Sri Lanka Institute of Information Technology

Information Technology Project - IT2080

Group No -

Project Proposal Report

Electrical and Service Management System

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Company Background

Newton Electrical, located at No. 17/A Avissawella Road, Kaduwela, is a distinguished provider of electrical goods and services. Specializing in electrical installation contracting, Newton Electrical is dedicated to offering essential services to its customers, ranging from services such as scheduling wiring projects, A/C repairs (both commercial and residential), and security camera installations for its clients. Additionally, Newton Electrical offers various other electrical-related services and provides a wide range of electrical items to its clients.

With a focus on reliability and professionalism, Newton Electrical employs a skilled service team who conduct home visits for scheduled repairs and installations. Newton Electrical is committed to providing top-notch service to its clients, whether it's ensuring the safety and efficiency of electrical systems or enhancing security with advanced camera installations, it provides efficient service to clients.

Motivated by a passion for excellence and customer satisfaction, Newton Electrical stands out as a trusted partner for both residential and commercial electrical needs. With a reputation built on quality service team and personalized service positions Newton Electrical as the preferred option for individuals and businesses who are seeking reliable electrical solutions.

As technology continues to evolve, Newton Electrical keeps evolving by embracing new innovative approaches to electrical and service management. By staying alongside industry trends and advancements, Newton Electrical ensures that its customers benefit from cutting-edge solutions tailored to their specific requirements.

Problem and Motivation

Problems

In today's technologically driven society, individuals often encounter numerous challenges when it comes to searching and finding essential electrical services. These challenges hinder efficiency and lead to frustration among customers. The key problems include:

- Difficulty in locating and reaching out to electrical businesses offering essential services like wiring, A/C repairs, and security camera installations.
- Absence of a centralized system for customers to easily find and contact service providers.
- The company has relied on manual records to keep track of their service details, bookings, annual service packages and other log reports. This has made it difficult for them to access and manage past customer records, service log reports, and loyalty status.
- Inefficient management of electricals, leading to difficulties in tracking and ensuring that customers receive timely and comprehensive maintenance for their electrical systems.
- Limited accessibility to real-time updates or notifications regarding service appointments, status updates, or special offers, resulting in reduced customer satisfaction and engagement.
- Lack of or poor communication between the service provider and the customer, leading to misunderstandings, delays, or missed services.
- The absence of a mechanism to collect overall feedback results in biased opinions from customers, affecting future business growth.

Motivation

The motivation behind developing an Electrical and Service Management System lies in bridging the gap between customers and electrical service providers. By creating a centralized platform, customers can efficiently locate and contact business offering services such as wiring, A/C repairs, and security camera installations. Implementing such a system not only enhances customer convenience but also simplifies the process of booking required services, leading to quicker response times and improved satisfaction levels. Additionally, an Electrical and Service Management System can facilitate better communication between customers and service providers, ensuring smoother interactions and timely resolution of issues. Ultimately, the main motivation behind development of such a system aims to improve efficiency, enhance customer experience, and address the challenges currently faced in the electrical service industry.

Aim and Objectives

Aims

The main goals of an electric service company are to create a system that helps owners and managers run their operations smoothly, automate administrative tasks, and provide better service to customers.

1. Operational Efficiency:

   To Enable seamless handling of service requests, assignments, and completions for improved operational efficiency. The system should be intuitive for both customers and employees, enhancing overall service delivery.

2. Project Management:

   Aims to facilitate effective planning and control of electrical projects, ensuring tasks are organized, assignments are clear, and real-time updates on project progress are available.

3. Manage Resources Better:

   Aims to efficiently manage company resources including supplies, tools, and equipment by implementing a system that alerts for replacements and maintains orderly inventory management.

4. Enhanced Service Accessibility

   Provide customers with a user-friendly platform to easily locate and contact electrical service providers, facilitating efficient access to essential services such as wiring, A/C repairs, and security camera installations.

5. Simple Billing Processes:

   Aims to simplify and ensure accuracy in billing procedures based on customer usage, supporting various payment methods and providing transparent billing details.

6. Improved Maintenance Tracking:

   Implement tools for efficient management and tracking of electrical systems maintenance, ensuring timely and comprehensive service for customers to enhance system reliability and performance.

7. Performance Monitoring and Decision Support:

   Aims to track project and service performance through key metrics and timelines, providing managers with actionable insights for informed decision-making.

8. Employee Well-being and Collaboration:

   Support effective management of employee schedules, compensation, and performance while fostering collaboration and communication among team members.

9. Analyze user behavior:

   Examine user information and behavior to offer specialized suggestions and quality services based on their interests and preferences. To process user data and provide personalized recommendations.

10. Enhanced Customer Engagement:

    Aims to establish a communication channel between the company and its customers, providing updates, promotions, and event information to enhance customer engagement and satisfaction.

Objectives

1. Simplify Service Requests and Management:

   Objective: Simplify the process for customers to request and manage electrical services, including scheduling appointments, tracking service status, and receiving updates.

2. Develop a User-Friendly Platform:

   Design and implement a user-friendly platform for customers to easily locate and contact Newton Electrical for essential electrical services, ensuring seamless service accessibility.

3. Enable real Time Communication:

   Integrate real-time communication methods and notification systems to keep customers informed about service appointments, status updates, and special offers, enhancing engagement and satisfaction.

4. Implement an Integrated System:

   Implementing a single integrated system and offers wide range of electrical goods and services into an single platform, providing customers with comprehensive access to various offerings to their electrical needs all in one place.

5. Increase Revenue:

   Boost operational effectiveness and efficiency, enhance the customer experience, and ultimately increase revenue and profitability by implementing a better electrical and service management system.

The planned electrical and service management system will give customers an easy to use platform to find a variety of electrical goods and services. It aims to achieve these goals, creating a central, automated system that focuses on better customer satisfaction and efficient service delivery. This will help improve how the industry works and make it more efficient.

System Overview

System Diagram

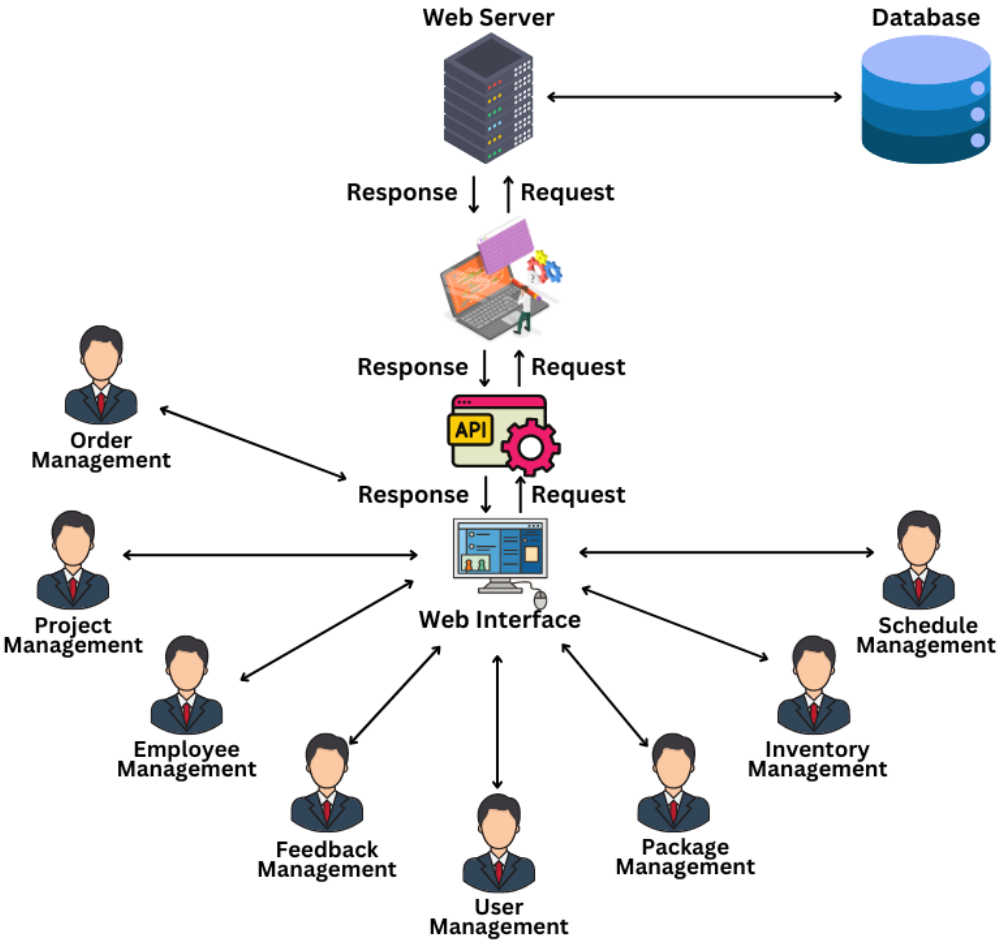

Figure 01

According to the system diagram, the primary subsystems are user, project, career, feedback, package, inventory, schedule, package, and order management, all of which interact with the web interface. The web interface communicates with the API, which sends requests to and receives responses from the backend, implemented using Node.js. Additionally, the backend is connected to the web server, which, in turn, interfaces with the database.

System Functional Requirements

1. User Management

A user management system within an electrical and service management system offers numerous functional requirements aimed at providing users with a customized and streamlined user experience. The system primarily has four user categories: unregistered users, registered users, employees, and user manager. Unregistered users have the ability to create new accounts, registered users can log in, and new employees can register with the system. The user manager is for managing all users and their data. Users can effortlessly navigate through their functionalities using the user dashboard.

Users can register with the system by creating an account simply by entering information, such as their names, unique email address, passwords and other relevant information. After registering for the system, users can login to the system using their username and password to manage their accounts. It also provides safe and reliable authentication methods to authenticate the user's identity, such as unique usernames and passwords. The system also enables users to edit their user information, reset password and delete the account if required. All these are possible because of the availability of the system.

The User manager is responsible for managing all users in the system. Also has the ability to assign roles or permissions to users. Also, can remove user accounts if they violate guidelines. Also, user manager can generate user reports which include details such as number of users, user activity report and other user details and search or filter user accounts based on certain criteria, such as account status or date of registration.

Employee accounts are also managed under this section, where employees can log in. Upon logging in, they will be directed to their profiles, and, like regular users, employees can make edits to their accounts. If necessary, employees can request account termination, the afterward process is handled by the user manager.

A special feature of the system is its reward point-based functionality. Users can unlock special rewards and free services based on the number of points they have earned, with the points determined by their user activity within the system. By providing such an interactive experience, it contributes to enhancing the overall customer experience in the system.

2. Career Management

Effective career management systems are essential tools in today's workforce management landscape for companies looking to maximize talent development, retention, and acquisition. Newton Electricals acknowledges the criticality of putting in place a strong career management system in order to promote smooth operations and improve customer satisfaction. The functional requirements that have been defined for the proposed career management system are described in detail below. This system aims to match employee talents and client needs with organizational objectives.

- User Registration and Profile Creation:

· When new employees join Newton Electricals, they ought to be able to log in and build extensive profiles in the career management system. These profiles ought to include all the necessary information. Once the employee is registered, he will direct to the interactive career landing page developed by the developer, which includes the data retrieved from the user employee profile manager.

- Job Listing and Search Functionality:

A well-curated list of current Newton Electricals job opportunities ought to be made available through the career management system. Employees and the HR manager (admin) should be able to examine this list and read the comprehensive job descriptions that are available which are posted by the HR manager (admin) . The system should also have strong search capabilities that let users narrow down job listings according to particular standards like department, area, or job title.

- Obtaining Resumes:

Through the career management system, Newton Electricals' clients who are interested in electrical services should have priority access to staff resumes. They ought to have the ability to peruse applicant profiles and choose suitable applicants according to their own needs and preferences; primarily, the HR manager would be able to view those as well. In order for the HR manager to review the resumes, confirm or reject the employment, and notify the employee by notification or another internal communication system (such as emails or phone numbers listed in the profiles), This feature improves openness and encourages direct communication between managers, clients, and prospective employees.

- Tools of Communication:

With integrated phone and email features, the career management system should enable smooth communication between customers and applicants. The system should also make it possible for clients and prospective workers to schedule interviews, promoting open and effective channels of contact.

- Notifications:

Robust alerting systems should be incorporated within the career management system to improve user engagement and responsiveness. Notifications on new job applications, updates on service requests, and other pertinent information should be sent to clients and staff in a timely manner. These alerts facilitate communication and guarantee timely reactions to important occurrences.

For the calculation and evaluation of the Function,

- Task Completion and Reporting:

HR managers should be able to check off tasks in the career management system so that others can see their advancement and accomplishments. HR managers, or admins, should use this information to determine the overall amount of work performed by staff members and to create thorough reports for performance reviews and pay increases. Within the company, this feature encourages accountability and makes data-driven decisions possible. The completed count of projects will be visible in each profile.

The clarification of functional needs highlights the critical function of an all-encompassing career management system in promoting worker engagement, streamlining talent acquisition, and augmenting customer happiness at Newton Electricals. Through the integration of these features, Newton Electricals hopes to improve personnel management, expedite hiring procedures, and increase overall operational efficiency.

Feedback Management

In analyzing the challenges faced in current electrical service management systems, it was observed that there is no mechanism to collect user feedback regarding the quality of services provided. This cause problems to the business owners to understand customer perceptions and areas for improvement.

Users should be able to provide feedback regarding the electrical services they received, including the performance of service technicians. Users should have the option to edit or delete their feedback as needed. The system should be accessible 24/7 to accommodate feedback submission at any time. Also customers can inquire about any thing from the company easily through contact us section which customer relations team will respond.

Once login and navigation to the relevant page, feedback manager should be able to view the feedback they have received from customers. This feedback provides information about the success of their service they received.

Both registered and unregistered users should be able to search for specific services. When searching for a service they are interested in, the system should display their ratings alongside allowing users to make informed decisions.

Newly submitted feedback should undergo approval by a designated manager, such as the customer service manager. Only approved feedback should be displayed on the respective service review section of the service. Managers should have the ability to approve or reject feedback submissions.

Customer service managers should be able to generate reports on user feedback and ratings for service technicians. These reports enable managers to analyze customer satisfaction trends and identify areas for improvement in service delivery.

4. **Service Schedule Management**

Service schedule management with the electrical service company streamlines the process for users, granting them the convenience to schedule services based on their availability and preferences. This system not only allows users to secure appointments but also enables them to make necessary modifications or adjustments as circumstances evolve. Through a user-friendly interface, customers can effortlessly coordinate electrical services, ensuring efficient communication and seamless scheduling. This booking functionality enhances user experience by providing a flexible and accessible avenue for obtaining timely and tailored

Unregistered users can freely explore our range of services. To book an appointment, a simple login or registration process is required to ensure a secure and personalized experience. Once users are registered, they can easily navigate to the appointment page, where a variety of service categories await them, ranging from air conditioning maintenance to wiring. Users can then refine their selection by specifying particular services, such as repairing an air conditioner or installing outlets. The system facilitates the process by presenting users with available dates and time slots, allowing them to pick the most convenient options. Following manager approval, a confirmation notification is promptly sent to the user, solidifying the booking.

For users who have successfully booked, the platform offers a convenient 'My Appointments' page, providing a detailed overview of all booking particulars. This user-centric feature not only ensures transparency but also allows users to adapt to changing schedules by offering an option to reschedule. The system intuitively displays alternative time slots and dates to accommodate evolving preferences. While users have the flexibility to cancel appointments, a managerial layer ensures that such cancellations undergo approval to maintain a well-coordinated schedule

The schedule manager utilizes advanced features in the system, generating insightful reports on bookings to aid decision-making. They are responsible for creating electricians' timetables, ensuring optimized resource allocation and workflow efficiency. Managerial approval, overseen by the schedule manager, extends to cancelation requests, contributing to a well-organized environment.

5. Inventory Management

An inventory management system within an electrical service management system is a crucial component that ensures efficient tracking, organization, and control of electrical components, tools, and equipment. It serves as a centralized platform where users can monitor the availability of these items in real-time to prevent stockouts and delays in service delivery. By enabling users to categorize electrical items based on type, specifications, and usage, the system facilitates easier management and retrieval, streamlining workflows and reducing downtime.

One of the primary functions of the inventory management system is to provide customers with access to their purchase history. This feature allows them to review past transactions, track expenses, and plan future purchases more effectively. Additionally, the system displays the availability status of each item on the store page, indicating whether it is in stock or out of stock. This transparency helps customers make informed decisions and reduces frustration caused by unavailable items.

Administrators play a crucial role in the inventory management system by adding new items to the inventory database. They input details such as item name, description, category, and price, ensuring accurate and up-to-date information for users. This allows for seamless integration of new products into the system and ensures that inventory records are comprehensive and reliable.

Overall, an effective inventory management system is essential for optimizing operations within an electrical service management system. It enhances visibility, efficiency, and customer satisfaction while empowering administrators to maintain a well-organized and up-to-date inventory database.

6. Offer Package Management

Some customers need to receive frequent services like repairing, replacing electronic components. In such a case, it isn't easy to contact a company regularly that provides electronic services. Then customers can choose monthly or annually subscription packages as a solution for this problem.

With its user-friendly form interface, the package manager can create carefully customized packages for the system. The package manager logs into the system using their credentials and

navigates to the package page. Upon arrival, they click on the "Add new" button, prompting a form to appear. They fill out the form with new package details, including prices and services. Each service within the package has its own price. After adding all services and their prices, the system generates the total package price. The package manager then clicks on the "Save and submit" button, adding the new package to the system with the total price displayed. Additionally, they can edit packages by selecting the desired package, clicking on the "Edit" button, and updating the package details in the displayed form. After making changes, they click "Save and submit" to finalize edits, updating the package details and total price. Furthermore, the package manager can delete packages by selecting the desired package, clicking on the "Delete" button, and confirming removal from the system.

Unregistered users can browse through available packages, but to receive them, they need to register with the system. Registered customers can view packages that are available after logging in. After logging in customers navigate to the package page and they can select the ones that best suit their needs and tastes by clicking on a package. After making their choice, customers can select their subscription between monthly and annual. Special discounts are offered for both monthly and annual purchases. Depending on the chosen subscription, the entire cost of the selected package is automatically lowered by a discount and displays the total price. After that, customers can continue to complete their choice by clicking the "Pay Now" button, they can make the payment or add selected package to the cart using “ Add to cart” option

The package manager creates monthly and annual reports about newly added packages, edited details of packages, and deleted packages. By keeping records of package additions, edits, and removals, the package manager can improve system performance and decision-making.

7. Project Management

The Project Management function within an electrical service management system serves as a pivotal component, seamlessly merging past and ongoing projects. Primarily overseen by a designated project manager, this module encompasses a spectrum of tasks aimed at enhancing project visibility and efficiency. The project manager's role encompasses adding new projects, categorizing them into distinct phases such as completed, ongoing, and future endeavors, and updating their statuses accordingly. This systematic approach fosters a structured representation of project history, encapsulating detailed insights into outcomes, encountered challenges, and key performance metrics, thus facilitating informed decision-making processes.

One of the salient features of the Project Management function is its provision of real-time updates on ongoing projects. By delivering transparent progress reports, the system empowers stakeholders with the requisite information to make informed decisions. This transparency not only fosters accountability but also streamlines communication channels, thereby optimizing resource allocation and timelines. Moreover, the integration of past project details with ongoing initiatives

ensures that historical data serves as a valuable asset, guiding current endeavors towards successful outcomes.

The holistic integration of past and ongoing project details significantly augments overall operational efficiency. By leveraging historical insights, the system can adaptively allocate resources, optimize timelines, and enhance client communication protocols. This approach underscores the system's commitment to delivering high-quality electrical services in a dynamic and informed manner, thereby bolstering stakeholder satisfaction and organizational reputation.

Furthermore, the project manager assumes a multifaceted role within the system, extending beyond project oversight to encompass user management functionalities. In addition to overseeing project lifecycles, the project manager has the authority to create, edit, and manage projects within the system's framework. Notably, they possess the prerogative to remove projects, thereby ensuring that outdated or irrelevant information is promptly expunged from the system.

Moreover, the project manager serves as the custodian of project-related data, tasked with generating comprehensive project reports. These reports offer stakeholders a bird's eye view of the company's project landscape, detailing metrics such as the number of completed projects, ongoing initiatives, and comprehensive breakdowns of project activities. By providing stakeholders with granular insights into project performance, these reports facilitate strategic decision-making and enable continuous improvement across organizational processes.

In summary, the Project Management function within the electrical service management system embodies a robust framework designed to streamline project workflows, enhance transparency, and drive organizational efficiency. By leveraging innovative features and functionalities, the system empowers stakeholders to navigate complex project landscapes with confidence, thereby ensuring the seamless delivery of high-quality electrical services in a dynamic and ever-evolving industry landscape.

8. Order Management

For the e-commerce functionality of an electrical and service management system that focused on excellence and customer satisfaction, a well-implemented modern order management system is a necessity. With the primary goal of streamlining and automating the complexities in the order management process, this ideally integrates with several kinds of other systems, such as user management systems, inventory databases, delivery companies, rating systems, and payment platforms to organize a perfect order flow. Mainly two types of users will interact with the OMS and all of them are required to log in to the system before doing so. Customers have the ability to place orders for the products they’re interested in, and the order manager is responsible for managing all orders, transactions and generating reports.

Customers can place orders for their selected products mainly in two ways: ordering directly from the item description page or checking out from the shopping cart. After making their purchase decisions, customers have to enter the quantity they need, select from available product variations, and then select their delivery preferences. The system offers two delivery modes: a home delivery mode where the ordered product will be delivered to customer's doorstep, and a store pickup mode where the customer have to collect their items from a warehouse. Once customers choose 'Buy Now' or 'Add to Cart', they will be redirected to the order confirmation page where they have to provide the details necessary for the successful completion of the order.

Then customers can choose between continuing with the payment or paying later. If they wish to proceed, the system will redirect them to a payment confirmation page and they are required to select a payment mode: online payment or cash on delivery. The cash on delivery mode may not be available for all products as it have to be decided by the supplier. For the online payment mode, the system will support all major payment methods such as card payments, EMTs, PayPal and other digital wallets for the added convenience. After customers provide all required information and comfirm the payment, the system will process it through a secure payment gateway. As described above, the order management system is essentially responsible for handling orders made for deliverable goods. But the payments made for scheduling of appointments and purchases of offer packages will also be handled by this payment management system which functions as a sub system of the OMS itself.

As customer retention and the prevention of uncertainties between the customer and supplier is necessary for the success of an e-commerce system, customers will be notified in real-time about their orders, from the placement to fulfillment. Customers have the complete access to their order and payment history, which increases the transparency of the system and helps them in finding out past-ordered products and tracking down price changes. Order history is well-categorized under few sections such as awaiting payment, processing, completed, awaiting shipment, awaiting collection, cancelled and dispute orders. Customers can cancel their orders at any time until it has been shipped or made available for collection.

Customers are given an opportunity to speak out to suppliers if they encounter any problems with their transactions. To provide customers with a better after-sales experience, the dispute raising functionality is introduced to the system. Customers can raise a dispute for an order due to the reasons such as the item is not as expected, something is broken or needs to be returned, but it have to be done within 3 months of the order fulfillment. Supplier is the first person to look into these disputes raised by customers, and both parties can discuss a solution to the problem, which many involve returning the product or issuing a half or full refund.

The order manager, the administrator who has the moderation power over the OMS, is responsible for managing all orders and transactions made throughout the system. He should be able to retrieve the order history of any customer and inspect them when necessary. If an order seems fraudulent or suspicious, the system will automatically hold it and notify the order manager, so he can take necessary actions. Order manager can filter all transactions using an advanced dashboard, and if there are any issues or violations, he can warn the user or limit their order related activities within the system.

If a dispute raised by a customer is not resolved by the supplier for a certain period, the order manager will step in and propose the best possible solution. Also, the order manager can generate reports on orders and transactions such as order fulfillments report, return authorizations report, monthly sales report, best selling products report which may include data on purchased products, their quantities, delivery times, carrier efficiency, sales, selling rates and return rates etc. By providing a such a streamlined user experience with increased transparency, OMS, the central nervous system of the e-commerce functionality, efficiently plays its role in enhancing the overall stability and the user experience of the system.

Non Functional Requirements

The system must meet the functional requirements of the users, which may include specific features or capabilities that the system must have in order to meet the needs of the user.

Performance:

The system must be able to perform its intended functions in a timely and efficient manner, with fast response times and minimal downtime.

Scalability:

The system must be able to scale to handle increasing amounts of data, users, or transactions without sacrificing performance or stability.

Reliability:

The system must be reliable and able to operate continuously without failure or unexpected downtime.

Security:

The system must be secure and protect user data and sensitive information from unauthorized access or attack.

Cost:

The system must be cost-effective, with a reasonable cost that is commensurate with the value that it provides to the user.

Compatibility:

The system must be compatible with other systems or software that the user may use, with the ability to exchange data or integrate with other systems, as necessary.

Usability:

The system must be easy to use and navigate, with an intuitive interface that is accessible to users with varying levels of technical expertise.

Accessibility:

The system must be accessible to users with disabilities or other special needs, with features that make it possible for all users to access and use the system.

Maintainability:

The system must be maintainable, with the ability to update or modify the system as necessary to fix bugs, add features, or improve performance.

Technical Requirements

Web-based System

Users can access the system using a web browser, making it convenient for them to use on any device with an internet connection.

Back-end

This is like the system's brain, handling tasks like storing and managing data, and ensuring everything runs smoothly behind the scenes.

User interface (Front-end)

It's what users see and interact with directly - like buttons, forms, and menus - making the system easy to use and navigate.

Database:

The system should have a database to store and manage data efficiently and effectively.

Security

This keeps everything safe and secure, making sure only authorized users can access sensitive information and protecting against cyber threats.

Data Management

Effective data management capabilities, including data storage, retrieval, processing, and analysis, are crucial for handling and leveraging large volumes of data efficiently.

Performance

To satisfy the needs of the users, the system should be built to function successfully and efficiently.

Maintainability

The system should be easy to maintain and update, with clear documentation, and efficient debugging tools to facilitate troubleshooting and updates.

User Interface:

The system should have an easy-to-use interface that allows users to interact with the system and perform necessary tasks and easy navigation without complexity.

Literature Review

	Similar solutions			
Features	STRADA	Electro-serv Lanka	DNA	Service Titan
User Management	yes	non	non	yes
Career Management	yes	non	non	yes
Feedback Management	yes	yes	yes	yes
Project Management	yes	non	yes	non
Inventory Management	non	non	yes	non
Order Management	non	non	yes	non
Package Management	non	non	yes	non
Schedule Management	yes	non	yes	non

Table 01

Within the domain of contemporary commercial operations, the incorporation of effective software solutions is essential for boosting efficiency and optimizing procedures. As a young

company in the electrical goods sector, Newton Electricals understands how critical it is to implement a full of functions web application in order to satisfy its operational requirements. In order to make this easier, a comparison between the features of the suggested features of the Newton Electricals web application and the features of the current solutions —STRADA [1], Electro Serv Lanka [2], DNA, and Service Titan —has been carried out.

User Management:

STRADA: Provides features for managing users.
There are no user management tools on Electro-serv Lanka.
DNA: It is devoid of user management features, just like Electro-serv Lanka.
Service Titan: Offers features for user administration.

Career Management:

STRADA: Contains tools for career management.
Electro-serv Lanka: Does not provide tools for career management.
DNA: Likewise, it is devoid of career management features.
Career management features are included in the Titan service.

Feedback Management:

The feedback management features of all four solutions—STRADA, Electro-serv Lanka, DNA, and Service Titan—ensure effective channels of communication between stakeholders.

Project Management:

STRADA provides resources for Project management.
There are no project management features in Electro-serv Lanka.
DNA: Offers features for project management.
Provision of services Titan: Does not provide tools for project management.

Inventory Management:

STRADA: Lacks features for inventory control.
Electro-serv Lanka: It is not capable of inventory management, just like STRADA.
Tools for inventory management are included into DNA.
Provision of services Titan: Does not provide features for inventory control.

Order Administration:

Order management features are absent from STRADA.
Electro-serv Lanka is unable to handle orders.
DNA: Offers features for order management.
Provision of services Titan: Does not provide tools for order administration.

Package Management:

STRADA: Lacks features for package management.
Electro-serv Lanka: It is not capable of managing packages, just like STRADA.
DNA: Contains tools for managing packages.
Service Titan: Does not provide features for package management.

Schedule Management:

STRADA: Provides tools for managing schedules.
Electro-serv Lanka: No features for managing schedules.
DNA: Offers features for managing your schedule.
Provision of services Titan: Does not provide tools for managing schedules.

Comparing STRADA, Electro-serv Lanka, DNA, and Service Titan reveals a range of features and functionalities in project management, inventory management, order management, package management, schedule management, career management, and feedback management. But none of these options fully captures every characteristic that Newton Electricals requires for its operations.

Therefore, the Newton Electricals web application that is being offered seeks to combine the key features that have been found in these current solutions in order to provide a customized, all-inclusive platform that maximizes operational effectiveness and makes it easier to handle different parts of the organization.

Methodology

Methods

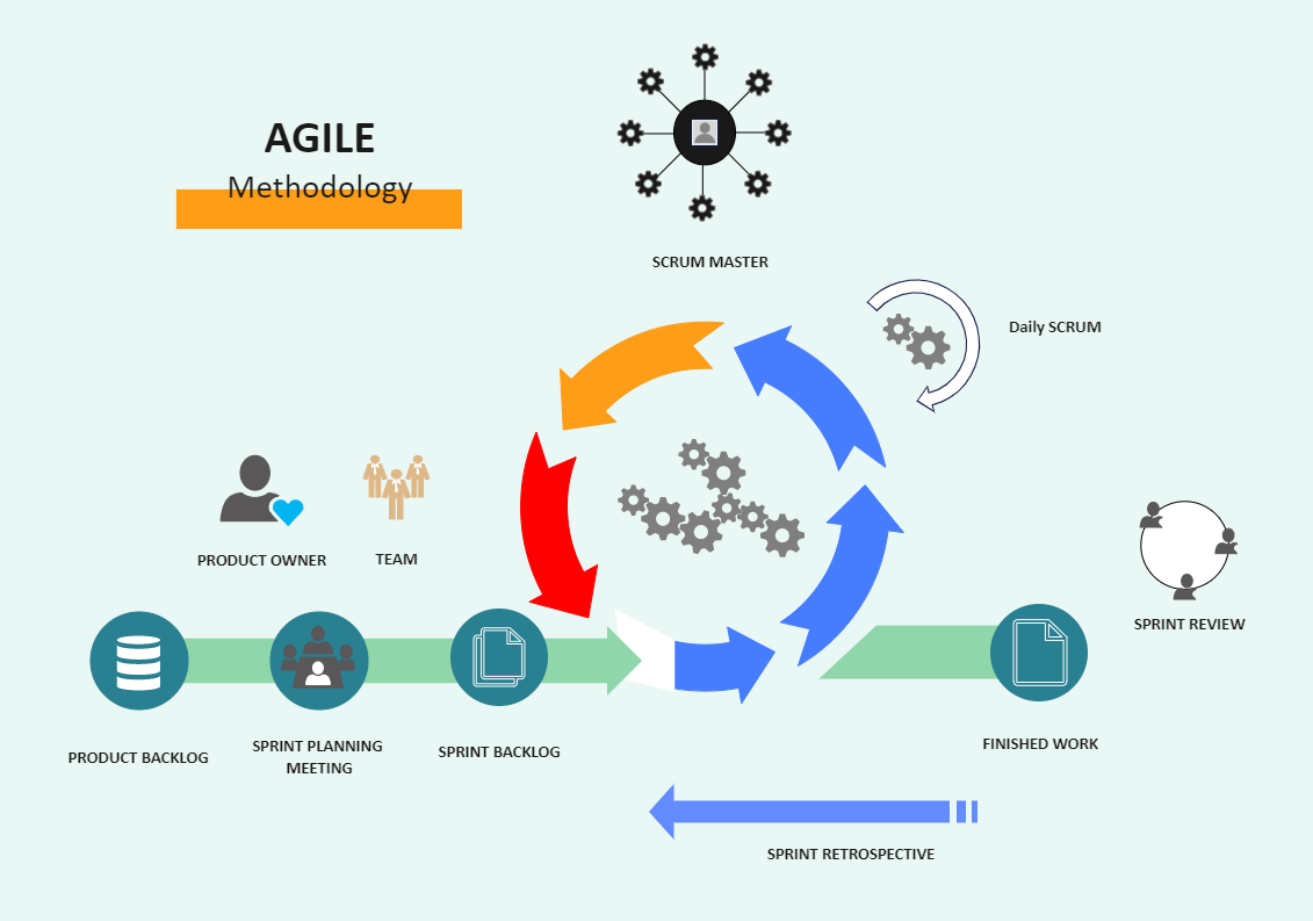

Figure 02

Agile methodology is an iterative software development process that puts a focus on adaptability, flexibility, and teamwork. In contrast to waterfall methodologies, which work in a straight line, Agile divides projects into smaller portions called "sprints," which usually span between one and four weeks.

This is how Agile functions:

Iterative Development: Agile breaks the project up into more manageable, smaller work packages called features or user stories. Delivering a functional product increment is the main goal of each iteration.

Customer Collaboration: Agile places a strong emphasis on keeping customers informed at every stage of the development process. Iterations are made with input from stakeholders and customers to make sure the end product fulfills their needs.

Cross-Functional Teams: Agile teams are usually made up of developers, testers, designers, and other essential personnel. They are also usually small and cross-functional. This arrangement promotes cooperation, exchange of ideas, and joint project ownership.

Agile's adaptability acknowledges that needs and priorities may change over time and welcomes change. Teams maintain their adaptability and receptivity to evolving opportunities, consumer input, and shifting market conditions.

Continuous Improvement: At the conclusion of each iteration, agile promotes introspection and adaptability. Teams use retrospectives to find areas for growth and make adjustments to improve workflow and output.

Transparency: Throughout the development process, agile fosters visibility and transparency. Stakeholders can keep an eye on the project's status in real-time by using tools like task boards and burndown charts to measure progress.

All things considered, teams using the Agile methodology are able to produce high-quality software more quickly, adapt to change, and ultimately meet client needs more successfully than they could with traditional development techniques.

A revolutionary approach to software development is provided by integrating Agile technique into the creation of Newton Electricals' online application. Newton Electricals can enhance its ability to deliver high-quality web applications that meet the changing needs of its workforce and clients more quickly by adopting Agile principles, which include iterative development, customer collaboration, cross-functional teams, adaptability, continuous improvement, and transparency. The web application is well-positioned to promote corporate growth and success in the highly competitive electrical products industry thanks to this agile-driven approach, which also improves the process' efficiency and effectiveness.

Tools and Technologies

Our web application uses the MERN stack for building our web applications. It includes MongoDB for handling databases, Express JS for making servers work smoothly, React JS for creating interactive user interfaces, and Node JS for running the backend efficiently.

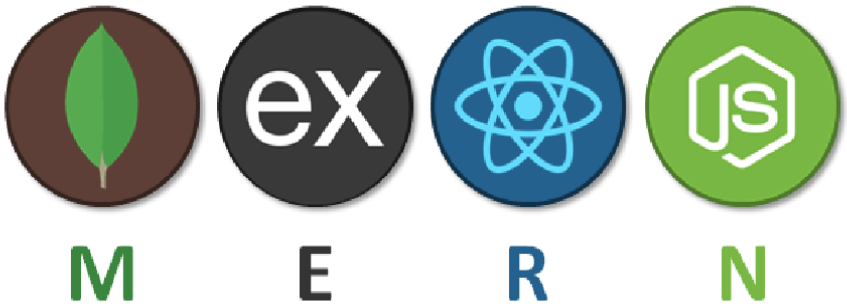

Figure 03

MongoDB is a flexible and scalable NoSQL database that stores data in JSON-like documents, providing high performance and flexibility for handling various types of data. [3]

ExpressJs is a minimalist and flexible Node.js web application framework that provides a robust set of features for building web and mobile applications. [4]

React JS is a JavaScript library for building user interfaces, developed by Facebook. It allows developers to create reusable UI components that can efficiently update and render data changes. [5]

Node.js is a cross-platform, open-source JavaScript runtime environment It allows developers to run JavaScript code outside of a web browser, making it ideal for building scalable and high-performance server-side applications. [5]

Gantt Chart

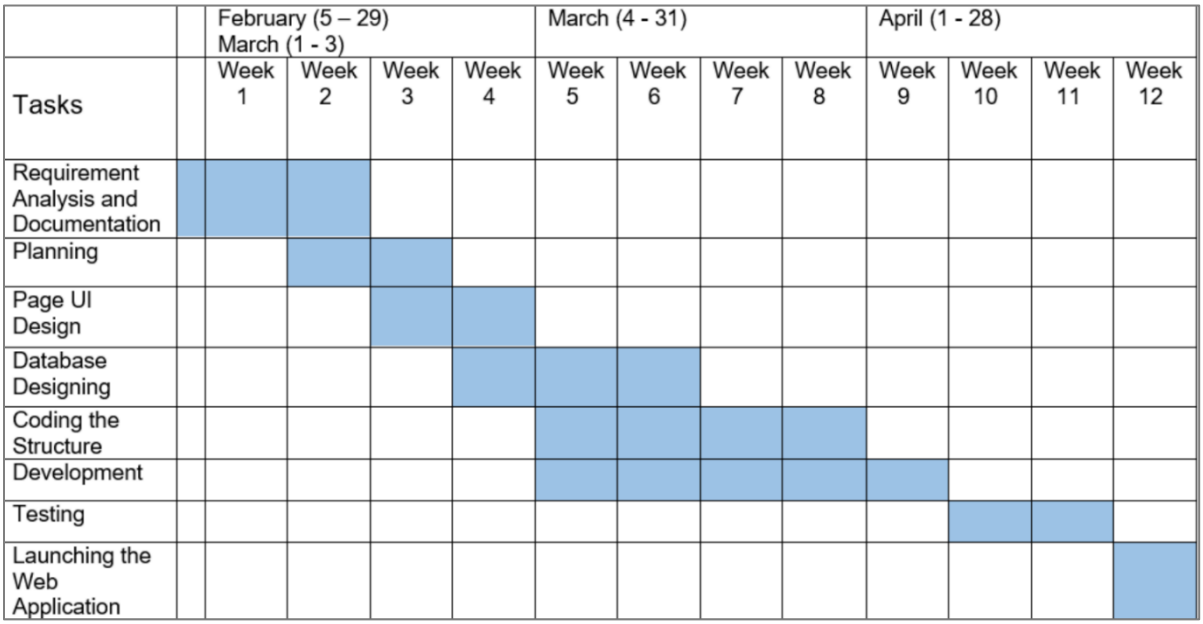

Figure 04

We started gathering details even before the semester started and it took 2 weeks from the semester starting date to complete our requirement analysis and documentation phase. We were able to gather all of the necessary information to be able to complete our requirements without any problems.

The second week was spent planning the project and within the third week we started to work on the UI design of the page. We have achieved a great result so far and are looking forward to the next step in the project.

During the fourth week we have decided to work on the database design phase for about three weeks.

Since we've been working on the database design phase, we've decided to add more features to it. We've made progress on the first two levels, but we need to add more features to the second layer. This will make the database more complicated, but it's important work that we need to continue.

Meanwhile, coding within the fifth week begins, and will continue for the next six weeks. This will allow you to complete the project by the end of the seventh week.

We are excited to begin our coding within the ninth week and developing with the hope of covering all aspects of the project. We are looking forward to learning more about coding, as well as the various development tools that we will be using.

Starting on the twelfth week after the testing phase, the web application will be launched. The application will be available during the eleven week period following the phase.

Work Breakdown Structure

Student ID and Name with initials	Task
Jayasinghe J A D T S IT22028464	**User Management:** User management Handles and manages all users in the system and assigns roles to users for improved efficiency in daily operations. User interface development, backend development, database creation and implementing CRUD. Completed company background, problem and motivation and system diagram section of the proposal.
Wimalarathna B P K IT22059604	**Career Management:** Career management-managing and handling all the engagements between the employees and management staff, optimizing their productivity and performance efficiency. User interface development, backend development, database creation and implementing CRUD. Completed Literature Review, Agile Software Engineering Methodology section of the proposal.
Gimsara W T G IT22898098	**Feedback Management:** Efficiently collects, manages, and analyzes user feedback to improve service quality and customer satisfaction in electrical service management system. User interface development, backend development, database creation and implementing CRUD. Completed nonfunctional requirement section of the proposal.

Reid P R IT22575944	**Service Schedule Management:** Organizes and tracks user appointments for electrical services, ensuring smooth communication and efficient scheduling. User interface development, backend development, database creation and implementing CRUD. Completed aims and objectives section of the proposal.
Galappaththi A G R S IT22345578	**Inventory Management:** An inventory management efficiently handles electrical tools, and equipment, ensuring real-time availability of items. User interface development, backend development, database creation and implementing CRUD. Completed evaluation methods section of the proposal.
Dayarathne R D T N IT22578396	**Offer Package Management:** Enables customers to subscribe packages, while the package manager creates, edits, and deletes packages, and generates reports for system improvement. User interface development, backend development, database creation and implementing CRUD. Completed technical requirements section of the proposal
Perera M M D IT22581716	**Project Management:** Oversees tasks and progress tracking within the system, led by a project manager. User interface development, backend development, database creation and implementing CRUD. Completed tools and technologies and Gantt chart section of the proposal
Madhubhashana M D H P IT22322876	**Order Management:** Handles browsing, ordering, and payment processes, with features like cart management, multiple payment options, and order tracking, ensuring efficient e-commerce operations. User interface development, backend development, database creation and implementing CRUD.

Table 02

Evaluation Methods

The objective of the assessment is to analyze designs and test systems to ensure they operate as intended and meet user requirements. This evaluation process should be ongoing throughout the design life cycle, with design revisions influenced by the findings of the assessment.

Software undergoes evaluation using various approaches, including benchmarking, testing, interviews, focus groups, inspections, walkthroughs, and user feedback.

In our project, we intend to utilize benchmarking, user feedback testing and focus groups as evaluation methods.

- Benchmarking
- User feedback
- Testing
- Focus groups.

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Appendix

Figure 01 – System Diagram

System diagram is a diagram that defines the boundary between the system, or part of a system, and its environment, showing the entities that interact with it. It includes components like hardware, software, processes, and data flows, providing a comprehensive overview of system.

Table 01 – Literature Review

A literature review is a summary of what has been written about a particular application or research question, helping researchers understand what is already known and what gaps exist in the existing knowledge.

Figure 02 – Agile Methodology

Agile methodology is a flexible way of making software. It involves working in short bursts, collaborating closely, and adjusting plans as needed based on feedback.

Figure 03 – MERN

MERN is a popular stack of technologies used in web development. It combines MongoDB, Express.js, React, and Node.js to create full-stack web applications.

Figure 04 – Gantt Chart

A Gantt chart is a type of bar chart that helps people visualize the schedule of a project. Each task is represented by a horizontal bar, with its length showing how long it is expected to take.

Table 02 – Work Breakdown Structure

A Work Breakdown Structure is like a roadmap for a project, breaking it down into smaller tasks and subtasks. It helps to organize and understand all the work needed for the project, from start to finish.