IoT for the developing countries from research to business transformation

GECON 2017

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France

Abdur Rahim

Open IoT

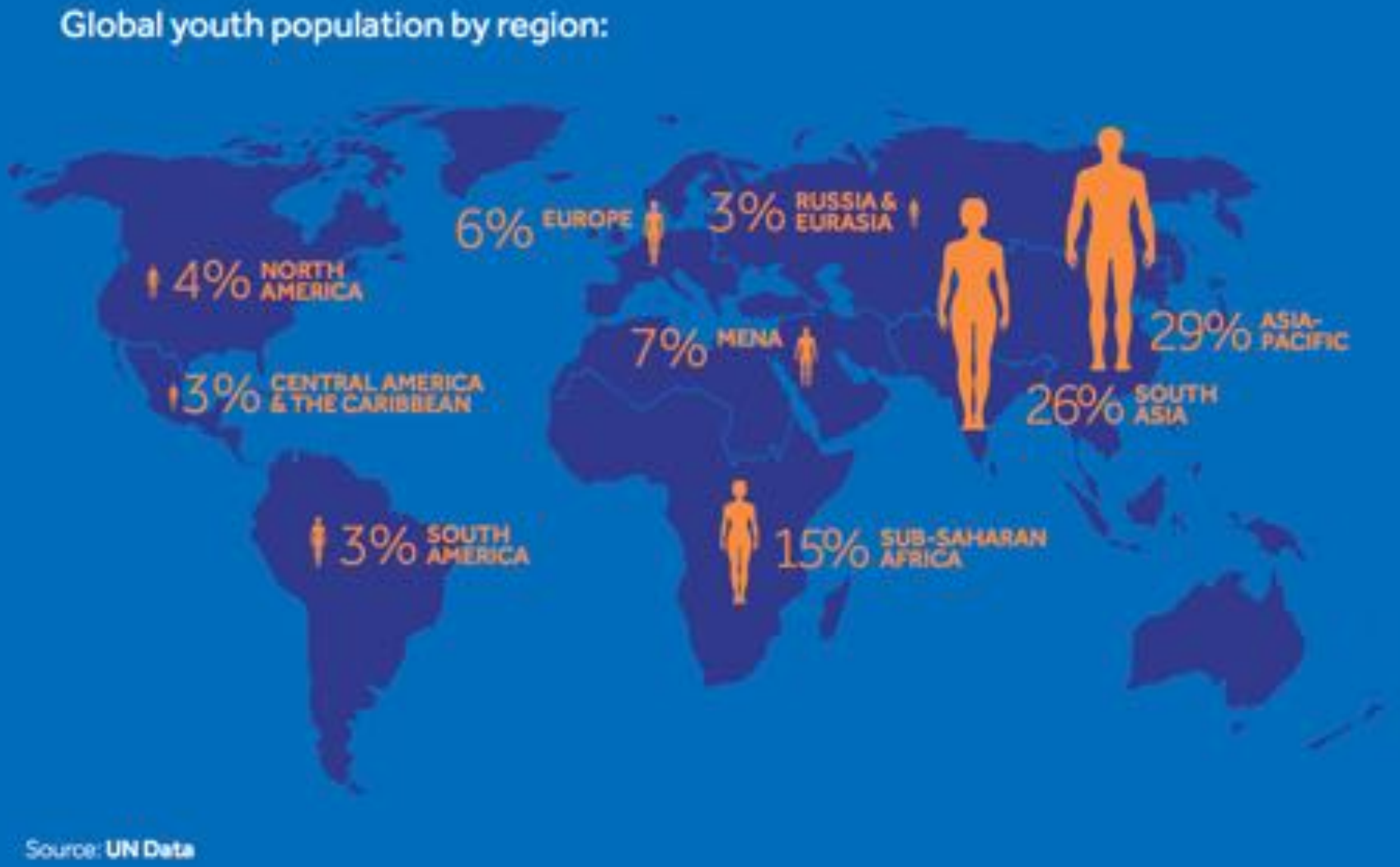
FBK CREATE-NET

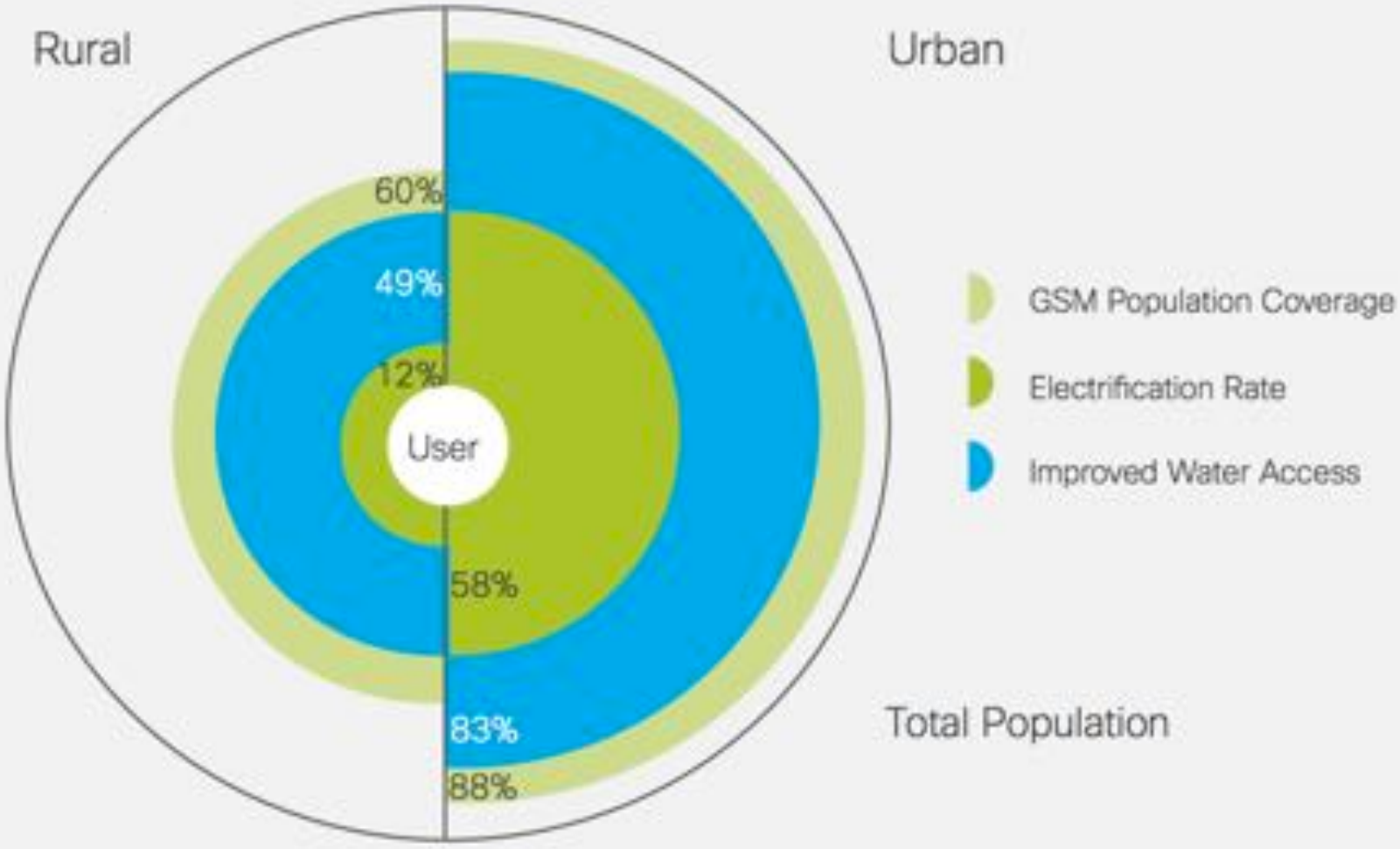
IoT transition from industrial to developing and emerging market

Total world population 7.4 billion (2017) and 70-80% people living in the developing and emerging countries

https://en.wikipedia.org/wiki/Developing_country

…the driver of the digital transformation





60%

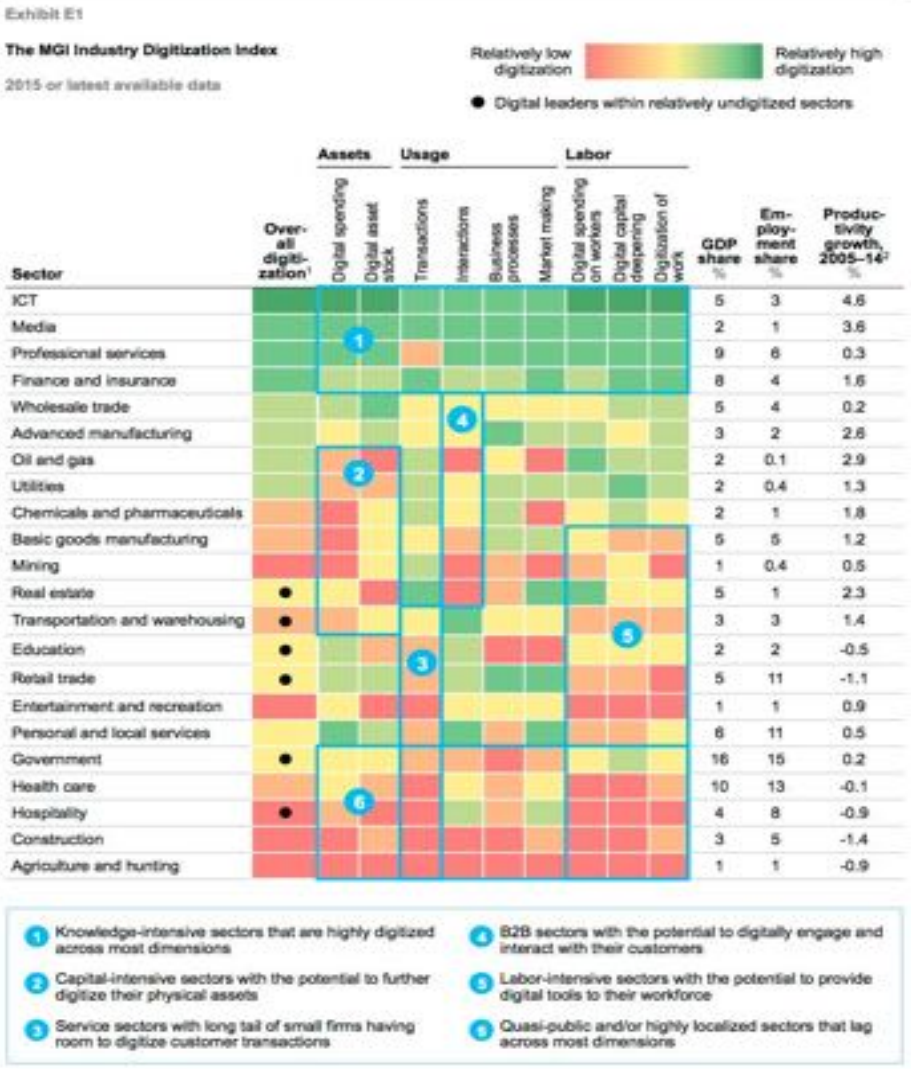
40%

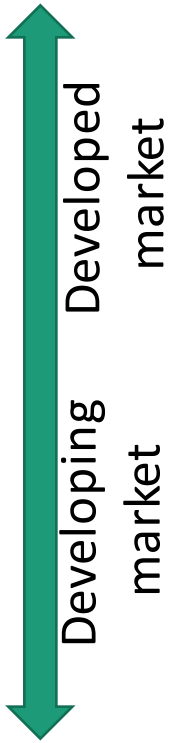
Source: GSMA, "Sustainable Energy & Water Access through M2M Connectivity. http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/Sustainable-Energy-and-Water-Access-through-M2M-Connectivity.pdf.

IoT applications domain in Africa

- **Rural applications**
  - Agriculture and weather
  - Cattle firms
  - Fish farming
  - Logistic and storage
  - Remote health
- **Urban applications**
  - Traffic and transportation
  - City lighting/energy saving
  - Urban agriculture-promote
  - Air quality

Digitalization in developing countries





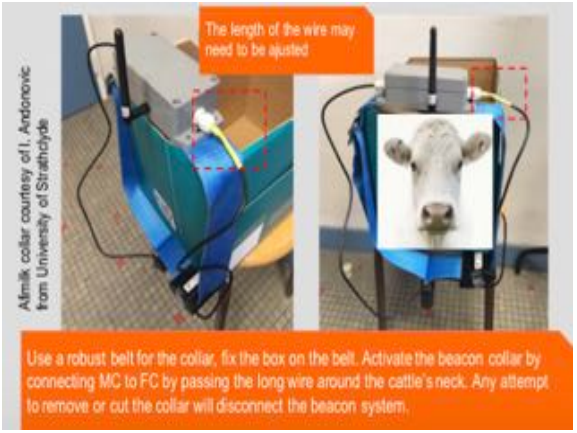
Developing countries as well as their main economical sector are less digitalized

WAZIUP Open IoT and Big data platform for Africans, by Africans

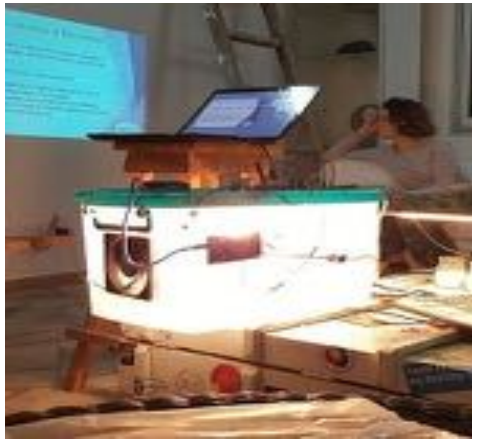
www.waziup.eu
Waziup IoT
Waziup IoT
Waziup
Waziup

wazlup.community@create-net.org

Getting ready to adapt IoT for the daily lives and business operations



Cattle rustling
Senegal



Incubateur Connecté
Benin

ElevUp

African IoT entrepreneurs

Urbanatic
Togo

Fish farming
Ghana

Urban waste
Togo

IoT product made in Africa

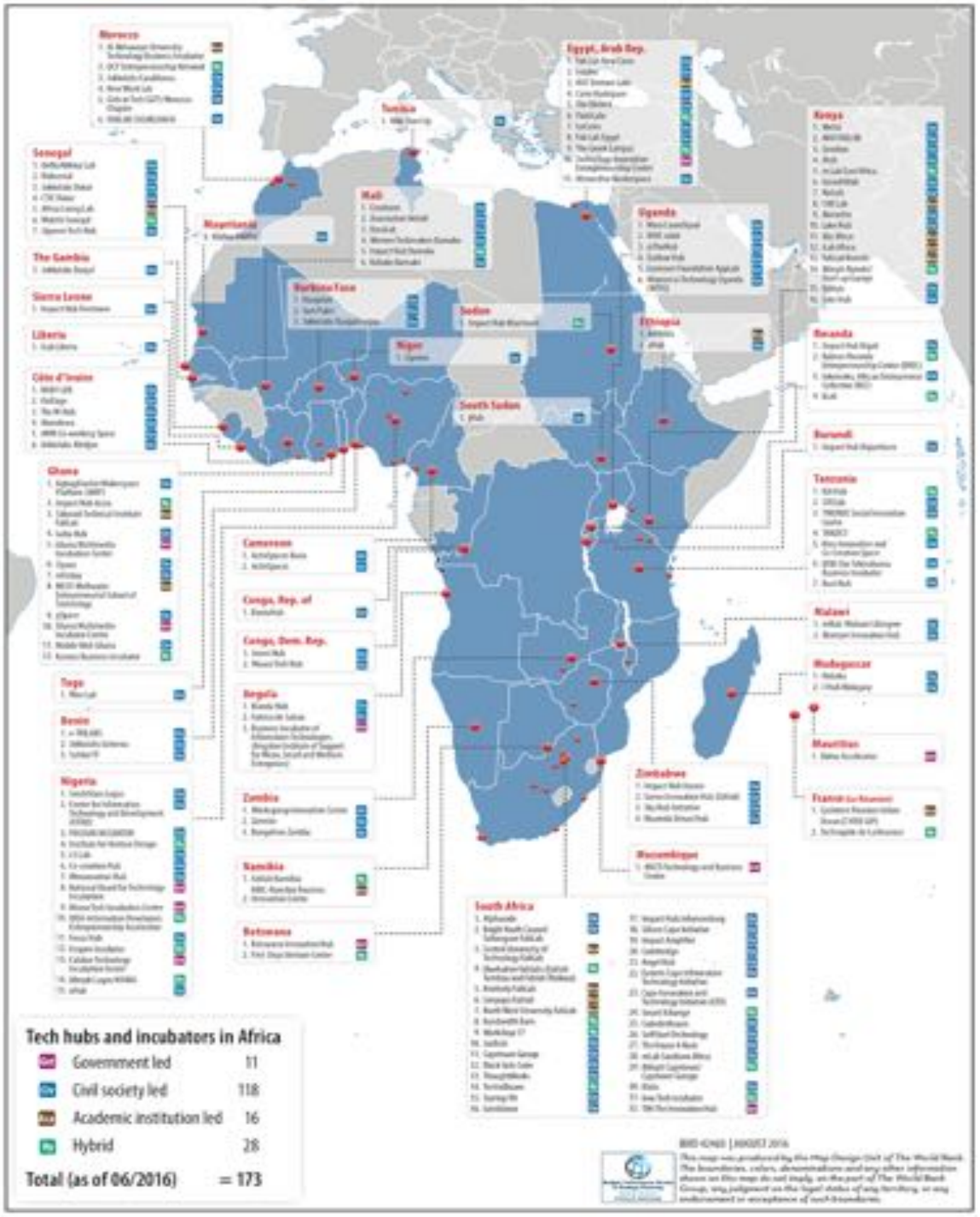
.. not for African but with African

Vision to redesign homegrown cost-effective alternative

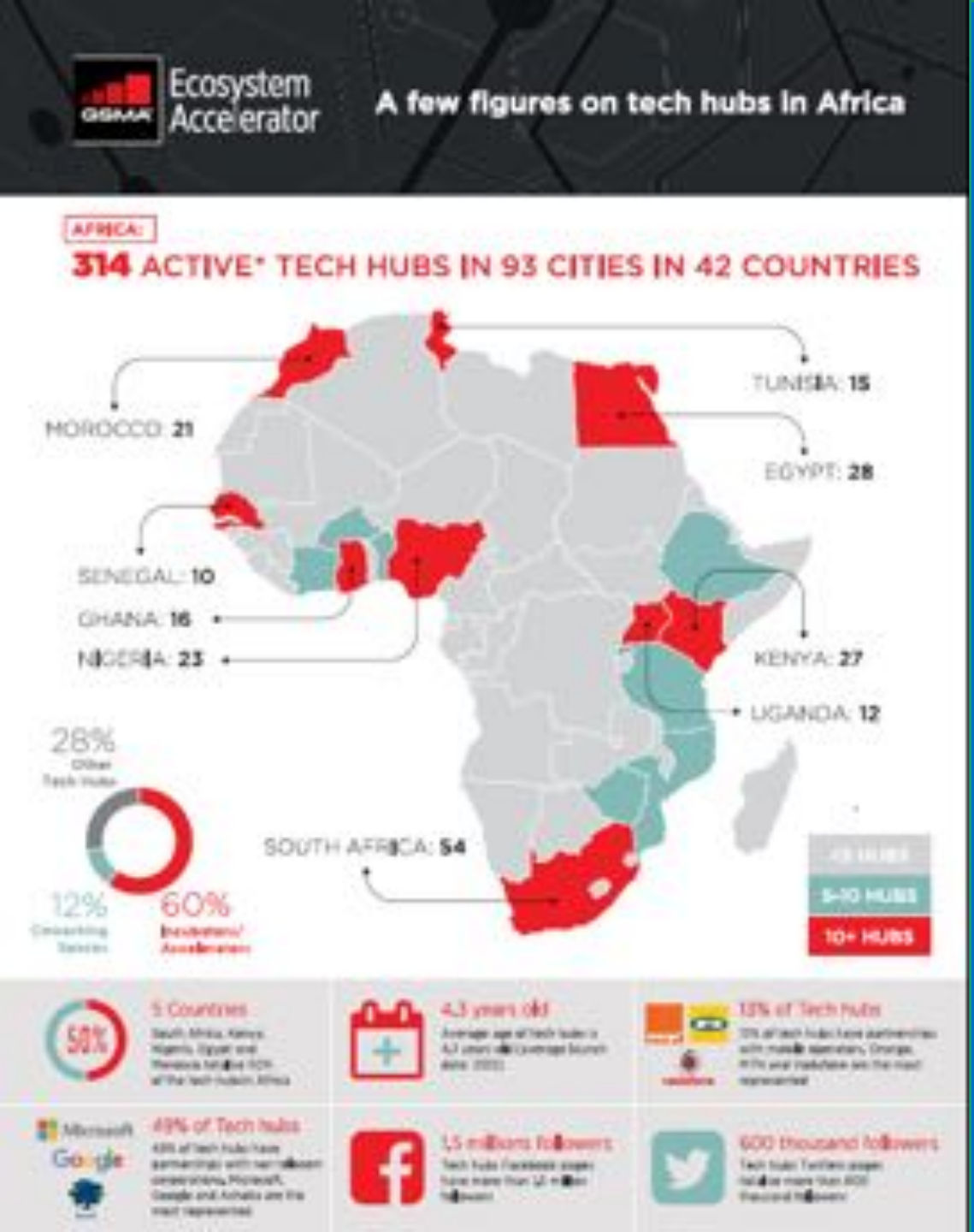
Local innovation hubs are the main driver of IoT innovation

Fablab in Lome

HubCité:
Fablab replication on all the city



Tech hubs and incubator are springing up across Africa, a source of local innovation



With the rise of tech hubs, African are coming together to collaborate to develop and prototype the ideas

Pan African IoT local hub

To empower African IoT innovation ***"Made in Africa" and "by Africa"*** *through IoT service creation and business transformation in the African local value-added setting by creating an IoT OpenHUB for local adaptation*

To offer the better accessibility of IoT to hub distributed across the countries and region

IoT catalyst for local hub

Accessibility of the IoT low cost and easy to deployment technologies for African innovation users

Accessibility of process for IoT start-up creation and acceleration for African innovation users

Accessibility of partnership for sustainability and growth-hacking for the African innovation users

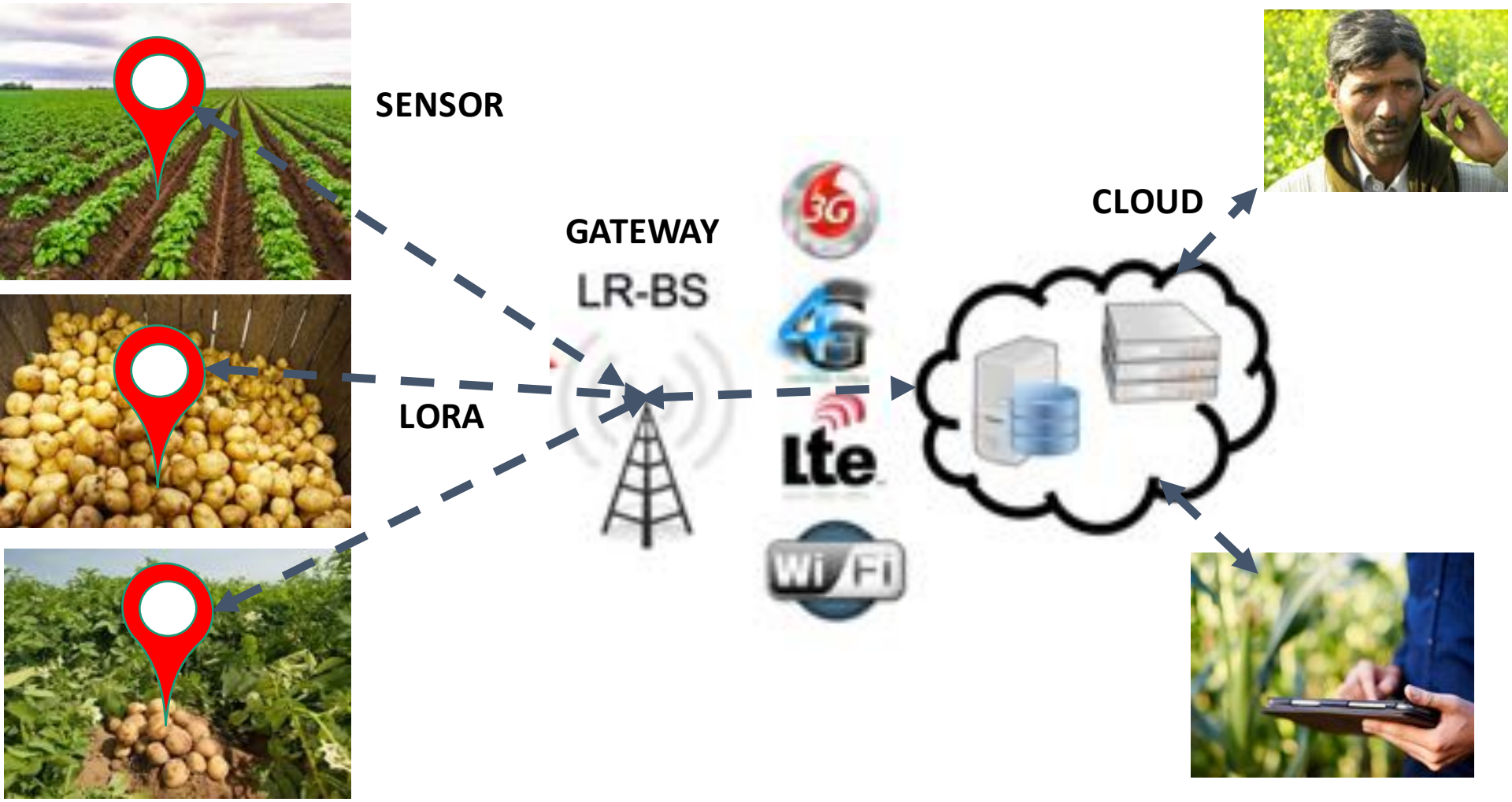
Technology Support: "Out-of-Box" LoRa IoT development kit including SDK. The kit will cost maximum 100 Euro and offer all the features to develop IoT sensor application

Accelerator: Accelerator programs for technical and business capacity building through training, seminars and workshops

Sustainability: Foster the creation of local IoT ecosystems. The ecosystem will include major users and actors from various disciplines, including those with industry backgrounds.

Framework for IoT local adaptation

System overview



Need for Specialized IoT solutions

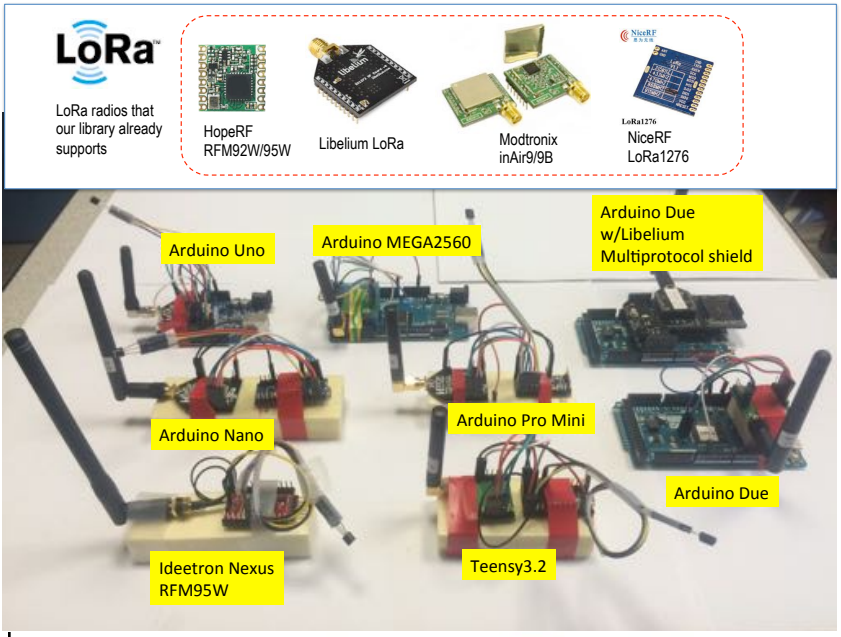
- To addresses fundamental problems
  - ✓ Internet and network connectivity,
  - ✓ Cost of solutions,
  - ✓ Simplicity and robustness in terms of deployment and operation,
  - ✓ User-centric design for notification (SMSs, voice, WhatsApp and Facebook)
  - ✓ Local language

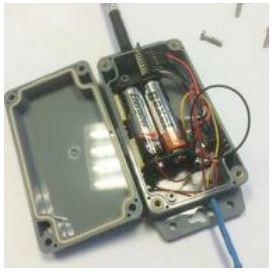
Accessibility of IoT LoRA prototyping

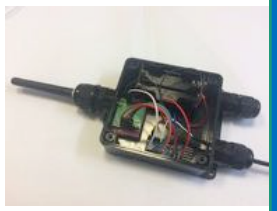
IoT LORA development kit

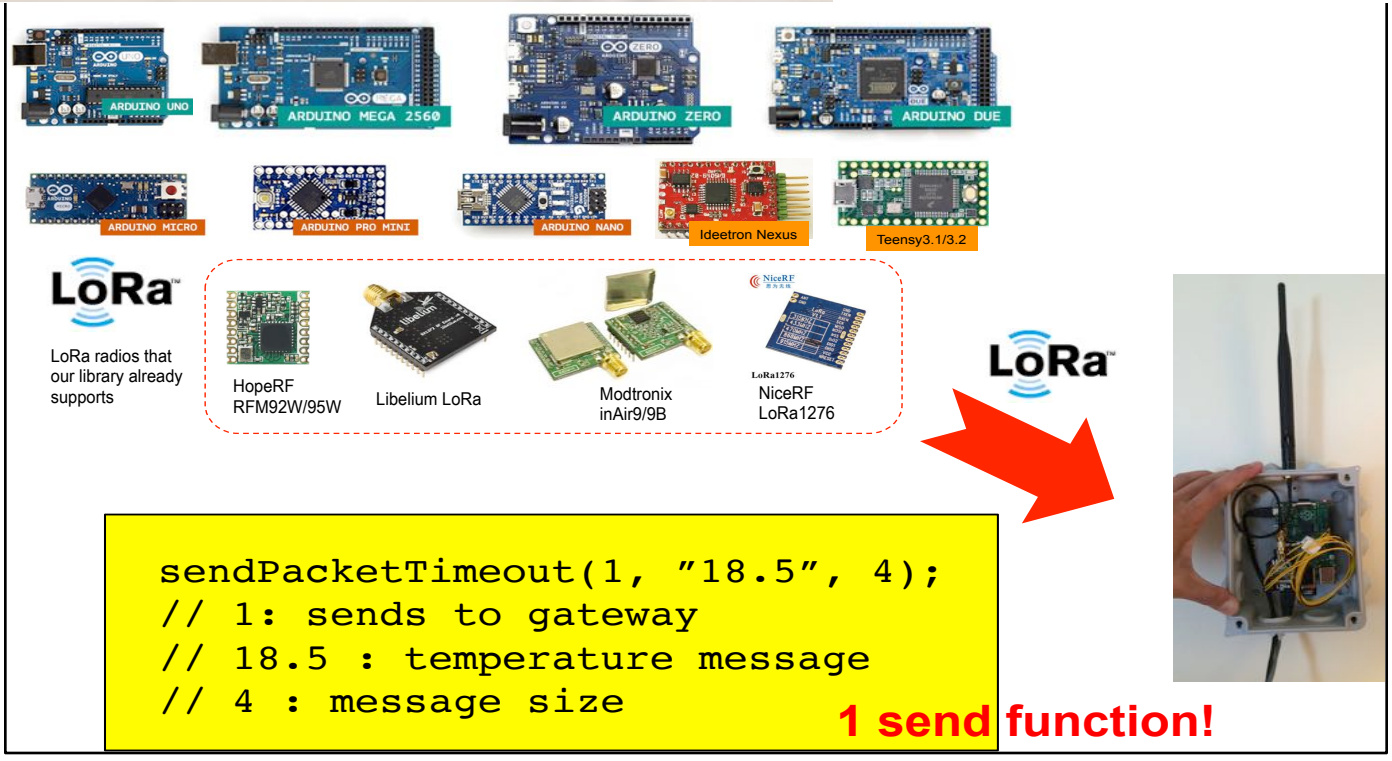
do it YOURSELF

Sensor node design:
DIY
IoT sensors
nodes





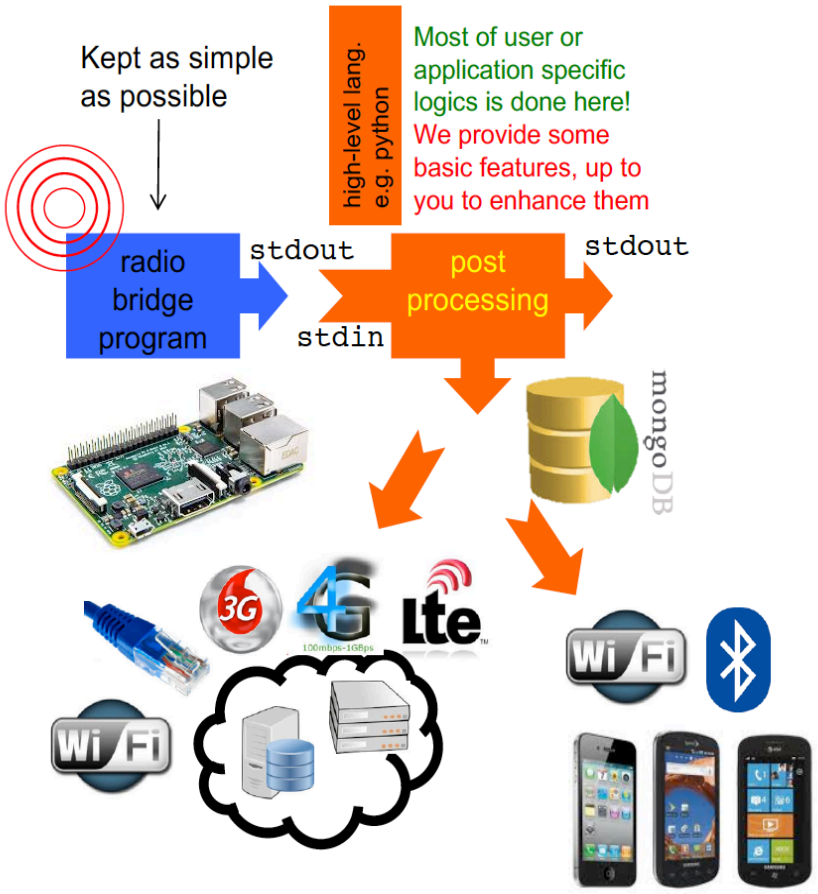


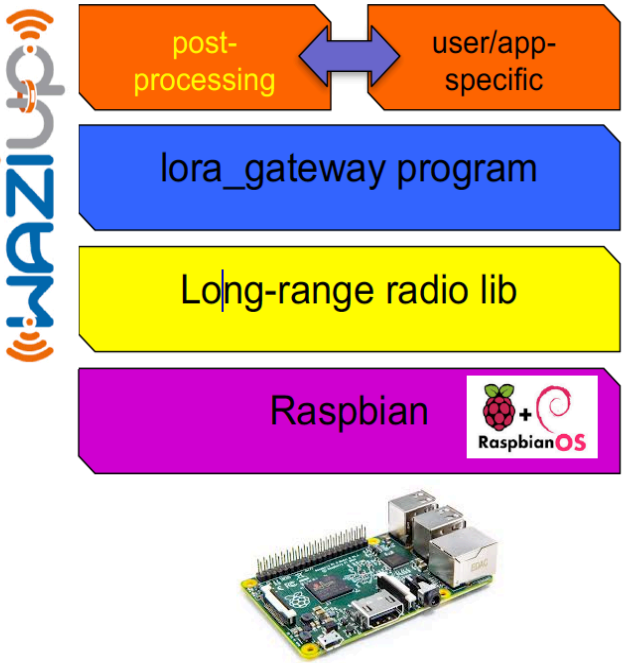



```
sendPacketTimeout(1, "18.5", 4);
// 1: sends to gateway
// 18.5 : temperature message
// 4 : message size
```

1 send function!

LoRa Gateway design



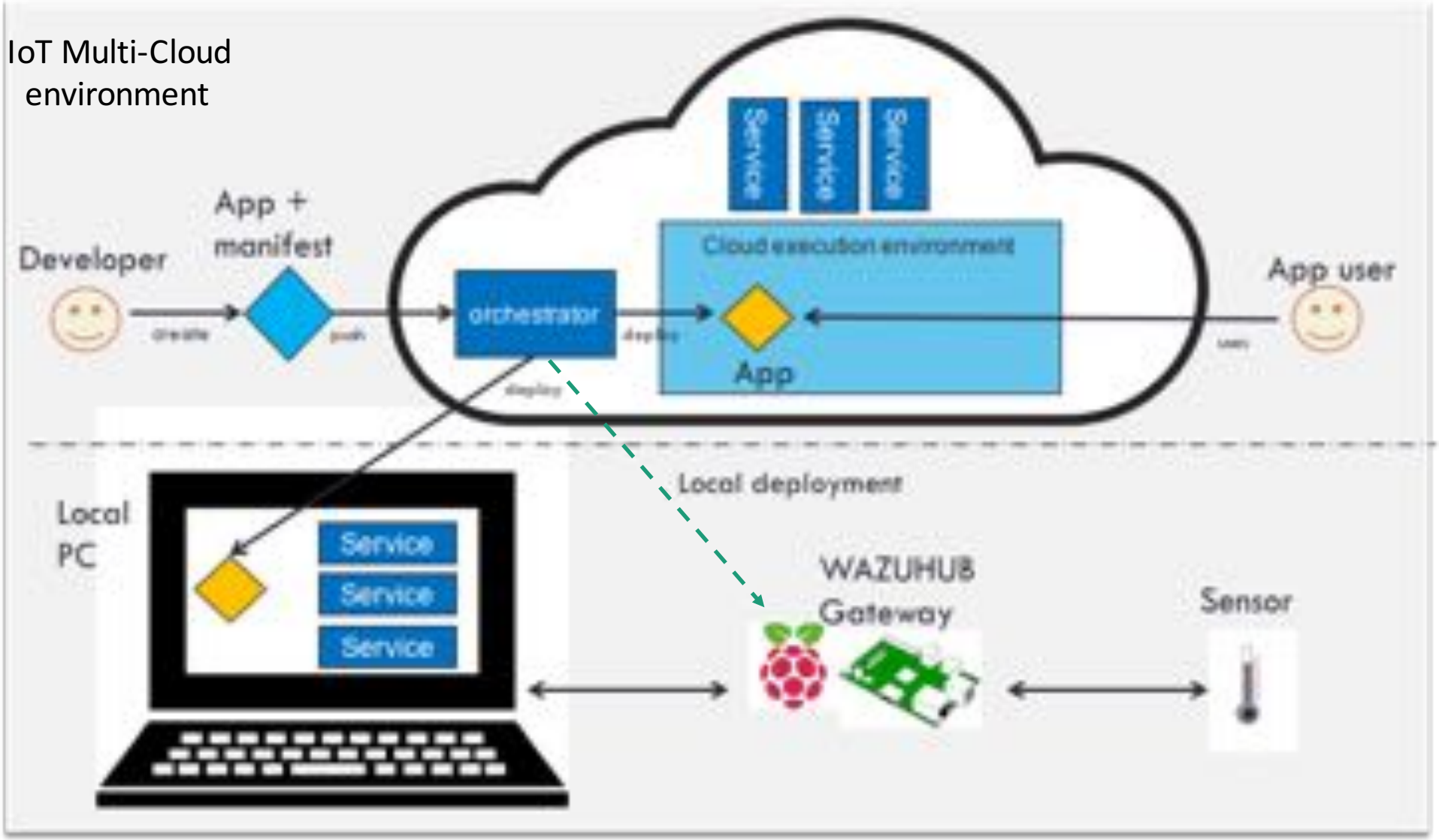


The Gateway collects the data from the sensors and push it to the Cloud

IoT cloud platform

WAZIUP platform (www.waziup.io) and all the source code in Github, https://github.com/Waziup

Multi-cloud environment



IoT smart village model

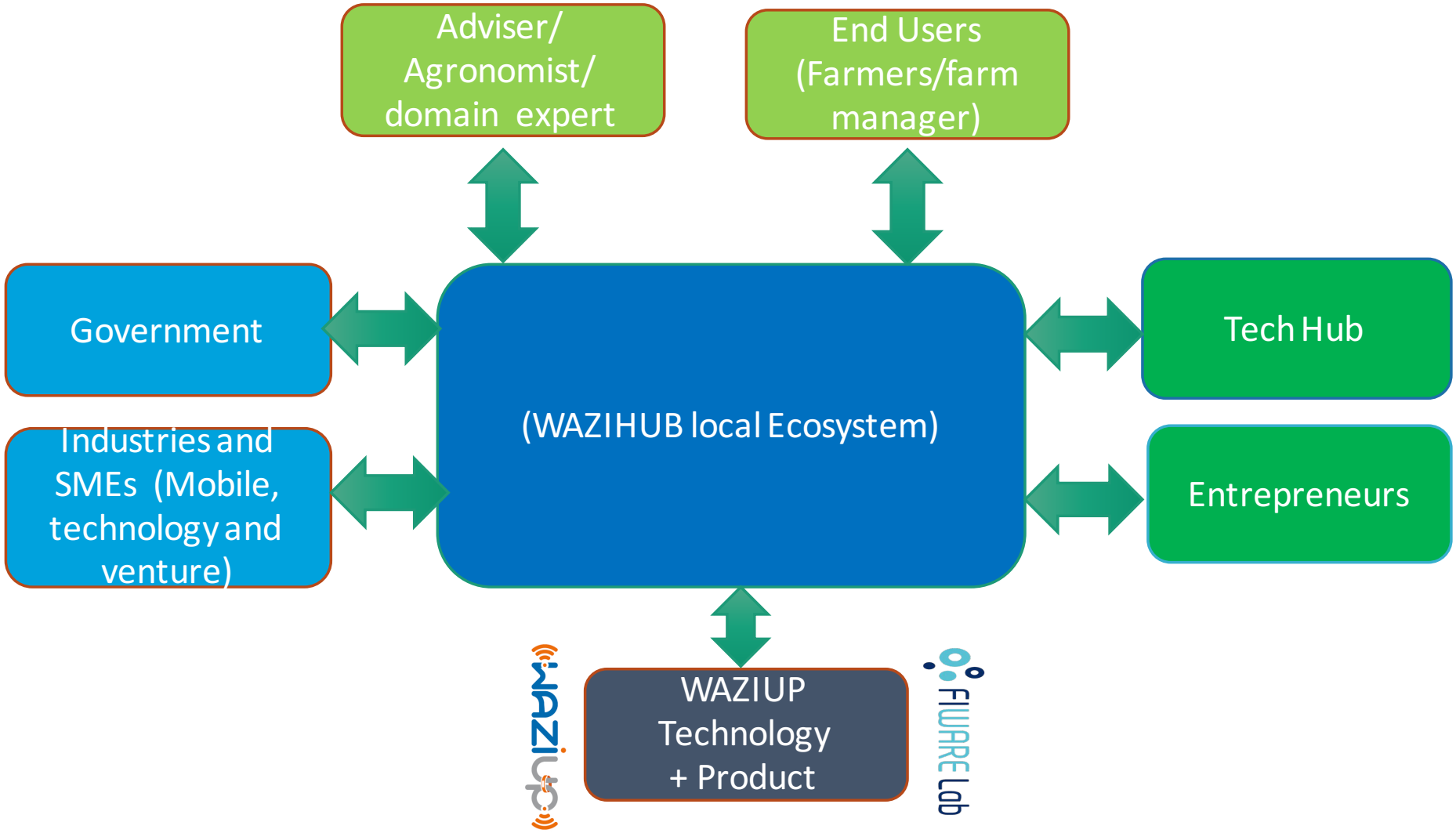
Large-Scale real-life testing infrastructure

A reference IoT smart village models in Senegal

Accessibility Innovation process

Sustainability of the start-up and hub

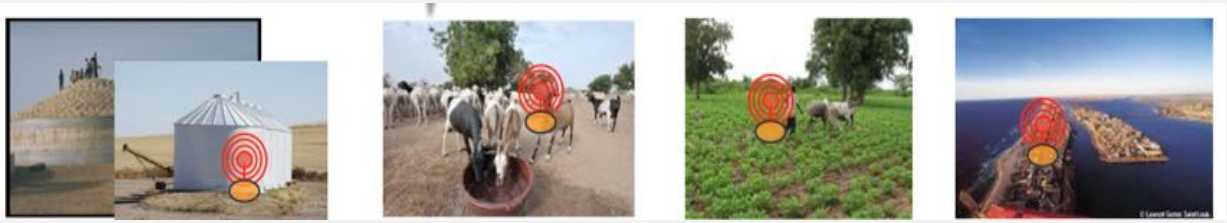
Ecosystem for sustainability



Market penetration

Shared market plans

Start-up and service creation shared by HUBs



Creation of start-ups in agriculture, health, transportation, livestock, environment domain

Common market plans

Connected with entrepreneurs, SMEs and industries

Core technology

Development kit | *IoT Smart Village* | *Multi-Cloud platform* | *Open IoT Data*

Connected with other hubs

Adaptation and available in local IoT Ecosystem Local Hub

Engagement and community building

- Social media
- Local events
- Tools

Accelerator

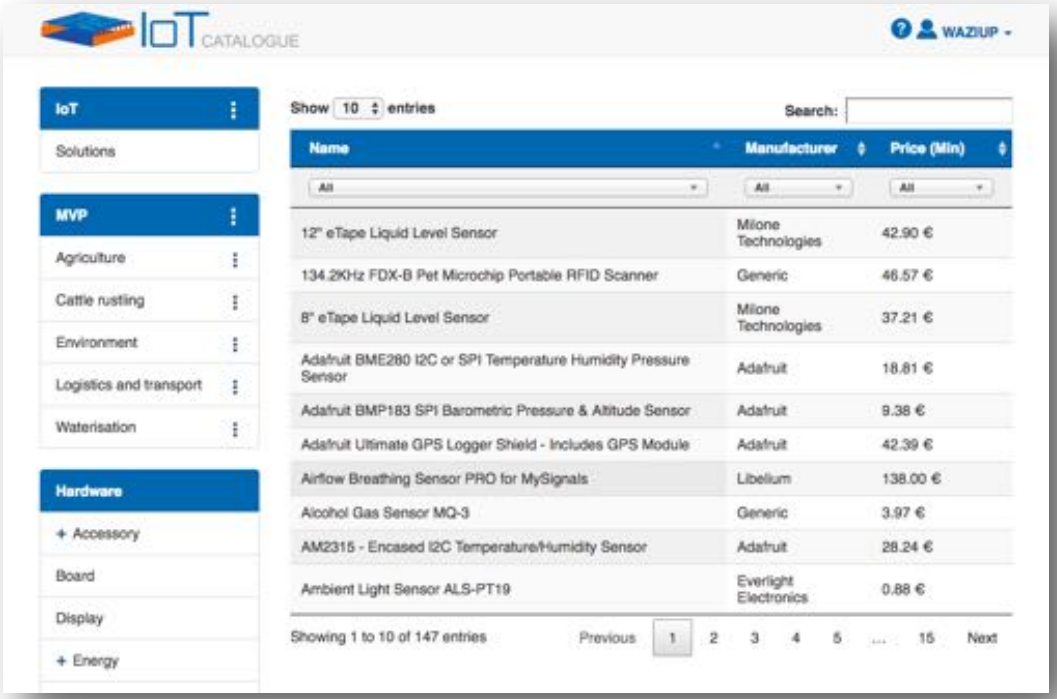
Leading IoT start-up program in Africa

WAZIbase

Rich IoT African database

dream café

IoT Catalogue- selecting the hardware



- **IoT Catalogue:**
  - Lists available sensors for each specific domain
  - Provide price information so that a low cost solution can be achieved
  - Provide detailed information of the sensors interfaces to prevent interoperability issues form occurring in WAZIUP hardware solutions

https://iot-catalogue.unparallel.pt/waziu

Find IoT information with WAZIBase

IoT SOLUTIONS

Market Segments: Close

- Agriculture
- Transportation
- Environment
- Healthcare
- General IoT

Types of Solutions: Open

- Hardware components
- Software component
- Services
- Systems
- Complete IoT Solutions

Ecosystem STAKEHOLDERS

Market Segments: Close

- Agriculture
- Transportation
- Environment
- Healthcare
- General IoT

By Locations: Open

- West Africa: Ghana, Senegal, Nigeria, Togo, Benin, Burkina Faso
- East Africa: Kenya, Rwanda, Uganda, Tanzania
- Southern Africa: Namibia, South Africa

A rich IoT information directory for the Africa.

(Find and build your own innovative solutions.)

WAZIHack- an event for enterpreners

Dream café

- Orange digital café is a community platform on which online qualitative studies are realized with real end-users
  - ✓efficiently collect users 'needs (SMES, startups, etc.)
  - ✓test mock-ups and prototypes & get feedback
  - ✓give orientations to development choices
  - ✓test usages opportunities & scenarios
- 5 steps process:

Interne Orange

orange™

We vision for the IoT local Adaptation

Made in Africa

Co-working with hubs and entrepreneurs

Thanks.

Let's make it happen

Dr.-Ing. Abdur Rahim

Project co-ordinator

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