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Blue Shadow MDAR Proof-of-Concept Prototype

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Dear Charlie,

Thank you for the opportunity to present our response regarding the development of Prototype for Blue Shadow. This response includes a structured development plan, key implementation details, and technical recommendations aligned with your business goals.

We have carefully reviewed your requirements and are excited to propose a tailored approach to meet your objectives.

Below, you will find our detailed proposal, including the solution overview, pricing, timeline, and other essential information. Should you have any questions or require further clarification, please don't hesitate to reach out.

Sincerely,
Head of European Partnerships
at Mirko Solutions,
Asya BODNAR

General Terms and Conditions

The Object of the Project:

The project focuses on the design and development of a clickable prototype and a revamped landing page for Blue Shadow - a maritime domain awareness and security platform. The prototype will simulate the platform's unique capabilities, including enhanced vessel tracking, dark ship detection, contextual maritime data overlays, and AI-driven alerts, using selected real-world scenarios and datasets. Supporting documentation (concept overview, technical approach, and development roadmap) will also be delivered to provide clarity and investor-ready materials.

The Goal:

The primary goal is to deliver a convincing proof-of-concept that clearly demonstrates Blue Shadow's value proposition and differentiators compared to existing vessel tracking solutions. This prototype and supporting materials will enable the founder to:

- Present the concept effectively to investors, partners, and potential customers.
- Showcase the tiered service model and future product vision.
- Attract initial funding and stakeholder interest necessary for developing a full MVP.

The **timeline** for the project is **310 hours** (a detailed timeline is provided below).

The **scope** of work will be divided into clearly defined phases, each marking a milestone in the project timeline. After completing each milestone, a review meeting will be held to evaluate progress, confirm alignment with project objectives, and incorporate any feedback or adjustments needed for subsequent phases. This structured, iterative approach ensures transparency, fosters collaboration, and keeps the project on track to deliver the desired outcomes.

Payment Terms. A prepayment is required, with the remaining amount due upon completion of the development phase. We are open to discussion and can offer flexible payment terms to suit your needs.

Block / Role	W1	W2	W3	W4	W5
Phase 1 – Setup & Planning					
Phase 2 – Backend Prototype (NestJS + Postgres)					
Phase 3 – Frontend Prototype (React)					
Phase 4 – Data Integration					
Phase 6 – Documentation & Demo Prep					

Project description

Blue Shadow is positioned as a next-generation maritime intelligence platform — bridging the gap between simple vessel tracking and actionable maritime threat detection. The immediate focus is on delivering a compelling prototype and landing page to secure investor interest, with a clear roadmap toward a scalable MVP and beyond.

The primary deliverable of Phase 1 will be a **web-based interactive prototype** simulating the Blue Shadow platform.

- **Geographic Focus:** The prototype will cover the **Baltic and North Sea region**, chosen due to its combination of dense commercial shipping, strategic naval presence, and recent notable incidents (e.g., cable sabotage, suspicious vessel loitering).

- **Objective:** Provide a **convincing demonstration** of Blue Shadow's unique capabilities in comparison to traditional AIS trackers, suitable for investor presentations and stakeholder engagement.

- **Format:** A browser-accessible map interface with interactive elements, animations, and pre-programmed scenarios to illustrate value.

Prototype Features

AIS-Based Vessel Display

- Realistic simulation of AIS data feeds (positions, names, speeds, routes).
- Vessel icons categorized by type (cargo, tanker, fishing, military, etc.).
- Ability to click vessels and view basic AIS info (MMSI, IMO, flag, last port).

Infrastructure Overlays

- Layers showing critical maritime infrastructure:

  Undersea cables (routes, landing points).
  Wind farms and offshore energy facilities.
  Oil rigs and pipelines.
  Ports and naval bases.

- Users can toggle these overlays to see how vessel activity interacts with sensitive infrastructure.

Dark Ship Detection Scenario

- Simulated incident where a vessel operates without AIS or with spoofed identifiers.
- The system highlights the vessel as an **"unknown contact"** on the map.
- A reveal mechanism (button or animation) demonstrates detection of this vessel by alternative sources (simulated RF or satellite data).

AI-Generated Alert Simulation

- Pop-up or side-panel alerts generated based on scripted logic (to mimic future AI functionality).
- Alerts include **risk levels** (Low/Medium/High) and short reasoning.

Interactive Vessel Details

Clicking on a flagged vessel opens a **detailed info panel**:

- Vessel identity (name, IMO, MMSI, flag, owner).
- Highlighted anomalies (frequent reflagging, deviation from route, AIS inconsistencies).
- Historical context or past incidents (pre-scripted for demo).

Risk assessment score with recommended action (*Investigate / Monitor / Dispatch patrol*).

Supporting Documentation

To strengthen investor and stakeholder engagement, the team will deliver a set of concise documents alongside the prototype and landing page:

- **Technical Outline** – Provides a non-technical but structured overview of how the system will evolve (data sources, AI integration, scalability).
- **Development Roadmap** – Shows phased growth: Prototype → MVP → Full Platform, with indicative timelines and milestones.
- **Use-Case Scenarios** – Short illustrated examples (illegal transshipment, infrastructure threat, smuggling) to demonstrate real-world applicability.

Project Stack:

Technology Component	Description & Role in Project
React & Next.js (Frontend)	Next.js is a React framework for building fast, interactive web UIs with support for server-side rendering. It will be used for the frontend interface of the platform (dashboard and all modules).
Nest.js (Node.js Backend)	NestJS is a progressive Node.js framework for building efficient and scalable server-side applications. It will serve as the backend REST API, handling business logic, multi-tenant data segregation, and integration with external services.
PostgreSQL + PostGIS (Database)	PostgreSQL is a reliable open-source relational database, and PostGIS adds geospatial extensions. Together, they will store all operational data (historical threats, maritime assets, audit logs) and enable geospatial queries (e.g., filtering threats within the Baltic Sea).
AWS Cloud Services (Hosting & Infrastructure)	Amazon Web Services will host the application and database. Core services include: S3 + CloudFront for the frontend site RDS (Postgres) for database ECS Fargate / Elastic Beanstalk for backend containers Cognito for authentication and access control AWS provides a secure, globally available infrastructure with built-in scalability.
Docker (Containers)	Docker is an open platform for developing, shipping, and running applications in containers. Docker will containerize the frontend and backend applications for consistent deployment across environments.
GitHub (Source Control)	GitHub will host the source code repository, facilitating team collaboration and version control.
CI/CD Automation (GitHub Actions)	GitHub Actions will be used to implement continuous integration and delivery. Each commit will trigger automated builds, run tests, build Docker images, and deploy the prototype to AWS.

Estimate

Block	Task	Estimate (hours)	Price(€)
UI\UX	UX Wireframes (Landing, Dashboard, Map), UI design (colors, icons, military designations, styles), Map styling (layers, markers, severity coloring), Prototype in Figma + Review	60	€2 400
Phase 1 – Setup & Planning	Project kickoff, requirements refinement	4	€160
	Repo setup (separate frontend/backend), CI/CD pipeline skeleton	4	€160
	AWS account setup (basic RDS, S3, CloudFront, ECS/EB), dev environment	5	€200
Phase 2 – Backend Prototype (NestJS + Postgres)	NestJS scaffold (modules, auth, controllers)	8	€320
	PostgreSQL schema (contacts, users, audit, hardcoded historical data)	9	€360
	CRUD API for contacts (GET/POST/PUT/DELETE)	8	€320
	Basic RBAC (viewer/operator/admin)	8	€320
	Threat taxonomy (military designators, severity codes) endpoint	8	€320
Phase 3 – Frontend Prototype (React)	React project setup, routing, auth integration	8	€320
	Landing page design (static marketing content)	8	€320
	Map component setup (Mapbox GL or Leaflet, with Baltic/North Sea viewport)	10	€400
	Marker rendering (icons by threat type/severity)	12	€480
	Clickable markers	10	€400
	Add/Edit Threat modal (form, validations)	5	€200
	Layer/filter controls (toggle infra, threats, severity)	8	€320
	Sidebar: activity feed with historical events (from hardcoded data)	6	€240
	Admin panel (basic config + user roles mockup)	8	€320
Phase 4 – Data Integration	Seed database with historical objects (import scripts / static JSON)	40	€1 600
	NestJS API scaffold (REST + WebSocket)	8	€320
	Seed/hardcoded historical data (JSON/CSV import)	5	€200
	API ↔ Frontend integration (React Query/SWR)	8	€320
	Map UX polish (clustering, icons, severity coloring)	10	€400
Phase 6 – Documentation & Demo Prep	Developer README + Overall project documentation	25	€1 000
	Prototype demo deck + dry run	5	€200
	DEV	**290**	**€11 600**
	PM (complimentary bonus)	**10**	**€400**
	QA (complimentary bonus)	**10**	**€400**
	Total	**310**	**€11 600**

As an added value, we are including 10 hours of QA, 10 hours of project management, and CTO-level supervision as a complimentary bonus to ensure the highest quality and smooth delivery of your project.