PERI – Port Environmental Risk Intelligence

Smart Port Challenge 2026

1. Project Overview

PERI is an AI-based environmental monitoring platform designed for ports.

It aggregates satellite-derived environmental indicators and operational activity metrics to produce a unified Environmental Risk Score (0–100).

The goal is to enable predictive environmental monitoring and reduce financial, operational, and public health risks.

2. Problem

Ports face environmental risks such as:

• Water pollution
• Coastal ecosystem degradation
 • Air emissions
• Environmental stress from operational congestion

Monitoring is often fragmented and reactive, without a unified risk indicator for decision-makers.

This exposes ports to operational disruptions, financial penalties, and reputational damage.

3. Solution

PERI:

• Uses Sentinel-2 satellite imagery
• Computes environmental indices (NDVI, NDWI)
• Applies anomaly detection models
• Generates sub-risk scores
• Produces a consolidated Environmental Risk Index
The system visualizes results through a simple dashboard and map interface.

4. Core Innovation

Instead of isolated monitoring, PERI provides a unified Environmental Risk Score based on:

• Water Risk
• Ecosystem Risk
• Emission Risk
• Operational Risk

This enables executive-level environmental intelligence.

5. MVP Scope

For the hackathon:

• Focus on one Moroccan port
• Satellite-based NDVI & NDWI analysis
• Basic anomaly detection
• Risk score computation
• Dashboard visualization

6. Impact

Environmental: Early detection of abnormal patterns Economic: Reduced operational and regulatory risk Social: Improved transparency and public safety

7. Team Structure (Max 4 Members)

1. Project Lead & Backend Architect

System design, backend, database, coordination

2. AI & Data Specialist

Environmental modeling and anomaly detection

3. Geo & Remote Sensing Specialist

Satellite processing and spatial analysis

4. Frontend Developer

Dashboard and visualization

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