COMAP national Italian downstream activity

VENEZIA, 6 OCTOBER 2021

ANDREA TARAMELLI - COORDINATORE NAZIONALE COPERNICUS USER FORUM
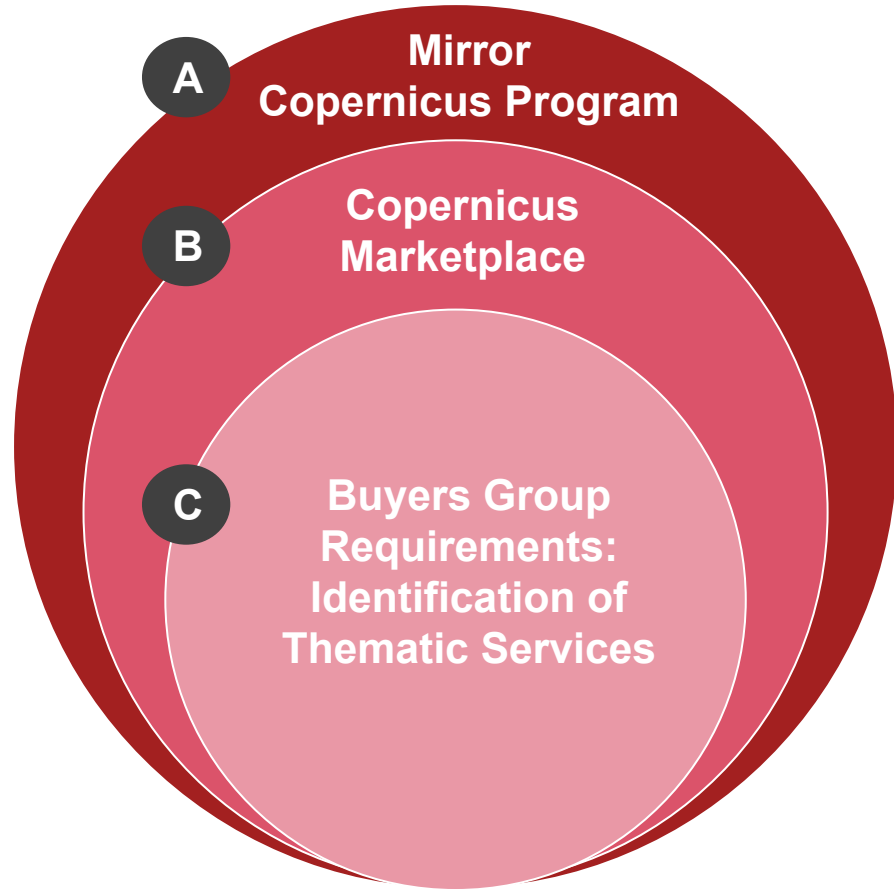
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PREPAIR PROJECT - 2a MIDTERM CONFERENCE
THE PO BASIN TOGETHER FOR THE QUALITY OF AIR

Outlilne

1. Concept

2. User Requirements Analysis

3. Thematic Services

4. Gap Analysis

5. Gap Filling Process

Analysis of buyers group requirements contributes to CoMaP development and supports the wider Mirror Copernicus program

A Mirror Copernicus Program

B Copernicus Marketplace

C Buyers Group Requirements: Identification of Thematic Services

A **Mirror Copernicus**

- Program with the objective to strengthen the Italian positioning within the emerging market of geospatial services
- Focuses on the realization of an innovative infrastructural system to boost the development of the sector in Italy

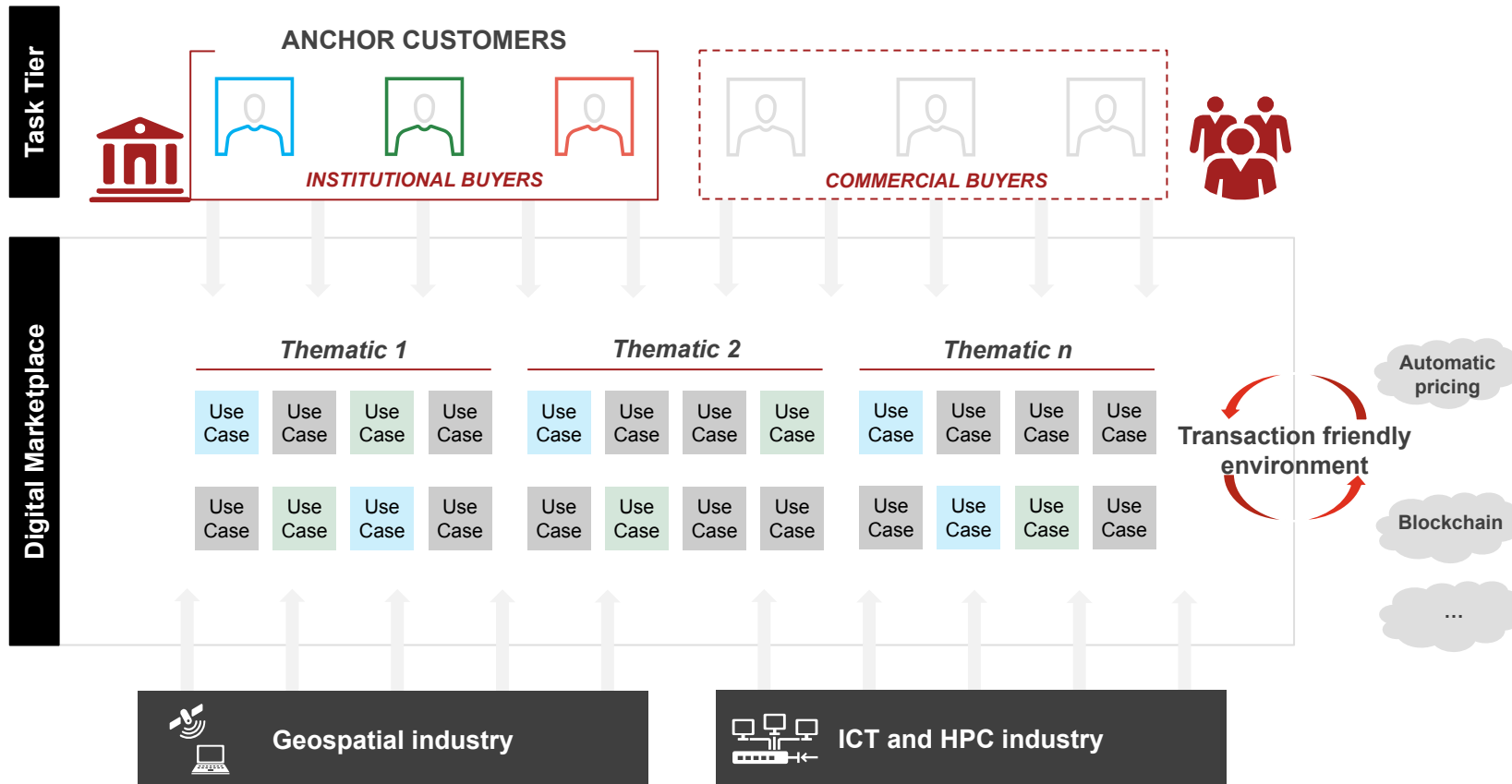**B** **Copernicus Marketplace (CoMaP)**

- Marketplace bridging demand and supply of value-added geospatial applications and services
- Aims to provide to institutional organizations and private sector companies, geospatial services tailored to their operational needs

C **Buyers Group Requirements: Identification of Thematic Services**

- Document with the objective to identify users requirements and define thematic services
- Definition of functional and operative goals, state of the art and minimum requirements of each service

Gap Filling Process

The CoMaP aims at constituting a transaction friendly digital market place, using institutional demand as anchor customers

Copernicus Marketplace

SUMMARY

The Copernicus Market Uptake Platform will connect demand and supply of geospatial solutions on **an open and flexible digital marketplace** using **institutional users demand as an anchor customer**. It will support the industry, **especially SMEs**, by developing a market responding to institutional operational needs around specific thematics. Being an anchor customer will allow institutional users to benefit from **cost-effective solutions** designed specifically to respond to their **operational needs**.
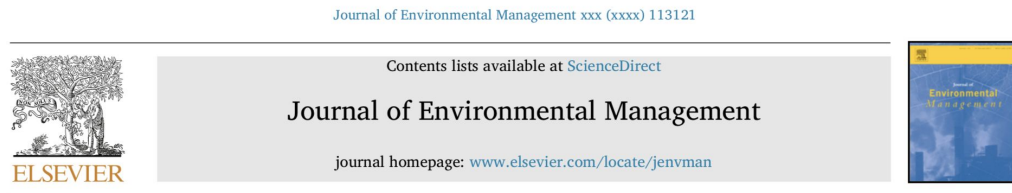
The CoMaP should also offer a **highly flexible** digital environment for **real time management of exchanges and easy transaction**, relying on cutting edge block-chain technologies or automatic pricing algorithms, etc.

The anchor customer would allow the development of the platform and facilitate **entrance/penetration for SMEs** that will be able to **access a market formerly too fragmented**.

The CoMaP shall also attract commercial users that could enter the platform to access specific services provided the digital marketplace.

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Different institutions have formed a **Buyers Group** that sets requirements for specific services, grouped in different **Thematic Services**

User requirements consolidation

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Monitoring environmental and climate goals for European agriculture: User perspectives on the optimization of the Copernicus evolution offer

Emma Schiavon [a,*], Andrea Taramelli [a,b], Antonella Tornato [b], Fabio Pierangeli [c]

[a] Istituto Universitario di Studi Superiori di Pavia (IUSS), Palazzo del Broletto, Piazza della Vittoria 15, 27100, Pavia, Italy
[b] Institute for Environmental Protection and Research (ISPRA), via Vitaliano Brancati 48, 00144, Roma, Italy
[c] Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA), Via Po, 14, 00198, Roma, Italy
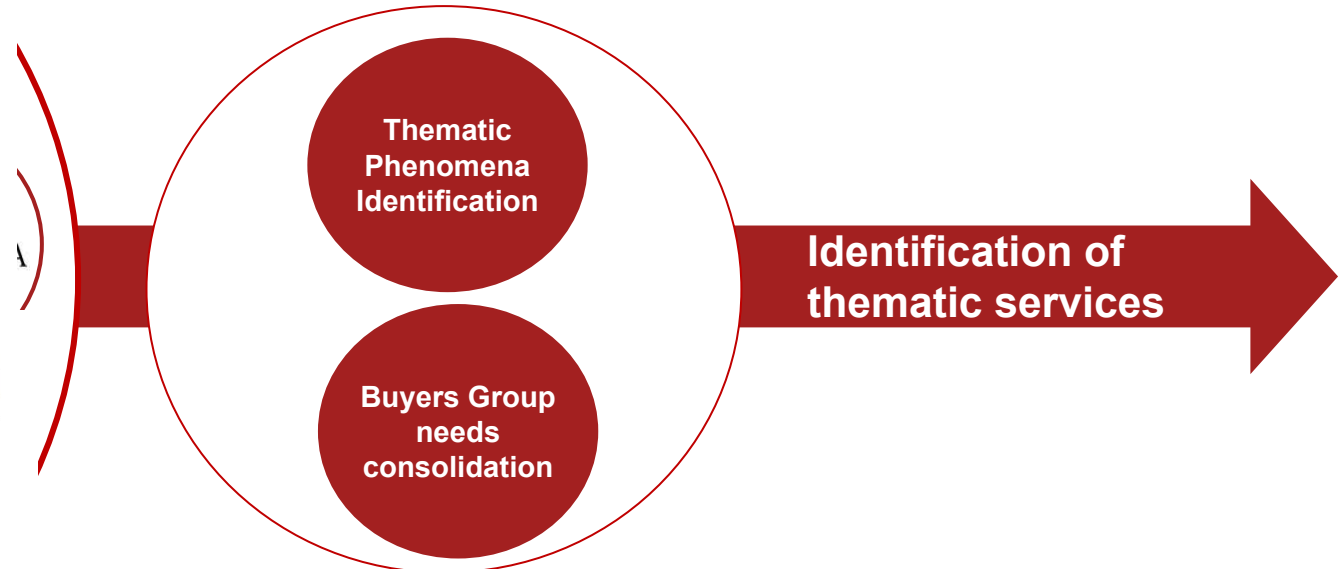
water   MDPI

Article

User Needs Analysis for the Definition of Operational Coastal Services

Serena Geraldini [1,*], Antonello Bruschi [1], Giorgio Bellotti [2] and Andrea Taramelli [1,3]

- Reduction of overlaps
- Reduction of inefficiencies
- Clustering of tools

Thematic Phenomena Identification

Buyers Group needs consolidation

Identification of thematic services

- Possible exploitation of economies of scale
- Simplification of interaction with industry

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Interaction with Buyers Groups resulted in the identification of specific thematic services to be developed

Thematic services identified

Coast and marine monitoring

Tracking and prediction of **waves, coasts geo-morphology, natural habitat** and events affecting the marine environment

Air Quality

Mapping of **pollutants** and **dispersion of ash** and **other materials** due to natural and anthropic events

Ground motion

Monitoring of ground motion due to **earthquakes, volcanic eruptions, landslides**

Monitoring of land cover and use

Mapping of **crops, forests, volcanic areas, soil consumption**

Hydro-meteorology climate service

Monitoring and forecast of greenhouse gases and other **Essential Climate Variables (ECV)**

Water resources

- **Hydromorphological** monitoring
- Modelling of hydrogeological and hydraulic modelling and **floods forecast**

Emergency services

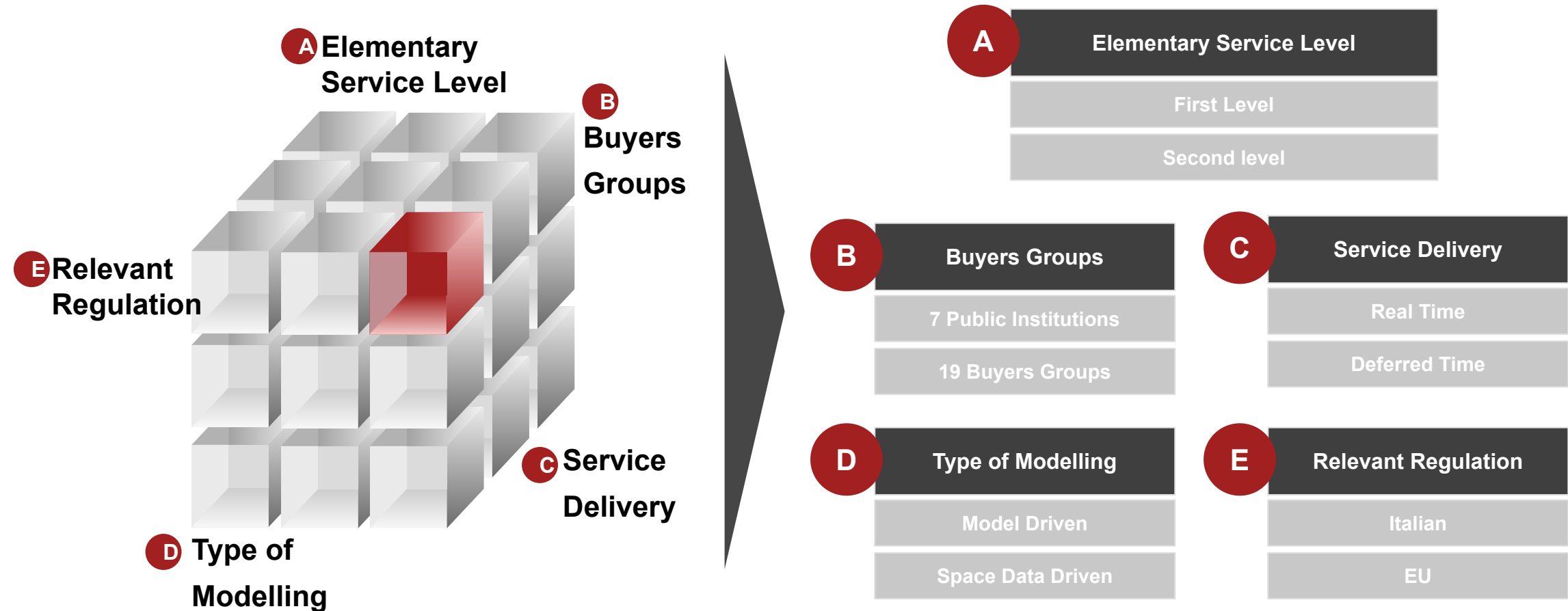Identification of critical events such as **floods, wildfires, earthquakes and eruptions** and mapping of damages

Security services

Maritime surveillance and surveillance of **UE external borders**

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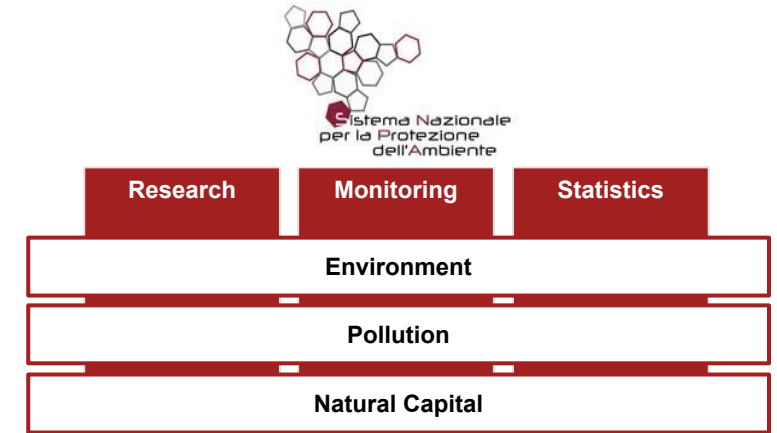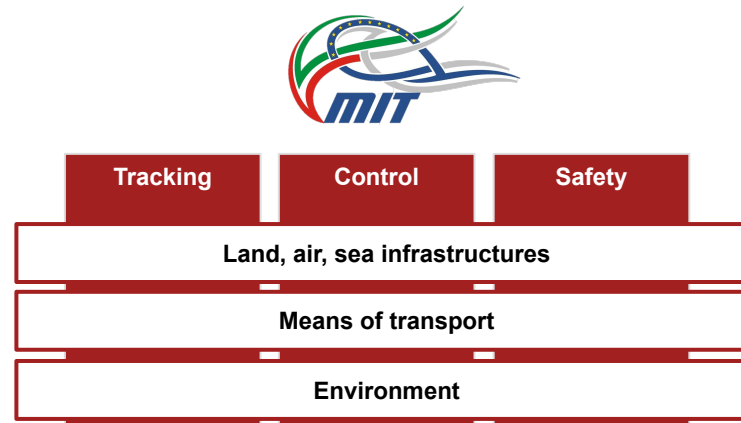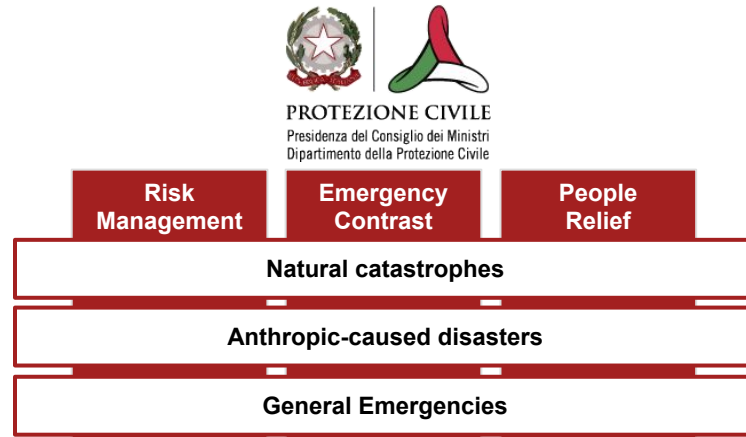# Thematic services identified have been described in a matrix

Thematic Services Matrix

A Elementary Service Level

B Buyers Groups

E Relevant Regulation

C Service Delivery

D Type of Modelling

A Elementary Service Level
- First Level
- Second level

B Buyers Groups
- 7 Public Institutions
- 19 Buyers Groups

C Service Delivery
- Real Time
- Deferred Time

D Type of Modelling
- Model Driven
- Space Data Driven

E Relevant Regulation
- Italian
- EU

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Different organizations define their requirement in accordance with their institutional goals and legislative provision
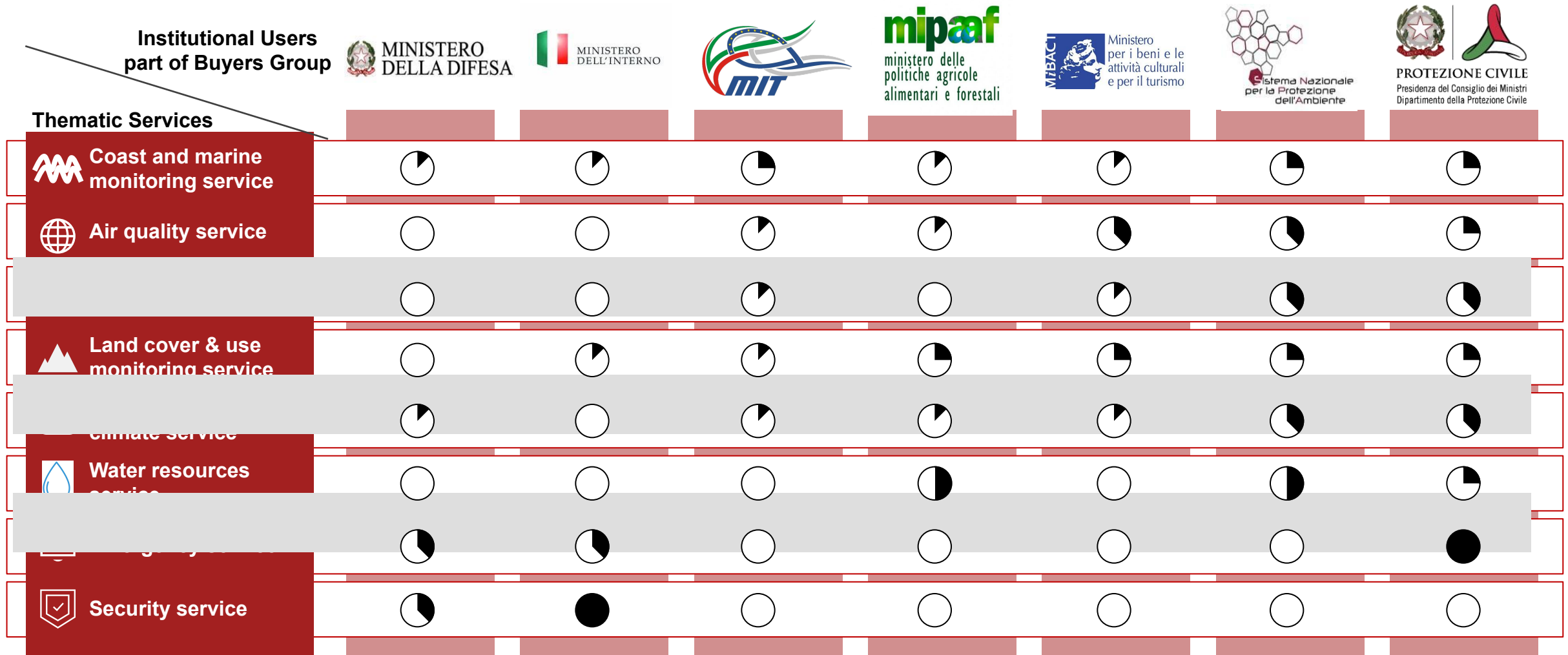
Users Task Tier

Ongoing process

PROTEZIONE CIVILE
Presidenza del Consiglio dei Ministri
Dipartimento della Protezione Civile

Risk Management	Emergency Contrast	People Relief

Natural catastrophes

Anthropic-caused disasters

General Emergencies

MIT

Tracking	Control	Safety

Land, air, sea infrastructures

Means of transport

Environment

Sistema Nazionale per la Protezione dell'Ambiente

Research	Monitoring	Statistics

Environment

Pollution

Natural Capital

mipaaf
ministero delle politiche agricole alimentari e forestali

Safety	Production	Protection

Agriculture

Food

Forests

MiBACT Ministero per i beni e le attività culturali e per il turismo

Preservation	Valorization	Fruition

Archeology

Fine Arts

Landscape and tourism

MINISTERO DELL'INTERNO

Correct functioning	Protection	Enforcement

Public order

Police forces

Civil rights

MINISTERO DELLA DIFESA

Integrity	Safeguard	Defense

Borders

National Territory

Country's vital interests

Main Role   **Perimeter of Activity**

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Different institutional users require multiple services that can help them to achieve their institutional goals

Share of first level services required by each buyers group

Institutional Users part of Buyers Group

Thematic Services

- Coast and marine monitoring service
- Air quality service
- Land cover & use monitoring service
- climate service
- Water resources service
- emergency service
- Security service

◯ ● Share of first level services required by each institution

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Competence Center of research analyzed thematic services, contributing to the identification of existing gaps

Research Institutes – Technical Gap Analysis

Gap Identified / Thematic Services	Area of focus	Main Gaps Identified		
		1 Data Sources	**2 Technology**	**3 Know-how**
Coast and marine monitoring service	✔	Integration of in situ and remote data	3D estimate of bio-geo-chemical variables; extreme waves models	Capability to elaborate radar data and elaborate complex models
Air quality service	✔	Data frequency	Mapping tool of volcanic ashes and desert dust transportation	Capability to exploit highly accurate models for Air Quality forecasts
Ground movement service	✔	Data frequency Integration w/geodetic networks	Automatic systems Interferometric system	
Land cover & use monitoring service	✘			
Hydro-meteorology climate service	✔	Integration of satellite, radar and observatories data	Sensors Advanced models for forecasts	
Water resources service	✘			
Emergency service	✘			
Security service	✘			

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Majority of gaps attaining Air Quality services come from a limited development of technology

Gap Analysis on Air Quality Services

Illustrative

Elementary Service 🌐	Main Gaps Identified	Gaps Area			Technical Gap Filling Proposal
		Data Sources	Technology	Know-how	
A **Monitoring of main atmospheric pollutants**	Impossibility to measure some Climate Essential Variables	◔	◕	○	• Share its **ground atmospheric observatories data** • **Improve its satellite monitoring product** able to **map pollutants** at high definition
B **Air Quality forecast**	High accuracy models	○	◕	◕	• Share the CHIMBO modelling tool able to forecast Air Quality for 72 hours at high resolution
C **Estimate of emissions related to forest wildfires, transportation and industrial plants**	Automatic system to identify and analyze volcanic ashes	◔	○	◕	• Share its optical remote sensing networks to improve the monitoring of volcanic ashes
D **Daily mapping and archive of dust transportation events**	Mapping system for desert dust transportation	○	◕	◕	• Share a fire detection/fire monitoring product based on satellite data

Deferred time 🟠 Real time

The Gap Filling Process contributes to realize an innovative infrastructural system boosting the sector development in Italy

Gap Filling

Mirror Copernicus

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Gap Filling

Copernicus Marketplace (CoMaP)

- Marketplace bridging demand and supply of value-added geospatial applications and services
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Gap Filling

Buyers Group Requirements: Identification of Thematic Services

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Gap filling process definition: different actors contribute to fill the gaps and develop new services, depending on their maturity and assets

Actors contribution to programme gap filling process

Conceptual

Data Sources	Buyers Groups	CNR, Ispra ASI & Research	Industry
Satellite data	○	◑	◑
In situ data	◔	◑	◔
Social media data	◔	○	◕
Technology			
Algorithms and models	○	◑	◑
Technological Infrastructure	○	◑	◑
HPC/Networking	○	◑	◑
Blockchain	○	◔	◕
Know-how			
System Integration	○	○	●
Big Data & Analytics	◔	◔	◑
Operational expertise	◔	○	◕

Legend: Low Contribution ○   High Contribution ●

Further co-operation among different actors includes

- Co-development of end-user products and solutions
- Talents hiring
- Contribution in kind

1 Data Sources

Databases and access keys

2 Technology

Hardware and software assets

3 Know-how

People and organization capabilities

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Assembly and Re-assembly (Building Block) of institutional user case components (data, models, etc.) will increase market uptake

CoMaP Development Phase 1

Actors	First Phase: R&D, Prototyping, Use cases analysis	First Phase: Proof of concepts	First Phase: Pre-operational testing
Groups	Definition of use case	Approval of proof of concept	Approval of CoMaP Design
Research Institutes	Use case enrichment by ERS	Verification of proof of concept	Verification of CoMaP Design
Industry	Add of technical specifications	Creation of a proof of concept	CoMaP Design

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Air Quality Theme: Building Block

USERS / CUSTOMERS

- MIPAAFT, MIT, MATTM
- Regional & Local Authorities
- Civil Protection Air Traffic authorities
- Private Service providers

PRODUCTS

- Regional AQ forecasts
- Local AQ forecasts
- Anthropogenic/natural events forecasts

- Air quality indexes and indicators
- Regulatory compliance
- Archives

- Historical trends
- Policy products

COMAP INFRA-STRUCTURE & HPC

- Atmosphere Composition Forecasts (modeling)
- Air Quality Data Store
- Atmosphere Composition Re-Analysis
- High resolution forecasts (modelling)

DATASETS

- Air Quality Ground Stations, In-situ data
- Citizens air quality Big Data
- Private provider proprietary data
- **DIAS**
  - Satellite data (S3, S5P, S4, S5)
  - Copernicus CAMS products
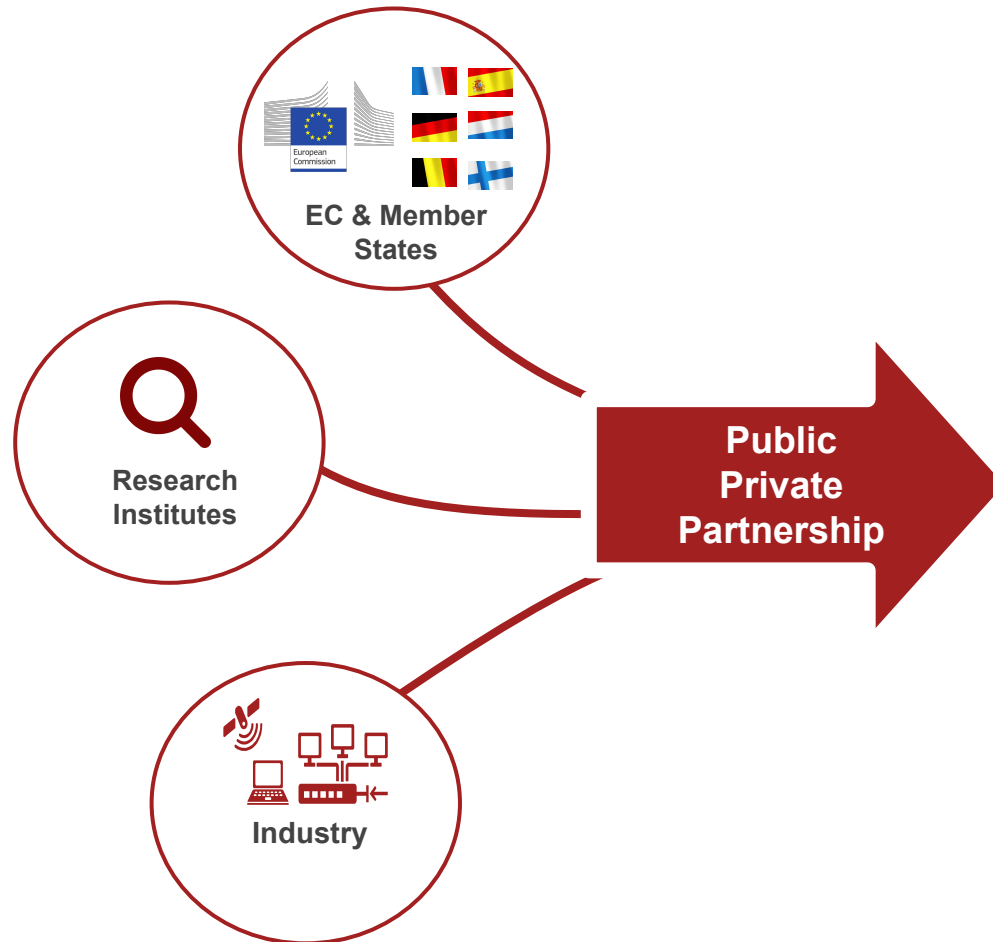
CoMaP will be realized as a result of Public Private Partnership (PPP), exploiting institutional demand as an anchor tenancy

CoMaP Development Phase 2

Thank you