Software Requirements Specification

for

Online Tender Management System

Version 1.2 approved

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1 Introduction

1.1 Purpose/Objective

The Online Tender Management System (TMS) aims to streamline the complex process of managing tenders efficiently and transparently. By providing a centralized digital platform, it enables organizations to publish, manage, and track tender-related information seamlessly. The system endeavors to enhance accessibility for both tender issuers and bidders, promoting fair competition and optimizing the overall tender management process. Its fundamental objective is to facilitate a convenient and equitable environment for tender management, ensuring a seamless and transparent experience for all stakeholders involved.

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.
- **RFI:** Request for Information. This term will be used to refer to the preliminary document soliciting general information from potential suppliers before the formal tendering process begins.
- **EOD:** End of Day. This abbreviation will be used to signify the conclusion of a business day or operational cycle within the context of time-sensitive tasks or activities.
- **PO:** Purchase Order. This abbreviation refers to the official document issued by a buyer to a seller, indicating the types, quantities, and agreed prices for products or services.
- **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 scope of the Tender Management System (TMS) encompasses the digitization and optimization of the entire tender management process, including tender creation, publication, bid submission, evaluation, and awarding. It also involves facilitating transparent communication between tender issuers and bidders, ensuring compliance with regulatory standards, and enhancing overall operational efficiency within the tendering ecosystem.

1.4 References

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

- "Public Procurement and the EU Competition Rules: Second Edition" by Albert Sánchez Graells, Oxford University Press, 2020.
- "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.
- "Digital Transformation of Public Procurement in Europe: The Path Towards Efficiency and Transparency" by Raluca Nestor, European Institute of Romania, 2022.
- "Tender Management: A Systematic Approach" by Susan J. Wright, Journal of Purchasing and Supply Management, Volume 22, Issue 4, December 2016.

2 History/Background Study (Sources of Domain Knowledge)

2.1 Technical Literature

The historical development of Tender Management Systems (TMS) has been influenced by a series of shifts in procurement practices. Literature such as "The Evolution of E-Procurement in the Public Sector" by Maria Rey-Marston (2018) highlights how technological advancements led to the adoption of digital platforms to streamline tender processes. Additionally, "Tender Management Reforms: A Global Perspective" by John K. Smith (2019) underscores the growing demand for transparency and accountability, prompting governments and organizations to embrace online TMS solutions for improved governance and enhanced competitiveness in the bidding process.

2.2 Existing Applications

Several existing applications such as 'TenderTraq' and 'BidSync' offer comprehensive solutions for tender management, emphasizing features like automated bid tracking, document management, and vendor communication. Notably, these platforms prioritize user-friendly interfaces and customizable workflows, catering to diverse organizational needs and fostering greater efficiency in the tendering process.

2.3 Customer Surveys

After conducting an extensive survey on a set of current TMS customers some of the major findings are as follows:

How often does your organization participate in tender processes?
37 responses

● Rarely
● Occasionally
● Frequently
● Regularly
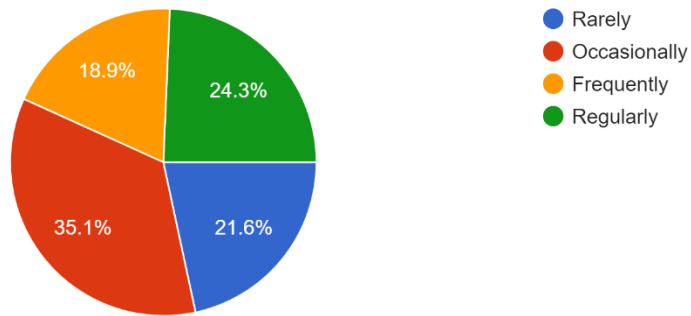
What are the major challenges your organization faces in the existing tender management system? (Select all that apply)
37 responses

Time-consuming processes	12 (32.4%)
Document management issues	15 (40.5%)
Lack of transparency	21 (56.8%)
Inefficient workflows	14 (37.8%)
Difficulty in version control	0 (0%)
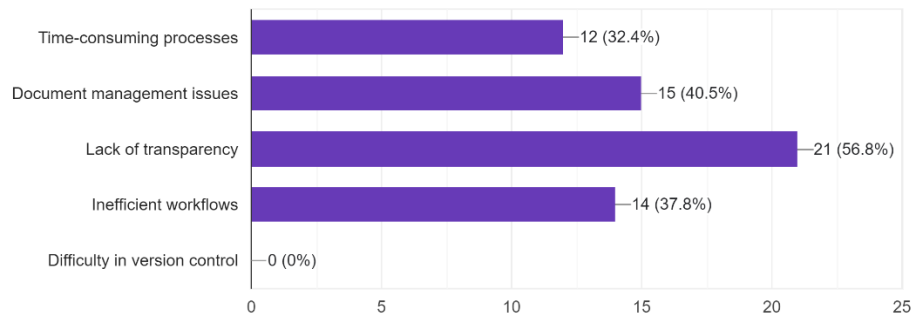
What features would you like to see in an ideal Tender Management System (TMS)? (Select all that apply)
37 responses

Automated tender creation and publication	13 (35.1%)
Transparent bidding process	15 (40.5%)
Real-time updates and notifications	14 (37.8%)
Enhanced collaboration with bidders	10 (27%)
Robust document management	13 (35.1%)
Data analytics and reporting	0 (0%)
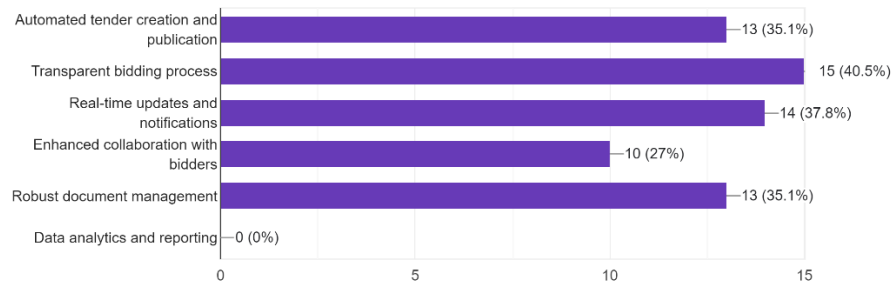
Are there any specific areas in the current tender management system that require improvement?
(Select all that apply)
37 responses
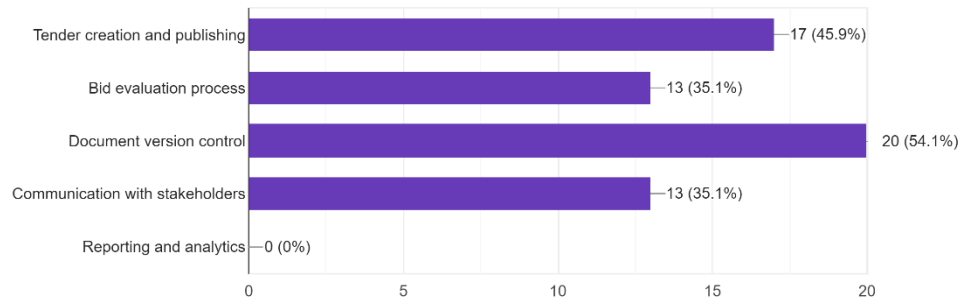
How important is it for your organization to adopt an automated and user-friendly Tender Management System?
37 responses

2.4 Expert Advice

Experts advise integrating robust encryption protocols to ensure the security and confidentiality of sensitive data within the Tender Management System (TMS). They also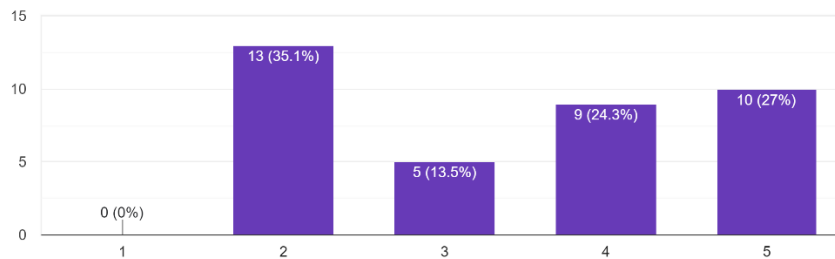 recommend implementing a user-friendly interface with clear instructions and intuitive navigation to enhance user adoption and streamline the overall tender management experience.

2.5 Current/Future requirements

Current and future requirements for the Tender Management System (TMS) include the integration of blockchain technology to enhance data security and transparency, the implementation of AI-driven analytics for efficient bid evaluation, and the incorporation of mobile-responsive design to enable convenient access and participation in the tendering process.

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 Login Portal

The system must allow new users to create accounts by providing essential details such as their full name, email address, contact information, and a secure password meeting predefined complexity requirements.

User registration should include mandatory fields for capturing necessary information, while optional fields can be included for additional details, such as organizational affiliations or designations.

Upon successful registration, the TMS should send a verification email to the user's provided email address, ensuring the validity of the registration and enabling users to activate their accounts securely.

3.2.2 The Home page
The home page will have as simplistic UI for easy access and understanding for users with limited technical exposure.

3.2.3 Tender Creation:
The system should allow authorized users, such as administrators or tender issuers, to create and publish new tender opportunities by providing essential details, including the tender title, description, specifications, and deadlines.

3.2.4 Document Upload:
The TMS should enable users to upload and attach relevant tender documents, such as bid templates, contract terms, and additional specifications, facilitating comprehensive information dissemination to potential bidders.

3.2.5 Customizable Tender Categories:
The system should offer customizable options for classifying tenders into distinct categories, facilitating efficient organization and easy accessibility for bidders interested in specific types of projects or services.

3.2.6 Real-Time Editing:
The TMS should provide a feature for real-time editing and modification of tender details, allowing administrators to update information, extend deadlines, or make necessary revisions to the tender requirements as needed.

3.2.7 Cash Deposit
The standard cash deposit system for ATM machines allows users to deposit cash into their accounts. Users will authenticate themselves, enter the deposit amount, and insert the cash into the designated slot. The ATM will validate and credit the deposited amount to the user's account, generating a transaction receipt.

- Input: The amount of cash to be deposited and the amount in suitable denominations.
- Output: Successful cash deposit.
- Error: Error message and reverted back to home page.

- The user will have to enter his/her credentials before accessing this facility.
- The user will also have to choose the option for Deposit cash on the screen.
- The user will then be prompted to enter the amount that he/she wishes to deposit.
- The user will then have to put in the amount in cash in the cash slot.
- The counting machine will be performing a check on the amount to ensure that it is the same amount that was mentioned by the user. If not, the cash slot won't accept the deposit and an error message will be displayed on screen.

3.2.8 Bid Submission Interface:

The TMS should provide a user-friendly interface for bidders to submit their bids in response to specific tender opportunities, allowing them to enter essential bid details and upload required documents within a designated submission window.

3.2.9 Bid Visibility:

The system should ensure that submitted bids remain confidential and visible only to authorized evaluators, safeguarding the integrity of the tendering process and maintaining fairness among competing bidders.

3.2.10 Bid Deadline Management:

The TMS should incorporate mechanisms for managing bid submission deadlines, notifying bidders of approaching deadlines and ensuring that submissions beyond the stipulated timeframe are not accepted, maintaining a transparent and consistent tender evaluation process.

3.2.11 Bid Revision:

The system should allow bidders to revise and update their submitted bids before the designated deadline, facilitating adjustments or improvements to their proposals based on changing requirements or additional information provided by the tender issuer.

3.2.12 Bid Confirmation and Receipt:

Upon successful bid submission, the TMS should generate a bid confirmation and receipt for the bidder, providing acknowledgment of the submission and ensuring transparency in the tendering process.

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 feature intuitive and user-friendly interfaces, enabling users to navigate through various system functionalities seamlessly and perform tasks efficiently. It should prioritize clear information presentation, interactive

elements, and straightforward navigation, enhancing user engagement and overall satisfaction with the TMS.

4.2 Hardware Interfaces

The TMS should be compatible with standard hardware components, including desktop computers, laptops, tablets, and smartphones, ensuring consistent functionality and accessibility across various devices and platforms. It should accommodate diverse hardware specifications and display resolutions, facilitating optimal user experiences and interactions with the TMS regardless of the specific hardware used.

4.3 Software Interfaces

The TMS should integrate seamlessly with external software applications, such as database management systems, email clients, and document processing tools, enabling efficient data exchange and interoperability with third-party software.

5 Conclusion

In conclusion, the Tender Management System (TMS) serves as a pivotal solution for 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, fostering fair competition, and optimizing operational effectiveness for all stakeholders involved.