Perché HaMMon

- Dare un contributo operativo al sistema Paese per la caratterizzazione del rischio legato agli eventi naturali estremi

- Creare strumenti utilizzabili in diversi domini applicativi

- Favorire la collaborazione tra enti di ricerca e sistema industriale italiano

HaMMon

HaMMon

Post-event analysis	WP2
Seasonal forecasts and weather generator	WP3
Building features extraction from images	WP4
Vulnerability curves for earthquake, landslides and flood perils	WP5
Technological infrastructure to run and deploy the applications	WP1

Finanziato
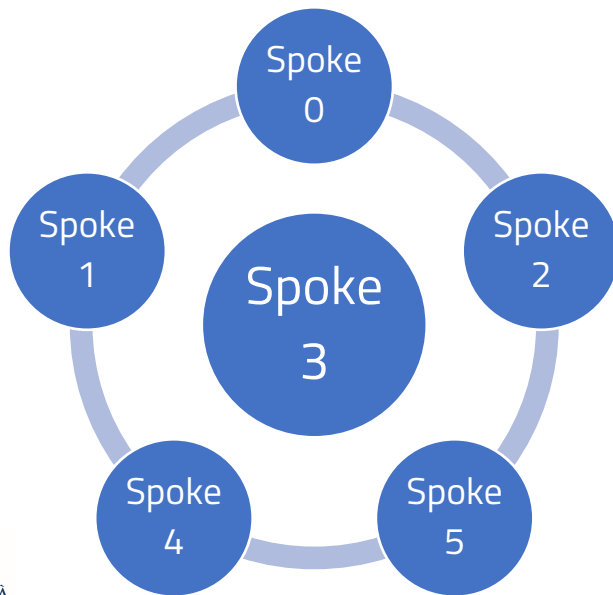dall'Unione europea
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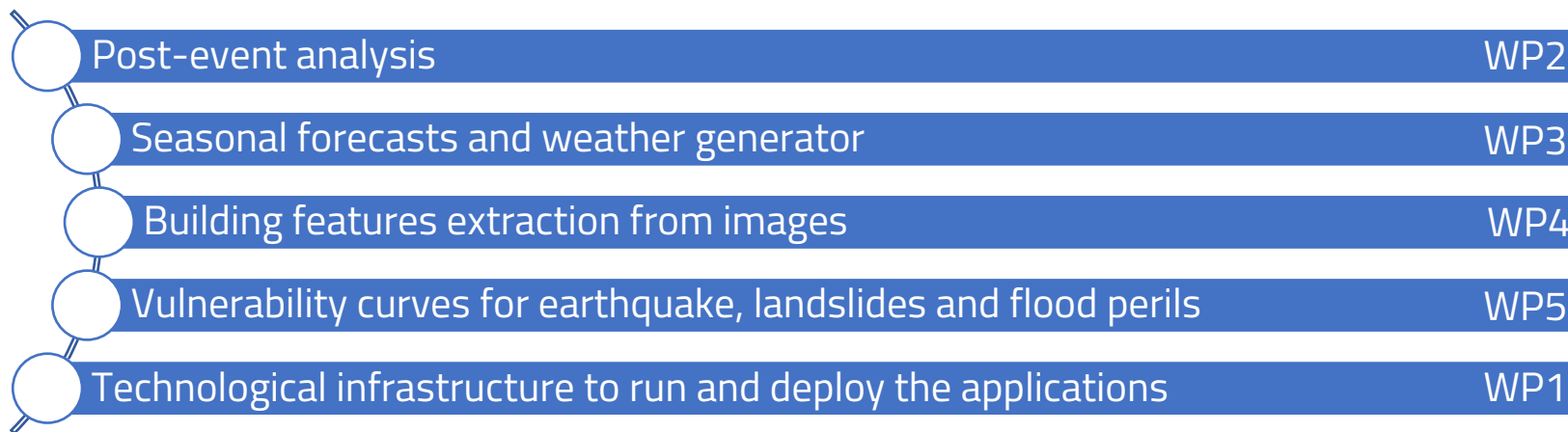
Management

Persone
Project coordinator (PI): Antonio Tirri – Leithà
Industrial Co-PI: Antonio Ballarin - Sogei
Research Co-PI: Fabio Vitello – INAF
System Engineer (SE): Costantino Cafaro – Leithà

General Assembly (GA)

Project Coordinator

Co- Project Coordinators

All Partners representative

Legal-IP Panel (LIP)

One representative for each involved Spoke

One representative for each industrial partner

Management Board (MB)

One representative for each involved Spoke

One representative for each industrial partner

System Engineer

Work Package Assembly (WPA)

Project Coordinator

Co- Project Coordinators

One representative for each partners involved in WPX

System Engineer

WP 1: Enabling Infrastructure

Objective: Creation and configuration of a Kubernetes cluster and a set of services such as data archive, cloud storage, workflow management as well as test, dev and prod environments, with a high-performance approach.

Involved partners:

Task:
- T1.1: Infrastructure for PoC (**Leader: UniTo**; Contributors: INAF, UnipolSai-Leithà)
- T1.2: Infrastructure for production-level operational Services (**INFN**; UnipoSai-Leithà, ENEA, UniTo)
- T1.3: Data Archive (**UniTN**; Unipolsai-Leithà, INFN)

Deliverables and milestones:
- D1.1 PoC level infrastructure (M7 – Nov23 – UniTO)
- D1.2 Use case requirements gathering (M7 – Feb24 - INFN)
- D1.3 Implementation of the first PoC of the Cloud Platform (M8 – Jun24 - INFN)
- D1.4 Implementation of the first integrated version of the Cloud Platform (M9 – Oct24 - INFN)
- D1.5 Implementation of the fully featured high-available Cloud Platform (M10 – Aug25 - INFN)
- D1.6 HaMMon Data Archive design (M7 – Feb24 - UNITN)
- D1.7 Final operational setup of the HaMMon Data Archive (M10 – Aug25 - UNITN)

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WP 2: Post-event analysis

Objective:
- Improve damage assessment, claims processing and time needed for on-site inspections after a natural disaster
- Collecting requirements for the remote inspection of areas damaged by natural disasters
- Development of algorithms to identify and classify objects and features within 3D models and 2D images.

Involved partners:

Description of work:
- T2.1: Workflow for data acquisition and creation of digital twin (**Leader: INAF**, Contributors: UnipolSai-Leithà, Sogei, ENEA)
- T2.2: Design of web application for remote inspection of areas damaged by natural disasters (**UnipolSai-Leithà**; INAF, Sogei)
- T2.3: Development of a web service to expose 3D models to third-party applications (**UnipolSai-Leithà;** INAF, Sogei)
- T2.4: Automatic (or semi-automatic) analysis (**INAF**; UnipolSai-Leithà, Sogei, UniSalento)

Deliverables and milestones:
- D2.1 Produce an algorithm for UAV data acquisition and creation of digital twin (M7 – Feb24 - INAF).
- D2.2 Deliver the design of a web application suitable for remote inspection in the aftermath of extreme vents (M8 – Jun24 - Unipolsai).
- D2.3 Deliver the web service for claim adjusters (M9 – Oct24 - Unipolsai).
- D2.4 Produce an algorithm for automatic or semi-automatic information extraction from digital twin (M10 – Aug25 - INAF).

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WP 3: Seasonal forecasts and weather generator

Objective:
- Developing a system for seasonal forecasting for the hazard assessment of extreme events
- Creation of a weather generator tool for the characterization of climate change risks.

Involved partners:

CMCC Centro Euro-Mediterraneo sui Cambiamenti Climatici   UnipolSai Assicurazioni   Leithà   FBK Fondazione Bruno Kessler   sogei   ENEA Agenzia Nazionale per le Nuove tecnologie, l'Energia e lo Sviluppo economico sostenibile

Description of work:
- T3.1 Impact insights from seasonal forecasts (**Leader: CMCC**; Contributors: FBK, UnipolSai-Leithà, ENEA, Sogei)
- T3.2 A weather generator for risk management (**CMCC**; FBK, UnipolSai)

Deliverables and milestones:
- D3.1 Analysis of seasonal forecast products (M8 – Jun24 - CMCC)
- D3.2 Derivation of an operational workflow for predictions of extreme events based on seasonal forecasts (M9 – Oct24 - CMCC)
- D3.3 CMCC - Prototype of a weather generator software for risk management applications (M10 – Aug 25 - CMCC)

WP 4: Building features

Objective:
- Mapping the main characteristics of the built environment in Italy
- Development of algorithms for the classification of the built environment using multiple data sources
- Development of vulnerability curves for a set of hazards by using abovementioned building features

Involved partners:

Description of work:
- T4.1 - Building Feature Extraction from aerial and satellite imagery (**Leader: UnipolSai-Leithà**; Contributors: INAF, UniBA)
- T4.2 - Building Feature Extraction from Street View Images (**UnipolSai-Leithà**; PoliBa, UniBa)
- T4.3 - Development of specific vulnerability curves (**CMCC**, Contributors: PoliBa, ENEA, UnipolSai-Leithà, IREA)

Deliverables and milestones:
- D4.1 Data provider shortlist and building features to monitor (M8 – Jun24 - UnipolSai)
- D4.2 Algorithm selection and dataset for ground truth (M9 – Oct24 - UnipolSai)
- D4.3 Vulnerability curves for seismic and flood risk (M10 – Aug25 - CMCC)
- D4.4 Classification models (M10 – Aug25 - UnipolSai)

Data provider

Data provider

Rilevazione 01-01-2014

Provider: Hexagon

Risoluzione: 30 cm

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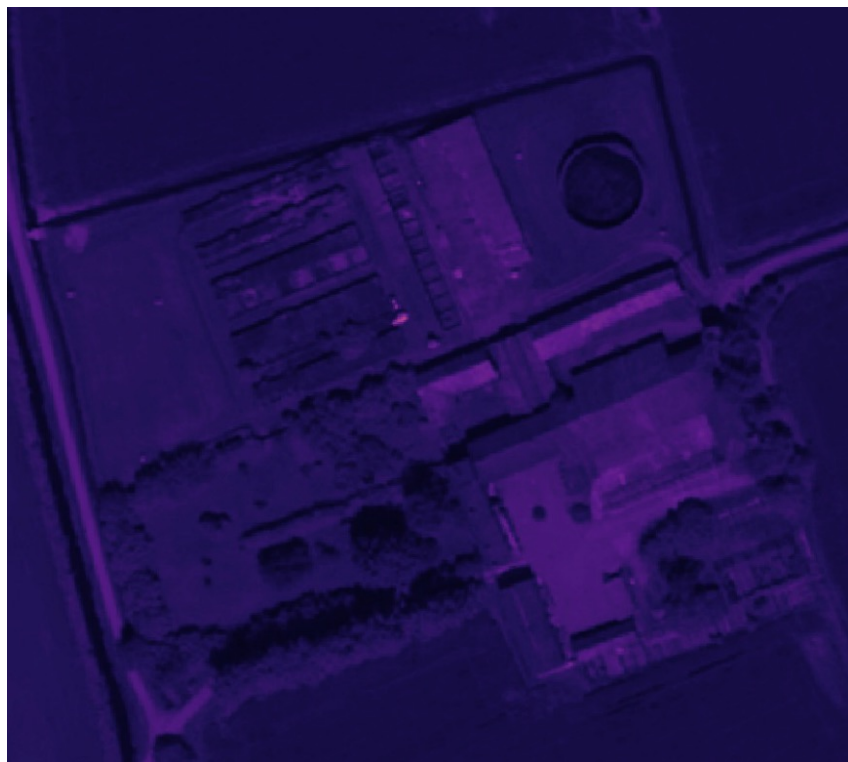Centro Nazionale di Ricerca in HPC, Big Data and Quantum Computing

Data provider

UP⁴²

Rilevazione 14-06-2021

Provider: Vexcel

Risoluzione: 8 cm

Data provider

Rilevazione 02-07-2022

Provider: Airbus

Risoluzione: 50 cm

Data provider

Rilevazione 01-12-2022

Provider: Vexcel

Risoluzione: 15 cm

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WP 5: Vulnerability curves

Objective:
- Provide vulnerability assessment criteria for damage induced on structures by slow-moving landslides
- Assess future evolution of risk related to slow-moving landslides due to evolving climate

Involved partners:

UnipolSai ASSICURAZIONI   Leithà   sogei

Description of work:
- T5.1 - Assess risk related to slow-moving landslides for future climate scenarios (**Leader: PoliBA**; Contributors: UnipolSai-Leithà, Sogei, UniRoma1)
- T5.2 - Provide vulnerability assessment criteria for buildings affected by slow-moving landslides (**PoliBa**, UnipolSai-Leithà, Sogei, UniRoma1, UnivAq)
- T5.3 - Derivation of fragility and loss curves for structural and seismic risk for the existing residential building stock (**PoliBA**; UnipolSai-Leithà, Sogei, UniRoma1, UnivAq)
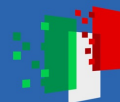
Deliverables and milestones:
- D5.1 Sample numerical models of slopes affected by slow-moving landslides, endowed with guidelines for construction and initialization of the model, as well as for the application of weather-related boundary conditions. Results of analyses carried out using future climate scenarios (M9 – Oct24 - PoliBA)
- D5.2 Landslide-related damage charts for prototype cases (M9 – Oct24 - PoliBA)
- D 5.3 Fragility and loss curves for specific building typologies for structural and seismic risk. M10 – Aug25 - PoliBA)

Grazie!