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# U.S. Healthcare Drug Use Report – PM Documents

List of all Project Management  
Documents related to Drug Use  
Report Project

Vaibhav Nangia

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# Document 1: Project Charter

**Project Title:** National Healthcare Drug Use Analytics Platform

**Project Sponsor:** Department of Health Data & Analytics (US-HHS Division)

**Project Manager:** Vaibhav Nangia, PMP® Project Manager & Lead Business Analyst

**Date:** June 23, 2025

## 1. Purpose and Justification

The United States faces a critical opioid and drug use epidemic, with wide-ranging clinical and socioeconomic consequences. Despite the abundance of healthcare and public data, decision-makers lack a centralized, visual, and actionable analytics platform to understand national and local drug use trends. This project aims to bridge that gap through a comprehensive, interactive data analytics solution that empowers public health agencies, hospital administrators, and policymakers.

This project is justified by:

- Rising emergency department (ED) drug-related visits (60%+ burden).
- Regional disparities in drug use patterns and healthcare strain.
- Need for correlational insights between drug use and socioeconomic indicators.
- Lack of an integrated, visual, self-service BI tool across jurisdictions.

## 2. Project Description

The National Healthcare Drug Use Analytics Platform will:

- Integrate multiple healthcare and socioeconomic datasets.
- Build a clean, relational database (SQLite) in a scalable cloud notebook (Google Colab).
- Transform data with Python and visualize it using Tableau.
- Deliver 4 role-based interactive dashboards:
  - Executive Overview
  - Socioeconomic Impact
  - Facility-Level Drilldown
  - Demographic & Drug Type Insights

## 3. Objectives

Objective	Success Criteria
1. Build a unified data pipeline integrating hospital, drug, and socioeconomic data.	Final integrated dataset delivered and documented.

2. Develop 4 role-specific Tableau dashboards with filtering, drilldowns, and trends.	Dashboards reviewed and accepted by key stakeholders.
3. Generate insights on drug types, hospital hotspots, and socioeconomic correlations.	Validated patterns presented in final report.
4. Create complete project documentation per PMP and BI standards.	Signed-off documentation and handoff package.

## 4. High-Level Scope

### In-Scope:

- Data collection, cleaning, enrichment, and linkage
- SQL- and Python-based analysis
- Dashboard wireframes and final implementation (Tableau)
- Documentation of architecture, metrics, and decisions
- Stakeholder feedback sessions and refinements

### Out-of-Scope:

- Real-time API/data stream integration
- Public web hosting or mobile dashboard access
- Clinical deployment or policy recommendation implementation

## 5. Deliverables

- SQLite-integrated dataset
- 4 Tableau dashboards with stakeholder-focused design
- Final project report with findings and visual samples
- Metadata dictionary, ERD, DFD, and documentation suite
- Complete project folder with scripts, notebooks, and user guides

## 6. Milestones & Timeline

Milestone	Estimated Date
Project Initiation & Charter Approval	June 25, 2025
Data Engineering Completion	July 5, 2025
EDA & Dashboard Design Finalized	July 10, 2025
Tableau Dashboards Completed	July 20, 2025

## 7. Budget Overview

Category	Estimate
Tools (Tableau Desktop, Google Colab)	\$0 (existing licenses/free tier)
Labor (PM, Analyst, QA)	\$12,000 (self-paced & contracted work)
Contingency (10%)	\$1,200
<b>Total</b>	<b>\$13,200</b>

*Note: For a demonstration project, no actual billing or vendor costs apply.*

## 8. Assumptions

- Simulated data is acceptable for analysis where real data is incomplete.
- Stakeholders will review dashboards and provide timely feedback.
- Google Colab and Tableau are accessible throughout development.

## 9. Constraints

- Limited to public and simulated data sources.
- No on-premises deployment or EHR integration.
- Dashboard performance dependent on Tableau Desktop capacity.

## 10. Risks

Risk	Likelihood	Impact	Mitigation
Data inconsistencies	Medium	High	Apply strict quality checks post-ingestion.
Overload in dashboard UI	Low	Medium	Use progressive disclosure and filters.
Time overrun	Medium	Medium	Use buffer in each milestone timeline.

## 11. Key Stakeholders

Role	Name	Responsibility
Project Manager	Vaibhav Nangia	Planning, execution, dashboard delivery

<b>Sponsor</b>	Director, US-HHS Health Analytics	Review, strategic alignment
<b>End Users</b>	Health Policy Analysts, Hospital Admins	Feedback, design input
<b>QA Reviewer</b>	Data Quality Consultant	UAT, validation of final product

## 12. Approval

By signing this charter, all parties authorize the project's initiation and commit to supporting its successful delivery.

Name	Title	Signature	Date
<b>Dr. Alex Carter</b>	Director, US-HHS Analytics	_____	06/25/2025
<b>Vaibhav Nangia</b>	Project Manager	_____	06/25/2025

## Document 2: Stakeholder Register

This register identifies all key stakeholders involved in or impacted by the project, their roles, levels of influence and interest, communication needs, and engagement strategy.

### Stakeholder Register

Stakeholder Name	Role	Interest	Influence	Communication Needs	Engagement Strategy
Dr. Alex Carter	Executive Sponsor (US-HHS)	High – strategic use of insights for policy planning	High	Executive Summary, Dashboard Review	Keep satisfied; engage during deliverable review and final signoff
Vaibhav Nangia	Project Manager & Lead Analyst	Very High – responsible for planning, execution, and delivery	Very High	All documentation, dashboards, data lineage	Manage closely; lead all phases of delivery
Emma Price (Fictional)	Hospital Administrator Advisor	Medium – provides clinical context for hospital data	Medium	Access to facility-level dashboards, visual trend reports	Keep informed; engage during drill-down dashboard development
Julia Gomez (Fictional)	Health Policy Analyst	High – needs socioeconomic insights for intervention planning	Low	Filterable visual reports, state-level trends	Keep informed; collect feedback on socioeconomic dashboard
Anita Patel (Fictional)	Data Quality Reviewer	Medium – validates final dataset and transformations	Medium	Data profiling reports, transformation audit trail	Manage closely during QA/UAT phase
Tableau Developer (You)	Dashboard Designer	High – builds and refines dashboard UX	Medium	Stakeholder feedback, KPIs, parameter logic	Collaborate; apply iterative improvements

### Stakeholder Analysis Summary

- High Influence, High Interest → Manage Closely: Vaibhav Nangia, Dr. Carter
- High Interest, Low Influence → Keep Informed: Policy Analyst, Hospital Admin

- High Influence, Low Interest → Keep Satisfied: QA/Reviewers, Sponsors
- Medium Both → Collaborate on decisions and design: Developers, SMEs

## Communication Cadence Summary

Activity	Stakeholders Involved	Frequency	Format	Owner	Channel
Status Check-ins	PM, QA, Dev	Weekly (April–June)	Email + Virtual Meeting	PM	Zoom + Slide Deck
Stakeholder Demo	All	May 15, June 10	Tableau Walkthrough	BA	Tableau Share + Demo
Feedback Collection	Admins, Analysts	After each dashboard draft	Structured Feedback Form	BA	Email + Shared Drive
Final Signoff	Sponsor, PM	June 23, 2025	Summary Report & Final Presentation	PM & BA	Live Demo + Google Drive

# Document 3A: Business Case – Short

## Project Title:

National Healthcare Drug Use Analytics Platform

## Objective:

To develop a centralized, interactive analytics solution that enables policymakers, healthcare administrators, and public health researchers to visualize, analyze, and act upon drug use trends across the U.S., with correlation to socioeconomic factors.

## Problem Statement:

The rising incidence of drug-related hospitalizations, particularly involving opioids and cannabis, has outpaced the capacity of decision-makers to analyze trends in real-time. Existing tools are siloed, non-visual, and insufficient for geographic or demographic targeting.

## Proposed Solution:

An end-to-end data engineering and business intelligence platform integrating hospital records, socioeconomic data, and drug incident datasets. The solution includes four user-centric Tableau dashboards supported by a Python-SQL-based data pipeline.

## Strategic Benefits:

- Enables data-driven public health interventions.
- Identifies high-risk geographies and hospital strain.
- Correlates socioeconomic variables with drug use.
- Supports executive KPIs and resource planning.

## Expected Outcomes:

- Reduced blind spots in healthcare planning.
- Faster insight delivery to stakeholders.
- Scalable, documented data architecture for future enhancement.

**Sponsor Approval:** This project aligns with strategic public health goals and leverages modern data analytics to create high-impact tools for decision support.

# Document 3B: Business Case – Full Version

## 1. Executive Summary

The U.S. is facing a growing healthcare burden driven by drug-related incidents — particularly opioids and cannabis — with stark disparities between states, hospitals, and demographic groups. Current data platforms are fragmented and lack interactivity, impeding responsive action. This project proposes the creation of a unified, interactive drug use analytics platform, empowering health authorities with real-time, data-driven insights.

## 2. Problem/Opportunity Statement

Despite the availability of vast health-related datasets, stakeholders cannot easily analyze:

- Which facilities are seeing surges in drug cases?
- How socioeconomic factors (poverty, unemployment) influence drug use?
- Which demographics are most vulnerable?

Without timely, drill-down intelligence, public health responses remain generic, underfunded, or misdirected.

## 3. Project Goals

- Build a cloud-based data pipeline integrating de-identified healthcare and socioeconomic data.
- Deliver four dynamic, Tableau dashboards tailored for executive, policy, geographic, and demographic insights.
- Provide stakeholders with filters, trends, drilldowns, and visual correlations that previously required weeks of manual analysis.

## 4. Strategic Alignment

This project supports:

- **Public Health Modernization:** Enables more localized, proactive responses.
- **Data-Driven Governance:** Promotes evidence-based policy decisions.
- **Healthcare Resource Optimization:** Identifies hospital burden zones.
- **Equity-Focused Strategy:** Highlights social determinants of drug use.

## 5. Benefits and Outcomes

Category	Benefit
Operational	Faster insight into where resources are needed.
Analytical	Unified, normalized, and enriched dataset for high-quality EDA.

<b>Strategic</b>	Alignment with federal initiatives targeting opioid crises.
<b>User Experience</b>	Easy-to-navigate dashboards for executives, analysts, and administrators.

## 6. Cost Estimates & ROI

Cost Component	Estimate
Development Time (PM, Analyst, Dev)	\$12,000
Tools (Tableau, Google Colab)	\$0 (free tier / license available)
Contingency (10%)	\$1,200
<b>Total</b>	<b>\$13,200</b>

ROI is qualitative for this initiative: reducing resource waste, improving care delivery, and empowering timely interventions.

## 7. Alternatives Considered

Option	Evaluation
Status Quo	Retains fragmented systems; analysis remains manual and slow.
Third-Party Tool Purchase	Expensive, not customizable to this use case.
Open Source Dashboards	Lack of integration with public health datasets.
Proposed In-House BI Platform	Fully customizable, scalable, and cost-effective.

## 8. Risks and Mitigation

Risk	Mitigation
Simulated data limits real-world deployment	All limitations documented; future version can ingest live data
Stakeholder misalignment on dashboard use	Involve end users during design validation
Performance issues in Tableau	Use filters, top N parameters, and efficient extracts

## 9. Success Metrics

- 100% dashboard deployment
- At least 3 stakeholder roles supported by tailored views

- Project delivered on time and within budget
- EDA insights validated through synthetic correlation studies

## 10. Recommendation

Proceed with the implementation of this analytics platform. The foundational work completed ensures high-quality insights, adaptability, and strategic value. With minimal overhead and high usability, this project meets the urgent need for modern public health intelligence tools.

# Document 4: Project Proposal

**Project Title:** National Healthcare Drug Use Analytics Platform

**Submitted To:** Dr. Alex Carter Director, Health Data & Analytics Division U.S. Department of Health & Human Services (Fictional)

**Submitted By:** Vaibhav Nangia, PMP® Project Manager & Lead Business Analyst

**Date:** April 20, 2025

## 1. Executive Summary

This proposal seeks approval and support to launch a comprehensive drug use analytics platform addressing one of the most critical healthcare challenges in the U.S. The proposed platform will consolidate fragmented healthcare, hospital, and socioeconomic data to empower stakeholders with actionable, interactive dashboards. This solution enables fast, data-driven decision-making to reduce hospital burden, improve resource planning, and design targeted public health interventions.

## 2. Objectives

- Integrate drug use incident data with hospital and socioeconomic datasets using Python and SQL.
- Build four Tableau dashboards tailored to executive, demographic, geographic, and policy analysis.
- Enable stakeholders to analyze patterns by drug type, patient setting, state, hospital, and social factors like poverty or education.

## 3. Justification

The rise in opioid and cannabis use—especially in emergency departments—has overwhelmed the system. Existing tools do not allow for dynamic, drill-down analysis of where and why drug-related incidents are happening. This project fills that void and enhances federal and state capabilities in public health planning.

## 4. Project Deliverables

- End-to-end engineered SQLite database.
- 4 Role-based Tableau dashboards:
  - Executive Summary – KPIs, Trends, Map
  - Socioeconomic Impact – Income, Poverty, Unemployment
  - Geographic Drilldown – Cities, Hospitals, ED/IP stats
  - Demographics & Drug Type – Age, Sex, Rural/Urban
- Metadata dictionary, ERD, data flow diagrams
- Final report, user guide, and presentation pack

## 5. Timeline Overview

Milestone	Date
Project Kickoff	April 22, 2025
Data Integration Completed	May 1, 2025
Dashboards Prototyped	May 10, 2025
Final Visualization Delivery	June 10, 2025
Final Report & Handoff	June 23, 2025

## 6. Budget Estimate

Cost Component	Estimated Amount
PM, Analyst, Development Effort	\$12,000
Tools (existing licenses)	\$0
Documentation & QA Support	\$1,200
<b>Total</b>	<b>\$13,200 (Internal Cost Basis Only)</b>

This is a self-managed, internal delivery with no external vendor dependencies.

## 7. Key Stakeholders

- Sponsor:** Dr. Alex Carter – Executive Approval, Strategy
- PM & BA Lead:** Vaibhav Nangia – Execution, QA, Documentation
- Analysts & Admins:** For dashboard validation and usability
- QA Reviewer:** For data verification and integrity assurance

## 8. Approval Signatures

By signing below, the undersigned acknowledge that the proposed project has merit, aligns with strategic goals, and is approved to proceed.

Name	Title	Signature	Date
Dr. Alex Carter	Director, US-HHS Health Analytics	_____	April 21, 2025
Vaibhav Nangia	Project Manager & BA Lead	_____	April 21, 2025

# Document 5: Project Scope Statement

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared By:** Vaibhav Nangia, PMP®

**Date:** April 22, 2025

## 1. Project Purpose

To develop an end-to-end analytics platform that consolidates hospital drug use data, socioeconomic indicators, and geographic details to empower stakeholders with actionable, interactive dashboards for healthcare decision-making.

## 2. Project Deliverables

Integrated SQLite database with clean, linked datasets Four interactive Tableau dashboards:

- Executive Summary & KPIs
- Socioeconomic Correlation Analysis
- Geographic & Facility Drilldown
- Drug Type & Demographic Breakdown:
  - Final Report with key findings and visual examples
  - Metadata Dictionary, ERD, and Data Flow Diagrams
  - Complete project codebase and user documentation

## 3. In-Scope

- Data acquisition (public health, hospital, census data)
- Data engineering in Python (Google Colab) and SQLite
- Tableau dashboard design with dynamic filters, parameters
- Stakeholder demos and feedback iterations
- PMP-standard documentation: charter, WBS, risk plan, RTM, etc.

## 4. Out-of-Scope

- Real-time data streaming or live database integration
- Clinical deployment or predictive modeling
- HIPAA or compliance-bound data usage
- Mobile/responsive web dashboard delivery
- Paid user access/authentication infrastructure

## 5. Constraints

- Google Colab limitations (runtime, file storage)
- Tableau Desktop license availability
- Simulated datasets used in absence of full real-world APIs
- Solo analyst workload and resource capacity

## 6. Assumptions

- Stakeholders accept and understand simulated data caveats
- Tableau dashboards will be reviewed asynchronously
- Data sources used are reliable and complete enough for visualization

## 7. Acceptance Criteria

- Dashboards are visually clean, performant, and drillable
- Each stakeholder persona has at least one relevant dashboard
- Documentation is complete, consistent, and includes traceability
- Final outputs are reviewed and approved by project sponsor

# Document 6: Work Breakdown Structure

**Project:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** April 22, 2025

## Work Breakdown Structure (WBS)

WBS ID	Task Description	Level
<b>1.0</b>	<b>Project Initiation</b>	<b>1</b>
<b>1.1</b>	Develop Project Charter	2
<b>1.1.1</b>	Define business need and opportunity	3
<b>1.1.2</b>	Establish measurable objectives and KPIs	3
<b>1.1.3</b>	Document assumptions, constraints, and exclusions	3
<b>1.1.4</b>	Identify preliminary risks and benefits	3
<b>1.1.5</b>	Get approval from project sponsor	3
<b>1.2</b>	Stakeholder Identification & Analysis	2
<b>1.2.1</b>	Identify all internal and external stakeholders	3
<b>1.2.2</b>	Classify by power, interest, and influence	3
<b>1.2.3</b>	Define engagement strategies by category	3
<b>1.2.4</b>	Create Stakeholder Register with contact matrix	3
<b>1.3</b>	Business Case and Proposal Development	2
<b>1.3.1</b>	Draft 1-page Executive Business Case	3
<b>1.3.2</b>	Develop full-form strategic justification	3
<b>1.3.3</b>	Prepare and submit formal project proposal	3
<b>1.3.4</b>	Secure leadership approval	3
<b>2.0</b>	<b>Project Planning</b>	<b>1</b>
<b>2.1</b>	Scope Definition	2
<b>2.1.1</b>	Conduct scope workshops (BA + Sponsor)	3
<b>2.1.2</b>	Document high-level and detailed scope	3

<b>2.1.3</b>	Confirm exclusions and handoffs	3
<b>2.1.4</b>	Obtain scope sign-off	3
<b>2.2</b>	Work Breakdown Structure Finalization	2
<b>2.2.1</b>	Decompose into logical work packages	3
<b>2.2.2</b>	Align with deliverables, not activities	3
<b>2.2.3</b>	Validate against stakeholder expectations	3
<b>2.2.4</b>	Freeze WBS baseline	3
<b>2.3</b>	Project Schedule	2
<b>2.3.1</b>	Estimate effort using 3-point estimation	3
<b>2.3.2</b>	Build timeline using Gantt with dependencies	3
<b>2.3.3</b>	Assign resources to key milestones	3
<b>2.3.4</b>	Define critical path and buffer zones	3
<b>2.4</b>	Communications Planning (Detailed)	2
<b>2.4.1</b>	Identify stakeholders' information needs	3
<b>2.4.2</b>	Define report formats (status, dashboards, demos)	3
<b>2.4.3</b>	Schedule regular syncs and demo checkpoints	3
<b>2.4.4</b>	Document Communication Management Plan	3
<b>2.5</b>	Risk Management (Expanded)	2
<b>2.5.1</b>	Brainstorm risks across phases	3
<b>2.5.2</b>	Quantify probability and impact	3
<b>2.5.3</b>	Define ownership and escalation path	3
<b>2.5.4</b>	Build live Risk Register with status tracking	3
<b>2.6</b>	Resource & Role Planning	2
<b>2.6.1</b>	Identify internal team roles (PM, Analyst, QA, Dev)	3
<b>2.6.2</b>	Assign tasks to RACI matrix	3
<b>2.6.3</b>	Confirm availability and capacity	3
<b>2.7</b>	Quality Management (Expanded)	2
<b>2.7.1</b>	Define data quality standards (accuracy, nulls, joins)	3

<b>2.7.2</b>	Define dashboard standards (load time, UX, filters)	3
<b>2.7.3</b>	Build Quality Control Checklist (data + dashboards)	3
<b>2.7.4</b>	Review defect severity levels and SLA targets	3
<b>2.8</b>	Requirements Management	2
<b>2.8.1</b>	Gather business, functional, and non-functional needs	3
<b>2.8.2</b>	Categorize by dashboard persona (executive, policy, ops)	3
<b>2.8.3</b>	Build Requirements Traceability Matrix (RTM)	3
<b>2.8.4</b>	Align with acceptance criteria and test cases	3
<b>3.0</b>	<b>Execution – Data Engineering &amp; Architecture</b>	<b>1</b>
<b>3.1</b>	Data Acquisition	2
<b>3.1.1</b>	Collect healthcare datasets (HCUP, CMS)	3
<b>3.1.2</b>	Collect socioeconomic datasets (ACS, Census)	3
<b>3.1.3</b>	Conduct source-to-target mapping	3
<b>3.1.4</b>	Document data lineage and licensing	3
<b>3.2</b>	Data Profiling & Cleaning	2
<b>3.2.1</b>	Analyze completeness, cardinality, duplication	3
<b>3.2.2</b>	Apply fixes (nulls, encoding, formatting)	3
<b>3.2.3</b>	Validate after every transformation	3
<b>3.2.4</b>	Save pre-clean and post-clean logs	3
<b>3.3</b>	SQLite Integration	2
<b>3.3.1</b>	Design entity-relationship model	3
<b>3.3.2</b>	Create normalized schema and foreign keys	3
<b>3.3.3</b>	Create summary and dimension tables	3
<b>3.3.4</b>	Build reusable SQL queries for dashboards	3
<b>3.4</b>	Feature Engineering	2
<b>3.4.1</b>	Create new metrics (duration, cases per capita)	3
<b>3.4.2</b>	Bin age groups, poverty levels, etc.	3
<b>3.4.3</b>	Aggregate by state, hospital, drug type	3

<b>3.4.4</b>	Document transformations in data dictionary	3
<b>3.5</b>	Exploratory Data Analysis	2
<b>3.5.1</b>	Run descriptive statistics and correlations	3
<b>3.5.2</b>	Use Plotly for early visual pattern detection	3
<b>3.5.3</b>	Identify insights and hypothesis	3
<b>4.0</b>	<b>Execution – Dashboard Development</b>	<b>1</b>
<b>4.1</b>	Design & Wireframing	2
<b>4.1.1</b>	Define user stories per stakeholder	3
<b>4.1.2</b>	Draft dashboard blueprints in Figma or hand-drawn	3
<b>4.1.3</b>	Validate filters, KPIs, interactivity	3
<b>4.2</b>	Dashboard 1 – Executive Overview	2
<b>4.2.1</b>	Map KPIs (case rates, top states, facilities)	3
<b>4.2.2</b>	Integrate scorecards, heat maps, line trends	3
<b>4.2.3</b>	Enable time and setting-based filtering	3
<b>4.3</b>	Dashboard 2 – Socioeconomic Correlation	2
<b>4.3.1</b>	Build scatter plots and bar charts	3
<b>4.3.2</b>	Add Top-N filter and poverty sliders	3
<b>4.3.3</b>	Link state name to demographics view	3
<b>4.4</b>	Dashboard 3 – Geographic Drilldown	2
<b>4.4.1</b>	Visualize hospital case loads by state	3
<b>4.4.2</b>	Add hospital drill-through and KPIs	3
<b>4.4.3</b>	Allow setting toggling (ED/IP)	3
<b>4.5</b>	Dashboard 4 – Demographic & Drug Breakdown	2
<b>4.5.1</b>	Build age, gender, and rural views	3
<b>4.5.2</b>	Create dynamic drug type selection	3
<b>4.5.3</b>	Validate filters sync across tabs	3
<b>4.6</b>	Testing & Optimization	2
<b>4.6.1</b>	Run cross-browser rendering tests	3

<b>4.6.2</b>	Test filter logic, hierarchy, edge cases	3
<b>4.6.3</b>	Apply performance tuning (LOD, extracts, limits)	3
<b>4.6.4</b>	UAT with multiple stakeholder roles	3
<b>5.0</b>	<b>Closure</b>	<b>1</b>
<b>5.1</b>	Final Report & Documentation	2
<b>5.1.1</b>	Deliver Executive Summary + Key Findings	3
<b>5.1.2</b>	Compile Dashboard User Guide	3
<b>5.1.3</b>	Deliver Data Dictionary, ERD, and DFD	3
<b>5.2</b>	Lessons Learned	2
<b>5.2.1</b>	Facilitate closure meeting with stakeholders	3
<b>5.2.2</b>	Log successes, delays, and recommended changes	3
<b>5.2.3</b>	Archive learnings for future analytics projects	3
<b>5.3</b>	Handoff and Signoff	2
<b>5.3.1</b>	Deliver all source files and Tableau workbook	3
<b>5.3.2</b>	Obtain formal signoff from sponsor	3
<b>5.3.3</b>	Archive project folder with version control	3

# Document 7: Project Timeline

**Project:** National Healthcare Drug Use Analytics Platform

**Duration:** April 22 – June 23, 2025

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** May 1, 2025

## Phase-Wise Timeline Based on WBS

WBS Code	Task/Deliverable	Start Date	End Date	Duration (Days)	Status
1.1	Develop Project Charter	Apr 22	Apr 23	2	
1.2	Stakeholder Identification & Register	Apr 24	Apr 25	2	
1.3	Business Case & Proposal Approval	Apr 25	Apr 26	2	
Milestone	<b>Initiation Phase Approved</b>	<b>Apr 26</b>	—	—	✓
2.1	Scope Definition	Apr 27	Apr 29	3	
2.2	Work Breakdown Structure Finalization	Apr 30	May 1	2	
2.3	Schedule & Gantt Planning	May 2	May 3	2	
2.4	Communication Plan	May 4	May 5	2	
2.5	Risk Management Plan & Register	May 6	May 7	2	
2.6	Resource Planning (RACI, capacity)	May 8	May 9	2	
2.7	Quality Management Planning	May 10	May 11	2	
2.8	Requirements Gathering + RTM	May 12	May 14	3	
Milestone	<b>Planning Phase Complete</b>	<b>May 14</b>	—	—	✓
3.1	Data Acquisition (HCUP, ACS, CMS)	May 15	May 16	2	
3.2	Data Cleaning & Profiling	May 17	May 19	3	
3.3	SQLite Database Design & Integration	May 20	May 22	3	
3.4	Feature Engineering (Derived fields)	May 23	May 24	2	
3.5	Exploratory Data Analysis (EDA)	May 25	May 26	2	
Milestone	<b>Engineering Ready for Dashboarding</b>	<b>May 26</b>	—	—	✓
4.1	Dashboard Wireframes + UX Review	May 27	May 28	2	

<b>4.2</b>	Dashboard 1: Executive Overview	May 29	May 31	3	
<b>4.3</b>	Dashboard 2: Socioeconomic Insights	Jun 1	Jun 2	2	
<b>4.4</b>	Dashboard 3: Geographic Drilldown	Jun 3	Jun 4	2	
<b>4.5</b>	Dashboard 4: Demographics & Drug Types	Jun 5	Jun 6	2	
<b>4.6</b>	QA, UAT, and Performance Optimization	Jun 7	Jun 10	4	
<b>Milestone</b>	<b>Dashboards Finalized</b>	<b>Jun 10</b>	—	—	✓
<b>5.1</b>	Final Report, Guide, ERD/DFD, Docs	Jun 11	Jun 13	3	
<b>5.2</b>	Lessons Learned Session	Jun 14	Jun 15	2	
<b>5.3</b>	Handoff, QA Signoff, Sponsor Review	Jun 16	Jun 23	6	
<b>Final Milestone</b>	<b>Project Completion</b>	<b>Jun 23</b>	—	—	✓

## Dependencies Overview:

Task	Depends On
<b>3.2 Data Cleaning</b>	3.1 Acquisition
<b>4.2 Dashboard Dev</b>	3.5 EDA Complete
<b>4.6 QA &amp; UAT</b>	All dashboards done
<b>5.3 Signoff</b>	Final Docs + Lessons Learned

# Document 8: Requirements Traceability Matrix

**Project:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** April 30, 2025

## Requirements Traceability Matrix

Category	Req ID	Description	Source	Mapped To	Acceptance Criteria	Status
<b>A. Business/Analytical Requirements</b>						
	RQ-A01	Show top 5 states by drug use per capita	Executive Sponsor	Dashboard 1	Renders top 5 with correct formula	Completed
	RQ-A02	Compare ED vs IP drug-related cases	Stakeholder	Dashboard 1 & 3	Stacked bar chart with setting toggle	Completed
	RQ-A03	Identify top 10 facilities by volume	SME	Dashboard 3	Ranked bar with drilldown	Completed
	RQ-A04	Highlight state-level socioeconomic impact on drug use	Policy Analyst	Dashboard 2	Correlation matrix with poverty, income, unemployment	Completed
	RQ-A05	Show top 5 drugs by state and demographic	Analyst	Dashboard 4	Drug-level breakdowns work by segment	Completed
	RQ-A06	Provide trend over time (monthly/yearly)	Sponsor	All dashboards	Line charts work with global year/month filter	Completed
<b>B. Data Engineering Requirements</b>						

	RQ-B01	Normalize HCUP, CMS, and ACS data sources	Technical Spec	full_analysis_df	All tables linked in SQLite with joins	Completed
	RQ-B02	Create feature for 'cases per 10,000 population'	BA	Engineered Field	Field exists and matches calculated output	Completed
	RQ-B03	Add duration fields (stay length, ED visit)	Analyst	Engineered Data	Accurate and non-null where applicable	Completed
	RQ-B04	Generate derived fields for poverty bands and income groups	Analyst	Dashboard Filters	Used in Dashboard 2 filters	Completed
	RQ-B05	Create mapping for rural/urban classification	Dataset Spec	geo_lookup table	Rural flag used in Dashboard 4	Completed
	RQ-B06	Validate each data pipeline step with logs	PM	Engineering Logs	Profiling results logged in notebook	Completed
<b>C. Dashboard Functional &amp; UX Requirements</b>						
	RQ-C01	Each dashboard must contain 3–5 focused visuals	UX Guideline	All dashboards	Visuals scoped and spaced	Completed
	RQ-C02	Dashboards must include legends and titles	BA	All dashboards	All visuals labelled clearly	Completed
	RQ-C03	Use consistent color scheme across dashboards	PM	All dashboards	No visual clashes or ambiguity	Completed
	RQ-C04	Display null counts in	QA	Tooltip Layers	Shows "Data unavailable" when required	Completed

		tooltips when applicable				
	RQ-C05	Show map view for geographic analysis	Sponsor	Dashboard 1 & 3	State/city map renders by metric	Completed
	RQ-C06	Enable mobile-optimized layout	Optional	Tableau	Dashboards responsive or scrollable	Future enhancement
<b>D. Filtering &amp; Interactivity Requirements</b>						
	RQ-D01	Add global date filter (year, quarter)	UX Review	All dashboards	Filter applies consistently	Completed
	RQ-D02	Allow toggle by patient setting (ED, IP, OP)	SME	Dashboard 1 & 3	Toggle present and working	Completed
	RQ-D03	Include multi-select drug filter	Analyst	Dashboard 4	User can compare >1 drug	Completed
	RQ-D04	Provide Top N selection for states/facilities	Sponsor	Dashboards 2 & 3	Parameterized control works	Completed
	RQ-D05	Implement demographic filters (age, sex)	Policy Team	Dashboard 4	Fields drive changes across visuals	Completed
	RQ-D06	Show interaction context (e.g., "filtered to X")	PM	All dashboards	Text updates dynamically	Completed
<b>E. Non-Functional Requirements</b>						
	RQ-E01	Dashboards should load in <5 seconds	Performance SLA	All Dashboards	Testing confirms this	Completed
	RQ-E02	Data must be self-contained (no live queries)	Sponsor	Tableau Extract	All dashboards use TDE or Hyper	Completed

	RQ-E03	Follow Tableau accessibility guidelines	PM	UX Implementation	Colorblind-safe palette used	Completed
	RQ-E04	Filter clicks should apply within 1 second	QA	Tableau Test	Interactions perform quickly	Completed
	RQ-E05	All source data stored securely	PM	SQLite DB	Stored locally, encrypted	Completed
<b>F. Documentation, Testing &amp; Handoff</b>						
	RQ-F01	Include complete data dictionary	PM	Final Docs	Field names, types, sources, meanings	Completed
	RQ-F02	Provide entity relationship diagram (ERD)	BA	Handoff Package	Linked tables illustrated	Completed
	RQ-F03	Include data flow diagram (DFD)	BA	Documentation	Shows pipeline from ingestion to dashboards	Completed
	RQ-F04	Write Tableau usage guide for each dashboard	BA	User Guide	Explains filters, structure, and views	Completed
	RQ-F05	Final walkthrough session held with stakeholders	PM	Calendar Invite	Slides + live dashboard demo delivered	Completed
	RQ-F06	UAT test cases completed and signed off	QA	UAT Log	Pass rate >95%, all blockers resolved	Completed

# Document 9: Communications Management Plan

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** May 5, 2025

## 1. Introduction

This plan outlines the strategies and processes for effective and timely communication among project stakeholders, ensuring all relevant parties receive the right information at the right time.

**Purpose:** To define how, when, and by whom project information will be administered and disseminated.

### Objectives:

- Foster stakeholder engagement and transparency.
- Ensure timely dissemination of critical project updates.
- Facilitate informed decision-making.
- Manage expectations and address concerns proactively.

## 2. Communication Strategy

### Key Principles:

- **Transparency:** Openly share project status, challenges, and successes.
- **Timeliness:** Deliver information promptly to support decision-making.
- **Relevance:** Tailor communication content to the specific audience's needs.
- **Clarity:** Use clear, concise language, avoiding jargon where possible.
- **Consistency:** Maintain a consistent message across all communication channels.

### Communication Channels:

- **Email:** Formal announcements, detailed reports, meeting minutes.
- **Virtual Meetings (Zoom/Google Meet):** Daily stand-ups, weekly status reviews, ad-hoc discussions, demos.
- **Tableau Public/Server:** Interactive dashboard sharing and feedback.
- **Google Drive:** Central repository for all project documentation (e.g., Project Charter, Scope Statement, WBS, RTM, reports).
- **Chat/IM (e.g., Slack/Google Chat):** Quick queries, urgent updates, informal discussions.

## 3. Communication Matrix

Communication Type	Audience	Purpose	Frequency	Format	Owner	Channel	Notes

<b>Project Kick-off Meeting</b>	All Stakeholders	Officially launch project, align on goals	Once	Virtual Meeting	PM	Zoom	Record for absent stakeholders
<b>Weekly Project Status Report</b>	Sponsor, PM, Core Team	Provide progress, highlight issues/risks	Weekly	Email + Slide Deck	PM	Email, Google Drive	Focus on WBS progress and blockers
<b>Daily Stand-up</b>	Core Team (PM, Analyst, Dev, QA)	Quick sync on progress, roadblocks	Daily	Virtual Meeting	PM	Zoom/Google Meet	15-minute quick sync
<b>Dashboard Review/Demo</b>	Sponsor, Policy Analysts, Hospital Admins	Gather feedback on dashboard prototypes	Bi-weekly (during execution)	Live Demo	BA	Tableau Share + Zoom	Interactive walkthrough, Q&A
<b>Risk Register Review</b>	PM, Core Team	Assess, update, and plan for risks	Bi-weekly	Virtual Meeting	PM	Google Meet, Google Drive (Risk Register)	Integrated with status review
<b>Lessons Learned Session</b>	All Stakeholders	Document successes, failures, improvements	Once (Project Closure)	Virtual Meeting	PM	Zoom	Facilitated discussion
<b>Final Project Report &amp; Handoff</b>	Sponsor, Policy Analysts, Hospital Admins	Present final deliverables, obtain sign-off	Once (Project Closure)	Presentation + Document	PM	Zoom, Google Drive	Formal project closure
<b>Ad-hoc Queries/Support</b>	All Stakeholders	Address immediate questions/issues	As Needed	Chat/Email	Relevant Owner	Chat/Email	For quick clarifications

## 4. Escalation Plan

When an issue or risk cannot be resolved at the current level, it will be escalated through the following chain:

- **Level 1 (Core Team):** Unresolved technical issues or task dependencies will be raised in daily stand-ups and weekly status meetings.
  - **Who:** Project Team Members, Project Manager
  - **What:** Technical blockers, scope creep, resource conflicts

- **When:** Within 24 hours of identification if solution not found
  - **How:** Via chat, then daily stand-up, then PM to BA/Dev leads
- **Level 2 (Project Manager & Sponsor):** Issues impacting scope, budget, or timeline beyond the team's control.
  - **Who:** Project Manager, Project Sponsor
  - **What:** Major scope changes, critical risks realized, significant budget overruns, unresolvable team conflicts
  - **When:** Within 48 hours of Level 1 escalation if no resolution
  - **How:** Formal email, dedicated meeting with Project Sponsor
- **Level 3 (Steering Committee/Executive Leadership):** Strategic issues requiring top-level intervention.
  - **Who:** Project Sponsor, Executive Leadership
  - **What:** Fundamental shifts in business strategy impacting project value, major resource shortages, unresolvable external dependencies
  - **When:** As determined by Project Sponsor, for severe, project-threatening issues
  - **How:** Formal report and presentation by Project Sponsor

## 5. Communication Metrics & Feedback

- **Meeting Attendance Rate:** Track attendance for key meetings (e.g., weekly status, dashboard demos) to ensure engagement.
- **Action Item Completion Rate:** Monitor the closure rate of action items from meetings to ensure follow-through.
- **Feedback Response Rate:** Track the percentage of stakeholders who provide feedback on dashboard prototypes or documentation.
- **Communication Effectiveness Survey:** Conduct a short survey at project closure to gauge satisfaction with communication frequency, format, and content.

# Document 10: Risk Management Plan + Risk Register

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** May 7, 2025

## 1. Introduction & Purpose

This Risk Management Plan details the processes and procedures for identifying, analyzing, planning responses to, and monitoring risks throughout the National Healthcare Drug Use Analytics Platform project lifecycle. Its purpose is to minimize the impact of negative risks and maximize the opportunities of positive risks, thereby increasing the likelihood of project success.

## 2. Risk Management Strategy

### Principles:

- **Proactive:** Identify risks early, before they become issues.
- **Integrated:** Risk management is an integral part of all project planning and execution activities.
- **Accountable:** Each identified risk will have a clear owner responsible for its management.
- **Transparent:** Risk information will be openly communicated to relevant stakeholders.

### Approach:

- **Iterative:** Risk management activities will occur regularly throughout the project.
- **Systematic:** Use defined tools and techniques for consistent risk assessment.
- **Scalable:** Adapt the level of detail to the project's size and complexity.

## 3. Risk Identification

### Categories of Risks:

- **Technical:** Data quality issues, platform integration challenges, software bugs.
- **Operational:** Resource unavailability, scope creep, unrealistic timelines.
- **External:** Changes in public data policies, unexpected market shifts (if applicable to a real-world scenario).

### Tools & Techniques:

- **Brainstorming Sessions:** With the core project team and key stakeholders.
- **Checklist Analysis:** Using historical data analytics project risk lists.
- **Interviewing:** Engaging SMEs for potential risks.
- **SWOT Analysis:** Identifying internal strengths/weaknesses and external opportunities/threats related to the project.

## 4. Risk Analysis

### Likelihood and Impact Scales:

#### Likelihood Scale:

- 1 = Very Low (0-20% probability)
- 2 = Low (21-40% probability)
- 3 = Medium (41-60% probability)
- 4 = High (61-80% probability)
- 5 = Very High (81-100% probability)

#### Impact Scale:

- 1 = Very Low (Negligible effect on scope, schedule, cost, quality)
- 2 = Low (Minor deviations, easily managed)
- 3 = Medium (Moderate impact, requires significant effort to manage)
- 4 = High (Significant impact, jeopardizes key objectives)
- 5 = Very High (Severe impact, may lead to project failure)

**Risk Score Calculation:** Risk Score = Likelihood x Impact (e.g., Medium Likelihood (3) x High Impact (4) = Score 12)

### Likelihood/Impact Matrix: (Conceptual; visualized in spreadsheet)

- Green (Low Risk): Score 1-6
- Yellow (Medium Risk): Score 7-15
- Red (High Risk): Score 16-25

## 5. Risk Response Planning

- **Avoid:** Eliminate the cause of the risk (e.g., changing scope).
- **Mitigate:** Reduce the probability or impact of the risk (e.g., backup plans, additional QA).
- **Transfer:** Shift the risk to a third party (e.g., outsourcing, insurance - not applicable here).
- **Accept:** Decide to take no action, or plan for a contingency if the risk occurs.

## 6. Risk Monitoring & Control

- **Risk Register Reviews:** Bi-weekly reviews during project status meetings.
- **Risk Audits:** Periodic checks to ensure risk processes are being followed.
- **Trend Analysis:** Monitoring changes in risk scores over time.
- **Contingency Reserve:** Manage budget/schedule reserves to address accepted risks.

## 7. Risk Register

Risk ID	Description	Category	Likelihood	Impact	Score	Trigger	Response Strategy	Owner	Status
R-001	Data inconsistency and quality issues from sources	Technical	4	4	16	Discrepancies in profiling reports	Mitigate: Implement robust data validation & cleansing scripts	Analyst	Open
R-002	Scope creep from evolving stakeholder requirements	Operational	3	3	9	New requests not aligned with charter	Mitigate: Formal change control process, strict scope definition	PM	Open
R-003	Delays in data acquisition from external public sources	External	3	4	12	API outages, slow data downloads	Mitigate: Use simulated data for development, parallel source search	Dev	Open
R-004	Tableau dashboard performance issues (slow load times)	Technical	3	3	9	Load time >5 seconds in UAT	Mitigate: Optimize data extracts, reduce visual complexity, LODs	Dev	Open
R-005	Resource unavailability (e.g., PM/analyst sickness)	Operational	2	4	8	Unplanned absence >2 days	Mitigate: Cross-training for critical tasks, clear documentation	PM	Open
R-006	Stakeholder misalignment on dashboard design/features	Operational	3	3	9	Negative feedback during early demos	Mitigate: Frequent prototyping, structured feedback sessions	BA	Open
R-007	Cybersecurity risks for local	Technical	1	5	5	Unauthorized access/breach	Mitigate: Local encryption,	Dev	Open

	SQLite database						strong passwords, secure storage		
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## 8. Risk Management Roles & Responsibilities

- **Project Manager:** Overall responsibility for implementing the Risk Management Plan, maintaining the Risk Register, and ensuring risk reviews.
- **Project Team Members:** Identify risks related to their specific tasks, provide input on likelihood and impact, and implement risk responses.
- **Project Sponsor:** Provide strategic guidance on high-level risks, approve major risk response strategies, and assist in removing impediments.

## 9. Risk Communication

- **Frequency:** Risk Register reviewed bi-weekly during core team meetings. Critical risks (score >15) are discussed weekly.
- **Format:** Risk Register (spreadsheet), summary slides in status reports.
- **Audience:** Core team, Project Sponsor (for critical risks), relevant stakeholders.

# Document 11: Quality Management Plan

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** May 11, 2025

## 1. Introduction & Purpose

This Quality Management Plan defines the processes, procedures, and responsibilities for ensuring that all project deliverables and processes for the National Healthcare Drug Use Analytics Platform meet the defined quality standards and stakeholder expectations. Its purpose is to deliver a high-quality product that is fit for purpose and provides accurate, reliable insights.

## 2. Quality Objectives

- Deliver all project deliverables (database, dashboards, documentation) error-free and complete.
- Ensure data accuracy and consistency at every stage of the ETL pipeline.
- Achieve dashboard performance (e.g., load times) within acceptable thresholds.
- Maintain clear, consistent, and comprehensive project documentation.
- Meet or exceed stakeholder satisfaction regarding the usability and value of the dashboards.

## 3. Quality Standards

The project will adhere to the following quality standards and principles:

- **Accuracy:** Data and calculations must be correct and verifiable.
- **Completeness:** All required data fields and dashboard functionalities must be present.
- **Consistency:** Data formats, visual elements, and terminology must be consistent across all deliverables.
- **Timeliness:** Information and dashboards must be updated and available as per the schedule.
- **Usability:** Dashboards should be intuitive, easy to navigate, and provide clear insights.
- **ISO 9001 Principles:** While not formally certified, the project will apply principles of continuous improvement, customer focus, and process approach.

## 4. Quality Control Activities

Quality Control (QC) activities focus on monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

- **A. Data Quality Control:**
  - **Techniques:** Data profiling, validation rules, null checks, duplicate checks, referential integrity checks.

- **Frequency:** At each stage of the ETL pipeline (acquisition, cleaning, integration, feature engineering).
  - **Tools:** Python scripting (Pandas), SQL queries.
- **B. Dashboard Quality Control:**
  - **Techniques:**
    - **Functional Testing:** Verifying filters, parameters, drilldowns, and calculations work as expected.
    - **User Experience (UX) Review:** Checking visual consistency, layout, navigation, and intuitiveness.
    - **Performance Testing:** Measuring dashboard load times and interactivity response times.
    - **Data Accuracy Verification:** Cross-referencing dashboard numbers with source data.
  - **Frequency:** After each dashboard is developed, and during integrated testing.
  - **Tools:** Tableau Desktop, manual checks, stakeholder UAT.
- **C. Documentation Quality Control:**
  - **Techniques:** Peer reviews, grammar and spell checks, adherence to templates, completeness checks.
  - **Frequency:** At key milestones for each document (e.g., after initial draft, before final approval).
  - **Tools:** Manual review, document templates.
- **D. Code Quality Control:**
  - **Techniques:** Code reviews, adherence to coding standards (e.g., PEP 8 for Python), unit testing of individual functions, commenting.
  - **Frequency:** During development sprints, prior to integration.
  - **Tools:** Python IDEs, Git version control.

## 5. Quality Assurance Activities

Quality Assurance (QA) activities focus on ensuring that the processes used to create the deliverables are effective.

- **Process Audits:** Periodic reviews of the project processes (e.g., data cleansing process, dashboard development process) to ensure they are being followed correctly and effectively.
- **System Audits:** Verifying that the tools and environment (e.g., Google Colab, Tableau) are configured optimally to support quality.
- **Process Improvement:** Implementing corrective actions based on QC findings and QA audits to continuously improve methodologies.

## 6. Quality Roles & Responsibilities

- **Project Manager:** Overall responsibility for the Quality Management Plan, ensuring its implementation and adherence.
- **Lead Business Analyst:** Defines functional and UX requirements, participates in dashboard UAT, and ensures documentation quality.
- **Data Engineer/Developer:** Responsible for data quality, code quality, database integrity, and dashboard performance.
- **QA Reviewer:** Conducts independent testing of data and dashboards, verifies acceptance criteria.
- **Project Sponsor:** Provides final acceptance of deliverables based on quality standards and objectives.

## 7. Quality Metrics

Key Performance Indicators (KPIs) to measure project quality:

- **Data Quality:**
  - **Data Accuracy Rate:** Percentage of records verified as correct.
  - **Null Value Percentage:** Proportion of critical fields containing nulls.
  - **Data Consistency Score:** Measures adherence to defined data standards.
- **Dashboard Quality:**
  - **Load Time (seconds):** Average time for dashboards to render completely.
  - **UAT Pass Rate:** Percentage of user acceptance test cases successfully passed.
  - **Defect Density:** Number of defects per dashboard/feature.
- **Process Quality:**
  - **Rework Percentage:** Proportion of work that needed to be redone due to quality issues.
  - **Change Request Acceptance Rate:** Percentage of approved change requests (indicates initial planning quality).

## 8. Continuous Improvement

- **Lessons Learned:** Capture quality-related successes and challenges during project closure.
- **Root Cause Analysis:** For significant defects or process failures, identify underlying causes to prevent recurrence.
- **Feedback Integration:** Regularly review feedback from QC and QA activities and incorporate improvements into processes and standards for future projects.

# Document 12: Change Management Plan

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** May 16, 2025

## 1. Introduction & Purpose

This Change Management Plan outlines the standardized process for identifying, evaluating, approving, and tracking changes to the project baseline (scope, schedule, cost, quality) of the National Healthcare Drug Use Analytics Platform. Its purpose is to ensure that all changes are managed systematically, minimizing disruption and maintaining project control.

## 2. Change Management Principles

- **Formal:** All changes must follow a defined, documented process.
- **Transparent:** All change requests, analyses, and decisions are visible to relevant stakeholders.
- **Timely:** Changes are evaluated and decided upon promptly to avoid delays.
- **Documented:** Every change, from request to implementation, is recorded and auditable.
- **Controlled:** No change is implemented without proper authorization.

## 3. Change Request Process

The following steps define the lifecycle of a change request:

- **Step 1: Change Identification & Request:**
  - **Who:** Any stakeholder (Project Team, Sponsor, User)
  - **What:** Identifies a need for change (e.g., new feature, timeline adjustment, budget revision).
  - **How:** Submits a formal Change Request (CR) using the defined template.
- **Step 2: Change Documentation:**
  - **Who:** Requester, Project Manager
  - **What:** Fills out the CR template with:
    - Description of the proposed change
    - Reason for the change (business value, problem solved)
    - Impact on scope, schedule, cost, quality, and risks
    - Requested priority
  - **How:** Completes the "Change Request Form" (digital or physical).
- **Step 3: Change Analysis & Impact Assessment:**
  - **Who:** Project Manager, relevant SMEs (Analyst, Dev)

- **What:** Analyzes the detailed impact of the proposed change on:
    - **Scope:** What deliverables or requirements are affected?
    - **Schedule:** How will the timeline be altered?
    - **Cost:** What are the associated costs (labor, tools)?
    - **Quality:** How might quality be impacted?
    - **Risks:** Does the change introduce new risks or alter existing ones?
  - **How:** Conducts detailed impact analysis, updates project plans as needed.
- **Step 4: Change Approval:**
  - **Who:** Change Control Board (CCB)
  - **What:** Reviews the CR and impact assessment, discusses, and makes a decision.
  - **Decision Options:** Approve, Reject, Defer, or Request More Information.
  - **How:** Formal CCB meeting, recorded decision.
- **Step 5: Change Implementation:**
  - **Who:** Project Team
  - **What:** Integrates the approved change into the project work.
  - **How:** Updates project plans (WBS, Schedule, RTM, etc.), assigns tasks, performs work.
- **Step 6: Change Verification:**
  - **Who:** QA, Project Manager, Requester
  - **What:** Confirms the implemented change meets the requirements and does not introduce new issues.
  - **How:** Testing, review, stakeholder sign-off.
- **Step 7: Change Closure:**
  - **Who:** Project Manager
  - **What:** Formally closes the change request, archives documentation.
  - **How:** Updates Change Log, communicates closure.

## 4. Change Control Board (CCB)

- **Members:**
  - Project Sponsor (Chairperson)
  - Project Manager (Facilitator, Analyst)
  - Lead Business Analyst (for functional/UX impact)
  - Lead Developer/Architect (for technical impact)
  - Key Stakeholders (as needed, for specific requests)
- **Responsibilities:**

- Review submitted Change Requests.
  - Assess the impact and feasibility of proposed changes.
  - Make decisions to approve, reject, or defer changes.
  - Ensure alignment with project objectives and strategic goals.
- **Decision Authority:**
    - Minor changes (e.g., minor wording changes in documentation, low impact aesthetic tweaks): Project Manager can approve.
    - Medium changes (e.g., adding a small new data field, minor dashboard adjustment affecting a few visuals, <5% impact on schedule/cost): Requires Project Sponsor approval.
    - Major changes (e.g., significant new feature, changes impacting critical path, >5% impact on schedule/cost, fundamental shift in scope): Requires full CCB approval.

## 5. Change Documentation & Tracking

- **Change Request Form (CRF):** Standardized template for submitting new requests.
- **Change Log:** A centralized spreadsheet or database to track all CRFs, their status, decisions, and implementation dates.
- **Version Control:** All updated project documents (e.g., Scope Statement, WBS, RTM) will be version-controlled in Google Drive to reflect approved changes.

## 6. Change Communication

- **Approved Changes:** Communicated to all affected stakeholders via email and updated in the weekly status report.
- **Rejected/Deferred Changes:** Communicated directly to the requester with reasons for the decision.
- **Change Log Availability:** The Change Log will be accessible to the Project Team and Sponsor via Google Drive.

## 7. Metrics & Continuous Improvement

- **Change Request Volume:** Number of CRs submitted per phase.
- **Change Approval Rate:** Percentage of CRs approved vs. rejected.
- **Change Implementation Time:** Average time taken from CR approval to implementation.
- **Post-Change Defects:** Track defects directly attributable to implemented changes to assess quality of change process.
- **Lessons Learned:** Discuss change management effectiveness during lessons learned sessions to refine the process for future projects.

# Document 13: Final Project Report & Lessons Learned

**Project Title:** National Healthcare Drug Use Analytics Platform

**Prepared by:** Vaibhav Nangia, PMP®

**Date:** June 23, 2025

## 1. Executive Summary

The National Healthcare Drug Use Analytics Platform project has successfully delivered a centralized, interactive analytics solution that enables policymakers and healthcare administrators to visualize and analyze drug use trends across the U.S. All primary objectives and deliverables were met, providing a valuable data-driven tool for public health decision-making. The project was completed within the planned timeline and budget, demonstrating effective project management and execution.

## 2. Project Performance Summary

Performance Area	Target	Actual	Variance	Notes
Scope	All 4 Dashboards + ETL	All 4 Dashboards + ETL	On Target	All defined requirements met.
Schedule	June 23, 2025	June 23, 2025	On Target	Project completed on the planned end date.
Budget	\$13,200	\$13,050	Under Budget	Cost efficiencies achieved in tooling.
Quality	UAT Pass Rate >95%	98%	Exceeded	High data accuracy and dashboard usability.
Risks	0 Critical Open Risks	0	Achieved	All identified critical risks were mitigated or closed.

## 3. Project Deliverables & Outcomes

- Centralized Database:** SQLite database integrating HCUP, CMS, ACS, and other socioeconomic data.
- Four Interactive Tableau Dashboards:**
  - Executive Overview
  - Socioeconomic Correlation Analysis
  - Geographic & Facility Drilldown
  - Demographics & Drug Type Breakdown

- **Comprehensive Documentation:** Includes Data Dictionary, ERD, Data Flow Diagrams, Dashboard User Guide.
- **Key Outcomes:** Enabled real-time insight into drug use trends, supported data-driven interventions, and established a scalable analytics framework for future expansion.

## 4. Key Achievements & Successes

- **Efficient Data Integration:** Successfully merged disparate public datasets into a unified, clean database.
- **User-Centric Design:** Developed highly intuitive and interactive dashboards validated through stakeholder feedback.
- **Strong Stakeholder Engagement:** Maintained consistent communication and incorporated feedback throughout the project lifecycle.
- **On-Time and Under-Budget Delivery:** Demonstrated effective resource and schedule management.
- **Scalable Architecture:** Built a foundational data pipeline and visualization layer that can be expanded with additional data sources or features.

## 5. Challenges Encountered & Resolutions

- **Challenge 1: Data Inconsistency from Public Sources:** Initial data profiling revealed significant inconsistencies and missing values across various public datasets.
  - **Resolution:** Implemented robust Python-based data cleaning and validation scripts, coupled with extensive manual review for critical fields. Documented all cleaning rules in the data dictionary.
- **Challenge 2: Securing Timely Stakeholder Feedback:** Due to busy schedules, getting prompt feedback on dashboard prototypes was challenging.
  - **Resolution:** Switched to shorter, more frequent demo sessions, provided specific questions for feedback, and utilized asynchronous tools for collecting comments.

## 6. Lessons Learned

- **A. What Went Well:**
  - **Proactive Planning:** Detailed WBS and RTM helped maintain scope and track progress effectively.
  - **Iterative Development:** Developing dashboards incrementally with frequent demos allowed for early feedback and reduced rework.
  - **Communication Cadence:** Regular weekly status reports and daily stand-ups kept the team aligned and informed.
- **B. What Could Be Improved:**

- **Initial Data Assessment Depth:** More time in initial phases for comprehensive data profiling would further reduce cleaning efforts later.
- **Automated Testing:** Future projects could benefit from more automated testing for data validation and dashboard functionality.
- **Formal User Training:** A dedicated, more extensive user training session could enhance initial user adoption and proficiency.
- **C. Recommendations for Future Projects:**
  - Allocate dedicated resources for automated data quality checks from the outset.
  - Consider implementing a phased rollout for complex dashboards to gather early user feedback.
  - Explore incorporating a formal user training program for new analytics solutions.

## 7. Stakeholder Feedback & Satisfaction

Initial feedback from the Project Sponsor and key policy analysts has been overwhelmingly positive. Users appreciate the intuitive interface, the ability to drill down into specific data points, and the clear visualization of trends and correlations that were previously difficult to obtain. The platform is seen as a significant enhancement to their analytical capabilities.

## 8. Future Recommendations & Next Steps

- **Phase 2: Predictive Analytics:** Explore incorporating machine learning models to forecast future drug use trends.
- **Data Expansion:** Integrate additional datasets (e.g., prescription drug monitoring program data, law enforcement data).
- **User Management:** Implement a user authentication and authorization system for controlled access.
- **Maintenance & Support:** Establish a plan for ongoing data updates and dashboard maintenance.

## 9. Project Sign-off

By signing below, the undersigned acknowledge the successful completion and acceptance of the National Healthcare Drug Use Analytics Platform project deliverables.

Name	Title	Signature	Date
Dr. Alex Carter	Director, US-HHS Health Analytics	_____	June 23, 2025
Vaibhav Nangia	Project Manager & BA Lead	_____	June 23, 2025