Task 1 – Proposal for Health Advice Group

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**Executive Overview**

Rolsa Technologies requires a new digital solution to enhance communication with both existing and potential customers while also supporting their internal operations. Currently, the company specializes in:

* Solar panel installation and maintenance
* Electric vehicle (EV) charging stations
* Smart home energy management systems

To expand their customer engagement and improve service delivery, they now require a platform that will:

* Provide information about green energy products available on the market
* Offer advice on how customers can reduce their carbon footprint
* Enable customers to schedule consultations and installations
* Allow users to calculate and track their carbon footprint

Following market research, Rolsa Technologies has identified key features to be included in the solution, such as:

* Account registration for managing consultations and data
* Accessibility features to accommodate a wide range of users
* A tool for calculating and tracking energy usage

The proposed digital solution will be designed to meet these needs efficiently and will be developed within the expected timeframe. By implementing this platform, Rolsa Technologies will improve user engagement, streamline service delivery, and contribute to a more sustainable future.

**Activity A:**

**Business Context**

**How Does This Relate to the Business?**

Rolsa Technologies requires a digital solution to enhance customer engagement while providing essential information and tools related to green energy. The platform must support both existing and potential customers, ensuring that they can make informed decisions about sustainable energy solutions. The need for this solution is evident in the features requested by Rolsa Technologies, such as account registration, energy usge tracking, and accessibility options. These features will allow users to interact with the platform effectively and access crucial information about solar panels, EV charging stations, and smart home energy management systems.

**User Needs**

**Who Will Use the Product?**

The digital solution will be designed for all sorts of customers, as well as Rolsa Technologies' employees who may use it for scheduling and customer support. The primary focus, however, is to provide users with upnto date green energy information and tools to help them reduce their carbon footprint. The requested features indicate that users want a platform that is informative, accessible, and interactive. Key user needs include but are not limited to: Account registration for managing consultations and tracking energy usage. Customers may want to log in and track their appointments, installations, and energy consumption over time. A tool for calculating and tracking energy usage Users will be able to enter their energy consumption details and receive insights on how to improve efficiency. Accessibility features The platform must be designed to accommodate users with different needs, including those with visual impairments.

**How Will Users Interact with the Solution?**

Based on Rolsa Technologies’ requirements, the solution will be highly interactive and designed to meet both functional and non-functional needs.

**Functional Requirements [Epics]**

The solution will include the following core features:

* Providing information about green energy products and sustainability
* As a customer, I want to access up-to-date information about solar panels, EV charging stations, and smart home energy solutions.
* As a customer, I want an intuitive interface with images and interactive elements such as "read more" buttons for easy navigation. Allowing customers to schedule consultations and installations
* As a customer, I want to easily book a consultation with an expert for solar panel installation or EV charging solutions.
* A tool for calculating and tracking energy usage As a customer, I want to input my energy consumption details and receive insights on how to reduce my carbon footprint. Accessibility features
* As a customer with sight loss, I want to navigate the platform using screen readers and high-contrast modes. Account registration for managing consultations and tracking energy usage
* As a returning customer, I want to log in and view my scheduled installations, past consultations, and energy-saving progress.

***Conclusion***

The digital solution for Rolsa Technologies will be designed to meet these needs, ensuring an intuitive, informative, and accessible experience for all users. The platform will provide valuable insights on sustainable energy while allowing customers to schedule consultations, track their energy consumption, and explore green technology solutions. By implementing these features, Rolsa Technologies will enhance customer engagement and support its mission of promoting eco-friendly energy solutions.

**Non-Functional Requirements**

**Security**

Since customer data will be stored within the digital solution, it is essential to ensure that this information is protected. The system must use secure database management and encryption methods to prevent unauthorized access. Implementing secure authentication protocols will ensure that only authorized users can access their personal data.

**Performance**

The platform must be responsive and efficient, ensuring that all interactive elements—such as buttons, navigation menus, and calculation tools—function correctly and provide immediate feedback. The system should handle multiple users at once without delays, maintaining a smooth and seamless user experience.

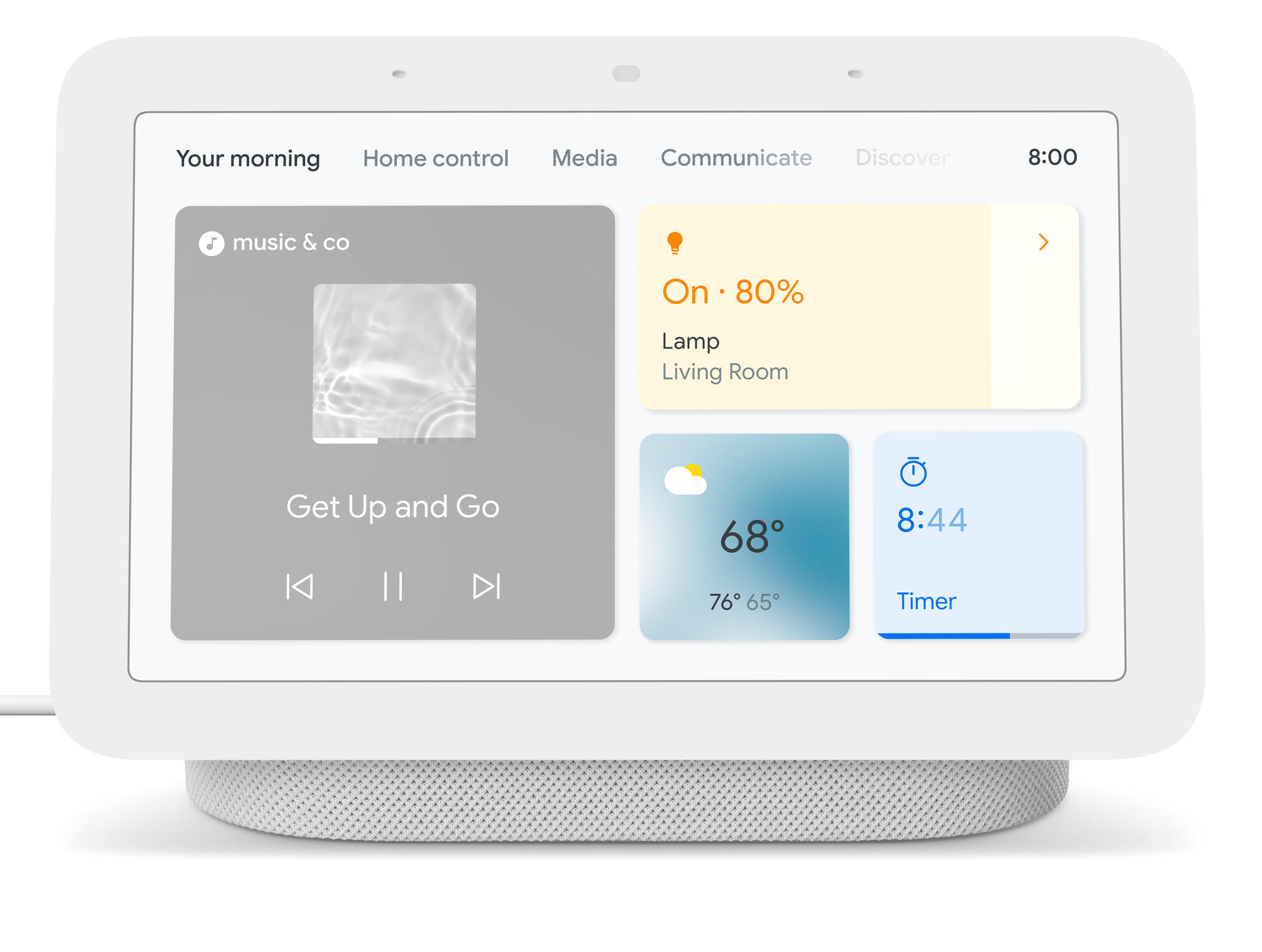
**Safety**

As users will be entering personal details, it is critical to implement data protection measures that prevent unauthorized access. Features such as secure login systems and encrypted data storage will ensure that only the account owner can view and modify their information.

**Quality**

User experience is a key priority for this solution. The interface must be intuitive, visually appealing, and accessible, ensuring that users can navigate the platform easily. High-quality design principles, including clear layouts, consistent colour schemes, and smooth functionality, will help create a professional and user-friendly experience that aligns with Rolsa Technologies' branding and customer expectations.

**Description**

Google Nest is a leading digital solution provider specializing in smart home technology designed to manage energy efficiently. Nest offers devices such as smart thermostats, cameras, doorbells, and speakers, all designed to help users manage their home energy usage effectively. Users can monitor energy consumption, optimise efficiency, and control their smart devices remotely through an intuitive app interface. Additionally, the Google Home app provides valuable insights and advice to help users lower energy usage and reduce their overall carbon footprint. 

**How it Uses Hardware/Software**

* Compatible with both iOS and Android devices
* Web-based platform accessible through browsers, smartphones, and tablets
* Requires internet connectivity for real-time monitoring and control
* Integrates seamlessly with various smart home devices (thermostats, security cameras, smart speakers, etc.)

**Strengths, Weaknesses, and Application to User Needs**

**Strengths**

* Multi-platform access (web-based, iOS, and Android devices), increasing accessibility for a wide range of users.
* Provides users with detailed energy usage tracking and insights, directly supporting Rolsa Technologies’ goal of helping customers manage and reduce their carbon footprints.
* Intuitive and accessible interface, allowing easy management of smart home features even for users less familiar with technology.
* Regularly updated software ensures consistent performance and reliable functionality.

**Weaknesses**

* Primarily geared toward home automation and energy management; lacks built-in scheduling specifically for consultations or installations.
* Limited direct information about broader green energy products (e.g., solar panels or EV charging stations), requiring additional resources or integration.

**Overall Relevance to Rolsa Technologies**

Google Nest offers several strengths relevant to Rolsa Technologies' digital solution, particularly its robust integration with smart home energy management systems and user-friendly energy-tracking capabilities. Its multi-platform support (mobile and web) would make Rolsa’s solution accessible to many potential customers, satisfying the accessibility and energy-management features requested by clients. However, to fully meet Rolsa Technologies' requirements, additional features such as consultation scheduling, detailed product information (e.g., solar and EV charging solutions), and specialized tools for carbon footprint calculation would need to be developed or integrated into the platform. This makes Google Nest an excellent reference model, providing inspiration for key features and demonstrating the importance of usability and multi-platform access in the proposed solution.

### **Description**

Tesla Energy App is a real-world digital solution focused on helping customers monitor and manage sustainable energy technologies such as solar panels, home battery storage (e.g., Powerwall), and electric vehicle charging. The app provides detailed real-time data on energy production, consumption, and storage. Users can track their energy usage, monitor solar energy generation, and manage charging schedules remotely, empowering them to make informed decisions about their home energy use and sustainability practices.

### **How it Uses Hardware and Software**

* iOS and Android Compatible: Available as an app, ensuring accessibility from smartphones and tablets.
* Integration with Hardware: Connects directly to Tesla’s solar panel systems, Powerwall batteries, and electric vehicle chargers.
* Internet Connectivity: Offers real-time data synchronization, updates, and energy usage reports via the internet.

### **Strengths, Weaknesses, and Application to User Needs**

#### **Strengths**

* Cross-platform Accessibility: Accessible via smartphone apps, allowing users to manage and monitor their home energy systems remotely.
* Real-time Energy Monitoring: Provides detailed insights into energy generation and consumption, directly supporting Rolsa’s requirement for energy tracking and carbon footprint reduction.
* User-friendly Interface: Designed to accommodate various user demographics with clear and intuitive controls.
* Encourages Sustainable Living: Empowers users to optimize energy efficiency, aligning closely with Rolsa Technologies’ sustainability goals.

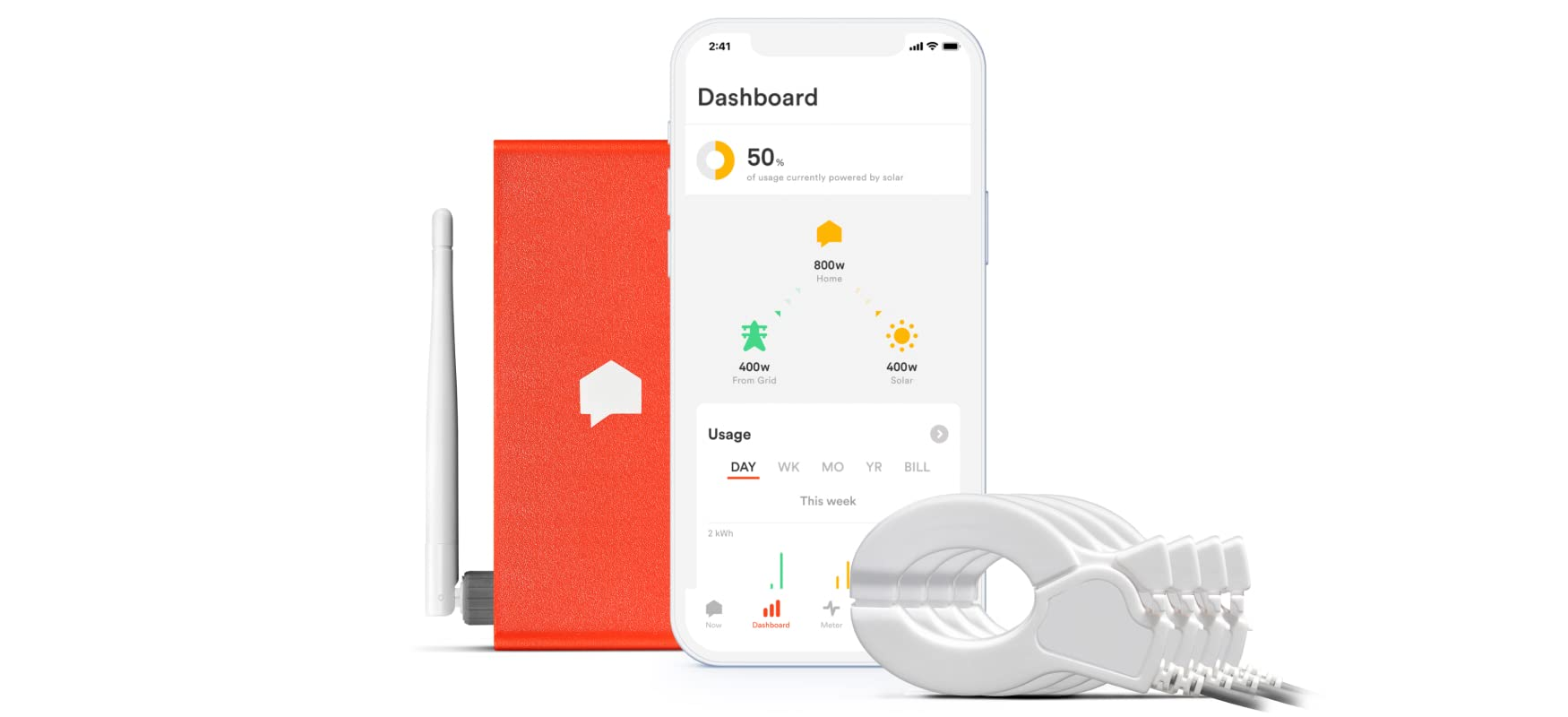
#### **Weaknesses**

* Primarily designed for existing Tesla hardware users (e.g., solar panels and battery systems), which may limit integration with other brands without customization.
* Limited direct capability for scheduling third-party installations or consultations outside Tesla’s own services.
* Does not include comprehensive content or educational resources beyond Tesla’s own products.

### **Overall Relevance to Rolsa Technologies**

Tesla Energy App aligns well with several key aspects of the digital solution required by Rolsa Technologies. Its strengths, such as detailed energy monitoring, multi-platform accessibility, and intuitive design, directly address Rolsa’s stated user needs. However, it lacks certain desired features, like consultation scheduling or broader informational content on various green technology products. These areas would need additional development to fully meet Rolsa Technologies’ requirements. Nevertheless, Tesla Energy App provides an excellent reference model for demonstrating successful integration of hardware, software, and user-focused features in a green technology solution.

### **Description**

Sense Home Energy Monitor is a smartphone app and web-based solution that enables users to track their home energy consumption in real-time. It offers features such as detailed energy-usage monitoring, device-level tracking, and personalized insights to help users reduce their energy consumption. Additionally, Sense provides advice on energy-saving habits and helps users understand how different devices impact their overall energy footprint.

### **How it Uses Hardware and Software**

* Available on iOS and Android apps: Providing convenient mobile access to users on various platforms.
* Web Access: Users can manage their energy information through a browser-based interface accessible from any internet-connected device.
* Smart Hardware Integration: Uses specialized sensors installed in home electrical panels to accurately measure electricity use at the appliance level.

### **Strengths, Weaknesses, and Application to User Needs**

#### **Strengths**

* Provides detailed real-time energy tracking and monitoring at the individual appliance level, aligning directly with Rolsa Technologies’ requirement for a tool to track and calculate energy usage.
* User-friendly interface that clearly visualizes energy data, supporting Rolsa’s accessibility goals.
* Includes resources and advice about reducing energy consumption, supporting Rolsa Technologies’ aim of educating customers about green energy solutions.

#### **Weaknesses**

* Primarily focused on energy monitoring and does not directly offer consultation scheduling or detailed product information about broader green energy solutions like solar panels or EV charging stations.
* Installation of hardware sensors can be complex, potentially requiring professional assistance.

### **Overall Relevance to Rolsa Technologies**

Sense Home Energy Monitor closely matches several features requested by Rolsa Technologies, particularly real-time tracking of energy use, and promoting energy-conscious living. Its detailed monitoring and insights functionality are particularly relevant, supporting customers in reducing their carbon footprints and managing energy effectively.

The app's strong emphasis on energy tracking and ease of access across multiple platforms makes it an ideal inspiration for the development of Rolsa Technologies’ digital solution. However, additional functionalities, such as consultation scheduling, detailed product information, and accessibility features, will need to be custom-developed to fully satisfy Rolsa Technologies’ complete set of requirements.

### **Internet and Emerging Technologies: Internet of Behaviour (IoB)**

The Internet of Behaviour (IoB) is an emerging technology which involves collecting and analysing user data from online activities to better understand user behaviours and preferences. IoB enables companies to deliver more personalised and targeted services, products, or solutions by examining detailed user data gathered from various internet sources.

IoB could provide significant advantages to businesses like Rolsa Technologies by helping them offer personalised recommendations based on customers’ energy usage habits or preferences. For example, by analysing data collected from smart home devices, online energy usage calculators, or web interactions, Rolsa Technologies could provide tailored recommendations on solar panels, EV charging stations, and smart home energy management systems.

However, IoB raises privacy concerns since companies must collect personal user data, often requiring explicit user consent. Customers might be cautious about sharing their personal information due to fears surrounding data misuse, hacking risks, or other cybersecurity issues.

### **Strengths and Weaknesses in Relation to Rolsa Technologies**

#### **Strengths:**

* Allows precise personalisation of recommendations for energy-efficient solutions based on individual customer needs and habits.
* Enhances user engagement by providing targeted advice on reducing their carbon footprint.
* Enables better alignment of products and services with customer preferences through detailed behavioural insights.

#### **Weaknesses:**

* Privacy risks associated with data collection may discourage some users from sharing personal information.
* Cybersecurity vulnerabilities could potentially expose sensitive user data, leading to user reluctance.

### **Overall Relevance to Rolsa Technologies**

The use of IoB could significantly enhance Rolsa Technologies’ digital solution by providing more personalised and relevant advice and product recommendations to customers. For instance, energy consumption patterns tracked via IoB could enable customised suggestions on energy efficiency or sustainable home improvements. However, the implementation must prioritise secure data handling practices and robust privacy policies to reassure users and comply with data protection regulations.

**Emerging Technology: Internet of Things (IoT)**

The Internet of Things (IoT) refers to the interconnection of everyday devices to the internet, enabling them to send and receive data. In the green technology sector, IoT facilitates real-time monitoring and management of energy consumption, enhancing efficiency and sustainability. For instance, IoT-enabled smart meters allow consumers to track their energy usage patterns, promoting more conscious consumption and aiding in reducing carbon footprints.

**Application to Rolsa Technologies**

Integrating IoT into Rolsa Technologies' offerings can significantly enhance customer engagement and operational efficiency:

Smart Home Energy Management Systems: IoT devices can monitor and control household energy usage, providing users with insights and automated controls to optimise consumption.

Electric Vehicle (EV) Charging Stations: IoT can enable smart scheduling and monitoring of EV charging, ensuring efficient energy use and cost savings.

Solar Panel Systems: IoT sensors can track the performance of solar panels, alerting users to maintenance needs and optimising energy production.

**Accessibility Considerations**

**To ensure the digital solution is inclusive:**

Colour Usage: Employ high-contrast colour schemes to assist users with visual impairments.

Descriptive Buttons: Label buttons with clear, descriptive text to aid navigation for all users.

Consistent Fonts: Use legible, uniform fonts to enhance readability.

Properly Labelled Forms: Ensure all form fields are clearly labelled for ease of use with assistive technologies.

Keyboard Accessibility: Design the interface to be fully navigable using a keyboard, accommodating users with mobility impairments.

Industry Guidelines and Best Practices

**General Data Protection Regulation (GDPR) Compliance**

Given that the project will involve storing customer data, adherence to GDPR is crucial. Key principles include:

Lawfulness, Fairness, and Transparency: Process data legally and transparently, informing users about data usage.

Purpose Limitation: Collect data only for specified, legitimate purposes and avoid unrelated processing.

Data Minimisation: Gather only the data necessary for intended purposes.

Accuracy: Keep personal data accurate and up to date.

Storage Limitation: Retain data only as long as necessary for its intended purpose.

Integrity and Confidentiality: Ensure appropriate security measures to protect data against unauthorised access or breaches.

Accountability: Be able to demonstrate compliance with GDPR principles.

**Best Practices**

Employee Training: Educate staff on data handling procedures to prevent breaches.

Data Backups: Maintain regular backups to prevent data loss.

Data Encryption: Encrypt sensitive information to protect it during storage and transmission.

Strong Passwords: Implement robust password policies to enhance security.

Data Retention Policies: Regularly review and delete data that is no longer necessary.

Anti-Malware Measures: Utilise up-to-date anti-malware software to protect against cyber threats.

**Assumptions**

Rolsa Technologies operates within the green technology sector, focusing on products like solar panels, EV charging stations, and smart home energy systems.

The company employs a team responsible for managing and implementing technological solutions.

Rolsa Technologies conducts business both online and offline, offering products and services through various channels.

Customer data is currently stored using secure database systems compliant with industry standards.

The project has a defined timeline, agreed upon by both the development team and Rolsa Technologies.

Regular communication between the development team and Rolsa Technologies is essential to ensure the project aligns with the company's objectives and to accommodate any new requirements that may arise during development.

**Design Proposal**

**Overview (Description and Justification)**

Rolsa Technologies has requested the development of a digital solution that meets the following primary requirements:

* Provide customers with up-to-date information about green energy products currently available.
* Offer guidance to users on reducing their carbon footprint.
* Allow customers to schedule consultations and installations.
* Provide tools for users to calculate and track their energy usage.

Following market research conducted by Rolsa Technologies, additional features identified as desirable include:

* Account registration for users to manage consultations, installations, and personal data.
* Accessibility features catering to users with diverse needs.
* Social interaction features to encourage user engagement.

This digital solution can be delivered within the given timeframe, incorporating essential features derived from market research and Rolsa Technologies’ specifications. Through thorough research, I have identified several innovative elements that can effectively address the functional requirements set by Rolsa Technologies and their customers.

**Potential Design Options**

Research highlights two main digital platforms widely used within the green technology sector: web-based applications and mobile apps. Consequently, two primary design options are available, offering flexibility to choose the most suitable platform.

**Web-Based Application**

A web-based solution effectively fulfils Rolsa Technologies' primary requirements and offers significant benefits, notably its compatibility across multiple platforms, ensuring accessibility on various devices.

**Strengths:**

* Cross-platform accessibility (desktop, tablets, mobile browsers).
* Easier and faster updates.
* No installation required, eliminating compatibility issues.
* Accessible through multiple web browsers.

**Weaknesses:**

* Reliance on consistent internet connectivity.
* Potential hosting and server maintenance issues.

Conclusion: A web-based application is the most suitable solution, providing extensive flexibility, scalability, and ease of maintenance. It can effectively deliver all specified functionalities while offering excellent opportunities for future enhancements.

**Mobile Application**

A mobile app could also offer advantages, especially in user engagement, since apps are easily accessible directly from the user's device.

Strengths:

* Rapid performance and responsive user interactions.
* Instant notifications and updates.
* Offline capabilities for certain features.
* Enhanced interaction through device-specific features (touch interface).
* Weaknesses:
* Higher development and maintenance costs.
* Multiple versions required for different operating systems (iOS, Android).
* Dependency on users downloading and regularly updating the app.

Conclusion: Despite its advantages, developing a mobile application introduces significant limitations in cost, complexity, and ongoing maintenance, making a web-based solution preferable for this project.

**Selected Design Option**

I have selected a web-based solution for Rolsa Technologies' digital platform. This approach best meets the business's goals, allowing efficient delivery of content, interactive features, and accessibility.

For front-end development, HTML, CSS, and JavaScript will be used, ensuring a responsive, intuitive, and accessible user interface. Python will be employed for back-end functionality, handling server-side operations such as customer account management, consultation bookings, and energy tracking calculations. Due to Rolsa Technologies not specifying an existing data storage solution, a secure database (e.g., PostgreSQL or MySQL) will be utilised for storing user data securely and compliantly rather than using an Excel sheet.

The web-based platform will address the following requirements effectively:

* Informing users about green energy products.
* Offering tools for reducing carbon footprints.
* Enabling consultation and installation scheduling.
* Providing energy usage tracking and calculation tools.
* Integrating accessibility features for all user groups.
* Encouraging user engagement through social features.

The web-based solution also facilitates easier future updates or rebranding efforts, ensuring sustained relevance and user satisfaction.

* Legal and Ethical Considerations

Before implementing the digital solution, the following legal and ethical considerations must be addressed:

Domain Name Usage: Confirm rights to use the selected domain.

Compliance with Policies: Ensure adherence to Rolsa Technologies’ internal policies and standards.

Accessibility Compliance: Ensure the platform meets WCAG (Web Content Accessibility Guidelines) to support diverse user needs.

Copyright Compliance: Secure permissions and provide credits for externally sourced materials.

Data Protection (GDPR): Obtain clear user consent for data collection, ensuring transparency and secure data storage.

E-commerce Compliance: Adhere to relevant financial regulations and standards for securely handling online transactions involving premium content.

Implementing these considerations ensures legal compliance, user trust, and the secure handling of customer data, supporting the long-term success of Rolsa Technologies’ digital platform.

Here's your reworded content, carefully aligned with your set task brief for Rolsa Technologies and structured to suit your Pearson T-Level exam requirements using British English conventions:

**Functional Requirements (In Detail)**

**Task Number, Functional Requirement, User Story (User Perspective), Tasks (Development Actions), User Acceptance Criteria**

1a, Provide information on green energy products and carbon footprint reduction., As a customer, I want to access clear information about green energy products and ways to reduce my carbon footprint., Create a homepage clearly displaying content about solar panels, EV chargers, and smart energy solutions., Customers can easily view accurate and relevant product and sustainability information.

1b, Provide interactive access to detailed product content., As a customer, I want interactive features to explore information more deeply., Add interactive elements such as expandable sections and "read more" buttons., Users can interact with and expand content easily.

2a, Enable customers to schedule consultations and installations., As a customer, I want to easily book consultations or installation services online., Develop a booking form/page accessible after logging in., Customers can successfully book and manage appointments online.

3a, Allow users to calculate and track their carbon footprint., As a customer, I want to calculate and monitor my personal carbon footprint., Implement an interactive carbon footprint calculator tool accessible via the user dashboard., Users can enter data and view their calculated carbon footprint clearly.

3b, Automatically generate personalised energy-saving tips., As a customer, I want to see personalised suggestions on reducing my energy usage., Integrate automated messaging and tips based on user-entered data., Users receive automated, personalised messages on their dashboard.

4a, Provide free and paid-for digital content., As a customer, I want access to both free and premium digital content., Create separate pages and dashboards for free and premium content., Users can select and view content based on their account status (free or premium).

4b, Clearly differentiate premium and free content., As a premium customer, I expect additional features and resources compared to a free account., Develop premium-specific dashboards featuring extra content and tools., Premium users have exclusive access to enhanced content and tools.

5a, Implement accessibility features for diverse users., As a user with visual impairments, I need tools to comfortably access content., Implement zoom capabilities, readable fonts, and compatibility with screen readers., Users with sight loss can effectively navigate and interact with content.

6a, Incorporate social engagement features., As a user, I want to share my experiences or view others' progress., Create a dedicated social/community page with sharing functionality., Users can post updates, view shared content, and interact with others.

5b, Enable users to easily share their progress., As a customer, I want to quickly share my energy-saving progress with others., Add share buttons linked to progress tracking sections., Users can easily click a share button to display their progress publicly.

6a, Offer customisable energy usage plans., As a customer, I want to adjust and personalise my energy management plan., Develop an interactive feature for users to customise their energy-saving goals and strategies., Users can easily personalise and adjust their energy plans.

6a, Implement secure user authentication and account management., As a user, I want secure access to manage my account information., Set up a secure login system linked to a database with user authentication., Users can securely log into their accounts using personal credentials.

7a, Provide accessibility features to support users with sight loss., As a visually impaired user, I require specific features to help me access and use the website., Integrate accessibility tools (e.g., zoom, screen reader compatibility, high-contrast themes)., Users with visual impairments can fully access and use the platform effectively.

8a, Host website securely online., As a customer, I want reliable online access to the platform., Configure and deploy the website using secure hosting methods (e.g., virtual private servers or cloud hosting)., The website is reliably available online without downtime or security risks.

Justification of Functional Requirements

Task, Functional Requirement, Justification

1, Develop a core web platform, Essential to deliver all required functionalities clearly and effectively.

1b, User authentication/login system, Ensures secure access and protects user data according to GDPR and data security best practices.

2a, Consultation scheduling and installation booking system, Required to streamline booking processes, enhancing customer experience and operational efficiency.

3a & 3b, Energy tracking and automated advice, Directly meets Rolsa Technologies' objective of promoting sustainable energy use and reducing users’ carbon footprints.

4a, 4b, Free and premium content differentiation, Ensures clarity on service offerings, enhancing customer satisfaction and potential revenue.

5a & 5b, Accessibility and social interaction features, Support diverse user demographics and foster community engagement, meeting user-expressed needs.

6a, Customisable energy management plans, Aligns with the core objective of empowering users to actively manage their energy use and reduce their carbon footprint.

8a, Secure website hosting, Ensures reliability, compliance, and safe data management.

This comprehensive proposal directly meets Rolsa Technologies’ stated needs, incorporates recommendations from existing customers, adheres to essential guidelines and regulations, and effectively leverages industry-standard best practices.

## **Non-Functional Requirements**

Non-functional requirements outline essential qualities and characteristics the digital solution must meet, beyond its core functions. These include aspects such as security, performance, usability, and accessibility, which significantly impact user satisfaction and the overall effectiveness of the platform.

### **Performance**

Performance is crucial for Rolsa Technologies' web-based solution, as slow or unresponsive interactions can negatively impact user experience and engagement. Performance considerations include:

* Page load times: Users should experience minimal waiting times, such as when logging into their accounts, viewing dashboards, or accessing interactive tools.
* Responsiveness: All interactive elements, such as navigation menus, buttons, or energy calculation tools, must respond promptly when clicked.

Ensuring the platform is responsive and efficient will help maintain user satisfaction and encourage continuous engagement with Rolsa Technologies' services.

### **Maintainability**

Maintaining clear and structured code is crucial for the long-term sustainability of the platform. Well-maintained code helps future developers understand and update the system efficiently. Essential practices include:

* Commenting code clearly: Ensuring that all key sections of code have descriptive comments helps developers quickly identify functions and understand system logic.
* Code readability: Writing clean, structured code with consistent formatting allows easier maintenance and reduces future development time, especially when Rolsa Technologies expands the solution by adding new features.
* Documentation: Maintaining comprehensive documentation outlining the solution's functionality, data structures, and architecture will simplify future updates or feature additions.

### **Security**

Since the web-based solution will handle sensitive customer data—such as personal details, account information, and potentially financial data—the security of this data is paramount. Important security measures include:

* Secure storage: Utilising secure databases with encryption methods to prevent unauthorised access to sensitive data.
* Access control: Implementing authentication and authorisation methods ensuring only authorised users and administrators can access certain data or features.
* Regular security audits: Routinely reviewing security procedures and protocols to prevent data breaches and maintain compliance with the General Data Protection Regulation (GDPR).

### **Quality (User Experience)**

User experience (UX) is a key success factor for Rolsa Technologies' digital solution, influencing customer satisfaction and overall adoption of the platform. Ensuring high-quality user experience includes factors such as:

* Intuitive navigation: Designing a clear, user-friendly layout to allow quick access to all pages and features, such as energy calculators, consultation booking, and information sections.
* Accessible colour schemes and fonts: Choosing accessible colour combinations and clear fonts ensures users with visual impairments can easily navigate and read the content.
* Visual consistency: Maintaining a consistent design throughout the website creates a professional appearance and enhances usability, encouraging customer engagement.

### **Accessibility**

Accessibility features are critical in ensuring the solution is inclusive and effective for a diverse audience, including individuals with sight loss. Key accessibility considerations include:

* Learnability: Ensuring users can quickly understand the function of each element through clearly labelled buttons, links, and interactive components.
* Efficiency: Allowing users to quickly navigate to desired pages (e.g., consultations, installations, blogs, energy calculators) without confusion or delay.
* Ease of use: Providing keyboard navigation capabilities and compatibility with assistive technologies, ensuring all content can be accessed without barriers.
* Visual enhancements: Implementing zoom and screen-reader compatibility for visually impaired users, making all content fully accessible.

Implementing these measures ensures compliance with industry guidelines such as the Web Content Accessibility Guidelines (WCAG).

By considering these non-functional requirements carefully, the digital solution will provide a robust, accessible, secure, and user-focused platform that meets both Rolsa Technologies' business objectives and the needs of their customers effectively.

Here's your fully reworded document, tailored explicitly to the Rolsa Technologies brief, aligned with Pearson T-Level assessment requirements, and using clear British English conventions:

**Project Management Methodology**

**Agile Methodology**

**Description:**  
 Agile methodology involves dividing a project into manageable phases or iterations known as ‘sprints’, with continuous collaboration and feedback from stakeholders. Developers regularly communicate with the client throughout each development phase, ensuring alignment with client expectations and objectives.

**Justification for Selection:**  
 I have chosen Agile as the project management methodology for Rolsa Technologies' digital solution due to the continuous need for client input and feedback. Agile allows frequent collaboration with Rolsa Technologies' owners, ensuring the solution aligns closely with their specific requirements such as the functionality of carbon footprint calculators, design preferences, accessibility features, and content details. Regular feedback at the conclusion of each sprint enables timely adjustments, significantly reducing the risk of major revisions later in the project lifecycle.

**Benefits of Using Agile Methodology**

**Benefit, Explanation**

Enhanced Client Satisfaction, Regular stakeholder involvement ensures continuous alignment between client expectations and the final digital solution.

Improved Quality, Iterative cycles mean frequent testing and refining, progressively enhancing the product quality after each sprint.

Increased Predictability, Fixed-duration sprints facilitate more accurate estimation of timelines, budgets, and overall project completion.

Improved Adaptability, Agile facilitates flexibility to adapt quickly to changes or new client requirements without significant disruption.

**Project Key Performance Indicators (Sprint Planning)**

Effective project management will involve breaking down the larger solution into smaller, achievable milestones or sprints. Techniques like decomposition (breaking down large tasks into smaller components), abstraction (focusing on essential elements), and pattern recognition (identifying common solutions) will guide efficient development.

The table below provides an organised framework for tracking progress across each sprint. Tasks not completed within the allocated sprint will be carried over to the subsequent sprint to maintain consistency and ensure task completion. Task difficulty is represented by a numerical value for clear prioritisation.

**Sprint, Tasks, Explanation**

1, - Set up server module (Python)- Develop backend model (Python)- Design homepage (HTML/CSS)- Develop customer account registration forms (HTML/CSS/JS)- Implement form submission functionality (HTML/CSS/JS)- Set up secure customer databases- Test initial server requests, This initial sprint establishes foundational infrastructure (server, model, basic frontend layout, forms, database) essential for subsequent feature development.

2, - Securely store customer registration data- Design customer account dashboards (HTML/CSS)- Develop login page and login button functionality (HTML/CSS/JS)- Connect frontend pages with backend logic, Sprint 2 focuses on developing user dashboards and login functionality, securely managing customer data, and ensuring integration between front and backend.

3, - Implement authentication for user accounts- Ensure successful user login redirects to correct dashboard (free or premium)- Design free account pages (limited features clearly indicated)- Design premium account pages with full features, Sprint 3 concentrates on implementing secure login procedures, clearly distinguishing free and premium accounts, and designing user-specific content pages.

4, - Create structured content areas (e.g., product blogs and educational content)- Add interactive elements ('Read More' buttons)- Develop carbon footprint tracking/calculation tools- Create consultation booking pages and scheduling functionality, Sprint 4 delivers interactive and engaging content areas, implements important customer tools, and develops appointment scheduling functionality.

5, - Implement social sharing functionalities allowing users to share progress or insights- Integrate additional interactive tools (energy-saving tips, personalised content)- Develop accessibility tools for visually impaired users (zoom, contrast adjustments), Sprint 5 enhances user experience through social and accessibility features, and personalised interactive functionalities to enrich customer engagement.

6, - Integrate video content pages, providing detailed product information and tutorials- Implement dynamic motivational messages on customer dashboards- Add logout functionality ensuring secure session management- Finalise premium content access restrictions, Final sprint adds valuable educational content through videos, implements dynamic user experience enhancements, and completes security features.

**Detailed Sprint Breakdown**

**Sprint 1**

Server Module (Python):  
 Create core backend infrastructure to handle client-server communication and data transfer securely.

Backend Model (Python):  
 Define backend logic for data processing, routing, and database interaction.

Homepage (HTML/CSS):  
 Establish initial user interface layout, navigation structure, and design style.

Registration Forms (HTML/CSS/JS):  
 Develop customer registration interfaces for both free and premium accounts.

Form Submission Buttons:  
 Implement form validation and secure data submission mechanisms.

Database Setup:  
 Design secure databases to store user registration data, complying with GDPR standards.

**Sprint 2**

Customer Data Storage:  
 Securely store and manage customer details based on account type (free or premium).

Dashboard Pages (HTML/CSS):  
 Create intuitive and accessible dashboards displaying relevant information and user-specific functionalities.

Login Functionality:  
 Develop secure, efficient, and intuitive login interfaces ensuring users gain access only to their designated accounts.

**Sprint 3**

User Authentication:  
 Verify user credentials accurately, ensuring secure account access and redirection to appropriate dashboards.

Dashboard Functionalities:  
 Clearly differentiate between free and premium dashboards, restricting and allowing access to appropriate content accordingly.

Content Pages Development:  
 Create informational pages including energy product blogs, carbon footprint calculators, and limited access indicators for free users.

**Sprint 4**

Interactive Product Information:  
 Design interactive content areas, including clearly structured blog posts and additional details accessed via 'Read More' buttons.

Consultation Scheduling:  
 Develop booking forms and calendar integration for customers to schedule consultations or installations.

Carbon Footprint Tools:  
 Provide users with effective tools to calculate, track, and improve their energy consumption and sustainability habits.

**Sprint 5**

Social Features:  
 Enable social sharing of user achievements, energy-saving progress, and insights through user dashboards.

Accessibility Implementation:  
 Ensure users with visual impairments can navigate and interact fully, incorporating features such as adjustable fonts, zoom functionality, and high-contrast modes.

Personalised Content:  
 Introduce dynamically generated energy-saving tips and personalised dashboard content to enhance engagement and usability.

**Sprint 6**

Educational Video Integration:  
 Provide users with accessible video content delivering detailed product information and sustainability tutorials.

Motivational Messaging:  
 Display motivational messages intermittently to encourage ongoing user engagement and positive interactions with the platform.

Secure Logout Functionality:  
 Implement secure logout options ensuring user data remains protected after sessions conclude.

Premium Content Controls:  
 Ensure premium content features remain exclusive to premium account holders, with clear restriction indicators on free accounts.

This reworded document reflects the requirements specified by Rolsa Technologies, aligns explicitly with the assessment criteria for the Pearson T-Level examination, and consistently applies British English grammar, spelling, and terminology.

Here's your fully reworded Data Requirements, carefully tailored to match the Rolsa Technologies task brief, your Pearson T-Level criteria, and using consistent British English spelling and conventions:

## Data Requirements

Below is a detailed list of data that will be collected, including how it will be stored and validated, ensuring compliance with GDPR regulations and aligning clearly with Rolsa Technologies' digital solution requirements.

### List of Data to be Collected and Stored:

|  |  |  |
| --- | --- | --- |
| Variable Name | Purpose | User Acceptance Criteria (Expected Behaviour) |
| Free\_FirstName | Stores user's first name from free registration form | Accurately stores the user's entered first name. |
| Free\_LastName | Stores user's surname from free registration form | Accurately saves the user's last name as entered. |
| Free\_Gender | Stores user's selected gender | Captures user's gender selection (e.g., Male, Female, Prefer not to say). |
| Free\_Email | Stores user's email address | Email must be stored correctly and contain a valid "@" symbol. |
| Free\_Password | Stores user's password securely | Password must contain at least 8 characters, including numbers and special characters (e.g., !?£$%&). |

Note: Premium accounts will follow the same variables, replacing "Free\_" prefix with "Premium\_" to avoid duplication.

### Payment Information (Premium Users Only)

|  |  |  |
| --- | --- | --- |
| Variable Name | Purpose/Function | User Acceptance Criteria |
| Card\_Number | Stores card number provided by the customer for premium subscriptions. | Must contain exactly 16 digits, validated securely through encryption methods. |
| Cardholder\_Name | Stores the cardholder’s name exactly as displayed on the card. | Must contain alphabetic characters only, no numbers or special characters allowed. |
| Expiry\_Month | Stores expiry month of the user's card, selectable via dropdown menu. | Must be selected from provided options (January–December). |
| Expiry\_Year | Stores card expiry year, selectable from a dropdown menu (current year onwards). | User must select a year from the provided list (2025 onwards). |
| CVV\_Check | Securely stores and verifies CVV number provided by the user. | Must verify the CVV is numeric and exactly 3 digits in length. |

### Data Validation and Verification Checks

|  |  |  |
| --- | --- | --- |
| Variable Name | Validation Checks | Acceptance Criteria |
| Check\_FirstName\_LastName | Ensures the user has entered their first and last name without special characters or numbers. | Must contain only alphabetic characters; otherwise, request correction. |
| Check\_Gender | Ensures a gender option has been selected. | Form submission requires gender selection; otherwise, a prompt appears. |
| Check\_Email | Validates the email entered follows standard email conventions. | Must contain "@" and "." symbols for valid submission. |
| Check\_Password | Checks for password strength and complexity (minimum of 8 characters, special characters, and numbers). | Password must meet complexity requirements; otherwise, an error prompt is displayed. |
| Check\_Card\_Number | Confirms the card number contains only numeric characters, and is exactly 16 digits. | Exactly 16 numeric digits; errors flagged for invalid inputs. |
| Check\_Expiry\_Month | Ensures an expiry month has been chosen from provided dropdown list. | Selection required from dropdown menu; prompts user if missed. |
| Check\_Expiry\_Year | Verifies that a valid expiry year (not in the past) has been selected from the dropdown. | A valid expiry year selection is mandatory; validation enforced before submission. |

### Security and Data Storage

Considering GDPR requirements and user privacy, customer data will be securely stored in a robust database (such as PostgreSQL or MySQL). Sensitive financial data (e.g., card details) will be encrypted, ensuring secure storage and preventing unauthorised access. Regular security audits and maintenance will be conducted to ensure compliance and protect customer data.

### Future Development Considerations

Additional variables and validation checks may be introduced during further development stages. Current variables are aligned closely with Rolsa Technologies' stated functional and user requirements, facilitating ease of future expansion or modification as necessary.

This structured approach ensures that Rolsa Technologies' digital solution adheres to both the client's specific needs and essential industry standards, providing customers with a secure, user-friendly, and fully compliant experience.

**Login Verification from CSV File**

// User Authentication Procedure Using CSV Data Storage

OPEN user data CSV file and store in 'user\_data'

SET LastNames\_List to empty list

SET Passwords\_List to empty list

FOR each row IN CSV file: APPEND row[0] (Last Name) TO LastNames\_List APPEND row[1] (Password) TO Passwords\_List END FOR

FOR index IN range of LastNames\_List: SET current\_LastName TO LastNames\_List[index] SET current\_Password TO Passwords\_List[index]

IF current\_LastName equals entered\_LastName AND current\_Password equals entered\_Password:  
 DISPLAY Dashboard Page  
END IF

END FOR

**Reading Data from CSV File (e.g., user data):**

OPEN CSV file as data\_file

SET line\_counter TO 0 # To keep track of number of lines read

FOR each row IN data\_file:

IF line\_counter EQUALS 0:

PRINT "Column Headers:" + row

ELSE:

PRINT "User Data:" + row

END IF

INCREMENT line\_counter BY 1

END FOR

PRINT "Total lines read:" + line\_counter

Here's the fully reworded **Test Strategy** document, structured to match the **Rolsa Technologies** task brief and tailored for your Pearson T-Level examination, written in British English:

## **Test Strategy**

Testing is essential to ensure that the digital solution for Rolsa Technologies meets the specified functional and non-functional requirements. The testing strategy involves various testing methods to ensure quality, reliability, and accuracy of all developed components.

### **Black Box and White Box Testing Approaches**

#### **Black Box Testing**

Black box testing is performed without the tester requiring detailed knowledge of the internal workings or programming of the system. This type of testing is suitable for stakeholders such as customers or client representatives, as it focuses on user interactions and functionality.

**Advantages of Black Box Testing:**

* Less time-consuming, focusing on overall functionality and external behaviour.
* Can be carried out by individuals without programming knowledge (e.g., clients, testers, end-users).
* Clearly identifies whether the system meets user expectations and requirements.

Black box testing includes the following approaches:

|  |  |
| --- | --- |
| **Level of Testing** | **Explanation** |
| Unit Testing | Individual components or features tested separately. |
| Integration Testing | Components or modules combined and tested together. |
| System Testing | Entire system tested as a whole to ensure all features interact correctly. |
| Acceptance Testing | Final checks to ensure the system meets user requirements and client expectations. |
| Boundary Testing | Checks the system's handling of input values at their minimum and maximum limits. |

#### **White Box Testing**

White box testing involves testers or developers who have detailed knowledge of the internal structure and code implementation of the software. It focuses on the internal logic and paths of the application, ensuring thorough testing at the code level.

**Advantages of White Box Testing:**

* Allows for in-depth verification of code correctness and logic.
* Helps identify issues early, reducing long-term maintenance problems.

**White Box Testing Approaches:**

|  |  |
| --- | --- |
| **Type of White Box Testing** | **Explanation** |
| Statement coverage | Ensures each line of code is executed at least once. |
| Path Coverage | Tests all possible execution paths through the application. |

## **Test Strategy Table (Rolsa Technologies’ Digital Solution)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component to be Tested** | **Type of Testing** | **Explanation of Test** | **User Acceptance Criteria** |
| Consultation Booking Form | Black box – Acceptance Testing | Users should complete and submit the form without errors. | User successfully schedules consultations or installations. |
| Registration Data Storage | Black box – Integration Testing | Data from registration forms securely stored in the database. | User registration data accurately stored in database. |
| Energy Usage Calculator | Black box – Unit Testing Black box – Integration Testing | Calculate carbon footprint based on user-inputted data and correctly update the database. | User successfully calculates and views carbon footprint results. |
| Premium and Free Account Access | Black box – Acceptance Testing | Premium users gain full dashboard access; free users have limited functionality. | Users have appropriate access according to account type. |
| Login and Logout Functionality | Black box – Acceptance Testing | Users log in and out securely, returning to appropriate pages. | Successful login and logout, redirecting users appropriately. |
| Payment Card Details Input | Black box – Boundary Testing | Validate input fields for exact card number length (16 digits). | Users must input exactly 16 numeric digits for payment cards. |
| Navigation Paths (Registration to Dashboard) | White box – Path Coverage | Ensure the logical flow from registration to login to dashboard is fully functional. | Users complete registration, log in, and reach the dashboard without errors. |
| Social Interaction Feature | Black box – Integration Testing | Users' shared progress posts correctly appear on the community/social page. | Posts are successfully shared and visible to the community. |
| Interactive Carbon Footprint Tool | Black box – System Testing | Users enter data, and results accurately calculate carbon footprint. | Tool calculates and clearly displays the correct footprint data. |
| Interactive Product Information Pages | Black box – Acceptance Testing | Users access additional content via interactive buttons (e.g., ‘Read more’). | Additional detailed content appears after interaction. |
| Video Content Playback | Black box – Acceptance Testing | Videos provided on the platform play, pause, and resume correctly without issues. | Users view video content smoothly and without disruptions. |
| Payment (Credit Card Details Entry) | Black box – Boundary Testing | Ensuring exactly 16-digit card numbers entered; rejects incorrect entries. | Users must enter exactly 16-digit card numbers for payments. |
| Duplicate User Account Prevention | Black box – Acceptance Testing | System rejects registration attempts using existing account details. | Duplicate registrations are disallowed, alerting user accordingly. |
| Accessibility Features | Black box – Acceptance Testing | Ensure accessible navigation features (screen readers, font adjustments, high-contrast mode) function correctly. | All accessibility features fully operational for users with visual impairments. |

## **Summary and Justification of Test Strategy**

This comprehensive test strategy ensures thorough validation and verification of the digital solution for Rolsa Technologies. Using a balanced combination of black box and white box testing methods allows robust validation of both functional behaviours and internal system logic.

**Black Box Testing** was chosen primarily because it aligns closely with the customer-oriented nature of the solution, ensuring the platform meets user expectations without requiring technical knowledge from testers.

**White Box Testing** complements this by ensuring all internal system paths and logic are correctly implemented, providing a high-quality, secure, and efficient solution.

The strategy ensures the digital solution adheres to Rolsa Technologies’ requirements, delivers a positive user experience, and complies with industry guidelines, particularly GDPR standards and accessibility regulations.

|  |  |
| --- | --- |
| <https://www.itproportal.com/features/top-10-essential-technology-trends-you-must-follow-in-2022/>  <https://www.techopedia.com/definition/34552/internet-of-behaviors-iob> | (1) Emerging Technology information been gathers for the research purposes |
| <https://www.altexsoft.com/blog/non-functional-requirements/> | (2) description of what non functional requirements is in brief |
| <https://gdpr.eu/> | (3) Rules of what laws come under GDPR |
| <https://www.nature.com/articles/s41377-021-00658-8> | (4) Emerging technology more information on visual reality (images also taken) |
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| <https://www.geeksforgeeks.org/differences-between-black-box-testing-vs-white-box-testing/> | (6) key deference’s between the two testing types |
| <https://www.whitesourcesoftware.com/resources/blog/black-box-testing/> | (7) more information on black box testing |