Know the Blast Radius of Every Code Change Before Production

Impact Delphyne automatically discovers services, builds a knowledge graph of dependencies, applies Retrieval-Augmented Generation over real code and contracts, and asks an LLM to explain the impact of each pull request – in language developers, architects and risk teams can trust.

The Problem: Impact Analysis Remains Manual in Distributed Banking Systems

In a CITI-scale environment, a single pull request can affect multiple domains, teams and regulatory surfaces. Today, understanding this impact still depends on a handful of SMEs and tribal knowledge, creating bottlenecks and increasing risk.

Manual, Non-Repeatable Process

Impact analysis happens via email threads, spreadsheets and meetings – slow, manual and impossible to scale consistently.

Complex Service Dependencies

Loosely coupled services, async flows and shared data models make it dangerously easy to miss an indirect consumer downstream.

Missed Downstream Impacts

Incidents and regulatory issues often trace back to missed downstream modules during change review processes.

Real-World Cascade Example

Module A changes output format → Module B (derived table) breaks silently → Module C (risk/reporting) produces incorrect results → Downstream BI and regulatory reports fail in ways that are hard to trace back.

An effective impact engine should predict this chain before deployment.

1000+

Microservices

Realistic scale where manual impact analysis simply does not work

Our Solution: AI-Native Impact Intelligence for Every Pull Request

Impact Delphyne combines a knowledge graph of services with RAG over real code and contracts, then asks an LLM to explain the impact in a way that developers, architects and risk teams can act on immediately.

01

Automated Service & Contract Discovery

Scans repositories to identify microservices, gateways, data services and OpenAPI/Proto contracts. Builds an enriched knowledge graph using NetworkX.

02

Graph-Aware RAG Over Code & Schemas

Uses OpenAI embeddings with FAISS/NumPy to retrieve the most relevant code snippets, configs and contracts – grounded in graph context.

03

LLM-Powered Impact Dashboard in CI

Orchestrates an LLM to generate an Impact Dashboard and JSON artifact on each PR: severity, impacted services, recommended tests and reviewer guidance.

How It Works: A Four-Stage Pipeline

Discover → Graph → Retrieve → Reason

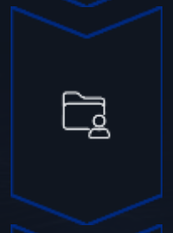
The design is intentionally modular and transparent. Each component can be reasoned about, tested and hardened for enterprise banking environments.

Ingestion & Discovery

Repo + changed files → Microservice discovery → OpenAPI/Proto contracts extraction

Knowledge Graph

NetworkX graph → PageRank, centrality, betweenness → Impacted services via breadth-first search



RAG Layer

Chunked code & contracts → Embeddings (OpenAI) → Vector index (FAISS/NumPy) → Relevant snippets retrieval

LLM & Output

LLM Impact Analyzer → Impact Dashboard (Markdown) → impact-summary.json artifact for CI/CD

Tech Stack Highlights

Python 3.12

Language & runtime

NetworkX

Graph engine with metrics

OpenAI + FAISS

RAG embeddings & retrieval

GPT-4o-mini

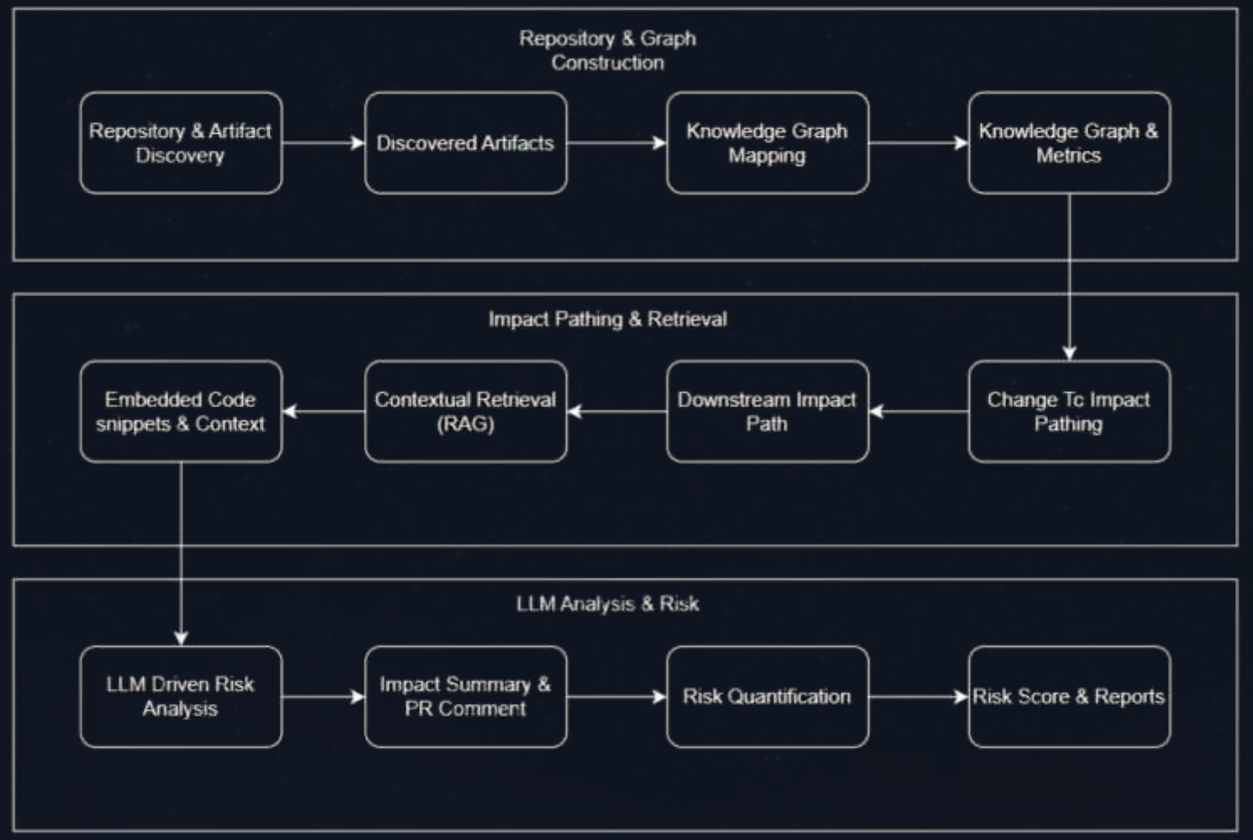
LLM reasoning engine

GitHub Actions

CI/CD integration surface

System Architecture Overview

Impact Delphyne operates through three integrated layers: Repository & Graph Construction for service discovery, Impact Pathing & Retrieval for RAG-based analysis, and LLM Analysis & Risk for intelligent impact assessment.



What It Produces: Artifacts for Machines and Humans

Impact Delphyne emits both a machine-readable JSON summary and a human-readable Impact Dashboard that can be posted as a PR comment or surfaced in internal change management tools.

Machine Artifact: impact-summary.json

Compact summary that CI pipelines, dashboards and change-management tooling can consume programmatically for automated workflows.

- Generated timestamp with PR metadata
- List of changed files and impacted services
- Risk estimate score for prioritization
- Structured for downstream automation

Human Dashboard: LLM-Generated PR Comment

Premium Markdown comment that reviewers receive on every PR, providing actionable guidance with severity, impacted services, recommended tests and rollout strategy.

- Visual severity indicators and metrics
- Service impact deep dive with explanations
- Recommended test coverage scenarios
- Clear rollout and rollback guidance

Built for CITI-Scale Banking Estates

This isn't just a clever demo – it's a production-ready pattern that banks can standardize across portfolios to reduce incidents, save SME time and dramatically improve auditability for regulatory compliance.

20%

SME Effort Reduction

Target decrease in SME hours per major change review cycle

30%

Faster Approvals

Reduction in time to approve high-risk PRs with better visibility

100%

Audit Coverage

Every PR has structured evidence of impact analysis

Measurable Benefits Across Delivery and Risk

For Engineering Teams

1

SME Time Savings

Routine impact checks are automated, allowing SMEs to focus exclusively on high-risk edge cases and strategic approvals.

2

Fewer Surprise Incidents

Better visibility to downstream consumers significantly reduces broken flows and cascading failures in production environments.

3

Faster, Safer Releases

Impact checks move left into CI/CD pipelines, eliminating delays from late-stage review meetings and approval bottlenecks.

For Risk & Compliance

1

Audit-Ready Evidence

Each PR automatically generates a structured story: what changed, potential downstream impacts and the reasoning for safety approval.

2

Change Advisory Confidence

Structured impact artifacts provide objective data for change approval boards, reducing subjective assessments and approval delays.

3

Regulatory Compliance

Systematic impact documentation supports regulatory requirements for change management in banking systems and operations.

Pilot Program Metrics and Validation

We propose a focused 90-day pilot on an ATM or payments portfolio to validate measurable improvements against current baselines and demonstrate production readiness.

20-30%

SME Hours Saved

Per major change

↓

Missed Impact Incidents

Measurable reduction

30%

Faster Approvals

High-risk PR reviews

↑

Advisory Confidence

Via structured artifacts

Next step after the hackathon: partner with architecture, SRE and risk teams to refine banking-specific ontologies and validate these KPIs in a controlled production environment.

What We've Demonstrated

Impact Delphyne represents a complete paradigm shift in how distributed banking systems handle change impact analysis – moving from manual, error-prone processes to automated, AI-powered intelligence that serves multiple stakeholders.

Automated Discovery

Services and contracts discovered from real repositories without manual configuration or documentation.

Knowledge Graph Intelligence

Graph metrics and algorithms reason about downstream impact using PageRank and dependency traversal.

RAG + LLM Pipeline

Produces both JSON artifacts for automation and human-readable Impact Dashboards for review workflows.

CI-Native Design

Ready to plug into GitHub Actions today with clear paths to internal LLMs and banking ontologies.

From Concept to Production

We've proven the technical feasibility. Now we need organizational support to transform this hackathon prototype into the standard pattern for impact analysis across the bank's entire technology estate.

Our Ask: Support a Production Pilot

1

Launch a Focused Pilot

Support a 90-day pilot in a real portfolio (ATM or payments) to validate impact metrics against current baseline processes.

2

Cross-Functional Partnership

Partner with architecture, SRE and risk teams to refine banking-specific ontologies, service taxonomies and risk classification models.

3

Internal LLM Exploration

Explore running the impact engine on internal LLMs where needed for sensitive codebases and proprietary banking logic.

4

Standardize the Pattern

Position Impact Delphyne as the standard pattern for impact analysis across the bank, reducing incidents and improving auditability.

Impact Delphyne: AI-powered impact intelligence for distributed banking systems.

Ready to transform how your organization understands and manages change risk.