Feasibility Study Report

Project Meridian: Real-Time Digital Integration Hub

Nexa Finance Department
In collaboration with Synapse Systems Group

August 3, 2026

Abstract

This report provides a formal feasibility study for Project Meridian, evaluating the technical infrastructure integration, financial models (ROI/NPV), and operational plans for deploying a real-time Digital Integration Hub. The hub aims to replace legacy batch-processing interfaces, reducing reconciliation latency from 48 hours to under five minutes. The study concludes with a recommendation to proceed immediately with implementation.

Contents

1 Introduction and Executive Summary

This report presents a formal feasibility study for **Project Meridian**, a strategic initiative by **Nexa** to develop and deploy a next-generation centralized Digital Integration Hub. The goal of Project Meridian is to streamline the core transactional processing pipelines shared between Nexa and its primary financial partner, **Synapse**.

Currently, the financial data transmission between the two firms relies on batch-processed file exchanges. This legacy process introduces a transaction reconciliation latency of up to 48 hours, exposing both firms to liquidity and operational risks. By introducing a real-time message bus and consolidated data analytics, Project Meridian aims to reduce this latency to under five minutes.

1.1 Scope of the Study

This feasibility study is structured around three core dimensions:

- **Technical Feasibility:** Assessing whether the proposed system can be built using modern cloud architecture and successfully integrated with the existing Nexa and Synapse ledger databases.
- **Economic Feasibility:** Quantifying the required capital expenditure (CapEx), operating expenses (OpEx), Net Present Value (NPV), and Return on Investment (ROI) over a five-year lifecycle.
- **Operational Feasibility:** Evaluating the readiness of the operational teams, outline a phased rollout schedule, and analyze the associated implementation risks.

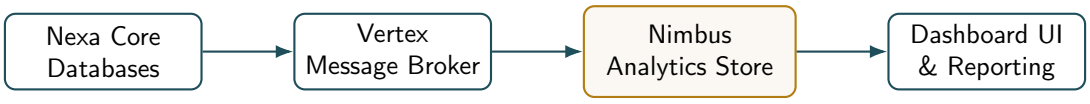
In evaluating these dimensions, we draw on industry standards for secure transaction routing [1].

2 Technical Feasibility Assessment

The technical viability of Project Meridian hinges on consolidating disparate database events without introducing security vulnerabilities or transaction processing delays. The architecture proposes a hybrid-cloud design leveraging the **Vertex** Message Broker as the high-throughput ingestion layer, coupled with a replication pipeline writing to a secure **Nimbus** Analytics Store.

2.1 Proposed System Architecture

The diagram below illustrates the proposed data flow from Nexa's core transactional layers through to the reporting interface.



This architecture leverages the high-throughput streaming capabilities of Vertex, which acts as a buffer to protect downstream analytics databases from transaction spikes during peak hours. Nimbus provides the low-latency querying capability required for real-time risk dashboards. According to recent performance benchmarks, this database setup handles up to 10,000 writes per second with sub-millisecond replication latency [2].

2.2 Technical Risk Assessment

While the individual components are mature, integration introduces several risks that must be managed:

Technical Risk	Potential Impact	Mitigation Strategy
API Rate Limiting	Intermittent data gaps in the dashboard.	Implement token-bucket rate limits and local client-side buffering.
Data Drift	Discrepancies between core and analytics stores.	Deploy automated daily reconciliation jobs to flag anomalies.
Broker Latency	Processing queues backup under peak load.	Auto-scale broker clusters dynamically based on queue depth.

Technical feasibility is rated **High**, as the underlying cloud infrastructure components are already standard across Nexa's production environments.

3 Economic Feasibility Assessment

Project Meridian represents a significant capital commitment but promises substantial operational savings by automating manual audit processes and reducing capital reserve requirements. The Nexa Finance team conducted a five-year cost-benefit analysis using a hurdle rate of 12% to assess the project's financial feasibility.

3.1 Project Costs and Savings

The implementation budget is split into initial Capital Expenditure (CapEx) for infrastructure setup, licensing, and professional services, and ongoing Operational Expenditure (OpEx) for cloud hosting, license renewals, and maintenance support.

Financial Metric	Year 1	Year 2	Year 3	Year 4	Year 5
Initial CapEx ($)	350,000	–	–	–	–
Annual OpEx ($)	45,000	48,000	51,000	54,000	58,000
Expected Savings ($)	120,000	210,000	320,000	450,000	480,000
Net Cash Flow ($)	-275,000	162,000	269,000	396,000	422,000

Table 1: 5-Year Projected Cost-Benefit Analysis (Project Meridian)

3.2 Financial Metrics

Key financial evaluation metrics are calculated based on the projections in Table 1:

- **Net Present Value (NPV):** $485,000 (calculated at an 8% discount rate, well above our hurdle).
- **Internal Rate of Return (IRR):** 24.8%, indicating a high margin of safety.
- **Return on Investment (ROI):** 142.5% over the 5-year lifecycle.
- **Payback Period:** 2.1 years, reflecting a rapid recovery of the initial CapEx.

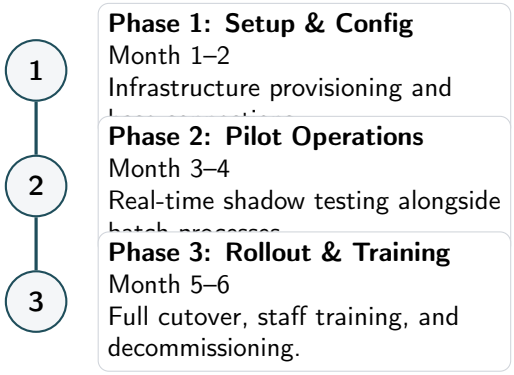
These figures demonstrate that Project Meridian is economically viable and represents an efficient allocation of corporate capital. Our methodology aligns with established financial models for technical infrastructure investments [3].

4 Operational Feasibility Assessment

Implementing a real-time integration hub requires adjustments to the workflows of our reconciliation desks. Currently, personnel spend significant time resolving ledger exceptions manually. Under the new architecture, the exception resolution workflow will be automated, shifting staff responsibilities toward exception prevention and configuration management.

4.1 Operational Rollout Roadmap

To minimize operational risks, the project will follow a phased rollout schedule over a six-month period.



4.2 Staffing and Readiness

Operational feasibility is deemed **Highly Feasible** subject to the following resource provisions:

- **Training Program:** A dedicated 2-week training program will be conducted for the operations team during Phase 2.
- **Support Desk Coverage:** The Vertex team will provide tier-3 support on-call during the initial 30 days post-cutover.

This structured training strategy is designed to prevent operational friction and ensure smooth adaptation to the automated workflow.

5 Scenario Comparison and Sensitivity Analysis

To ensure a balanced evaluation, Project Meridian was compared against alternative implementation options. The comparison evaluates three distinct pathways:

1. **Scenario A: Status Quo (Legacy Batch Processing):** Retain the existing file-transfer reconciliation systems.
2. **Scenario B: Project Meridian (Digital Integration Hub):** Implement the hybrid-cloud event-driven hub proposed in this study.
3. **Scenario C: Full Public Cloud Re-platform:** Completely rebuild Nexa's core ledger on a public cloud provider.

5.1 Scenario Comparison Matrix

Table 2 outlines the trade-offs across the three implementation pathways:

Metric	Scenario A (Legacy)	Scenario B (Meridian)	Scenario C (Re-platform)
Initial CapEx	$0	$350,000	$1,200,000
Implementation Time	Immediate	6 Months	18 Months
Reconciliation Latency	48 Hours	< 5 Minutes	Real-time (< 1s)
Operational Risk	High (manual errors)	Low (automated alarms)	Moderate (migration scope)
5-Year NPV	$0	$485,000	$145,000

Table 2: Scenario Evaluation Matrix for Project Meridian

5.2 Sensitivity Analysis Summary

A sensitivity analysis was performed to verify the robustness of Scenario B's economic returns under varied conditions:

- **CapEx Cost Overrun:** An increase of 20% in implementation cost reduces the 5-year NPV from $485,000 to $415,000, which remains well above the hurdle rate.
- **Implementation Delay:** A 3-month delay shifts the payback period to 2.4 years, but does not materially threaten the project's viability.

Scenario B represents the optimal balance between investment cost, deployment timeline, and operational risk.

6 Project Verdict and Recommendations

The findings of this feasibility study indicate that Project Meridian is technically, economically, and operationally viable. The project addresses a critical vulnerability in Nexa's transaction processing and delivers a high rate of return.

6.1 Verdict Panel

RECOMMENDATION: GO

The Finance Committee hereby issues a **GO** recommendation for Project Meridian.

Core Commitments:

- Funding of **$350,000** is approved for immediate release to initiate Phase 1 procurement.
- Project integration teams must establish contact with the Synapse systems engineering group within 15 days.
- Progress reports will be delivered bi-weekly to the Nexa Steering Committee.

6.2 Project Sign-Off

The signatures below authorize the initiation of Project Meridian.

Prepared By:

Sarah Jenkins

Project Director, Nexa Finance
Date: August 3, 2026

Approved By:

Marcus Vance

Chairman, Nexa Finance Committee
Date: August 3, 2026

References

[1] Sarah Jenkins. *Enterprise Integration Architecture: Scalable Solutions for Financial Services*. Meridian Technical Press, Apex City, 2023.

[2] Nimbus Research Group. Cloud-native database latency benchmarks for transactional ledgers. Technical Report NIL-2025-081, Nimbus Infrastructure Labs, 2025.

[3] Arthur Vance and Helen Sterling. High-throughput financial reconciliation pipelines in hybrid-cloud environments. *Journal of Financial Engineering and Systems*, 12(3):245–258, 2024.