DYNABIC

Dynamic Business Continuity and Response of Critical Systems against advanced cyber-physical threats

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Project Facts

- **Project Coordinator:** Tecnalia
- **Consortium:** 16 partners
- **Budget:** € 4,999,695
- **Project Type:** RIA
- **Grant Agreement ID:** 101070455
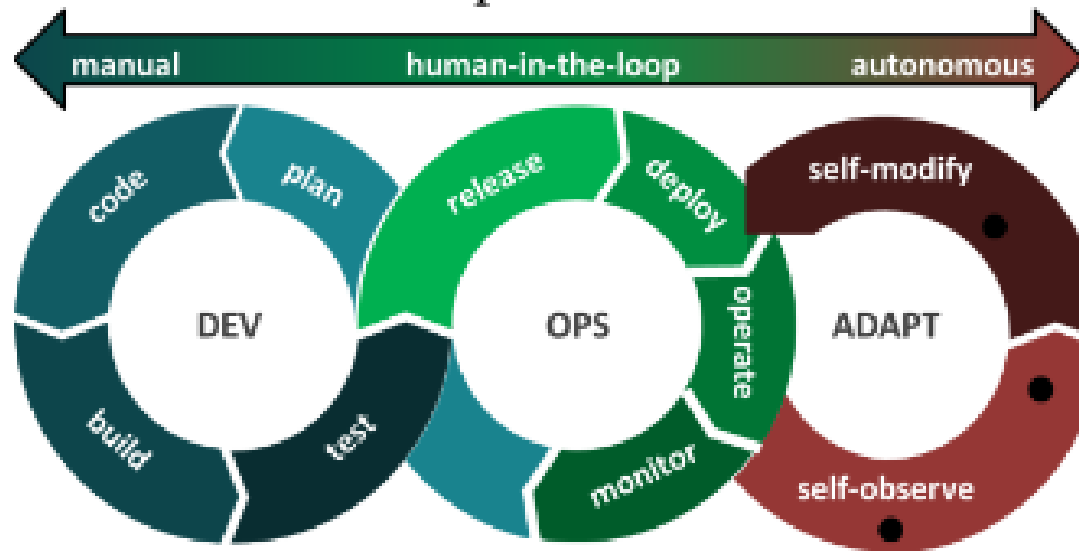- **Start Date:** 01/12/2022
- **Duration:** 3 years

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MINDS

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Overall Objective

> **Increase** the **resilience and business continuity** capabilities of European **critical services** in the face of **advanced cyber-physical threats**.

The focus is on **cyber-physical threats** that may cause **business disruption** or underperformance **risks**, including the assessment of their **cascading effects** on **interconnected critical infrastructures**.

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Core idea

➤ Business continuity risk management in critical infrastructures, based on **SecDevOpsAdapt cycle**

Source: A. Metzger "Software Engineering for ECS: Towards Dev-Ops-Adapt", Workshop on Software in Electronics, Components and Systems-based Digitisation, Virtual, May, 2021

to enable the **dynamic adaptation of the response to incidents and disruptions**.

Detailed objectives

Objective 1: Deliver the **DYNABIC Framework** for ensuring **increased resilience** of critical systems, while assuring the **continuity** of business and operations.

Objective 2: Enable Operators of Essential Services to Predict, Quantitatively Assess and Mitigate Real-time **Business Continuity Risks** and **cascading effects**.

Objective 3: Enable **Disaster Preparedness** in Critical Infrastructures and improve **the Prevention** of business continuity risks **cross-organisation** and **cross-domain**.

Objective 4: Enable the **Dynamic Autonomous Adaptation** of critical infrastructures to meet Resilience goals

Objective 5: Facilitate the **Coordinated vulnerability and threat information sharing** across the EU and Enable CI operators meeting the EU NIS Directive 2.

Objective 6: **Demonstration** of the DYNABIC Framework integrated into critical services use cases relevant for Europe.
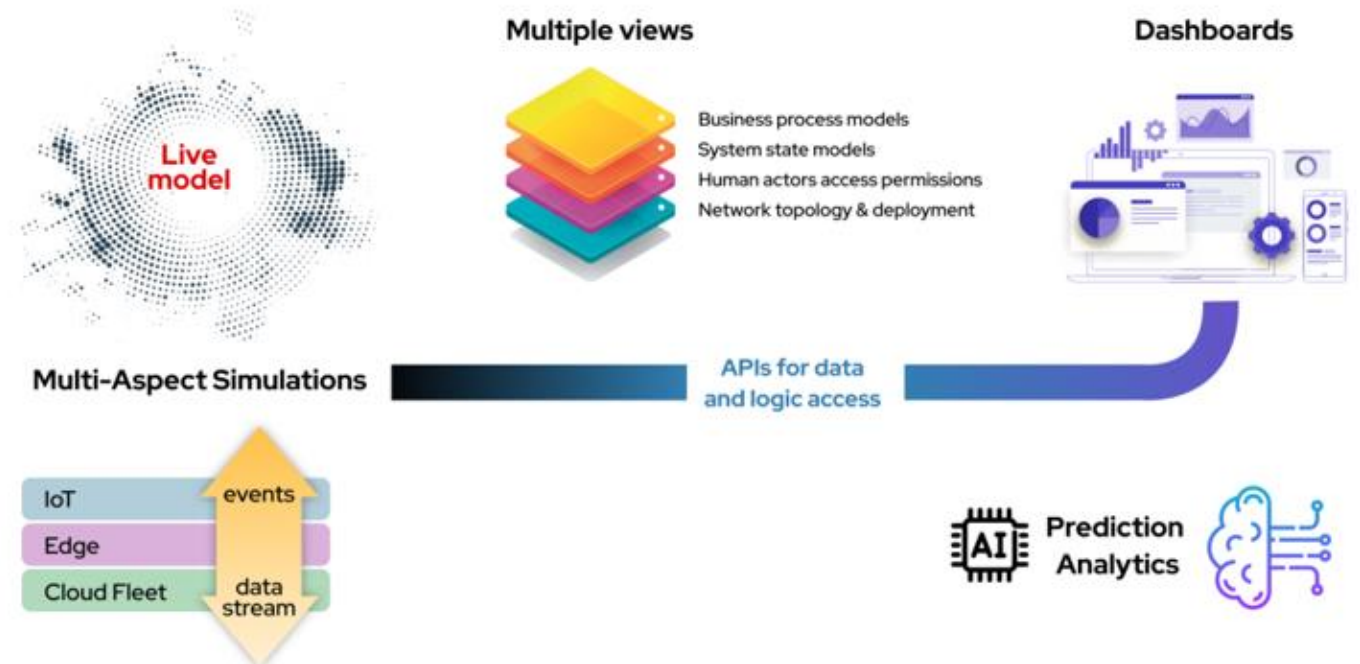
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Main contributions

➢ The **DYNABIC Framework** to predict, quantitatively assess and mitigate in real-time business continuity risks and their potential cascading effects.

➢ By enabling the **dynamic autonomous adaptation** of critical infrastructures to **meet Resilience goals** by the automatic optimization and orchestration of response strategies.

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DYNABIC in a Nutshell

➤ A **Multi-Aspect Digital Twin** (MADT) of interconnected CIs.

➤ **Resilience solutions** on top of MADT to analyse and predict potential business disruptions and their propagation.

Multi-Aspect Digital Twin

Live model

Multiple views
- Business process models
- System state models
- Human actors access permissions
- Network topology & deployment

Dashboards

Multi-Aspect Simulations

IoT — events
Edge
Cloud Fleet — data stream

APIs for data and logic access

AI Prediction Analytics

The DYNABIC Framework

REAL-TIME BUSINESS CONTINUITY RISK MANAGEMENT

- Risk-enriched Business Process Modelling
- AI-based Forecasting of Business Risk Cascading effects
- Real-time Multi-factor Quantitative Risk Assessment and Mitigation

forecasting

Live model

Multi-Aspect Digital Twin

real

CONSCIOUS PREVENTION & DETECTION

- Simulation of Cyber-physical Threats

forecasting

Business Continuity Situational Awareness

- Self-monitoring and Context Sensing and Analysis
- AI-based Cyber-physical Threat & Anomaly Detection

real

sync

AUTONOMOUS DYNAMIC ADAPTATION & RESPONSE

- Autonomy & Self-learning for Resilience (RL)
- Multi-level SOAR and Self-healing

forecasting

- Personalised Assisted Human Responses
- CTI & Incident Information Sharing

real

External environment: Supply chain & other Critical Infrastructures

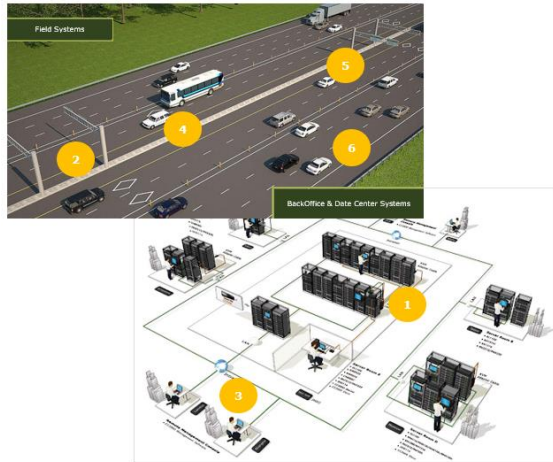main system (Smart grid, engine, machine, etc.)

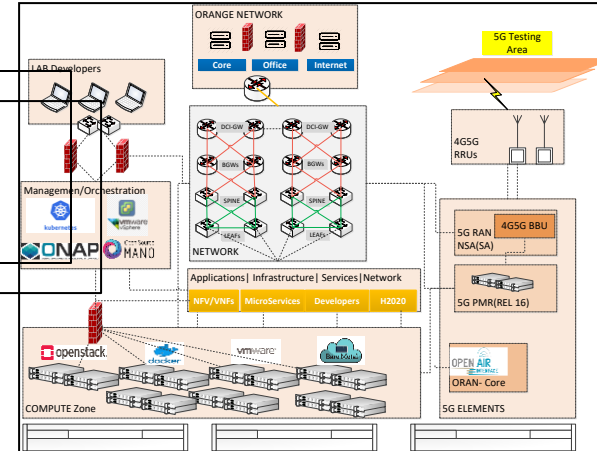Business process

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Use cases

➢ Smart Preparedness, Prevention and Response to Business Disruption risks in 4 critical infrastructures and supply-chains
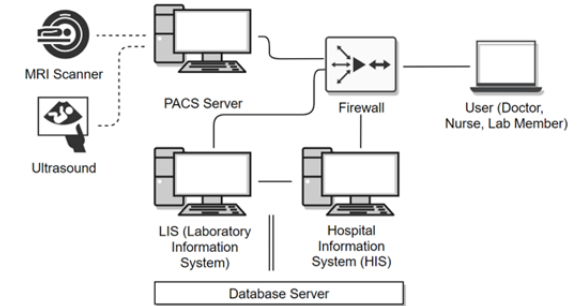

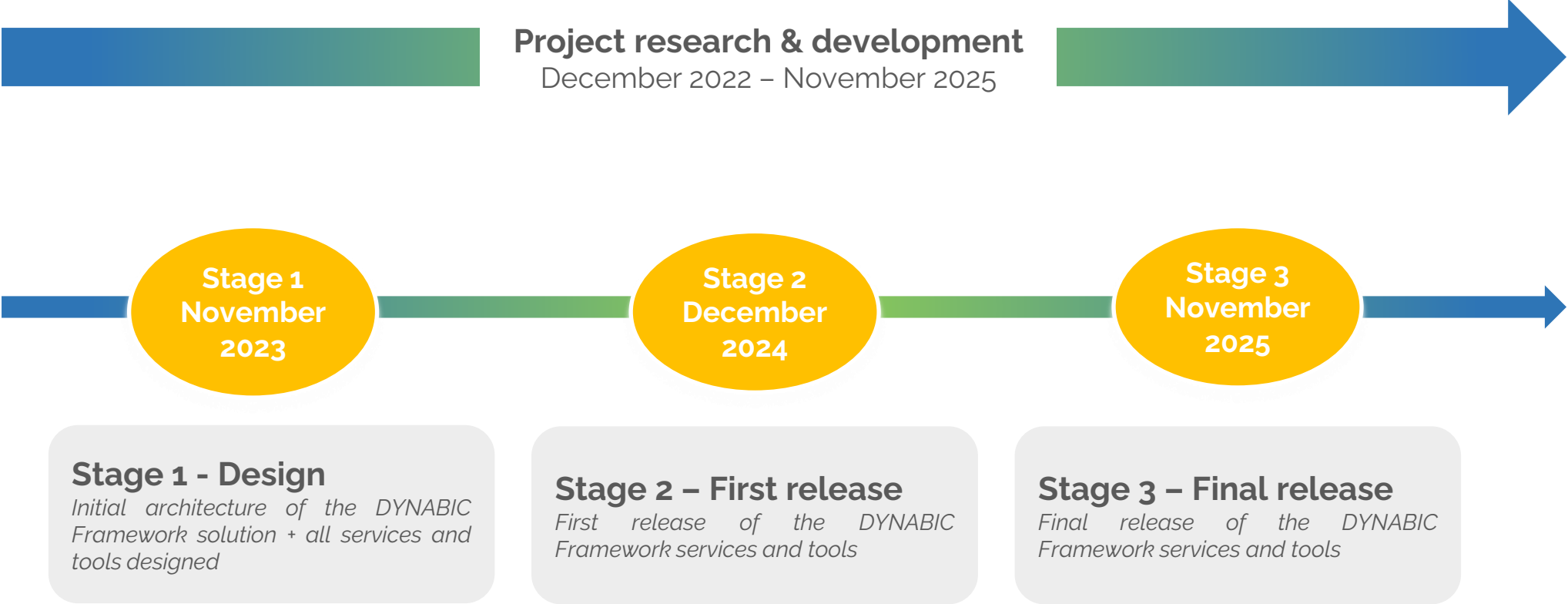Transport services   EV charging station   5G Telco   Health

Cascading effects in interconnected CI

The DYNABIC Timeline

Project research & development
December 2022 – November 2025

Stage 1
November
2023

Stage 2
December
2024

Stage 3
November
2025

Stage 1 - Design
Initial architecture of the DYNABIC Framework solution + all services and tools designed

Stage 2 – First release
First release of the DYNABIC Framework services and tools

Stage 3 – Final release
Final release of the DYNABIC Framework services and tools

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Thank you for your attention!!

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