

# Digital Innovation Hubs

*An opportunity for collaboration between Europe and Africa*



**DIGITAL INNOVATION HUBS:  
AN OPPORTUNITY FOR  
COLLABORATION BETWEEN  
EUROPE AND AFRICA**

**FEB 9  
2023**

Online @ 9:00 CET

**CO-ORGANIZED**



## **AGENDA**

**WELCOME and HOUSEKEEPING (10 mins)** - Massimo Privitera (ESN - HUBiquitous)

**SESSION 1: Introduction of the initiatives (40 mins)**

- The HUBiquitous project and its outcomes - Servane Crave (Orange - HUBiquitous)
- The DIH4AI project and its outcomes - David Brunelleschi (Intellera Consulting - DIH4AI)

**SESSION 2: Showcase of DIHs, innovative solutions and ecosystem connectors (70 mins)**

- AI experiments from DIH4AI: Jaime Codagnone & Noemi Luna Carmeno (Intellera Consulting - DIH4AI)
- Experimental Facility Management: Simon Dalmoen (TNO - DIH4AI)
- Smart Solar Box: Markus Duchon (Fortiss - DIH4AI)
- Service Partners Onboarding: Hartwell Ayambiliko (Cloudport - HUBiquitous)
- Presentation of an IoT solution from HUBiquitous: Chinagozi Daniel (IGHUB - HUBiquitous)
- Presentation of Afrilabs: Moataz Helmy (Afrilabs)
- Closing remarks: Massimo Privitera (ESN - HUBiquitous)

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# A quick dive into the Hubiquitous project, Goals & Achievements

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DIH4AI & Hubiquitous co event  
February, 9th 2023

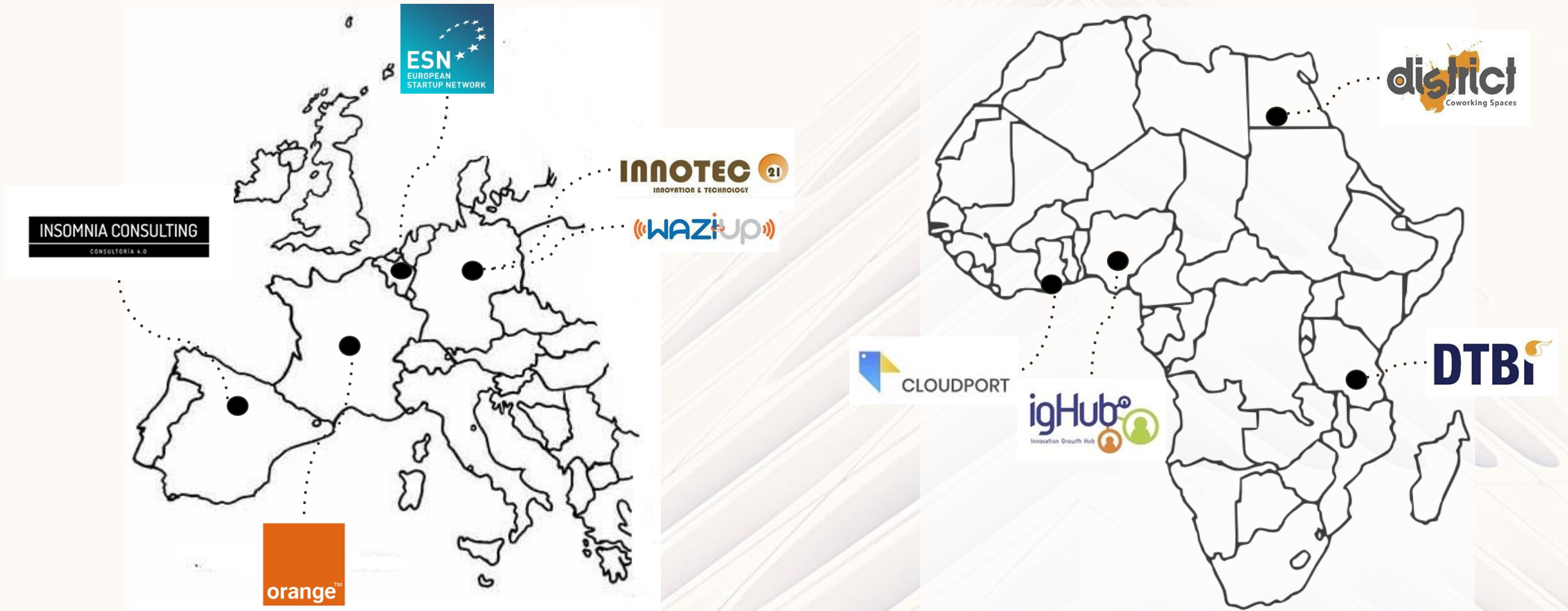


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 101016895



**Servane Fauvet**

# The consortium



# HUBiquitous objectives

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Support IoT & disruptive technologies capacity building in African DIHs to foster the development of services and application



Create a joint Africa-Europe Tech & startup Ecosystem in IoT and disruptive technologies for long-term collaborations and partnerships

# Sustainability & wider accessibility of IoT innovation to African DIHs

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## African DIH needs

- Hands-on skills and competences on disruptive technologies
- Access to development & infrastructure for testing, validation and beta deployment)
- Ready-to-use application and business development kits integrating technology
- Training and business support services.

## Hubiquitous Hubs Capacity Building

- Engaging 25 local/regional DIHs (5 DIHs in each country) in 5 African countries
- Enabling DIHs with new technology services and business models
- Transforming African DIHs to next-generation competence centre through ensuring a wider accessibility and availability of the enablers and programs to local African communities

# HUB ubiquitous Implementation approach

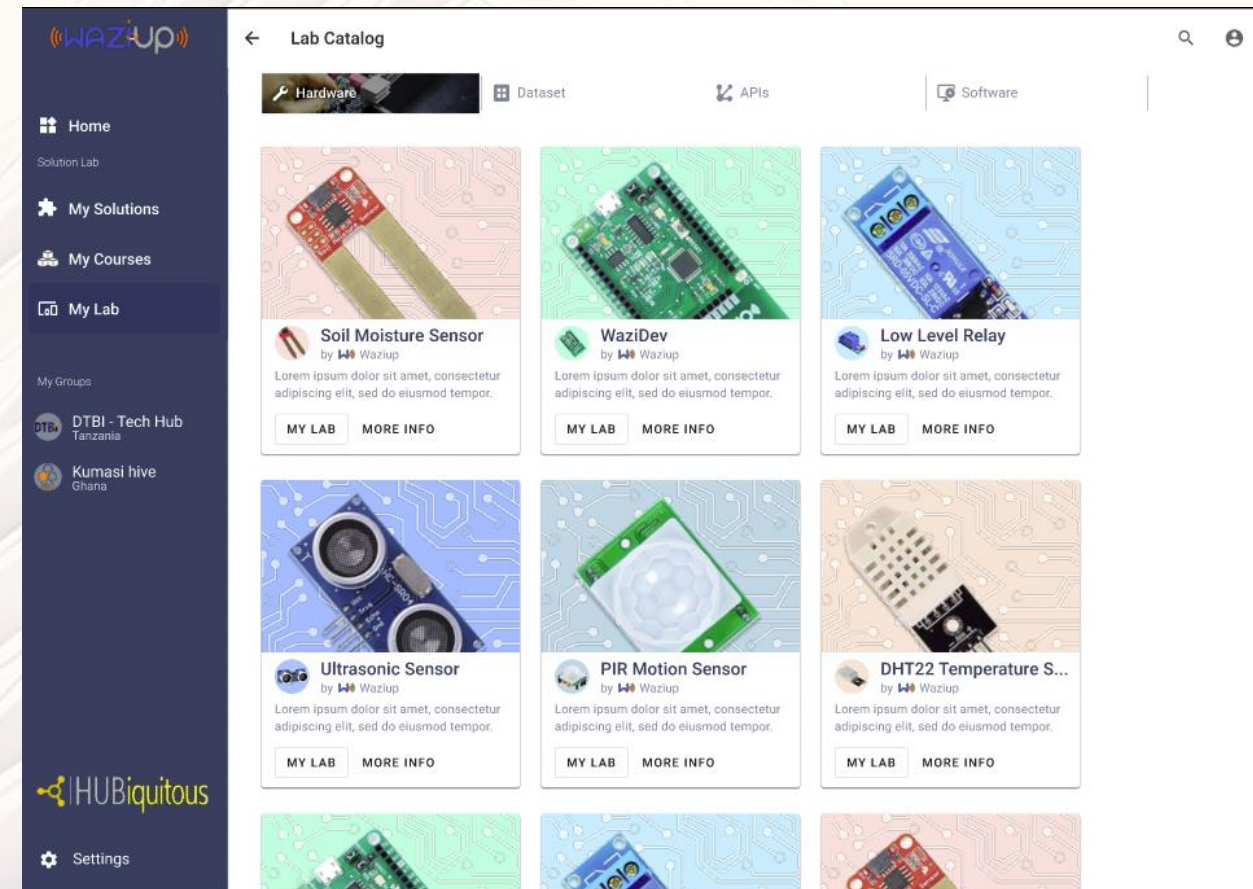


# Solution lab v1.0

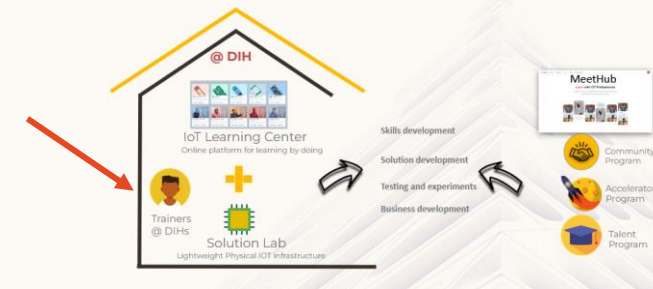
- Version 1.0 of the Solution Lab packaged is developed and deployed
- The Solution Lab package is implemented in My Lab module of the Learning center



The cost of a Solution Lab kit is around 550€



# HUBs Capacity building

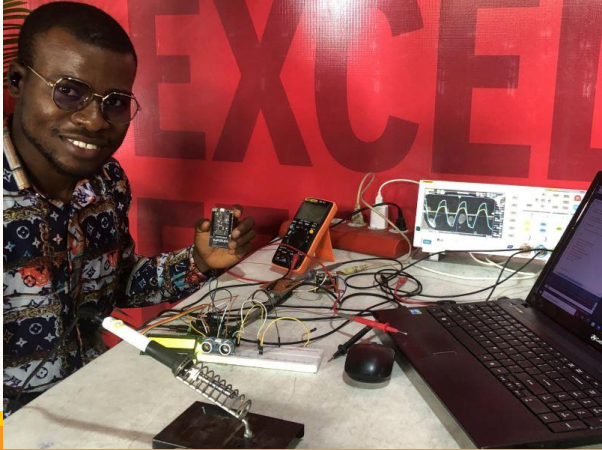


- Prepare partnership agreement with HUBs
- 10 solution lab packages are deployed in African hubs
- EUR 3,500 Voucher to support HUBs Engagement

HUBs capacity building: “Train the Trainers” curriculum and training (16 TTT trained)

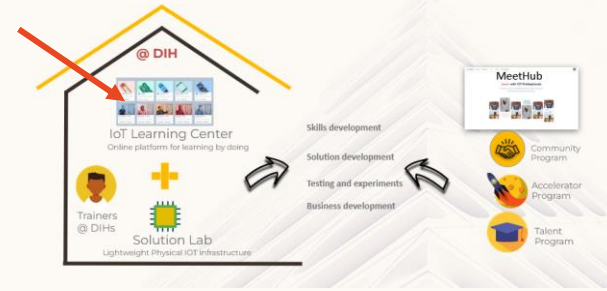


Access to learning center and solution lab physical resources





# IoT learning center



The Learning Center is the digital implementation of the enablers on a single platform (<https://lab.waziup.io>)

- My Lab: catalogue of hardware, software, open sources tools, AI tools, testing infrastructures.
- My Courses: Online course for the tech enthusiasts
- My Solutions: step by step guidelines to develop IoT solutions

DTBI - Tech Hub

Groups / DTBI - Tech Hub / Courses

COURSES RESOURCES SOLUTIONS MEMBERS FILES SETTINGS

8 Modules

- Fundamentals of IoT
- Waziup Ecosystem
- Basic Electronics
- Web and Mobile Apps
- Dev-boards and sensors
- Artificial Intelligence
- Data Analysis
- Edge Computing

6 Courses

- Course 1: Fundamentals of IoT
- Course 2: Intro to basic electronics
- Course 3: Getting started with Arduino
- Course 4: Getting started with Waziup te...
- Course 5: Getting started with ... Draft
- Course 6: Getting started with Waziup te...

+ ADD COURSE

DTBI - Tech Hub

Groups / DTBI - Tech Hub / Members

COURSES RESOURCES SOLUTIONS MEMBERS FILES SETTINGS

27 Members

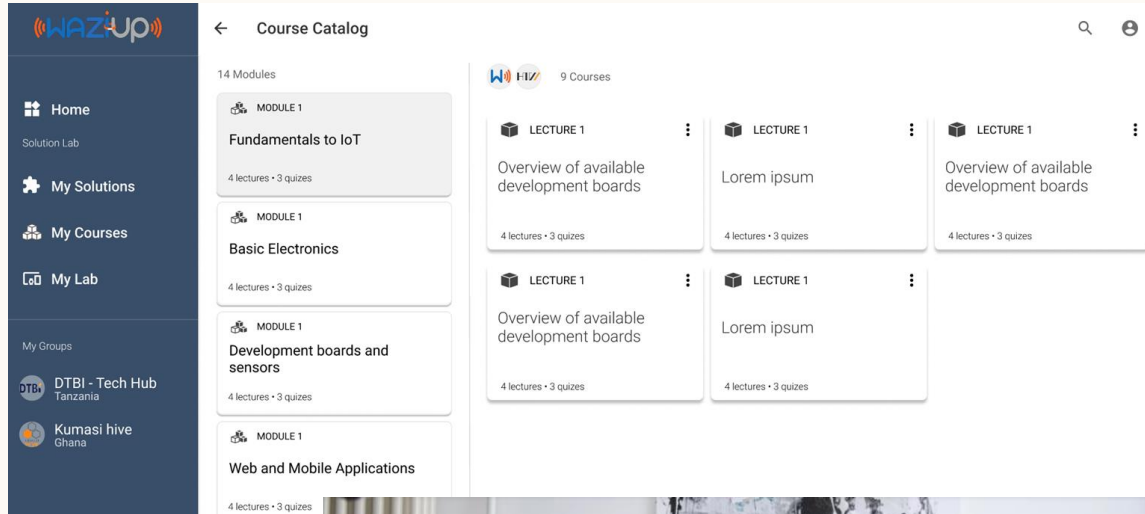
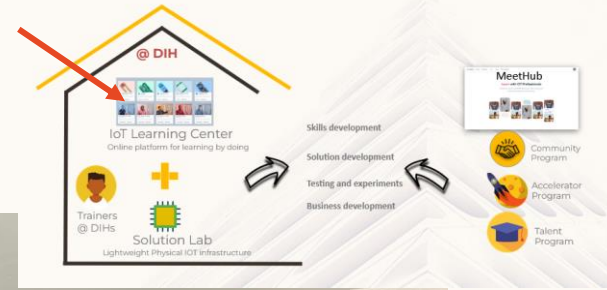
+ INVITE

User	Email	Courses Enrolled / Progress	Tests Taken / Passed	Roles
John Dorian	john.dorian@sacred-heart.com	4 / 100%	1 / 0 (0%)	Trainer
Perry Cox	perry.cox@sacred-heart.com	2 / 80%	2 / 1 (50%)	Trainer Editor
Elliot Reid	elliott.reid@sacred-heart.com	8 / 45%	8 / 7 (87.5%)	
Christopher Turk	turk.turkelton@sacred-heart.com	3 / 27%	0 / 0 (0%)	
Bob Kelso	bob.kelso@sacred-heart.com	0 / 0%	12 / 8 (75%)	Admin
Janitor	janitor@sacred-heart.com	8 / 60%	8 / 6 (75%)	Editor
John Dorian	john.dorian@sacred-heart.com	4 / 100%	1 / 0 (0%)	
Perry Cox	perry.cox@sacred-heart.com	2 / 80%	2 / 1 (50%)	
Elliot Reid	elliott.reid@sacred-heart.com	8 / 45%	8 / 7 (87.5%)	
Christopher Turk	turk.turkelton@sacred-heart.com	3 / 27%	0 / 0 (0%)	
Bob Kelso	bob.kelso@sacred-heart.com	0 / 0%	12 / 8 (75%)	

Click here to add more

# High quality online video courses

24 videos created and published.



# Programs



## Talent Program



-  Courses & mentoring
-  Employment opportunities
-  Skills on disruptive technologies (e.g., IoT, Big data and AI)
-  Practical training (e.g., prototyping and developing)

## Accelerator Program



-  Improving the innovation for entrepreneurs and startups
-  Supporting joint African-EU projects and ventures
-  Increasing investment opportunities in African startups

## Community Program



-  Building Africa-Europe Innovation Communities
-  Engaging European and African innovation ecosystem stakeholders

# Talent program call 1



## Topics

The Ubiquitous IoT Training Course will cover the following topics:

- 🔧 Fundamentals of IoT,
- 🔧 Introduction to **Basic Electronics**,
- 🔧 Development **Boards and Sensors**,
- 🔧 Getting started with **Waziup technologies**,
- 🔧 IoT **Cloud platforms**.

## Requirements

The Ubiquitous IoT Training Course will lay down the following requirements for the course:

- 🔧 An educational background in **Computer Science**, or similar engineering field, is preferable
- 🔧 Basic knowledge in **programming**
- 🔧 Knowledge in **basic electronics**

## Objectives

The Ubiquitous IoT Training Course pursues the following objectives:

- 🔧 Provide **advanced IoT knowledge**,
- 🔧 Ensure mastering in the **Waziup Technology Ecosystem**,
- 🔧 Increase **prototyping capabilities**,
- 🔧 Enable the ability to use the **Solution Lab** and the **Application Business Box**
- 🔧 Enhance **employability** within the ecosystem

- First Call for application for talent program
- A total of **363** applications received and **154** applications selected
- Module specific webinar organized
- Talents were also provided the access to online courses

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
<b>Hardware &amp; device programming</b>	<b>Gateway &amp; radio communications</b>	<b>IoT Platforms and Web &amp; Mobile App</b>	<b>Data Analysis &amp; Visualisation and AI</b>	<b>Casing &amp; Deployment</b>
<ul style="list-style-type: none"> <li>• <b>Fundamentals of IoT</b> <ul style="list-style-type: none"> <li>- Introduction to IoT</li> <li>- Architecture and communication protocols</li> </ul> </li> <li>• <b>Electronics</b> <ul style="list-style-type: none"> <li>- Introduction to Basic Electronics</li> </ul> </li> <li>• <b>Development Boards and Sensors</b> <ul style="list-style-type: none"> <li>- Overview of available development boards</li> <li>- Getting started with the Arduino</li> <li>- Wiring and programming sensors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Gateway &amp; radio communications</b> <ul style="list-style-type: none"> <li>- Wireless communication essentials</li> <li>- Wifi &amp; Bluetooth on IoT devices</li> <li>- Long range radio communications (5G, LoRa, NB-IoT)</li> <li>- Dense Deployment of IoT Networks</li> </ul> </li> <li>• <b>IoT Gateways</b> <ul style="list-style-type: none"> <li>- WaziGate configuration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>IoT Cloud Platforms</b> <ul style="list-style-type: none"> <li>- Cloud Platforms 101</li> <li>- Advanced Cloud Platforms</li> </ul> </li> <li>• <b>Web &amp; Mobile Applications</b> <ul style="list-style-type: none"> <li>- Using APIs (HTTP + MQTT)</li> <li>- Database and IoT data management</li> <li>- Cloud hosting</li> <li>- Simple IoT web apps</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Data Analysis &amp; Visualization</b> <ul style="list-style-type: none"> <li>- Data visualisation using existing platforms</li> <li>- Data analysis using python</li> </ul> </li> <li>• <b>Artificial Intelligence</b> <ul style="list-style-type: none"> <li>- Basics of AI</li> <li>- Computer Vision</li> <li>- Pattern prediction</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Casing &amp; Deployment</b> <ul style="list-style-type: none"> <li>- Designing cases for devices</li> <li>- Deployment and maintenance</li> <li>- Testing and Evaluation</li> </ul> </li> </ul>
<b>Duration</b> 4 weeks	<b>Duration</b> 2 weeks	<b>Duration</b> 4 weeks	<b>Duration</b> 2 weeks	<b>Duration</b> 2 weeks

# CERTIFICATE

*This is to certify that*

## Dominic John Nambole

has successfully completed the

# HUBiquitous IoT Course

an IoT training course delivered as part of the HUBiquitous Talent Program

**Elke Göring**  
Project Coordinator HUBiquitous

**September 16, 2022**  
DATE OF COMPLETION

Agreement No.101016895  
Innovation programme Under Grant From The Horizon 2020 Research And This Project Has Received Funding

# Talent program- bootcamp and hackathon

**Bongo TECH** Research Labs  
**DTBI**

**HUBiquitous**  
HUBiquitous Talent program  
Presents  
**3 Days BOOTCAMP + HACKATHON**

LET'S TALK ABOUT INTERNET OF THINGS  
**CODE - DESIGN - BUILD**  
14-16 SEPT 9 AM - 4 PM EAT  
BUNI INNOVATION HUB, SAYANSI COSTECH

CONTACT :  
+255 718 395 627  
bunihub@gmail.com | admin@teknohama.or.tz  
www.bunihub.or.tz | www.teknohama.or.tz

This project has received funding from the Horizon 2020 research and innovation programme under grant agreement No. 101016895

**HUBIQUITOUS TALENT PROGRAM PRESENTS HER**

## BOOTCAMP & HACKATHON

<p>Host</p> <p><b>Daniel Chinagozi</b> The Founder &amp; CEO of Innovations, Smart City, Business Developer and Renewable Energy Expert.</p>	<p>Judge/Mentor</p> <p><b>Tochukwu Clinton</b> The CEO &amp; Founder of Global Innovation Center, an incubator &amp; start-up accelerator.</p>	<p>Guest Speaker</p> <p><b>Prince Banini</b> The Founder &amp; CEO of Program, Operations, Community, and Business Development &amp; Growth of Global products.</p> <p>Topic: Wazup Technology.</p>	<p>Guest Speaker</p> <p><b>Ability Essien</b> The CEO and Founder of iot4.</p> <p>Topic: Business in IoT.</p>
<p>Guest Speaker</p> <p><b>Salama Jatau</b> An Android and Embedded System Developer.</p> <p>Topic: Design Thinking</p>	<p>Moderator I</p> <p><b>Martins Obiefule</b> An Embedded Systems Engineer &amp; Network Support Administrator.</p>	<p>Moderator II</p> <p><b>Magnus Emenuga</b> The Founder &amp; Magnus's Technical Co-Owner, an Embedded System Developer &amp; Product Designer.</p> <p>Topic: Arduino Programming and Sensors.</p>	<p>Time: <b>9AM DAILY</b></p>

**INNOVATION GROWTH HUB** | No. 10 Calabar Street, Opposite Abia State Polytechnic, Aba, Abia State. | 20th - 22nd Bootcamp & 23rd - 25th Hackathon | Sept. 2022

**HUBiquitous** | This project has received funding from the Horizon 2020 research and innovation Programme under grant agreement No. 101016895 | **ighub** | Hosting Partner



# Talent program call 2



- **Ghana** (Icode Ghana, Foundry Camp)
- **Nigeria** (Colab Kaduna, Start Innovation Hub)
- **Tanzania** (Suza, Sido Arusha)
- **Kenya** ( ilabAfrica, Sote Hub)
- **Egypt**

## 5 countries

## Call for applications

20 Feb 2023

10 March 2023

**Stay tuned!!!**

# HUBiBiquitous accelerator program

## - call 1

The Open Call successfully closed with 43 applications, 26 being eligible.



FIRST OPEN CALL  
**THE FIRST AFRICA-EUROPE ACCELERATOR PROGRAMME IS NOW HERE!**

The HubiBiquitous 1st Open Call will select the 20 most promising, sustainable and innovative ideas using IoT technology in five different industries: agrifood, smart cities, health, industry 4.0 and green economy.



## Acceleration of 16 Startups

Improving the innovation for entrepreneurs and startups  
 Supporting joint Africa-EU projects and ventures  
 Increasing investment opportunities in African startups



<https://www.opportunitiesforafricans.com> > Traducir esta página  
**HubiBiquitous Africa-Europe Accelerator Programme 2022 ...**  
 21 jun 2022 — A platform for IoT stakeholders to collaborate in Europe and Africa. It encourages networking and learning between professionals, enthusiasts, ...

<https://www2.fundsmogros.org> > h... > Traducir esta página  
**HubiBiquitous launches Africa-Europe Accelerator Programme**  
 30 jun 2022 — HubiBiquitous is a co-funded project from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016895.

<https://vc4a.com> > the-hubiBiquitous... > Traducir esta página  
**The HUBiBiquitous – H2020 - VC4A**  
 10 jun 2022 — HubiBiquitous is an innovation action aiming at creating a joint Africa-Europe startup & innovation ecosystem for long-term collaborations and ...

<https://startupxs.com> > acelerator > Traducir esta página  
**HubiBiquitous Africa-Europe Accelerator Program - StartupXs**  
 HubiBiquitous Africa-Europe Accelerator Program will select the 20 most promising, sustainable, and innovative ideas using IoT technology.

<https://aedibnet.eu> > about-us > ass... > Traducir esta página  
**Associated Initiatives and projects - AEDIB|NET**  
 HUBiBiquitous aims at empowering innovation and sustainable technological solutions in Africa through the creation of a joint Africa-Europe Startup ...

<https://find-and-update-company-information.service.gov.uk> > Traducir esta página  
**HUBIQUITOUS LTD** - Companies House - GOV.UK

**Open Call for Startups**  
**INFO-SESSION**

**Tuesday, 5th of July**

	<b>11:00h</b>
	<b>12:00h</b>
	<b>13:00h</b>
	<b>14:00h</b>

**Discover the Open Call for the first IoT Europe-Africa Accelerator Program**  
**And be one of the selected applicants!!!**

**Requirements - Application Tips - Best practices - Examples - Q&A**

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT AGREEMENT NO 101016895

# Accelerator program - 16 startups' projects selected

## **IDEA8**

Democratizing the best market data and analytics

## **SSIS**

Solar Smart Inverter System

## **VALLEYBEE**

Innovating with IoT and AI to produce automated hives

## **FINGATT**

Smart attendance system with cloud storage support

## **PLSTKA**

App with AI Optimization and IOT to waste management

## **OPENHYDRANGTH**

Emergency Technology for disaster prevention

## **KILIMOINVEST**

To empower farmers and improve food security

## **FLUX**

An IoT based crop monitoring system

## **ANICARE**

Proposal to combating deadly diseases

## **WANISTAT**

Wearable Technological Device for Monitoring Animal Status

## **WASTEWATER TECH**

Integrating IOT in Centralized Municipal Wastewater

## **OMNIGLOBAL**

Digital Cassava Mobile Solar Processing Machine

## **URBAN**

Urban Farming System: simulate a swamp land

## **MUSHFOOD**

Intra logistics and supply of organic food

## **VINSIGHTE**

AI to aid the visually impaired

## **CORNBEST**

Empowerment of women and ecological management



# Accelerator program

Mentoring, intensive training and tutoring within the following blocks

	November 2022	December 2022	January 2022	February 2023	March 2023	April 2023
Services	<b>Business Definition and Strategy</b>					
	Business Model Canvas	Go-to-Market Strategy				
	<b>Prototyping and MVP</b>					
			<b>Growth and Investment Readiness</b>			
			Funding Opportunities and Connection to Investors			
	<b>Continuous Mentoring and Coaching</b>					
	<b>Networking Activities</b>					

## → Online Training Sessions

The top screenshot displays a slide titled "BUSINESS DEFINITION PART 2" with a diagram illustrating a REST API cycle: Client sends an HTTP Request to a REST Web Service Server, which returns an HTTP Response to the Client.

The bottom screenshot shows a graph with "Valuation" on the vertical axis and "Time" on the horizontal axis. The graph depicts the progression of risk and market conditions over time. It includes boxes for "Product Risk", "Normal Market Risk Prices", "Growth / Scale Risk", "FOMO Market Risk Prices", and "Monetization / Competition Risk". A list of participants is visible on the right side of the bottom screenshot, including Daniel Chirigoi, Lucia- Insomnia, Lucía- Insomnia, Jan Bormans, and Michael Osunire.

**NEXT STEPS:** EVALUATION, FINAL AWARDS, 2ND OPEN CALL

# Community program

How HUBiQuitous engages the wider ecosystem



## Website (www.hubiquitous.eu)



# Community program

How HUBiquitous engages the wider ecosystem

## Social Media

Twitter  
(@Hubiquitous2021)

LinkedIn  
(@HUBiquitous H2020)

YouTube  
(@HUBiquitousH2020)

Hubiquitous -H2020 PROJECT  
682 Tweets

**EMPOWERING INNOVATIVE ECOSYSTEM WITH LOW COST END TO END RESOURCES**

IoT Ecosystem

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 101016895

Hubiquitous -H2020 PROJECT  
@Hubiquitous2021

Empowering Innovative Ecosystem with low cost end to end resources- H2020 PROJECT

hubiquitous.eu Joined December 2017

582 Following 732 Followers

HUBiquitous H2020 Super admin view

All Pages Products Content Analytics Activity

Hubiquitous

+SOFTWARE TECH+BIZ SUPPORT

2 CONTINENTS

5 COUNTRIES IN AFRICA

HUBiquitous H2020

Empowering innovative startup ecosystems through collaboration of African & European Digital Innovation Hubs

Information Technology & Services · Brussels · 68 followers

Analytics

Last 30 day activity

19 Search appearances Last 7 days

72.7%

Start a post

Photo Video Poll

YouTube BE

Search

HUBiquitous

WHAT IS HUBIQUITOUS ?

**Hubiquitous Project**

Office of ESN - Belgium

Play (k)

0:01 / 1:56

What is Hubiquitous?


15 views · Dec 9, 2021

4 DISLIKE SHARE SAVE ...

# Community program

How HUBiQuitous engages the wider ecosystem

## Newsletter (Subscribe on the website)



**Newsletter #1**

**The HUBiQuitous project is up and running!**

For those of you who do not know us yet, HUBiQuitous is a European Innovation Action aiming at **creating a joint Africa-Europe Startup & Innovation Ecosystem for long-term collaborations and partnerships**. The project has the ambition to increase the technology level and capacity building of 30 local Digital Innovation Hubs (DIHs)/TechHubs in 5 African countries.

You can find more information on our website: [www.hubiquitous.eu](http://www.hubiquitous.eu)

# African Innovation Ecosystem handbook

- The handbook provides a **better understanding** of the **African Innovation Ecosystem** in **digital Technologies** and the available **opportunities**.
- It provides **information** that is necessary for **building networks** that **leverages** the **collaboration** between **African** and **European** startups, innovation hubs, innovation networks, entrepreneurs and other interested actors.

**final release: mid 2023**



# THANK YOU

A Horizon 2020 project, funded by the European Commission



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[INNOVATION ENABLERS](#)

[PROGRAMS](#)

[TECHNOLOGIES](#)

[EVENTS](#)

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## Empowering innovative startup ecosystems through collaboration of African & European Digital Innovation Hubs

[DISCOVER THE PROJECT](#)

### Our programs

[Talent Program](#)

[Accelerator Program](#)

[Community Program](#)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 101016895



# DIH4AI: Project Overview

**David Brunelleschi**  
*Intellera Consulting*



H2020 Innovation Action - This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 101017057

# DIH4AI Introduction



The DIH4AI “**AI on-demand platform for regional interoperable Digital Innovation Hubs Network**” has clear **objectives** that rely on **three fundamental pillars**

## OBJECTIVES



Build a network of AI-on-demand innovation and collaboration platforms, **interoperable with the AloD platform**



Supporting the **joint development and provision of services** through a sustainable network of regional AI DIHs and targeting local SMEs and GovTech agencies.

## KEY PILLARS



**Technological Open Platform for AI DIHs**




**Regional and European Interoperability Framework**




**Methodological Framework for DIHs collaboration**




# Building upon the AI DIH Network project

- 


**Creation of a EU Network of DIHs focusing on AI**

**30 DIHs** were selected – out of **150 applications** – for being involved in the AI DIH Network project
- 

**The profile of an AI DIH**


Definition of the key characteristics of an AI DIH, **in terms of service offering, competences & operating model**
- 

**Multi-lateral framework cooperation agreement**

Signature of a co-drafted multi-lateral framework cooperation agreement among **25 AI-focused DIHs**
- 

**Structured approach for cross-border collaboration**

Development, through co creation activities of **3 scenarios for cross-border collaboration and the blueprint**

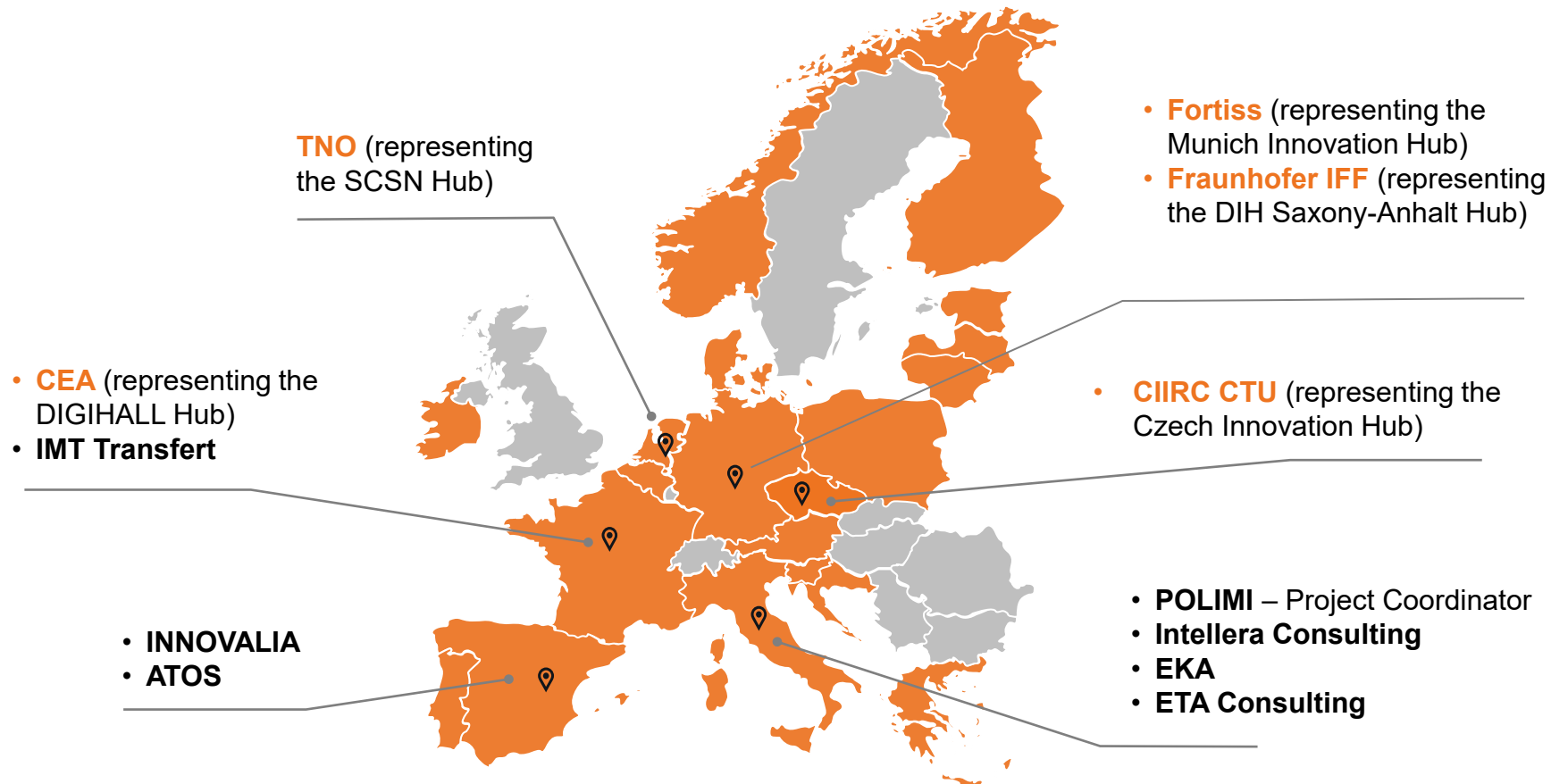


As an outcome of the AI DIH Network project, it also clearly emerged the need for fostering synergies - while promoting sustainability - by linking the **AI DIH Network** and the **AI4EU service platform power**


# DIH4AI: The Consortium



The DIH4AI Consortium is composed of **12 partners** coming from 6 EU countries, covering 3 key dimensions: Regional specialization, Methodological specialization and AI tech providers.




# DIH4AI network of (E)DIHs specialized in AI



**18 DIHs in DIH4AI Innovation Action (90+ applications)**

The 5 DIHs in the initial project are extended with further 13 DIHs coming from the first Open Call. In the second OC 10+ new DIHs



**30 DIHs in the [AI DIH Network Study](#) (150 applications)**

A European Commission study to train the trainers towards AI-driven Digital Transformation and cross-DIH collaboration (legal MoU)



**50+ DIHs in [ICT49 World Café](#)' at EU Week of Regions**

ICT49 projects are organizing awareness events for promoting regional Digital Transformation and advertising Open Calls funding opportunities



Any **Digital Innovation Hub** can make **part of our network**. Do not hesitate to **reach out to us** if you wish to find our more!

# DIH4AI: Our three pillars for DIH collaboration



The DIH4AI project ensures an effective **collaboration between Digital Innovation Hubs** thanks to three fundamental project outputs.



LBEST Taxonomy of services

The L-BEST taxonomy is a 3-level categorization for AI DIHs services. The objective is to provide to DIHs a standard framework to describe their services.



Technological platforms

A set of technological platforms such as the AI-on-Demand platform, where Digital Innovations Hubs are able to upload their relevant Artificial Intelligence assets.



Collaboration scenarios

The definition of Cross-DIHs collaboration scenarios to ensure the joint provision and development services, and the joint matchmaking of complementary competencies

# Collaboration with ICT49 Cluster



**The Trustworthy AI Working Group**

DIH4AI is promoting an ICT49 working group about a common position and service provision regarding Trustworthy AI

Legal		
<b>LEGAL AND IPR ASSISTANCE</b>	<b>ETHICAL AI ORGANISATIONAL SUPPORT</b>	<b>ETHICAL AI LIFE CYCLE ASSISTANCE &amp; ASSESSMENT</b>
<ul style="list-style-type: none"> <li>Legal advice and support</li> <li>IPR assistance &amp; management</li> <li>Model agreements &amp; assistance</li> <li>Regulatory Sandboxes</li> </ul>	<ul style="list-style-type: none"> <li>Support definition of internal AI Code of Conduct</li> <li>Ethics-related organizational measures</li> <li>Training on Ethical &amp; Legal AI services</li> <li>Ethics Expert on-demand</li> </ul>	<ul style="list-style-type: none"> <li>Ethical AI Committee as a Service</li> <li>Ethical risk assessment</li> <li>Support the development of ethically-aware AI solutions</li> <li>Conformity assessment / certification of AI solutions</li> <li>AI solution independent audit</li> </ul>

**DIH4AI to provide DIHIWARE platform (II) for ICT49**

The DIHIWARE Innovation and Collab platform at Level I implements a DIH's ecosystem; at level III the DIH4IND marketplace; at level II is AI4EU





# Cross-DIHs colaboration: tools and lesson learned

**Noemi Luna Carmeno**  
*Intellera Consulting*

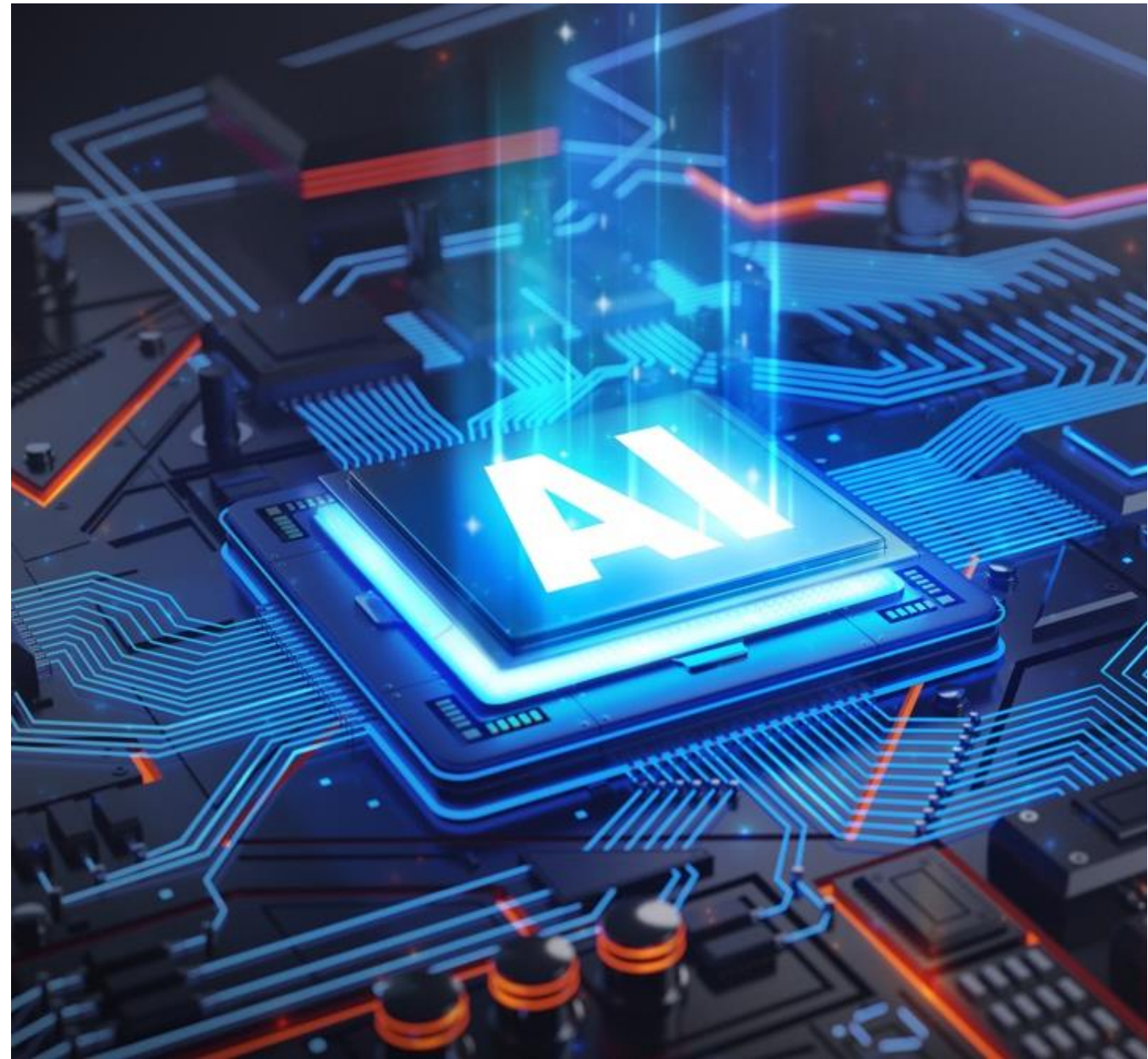


# L-BEST Service Portfolio

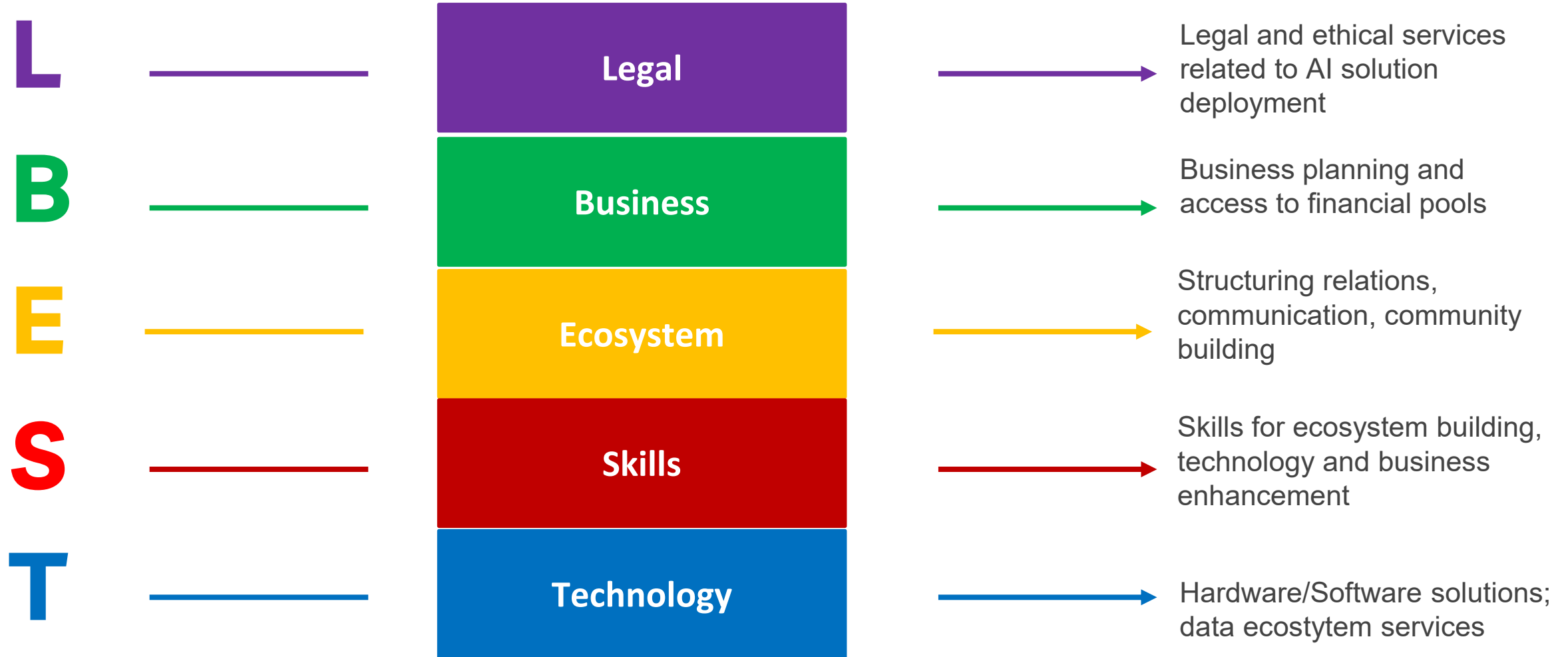
DIH4AI inherited, from AI REGIO project, the concept of Service Portfolio **3-levels taxonomy** for classifying the **AI DIH's services**. The taxonomy was also enriched based on the AI DIH Network services for ethics and legal AI aspects.



The objective is to provide to DIHs a **standard framework** to describe their services according to a common taxonomy, also in the perspective of **collaboration opportunities**.



# L-BEST service portfolio – Level 1





# Cross-Regional experiments overview

L B E S T	1. Joint Provision of complex services	2. Joint Development of collaborative services	3. Joint Matchmaking of complementary competences
<b>Business</b>		<ul style="list-style-type: none"> <li>▶ <b>AI Business Plan Assessment</b> Lead: CTU/CIIRC Partners: Fraunhofer IFF, TNO <b>X-PRAG-3</b></li> </ul>	
<b>Ecosystem</b>	<ul style="list-style-type: none"> <li>▶ <b>Pan-EU AI Adopters Ecosystem</b> <b>L</b> Lead: DIGIHALL Partner: Fraunhofer IFF <b>X-PAR-1</b></li> <li>▶ <b>AI Awareness Raising Skills for DIH</b> Lead: Fraunhofer IFF Partner: TNO, Fortiss <b>X-SAX-1</b></li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Catalog of experiments at cross-DIH level</b> Lead: CIIRC/CTU Partners: TNO, DIGIHALL <b>X-PRAG-2</b></li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>AI EU Consortia</b> Lead: DIGIHALL Partner: Fraunhofer IFF <b>X-PAR-2</b></li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>▶ <b>AI DIH Winter School</b> Lead: CTU/CIIRC Partners: fortiss, Fraunhofer IFF <b>X-PRAG-1</b></li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Quick Check –Maturity Assessments</b> Lead: fortiss Partner: DIGIHALL, CIIRC/CTU, Fraunhofer <b>X-MUC-1</b></li> </ul>	
<b>Technology</b>	<ul style="list-style-type: none"> <li>▶ <b>AI Testing and Experimental Facility in Manufacturing</b> Lead: TNO Partner: CIIRC/CTU <b>X-NL-2</b></li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Platform-as-a service for accountable evidential transactions</b> <b>L</b> Lead: fortiss Partner: TNO <b>X-MUC-2</b></li> </ul>	

▶ Activities ongoing

**L** Legal-ethical component



# A focus on Cross-DIHs collaboration scenarios



## 1) Joint provision of complex services

- **Partnership to provide services jointly**, pulling together existing resources, to enable DIHs to respond to a client's request leveraging on the capabilities and infrastructure available in the network

*e.g. a multi-disciplinary Summer School, a cross-regional investors' matchmaking event*

## 2) Joint development of collaborative services

- Design, develop and provision of **innovative new services** to widen the DIH offering to the ecosystem. This is based on cooperation with other DIHs in Europe that face similar challenges and needs.

*e.g. a new AI Digital Maturity Assessment method; a new Skills and Competencies framework for AI.*

## 3) Joint matchmaking of complementary competencies

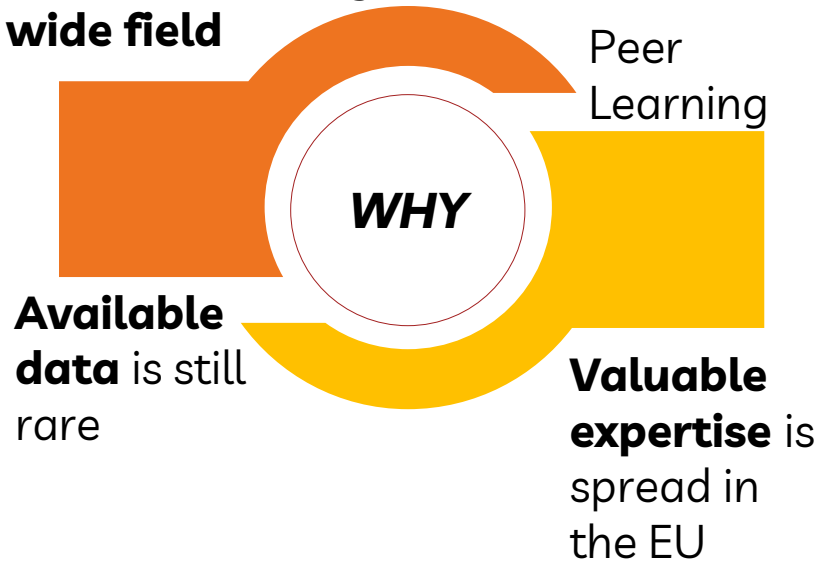
- **Matchmaking** to enable DIHs to provide **new opportunities to the ecosystem**, creating connections with players operating in other regions

*e.g. AI startup looking for new customers outside its region; a user SMEs looking for AI solutions in predictive maintenance; a hospital looking for other hospitals to share experiences in digitalization*

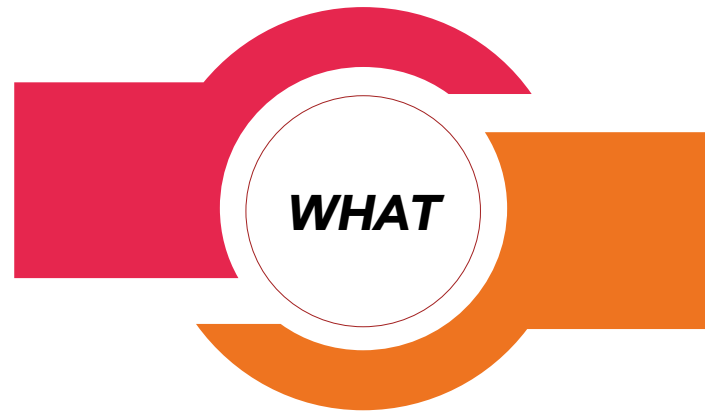
# Cross DIH collaboration

Achieving a smooth and successful **collaboration between Digital Innovation Hubs** can have a significant impact on the delivery of a specific service

AI is an extremely **wide field**

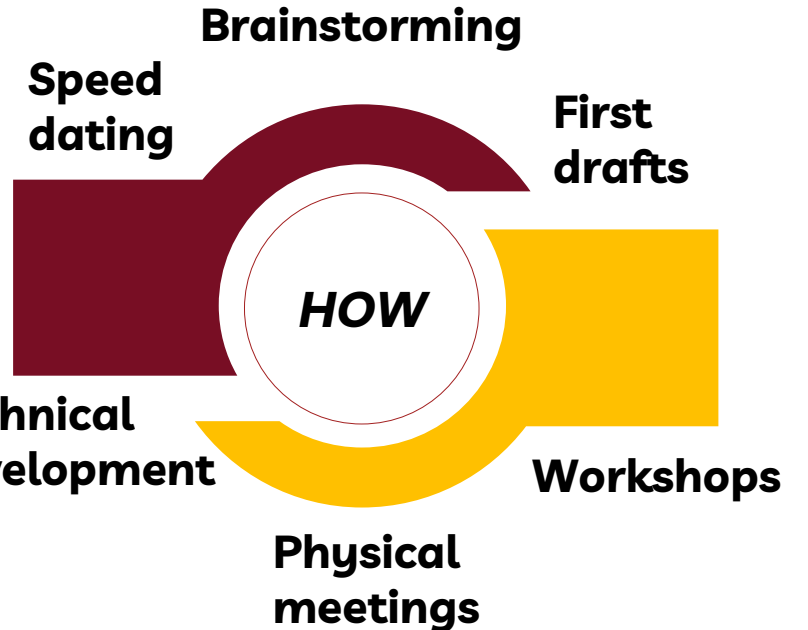


**Development of joint services** among different DIHs



**Provision of joint services** among different DIHs

Joint matchmaking of **complementary competences**



**Technical development**

# Difficulties and Lessons Learned

Thanks to this cross-DIH collaborative experiment between Fortiss and TNO Digital Innovation Hubs we were able to gather useful insights for future collaborations



## Challenges

- Difficulties in understanding each other on complex experiments due to the impossibility of meeting physically
- Identification of common technologies and interest
- Commitment of involved partners and lack of personal exchange



## Lesson learnt

- It is essential to meet physically to be able to carry out complex experiments
- Need for having a common repository of services and AI assets to improve collaboration
- Need to translate in local languages documents and other materials for SMEs in the different European regions



# DIH4AI: Introduction to different experiments

**Jaime Codagnone**  
*Intellera Consulting*



# DIH4AI AI experiments



The DIH4AI project focuses on two types of experiments: **Intra-regional experiments** and **Cross-Regional experiments**

## Intra-Regional



Supervise and coordinate the Regional experimentations for the five DIHs



Collect and benchmark experiences, business benefits, social feedback and lessons learned



Use the collected information to draw a recommendation document for Regional authorities and the European Commission

## Cross-regional



Supervise and coordinate the Regional experimentations in three collaboration **macro scenarios**



To prepare and conduct the Joint **provision**, Joint **development** & Joint **matchmaking** experiments in cross-DIH and Regions-Europe scenarios



Collect and benchmark experiences, business benefits, social feedback and lessons learned



Use the collected information to draw a recommendation document for Regional authorities and the European Commission

# A glance at two DIHs present today

Today we are going to see the direct experience of two Digital Innovation Hubs of our projects: Fortiss and TNO



**Geographical distribution**



Munich DIH : Fortiss



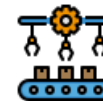
South-Netherlands DIH: TNO



**Today's presentations**



SMART SOLAR BOX - Fortiss



Experimental Facility Manufacturing - TNO

# A glance at two DIHs present today

While for our project the primary focus is Artificial Intelligence, all of our Digital Innovation Hubs work and develop different types of technologies. Among many we have:



i

All of our DIHs focus on a wide variety of Technologies. Here you can find a short overview of some of them.



## Technologies of focus Overview



Internet of Things



Software development



Robotics



Cybersecurity



Virtual and Augmented Reality





# AI Testing and Experimental Facility in Manufacturing

Simon Dalmolen

**TNO** innovation  
for life



H2020 Innovation Action - This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N. 101017057

# Portal, Data & Cloud Interoperability with AloD

## Portal

GUI for cross-DIH collaboration

- DIHIWARE Level 2 Portal for cross-DIH collaboration
- APIs for getting/sharing resources

Knowledge Platform



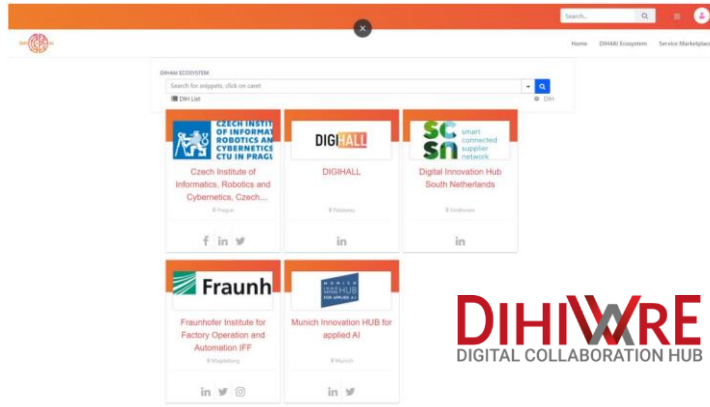
Innovation Capabilities



Marketplace



Collaboration Services

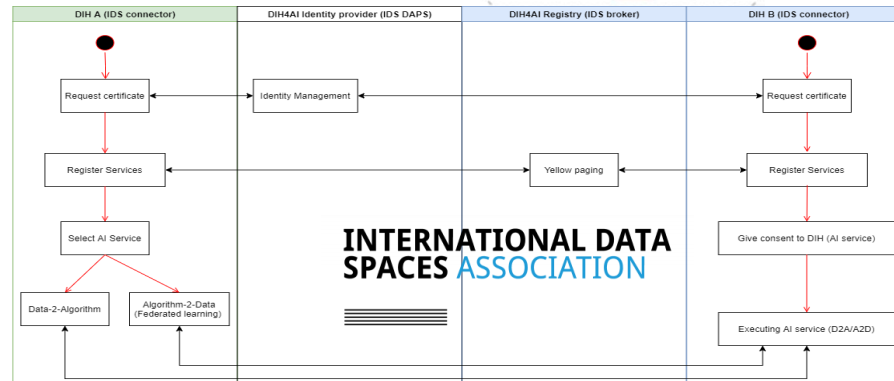
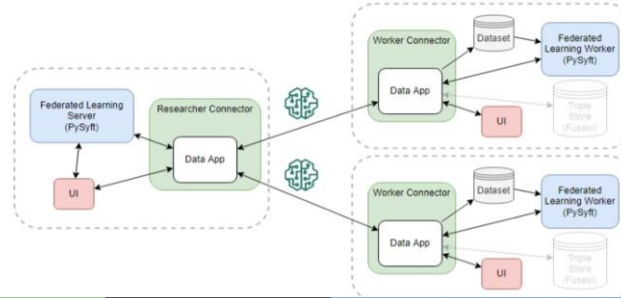


**DIHIWARE**  
DIGITAL COLLABORATION HUB

## Data

A data space for DIHs

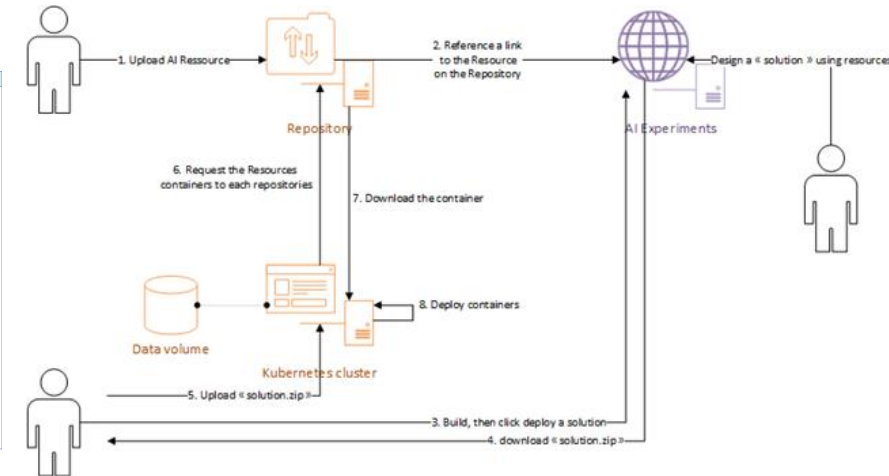
- Enabling cross-DIH data sharing
- Following IDS approach
- Experiments with federated learning in several DIHs in progress



## Cloud

A Playground for experimentation for DIHs connected to the AloD

- AloD Experiments playground for DIHs
  - Repository
  - Execution space
- Kubernetes cluster with the playground available for DIHs experiments
- Connection to the AloD platform
  - Towards automatic onboarding & publishing solutions to the AloD



# DIH - TNO

- TNO is the Netherlands Organization for applied scientific research. Set up by law in 1932, it has been our mission to give the right answers – and to ask the right questions. This is how we work for welfare and prosperity. For the world of today and tomorrow. By combining disciplines and domains, we tackle the most complex questions. On the road to a better life and a brighter future.
- We focus on contributing to solutions for 4 societal challenges:
  - safe and secure society
  - healthy society
  - sustainable society
  - digital society
- Digitalization and Artificial Intelligence is a major horizontal research topic for TNO. We are working with industrial partners on the application of AI in various vertical domains (logistics, health, manufacturing, etc.). Through our early research programme we try to push the boundaries on explainable and trusted AI.

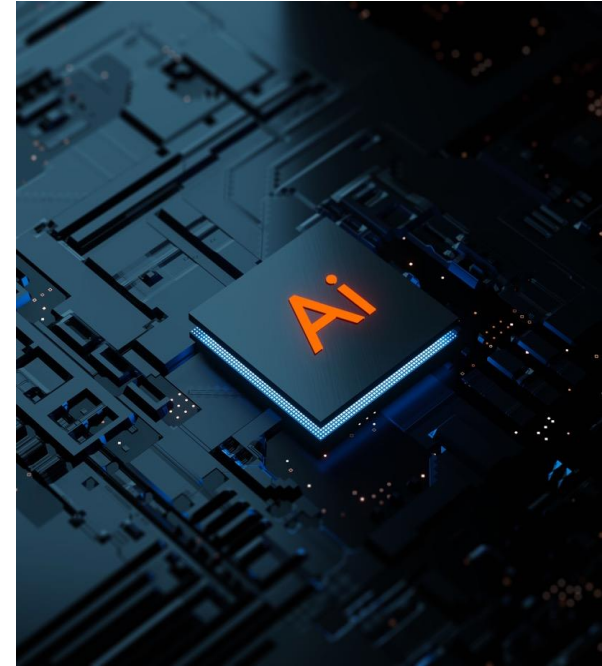


[TNO - Netherlands Organisation for Applied Scientific Research | AI-on-Demand \(ai4europe.eu\)](https://ai4europe.eu)



# Problem statement

- **Data is scattered across the supply chain and in systems** → Manufacturing companies have strong relations with suppliers and customers in their supply chain in order to develop complex products. Because many partners are involved in the production of a product, data is scattered across the supply chain and in various systems.
- **Data exchange between/within organization is challenging** → There is a strong need for secure, trustworthy, and sovereign data exchange, but this is not yet a common good. Data exchange is the enabler for AI in manufacturing.
- **Innovative technologies are not accessible for potential users** → IT-integrators, DIHs, and manufacturing companies find it challenging to test and integrate new innovative data exchange technologies to support their AI solutions, therefore causing many custom-made solutions instead standardized interfaces.



# Southern Netherlands DIH - TNO

B	TNO	I-NL-1: Portfolio of generic value cases
E	<b>TNO</b>	<b>I-NL-2: Industry 4.0 Blueprint/Scale AI innovation</b>
S	TNO	I-NL-3: Industry4.0 Business case methodology
T	<b>TNO</b>	<b>I-NL-4: Plug&amp;Play SCSN-based AI services</b>



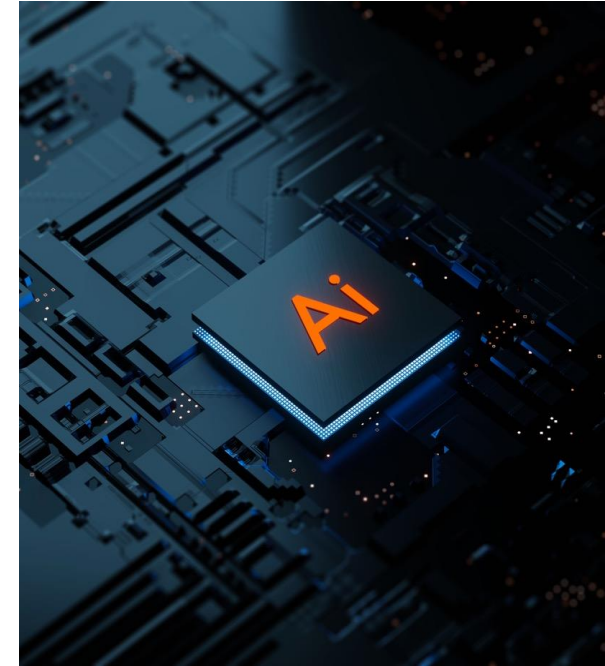
# Southern Netherlands DIH - TNO

- This experiment sets out to make **technical innovations** regarding **industry 4.0** more accessible to companies and SMEs in particular. There are already lots of developments in the field of automation, digitalization and the utilization of data in manufacturing, but these are often difficult to put in context or translate to action within a company. Especially within small and medium sized enterprises where there is limited capacity to take risks on new innovations or conduct lengthy research in what is already available.
- This experiment **defines generic building blocks** which can be used to realize industry 4.0 applications and innovate within the manufacturing domain. These building blocks are structured along the **RAMI 4.0 model** and are initially selected to enable smart industry cases. As multiple technologies can be used to fulfill the same function the result of this experiment will be a set of building blocks which are partially interchangeable and together make up a way to implement industry 4.0 ideas.
- Moreover, a subset of these building blocks will be used to realize a reference implementation and demonstrate an AI driven planning solution.

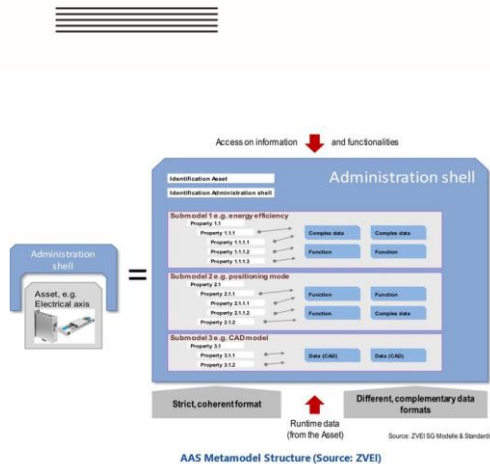


# Experiment overview – Solution Overview

- **Open AI Manufacturing Testbed** → hybrid (physical and virtual) and international environment for testing AI algorithms in the manufacturing domain.
- **Testbed containing a multitude of AI-enabling technologies** → technologies which contribute to data sovereignty, AI transparency and accountability, and traceability of data and processes, continuous verification & dynamic certification.

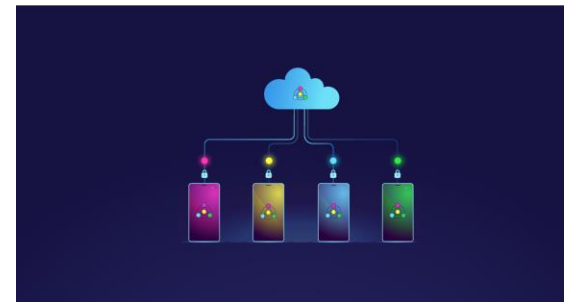
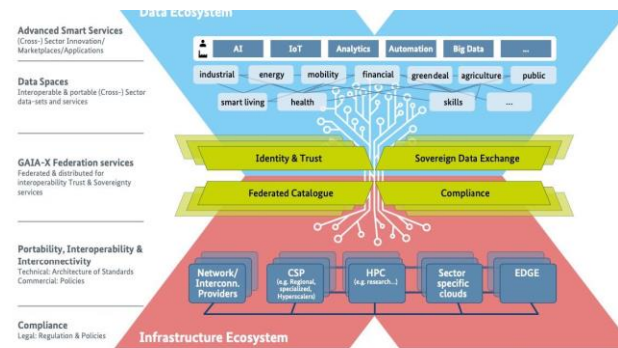


## INTERNATIONAL DATA SPACES ASSOCIATION

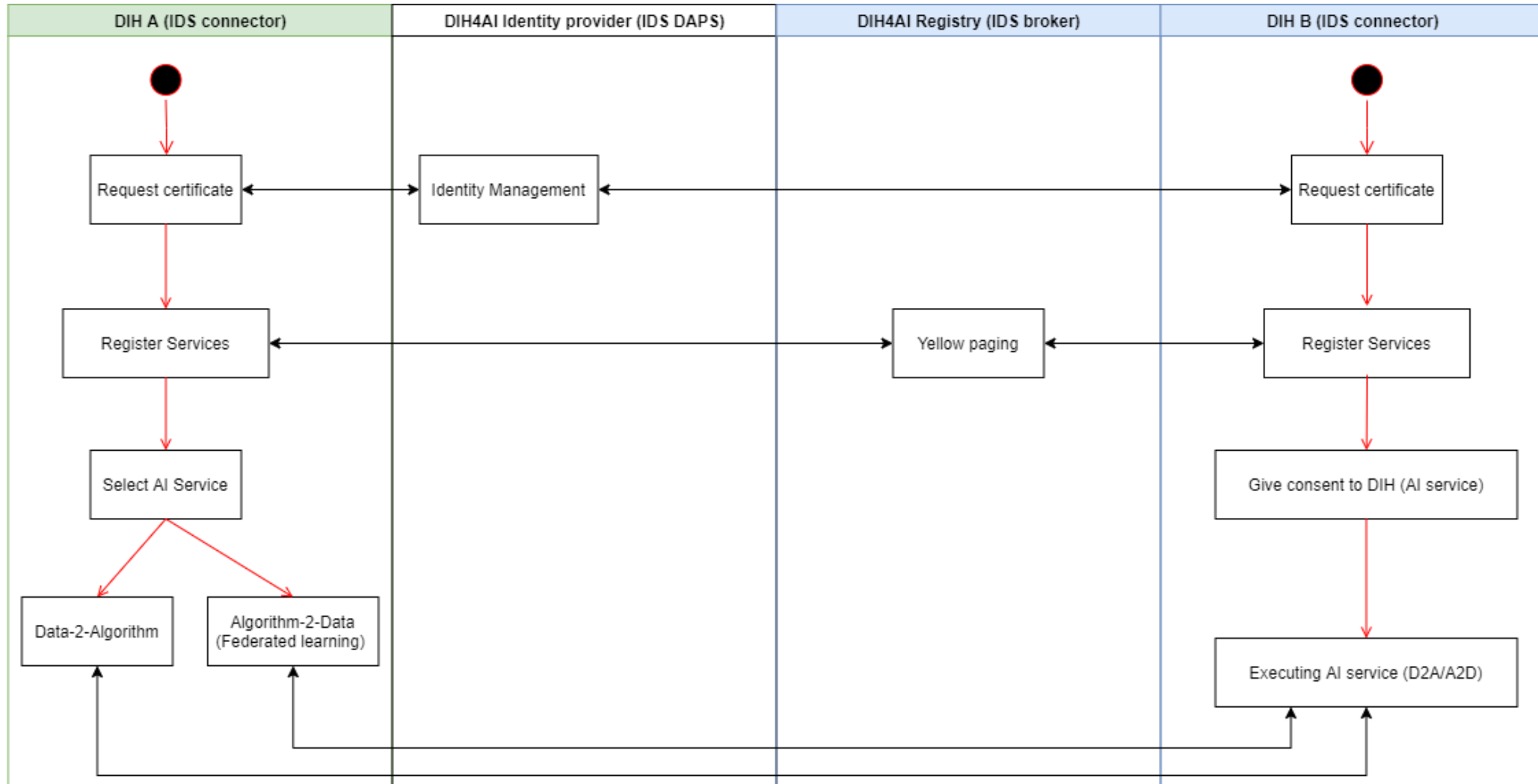


**SC**  
**SN**

smart  
connected  
supplier  
network



# Inter DIH collaboration (Smart Manufacturing)





# Southern Netherlands DIH - TNO

## Federated Learning (in short)

A common form for data sharing in AI is Federated Learning (FL). This is a distributed Machine Learning approach that meets the need not to share privacy-sensitive data over the network. With FL, there are multiple data providers in the network, each managing their own set of data. The data consumer (and also the supplier of the FL algorithm) initiates the process and acts as the orchestrator in the learning process. FL works broadly as follows:

1. All data providers run the same ML algorithm using their own ML model on their own dataset, which only contains information about the patients' data in their own organization.
2. The individually trained model is sent by the data providers to the orchestrating server.
3. The orchestrator combines the models of all individual data providers in a single model.
4. The orchestrator sends the updated model back to the data providers.
5. Steps 1 through 4 are repeated until the training algorithm is complete. The result is an algorithm that is trained on more data and thus becomes more statistically reliable, assuming that the data providers can deliver good quality data.



# THANKS



# References

- [TNO - Netherlands Organisation for Applied Scientific Research | AI-on-Demand \(ai4europe.eu\)](https://www.tno.nl/en/ai-on-demand)
- [AI4EU Experiments \(ai4europe.eu\)](https://ai4europe.eu/experiments)
- <https://www.internationaldataspaces.org/>
- <https://www.dih4ai.eu/>



fortiss

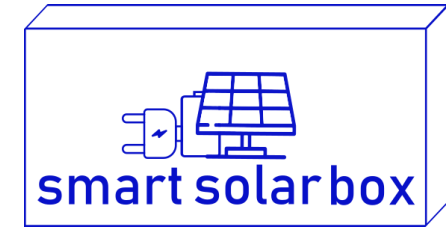
Marchus Duchon

# Introduction to Smart Solar Box

- What is this box?
  - Vision
  - Applications
- Future goals of this project



# Introduction to Smart Solar Box

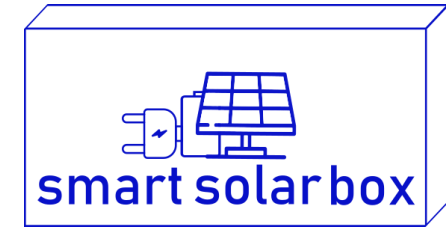


Smart, intelligent and portable solar power generator with monitoring and control capabilities.

- ▶ Developed using easily available components in the market.
- ▶ Versatile with varied output ports : AC, USB, and 12V
- ▶ Users can add their own features



# Introduction to Smart Solar Box



## Solar Panel:

- Supported Voltage: 12V/24V
- Max. Current: 10A
- Max. Solar power: 120W/240W

## Battery:

- Type: Lifepo4
- System Voltage: 12V (10-14.4V)
- Capacity: 22 AH (300Wh)



# Software – Portal

1. Connect with Wireless Network
  - smartsolarbox1
  - password: ChangeMe
2. Open a web browser on your smartphone
3. Navigate to <http://10.3.141.1:8080>

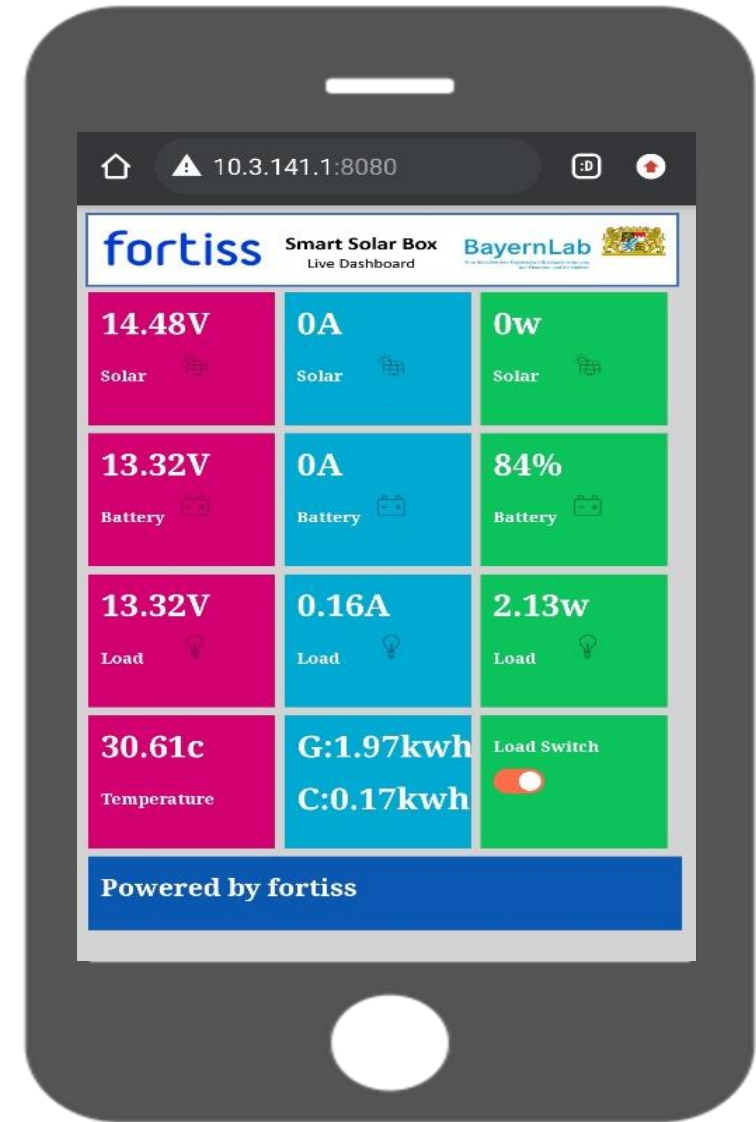
↓ (or simply scan QR Code)



▶ WIFI Network QR



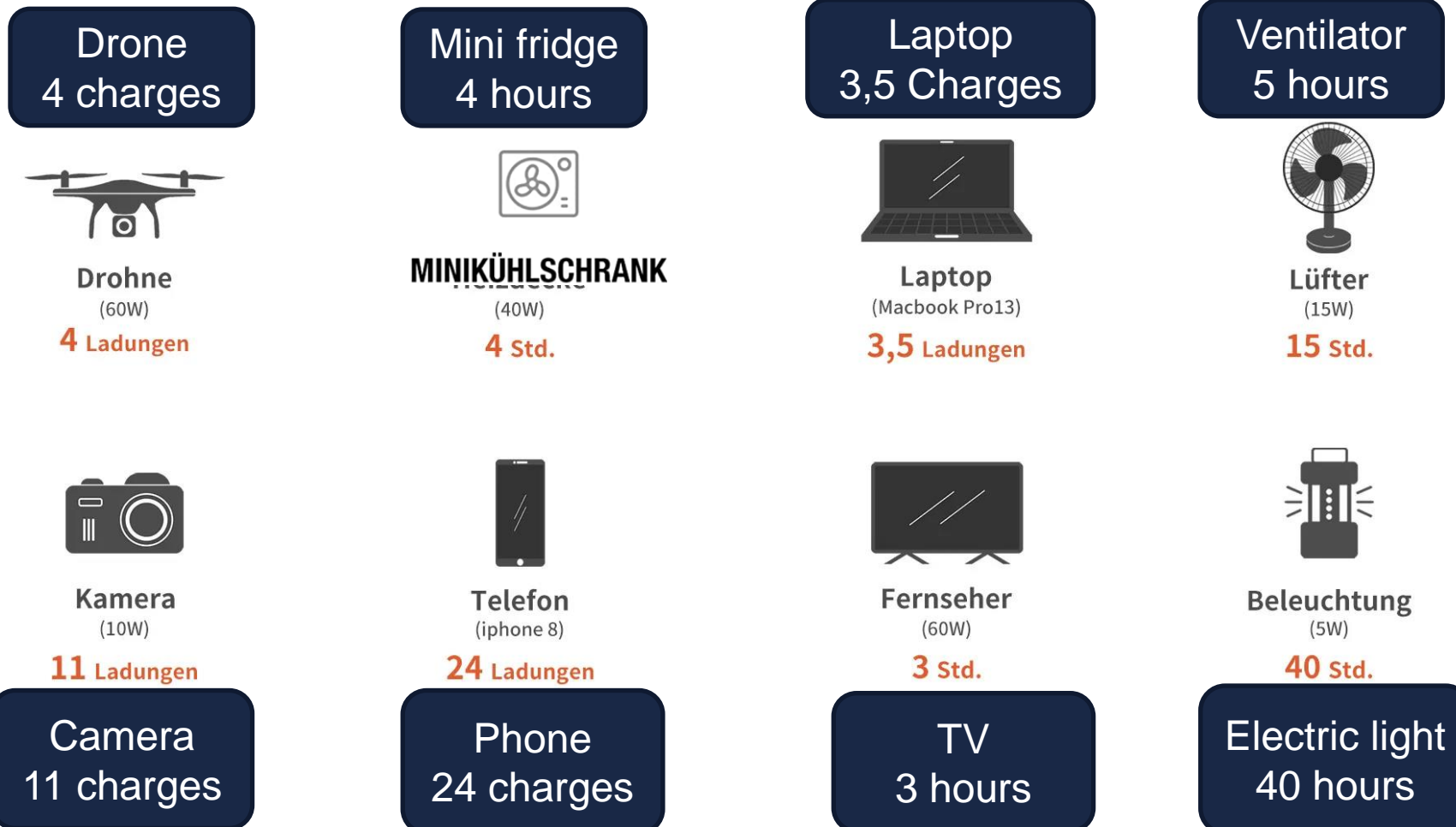
▶ Dashboard QR





# Introduction to Smart Solar Box

## Powered Appliances/gadgets



# Introduction to Smart Solar Box

## Applications and Vision



*Offgrid Power supply*

### **Usecases:**

Powering household appliances and local loads



*Solar Education*

### **Usecases:**

Solar PV experiments for students in schools and colleges



*Research*

### **Usecases:**

Axis tracking, solar panel performance testing, generation forecasting, implement energy management algorithms etc.

# Introduction to Smart Solar Box

## Applications and Vision



**Solar Offgrid Container System for microgrids**



**Camping and Picnicks**



**Emergency Power supply**

# Previous Workshops



► Solarbox Training @  
Professional School, Andhra  
pradesh, India



► Solarbox @ Primary School  
in India

Thank you.



# Contact

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**SERVICE  
PARTNER  
ONBOARDING**



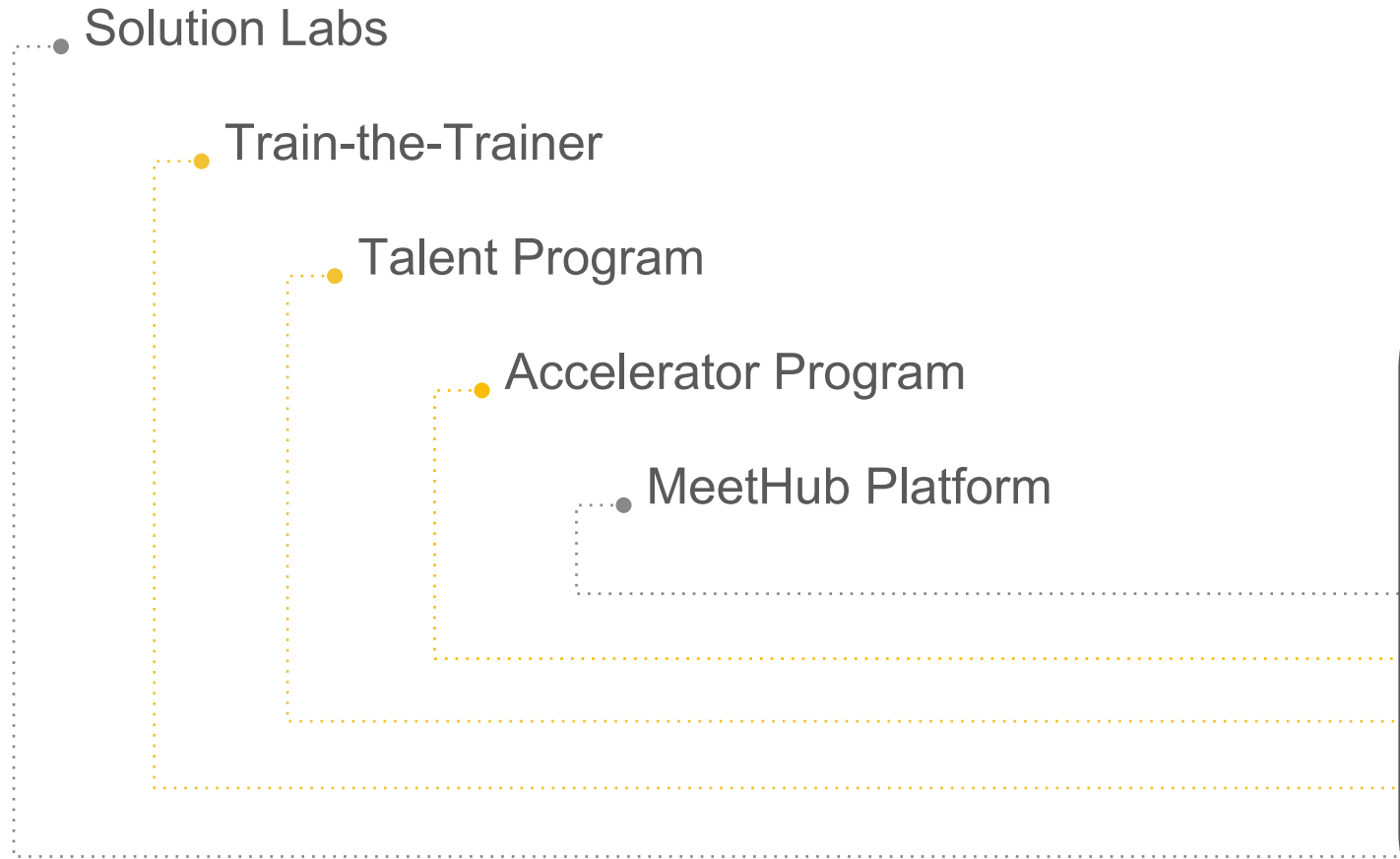




# Outline

- 1 Background
- 2 Engagement Process
- 3 Partner Responsibilities
- 4 Associated Deliverables
- 5 Benefits Framework

# The HUBiquitous Project



**Aim:**

Creating a common African-European startup and innovation ecosystem for long-term collaboration and partnerships

**Objective:**

To support IoT capacity building of local DIHs/Tech hubs in Africa



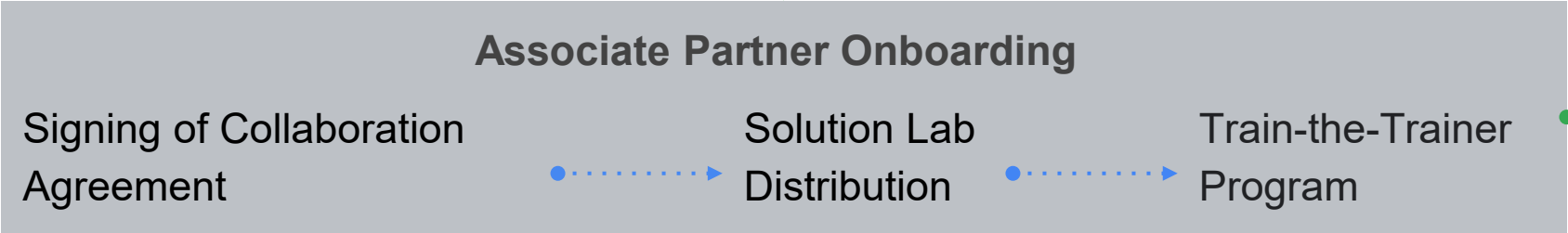
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 101016895



# Engagement Process

Selection of Potential Associate Partners by Local Partners

Offer of Engagement to Associate Partners



# Responsibilities of the Associate Partners

## General Responsibilities

Provide at least two IoT technicians/engineers/trainers who will participate in the Train-the-Trainer Program.

## Technology Partner

- Develop one (1) MVP. An MVP constitutes a finished product that has been deployed.
- Showcase the finished MVP as part of the opening ceremony for the Hackathons and Bootcamps in their country.

## Service Partner

- Engage the Talent Program participants.
- Organise a Bootcamp and Hackathon at their hub, as part of the Talent Program.
- Provide support to the Technology partner from their country where needed.

# Responsibilities of HUBiquitous

- Provide the Solution Lab infrastructure (hardware & software packages; it's a kit that comes with hardware components as well as software packages)
- Provide free training and IoT capacity building for the team members of associate partners in relation to the Solution Lab
- Work with the Service Partners to organize the Hackathons and Bootcamps
- Work with the Technology Partners to showcase their finished MVPs at the two separate Hackathons and Bootcamps happening in their country.
- Provide a budgetary allocation to Associate Partners in support of the MVP development and deployment process (TP), and in support of the project's capacity-building process for the hubs and the innovation ecosystem (SP).

# Associated Deliverables

## Collaboration Agreement

### SERVICE PARTNERS

Strategy for Engaging Talent Program  
Participants

Detailed Plan of Events for The Hackathon  
& Bootcamp including the Budget

Information Gathering Document: Includes  
CVs of the two Trainers

### TECHNOLOGY PARTNERS

D1.1 - Detailed Specification of the Prototype

D1.2 - Realization Plan

D1.3 - Technical Documentation of the Prototypes

D1.4 - Prototyping Test Report

D2.1 - Detailed Specification of the MVP

D2.2 - Realization Plan (MVP)

D2.3 - Technical Documentation of the MVP

D2.4 - MVP Test Report

# Benefits Framework

- Associate Partners receive financial and technical support while executing capacity-building programs or working on their IoT ideas/solutions.
- The solutions developed will be solely theirs. They are only required to acknowledge that they received funding from the HUBiquitous Project.
- They get to enrich their portfolio and gain more exposure.
- They get access to a community of IoT professionals and organizations from across Africa and Europe. This will give them the opportunity to network and grow their connections, and is to be facilitated by the MeetHub Platform.

**Thank You**



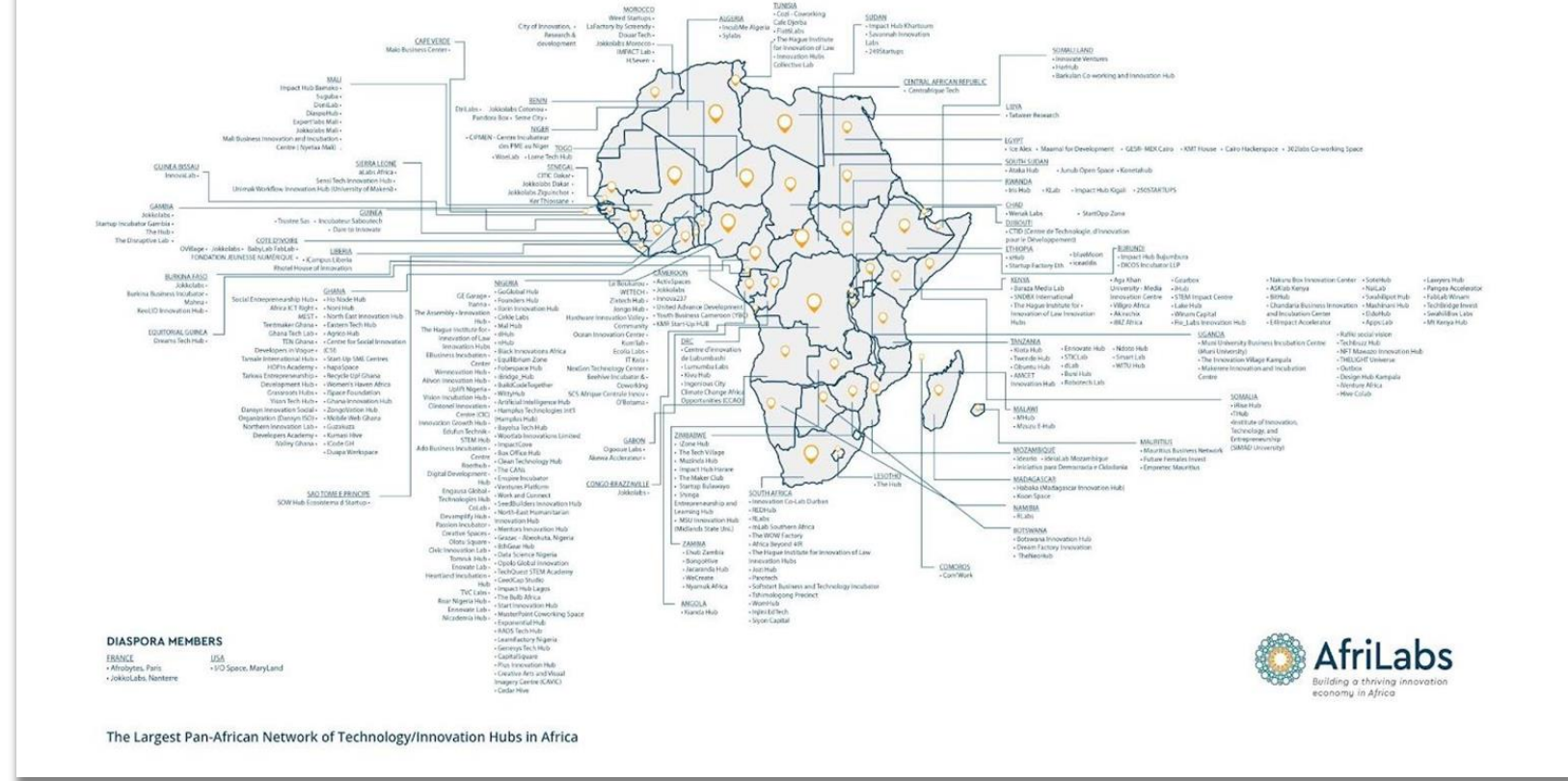
# AfriLabs

Moetaz Helmy, Chairman, AfriLabs.

# AfriLabs

- 1031+ Innovation hubs in Africa
- 400 Innovation hubs in AfriLabs
- HQ in Abuja, Nigeria
- Coworking Spaces, Incubators, Accelerators
- 51 African Countries
- AfriLabs Capacity Building Program (2M euros)
- Catalytic Africa (1.5M euros Matchmaking fund)

## AFRILABS NETWORK MEMBERS ACROSS AFRICA



# EQUITY BY COUNTRIES

## NIGERIA

**\$1.2B**  
189 DEALS

1

## EGYPT

**\$787M**  
144 DEALS

3

## KENYA

**\$758M**  
103 DEALS

4

## SOUTH AFRICA

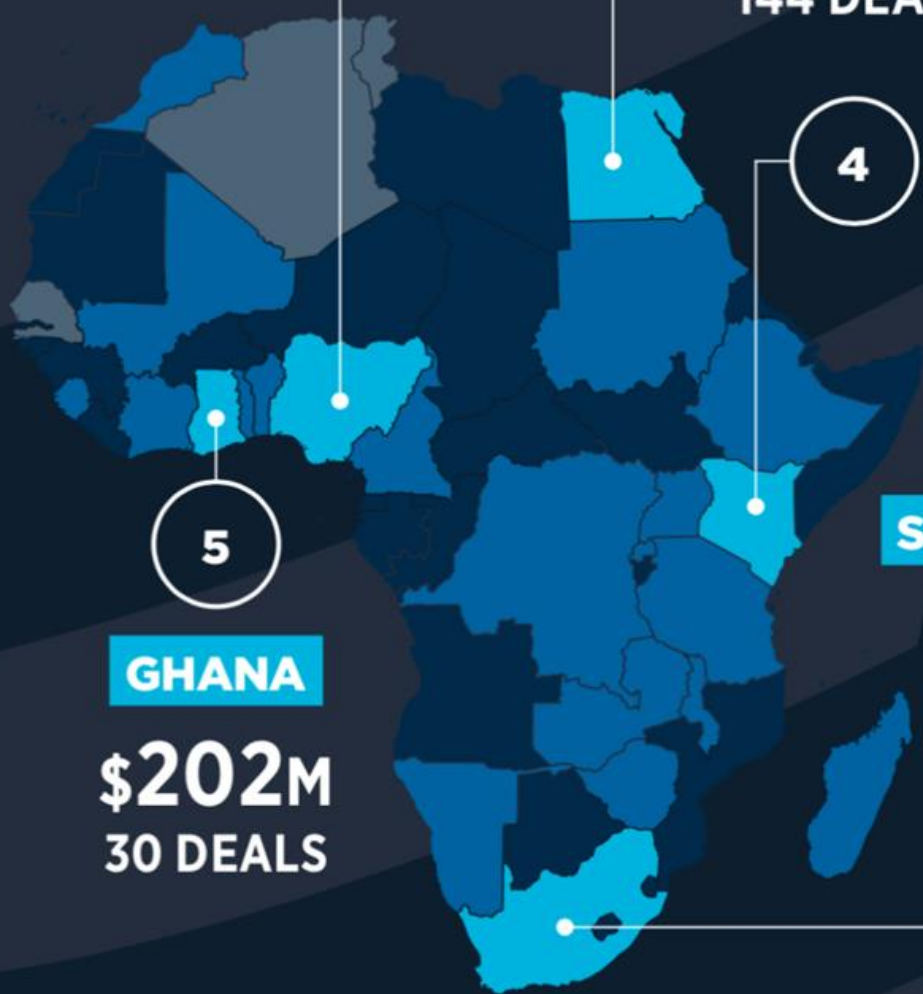
**\$830M**  
95 DEALS

2

## GHANA

**\$202M**  
30 DEALS

5



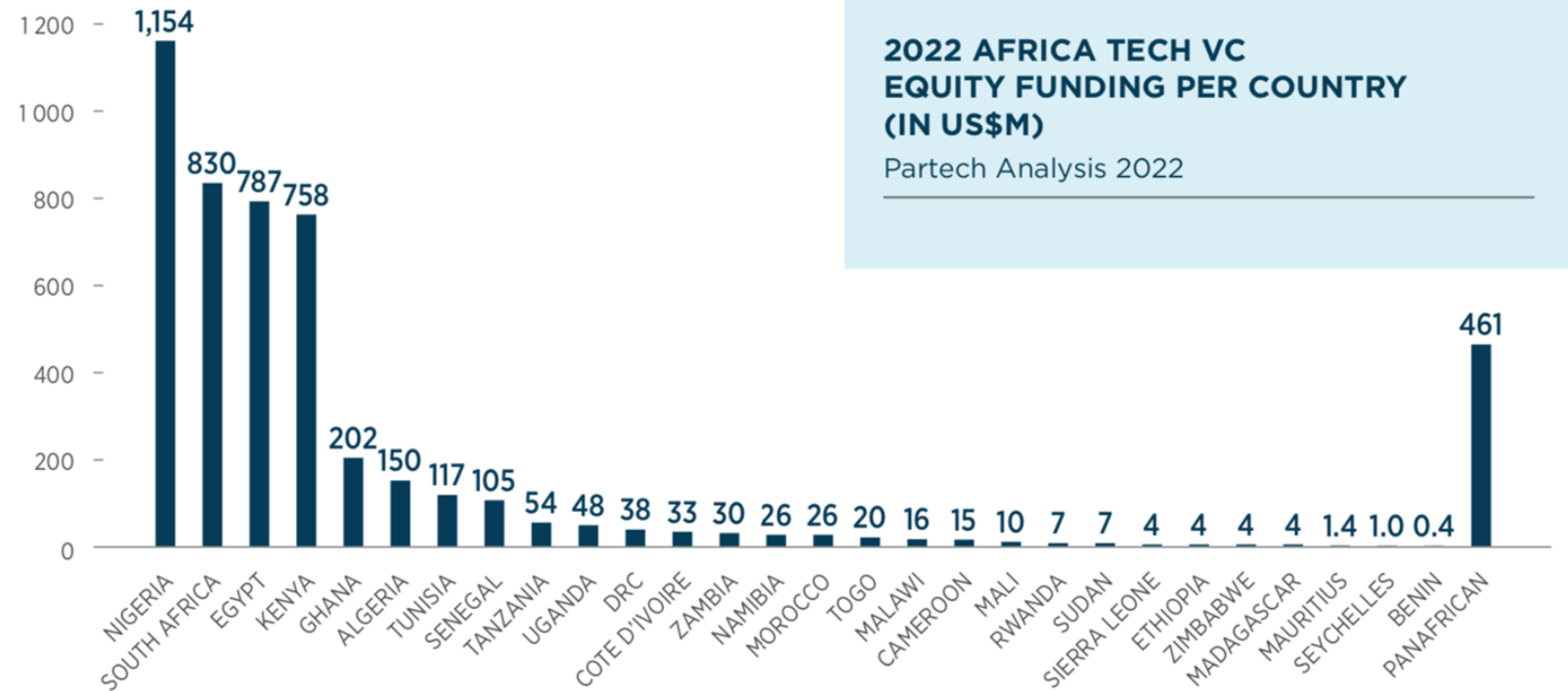
		US\$M	DEALS
6.	Algeria	150	1
7.	Tunisia	117	12
8.	Senegal	105	15
9.	Tanzania	54	5
10.	Uganda	48	15
11.	DRC	38	2
12.	Cote D'Ivoire	33	11
13.	Zambia	30	3
14.	Namibia	26	3
15.	Morocco	26	19
16.	Togo	20	1
17.	Malawi	16	1
18.	Cameroon	15	5
19.	Mali	10	4
20.	Rwanda	7	4
21.	Sudan	7	2
22.	Sierra Leone	4	1
23.	Ethiopia	4	3
24.	Zimbabwe	4	3
25.	Madagascar	4	2
26.	Mauritius	1	1
27.	Seychelles	1	1
28.	Benin	0,4	2



Which African Country secure the  
highest Startup Investment?

# Investment Inflow in African Tech startups in 2022

- 764 deals for 6.5B\$ ( 77% Equity+ 23%Debt)
- Total equity funding: \$4.9 B (-6% YoY)
- Total Debt funding: \$1.5B (+102 YoY)
- 693 Equity Deals (+2% YoY)
- 7 MegaDeals (>\$100 M) (-50% YoY)
- Source: Partech Report\*

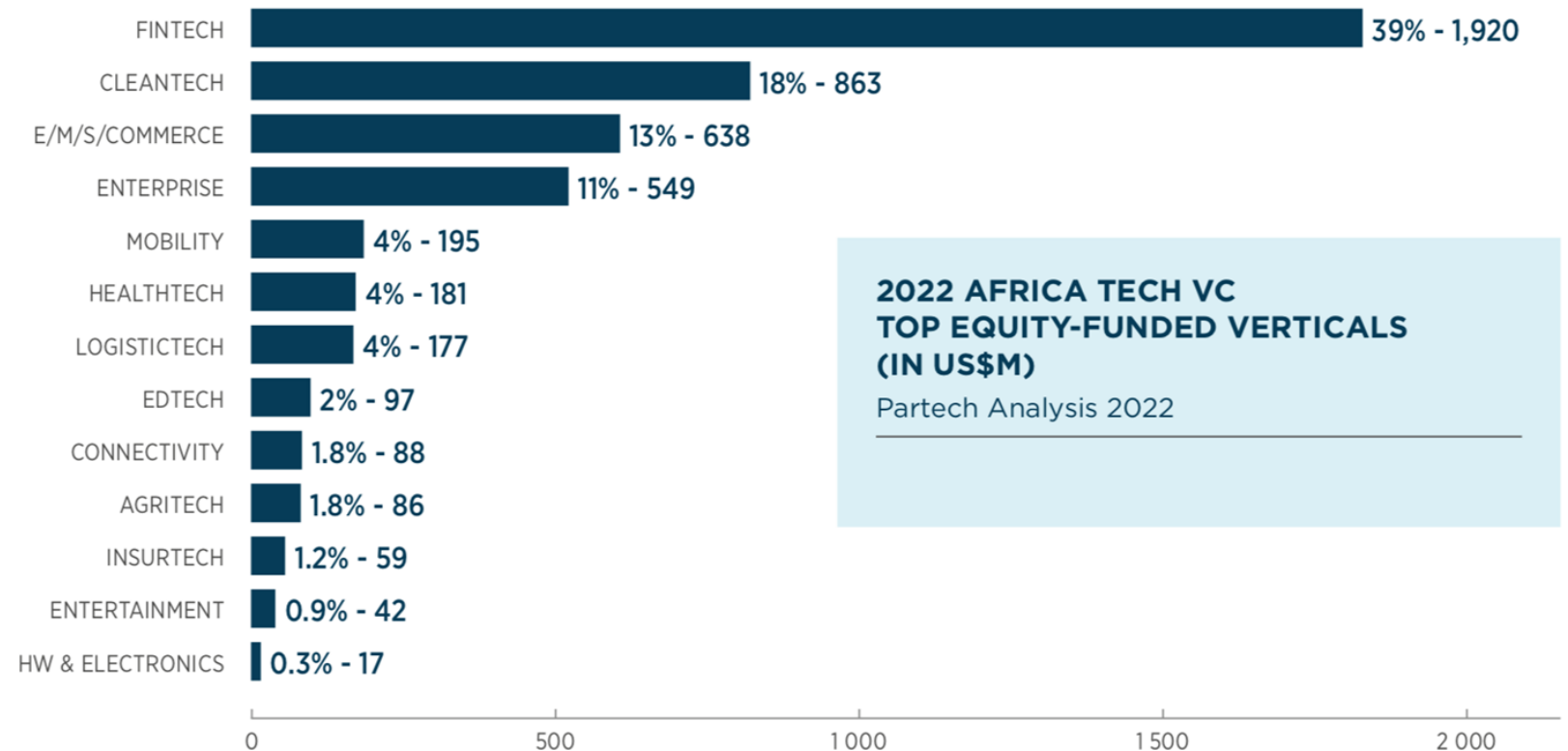


The top right corner of the slide features a decorative arrangement of overlapping geometric shapes, including triangles and squares, in various shades of blue and dark blue.

What is the most attractive sector  
for investors in Africa?

# Investment Inflow in African Tech startups per sector

- Fintech accounts 39 % of funds against 63% in 2021
- 5 Vertical attract 50% of funding
- LeapFrog
- Source: Partech Report\*





How many active Investors invest  
in African Startups?



# INVESTORS

**1,149**

UNIQUE EQUITY INVESTORS IN 2022 (+29% YOY)

**335**

INVESTORS  
HAVE PARTICIPATED  
IN 2 DEALS OR MORE  
(+27% YOY)

**89**

INVESTORS  
HAVE PARTICIPATED  
IN 5 DEALS OR MORE  
(+37% YOY)

**20**

INVESTORS  
HAVE PARTICIPATED  
IN 10 DEALS OR MORE  
(+11% YOY)

**8**

INVESTORS  
HAVE PARTICIPATED  
IN 15 DEALS OR MORE  
(-27% YOY)



The third Wave?

# The Three Waves of the Internet

FIRST WAVE	SECOND WAVE	THIRD WAVE
1985 - ~1999	2000 - ~2015	2016 -
<b>Building the Internet</b>	<b>App Economy and Mobile Revolution</b>	<b>Internet of Everything</b>
<i>Laying the foundation for the online world.</i>	<i>Search, social, and ecommerce startups grow on top of the internet</i>	<i>Ubiquitous connectivity allows entrepreneurs to transform major, real-world sectors</i>
<b>Driven By:</b>	<b>Driven By:</b>	<b>Driven By:</b>
People Products Platforms Partnerships Perseverance	People Products Platforms	People Products Platforms Partnerships Policy Perseverance
<b>Major Players:</b>	<b>Major Players:</b>	<b>Major Players:</b>
Cisco IBM Apple America Online Sprint Sun Microsystems	Amazon Waze Snapchat Facebook Google Twitter	TBD

**Thank You**

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Moetaz@afriabs.com

# Digital Innovation Hubs

*An opportunity for  
collaboration between  
Europe and Africa*



# Thank you!

[hubiquitous.eu](https://hubiquitous.eu)

[www.dih4ai.eu](https://www.dih4ai.eu)



Funded by  
the European Union