BONSAPPS

AI-as-a Service for the Deep Edge

AI Days – HES-SO

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BONSAPPS
AI-as-a-Service for the Deep Edge

Summary

BonsAPPs aims at developing a fully functional (TRL-8), **scalable** AI-as-a-Service layer (**AI-aaS**) that will interoperate with the **AI-On-Demand Platform** as an external service. The service layer enhances an existing AI platform (Bonseyes AI Marketplace - **BMP**) to cover experimentation, benchmarking, deployment and secure licensing of AI solutions at the Deep Edge.

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AI-as-a-Service for the Deep Edge

BonsAPPs Consortium

Hes·so
Haute Ecole Spécialisée de Suisse occidentale

BCA Bonseyes Community Association

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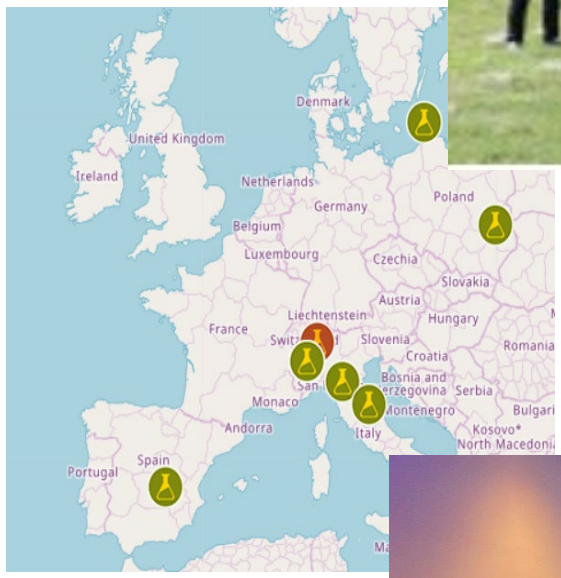

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Embracing AI is challenging

- Mismatch between what AI scientists propo[illegible] end user needs (***#lack of user-centered AI research***)
- End users fail to put their nee[illegible]ns (***#lack of basic AI capabilities by end users***)
- AI Talents struggle to [illegible]***d business models***)
- The majority of AI tooli[illegible]ct-agnostic (***#vendor lock-in***)
- Industrial security (data [illegible] AI Solutions (***#secure computing and #data p***
- Integration of AI is a hig[illegible] SMEs (***#costly investments and #limited scalability***)
- Impact potential of AI experim[illegible]nited by the low proportion of tech-based companies within t[illegible]***iders of verticalized AI in low tech sectors***)

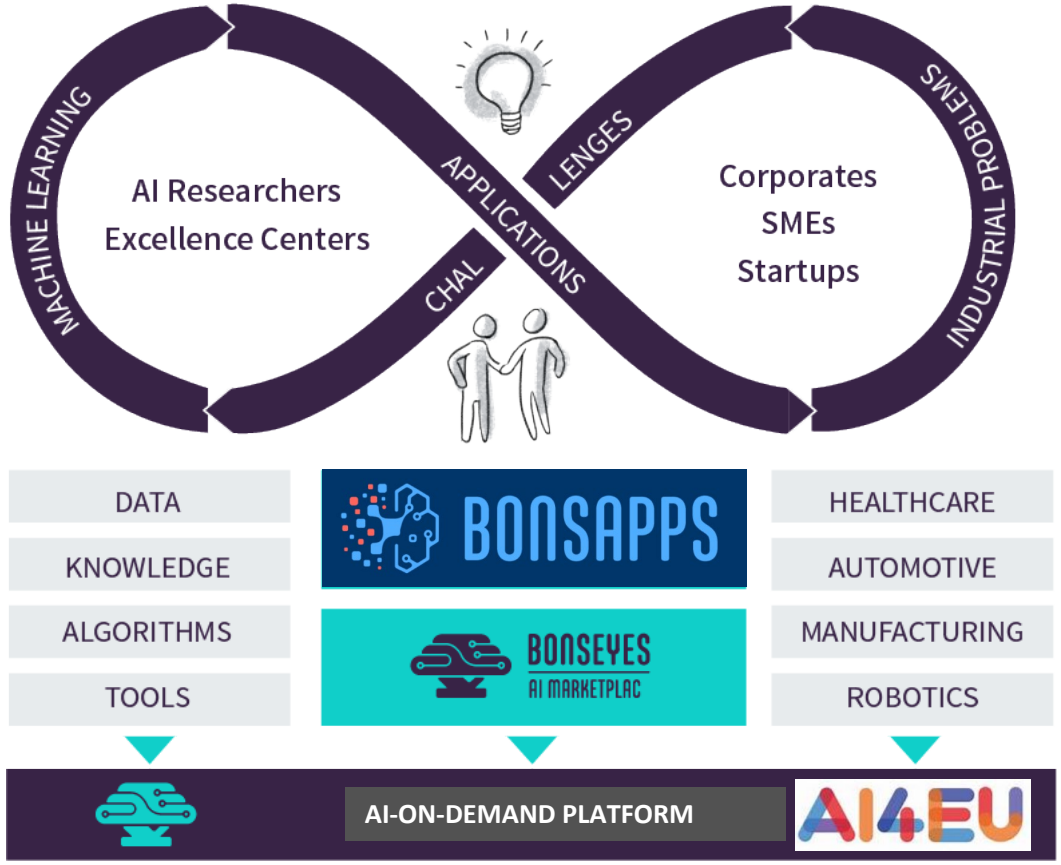
BonsAPPs
Vendor-agnostic, modular Edge@AI services helping join up Research and Industry

The Context: Europe AI Strategy

- Bonseyes emanates from an EC-funded project (H2020 2018-20 Grant agreement, 8.5m Euros)
- BonsAPPs is the logical continuation of this effort and is also an EC-funded project
  (H2020 2020-22 Grant agreement, 5m euros)
- Both contribute a broader initiative to build the European AI-on-Demand platform, with total cumulative investment of >60m Euros

Bonseyes AI Marketplace

AI-as-a-Service for the Deep Edge



A Marketplace With A Service Layer for the Deep Edge

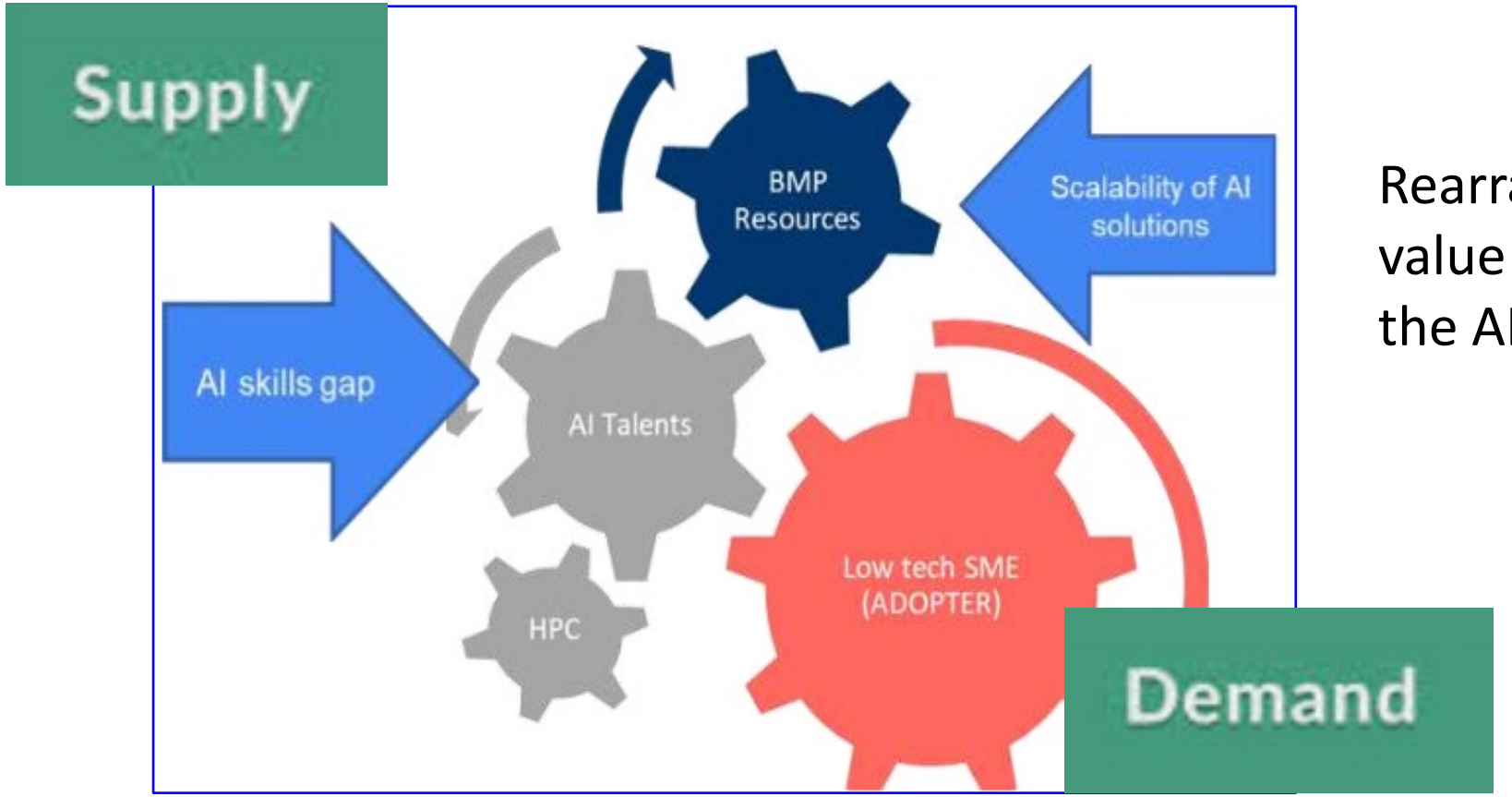
Originating from EU H2020 project (2018-2020), Bonseyes is a secure, distributed marketplace that offers a range of **vendor-agnostic**, **modular services (BonsAPPs):**

- ✓ **Experimentation**
- ✓ **Model compression and optimization**
- ✓ **Benchmarking**
- ✓ **Deployment on hardware**
- ✓ **Security & licensing**

Bonseyes AI Marketplace increases AI usage by enterprises and SMEs which lacks internal innovation capabilities by providing tools to build **end-to-end, containerized, ready-to-integrate and re-usable solutions**

Building A Peer-to-Peer Platform

Bringing Together On A Platform AI Talents, AI Resources and SMEs



Rearrange & distribute value capture along the AI supply chain !

What Are The Services

Modular Services For SMEs On An Automated Delivery

BonsAPPs Modular services for SMEs

BonsAPPs does this by offering a series of modular services—such as experimentation, model compression, optimisation, benchmarking, and deployment on hardware and security—that will increase AI usage among enterprises and SMEs which currently lack internal innovation capabilities.

EXPERIMENTATION
Challenge Definition
AI Asset Deployment
Infrastructure Sandbox

DATA
Data Collection
Data Annotation
Dataset Creation

BENCHMARKING
Definition and Metrics
SoA Analysis
Resource Analysis

OPTIMIZATION
Model Compression
Model Pruning
Model Quantization

DEPLOYMENT
Interface Definition
Algorithm Development
Platform Configuration

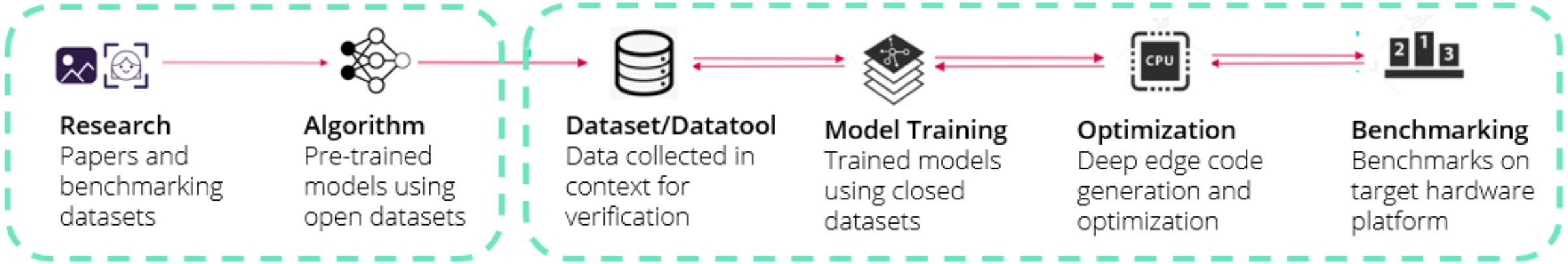
SECURITY
Adversarial Robustness
Model Verification
Model Explainability

BonsAPPs Solution

Automated and standardized workflows for lower production cost of AI Apps

Experimentation
Open and public deep learning research

Industrialization
State-of-the-art model training, compression, and deployment



Research
Papers and benchmarking datasets

Algorithm
Pre-trained models using open datasets

Dataset/Datatool
Data collected in context for verification

Model Training
Trained models using closed datasets

Optimization
Deep edge code generation and optimization

Benchmarking
Benchmarks on target hardware platform

AI Research | **AI Asset** | **AI App**

AI4EU

GitHub

+ Open paper and code
+ Open benchmark
+ Pre-trained model

+ Verification data
+ Benchmark code
+ Target KPIs

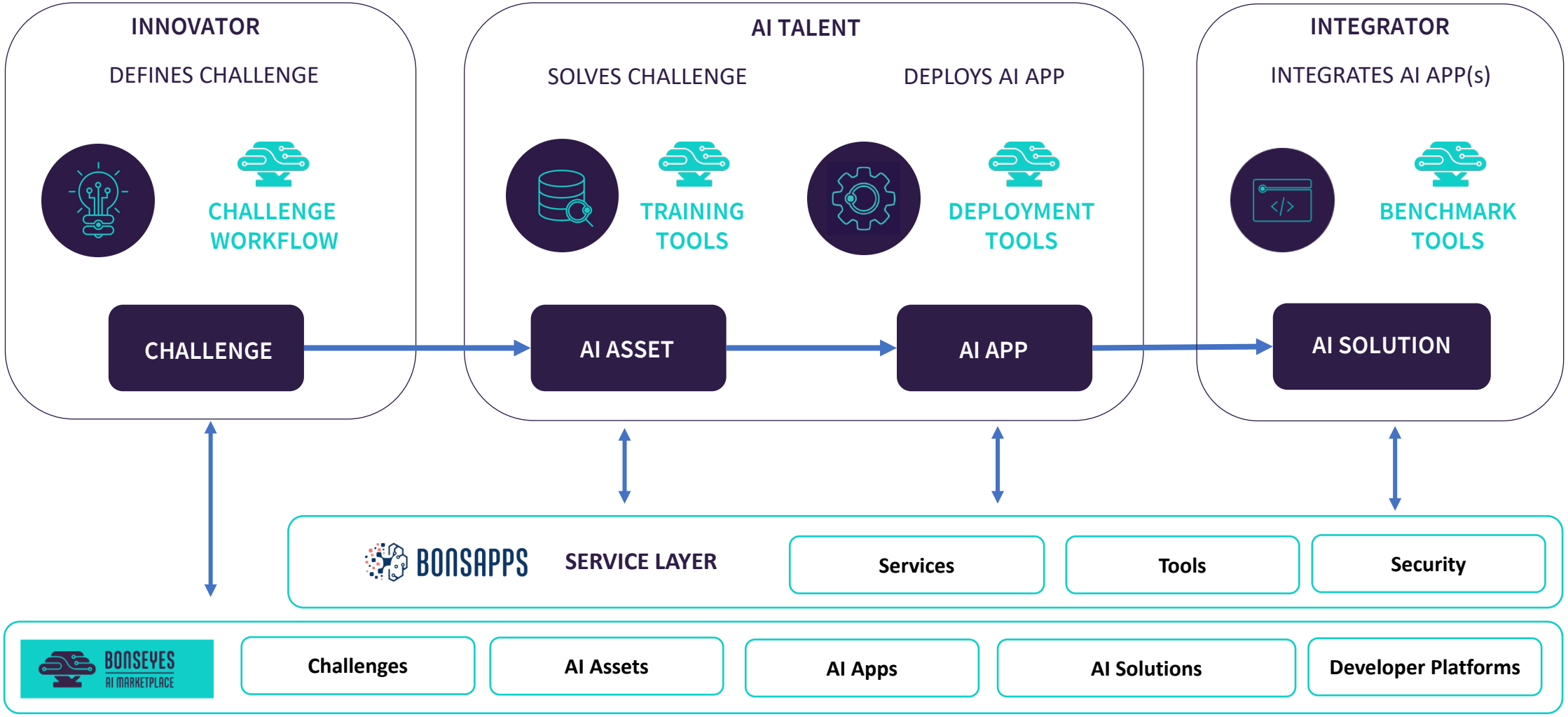
+ Trained model
+ Compressed model
+ Benchmarks

LPDNN
DEEP EDGE AI

+ Code generation
+ API/SDK
+ CPU/GPU/NPU

BonsAPPs - Unique Value Proposition

Collaborative Development ¦ AI Value Chain



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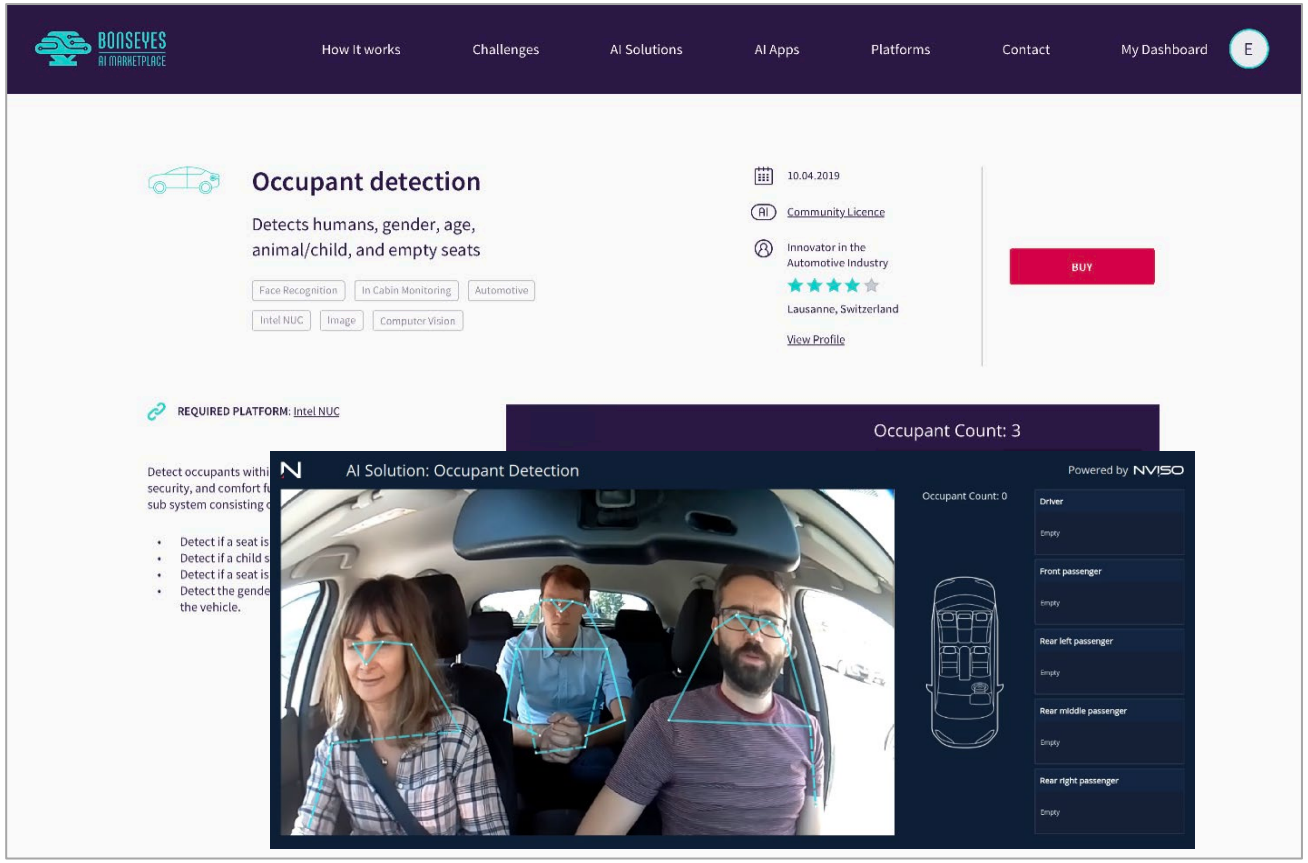
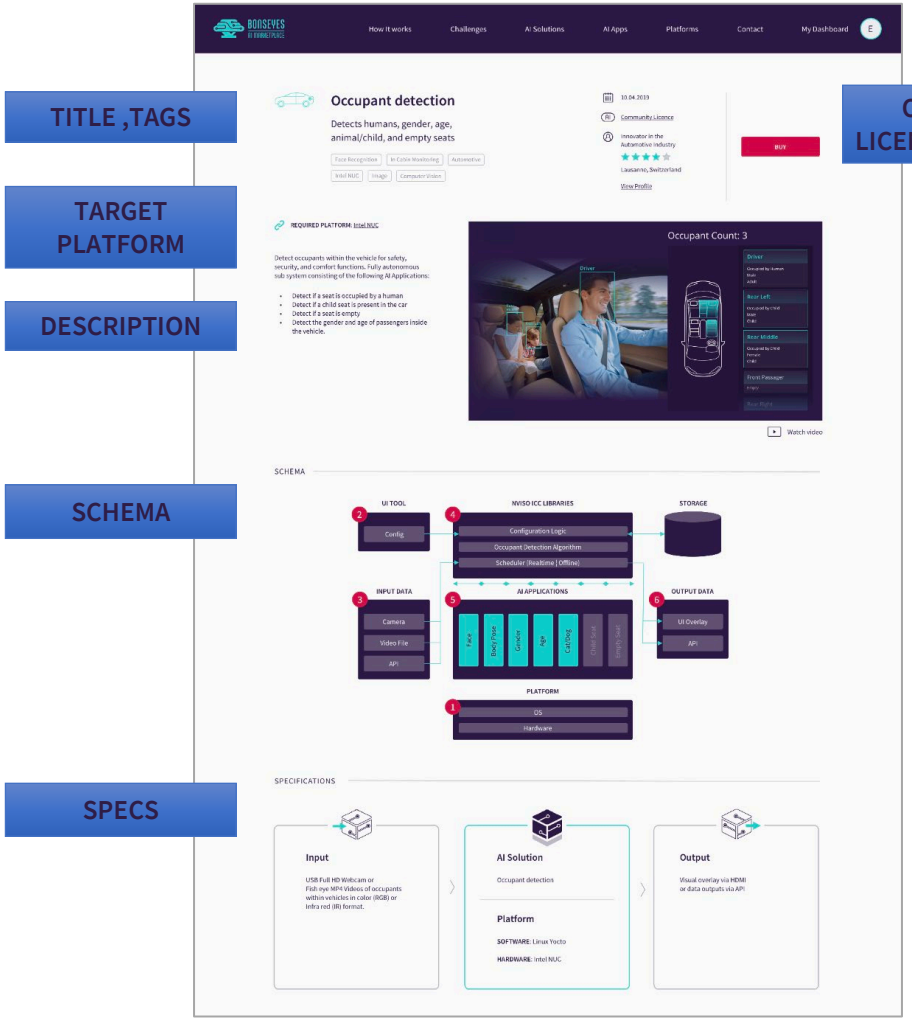
Enabling Startups, SMEs, and Industry with AI Solutions

Automotive Example





BonsAPPs – **Validation with Community** (FSTP)

Two Open calls:

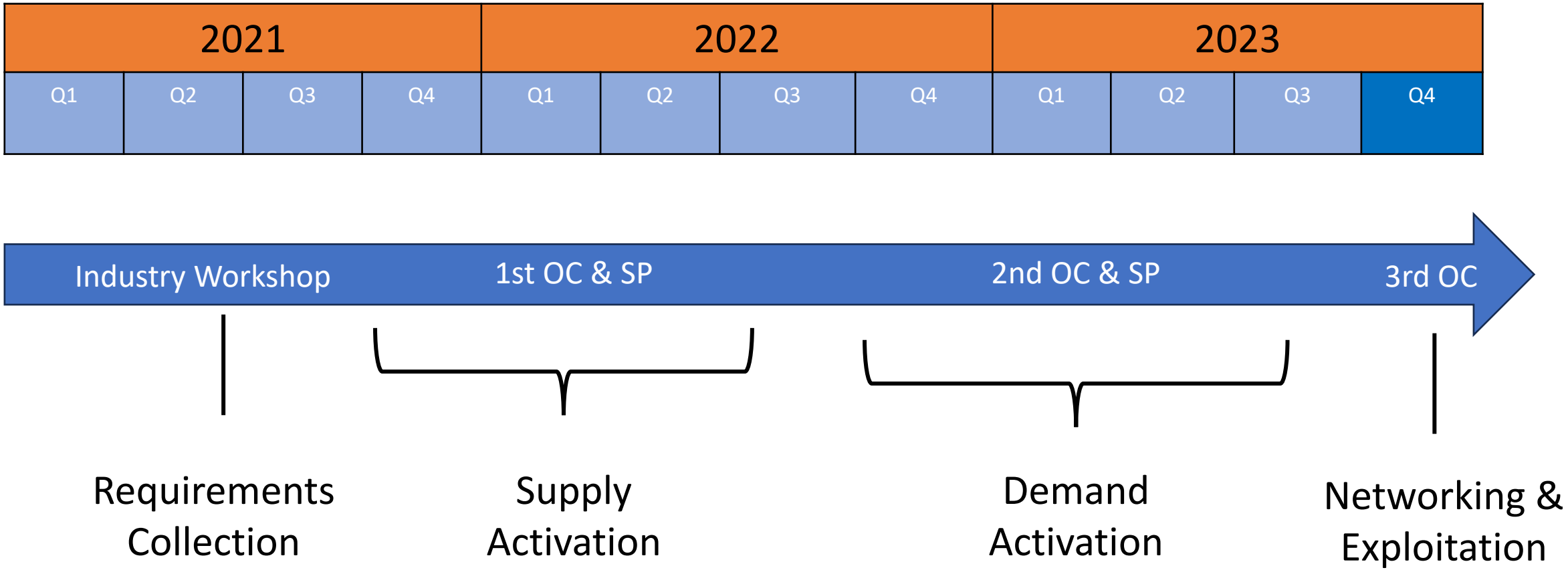
	Use Case Owner	Industry Challenge	AI@Edge Apps & Solutions
Round 1 (supply activation)	AI Talent (AI supplier)	Predefined by end users before Use Case Owner is selected	Developed by Use Case Owner
Round 2 (demand activation)	Non-tech SME (end user)	Defined by Use Case Owner with the support of a subcontracted Digital Transformation Agent	Developed by AI Talents contracted by Use Case Owner

- ✓ M12
- ✓ 30 AI talents

- ✓ M24
- ✓ 10 end-users

- ✓ Selection Committee
- ✓ Sub Grant Agreements

BonsAPPs – Timeline



BonsAPPs - OCs Results

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Amazing numbers!

- 20 Industrial AI Challenges on the Edge have been tackled.
- 50 teams have been involved in solving those AI Challenges (2M € Budget).
- Over 60 datasets were analysed and described.
- More than 50 unique structured, containerised and reusable datatools created.
- 20 AI Assets workflows (training to deployment) completed.
- 100+ AI Models have been trained and optimised by AI Talents to solve the AI Challenge.
- 300+ AI Applications have been deployed on various HW platforms with different inference engines.
- Great increase of Bonseyes platform’s maturity and know-how ☺

Exploitation & Sustainability Objectives

From Experimentation to Industrialisation of AI

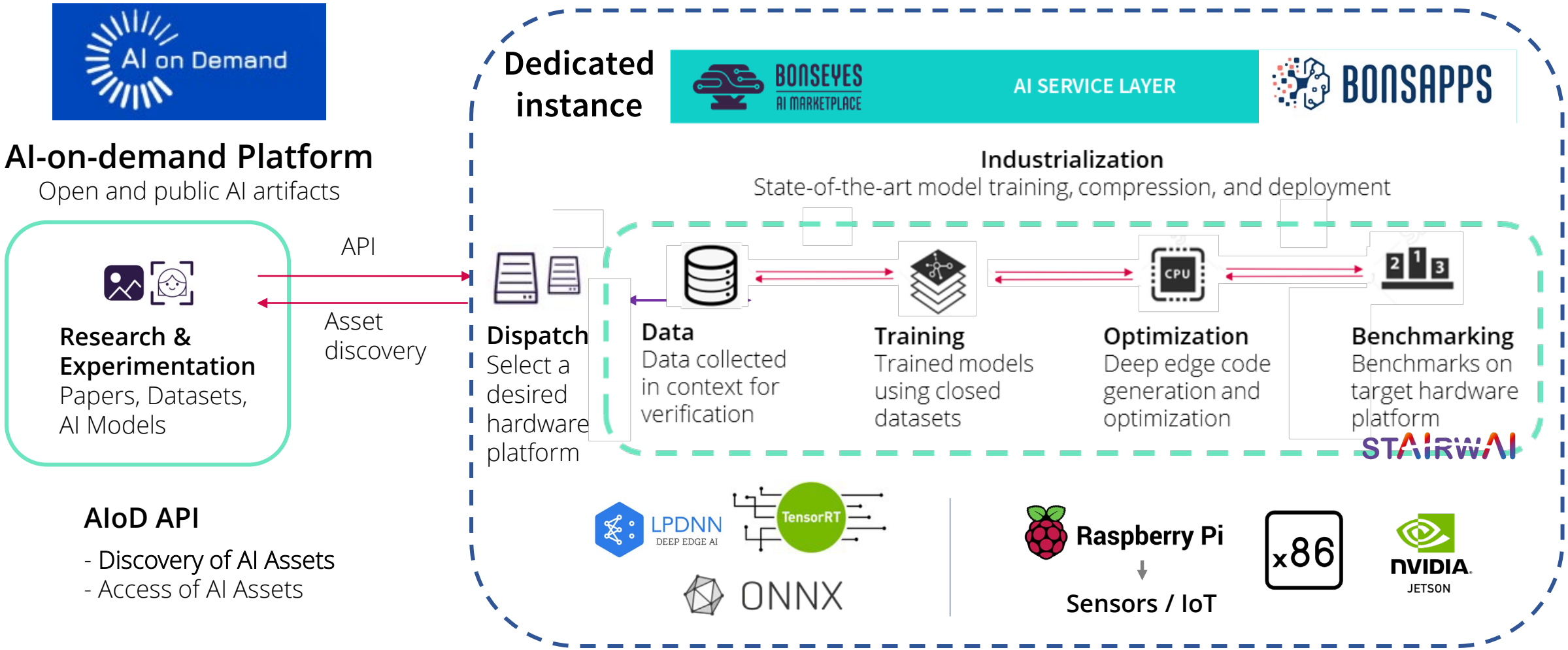
- Making the **BonsAPPs services, tools, as well as its user support framework** available for commercial exploitation by SMEs and enterprises on the existing Bonseyes AI Marketplace
- Developing a ‘go-to-market’ plan for attracting industry into Edge AI by offering value added services and defining a **longer-term commercialization path** where users can get remunerated for their skills and pay for AI solutions
- **Validate the BonsAPPs workflows, tools, services** and business model with the two rounds of Open Calls during the project life, actively involving AI talents and SMEs
- Promote the **efficient re-use of new AI resources** generated by the project (AI Assets, Applications and Solutions) and further results from AI Talents and end users involved in their creation, under a preset licencing framework
- Ensuring **integration and alignment** between the BonsAPPs exploitation model in Bonseyes AI Marketplace (BMP) and the future **AI-on-Demand platform**.

Accessing From AIoD

Monetizing BonsAPPs Services

BonsAPPs AI-as-a-Service Modules

Developing Apps & Measuring model performance on a target hardware platform



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Thank you!

QUESTIONS ?

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