Software Requirements Specification

for

Online Tender Management System

Version 1.2 approved

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1 Introduction

1.1 Purpose/Objective

The primary goal of the Online Tender Management System (TMS) is to simplify and optimize the intricate process of tender management. This digital platform serves as a centralized hub, offering organizations the capability to effortlessly publish, oversee, and monitor tender-related information. The system is designed to improve accessibility for both tender issuers and bidders, fostering fair competition and streamlining the tender management workflow. Its core objective is to establish a user-friendly and equitable environment for tender processes, promoting transparency and efficiency across all involved stakeholders..

1.2 Document Conventions (Definition, Acronyms, Abbreviations)

- **ATM:** The very widely used abbreviation for an Automated Teller Machine, i.e. ATM, will be used repeatedly in the document.
- **UI:** User Interface.
- **GUI:** Graphical User interface. This term will most commonly refer to an interface or a platform for users to interact with the machine which is graphical and user-friendly in nature.
- **SRS:** System Requirements and Specifications.
- **RFP:** Request for Proposal. This term will refer to the formal solicitation document issued by the organization seeking products or services from potential suppliers.
- **BID:** This abbreviation represents the competitive offer submitted by a bidder in response to a specific tender or request for proposal.
- **HTTP:** Hypertext Transfer Protocol
- **Font face:** Times New Roman (For the entire document)
- **Font Sizes:**
    - Main Title: 16
    - Sub Title: 13
    - Sub Headings: 12
    - Body (Normal Text): 12
- **Alignment:** The entire document uses Justified Alignment.

1.3 Scope

The Tender Management System (TMS) is designed to digitally transform and enhance the efficiency of the complete tender management lifecycle. This includes the digitization of processes such as tender creation, publication, bid submission, evaluation, and awarding. The system facilitates transparent communication between tender issuers and bidders, ensuring adherence to regulatory standards and optimizing operational efficiency throughout the tendering ecosystem. The scope of TMS aims to provide a comprehensive solution for all stakeholders involved in the tender management process.

1.4 References

Some of the important guideline documents from expert authorities that must be consulted beforehand are:

- "Public Procurement Law: Damages as an Effective Remedy"
  Author: Martin Trybus
  Publisher: Hart Publishing, 20"Electronic Tendering" by Caroline P. Evans, Routledge, 2019.
- "Tender Evaluation Using Qualitative Method" by P. Balachandra, International Journal of Advanced Engineering Research and Science, Volume 2, Issue 4, April 2015.
- "Tendering and Negotiating MOD Contracts"
  Author: Tracy Gordon
  Publisher: CRC Press, 2018.
- "Strategic Public Procurement and the Law"
  Author: Duncan Fairgrieve, François Lichère
  Publisher: Oxford University Press, 2019.

2 History/Background Study (Sources of Domain Knowledge)

2.1 Technical Literature

The evolution of Tender Management Systems (TMS) reflects a dynamic response to transformative changes in procurement practices over time. Scholarly works, such as "The Evolution of E-Procurement in the Public Sector" by Maria Rey-Marston (2018), emphasize the pivotal role of technological advancements in catalyzing the shift toward digital platforms for the optimization of tender processes. Furthermore, insights from "Tender Management Reforms: A Global Perspective" by John K. Smith (2019) underscore the pervasive need for heightened transparency and accountability. This has driven governments and organizations worldwide to embrace online TMS solutions, thereby fostering improved governance and fostering heightened competitiveness in the bidding landscape.

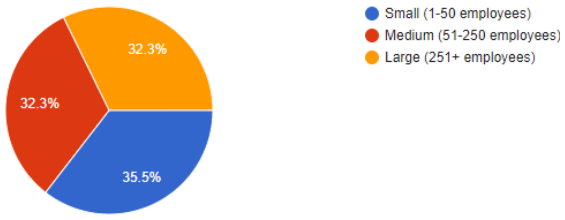
2.2 Existing Applications

Numerous established applications, including 'TenderTraq' and 'BidSync,' present robust solutions for tender management. These platforms emphasize features such as automated bid tracking, efficient document management, and streamlined vendor communication. Notably, their commitment to user-friendly interfaces and customizable workflows addresses the varied needs of organizations, contributing to heightened efficiency in the tendering process..

2.3 Customer Surveys

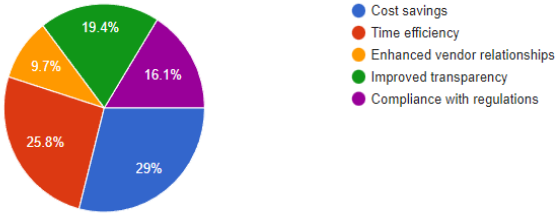
What is the size of your organization?

31 responses



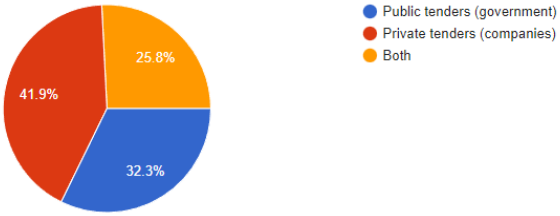
What is the primary goal of using a Tender Management System?

31 responses



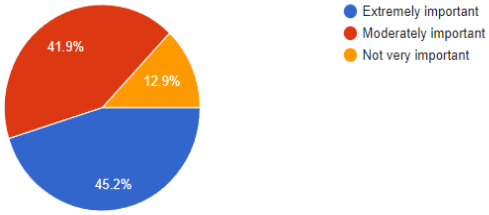
Which types of tenders do you typically manage?

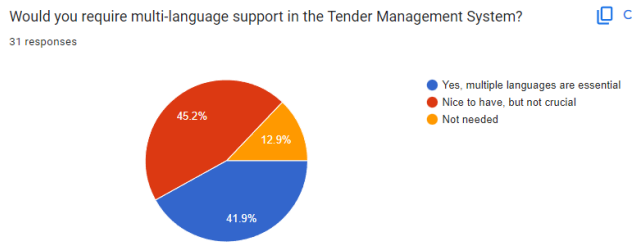
31 responses

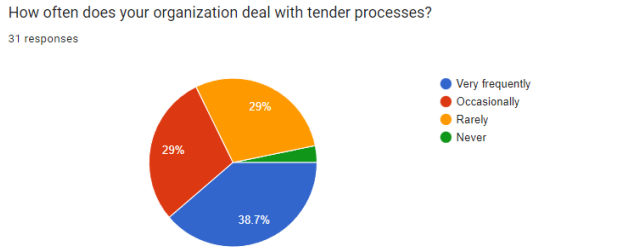


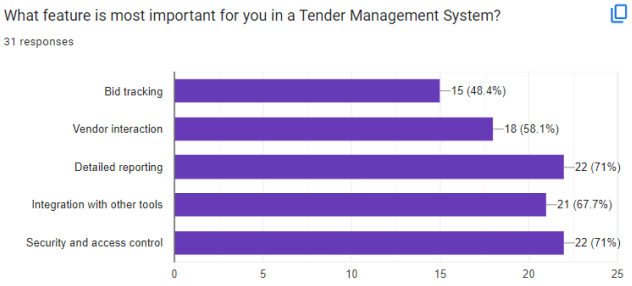
How would you rate the importance of data security in the Tender Management System?

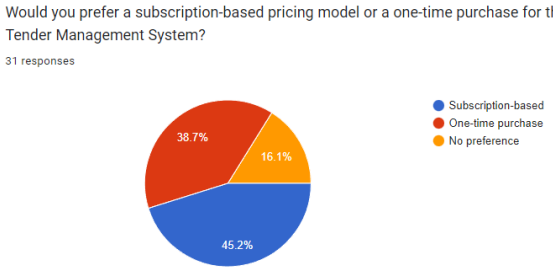
31 responses











Survey Form Link: https://forms.gle/pDsKoi9D1CCZEkhW8

2.4 Expert Advice

Experts strongly recommend the integration of robust encryption protocols within the Tender Management System (TMS) to safeguard the security and confidentiality of sensitive data. Additionally, they emphasize the importance of implementing a user-friendly interface featuring clear instructions and intuitive navigation. This approach is designed to enhance user adoption and streamline the overall tender management experience, contributing to a more effective and user-centric system.

2.5 Current/Future requirements

The future requirements for the Tender Management System (TMS) involve integrating blockchain technology to fortify data security and transparency. Additionally, the implementation of AI-driven analytics aims to enhance the efficiency of bid evaluation by automating the analysis process. Ensuring a mobile-responsive design is also crucial for enabling convenient access and participation in the tendering process, fostering inclusivity and efficiency across diverse user platforms. These advancements underscore TMS's commitment to staying technologically current and providing a robust, forward-looking solution for effective tender management.

3 Overall Description

3.1 Product Functions

3.1.1 Hardware Requirement

- Servers with adequate processing power and memory capacity for managing the influx of tender-related data and user requests.
- Reliable networking equipment to ensure seamless connectivity and data transfer between the TMS and user devices.
- Secure storage devices for backing up and safeguarding critical tender information and system data.
- Robust security systems, including firewalls and intrusion detection/prevention systems, to protect the TMS from unauthorized access and cyber threats.
- High-resolution monitors and compatible display devices for facilitating clear and user-friendly interfaces for TMS administrators and users.

3.1.2 Software Requirements:

- **Operating System:** Compatibility with widely used operating systems such as Windows, macOS, and Linux to ensure broad accessibility for users.
- **Database Management System:** Integration with robust database systems like MySQL or Oracle for efficient storage and retrieval of tender-related information.
- **Web Servers:** Support for popular web server software such as Apache or Nginx to enable the hosting and management of the TMS platform.
- **Security Software:** Implementation of advanced security software, including antivirus and anti-malware programs, to safeguard the TMS from potential cyber threats and vulnerabilities.
- **Encryption Tools:** Integration of encryption software for securing sensitive data transmitted and stored within the TMS, ensuring data privacy and protection.

- **Development Frameworks:** Flask offers a flexible and efficient approach to building web applications, providing the necessary tools for developing a robust and scalable TMS with a user-friendly interface and seamless functionality.

3.2 Functional Requirements

3.2.1 User Authentication/Login:

- **Input:** User's username/email and password.
- **Description:** Users should be able to log in with valid credentials to access the Tender Management System.
- **Output:** Successful login confirmation.
- **Error:** Display an error message for invalid or missing credentials.

3.2.2 Tender Creation:

- **Input:** Tender details including title, description, cost, company name, and other relevant information.
- **Description:** Users should be able to create a new tender with comprehensive details.
- **Output:** Confirmation of successful tender creation.
- **Error:** Display an error message if any required information is missing.

3.2.3 Tender Updation:

- **Input:** Existing tender details to be updated.
- **Description:** Users with appropriate permissions should be able to update the details of an existing tender.
- **Output:** Confirmation of successful tender update.
- **Error:** Display an error message if the update fails or if the user lacks the necessary permissions.

3.2.4 Document Upload:

- **Input:** Relevant documents and files related to the tender (e.g., specifications, terms, attachments).
- **Description:** Users, especially tender issuers, should be able to upload necessary documents when creating or updating a tender.
- **Output:** Confirmation of successful document upload associated with the tender.
- **Error:** Display an error message if the document upload fails or if the uploaded file does not meet the system's requirements, such as file type or size restrictions.

3.2.5 Multi-language Support:

- **Input:** User's language preference.
- **Description:** The system should support multiple languages to cater to users with different language preferences.
- **Output:** The system's interface and content are displayed in the user's selected language.
- **Error:** Selected language not supported.

3.2.6 Sort Tenders by Price and Category:

- **Input:** User's selection for sorting (by price, category, etc.).
- **Description:** Users should be able to sort the list of tenders based on specified criteria.
- **Output:** The system displays the sorted list of tenders according to the user's selection.
- **Error:**Invalid sorting criteria selected.

3.2.7 Search Tenders:

- **Input:** Search query or parameters (e.g., tender title, category).
- **Description:** Users should be able to search for specific tenders based on specified criteria.
- **Output:** The system displays a list of tenders matching the search criteria.
- **Error:** Invalid search parameters. Check your input and try again.Bid Submission Interface:

3.2.8 Bidding Functionality (Add and Delete Bid):

- **Input:** Bid details (amount, user ID, tender ID).
- **Description:** Users should be able to place bids on open tenders and remove their bids if needed.
- **Output:** Confirmation of successful bid addition or deletion.
- **Error:** Display an error message if the bid cannot be added or deleted.

3.2.9 Accept and Reject Bid:

- **Input:** Bid ID or details for accepting/rejecting a bid.
- **Description:** Users with appropriate permissions should be able to accept or reject bids for a tender.
- **Output:** Confirmation of successful bid acceptance or rejection.
- **Error:** Display an error message if the acceptance or rejection fails or if the user lacks the necessary permissions.

3.2.10 Sorting Bids by Prices:

- **Input:** User's selection for sorting bids (by price, ascending/descending).

- **Description:** Users should be able to sort the list of bids for a tender based on specified criteria, such as bid amount.
- **Output:** The system displays the sorted list of bids according to the user's selection.
- **Error:** Invalid input. Check your sorting criteria and try again.

3.2.11 Review Tender:

- **Input:** Tender ID or details and rating for reviewing.
- **Description:** Users should be able to review the details of a specific tender.
- **Output:** Display detailed information about the selected tender.
- **Error:** Review submission failed. Please try again later.

3.3 Non-Functional Requirements

3.3.1 Correctness:

The TMS should ensure accurate and reliable processing of tender-related data and information, minimizing errors and inconsistencies throughout the tender management lifecycle.

It should incorporate data validation checks and error-handling mechanisms to detect and rectify any inaccuracies or discrepancies in the system's outputs and operations, ensuring the integrity and correctness of all processed data.

3.3.2 Portability:

The TMS should be designed for portability, allowing seamless deployment and operation across various computing environments, including different operating systems and hardware configurations.

It should adhere to industry standards for cross-platform compatibility, enabling users to access and utilize the system with consistent functionality and performance, regardless of the specific devices or platforms they use.

3.3.3 Efficiency:

The TMS should demonstrate high efficiency in processing tender-related tasks and operations, ensuring optimal system performance and minimal resource utilization.

It should prioritize fast response times for user interactions, swift data processing, and efficient utilization of computing resources, enabling users to engage with the system seamlessly and perform tasks with minimal delays or latency.

3.3.4 Maintainability:

The TMS should be designed for easy maintenance and updates, facilitating the seamless incorporation of new features, bug fixes, and system enhancements as required.

It should adhere to standardized coding practices and modular design principles, enabling developers to identify and resolve issues efficiently and ensuring long-term sustainability and scalability of the TMS through regular maintenance and updates.

3.3.5 Usability:

The TMS should prioritize user-friendly interfaces and intuitive navigation, ensuring ease of use and accessibility for users with varying levels of technical expertise and experience.

It should incorporate clear instructions, informative tooltips, and contextual help features, enhancing user understanding and engagement with the system's functionalities and ensuring a positive user experience throughout the tender management process.

3.4 User Characteristics

- **Administrator:** Responsible for managing the overall system operations, user permissions, and data security, ensuring smooth and secure functioning of the TMS and overseeing the approval of published tenders.
- **Tender Issuers:** Individuals or organizations responsible for creating and publishing tender opportunities on the TMS, providing detailed specifications and requirements for potential bidders and overseeing the evaluation and selection of winning bids.
- **Bidders:** Entities interested in participating in the tendering process, submitting competitive bids in response to published tender opportunities and engaging with the TMS to access relevant tender information, submit bids, and track tender statuses.
- **Evaluators:** Designated personnel responsible for evaluating and assessing submitted bids based on predefined criteria, ensuring fair and transparent bid evaluations and facilitating the selection of the most suitable bids for contract awarding.
- **System Support Staff:** Personnel responsible for providing technical support, troubleshooting assistance, and user guidance for individuals encountering issues or challenges while using the TMS, ensuring smooth user experiences and efficient resolution of any system-related issues.

3.5 Design & Implementation Constraints

Design and implementation constraints for the Tender Management System (TMS) include adherence to stringent data security regulations, compatibility with existing procurement frameworks, seamless integration with third-party

applications, scalability to accommodate increasing user loads, and adherence to budgetary constraints while ensuring the timely deployment of system updates and enhancements.

3.6 Assumptions & Dependencies

Assumptions and dependencies for the Tender Management System (TMS) encompass reliable internet connectivity for seamless system access, user compliance with data security protocols, availability of hardware and software components meeting system requirements, adherence to regulatory guidelines by all stakeholders, and effective collaboration between TMS administrators and external procurement authorities for timely data sharing and updates.

4 Interface Requirements

4.1 User Interfaces

The TMS should prioritize intuitive and user-friendly interfaces, empowering users to navigate through various system functionalities seamlessly and execute tasks efficiently. The design should emphasize clear information presentation, interactive elements, and straightforward navigation, contributing to enhanced user engagement and overall satisfaction with the Tender Management System. An intuitive interface ensures that users, including tender issuers and bidders, can easily understand and utilize the system, fostering a positive user experience throughout the tender management process.

4.2 Hardware Interfaces

The TMS should demonstrate compatibility with standard hardware components, encompassing desktop computers, laptops, tablets, and smartphones. This ensures consistent functionality and accessibility across a spectrum of devices and platforms. The system should be designed to accommodate diverse hardware specifications and display resolutions, providing optimal user experiences and seamless interactions with the TMS. This versatility ensures that stakeholders can effectively engage with the Tender Management System regardless of the specific hardware configurations they employ.

4.3 Software Interfaces

The TMS should seamlessly integrate with external software applications, including database management systems, email clients, and document processing tools. This integration is essential for ensuring efficient data exchange and interoperability with third-party software, enhancing the overall functionality and adaptability of the Tender Management System. The goal is to create a cohesive digital environment that promotes fluid communication and data sharing between the TMS and other essential tools utilized in the tender management process.

5 Conclusion

In conclusion, the Tender Management System (TMS) stands as a pivotal solution, effectively streamlining and enhancing the efficiency, transparency, and accessibility of the tender management process. With its robust features and user-friendly interface, the TMS is poised to revolutionize the landscape of tender management. It aims to foster fair competition, promote transparency, and optimize operational effectiveness for all stakeholders involved, marking a significant step forward in modernizing and improving the tendering ecosystem.