Software Engineering Software Requirements Specification (SRS) Document

Case Study 2: Tree-Saving Non-Profit Software Solution

29/09/2023

PART 1

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Introduction

The purpose of the Software:

The purpose of the Software is to empower a non-profit organisation dedicated to saving trees to overcome its operational hurdles and enhance its impact on the environment and wildlife. The organization's commitment to highlighting the significance of trees necessitated a more practical approach to achieving its mission. By creating a tailored software solution, the organisation aims to streamline its operations, strengthen communication with supporters, facilitate efficient fundraising, and provide means of transparently showing its activities and impact. This software will serve as a dynamic tool to assist the organization in promoting environmental awareness, encouraging volunteer engagement, managing resources effectively, and demonstrating the possible outcomes of its initiatives. (Anon., 2023) (Quora, 2017)

Scope of the Project:

The scope of this project entails the design, development and implementation of a customized software platform that addresses the specific challenges faced by the non-profit organization. The software will compromise several key components including a tree-planting project management system to track and monitor planting efforts, a communication platform to engage supporters and volunteers in real-time, an online donation portal for secure and efficient fundraising, an impact reporting dashboard for transparently showcasing achievements, and a multilingual support feature to reach a wider audience. The project will follow an agile approach, breaking the development process into iterative cycles to ensure constant collaboration, adaptability, and alignment with the organization's evolving needs. The agile methodology will facilitate the creation of a comprehensive and tailored solution that effectively supports the non-profit's mission of saving trees, fostering environmental conservation, and connecting with its stakeholders. (Lutkevich, 2021) (Martins, 2022)

Functional Requirements:

1. Service agreement with accept cookie:

The "Accept Cookies" implementation involves integrating a user-oriented service agreement into the organization's website to regulate the data collection process via cookies. As users access the website, they are met with a prominent user interface element, such as a pop-up or a banner, presenting the service agreement. This agreement explicitly outlines the organization's intention to collect data through cookies, clarifying the purpose and scope of data usage for enhanced user experience and insights. Users are prompted to review the service agreement and provide their informed consent by clicking an "Agree" button, thereby granting permission for the organization to gather data using cookies. This process fosters transparency, empowering users to make an educated decision about their data's usage within the website ecosystem. Simultaneously, a robust backend system is established to effectively manage, process, and securely store the collected cookie-related data. (iubenda, n.d.) The "Accept Cookies" mechanism is strategically positioned on the website's user interface to ensure immediate visibility upon entry. This proactive placement aligns with best practices for user consent and data privacy. The user-friendly design of this interface element encourages engagement while highlighting the significance of data transparency and user control. If a user opts not to agree with the service agreement, the organization refrains from collecting data through cookies from that user. This approach respects user preferences, honouring their right to privacy and choice, while ensuring that data collection occurs only with explicit consent. The implementation's efficacy is subject to rigorous testing. The user interface's functionality and responsiveness, the clarity and comprehensibility of the service agreement's terms, the seamless operation of the "Agree" button, and the backend system's capability to securely manage and store data are all testable components. This comprehensive testing assures a seamless user experience, adherence to legal and regulatory frameworks, and a commitment to fostering a transparent and respectful approach to user data interactions.

(Usercentricas, 2023)

2. Online Donation and fundraising/ Integration of Payment Gateways:

The organization's endeavour revolves around establishing a robust and secure online donation platform that transcends transactional aspects, emphasizing both contribution convenience and absolute transparency. This comprehensive solution entails the integration of a highly secure online payment gateway, fortifying the organization's commitment to the safety of financial transactions. Within the heart of the organization's website, a dedicated section labelled "Donate" will prominently reside, accessible through the main navigation menu. Within this section, supporters and well-wishers will encounter a thoughtfully designed user interface that ensures seamless interaction. Through this interface, users can not only specify the donation amount they are comfortable with but also select from a range of tree-planting projects they wish to allocate their contribution. This empowers donors with a sense of direction and purpose, as they align their support with the organization's objectives. By providing this clear choice, the organization leverages the donation platform to not only collect funds but also to educate supporters about the specific projects they can actively participate in. This synergy between ease of use and informed engagement transforms the act of donating into an integral aspect of the supporters' connection with the organization's mission. As each donation is processed, the system securely collects data

regarding the contributions and their respective allocations. This data, meticulously compiled, forms the bedrock of the transparency initiative. Utilizing a dynamic reporting mechanism, the platform showcases how each contribution has contributed to the progress of tree-planting projects, thus substantiating the organization's commitment to transparency. In summary, the online donation platform, nestled within the organization's website, becomes a conduit not only for financial support but also for fostering an ecosystem of informed and engaged contributors united by the common goal of preserving our environment through tree conservation. (GoCardless, 2023)

3. Volunteer and Donor Registration and Management:

Introducing a sophisticated platform that seamlessly manages volunteer and donor engagement while implementing stringent email verification measures to ensure authenticity. The system offers tailored pathways for both volunteers and donors, optimizing their experience and contributions. Through an intuitive interface, volunteers can effortlessly provide personal information, skills, and availability. This process empowers volunteers to refine their profiles, update skill sets, and indicate availability preferences for potential projects they wish to participate in, enhancing their commitment to the organisation's mission. The system further accommodates potential donors by incorporating a secure donation form that offers a dual-choice mechanism, allowing users to identify as either a donor or a volunteer. This not only streamlines the process but also enhances the sense of inclusivity within the organization. Donors can also conveniently access their donation history, update their profiles, and customize preferences, with the added convenience of automated tax receipt generation. To increase the platform's security, a robust email verification system is implemented during registration. This vital step confirms the legitimacy of user accounts, enhancing the integrity of the engagement hub and safeguarding against fraudulent activities. This comprehensive system finds its home within the core of the organization's website. The front-end houses dedicated sections where prospective volunteers seamlessly register, filling in their pertinent details. Simultaneously, donors choose to identify their role while securely contributing through the donation form. The email verification process is seamlessly integrated into the registration journey, ensuring authenticity. By finely intertwining volunteer and donor engagement, security measures, and streamlined processes, the organization is poised to bolster its mission while creating an inclusive and secure online environment for its stakeholders. (bloomerang, n.d.)

4. Administration Tools:

The administrator tools collectively offer a comprehensive suite of functionalities that empower the non-profit organization's administrators to efficiently manage various aspects of its operations. The Project Management Dashboard, accessible through the "Projects" section, enables the creation and oversight of tree-planting initiatives, while the User Management function, found in the "Admin Panel" or "Settings," allows for the management of user roles and permissions. The Communication Hub, situated in the "Community" or "Engage" area, facilitates interaction with supporters through announcements, forums, and newsletters. For donation tracking and transparency, the Donation Tracking and Management tool is present on the "Donate" or "Support Us" page, and Reporting and Analytics, located within the "Reports" or "Analytics" section, provide data-driven insights.

Collaboration and Volunteer Management are embedded in project-specific pages, the Content Management System enables content updates from the "Content Management" section, and security features are found in the "Security" or "Account Settings." Additionally, the Multilingual Support Management tool ensures inclusivity through the "Language Settings," while Data Backup and Disaster Recovery safeguards data integrity from the "System Settings" area. Through these tools, administrators effectively manage projects, engage stakeholders, monitor donations, ensure

security, and drive the non-profit's mission of tree conservation and environmental awareness. (Microsoft, 2014)

5. Enhanced Communication, Collaboration and Engagement Hub:

This comprehensive system reshapes the landscape of communication efficiency and engagement, harnessing real-time communication tools and an integrated virtual collaboration workshop within the organization's website. At its core, this system strives to forge punctual and interactive lines of communication among supporters, volunteers, and beneficiaries, effectively combatting the hurdles linked to insufficient communication and lacklustre engagement. The facet of real-time communication entails the implementation of mechanisms designed to dispense consistent updates and event notifications across diverse platforms like chatbots, emails, discussion forums, and instant messaging, with the incorporation of Microsoft Teams for streamlined communication. The success of this facet is evaluated through the lens of update frequency, the promptness of notifications, the efficacy of communication channels, and valuable feedback from stakeholders. In parallel, the virtual collaboration workshop, enhanced through the integration of Microsoft Teams, fosters a harmonious environment for collaborative endeavours, proffering dedicated arenas for document exchange, threaded discussions, task allocation, and dynamic real-time collaboration tools. Situated at the forefront of the website, this attribute empowers stakeholders to partake collectively in projects, share insights, and record progress seamlessly. The testability of the workshop encompasses judicious evaluations of usability, the functionality of document sharing, and the quantification of communication effectiveness as it enriches collaborative pursuits. (bloomerang, n.d.)

6. User Feedback Collection:

Create an interactive mechanism dedicated to collecting valuable insights from volunteers, beneficiaries, and partners, fostering a culture of engagement, and driving iterative enhancements. Through the utilization of well-established survey tools like Microsoft Forms and Google Forms, this system empowers stakeholders to provide experiential feedback seamlessly. Positioned within the website's architecture, likely housed within the 'Engagement', or 'Get Involved' section, this avenue enables users to access user-friendly feedback submission forms tailored to their roles. Once submitted, the backend system orchestrates the process, systematically aggregating and dissecting feedback data. This meticulous analysis facilitates a nuanced understanding of stakeholder experiences, acting as a cornerstone for refining organizational approaches. The testable nature of this mechanism ensures rigorous assessment of feedback form functionality, data collection precision, and the efficacy of survey distribution. Through this holistic approach, the organization not only bolsters its engagement initiatives but also crafts a responsive environment for perpetual advancement. (community, 2023)

7. Online learning and Training:

Embark on the creation of an integrated e-learning ecosystem that encompasses a diverse array of training resources, interactive modules, engaging video tutorials, collaborative virtual workshops, and a dedicated YouTube channel. This comprehensive initiative is meticulously designed to elevate the knowledge and competencies of volunteers and beneficiaries in the realm of environmental conservation. The user-friendly virtual platform will feature a dedicated section for interactive modules covering environmental impact, wildlife preservation, and the organization's mission, creating an immersive learning experience. Engaging video tutorials will visually elucidate complex

concepts and practical techniques, complemented by the organization's YouTube channel extending the reach of educational content. Collaborative virtual workshops will foster shared learning and open avenues for questioning. Seamlessly integrated into the website's front end, this initiative will enable easy access to resources, registration for workshops, and navigation to the YouTube channel. Rigorous testing encompassing content accessibility, user account functionality, intuitive user interfaces, and comprehensive performance evaluations will ensure a seamless educational journey for all users. (Andriotis, 2017)

8. Integrated Environmental Impact Management System: Maximizing Efficiency through Outcome Tracking, Resource Allocation, and Project Management:

Develop an integrated system that combines program outcome tracking, reporting, resource allocation optimization, and tree-planting project management to bolster the organization's mission of environmental conservation. This multifaceted system serves to monitor and display the outcomes of tree-planting events, showcasing the impact achieved and progress made. Simultaneously, it employs resource allocation optimization algorithms to ensure efficient distribution of resources, factoring in project priorities, available resources, and geographical considerations. On the website, this integrated functionality finds its place in both the backend and front end. In the backend, administrators and authorized users access a dedicated section to input and review project outcomes, monitor progress, and make informed resource allocation decisions based on algorithmic recommendations. On the front end, project managers and administrators utilize a project management interface within the website, enabling seamless input and tracking of project details, progress updates, resource allocation calculations, and outcome reporting. This comprehensive approach not only addresses the challenge of ineffective project management but also empowers the organization to maximize its impact through optimized resource allocation and transparent project tracking. (Hill, 2000)

9. Personalized User Dashboards:

A personalized user dashboard feature will be developed to cater to the individual needs and preferences of supporters, volunteers, and donors. Each user will have access to a unique dashboard upon logging in to the organization's website. The dashboard will present a tailored overview of their engagement, contributions, and ongoing projects. Through widgets and modules, users can easily view their donation history, project involvement, upcoming events, and personalized messages from the organization. This personalized approach enhances user engagement by providing a one-stop hub for their interactions with the non-profit. Users can customize the arrangement of widgets based on their interests, ensuring a user-centric experience. Testable aspects include the dashboard's user interface design, responsiveness on various devices, accurate data integration, and the user's ability to rearrange and personalize widgets. (Ganoe, 2023)

10. Integration with Social Media Platforms:

To amplify the organization's reach and engagement, an integration with popular social media platforms will be implemented. Users will have the option to share project updates, success stories, and donation contributions directly from the organization's website to their social media profiles. This seamless integration enhances the organization's visibility and encourages supporters to spread the word about tree-saving initiatives. Social media sharing buttons will be strategically placed alongside relevant content, ensuring ease of use. This feature's effectiveness can be tested by tracking the number of social media shares, monitoring website traffic driven by social media

referrals, and assessing user feedback regarding the integration's convenience and impact on engagement. (Laroya, 2023)

Non-functional Requirements:

1. Usability and User Experience:

The software solution embarks on a journey to enrich the user experience by introducing an intuitive and user-friendly interface that resonates across all user categories - supporters, volunteers, and administrators. This transformational effort revolves around an interface overhaul aimed at seamlessly guiding users through their interactions. Navigation menus will be thoughtfully streamlined organized and located prominently for easy access. Recognizable icons will be strategically positioned within the interface, granting swift entry to specific features. User workflows will be meticulously designed, providing a logical sequence that ensures users can effortlessly accomplish tasks. (Hamid Akhtar, 2023) This holistic design approach anticipates a substantial enhancement in user engagement. The transformed interface will seamlessly integrate into the website's front end, assuming a central role in every user's online journey. Navigation menus, enriched with clear labels, will likely reside at the top or sides of web pages, facilitating rapid navigation to key sections. Familiar icons, discernible at a glance, will be thoughtfully placed throughout the interface, enabling users to access specific functionalities with minimal effort. User workflows will chart a seamless path from one task to another, erasing friction and promoting task completion. By coherently integrating the interface within the website's architecture, users will naturally gravitate toward more profound engagement. Continuous user testing will be pivotal in elevating usability. Actual users will interact with the interface, offering invaluable feedback on their experience. This iterative process will aid in refining and optimizing the interface's design, making it not only intuitive but also adaptive to users' preferences and habits. Through this user-centric approach, the organization strives to forge a connection between the interface and the user community, fostering satisfaction, productivity, and lasting engagement.

(VisureSolutions, 2023)

2. Data Privacy and Security:

The software solution places paramount importance on fortifying the security and privacy of donor information and sensitive data. This involves a comprehensive strategy aimed at preventing unauthorized access and maintaining the confidentiality of critical data. The system employs industry-standard encryption protocols to safeguard both data transmission and storage. This encryption ensures that any data being sent over the network or stored within the system remains unreadable to unauthorized individuals. (Steed, 2014) Additionally, strict access controls are implemented, regulating who can access specific data and functionalities within the system. Rolebased authentication further bolsters this security by allowing different levels of access based on user roles. Regular security audits are conducted to proactively identify and address potential vulnerabilities, ensuring the system remains resilient against emerging threats. The data security and privacy measures are intricately woven into the system's architecture and are mostly managed in the backend of the website. (AshmeetSaggu, 2023) The encryption protocols for data transmission and storage are implemented at the server level, ensuring that all data exchanges between the website and users are encrypted. Access controls and role-based authentication mechanisms are typically managed through the backend admin panel, allowing administrators to define user roles and permissions. Regular security audits are scheduled processes that are also managed in the

backend, involving thorough evaluations of the system's security posture. While most of these security measures operate behind the scenes, their collective effect ensures that the entire website and its associated functionalities remain safe and secure for donors, volunteers, and all stakeholders involved.

(Rome, 2023)

3. Performance and Scalability:

At the heart of this software augmentation lies the commitment to sustain impeccable performance as the organization's reach expands. This multifaceted enhancement is orchestrated through a meticulous orchestration of optimization techniques. The codebase is fine-tuned to ensure every process executes with utmost efficiency, minimizing resource consumption. Concurrently, database queries are strategically streamlined, translating to expedited data retrieval and heightened system responsiveness. Importantly, caching mechanisms are seamlessly integrated to substantially diminish load times, seamlessly delivering swift and seamless user interactions. (Hamid Akhtar, 2023) These performance-boosting enhancements permeate the website's foundation. Within the backend architecture, the optimized codebase, refined database queries, and caching mechanisms collectively underpin the system's responsiveness and speed. The effects are tangibly felt by users as they navigate through various facets of the website. Whether it's loading pages, accessing intricate project details, or completing donation processes, the optimized performance ensures swift and seamless interactions. While the users may not be privy to the technical intricacies, the results are unmistakably apparent – accelerated load times, fluid navigation, and heightened interactivity throughout the site. This concerted effort serves to amplify user engagement and satisfaction, driving a more impactful and immersive online experience for supporters, volunteers, and all stakeholders invested in the organization's mission. (Martin, 2023)

4. Data Backup and Recovery:

A pivotal initiative in safeguarding the organization's digital landscape revolves around the implementation of a comprehensive data protection strategy to prevent potential data loss and disruptions. This multifaceted strategy entails the seamless orchestration of automated and regular data backups encompassing both databases and files. (Jenkins, 2022) These backups are securely stored in offsite repositories, strategically fortified to shield against unforeseen mishaps, system failures, or cyber threats. Complementing this robust data preservation mechanism is a vigilant recovery protocol designed to swiftly restore compromised data to its original state in the face of unexpected data loss or system disruptions. (Steed, 2014) This involves a meticulously outlined sequence of protocols and steps that ensure the restoration of data integrity and operational continuity. From an implementation perspective, these crucial functions will likely reside within the organization's backend infrastructure, accessible through a dedicated administrative dashboard. This dashboard serves as the control centre where backup schedules can be configured, backup status monitored, and the recovery process initiated if necessary. While these functionalities may not be directly visible to the public eye, they stand as sentinels, ensuring the resilience of the organization's digital assets and maintaining operational robustness. (Indeed Editorial Team, 2022)

5. Availability and Reliability:

The primary goal of the software solution is to establish a high level of availability and reliability, minimizing the occurrence of system downtime and guaranteeing uninterrupted user access. This will be achieved by strategically deploying the software across redundant servers equipped with failover mechanisms. These mechanisms are designed to seamlessly switch operations to backup servers in case of server failures, ensuring continuous service delivery. (Rome, 2023)

To implement this, the system will be constantly monitored in real-time to assess the health of servers, response times, and overall system status. In the event of any anomalies, an automated failover protocol will immediately take over, seamlessly maintaining operations. On the website, this functionality will be integrated into the backend infrastructure. It won't be directly visible to users but will play a crucial role in maintaining the website's availability. The monitoring dashboard and failover mechanisms will reside within the system's backend, accessible to administrators and technical personnel, enabling them to proactively manage server health and ensure uninterrupted user experiences. (altexsoft, 2022)

User Interface (External System: Website):

Introduction

In the ever-evolving digital landscape, user interfaces (UI) are the gateway through which users interact with software solutions. (Anastasia, 2022) emphasizes the pivotal role that the UI plays in ensuring effective communication between websites and external systems. It is the linchpin that facilitates user interactions, engagement, and navigation within an organization's digital ecosystem. This essay delves into the external interface requirements for a user interface, highlighting their significance in ensuring a seamless user experience and the achievement of the software's goals.

Navigation and Menus

The navigation menus of a website are often the first point of contact for users. They must be intuitive, organized, and user-friendly. Clear and logically structured menu items enable users to access different sections of the software with ease. Crucially, links to key sections, such as "Projects," "Donate," "Community," "Reports," and "Content Management," should be prominently placed and consistently accessible across pages. (Indeed Editorial Team , 2023) This ensures that users can swiftly and effortlessly find the information or features they seek. (usability.gov, 2023) (Martin, 2023)

User Dashboards

Upon logging in, personalized dashboards serve as command centres for users, be they supporters, volunteers, or donors. These dashboards display relevant widgets and modules that provide an overview of the user's engagement, donations, ongoing projects, and upcoming events. Customizability empowers users to arrange widgets according to their preferences. This personalization not only enhances the user experience but also fosters a sense of ownership and engagement.

Engagement Tools

Effective communication is at the core of user engagement. Real-time communication tools such as chatbots, forums, and instant messaging embedded within the UI enable users to interact seamlessly with the organization and other stakeholders. Integration with platforms like Microsoft Teams offers a unified communication platform, enhancing collaboration. Furthermore, strategically placed social media sharing buttons empower users to share updates and contributions, thereby amplifying the organization's reach and impact. (Ganoe, 2023)

Forms and Feedback

User feedback is invaluable for continuous improvement. Therefore, user feedback forms should be easily accessible through dedicated sections such as "Engagement" or "Get Involved." Integration with platforms like Microsoft Forms or Google Forms simplifies the feedback collection process, allowing users to provide insights and suggestions effortlessly. (MOGENSEN, 2020) (community, 2023)

Learning and Training

To further their mission, organizations often provide educational content to their users. Access to an integrated e-learning ecosystem within the UI, comprising interactive modules, video tutorials, workshops, and links to the organization's YouTube channel, ensures that users seeking educational

content can easily find and engage with it. This promotes learning and deepens users' understanding of the organization's goals and initiatives. (Aroyo, 2004) (Al and the LinkedIn community, 2023)

Donation and Fundraising

The ease with which users can contribute financially to a cause is critical to a software solution. The "Donate" section should offer a user-friendly interface for selecting donation amounts and allocating contributions to specific projects. Additionally, users should have the option to view their donation history and customize their profiles, enhancing transparency and trust in the organization. (Ibrisevic, 2023)

Volunteer and Donor Registration

Streamlined registration processes for volunteers and donors are vital to attracting and retaining support. Intuitive forms that capture necessary details, along with secure email verification during registration, ensure authenticity and build trust with users. (McCracken, 2023)

Multilingual Support

The digital world is diverse, and organizations must cater to a global audience. Providing options for users to select their preferred language through the UI, supported by multilingual management tools, enables organizations to expand their reach and connect with a wider demographic. (JIMDO, 2022)

Project Management and Reporting

Administrators and organizers require tools to oversee and manage initiatives effectively. The UI should provide access to project management dashboards and reporting and analytics tools that offer data-driven insights. These features not only aid in effective management but also provide transparency to stakeholders. (LinkedIn, 2023)

Communication and Collaboration Hub

Real-time updates, announcements, and discussions are essential for keeping users engaged and informed. A communication hub accessible directly from the UI, coupled with integration with collaboration platforms like Microsoft Teams, enhances communication and fosters collaboration among users and stakeholders. (McCracken, 2023)

Security and Data Privacy

In today's data-conscious world, users value their privacy. The UI should communicate the organization's data privacy measures transparently, promoting trust and compliance with regulations. Additionally, presenting the "Accept Cookies" service agreement with a clear "Agree" button upon entry ensures transparency in data collection practices. (ADM-IP-TRADE, 2022)

Responsive Design

User interfaces must adapt to the diversity of devices used by today's audiences. A responsive design ensures that the UI offers a consistent and optimal user experience across various devices, including desktops, tablets, and mobile phones, enhancing accessibility and user satisfaction. (community, 2023)

Conclusion

The user interface is the keystone of software solutions, serving as the vital bridge between users and a software's functionalities. Its design, accessibility, and user-friendliness are paramount in ensuring that users can effectively engage with an organization's mission, projects, and initiatives. By adhering to the external interface requirements outlined above, organizations can create a seamless and well-designed interface that not only fulfils the software's purpose but also maximizes its impact in achieving its goals. In the digital age, the user interface is not just a component; it is the linchpin that can elevate a software solution to success. (Anastasia, 2022) (IBM, 2021)

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