IoT for the developing countries from research to business transformation

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Open IoT
FBK CREATE-NET
IoT is not the story only for the industrialized countries

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

...the driver of the digital transformation

Global youth population by region:

- **North America**: 4%
- **Central America & the Caribbean**: 3%
- **South America**: 3%
- **Europe**: 6%
- **Russia & Eurasia**: 3%
- **MENA**: 7%
- **Sub-Saharan Africa**: 15%
- **Asia-Pacific**: 29%
- **South Asia**: 26%

Source: UN Data
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

Affordable technologies to empower rural economics

Exploit advanced research capitalizing on IoT and Big data state-of-the-art findings

Develop IoT solutions and applications meeting African needs

www.wazipur.eu

Waziup IoT

waziup.community@create-net.org
Getting ready to adapt IoT for the daily lives and business operations
African IoT entrepreneurs

Cattle rustling
Senegal

Incubateur Connecté
Benin

ElevUp

Urbanatic
Togo

Fish farming
Ghana

Urban waste
Togo
IoT product made in Africa

Local adaptation addressing the local problems and needs
.. not for African but with African

Vision to redesign homegrown cost-effective alternative
Local innovation hubs are the main driver of IoT innovation
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

WAZIHUB IoT Smart village in Senegal

WAZIHUB IoT Global Cloud (FIWARE node in Senegal/Public cloud)

WAZIHUB applications

WAZIHUB Local IoT Cloud in Hubs

BUNI@Tanzania  KumasiHIVE@Ghana  HIVE@Uganda  WITU@Uganda
System overview
Need for Specialized IoT solutions

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

1 send function!
LoRa Gateway design

Kept as simple as possible

high-level lang., e.g. python

Most of user or application specific logics is done here! We provide some basic features, up to you to enhance them

radio bridge program

post processing

stdout

stdin

post-processing

lora_gateway program

LoRa-range radio lib

Raspbian

mongoDB

3G
4G
LTE

Wi-Fi

Bluetooth

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 Multi-Cloud environment
IoT smart village model

Large-Scale real-life testing infrastructure

A reference IoT smart village models in Senegal
Accessibility Innovation process

1. Selection and showcase of IoT entrepreneurs
2. Training and development of IoT entrepreneurs
3. Co-design and development of high potential IoT products and services
4. Piloting and testing service in large scale smart village infrastructure
5. Growth hacking and unlocking finance for IoT entrepreneurs
6. Strengthen network of IoT collaborators in Africa and the developing world
Sustainability of the start-up and hub

IoT is not the story only for the industrialized countries
Ecosystem for sustainability

(WAZIHUB local Ecosystem)

- Adviser/Agronomist/domain expert
- End Users (Farmers/farm manager)
- Government
- Tech Hub
- Entrepreneurs
- Industries and SMEs (Mobile, technology and venture)
- WAZIUP Technology + Product
Market penetration

Shared market plans

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

Adaptation and available in local IoT Ecosystem

Local Hub

Start-up and service creation shared by HUBs

Connected with other hubs
Engagement and community building

- Social media
- Local events
- Tools

Accelerator
Leading IoT start-up program in Africa

WAZIbase
Rich IoT African database

dream café

WAZiHack
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

[IoT Catalogue](https://iot-catalogue.unparallel.pt/waziup)
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 entrepreneurs

Do More With Less
LOW-COST
LONG-RANGE
IoT to
EMPOWER
RURAL ECONOMIES

14 & 15 Décembre
Hôtel de Ville de Dakar
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:
We vision for the IoT local Adaptation

Made in Africa

Co-working with hubs and entrepreneurs
Thanks.

Let’s make it happen

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