Product Requirements Document (PRD): TESICNOR DRR Multi-Risk Platform

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- **Version:**

Contenido

1. Intro

High-Level Problem Space

TESICNOR DRR (Disaster Risk Reduction) aims to address the growing need for a centralized, intelligent, and scalable platform to manage multi-risk scenarios in disaster-prone areas.

TESICNOR DRR (The Company) commercial offering combines SaaS capabilities with expert consultancy services, specifically addressing gaps in existing DRR solutions by leveraging TESICNOR's deep expertise in weather, GIS, climate, risk management, software and ML/AI.

TESICNOR's platform (The SaaS) combines cutting-edge AI with user-friendly design to offer a comprehensive solution for multi-risk management across the entire DRR value chain and throughout the whole lifecycle of Disaster Risk Reduction. It integrates SaaS and services to support water, fire, air, and earth-related risks, ensuring regulatory compliance and operational effectiveness

TL;DR

Creating an integrated, AI-powered multi-risk SaaS platform that leverage on consultancy services to support governments, organizations, and communities throughout the entire lifecycle of disaster risk reduction: analysis, preparation, response, and reconstruction. The SaaS multi-risk platform is described in this document.

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2. DRR Lifecycle

The new TESICNOR DRR Multi-Risk Platform transforms how Disaster Risk Reduction (DRR) is managed by enhancing the efficiency and scalability of operations:

- **Across all phases of the DRR lifecycle**

- **Throughout the value DRR chains and ecosystems**

TESICNOR RRD commercial offering combines SaaS capabilities with expert consultancy services, leveraging knowledge in weather, GIS, climate, risk management, and AI. The following table highlights the transformative impact of this integrated approach:

DRR Lifecycle Phase	Jobs to Be Done	TRADITIONAL RRD	TESICNOR RRD in 2 Years
Prevention	Identify potential risks.	Manual risk evaluations based on historical data, observation, predictive tools.	AI-driven predictive analysis with real-time dynamic scenarios.
	Develop mitigation strategies tailored to identified risks.	Basic advisory services for policy development.	Automated policy recommendations integrated.
	Ensure proactive **strategies** for high climate or natural-risk zones and assets.	Basic advisory services. Reporting.	Proactive, AI-powered RRD and climate risk reporting aligned with regulatory frameworks and reporting standards.
Preparation	Create adaptive action **plans** for different scenarios and simulate their effectiveness.	Template-based action plans and in-person training. (e.g. PAM-RI)	Scenario-based planning, compliant with regulations, with local adaptation, including ==risk== mitigation ==measures measurement== (e.g. barriers), custom software developments (e.g. local website) and operational tools (e.g. EPIs). And interactive virtual training programs.
	Establish real-time alert systems tailored to different audiences.	Standard massive alert protocols with limited customization.	IoT-connected, ML-enhanced early warning, forecasting and nowcasting systems for tailored alerts, real time reporting and proactive risk management and seamless integration with 3rd party systems.
Response	Rapidly activate emergency protocols and allocate resources efficiently.	Manual activation of emergency protocols. (e.g. SMS)	Automated protocol activation driven by AI insights wiith configurable degrees of Agentic behaviour.
	Communicate critical information to stakeholders effectively.	Standard messaging via local media.	Multichannel, AI-driven communication with personalized chatbots.
	Adjust response to the evolution of the event	Observation of parameters, cope with damages of information systems (e.g. sensors damaged)	Proactive scraping of all available sources of information for dynamic support during the event (e.g. social networks, official channels)

DRR Lifecycle Phase	Jobs to Be Done	TRADITIONAL RRD	TESICNOR RRD in 2 Years
(Recovery)	Conduct damage assessments quickly and allocate resources for reconstruction.	Manual damage evaluations and long-term planning.	Drone-enabled rapid assessments and AI-guided reconstruction strategies.
	Provide continuous social and psychological support for affected communities.	Basic, localized support programs.	Comprehensive digital platforms for continuous social and psychological support.

This lifecycle illustrates the profound shift TESICNOR RRD introduces by addressing inefficiencies and leveraging advanced technologies to deliver faster, smarter, and more effective DRR management.

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3. Market Insights

Market Analysis

The demand for advanced disaster management tools is increasing due to climate change, urbanization and increasing deployment of critical assets in risk-prone natural spaces (e.g. renewable energy infrastructure, autonomous mobility). Existing solutions often lack integration, scalability, nowcasting or real-time capabilities. TESICNOR's platform will fill this gap by offering a unified, adaptable and evolutive system.

Competitor Analysis

- **Competitors:** TechnoSylva, INTELIALERT, Meteoclim, Mitiga Solutions, Lobelia, Google Earth Engine, and early warning systems (e.g., MeteoGroup, Esri GIS), but they lack holistic integration.

- **Opportunities:** Differentiation via open and private data integration, ML-driven data pipelines, AI-driven risk analysis and user experience, real-time and nowcasting updates, plugins and scured connectors and user-centric design.

4. The Customers

Customer Segments

TESICNOR RRD serves three main groups:

1. **Public Sector (GovTech):** Civil Protection, Hydrographic Confederations, Administrations, and critical infrastructures.

2. **Private Sector:** Industries such as energy, telecommunications, logistics, and consultancies leveraging the platform for digitizing DRR plans.

3. **Innovation and Research:** International organizations, universities, and research centers.

User Personas

- **Emergency Manager:** Requires real-time data and insights to coordinate disaster response effectively.

- **DRR Consultant:** Uses the platform to digitize and enhance disaster risk reduction plans for clients, ensuring efficiency and compliance.

- **Field Responder:** Needs actionable, on-the-ground data to make quick decisions in remote or high-risk locations.

- **Climate Analyst, Urban Planner, H&S Manager, Sustainability Manager:** Relies on comprehensive risk models and simulations to support long-term urban and infrastructure planning.

5. The Problem

Use Cases

TESICNOR RRD delivers key capabilities to address multi-risk scenarios by:

1. Monitoring precipitation, flooding (fluvial, pluvial, and coastal), wildfires, and air quality using nowcasting and forecasting to ensure timely and effective disaster responses.

2. Managing extreme weather events, including heat, cold, severe storms, drought, and desertification. And seismic activity.

3. Providing tools for real-time impact assessments and predictive modeling.

4. Digitizing Disaster Action Plans and automating their implementation using AI capabilities.

5. Supporting s and tailored climate risk reporting.

Pain Points

- Growing devastating impact of extreme weather events.

- Reactive, uncoordinated management and complex regulatory frameworks increase costs and vulnerability. TESICNOR RRD addresses these challenges by offering AI-driven solutions that simplify compliance, harmonize data across jurisdictions, and streamline risk assessments to reduce inefficiencies and vulnerabilities.

- Current solutions lack predictability and automation, leaving critical sectors and managers unprotected.

6. The Solution

Ideation

- Centralized risk management dashboard.

- AI-driven predictive analytics.

- Real-time communication tools for multi-agency coordination.

- Integration of services and SaaS across all four phases: analysis, preparation, response, and reconstruction.

- Multi-agent expert architecture to support key decision-making, ensure service levels, and regulatory compliance.

- Certified training and provision of operational measures such as barriers and PPE.

Solution Architecture mock-up (March 2025)
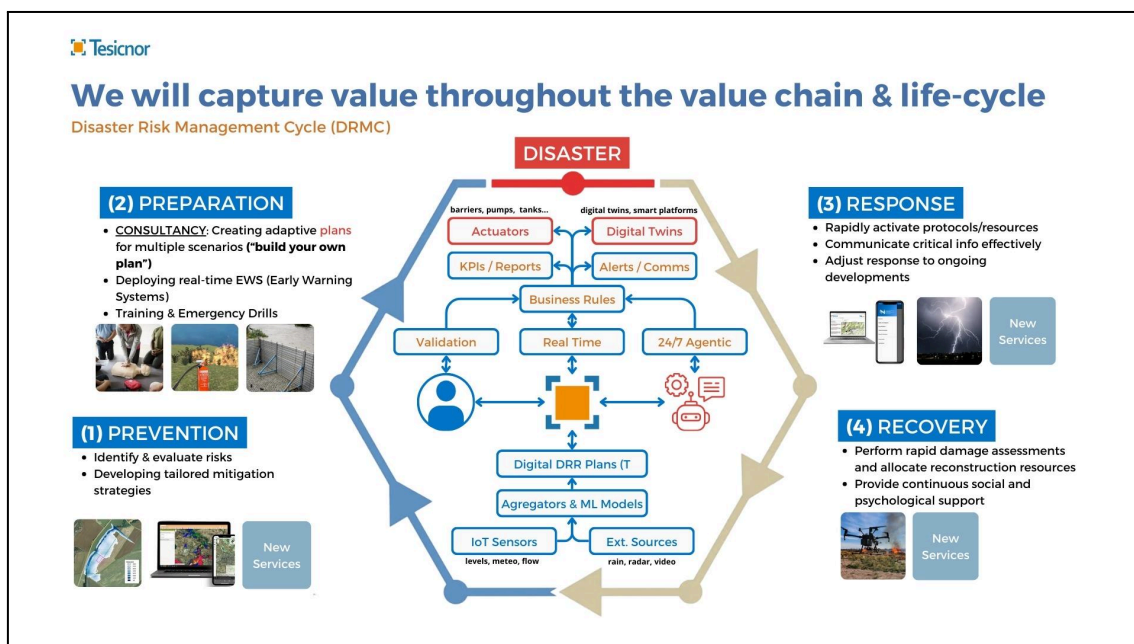
Solution Interface Mmock-up (March 2025)

Mockup muy básico para ver como podría ser la interacción con el agente LLM

System Architecture (March 2025)
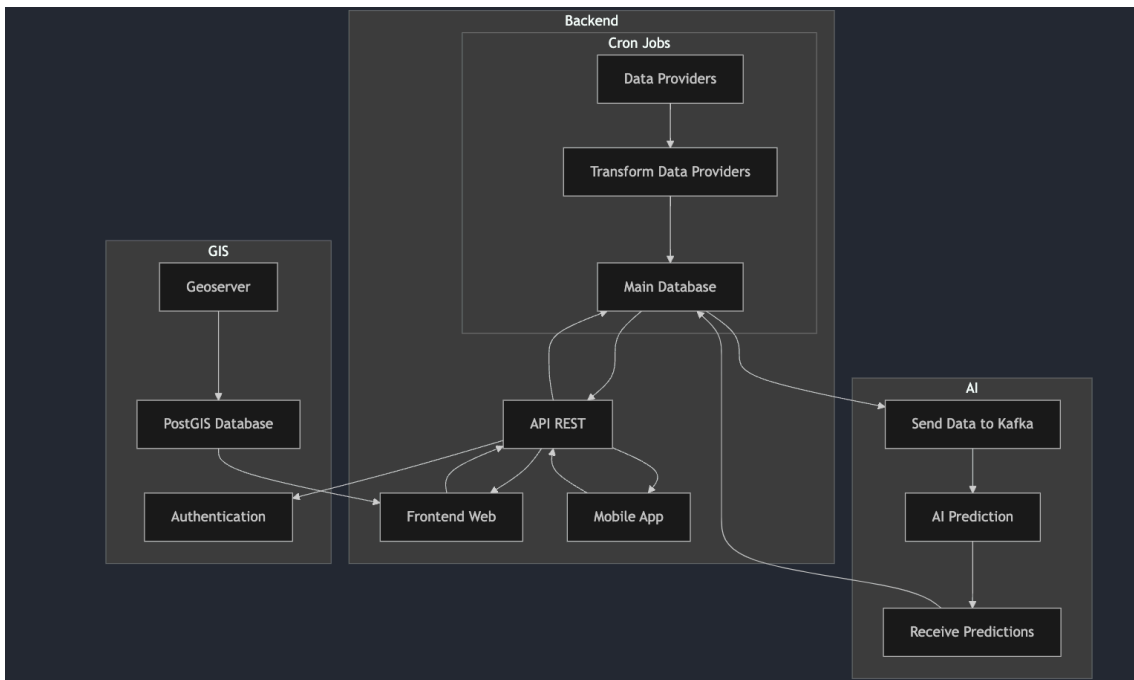
7. Challenges

8. Roadmap

V.1.0 <mark>(Podríamos entender que es el MVP. Confirmar lo que entra en V.1 grosso modo y lo que queda fuera para V.2 o V.3)</mark>

Develop a platform that:

1. Covers the entire DRR lifecycle, supporting analysis, preparation and digitalization of 3rd party plans, response, and reconstruction.

2. Integrates real-time data for fluvial flooding, pluvial flooding, wildfires, heat stress, severe convective storms, and air quality.

3. Offers advanced Geographic Information System (GIS) visors and other integrated data sources.

4. Integrates input data from GIS and IoT devices.

5. Includes a pipeline and tools for ML/AI models to enable consultancy and delivery of specialized projects, such as climate risk analysis and tailored reporting.

6. Offers real-time risk prediction and visualization.

7. Includes an AI assistant for decision support. <mark>V.2 o V.3</mark>

8. Provides modular training programs and essential operational resources.

V1.0:

- Covers the entire DRR lifecycle, supporting analysis, preparation and digitalization of 3rd party plans, response, and reconstruction.

- Flood alert management system.

- Real-time data capture from various providers for rainfall, river flow and water levels.

- Offer GIS layer visualization in an integrated web viewer.

- Prediction data for heat stress, viewable in the integrated viewer.

- Includes AI techniques for river flow predictions.

- Mobile application with integrated functionalities.

V2.0:

- Prediction using radar images for thunderstorms and integration into web viewer.

- Visualization of lightning strike history in the web viewer.
- API service for third parties, allowing access to historical flood data.
- Generate automatic reports on floods and the actions taken by each client during emergencies.
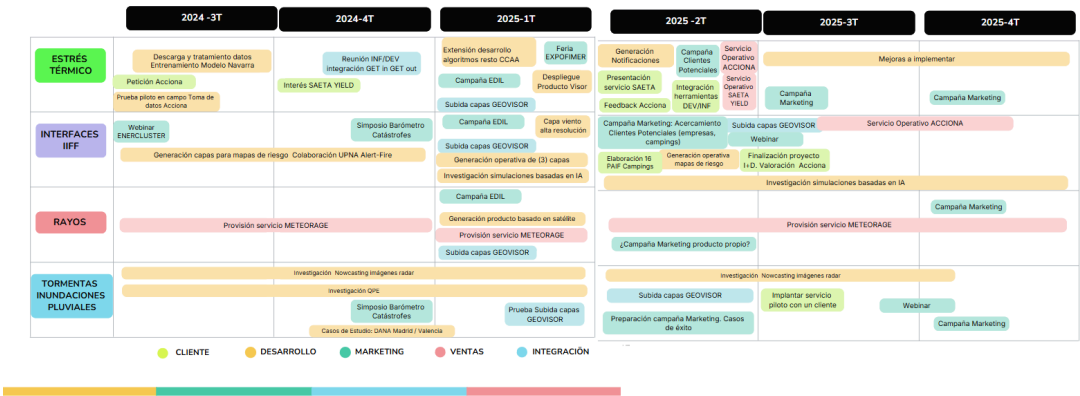- Include a virtual bot for flood emergencies that can read the PAMRI document, answer questions about it, suggest actions and provide real-time station data.
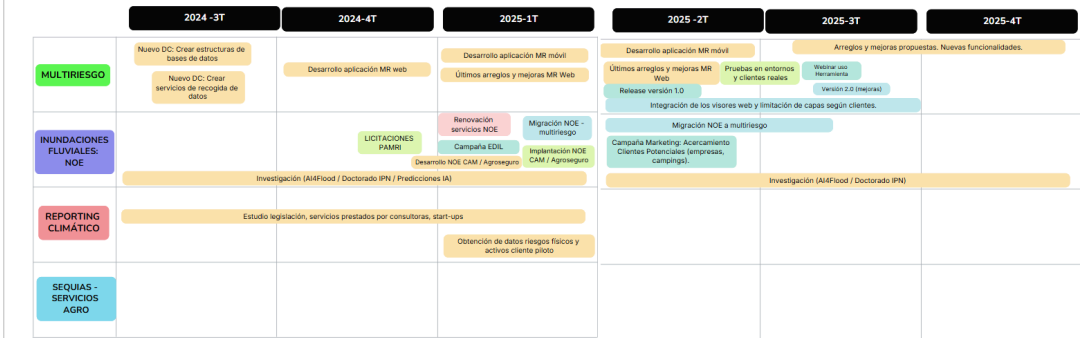
V3.0:

- Include a language model for a virtual assistant capable of managing processes, such as sending SMS to the relevant population, emails, or social media updates for example.
- Visual integration of the flood emergency management system with web viewer (potentially in the future, to centralize all risks in a single viewer instead of having floods separated as they are now)

Hoja de Ruta Productos RRD

	2024 -3T	2024-4T	2025-1T	2025 -2T	2025-3T	2025-4T
ESTRÉS TÉRMICO	Descarga y tratamiento datos Entrenamiento Modelo Navarra; Petición Acciona; Prueba piloto en campo Toma de datos Acciona	Reunión INF/DEV integración GET in GET out; Interés SAETA YIELD	Extensión desarrollo algoritmos resto CCAA; Feria EXPOFIMER; Campaña EDIL; Despliegue Producto Visor; Subida capas GEOVISOR	Generación Notificaciones; Campaña Clientes Potenciales; Servicio Operativo ACCIONA; Presentación servicio SAETA; Integración herramientas DEV/INF; Servicio Operativo SAETA YIELD; Feedback Acciona	Campaña Marketing; Mejoras a implementar	Campaña Marketing
INTERFACES IIFF	Webinar ENERCLUSTER; Generación capas para mapas de riesgo	Simposio Barómetro Catástrofes; Colaboración UPNA Alert-Fire	Campaña EDIL; Capa viento alta resolución; Subida capas GEOVISOR; Generación operativa de (3) capas; Investigación simulaciones basadas en IA	Campaña Marketing: Acercamiento Clientes Potenciales (empresas, campings); Subida capas GEOVISOR; Servicio Operativo ACCIONA; Webinar; Elaboración 16 PAIF Campings; Generación operativa mapas de riesgo; Finalización proyecto I+D. Valoración Acciona; Investigación simulaciones basadas en IA		
RAYOS	Provisión servicio METEORAGE		Campaña EDIL; Generación producto basado en satélite; Provisión servicio METEORAGE; Subida capas GEOVISOR	¿Campaña Marketing producto propio?; Provisión servicio METEORAGE		Campaña Marketing
TORMENTAS INUNDACIONES PLUVIALES	Investigación Nowcasting imágenes radar; Investigación QPE	Simposio Barómetro Catástrofes; Casos de Estudio: DANA Madrid / Valencia	Prueba Subida capas GEOVISOR	Investigación Nowcasting imágenes radar; Subida capas GEOVISOR; Implantar servicio piloto con un cliente; Preparación campaña Marketing. Casos de éxito	Webinar	Campaña Marketing

Leyenda: ● CLIENTE ● DESARROLLO ● MARKETING ● VENTAS ● INTEGRACIÓN

Hoja de Ruta Productos RRD

	2024 -3T	2024-4T	2025-1T	2025 -2T	2025-3T	2025-4T
MULTIRIESGO	Nuevo DC: Crear estructuras de bases de datos; Nuevo DC: Crear servicios de recogida de datos	Desarrollo aplicación MR web	Desarrollo aplicación MR móvil; Últimos arreglos y mejoras MR Web	Desarrollo aplicación MR móvil; Últimos arreglos y mejoras MR Web; Pruebas en entornos y clientes reales; Release versión 1.0; Integración de los visores web y limitación de capas según clientes.	Arreglos y mejoras propuestas. Nuevas funcionalidades.; Webinar uso Herramienta; Versión 2.0 (mejoras)	
INUNDACIONES FLUVIALES: NOE		LICITACIONES PAMRI; Investigación (AI4Flood / Doctorado IPN / Predicciones IA)	Renovación servicios NOE; Migración NOE - multiriesgo; Campaña EDIL; Implantación NOE CAM / Agroseguro; Desarrollo NOE CAM / Agroseguro	Migración NOE a multiriesgo; Campaña Marketing: Acercamiento Clientes Potenciales (empresas, campings).; Investigación (AI4Flood / Doctorado IPN)		
REPORTING CLIMÁTICO		Estudio legislación, servicios prestados por consultoras, start-ups	Obtención de datos riesgos físicos y activos cliente piloto			
SEQUIAS - SERVICIOS AGRO						

9. Metrics

- Adoption: Onboarding X agencies in the first year.

- Performance: X% accuracy in risk predictions.

- ROI: Demonstrating cost savings in disaster mitigation efforts.