

Material Testing Software

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Situation:

- UBIXA lab receives customer letters containing project details, client names, dates, and testing materials, which are manually recorded before starting any laboratory testing process.
- Technicians perform tests on cement, concrete, steel, soil, and aggregates, then prepare handwritten observation sheets which later become the base for report creation.
- Reports are currently prepared manually in Excel and Word, making the process slow, repetitive, and prone to small but significant mistakes in formatting.
- Each report requires complete data entry from scratch, consuming additional effort and delaying the final delivery to customers and management.
- Managers review these reports manually without a centralized system, resulting in delays, inefficiency, and miscommunication across teams.

Problem:

- Manual reporting consumes more time, creates higher chances of errors, and reduces accuracy in material testing documentation and reporting process.
- Data storage is not centralized or secure, making it difficult to retrieve old reports and letters when urgently required.
- Monthly tracking of inward letters and generated reports is unreliable, creating inefficiency in measuring company's overall productivity.
- Misplaced or incomplete reports create risks for quality control and reduce client trust in UBIXA's testing process.
- Absence of an automated reporting solution leads to wasted effort, low productivity, and poor visibility for management decision-making.

Opportunity:

- Develop a centralized **Material Testing Software** for UBIXA that digitizes the entire reporting workflow from inward entry to report generation.
- Centralized data storage ensures safety, easy retrieval of old records, and better organization of customer details and reports.
- Report analysts will enter testing values directly into the software, while managers can instantly approve or reject with proper remarks.
- Approved reports become finalized within the system and can be printed immediately with accurate, verified details for clients.
- Dashboards and advanced search functions will provide quick monthly tracking, productivity measurement, and detailed insights into all completed testing work.

Purpose Statement (Goal):

The purpose of this project is to design and implement a **Material Testing Software (MTS)** for UBIXA, focused entirely on reporting and record management. At the beginning, every customer letter will be inwarded into the system by entering project name, client details, letter date, and material type. During inward entry, the report analyst will also select the required material and corresponding test type to be reported, such as compressive strength for cement, moisture content for soil, or tensile strength for steel. Once the inward entry is created, the system will generate a unique inward number that links all associated reports. Using this inward number, the report analyst will later enter actual test readings based on laboratory results. Submitted reports will go to the manager for review and may be approved or rejected. Approved reports will be finalized, securely stored, and made available for printing, ensuring faster reporting, safe data storage, and efficient monthly tracking.

Project Objectives:

- Select, analyze, and design the Material Testing Software according to clearly defined requirements, specifications, and UBIXA's business needs, ensuring alignment with organizational goals and industry reporting standards.
- Develop, prototype, and thoroughly test the software modules for letter inward entry, report creation, manager approval workflow, and final printing to ensure smooth functioning and user-friendly interface.
- Ensure safe, centralized data storage for all customer letters and reports with quick search and retrieval features, providing secure access and reducing risks of data loss or duplication.
- Automate report submission, manager review, approval, and final report generation within the software to minimize manual effort, reduce errors, and improve reporting accuracy and accountability.
- Provide dashboards and monthly tracking features to measure productivity, monitor work volume, analyze inward letters, and generate insights for management decision-making and performance improvement.

Success Criteria:

- **Centralized Digital Storage**
Improve the availability and accessibility of test reports, customer letters, and project details through a centralized digital system, ensuring secure data storage and quick retrieval whenever required.
- **Faster Report Generation**
Reduce manual effort, system downtime, and waiting time by implementing an automated process, ensuring faster, reliable, and accurate response for test report generation across all materials.
- **High Accuracy in Reporting**
Achieve a minimum of 95% accuracy in data entry and report preparation through structured analyst-driven workflows, reducing human errors and enhancing report reliability.
- **Manager Approval Workflow**
Enable managers to review, approve, or reject reports digitally within the software, ensuring accountability, improving process transparency, and minimizing errors in final report delivery.
- **Dashboards and Tracking**
Provide monthly dashboards and advanced search functionality to track inward letters, completed material tests, and overall company productivity efficiently, supporting management decision-making and performance analysis.

Methods/Approach:

- **Define Requirements**

Requirements will be gathered by interacting with key stakeholders such as report analysts, technicians, and managers. Elicitation techniques like interviews, questionnaires, document analysis, and workshops will be used to capture both functional and non-functional needs effectively.

- **Technology Selection**

Appropriate technology stack and development tools will be selected after reviewing multiple options, analyzing feasibility, scalability, and cost-effectiveness to ensure long-term sustainability and smooth functioning of the Material Testing Software.

- **System Design and Development**

The software will be designed and developed using the **Waterfall Model**, ensuring step-by-step modules for inward entry, report creation, manager approval workflows, and final report printing with proper documentation at each stage.

- **Testing and Training**

The system will be tested with sample data to verify accuracy and reliability. Training sessions will be conducted for report analysts and managers, while structured support processes will be established for smooth adoption.

- **Deployment and Go-Live**

After successful testing and training, the solution will be deployed across UBIXA labs. The project will go live with the new reporting system, enabling digitized workflows and improved operational efficiency.

Resources:

- **People** – Business Analyst, Software Developers, Testers, Report Analysts, Technicians, Project Manager, and IT Support staff will collaborate to design, develop, test, and implement the software successfully.
- **Time** – The entire project implementation, including requirement gathering, design, development, testing, training, and deployment, is expected to be completed within **6 months** following the Waterfall methodology.
- **Budget** – Overall estimated project budget is **₹15,00,000**, covering manpower cost, hardware, software licenses, development tools, training sessions, implementation, and deployment services for UBIXA company.
 - Software: ₹ 5,00,000
 - Hardware: ₹ 2,00,000
 - Training & Services: ₹ 8,00,000
- **Other** – Includes third-party software evaluations, validation site visits, technical documentation, and research reports to ensure accuracy and feasibility, with allocation included in the overall project budget.

Risks and Dependencies:

Risks:

- Current manual reporting process has been in use for years; shifting to a new system may face resistance from employees who are comfortable with existing methods.
- Incorrect or incomplete data entered by report analysts may lead to errors in final reports, reducing system accuracy and client trust.
- Delays in system development or testing may increase overall project timeline and budget, impacting business operations and deliverables.
- Hardware or software failures, including server downtime, could affect report generation, storage, and accessibility, impacting day-to-day operations.
- Lack of proper training for staff may result in improper use of the system, reducing expected benefits and slowing adoption.

Dependencies

- Project success depends on timely and accurate requirement gathering from stakeholders like report analysts, technicians, and managers.
- Reliable infrastructure, including servers, storage, and internet connectivity, must be available for smooth software deployment and usage.
- Continuous support and commitment from management and end-users are essential for adopting the system and achieving long-term success.

THANK YOU