Automation and AI Integration in Work Order Closing Process:

A Business Solution for Timely Billing and Quality Assurance

A Comprehensive Overview

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Abstract

This study aims to develop a **Smart Vendor Project Monitoring System** that automates and streamlines the process from project completion to vendor billing. It addresses common delays in document submission, inspection, and penalty enforcement through an integrated dashboard, automated reminders, and AI-assisted tracking. The system will enhance visibility, improve compliance, and reduce manual workload supporting faster, data-driven decision-making in vendor project management.

Why This Study Matters

Projects are completed... but vendor billing is delayed.

Missing documents, repeated follow-ups, and inspection bottlenecks slow everything down.

QI teams are overloaded, and there’s no system to track everything in real time.

The result: delayed payments, process inefficiency, and accountability gaps

This study proposes a Smart Monitoring System that uses automation, analytics, and AI to improve the process.

Observations

The current work order closing process in is manual, fragmented, and inefficient, resulting in delayed vendor billing, inconsistent quality inspections, and lack of real-time monitoring. The absence of automation and AI-driven analytics prevents timely decision-making and contributes to vendor non-compliance, audit backlogs, and operational bottlenecks.

Problem 1

Vendor Submission Delays – Vendors often fail to submit required COC and documents on time, resulting in project backlogs and extended billing cycles.

Problem 2

Weak Penalty Enforcement – Service Level Agreement (SLA) breaches by vendors are not consistently penalized, reducing accountability and encouraging repeated delays.

Observations

Problem 3

Overloaded QI Monitoring – Quality Inspectors (QI) experience high workloads, making it difficult to meet audit targets and monitor compliance effectively.

Problem 4

Limited Process Visibility – The lack of an integrated dashboard and real-time tracking hinders timely decision-making and proactive issue resolution.

Statement of the Problems

The existing manual work order closing process lacks automation and AI integration, causing frequent delays, inconsistent monitoring, and inadequate enforcement of compliance measures, which ultimately slow down vendor billing and quality assurance.

1. **Real-time project monitoring and KPI visualization are insufficien**t, making it difficult for stakeholders to track progress effectively.
2. **Reminders and notifications to vendors and internal teams are not automated**, leading to delays in document submission and resolution of backjobs.
3. **The process lacks AI-powered features** that could provide predictive analytics, automated corrective suggestions, and instant project inquiries.
4. **SLA compliance is not consistently tracked**, and **penalty enforcement for vendor delays is weak**, allowing non-compliance to persist.
5. **QI workload management is inefficient**, with no systematic approach to calculate audit targets or analyze reasons for missed inspections.
6. **Report generation is manual and time-consuming**, limiting the availability of accurate and timely data for management decisions.
7. There is **no mechanism to measure and compare the effectiveness** of the current process with an improved automated system, hindering continuous improvement efforts.

Objectives

To design and develop a **Smart Vendor Project Monitoring System** that integrates automation and artificial intelligence to streamline the work order closing process, enhance quality assurance, and ensure timely vendor billing.

1. To **automate project monitoring** through a centralized dashboard that provides real-time tracking, KPI visualization, and workload distribution for QI and other stakeholders.
2. To **implement an automated email and notification system** that sends scheduled reminders to vendors and internal teams, ensuring timely submission of documents and faster resolution of backjobs.
3. To **integrate AI-powered features** such as a chatbot for project inquiries, predictive analytics for delay forecasting, and automated suggestions for corrective actions and process improvements.
4. To **develop SLA monitoring** and to **enforce strongly the penalty modules** that automatically track compliance, flag overdue tasks, and generate penalty memos to discourage repeated vendor delays.
5. To **incorporate a workload capability tracker** for QI teams that calculates audit targets based on historical performance and summarizes reasons for unmet targets, supporting data-driven corrective measures.
6. To enable **automated report generation** (weekly/monthly) that summarizes project statuses, vendor compliance, SLA breaches, billing progress, and other key metrics for management decision-making.
7. To **evaluate the system's effectiveness** in improving work order closing timelines, reducing manual workload, and increasing compliance compared to the current manual process.

PROJECT FEATURES

CORE FUNCTIONALITIES

Automated Dashboard

Real-time project tracking

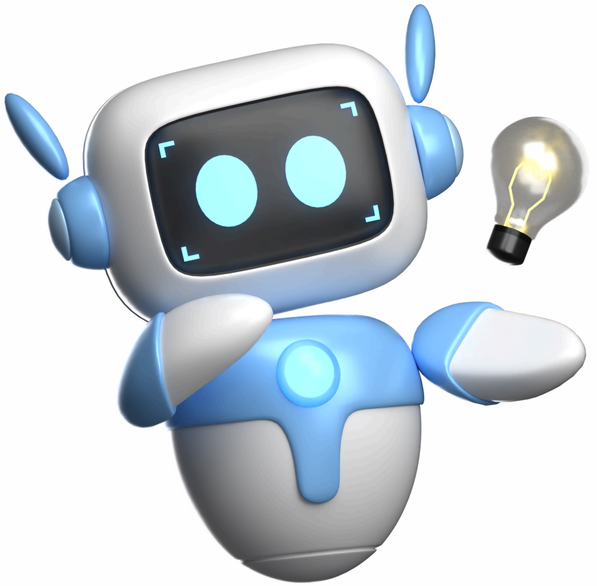
KPI visuals and status indicators

Large-monitor and mobile-friendly view

Automated Email and Notification System

Scheduled reminders to vendors and internal teams

SMS or push alerts for urgent cases



AI Integration

Natural language chatbot for instant inquiries

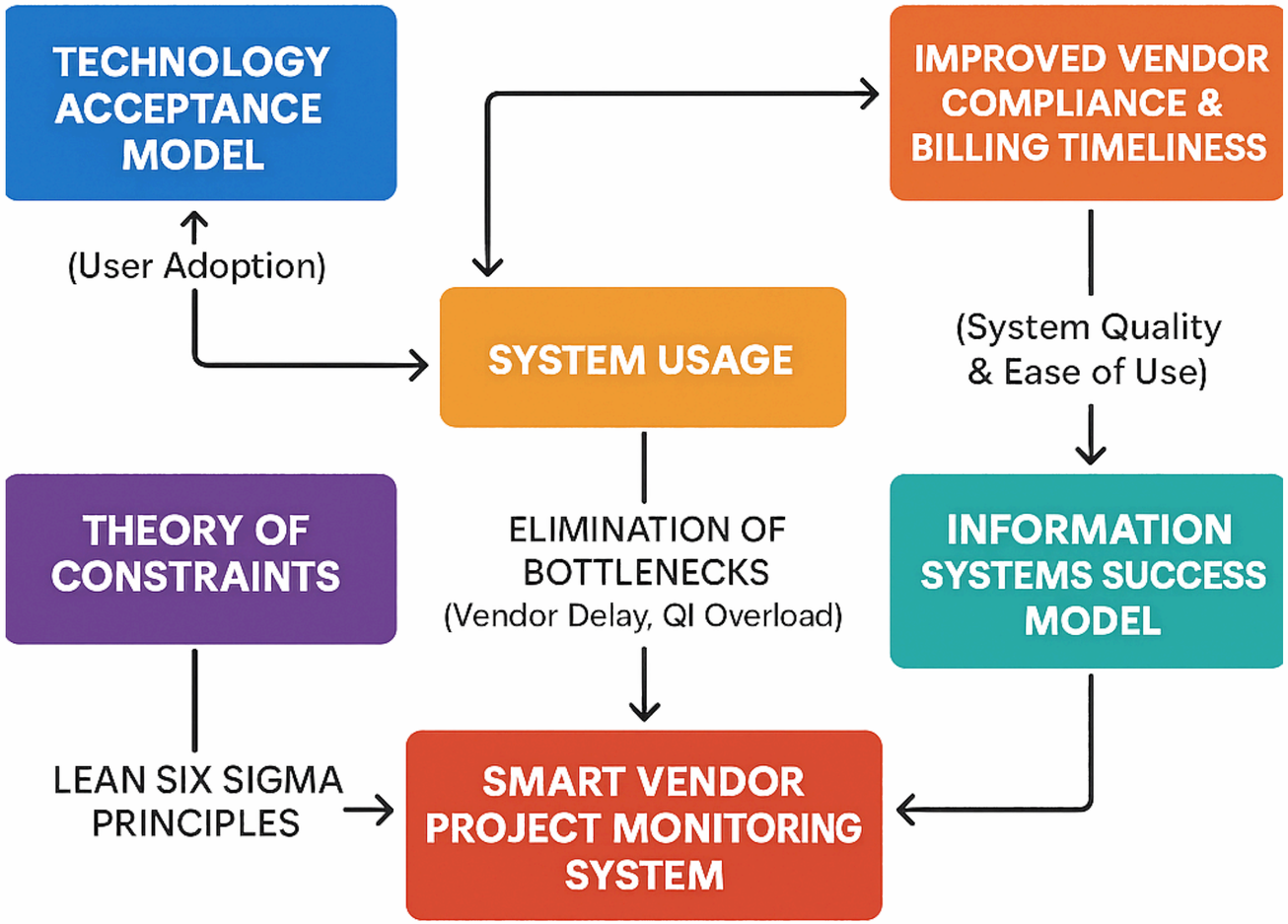
Historical query handler for project data retrieval

Hypothesis

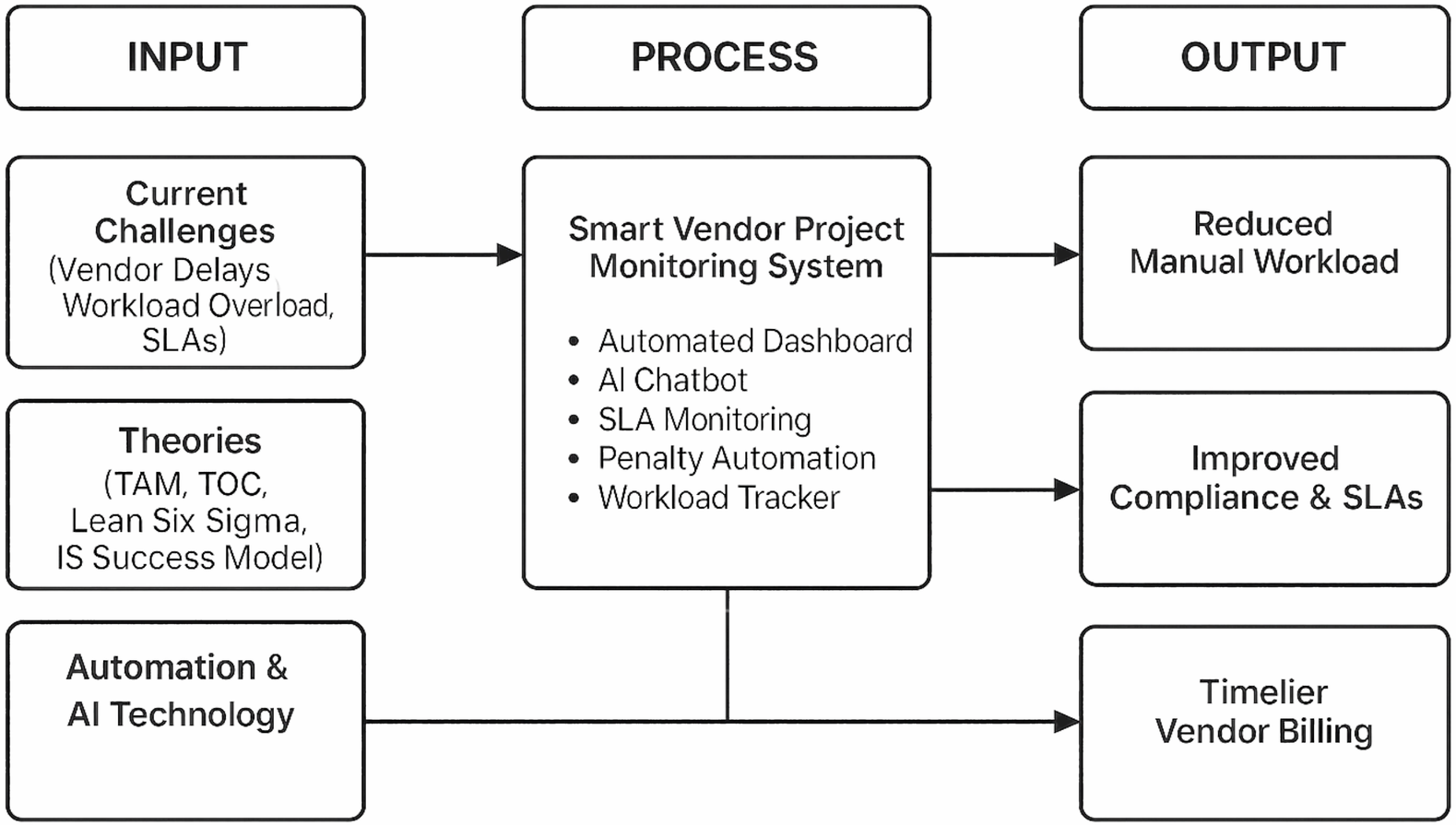
Null Hypothesis (H_0)
The implementation of the Smart Vendor Project Monitoring System that integrates automation and AI does not significantly improve the efficiency of work order closing, vendor compliance, and timeliness of billing compared to the current manual process.

Alternative Hypothesis (H_1)
The implementation of the Smart Vendor Project Monitoring System that integrates automation and AI significantly improves the efficiency of work order closing, vendor compliance, and timeliness of billing compared to the current manual process.

Theoretical Framework



Conceptual Framework



Literature Review

01

Automation in Vendor Management

- Automation reduces manual tasks and compliance gaps.
- International studies show efficiency gains of 25–45%.
- Local studies confirm improved compliance and process visibility.

02

AI in Project Tracking and Predictive Monitoring

- AI enables real-time monitoring and predictive alerts.
- Enhances decision-making with historical data analysis.
- Local studies confirm improved project scheduling and reduced delays.

03

Automation in Billing and Invoice Systems

- Billing automation reduces errors and processing time.
- Global studies highlight benefits of ML and RPA.
- Local research shows faster payment cycles with e-invoicing.

04

SLA Monitoring, Escalation & Penalty Automation

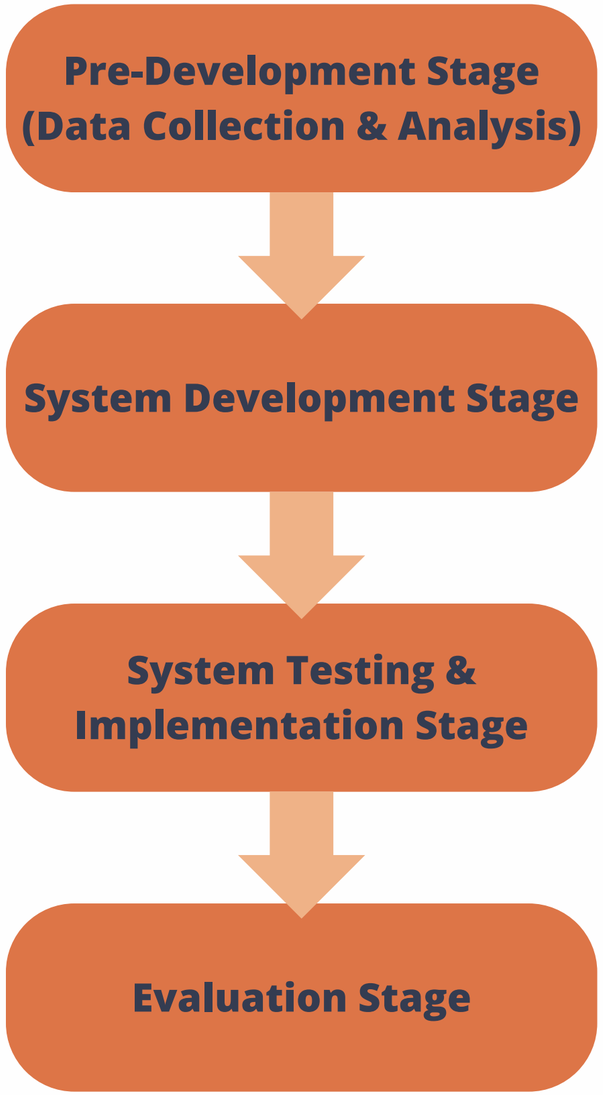
- SLA monitoring ensures compliance with deadlines.
- AI supports escalation workflows and penalty enforcement.
- Local studies show reduced vendor delays with automation.

Research Design

This study will employ a **Developmental Research Design (R&D)** combined with a **Descriptive-Evaluative Approach**.

- The R&D design is appropriate as the study involves the design, development, and testing of a Smart Vendor Project Monitoring System integrating automation and AI.
- The Descriptive-Evaluative component will measure and describe the system's impact on the existing process by gathering feedback and comparing KPIs before and after implementation.

Data Gathering Procedure



- Conduct interviews and surveys with QI personnel, WO Supervisors, and Vendors to identify current process pain points.
- Collect historical project data (e.g., completion times, SLA compliance rates, vendor delays) to serve as baseline metrics.

- Use an Agile development approach to design and prototype the system.
- Continuous feedback loops from stakeholders.

- Deploy the system in a pilot area (one department or vendor group).
- Monitor performance, collect usage data, and record issues.

- Conduct post-implementation surveys and KPI analysis.
- Compare with baseline data to evaluate effectiveness.

Implementation

Phase	Description	Expected Output
Phase 1 – Requirement Analysis & System Design	Gathering data, defining specifications, designing system modules.	Functional Requirements Document, System Design Blueprint
Phase 2 – System Development	Coding and integrating features: Dashboard, Email Automation, AI Modules, etc.	Beta Version of the System
Phase 3 – Pilot Testing & Feedback	Deploying system to a selected department for initial testing and refinement.	Pilot Results, Issue Logs, User Feedback
Phase 4 – Full Deployment & Training	Implementing system company-wide, conducting user training.	Fully Functional Smart Vendor Monitoring System
Phase 5 – Post-Implementation Evaluation	Monitoring KPI improvements, evaluating system performance.	Evaluation Report, Final Recommendations

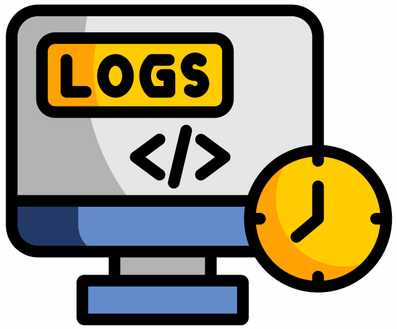
Implementation

Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Requirement Analysis & Data Collection						
System Design						
Development						
Pilot Testing						
Deployment						
Evaluation & Final Report						

Instrumentation

Survey Questionnaire

to gather user satisfaction data from QI, vendors, and supervisors.



System Usage Logs

to track real-time usage, compliance rates, and workload distribution.

Interview Guide

to collect qualitative insights during the pilot testing stage.

KPI Metrics

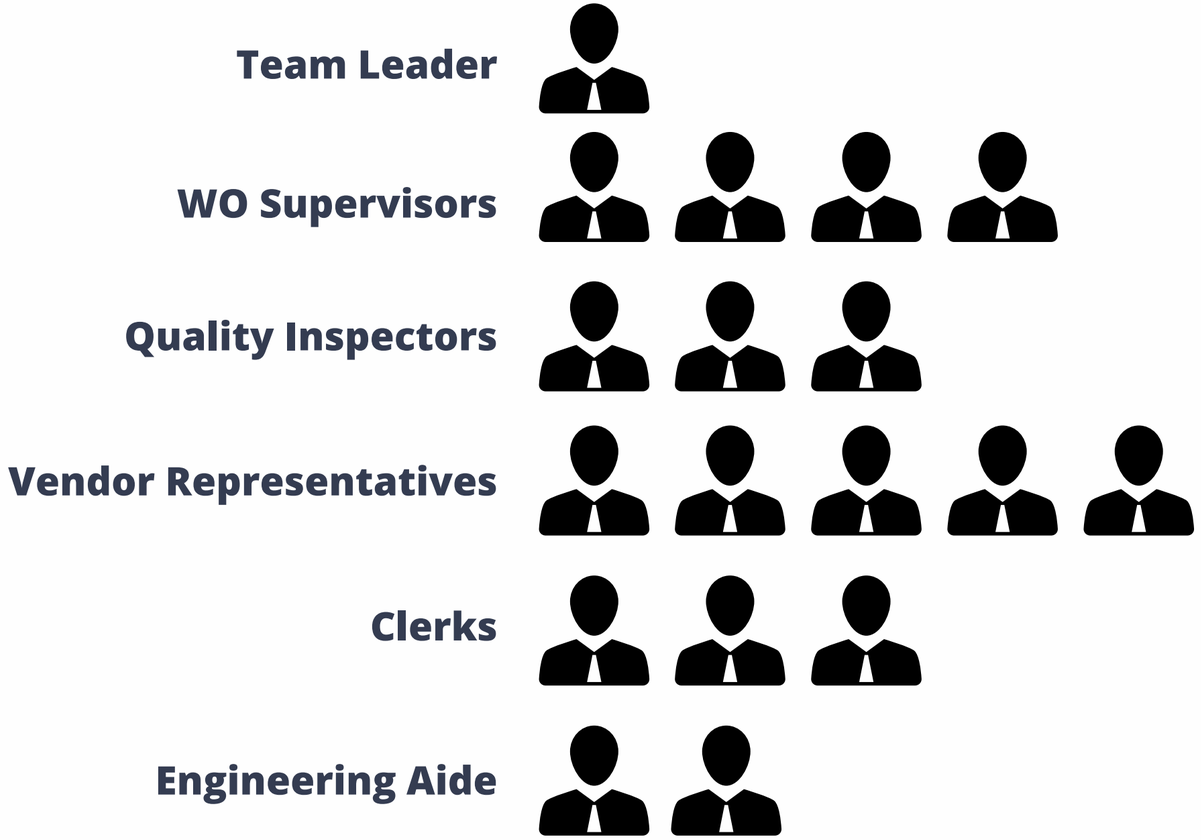
comparing pre- and post-implementation data

Research Locale

Location: Meralco Networks – Paranaque Sector
Construction 1 Office
Justification: The department directly handles project schedules, vendor billing, and quality inspections, making it the ideal testing ground for the Smart Vendor Project Monitoring System.

Sampling Technique

Purposive Sampling will be used since only participants directly involved in work order closing and vendor management will be included.



Thank You So Much!

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