personnel make up the different sections of the roster. Employees who are still actively employed by the company are considered to be "active." Inactive employees are people who have been invited to the organisation but have not yet been registered to work there. Suspended employees are individuals who have been suspended by their manager for the reason given by the company. Selected employees are those in the organisation who have been chosen to conduct a set of specific activities for all selected individuals, such as reinviting or changing the password. It also involves the process of inviting new employees to join the company. An official invitation to join the company will be sent to the invited employee by postal mail. An option exists to send an invitation again if he or she does not respond to the first one. There is a tool called forgot password for employees who have forgotten their password, and a feature called change password for the employee in the employee's activities is available for managers who need to change an employee's password for any reason whatever. The dashboard page for the employee list is displayed when you click on the module for the employee list. The organization's staff can be seen here. An employee is added to the company by selecting the "Invite New Employee" button. When the button is pressed, an invitation is sent to the employee's e-mail address on file.

Using the `useEffect()` hook in react will allow us to retrieve all of our employees' information and generate the web page. Because the `useEffect()` hook is made up of an array of dependencies, an empty array means that just one call will be made to the list of employees. Additionally, the project's metadata is used to identify and load the employee. The MUI table has a search mechanism that can be used to find information. With the use of this table search, we were able to narrow down our list of potential employees. You can see all of your contact information on your company's website. The Material UI table has a search mechanism that allows us to look for an employee based on any of these criteria.

B. Task Management

In order to replace email as a means of communication and collaboration at work, the Employee Management System was developed. All job decisions and task organisation were carried out via email before project management systems became widely used. Now that you've set up your project, it's time to start adding tasks to it! In Employee Management, a task is the smallest and most specific piece. Title, description, and due date are all part of the work. It is possible to assign a job to a team member in order to keep track of their progress. Tasks are an excellent way to monitor the productivity of remote workers and those who operate from home.

We may use this task management to build a company-wide project and then add the employees who are responsible for it. This aids in the resolution of our primary issue, namely, the need to keep track of which employees work for which companies. Tasks are added to a project after it has been created. In the same portal, we may create and update tasks, assign them to specific employees, and then use a feature called the remark box to solicit feedback from the manager or the employee. Depending on the task's description, we can use labels to keep track of it or filter it out. For each individual task, we may set a due date and priority, as well as receive reminder messages. Our projects list will be retrieved thanks to the `useEffect()`

hook in React, which makes it easier to display on the web. If there is no dependency array in the `useEffect()` hook, it signifies that only the list of projects will be called at a time. The project's metadata is also used to load the project from an id-based url. The MUI table has a search mechanism that can be used to find information. We may use this table search to narrow down the items we're looking for. Thereafter, the New Project component will be added to the project list table, which will add a record of your new project to Firebase Firestore and send an instantaneous snapshot so that you don't have to refresh the page to see it. In the firebase firestore, the New Task component creates a record under the project id to link it with a specific project. Afterwards, a real-time snapshot is used to populate a task list with the new information.

C. Wiki Management

Employees can use this module to provide their thoughts on the following topics. Among the topics covered in this module are articles that can be added to several categories such as General Knowledge and Science. The article is viewed by the organisation, and it is possible for the article to receive comments and feedback. Recent additions to the site are displayed in the recently added category, while archived content is displayed in the archived category. Onboarding new employees can be stressful, and this seminar aims to alleviate some of the most common issues they confront.

When you click on the wiki module, you'll be taken to the wiki's dashboard page. List of recently added, archived, and default general and knowledge articles can be viewed here. If there is no dependency array in the `useEffect()` hook, then it will only ever call the list of articles once. Using the category id and its associated metadata, the category name is then loaded into the browser. Material UI helps with the autocomplete search by taking the necessary options and presenting them. This component allows us to create an article in a specific category and add its description as well as any attachments we'd like to include with it. If an article is created, a document is created in Firebase and a snapshot of React's DOM is used to keep track of any changes, saving time by not having to reload the full collection each time. This boosts the system's performance. It is possible to reuse the `NewArticle` component for `EditArticle` thanks to the react's component reusability. Additionally, we can follow, unfollow, like, and dislike an article in the article. Those who follow the article will receive an email anytime the author or administrator makes an update to the article. A wiki administrator or manager has the ability to delete an article, check its deletion history, and restore an article that has been deleted. A materials table summarises the article's history. An administrator can revert these changes to the original article if we like. As a result, the old contact's information is included in the updated article. To see all of the categories and articles in a certain category, click on "More Articles" on the home page. We are able to load these additional articles thanks to the redux store's pre-loaded content. When we click on an article's title, we are taken to the article's view page with its Meta information.

D. History Management

Managing history involves two distinct scenarios. One is the perspective of the employee, the other is that of the management. You can examine what you've done and what services you've used from your own perspective as an employee. This helps him keep track of the work he's done or the items he has to fix. The manager will be able to see all of the modifications that have been made throughout the project, including who made the change, what the change

was, and where it was made, as well as the date and time it was made. Only the user's actions are included in the history, as stated in the user's perspective. So, we need to restrict the user so that he can only see what he has done. The firebase token that a user receives upon logging into the app is used to accomplish this. As a result, every user who tries to access the employee's history over the rest API will only be able to utilise a firebase token. Using the `auth.verifyIdToken()` method, Firebase verifies the token and returns a decoded result. The employee's `userId` is returned as a result of the query. The history of the employee's history will be loaded based on the `userId`. Viewing the application in the administrator or manager view, the administrator can observe all of its actions. Every aspect of the event is documented using event details objects, both before and after the event. So, we'll be able to keep tabs on everything that happens in the application. It's obvious that as consumption grows, so does the archive of historical records. The paginated data option provided by the firestore helps us overcome this issue. A query can be broken into batches based on parameters defined in the query using query cursors in the cloud firestore.

4. Architecture of the Proposed System

1. Architecture Flow

It depicts the block diagram of the proposed system. This system has two primary architectures.

1.1 React- Redux Architecture

The official UI binding for react Application is React Redux. Whenever an API change occurs, it is automatically updated to ensure that your React components continue to function correctly. A good 'React' architecture can be encouraged by this tool. Many performance enhancements are built-in, so components only re-render when necessary. JavaScript library Redux is used to manage application-source stater interfaces in React. React-Redux is Redux's official React binding. It makes it possible for React components to access data stored in a Redux Store and to make updates to that data by sending Actions to the Store. By providing a one-way data flow architecture for handling state, Redux aids in app scalability. React-Redux is based on a simple premise. It joins the Redux store, checks to see if the data required by your component has changed, and then re-renders your component once more as needed.

The Redux architecture's components are outlined below.

Store: A store is a place where you can see how your application is progressing. An action dispatch method is provided, as is management of the app's status. All the moving parts are coordinated by a central brain in Redux.

Action: A payload sent or dispatched from a view can be read by Reducers and is known as an action. Intended solely for storing the user's event details, it is a simple object. Details include the type of activity, the time and location, the coordinates, and the target state.

Reducer: Reducer uses the state to update the store based on the payloads it receives from the actions. A pure function is one that returns a new state from the original state.

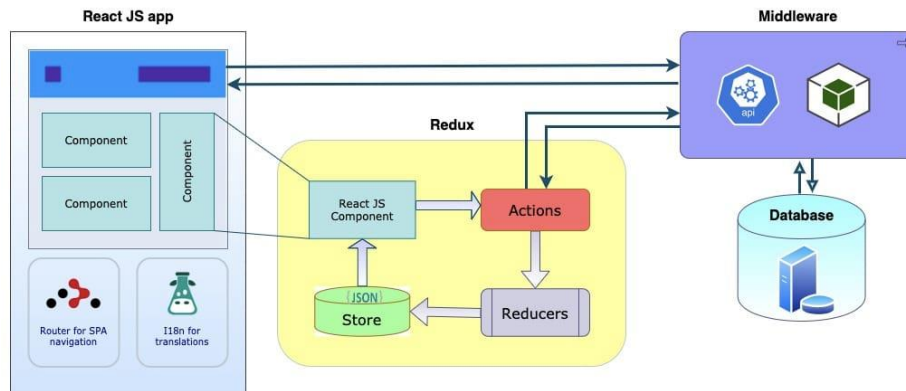


Fig. 1 **React Redux** Architecture Diagram of the Proposed System

2. Publisher-Subscriber (Pub/Sub) Architecture

Latencies of less than 100 milliseconds are possible with Publisher/Subscriber (Pub/Sub). It is common practise in streaming analytics and data integration pipelines to use Pub/Sub for data ingest and dissemination. As a queue for task parallelization, or as a messaging-oriented middleware for service interaction, it has many potential applications. The Pub/Sub system can be used to create systems of event producers and consumers, known as publishers and subscribers. As an alternative to sending commands in real time over the network, publishers send notifications to subscribers in real time (RPCs).

Regardless of how or when events are processed, publishers send them to the Pub/Sub service. Afterward, Pub/Sub distributes the events to all the services that need to respond to them. Asynchronous integration improves the overall flexibility and robustness of the system compared to systems communicating via RPCs, where publishers must wait for subscribers to receive the data.

Topic: Publishers send messages to a designated resource.

Subscription: Sending messages from one specific topic to a subscribing application via a single named resource. For more details about subscriptions and message delivery semantics, see the Subscriber Guide.

Message: A publisher's data and (optional) attributes are delivered to subscribers in the form of a topic.

Message attribute: A publisher can define a key-value pair for a message. Subscribers who speak English, for example, can mark messages with the `iana.org/language` tag key and value.

Publisher: Sending messages to a specific topic via an application (s).

Subscriber: When a programme is subscribed to a particular subject, it will get messages from that subject.

Acknowledgment (or "ack"): When a Pub/Sub subscriber receives a message successfully, it sends a signal to Pub/Sub saying so. The subscription's message queue is cleared of messages that have been acknowledged.

Push and pull: The two methods of distributing information. To receive messages, a user can use Pub/Sub to send them to an endpoint of their choice, or they can pull them directly from the service.

Many-to-one (fan-in) and many-to-many (fan-out) are three possible publisher-subscriber relationships depicted in the following diagram:

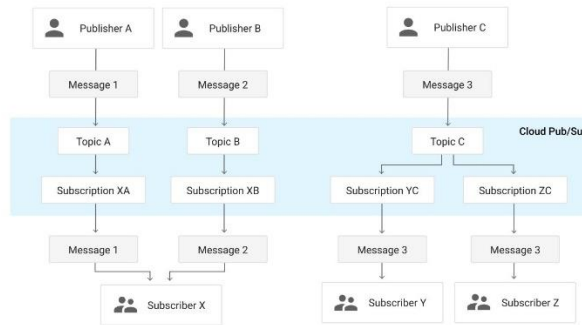


Fig.2 Pub-Sub Architecture Diagram of the Proposed System

3. Our Basic Application Structure

Designing a system that meets or exceeds a set of specifications is called System Design. There is a general description of how the system works and how it interacts with external users, which in general captures the system's behaviour as a whole.

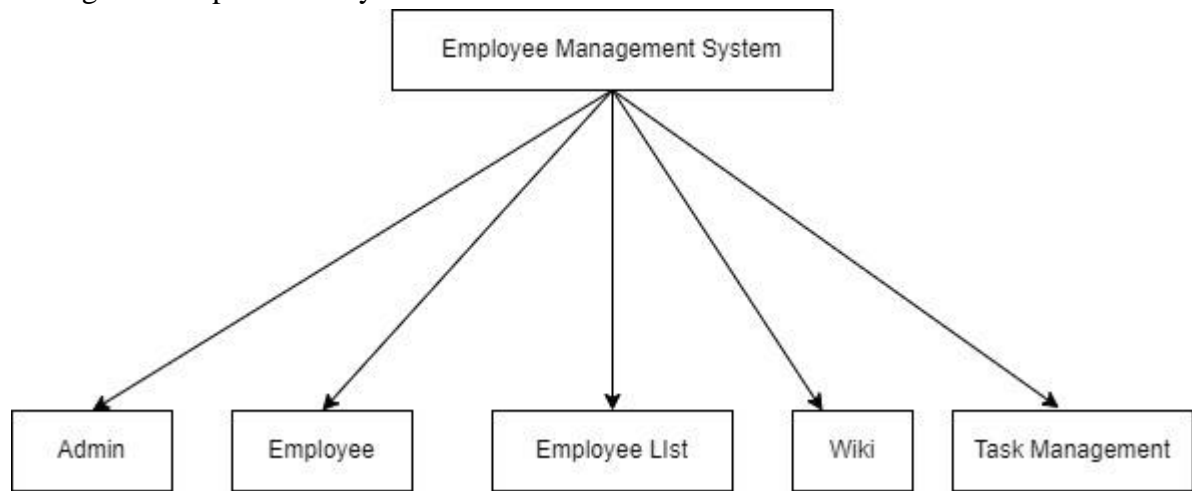


Fig.3 The Basic Application Architecture

5. Experimental Results

In the end, we will be able to keep track of our employees and the tasks they complete throughout the month, and we will be able to use this information to calculate their salaries. An employee's personal information can be stored in this way, so that it can be retrieved at any time.

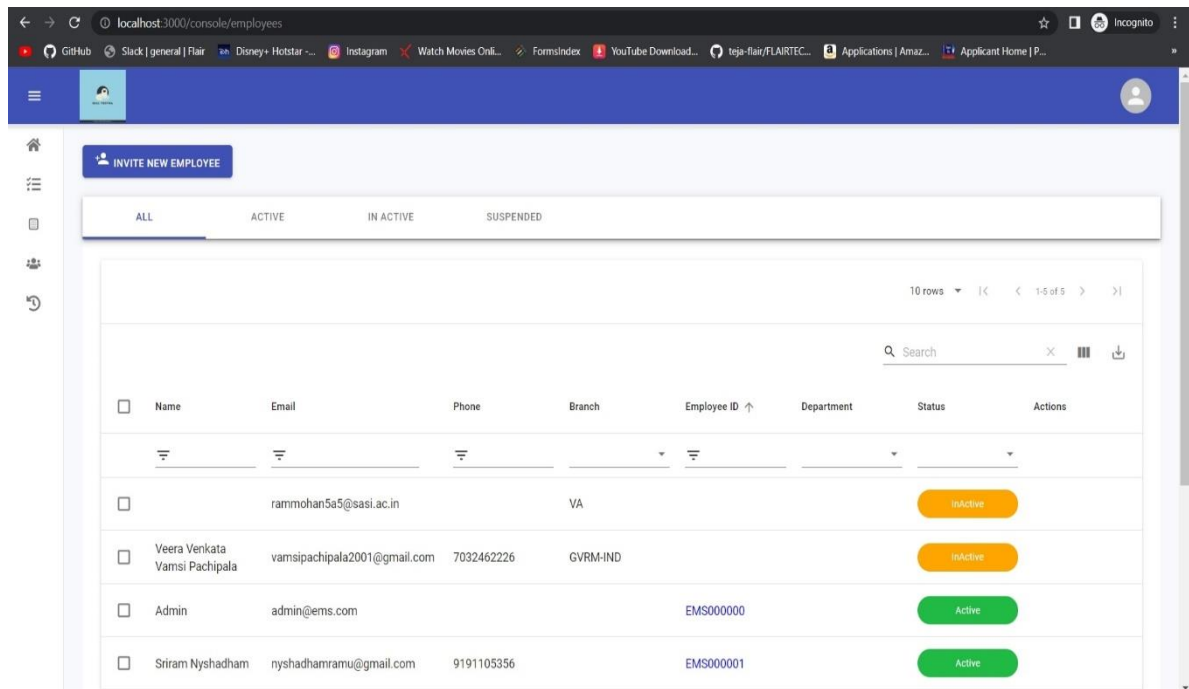


Fig.4 Employees List

This module displays a list of the company's employees. Active, inactive, and suspended employees make up the different sections of the roster.

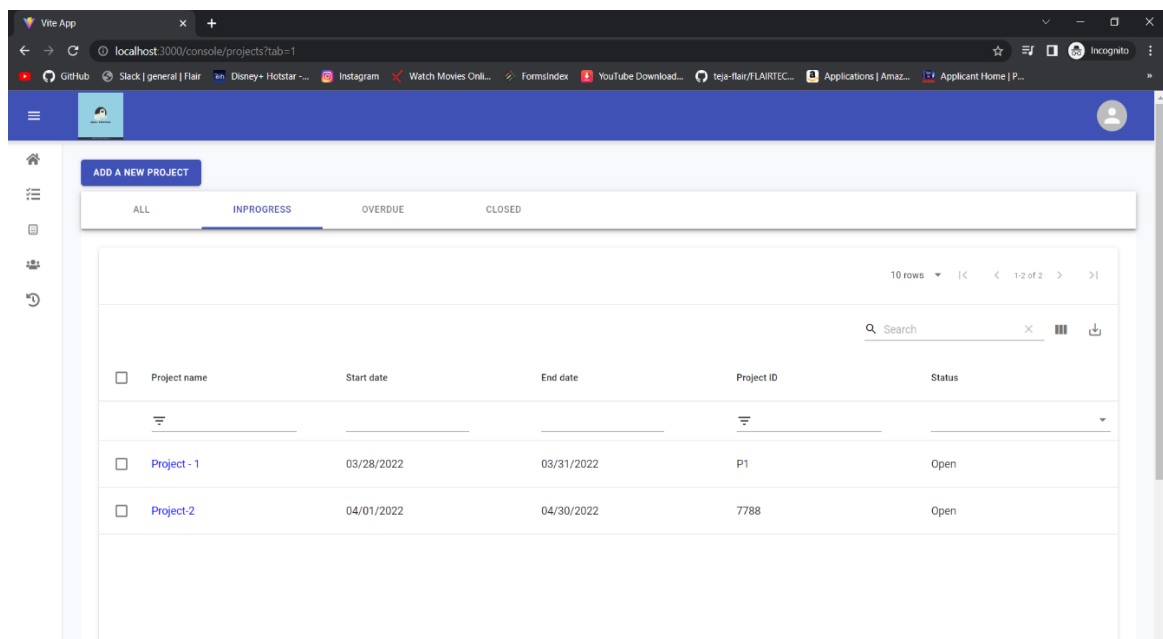


Fig.5 Project Dashboard

The project list page will be displayed when the task management module is opened. We'll display a list of all the projects associated with the organisation in that section. Once a task has been selected and clicked on, various fields that are related to the task will be displayed. A subtask within a task can be created to better track productivity and results.

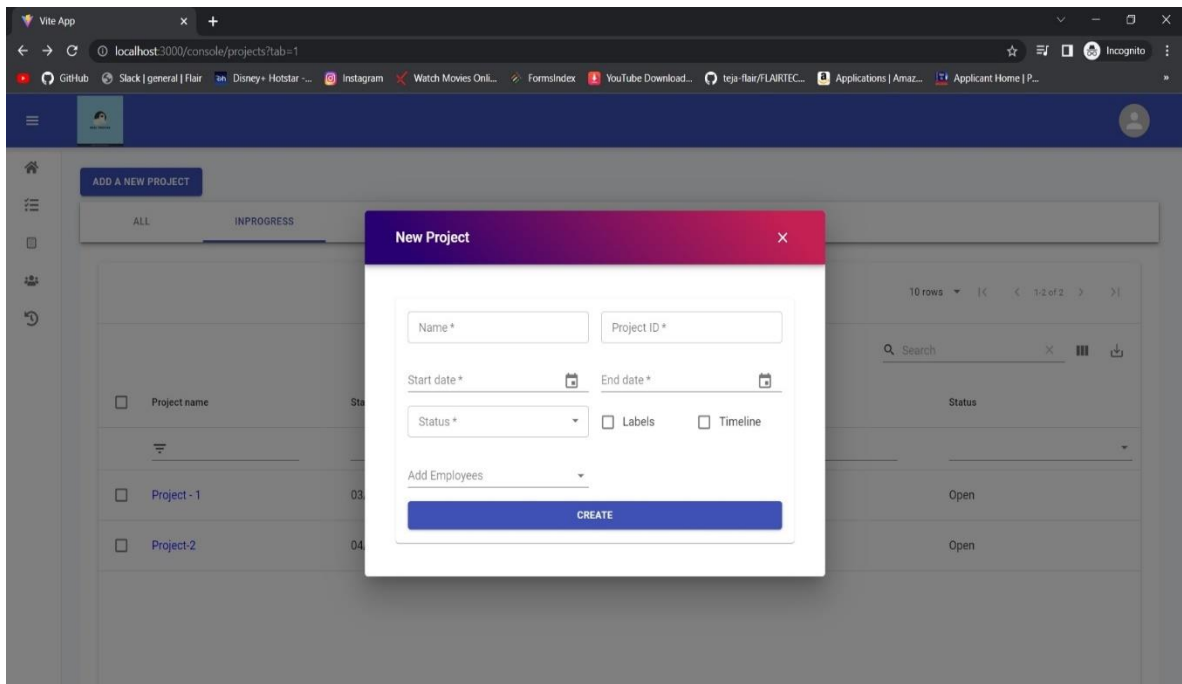


Fig.6 New Project Creation

New projects can be created and stored in Firebase Firestore, which then sends a real-time snapshot to our projects list, making it unnecessary for users to refresh the page to see our most recent additions.

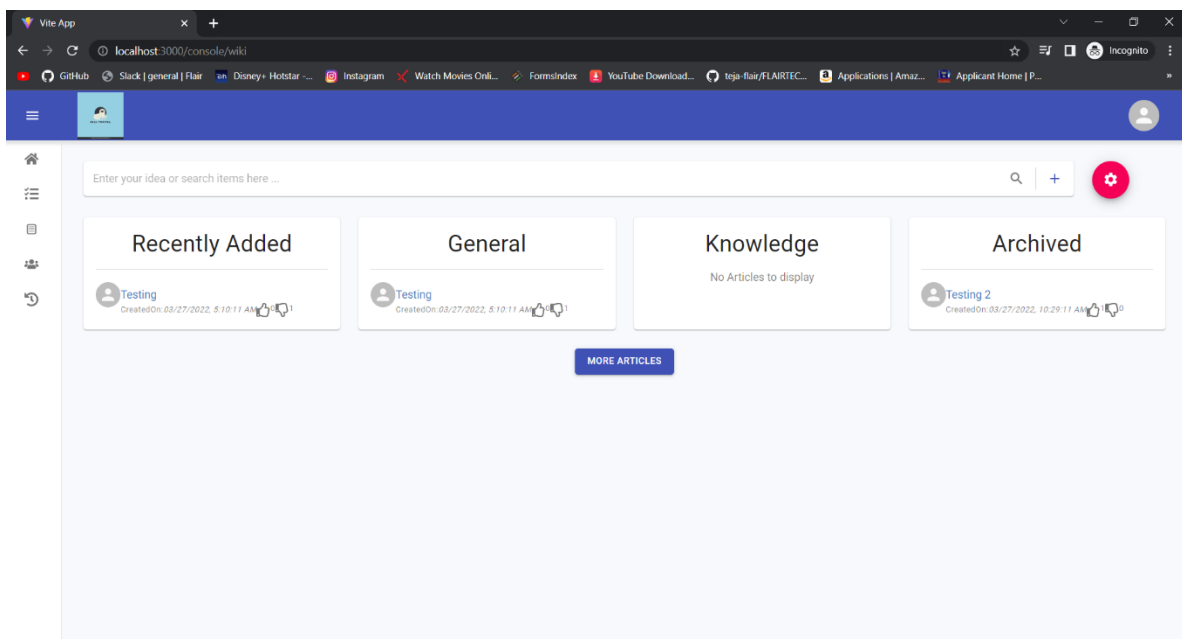


Fig.7 Wiki Management

The wiki's dashboard appears when you click on the wiki module. A list of recently added, archived, and all-purpose articles can be found in this section. An article can be up- or down-voted, followed or unfollowed, and up- or unfollowed. As a wiki manager or administrator, they can delete the article, view the article's history, and restore it if it has been deleted.

Action by	Timestamp	History
Admin	04/01/2022, 4:02:20 AM	Unfollowed the article:
Admin	04/01/2022, 4:02:15 AM	Devoted for an article: .
Admin	04/01/2022, 4:02:04 AM	Voted for an article: .
Admin	04/01/2022, 1:15:08 AM	Added to Project.
Admin	03/31/2022, 9:06:31 AM	Created project .
Admin	03/30/2022, 1:17:38 AM	Wiki page deleted: .
Admin	03/30/2022, 1:17:10 AM	Wiki page updated: .
Admin	03/30/2022, 1:13:55 AM	Unfollowed the article:
Admin	03/30/2022, 1:13:49 AM	Devoted for an article: .
Admin	03/30/2022, 1:12:18 AM	Voted for an article: .
Admin	03/30/2022, 1:11:37 AM	Devoted for an article: .
Admin	03/30/2022, 1:07:43 AM	Wiki page updated: .

Fig.8 History Management

There are two types of cases in history management. Employees and managers have different perspectives. In the employee's view, the employee can see all of the tasks he has completed and the services he has used in the portal. The manager will be able to see all of the changes that have been made throughout the project, including who made the change, what the change was, and where it was made, as well as the date and time it was made.

Event details objects, such as after and before images, record every little nuance. So, we'll be able to keep track of everything that happens in the app. It is clear that the number of historical documents being collected grows as the number of people using them grows.

Employee	Wiki	Timesheets	Immigratio	Task Manageme	Employee Self Service	Discussion	Accounts	Employees Manager	Console Customizat	Wiki Manager	Timesheets Manager	Immigratio Manager	Accounts Manager	Task Manageme Manager	ESS Manager	Action
Admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	UPDATE
Sriram Mohan Nyshadham	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	UPDATE
Sai Prasad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	UPDATE
Sriram Nyshadham	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	UPDATE

Fig.9 Console Customisation

Users with console-customization permission can only access the customization options. The module level access is where the permissions of users or employees are granted. As a result, he is in complete command of every module. The following services are the primary focus of the website.

Access to the Module Level: All of the employees' names and access levels are listed in the module. As a result, any manager or admin has the ability to change this access, preventing users from seeing those modules.

Information about the business: The company details service contains all the information necessary to run the application, as well as metadata about the application, such as the company name, URL, and so on.

6. Conclusion and Future Enhancements

Fast, accurate, time-saving, and effective, the HUMAN RESOURCE AND WORKFLOW TRACKING SYSTEM is an excellent choice for your next project. As a result of our research into other systems' flaws and successes, we were able to adapt our model and make it work. When compared to other systems, this one provides a better use case because it performs better, is more efficient, and is more dynamic. When compared to existing systems, our model has a server-less architecture, which enables us to better balance load and achieve better results.

Modules like timesheets, payroll, expense management, deductions, and client management will be added in the future.

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