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GREEN LEAF INFORMATION MANAGEMENT SYSTEM

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Introduction

Company background

Sri Lanka is a country that produces tea throughout the year. Tea exportation is one of the primary sources of foreign exchange. Tea production was introduced in 1867. Central highlands and southern areas of the island are usually concentrated for tea growing. Most of the people in UVA province, do tea plantations as a livelihood. **Gold Buds Uva Tea** is a developing company which is situated in the Badulla district. The company collects raw materials from the suppliers by using their freight lorries. Then, they transport those raw materials to their factory and test the quality of the tea leaves. After that, the tea leaves are referred to the manufacturing process. By doing a huge process, tea leaves are ready for packaging process according to standard methods. After completing the packaging process, packed materials are stored in the warehouse. The final product is stored in the warehouse until the order is confirmed and notified to release the order which is requested by the primary customer.

Client background

Mr. E.M.Ishan Rathnayake is our main client who works in the Gold Buds Uva tea factory as a managing director. His primary intention is to have a computer-based system to get rid of mistakes, loss of details, fraud occurrence, etc.

The project primarily focused on raw material transport management, supplier and quantity management, payment management, warehouse management, customer and order management, Machine management, financial management & time scheduling and target management. All sub systems are categorized according to the client's requirements. All manual paperwork calculations are switched to computer-based system using aspects of the client. The role of the project client is critical to the success of the project, as they are the primary stakeholders who will benefit from the project's outcome.

Problems and Motivation

Problems

The factory does not have a proper way to contact raw material suppliers with the company. This is the major problem that the client had faced.

As a factory,

They store their most details manually in books. The quantity that the supplier provides daily is written in logbooks. Sometimes the data can be erased or missed place due to various reason. In rainy periods, books may get wet and may have a chance to lost data. So, will not be easy to identify written details. Sometimes the factory must few loses due to fraud occurrence.

If some administrator in the company want to see recorded details, they want to look for relevant book it will get a lot of time and it is very difficult. Some documents may be missed place too.

As a supplier,

They do not have a way to contact with the factory.

Their provided raw material amount is written in a book. If any case, they forgot to bring the book. A small sheet is given to them on that day by indicating the provided raw material amount. If they lost that sheet at the end of the month when the payment is done it will be problem to them because they don't have the total amount of raw material provided by them.

Solutions

As the solutions the company had decided to make their system computer based.

As a solution to contact customers directly with the company, decided to make an QR code system. And decided to have a QR code to each supplier and when the officer who going to collect the raw material can scan it and enter the details. But this was useless because, in case if the supplier forgot to bring the QR code there would be known method to enter the provided raw material on that day.

So, we have come with a solution make a mobile view, the officer can search for supplier ID and can enter the provided raw material amount. Then it will be entered in the system. At the end of the month, each supplier can get a report of provided raw material amount.

All the details of the factory are entered into the system to avoid manual recording and fraud occurrence when collecting raw materials, a tracking system is used to avoid it. Through this system it will easier any administrator search for records.

Benefits

This system mainly focuses on and targets the factory and the suppliers to make their work easier and more efficient. The use of modern technology is also a way of reducing the expenses of production. When we use computerized ways of managing, our results are of greater consistency. The production is more efficient and labor costs are lowered because most of the work done by laborers can be replaced by the computerized system. This system helps to fulfill the various demands of the customers using efficient tools. In a tea factory, if we use a handheld book of records, there can be many errors and when errors occur it leads to expenses. So, in order to reduce the amount of expenses we can use a computerized system which also makes our work faster and more efficient with less number of errors. This system makes their work easier for the factory management and also for the suppliers. By using this system we can manage time well, reduce our production wastage, reduce our transportation cost and many more. By using this system we can get to know the correct amount of tea leaves that the supplier has supplied to the driver, and the supplier will enter those details into the system at that moment also. Then once the drivers arrive at the factory with the tea leaves, we can calculate the number of tea leaves currently available in the lorries and compare it with the amount received from the supplier and check whether any amount is lost. If some have been lost it is the driver's responsibility to prove what has happened on the way. Using this system we can also track the driver's live location using a map which is an advantage for the factory. Using the map we can check whether the driver is going somewhere beyond the routes given to them. And also if we get a big order from a customer to obtain our products on a given date, we can quickly check the stocks for availability and if the stocks are not up to the required amount, the stock manager can quickly send a message to the time and target manager saying him about the order received. Then he can quickly assign a target and send it to the drivers to collect the required amount of tea leaves from the suppliers before the required date. Using this system, we can obtain stocks quickly from the suppliers and send them quickly to the customers to satisfy them.

Aim and Objectives

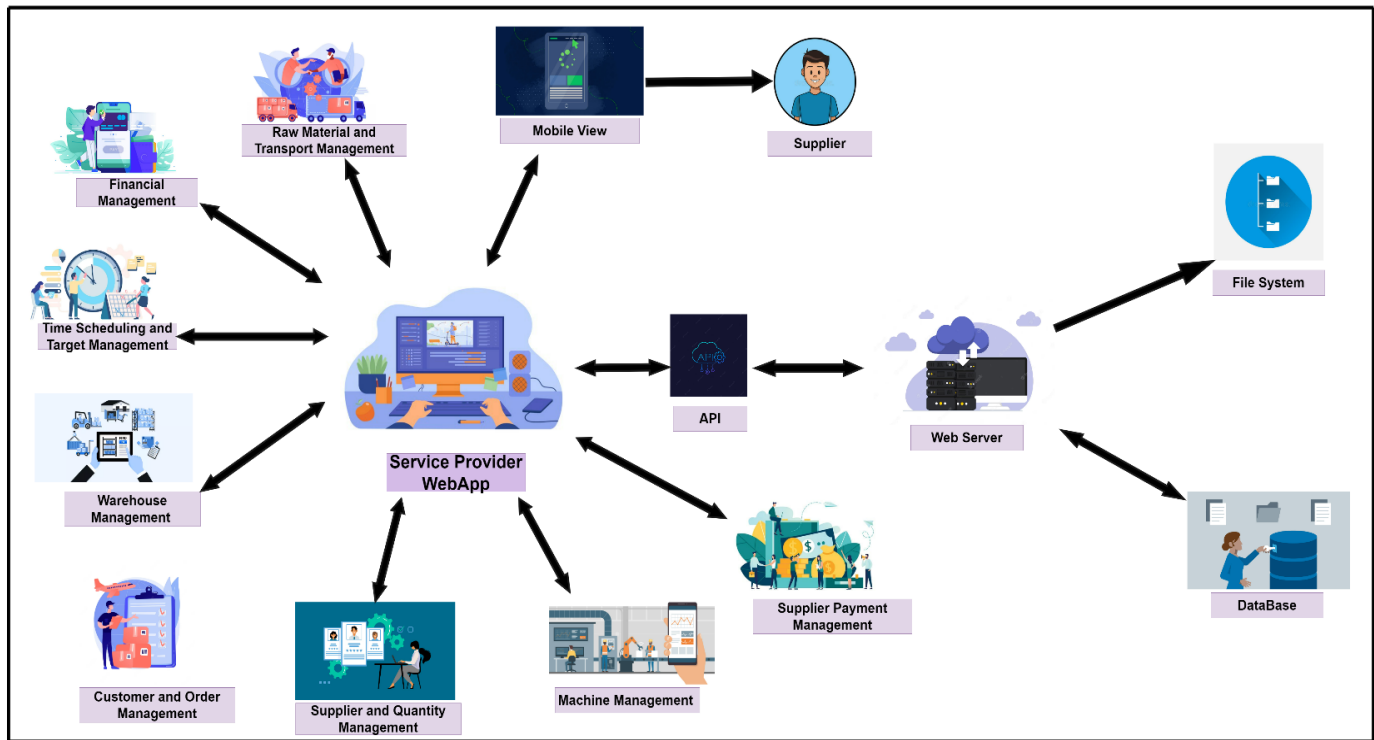
Aims

The aim of the project is to solve the problems and issues faced by the company improve the quality of the company and upgrade the system and introduce an online platform where they can encounter more suppliers and expand the company. Implement the system covering all the requested functions like Raw material transport management, Supplier and Quantity management, Payment management, Warehouse management, Customer and order management, Machine management, financial management, Time scheduling and target management. our aim is indicated here, as we must upgrade our ideas if any requirement is essential, the outcome will be an updated version of the above-mentioned system.

Objectives

1. To reduce labor time when using manual calculations
2. To maintain higher precise of data.
3. Easy to manage the sub-systems.
4. Adopt to the globalization.
5. Maintain higher quality tea product during the customer requested time.
6. Reducing unnecessary expenses and provide products with cost effectiveness.
7. Maintain order to have higher customer satisfaction without rejecting their orders.
8. Develop innovative and comprehensive transport evaluation criteria accounting for distributional effects and accessibility.

System Overview



Non -Functional requirements

1) Performance

When the system performs a specific task under particular circumstance such as software's throughput, execution time, reaction time, and storage capacity.

2) Security

Ensuring that no unauthorized access to access any of the system's data.

3) Usability

The website's interface is simple to use and user friendly.

4) Reliability

The system can program working flawlessly for a predetermined number of uses or period of time.

5) Availability

Probable that a user will be able to access the system at a particular time.

Functional requirement

Functional Requirement	Stakeholders
Login to the mobile view	Driver
Login to the system	Transport manager/Supplier manager/Quantity manager/Supplier payment manager/Warehouse manager/Order and customer manager/Machine manager / Finance manager / Time scheduling and time manager
Search for supplier ID	Driver
Send location data	Driver
Enter details	Transport manager /Machine manager/Supplier payment manager/Financial manager/Customer and order manager /warehouse manager
Track vehicle	Transport manager
Generate report	Transport manager / Supplier manager/Quantity manager/Supplier payment manager/Warehouse manager/Order and customer manager/Machine manager / Finance manager / Time scheduling and time manager
Send daily amount of tea leaves provided	Supplier management
Read quantity of tea leaves	Supplier management
Register supplier	Supplier management
Check for target	Quantity manager
Manage daily quantity	Quantity manager
Generate notification	Machine manager
Set time for machine service	Machine manager
Send reports	Machine manager /supplier payment manager/ Customer and order manager
Read supplier provide quantity	Supplier payment manager
Insert unit price of tea leaves	Supplier payment manager
View notification	Warehouse manager
Receive notification	Warehouse manager
Generate QR - code	Warehouse manager
Manage space of available final product	Warehouse manager
Read product details	Customer and order manager
Analyze final product details	Customer and order manager
Receive income details	Financial manager
Receive expense details	Financial manager
Calculate net profit	Financial manager
Create timetable	Time scheduling and target manager
Set target	Time scheduling and target manager
Receive order target	Time scheduling and target manager

Literature review

Resource	Author	Failure	
[1] Online Tea Factory Management System	J.S Mbogho & S.E Mwita	<ul style="list-style-type: none"> • Insufficient data input and analysis • Lack of maintenance and development • Insufficient system user training 	
[2] Online Management System for The Tea Processing Industry	[2] N.N Nandini & K Thirumalini	<ul style="list-style-type: none"> • Lack of Confidence in the system's precision and dependability • Lack of resources to maintain the system 	
[2] Development of a Web Base Information Management System for the Tea Industry		<ul style="list-style-type: none"> • Variety of Causes • Insufficient employee training • Lack of Integration • Poor data quality 	
Green leaf Information management system	(Our ITP project)	No failures found yet.	
		How to overcome failures?	1. Using QR for data input to overcome insufficient data inputs. 2. Auto generating notification to avoid omissions. 3. Analyzing data for future plans. 4. Manual calculations done using auto calculations by the system.

1. Supplier and Quantity Management

Every company must have a solid relationship with the suppliers of a company in order to create the best products. Suppliers exist outside of the business meaning that the company needs to be careful with the information that it provides to the supplier. So, this system is built to build a lasting relationship between suppliers and the company. The raw material management focuses on ensuring that no components are wasted. So, this system used manage the quantity of raw materials.

- **Register suppliers** – The supplier details are taken manually, and details are entered into the system by the manager to register suppliers to the system.
- **View tea quantity** – The manager can view the raw material supplied by each supplier daily.
- **Suppliers' analysis** – The administrator can generate a report through this system regarding supplier details.
- **Calculate quantity** -The system will calculate the total quantity.
- **Quantity analysis** - Generate report of provided raw materials in a month and a report on the daily provided tea by the supplier.
- **Notifying suppliers through message** -Message is sent to each supplier who had provided tea to the factory on each day. So that suppliers can see the amount of raw material provided by them.
-At the end of the month, a monthly report of provided tea by each supplier in that month is sent as a link to the supplier by the administrator through the system.

Supplier management

According to the client's requirements, the major problem the client had was no proper system to contact the suppliers who provide tea leaves to the factory. This supplier management function is used to manage the details of the supplier.

Users of the feature and their operations

[Create]	Enter supplier details. Details such as supplier name, NIC, Address, Age, contact number, and Account details are taken
[Read]	When the supplier provides raw materials, the supplied amount is entered by the officer using a mobile view. It is read by this system, then supplied amount by each supplier is viewed in the system.
[Update]	Staff can update the supplier details if needed. If new supplier prefers to provide raw materials, the staff can add the new supplier. Also, daily the provided amount of tea is updated day by day
[Delete]	If an existing supplier had stopped providing raw material, staff has the capability of deleting that supplier from the system
[Search]	Staff may search on each supplier's provided raw material amount by the supplier ID. Through the system, will fork it easier to find inform ion regarding supplier provided raw material amount. If needed staff can search on the total amount of a raw material provided by the supplier on each day.
[Report generation]	Generate monthly and daily reports for the suppliers and to the factory administration

Quantity management

The main aim of this system is to find whether there is a lost in the tea leaves brought to the factory. The total quantity of supplier provided raw materials and quantity brought to the factory by lorries are compared by the system to find whether there is a lost.

[Create]	The quantity brought by each lorry is added to the system and if the moisture will be added. Next the total amount of raw material is calculated by the system daily.
[Report generation]	A report is generated by administrator on the quantity of raw materials brought to the factory daily.

If there is any target available on a specific day a notification is sent to the quantity management system by target management system. It can be viewed by the administrator. If there is more raw material more than the given target on that day, a notification will be sent to the warehouse management system. By indicating amount raw material.

Non-functional requirement

- **Availability** - System can remain accessible, and operational for an extended period without and disruption of downtime.
- **Quick responsive**-The System have the ability respond quickly to users' requests.
- **Scalability**-The system can handle increasing number of suppliers.
- **Reliable**- Enabling to make informed decisions and manage the suppliers effectively.

Technical requirements

- **Data management** – The system can store and manage supplier data including their details.
- **Communication Management** -The system can facilitate Communication between supplier through features such as messages and with other management by notifications.
- **Report and Analytics** – The system can provide real-time reporting and analytic capabilities.

2. Transport and Raw material management

The management system for the tea factory must include the driver management function. It is in charge of overseeing every driver and vehicle used to move tea leaves from suppliers to the factory.

Keeping track of all the drivers in the factory is one of the key responsibilities of driver management. This comprises particulars of their driver's license as well as their name, contact information, and other personal data. This information is updated as required and removed when a driver leaves the factory.

The driver management function is in charge of not only managing the drivers but also maintaining information regarding each driver's particular truck. This covers the truck's make, model, registration information, and any other pertinent data. Moreover, these specifics are changed and removed as required.

The main responsibility of the drivers is to deliver tea leaves from the suppliers to the factory. Each route's required drivers and vehicles are assigned by the driver management function. This is done in tandem with the time schedule system, which notifies the driver management function of the pick-up and delivery times for tea leaves. The drivers depart once the routes have been determined.

The driver management function has the ability to track the locations of the drivers using geolocation APIs to make sure they are traveling the routes that have been given to them. This enables the system to track each driver's progress in real time. The system will alert the factory if a driver deviates from the planned itinerary.

The driver management feature offers a mobile user interface (UI) for the drivers to make picking up tea leaves from the suppliers easier. They can enter information about the tea leaves they pick up, such as the weight and the provider, using this. The driver's user interface also enables them to name-search for vendors along their route.

The driver management function offers the drivers a mobile user interface (UI) to make the process of collecting tea leaves from the suppliers easier. They are able to enter the weight and supplier information of the tea leaves they pick up. Also, the route's providers can be found by name using the driver's user interface.

The information is directed to the system's database once it has been entered into the system. This enables data sharing across various system elements, such as the driver management feature and the Supplier and Quantity management system.

In conclusion, the driver management function is an essential component of the management system for the tea factory. It guarantees efficient management of the drivers and lorries, timely pickup and delivery of the tea leaves, and real-time tracking and monitoring of the entire process.

Users of the feature and their operations

[Create]	By entering their name, contact information, and license information, new drivers can add records to the system
[Read]	Obtaining driver records from the system in order to either show them to the admin or use the data in other processes. This process could entail getting all of the system's records or looking for records using specific criteria
[Update]	Altering contact details, license details, or other personal data on already-existing driver records in the system. This procedure makes sure that driver records are current
[Delete]	Deleting driver records from the system, which usually takes place when a driver leaves the factory or loses their driving privileges. Records may be permanently deleted as part of this operation, or they may be archived for later use
[Search]	Offer a text search feature that enables admin to look for particular terms or phrases in driver data, like the name of a particular vendor or the time of a previous delivery.
[Report generation]	Allow admin to generate a report for monthly summery of total trips.

Non-functional requirement

- **Speed:** To ensure that data can be submitted and accessed quickly and effectively, the driver management function should operate with the least amount of latency and response time possible.
- **Portability and compatibility:** There shouldn't be any compatibility issues with the driver management feature while using a range of hardware, software platforms, and operating systems. Drivers and administrators will be able to use a range of devices and locations to access the system thanks to this.
- **Security and Reliability:** Data should not be lost or compromised as a result of system failure or outside threats, and the driver management function should be secure and dependable to guarantee that driver information is kept private. In doing so, the operations and reputation of the tea factory will be safeguarded.

Technical requirements

- **Real-time tracking:** The driver management function must have the capability to track the location of drivers in real-time using geolocation APIs, ensuring that drivers are following the planned route and alerting the factory if there is any deviation.
- **Mobile user interface:** The driver management feature should provide a user-friendly mobile interface for drivers to easily input data about the tea leaves they pick up, as well as locate vendors along their route.
- **Data sharing:** The driver management system should enable data sharing across various system elements, such as the supplier and quantity management system, ensuring that all relevant information is available for efficient management of the tea factory.

3. Supplier payment management

Payment management is the process of managing payments and payment data. Payment management also includes keeping track of payment history and managing refunds and chargebacks.

Management to consider before deciding about whether to use this type of system. The pros include the ability to automate payments, which can save time and money; the ability to track invoices and payments, which can help keep companies organized; and the ability to manage multiple payment methods, which can be helpful for businesses that accept different types of payments. The cons of Payment Management include the potential for errors, as well as the need for companies to be able to understand and use the system in order to take full advantage of its features.

Specifically, this section manages all payment of tea suppliers. The payment of the tea suppliers is currently done through an intermediary. Our client wanted the payment of the tea suppliers to be made through the company itself, so we included this function in the system.

Users of the feature and their operations

[Create]	Fertilizers are also provided, and all these allowances are included in the function through this system. The value of the above offer and tea buds is calculated automatically.
[Read]	Account details of the supplier, the weight of the tea buds supplied by each supplier and the supplier's ID are read through the system.
[Update]	The monthly value of 1kg of tea provided by the supplier varies from month to month. Therefore, here the monthly value of 1kg of tea buds provided by the suppliers through the company, one packet of tea is given to the supplier by the company every month.
[Delete]	All the unnecessary details in the history are deleted.
[Search]	The ability to search for details, supplier ID.
[Report generation]	At the end of this calculation a monthly payment report is generated and sent to the finance department.

Non-functional requirements

- Compatibility with supplier details.
- The system is readability to the supplier.
- The system is upgraded and maintained daily.
- Keep a backup of the generated documents.
- Be alert on supplier payment on time.
- The payment management system must have security.

Technical requirement.

- Accessibility.
- Authentication and authorization.
- Data quality.
- Information security.
- Interoperability.

4.Warehouse management

This function is used to manage the stock in the warehouse. Raw material, packing material, Final product and Machine parts are stored in the warehouse mainly. Through this function these items and the space for the final product can be managed.

- **Mange stocks** – The manager should categorize the stocks according to the type and enter the details of the stocks into the system.
- **Generate notification** – A notification will be auto generated through the system when the packing materials drop below specific amount.
- **Generate QR-code** - The manager can generate QR-code through the system to each end product stack in the warehouse.
- **Stock analysis** – Generating monthly report for released stock from the warehouse.
- **Receive notification** – The manager can view message sent from the machine and order managers, when the stocks are needed, and the stocks will be released from the warehouse.

Users of the feature and their operations

Raw materials

Tea leaves are considered as raw materials. Specific amount of tea leaves are used per day for the production of final product. Remaining tea leaves are stored in the warehouse because there should be a proper process to minimize wastage of tea leaves.

- | | |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| [Create] | The weight of remained tea leaves and the date when the tea leaves are received by warehouse is entered to the system. |
| [Read] | The admin can read the remaining raw material amount stored in the warehouse |
| [Delete] | That remaining tea leaves will be used for the production in the next day and then the previously entered details can be deleted from the system. |

Packing material

Multi Wallpaper Sack (MWPS) and food safe glue are used for packing purpose, and they are stored in the warehouse.

[Create] The number of stacks and liters of glue received to the warehouse are entered to the system.

[Update] A proper amount of packing materials which are needed for packing per day are released. Further, the remained number of materials is auto updated when released amount is entered.

As mentioned by client they had no system to be informed when there is a decline in packing materials

As a solution to this problem,

[Read] Packing materials should be in a constant amount of stock and when packing material amounts are dropped below a specific amount for an example (MWPS < 500 and glue < 100L), a notification will be auto generated by system.

- According to the current process that the company have, all details of the end- product is printed in the sack, details such as Date of production, type of the tea, grade of the tea and the unique ID relevant to the sack. The company had to bear big cost for these printing. To reduce the cost and make it user friendly, through the system a unique QR-code for each sack will be generated when needed, therefore the manager can scan for it and read the relevant details.

Final product

[Create] Production date and weight of each tea type (Black tea, green tea, White tea, Herbal Tea, Organic tea) stored in the warehouse is entered to the system.

A notification is received from the order management system when an order is placed. Then the order product will be released from the warehouse.

[Update] Those details (release amount and type of tea) will be entered into the system and the remaining amount will be auto updated in the system.

[Report generation] It is importance to reserved details about released orders. Therefore, a report is generated monthly including details about the amount of released orders of tea through the system when needed.

Machine parts

[Create] The parts that needed be replaced for certain machines are stored in the warehouse. Their details (name and amount of each part available) are entered into the system

- Notification will be received by machine management system when a part is needed.

[Update] When that machine part is released, the released amount will be entered, and the remaining amount will be auto updated by the system.

Next the specialty of the system is, it will display the remaining and allocated spaces for the product, this will help to manage the space in the warehouse for end products using the system.

Non-functional requirements

- **Performance** – The warehouse management can handle large volume of data and to process requests in a timely and consistent manner.
- **Usability** – This system is easy to use, had design to minimize errors and reduce need for extensive training.
- **Compatibility** – System is ability to integrate with other system and applications.
- **Maintainability**-Can updated without any causing downtime.
- **Availability** - In warehouse management ensure timely and efficient fulfillment of customer orders.

Technical requirement

- **QR-code scanning** -This system has the ability to scan the QR-codes on the packing materials and track the details.
- **Real-time data capture**-Could capture and process data in real time providing accurate information.
- **Reporting and analytics** -This system can generate reports provide analytics on released products.

5. Customer and Order Management

A tea factory basically depends on customers and their orders. Therefore, should mainly focus on the customer and order management sub-system. It handles by the manager who deals with this sub-section. The manager must input customer details into the system as a registered customer. And also should maintain separate profile descriptions for each customer.

- **Schedule orders**- The manager should categorize the orders according to types and should schedule for the time period which remains for the production.
- **Supervision stocks**- By analyzing stock details, the manager has to manage orders relevant to productions.
- **Notify through message**- An auto-generating message send to the target and time scheduling system for an increasing targeted production if the stocks are not enough due to high demand.
- **Order analysis**- Generate monthly and annual reports by analyzing and categorizing order types.
- **Customer analysis**- Generate customer reports by comparing the details of orders requested throughout the year/month.

Users of the feature and their operations

[Create]	Input customer details. Input order details.
[Read]	Reading customer profile description. Reading successful order details.
[Update]	Update customer information (contact number, address, etc) Updating order dates and order numbers.
[Delete]	Removing non-permanent customers who are not dealing currently. Removing released orders.
[Search]	Search customers who deal with every month recently. Search the order which has to be delivered soon
[Report generation]	Generating annual & monthly order reports

Non-functional requirements

- Update the order details on time.
- Should be easy to use even any sectional manager.
- Be alert on customer orders on time.
- Keep a backup of the generated documents.

Technical requirements

- Allows to work in all browsers.
- Should be mobile responsive.
- Browsing capability

6. Machine management

The Tea Factory Management System's Machine Management function is essential since it is in charge of keeping an accurate record of all the machines in the factory, including their components and repair schedules. This function makes sure that every machine is running as it should and that any repairs or part replacements are done as soon as they're required.

In order to achieve this, users may store all the information about each machine in the factory, including its make, model, serial number, and other pertinent facts, using the Machine Management feature. Admin have the option to update this data as needed and delete unused devices from the system.

The method also employs set intervals for machine maintenance and the replacement of new components. The system produces a notification five days before the planned date of a machine's servicing or component replacement, giving users time to make preparations.

The system also maintains a thorough log of every machine component, complete with its specifications and history of maintenance and replacement. By doing this, admin is guaranteed to have all the knowledge they need to repair and replace parts effectively and quickly.

The system notifies the supply department to order the necessary component whenever a machine needs maintenance or a part replacement. This function guarantees quick machine maintenance and repair, reducing delay and increasing output.

The financial section receives a report from the Machine Management function detailing the overall cost of maintaining machinery and purchasing new parts. This enables the business to keep track of its costs and decide on equipment upkeep and replacement with knowledge.

Overall, the Tea Factory Management System's Machine Management function plays a critical role in ensuring that all of the factory's machines are operating at peak efficiency and that any required maintenance or part changes are completed on time.

Users of the feature and their operations

[Create]	Adding machine records to the system, such as machine ID, make, model, serial number, and other relevant information.
[Read]	Retrieving machine data from the system in order to either show it to the user or use it for other tasks. This process could entail getting all of the system's records or looking for records using specific criteria.
[Update]	Updating repair schedules, maintenance windows, or other relevant information in the systems existing machine records. By performing this action, the system is guaranteed to have the most recent data regarding each machine
[Delete]	Deleting machine records from the system, usually when a machine is shut down or isn't being used anymore. Records may be permanently deleted as part of this operation, or they may be archived for later use.
[Search]	Deleting machine records from the system, usually when a machine is shut down or isn't being used anymore. Records may be permanently deleted as part of this operation, or they may be archived for later use.
[Report generation]	A summary of cost of machine service and buying new parts.

Non-functional requirement

- **Security:** To guard against unauthorized access, data breaches, and other security threats, the system should be designed and executed with security measures in place.
- **Performance, Maintainability, Scalability, and Usability:** The system needs to be well-performing, simple to manage, scalable to handle increased workload or user numbers, and user-friendly.
- **Reliability, Compatibility, Availability:** Admin should be able to access the system whenever they need it, and it should be dependable and function as intended across a range of running systems and web browsers.

Technical requirement

- Web-based system using secure web framework for data security.
- Search and filter capabilities for efficient data retrieval.
- Notification system for machine maintenance and part replacement.

7. Finance management

To manage finances more effectively and efficiently, Financial Management offers a simple and user-friendly solution. This system can increase accuracy and timeliness of financial information while streamlining financial procedures and lowering errors.

This system has many different characteristics and capabilities, such as:

1. Accounting module: Our system has the capacity to manage the general ledger, the expenses account, and the income account. This module offers a central repository for financial data, making it simple for you to keep track of financial transactions, keep an eye on cash flow, and keep precise financial records.
2. Financial reporting: Both income reports and expense reports can be produced using our system. The stakeholders may be given access to these reports.
3. Forecasting module: Also, our system offers a forecasting module with the capacity to build financial models and do financial analysis. This module provides insights into prospective future scenarios to assist you in making educated decisions about investments, finance, and risk management.

[Create]	User would have to login using their user credentials. Then the next step would be the user authentication process. After that user will be prompted to the financial management system. User profile is also included with the ability to edit the information if needed. User can create new items in the income account and the expenses account after referring the reports received from other respective management systems.
[Read] and [Update]	General Ledger and the charts of the forecasting module will be updated automatically. User can also read the items after the submission.
[Delete]	Delete details if user entered incorrectly.
[Search]	Filter out incomes, expenses and losses separately.
[Report generation]	User can also get the monthly financial report.

User can also refer to the charts of the forecasting module to conduct financial analysis to make informed decisions about investments, financing, and risk management.

Overall, our computer-based financial management system gives your business a simple, user-friendly solution to better and more effectively manage your funds. Our solution helps you reach your financial objectives by reducing errors, increasing accuracy, and promoting transparency in the financial operations.

Non-Functional requirements

- Interface should be easy to use and user friendly.
- Generate monthly reports on time.
- keep a backup of the generated reports.

Technical Requirements

- User authentication and authorization system for secure login.
- Automated update of the general ledger and forecasting charts.
- Filter functionality for searching incomes, expenses, and losses.

8. Time schedule and target management

Tea industry has had to face many expenses in production and mismanagement that had been a threat for its survival. The main reason for this is the lack of time and target management. If we do not manage the time well we might have to face many expenses, which would lead the company to a loss. Therefore we must manage time well and assign accurate targets to reduce the amount of expenses and increase the profit. So, it is essential to manage the time and target management function in order to make the system a success.

- **Setting targets** – The manager should set targets according to the orders received.
- **Setting time** – The manager should assign a time period for the drivers to bring the stock from the suppliers.
- **Managing a timetable** – Generate and manage a timetable for obtaining tea leaves from the suppliers on time.
- **Notifying through a message** – An auto-generated message is sent to the supplier and quantity manager saying that the target is set and the orders will be received on time.

Users of the feature and their operations

[Create]	Setting targets. Setting time periods for targets to be achieved
[Read]	Reading the targets received from the quantity manager. Reading time from the timetable
[Update]	Updating targets assigned to obtain tea leaves from suppliers. Updating time for orders to be received from the supplier. Updating the timetable
[Delete]	Removing targets that had been completed. Removing targets that had been set wrong or that had been cancelled

Non-Functional requirements

- Update the timetable on time.
- Be alert on customer orders to set new targets.
- Keep a backup of the generated timetable reports.
- The timetable should be easy to use by other managers.

Technical Requirements

- Planning
- Decision-making and prioritization
- Setting targets
- Time assessment

Methodology

Tools and technology

Introduction:

We are developing a web application using the MERN stack. The MERN stack includes React.js for the front end, Node.js and Express.js for the backend, and MongoDB as the database. This stack provides a robust and scalable platform for developing web applications. We are also using a range of other tools and technologies to support the development and functionality of our web application.



Frontend:

For the front end, we are using React.js, a popular JavaScript library for building user interfaces. React.js provides a range of features and tools for creating reusable UI components, handling user interactions, and managing the state. We are also using Material UI and Ant Design libraries to ensure a visually appealing and professional-looking user interface. These libraries provide a range of pre-built UI components and styles that make it easy to create complex and responsive interfaces.

Also, we use Material UI and Ant Design to design our web application.

Material UI is a popular React UI library that provides a set of customizable and reusable components for building user interfaces. It is based on Google's Material Design system and provides a consistent and modern look and feels to our web application. By using Material UI, we can easily add high-quality and responsive components, such as buttons, forms, and icons, to our front end.

Ant Design is another popular React UI library that provides a set of customizable and reusable components for building user interfaces. It is based on the principles of the Ant Design language, which is a design language created by Ant Financial, a subsidiary of Alibaba Group. Ant Design provides a wide range of components, including charts, tables, and forms, which can be easily integrated into our web application. It also provides a customizable and modern look and feels that can enhance the user experience of our application.

By using both Material UI and Ant Design libraries, we can add a consistent and visually appealing design to our front end, making it more engaging and user-friendly. We can also save time and effort by using pre-built components that have already been tested and optimized for performance.



Backend:

For the backend, we are using Node.js and Express.js. Node.js is a server-side JavaScript runtime that provides a robust and scalable environment for developing server-side logic and APIs. Express.js is a popular web framework for Node.js that provides a range of tools and features for building RESTful APIs.



Database:

To store and manage our data, we are using MongoDB. MongoDB is a powerful NoSQL database that is designed to handle large volumes of data and provide fast and efficient access to that data. We are using the Mongoose library to interface with the MongoDB database and provide a simple and intuitive data management system.



API Testing:

To test our APIs, we are using Postman, a widely used tool for API testing and documentation. Postman provides a user-friendly interface for sending requests to APIs and checking the responses, making it easy to identify and debug issues.



Mapping:

To provide mapping functionality in our web application, we are using Mapbox, OpenStreetMaps, and Leaflet JS. These are open-source mapping platforms that provide a range of features and tools for working with map data. We are using these platforms to provide real-time location tracking for our drivers and to display maps.



OpenStreetMap



Messaging:

We are using the Twilio API service to send messages to phones. Twilio is a cloud communications platform that provides a range of services for sending and receiving messages, making it easy to add SMS functionality to our web application.



Geolocation:

To track the location of our drivers, we are using the Geolocation API, which provides access to GPS location data from the device of the driver. This enables us to accurately track the location of our drivers and provide real-time updates to customers.



Code Editor:

VSCode provides a wide range of features that can improve the efficiency and productivity of our development process. Some of the key features include IntelliSense, which provides intelligent code completion and suggestions, debugging tools, which allow us to quickly identify and fix errors in our code, and Git integration, which makes it easy to manage our code repository.

In addition, VSCode supports a wide range of extensions and plugins, which can further enhance our development experience. For example, we can use extensions like Live Server to preview our web application in real-time, or ESLint to ensure that our code conforms to best practices and coding standards.

Overall, using VSCode as our code editor can improve our productivity and make our development process more efficient. We can take advantage of its rich set of features and extensions to write clean, efficient, and high-quality code for our web application.



Version Control:

For version control, we are using Git as our version control system. Git is a widely used and popular version control system that provides a range of features and tools for managing changes to code and collaborating with other developers. We are using GitHub as our hosting platform for our Git repository, which provides additional features such as issue tracking, pull requests, and code review tools.

In summary, we are using a range of tools and technologies to support the development and functionality of our web application. These include React.js, Node.js, Express.js, MongoDB, Postman, Mapbox, OpenStreetMaps, Leaflet, Twilio API service, Geolocation API, Visual Studio Code, Git, and GitHub. By leveraging these tools and technologies, we are confident that we can deliver a reliable, scalable, and visually appealing web application that meets the needs of our customers.



In conclusion, a variety of tools and technologies are being used to support the creation and operation of our online application. They include Twilio API service, Geolocation API, React.js, Node.js, Express.js, MongoDB, Postman, Mapbox, OpenStreetMaps, Leaflet, Visual Studio Code, Git, and GitHub. We are certain that by utilizing these tools and technologies, we will be able to provide our clients with a dependable and scalable online application.

Gantt chart

Task	February				March				April				May			
	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Analysis																
Requirement Gathering																
Requirement Analysis																
Preparing Charter Document																
Preparing Proposal Presentation																
Preparing Proposal Document																
SCRUM																
Design																
Proposal Evaluation																
Wireframe Drawing																
User Interface Design																
Database Design (ER)																
Database Development																
Document Design Specifications																
Development																
Develop System Modules																
Integrate System Modules																
Perform Initial Testing																
Progress Evaluation																
Testing																
Perform System Testing																
Debugging																
Implementation																
Final Report Writing																
Final Presentation and Viva																
Final Report Submission																
System Implementation																

References

- [1] S. M. J.S Mbogho, "WEB BASED FACTORY MANAGEMENT SYSTEMFORDEENSIDE TEA FACTOR," Course Hero, Colombo, 2010.
- [2] N. N. .K.Thirumalini, "The tes processing industry," North Eastern Development Finance Corporation Ltd, 2017.

Usercase diagram



Work breakdown structure

Name	Student ID	Work distribution
Wijethunga R.D.K.G	IT21240942	Supplier and quantity management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Sellapperuma M.S	IT21243226	Raw material transport management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Chandrasekara C.M.A.P.K	IT21255588	Order and customer management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Manathunga M.A.O.S	IT21224652	Time scheduling and time management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report

Dahanayake R.A	IT21270338	Supplier payment management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Bandara E.M.S.S	IT21239298	Warehouse management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Gunasekara G.H.M	IT21232022	Machine management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report
Thennakoon K.M.K.K	IT21232336	Finance management <ul style="list-style-type: none"> • User interface development. • Back-end development • Implementing related create, update, retrieve and delete function. • Creating database • Generating report