

Innovation systems readiness for I4.0 in Sub-Saharan Africa

Dr Mafini DOSSO

***HIGH LEVEL SEGMENT : AFRICA IN A KNOWLEDGE-BASED ECONOMY:
CHALLENGES AND OPPORTUNITIES IN THE 4TH INDUSTRIAL REVOLUTION***

***WAO Conference on Intellectual Property (IP), Innovation and Value Addition
for Business Competitiveness and Sustainable Development in Africa***



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OUTLINE

INDUSTRY 4.0

1. Industrial Properties 4.0 (patents & trademarks)
2. Innovation systems readiness for I4.0 : challenges for Policy & MSMEs in Africa
3. Further perspectives: IP, Sustainability & African Innovation (eco)Systems in I4.0 era

INDUSRTY 4.0 – I4.0 / The Fourth Industrial Revolution (I)

- “...the 3rd production revolution has brought its waves of innovations through a wider penetration of **ICT & automation**, Industry 4.0 is expected to extend, accelerate, connect and scale up these **disruptions & transformations** and to trigger a **wider integration across domains & discoveries.**“ *
- Interactions across the physical, digital and biological spheres (Schwab, 2016)

* **Dosso Mafini (2019) “Technological readiness in Europe: policy perspectives on Industry 4.0.** In *Industry 4.0 and Regional Transformation* edited by D. Bailey & L. De Propriis. Routledge, Taylor & Francis Group.

INDUSRTY 4.0 – I4.0 / The Fourth Industrial Revolution (II)

New & emerging (combinations of) Technologies & materials,
Technology-enhanced processes & systems

– 3D printing, Internet of Things (IoT), Big data & cloud computing, Artificial intelligence (AI), Advanced robotics, Smart factories, Precision farming and agriculture, Fintech, Neurotechnology, Microengineering, Predictive medicine, Synthetic biology, Predictive gene-based healthcare. *

**New
Technologies,
Markets,
Industries**

**New Innovation,
production systems &
(services) Business
models, Supply chains**

**New Societies,
communities, co-
creation/knowledge
sharing groups**

**New policy
(learning),
regulatory
approaches**

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2. Innovation systems readiness for I4.0: Policy & MSMEs
3. Further perspectives

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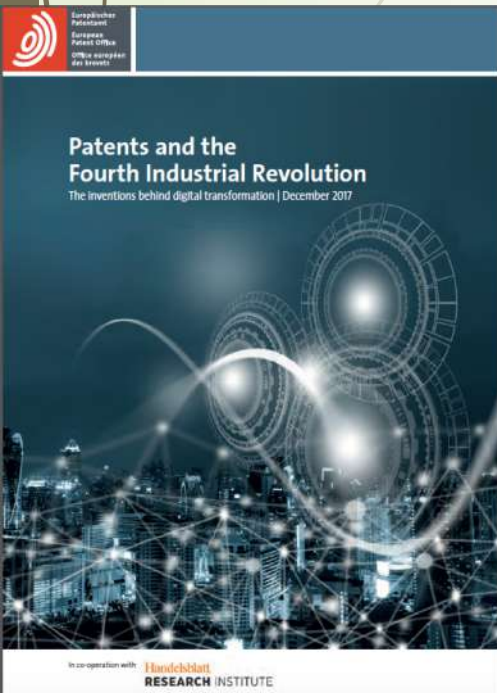
Industrial Properties in Industry 4.0 era (1/3)

- **Patents for Inventions 4.0 ?**
– *patent/ technological classes*

- **Core technologies :**
Hardware, Software and Connectivity
- **Enabling technologies :**
Analytics, Security, Artificial intelligence, Position determination, Power supply, 3D system, User interfaces



- **Application domains :** Home, Personal, Enterprise, Manufacturing, Infrastructure, Vehicles

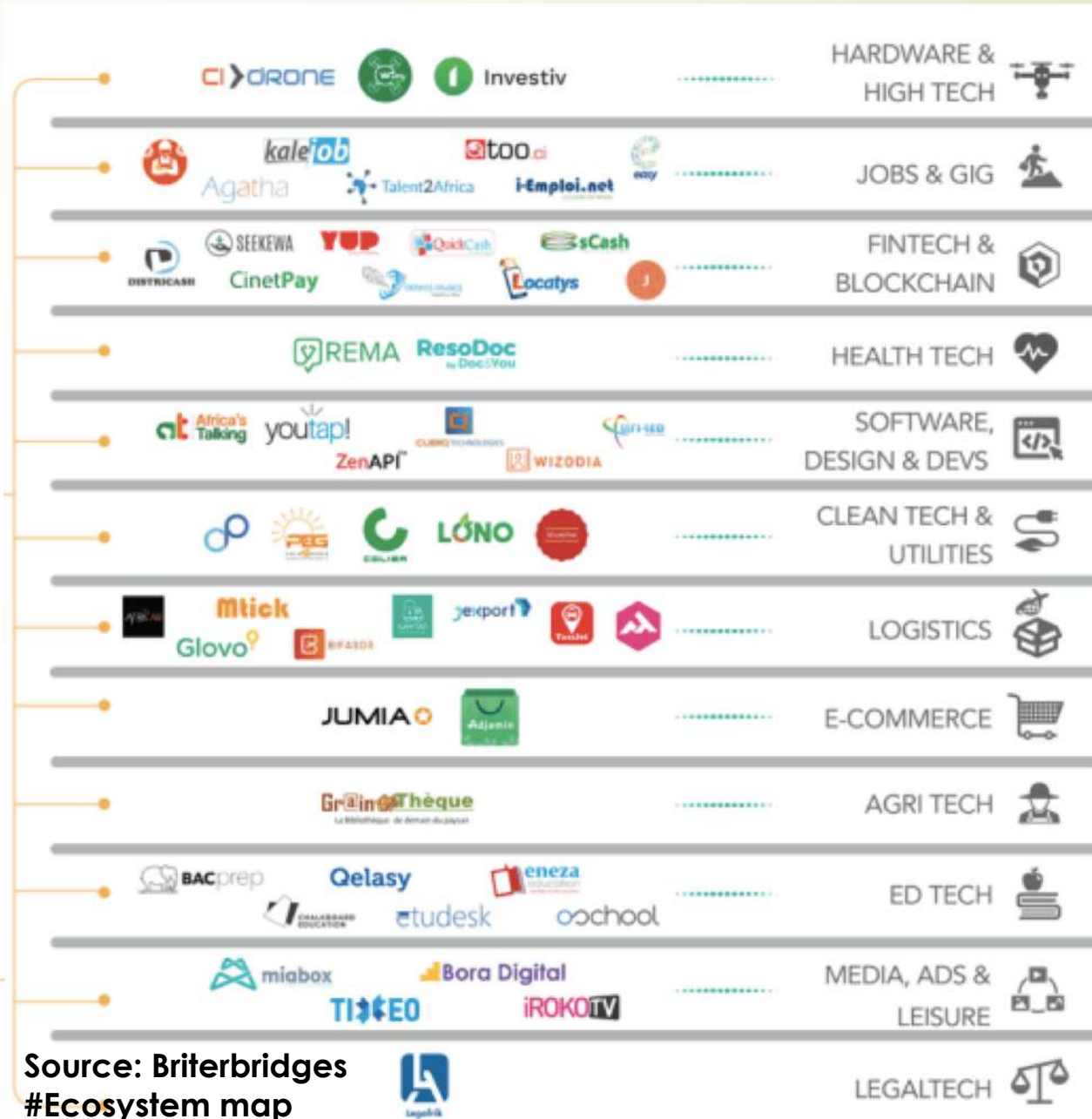


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Industrial Properties in Industry 4.0 era (2/3)

Trademarks and Brands 4.0

- Goods and services differentiation
- Reputational assets & Market strategies
- Capabilities for commercialization, marketing, promotion/intangibles investments



Source: Briterbridges
#Ecosystem map

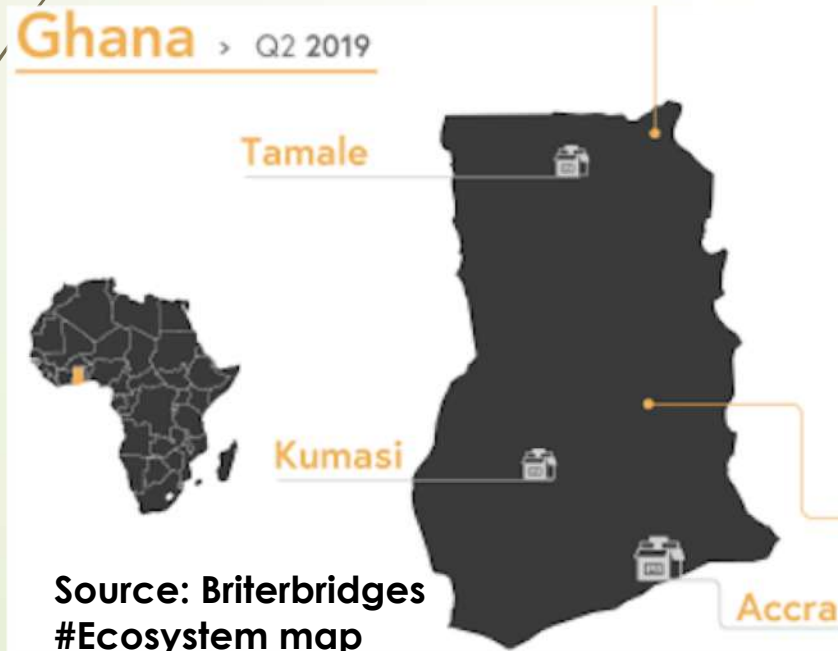


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Industrial Properties in Industry 4.0 era (3/3)

Trademarks and Brands 4.0

- Goods and services differentiation
- Reputational assets & Market strategies
- Capabilities for commercialization, marketing, promotion/intangibles investments



2. Innovation systems readiness for I4.0 in Africa : **challenges for Policy & MSMEs**

Innovation (eco)systems readiness for I4.0 (1/6)

Western Africa

➤ Innovation Policy readiness for I4.0

1. Society, Environment challenges
2. Manufacturing, Agricultural, Extractive industries
3. Innovation diffusion & Infrastructure



4. Business models & work org.
5. Education and Skills (STEM and “power” skills)

Rating

- SDG achieved
- Challenges remain
- Significant challenges remain
- Major challenges remain
- [information unavailable]

Source: Africa SDG Index and Dashboards Report 2019
https://sdgcafrica.org/wp-content/uploads/2019/06/SDGS_INDEX_REPORT_2019WEB.pdf

Innovation (eco) systems readiness for I4.0 (2/6)

➔ Innovation Policy readiness for I4.0:

6. PPP for **critical mass** & synergies

7. Standards & **Interoperability**

8. (timely) **Regulation** (mobile money trans.)

9. Tax policies (**DRM**)

10. Data **privacy** and ownership, Digital lending issues vs. financial inclusion (**ethics**)

Southern Africa



Rating

- SDG achieved
- Challenges remain
- Significant challenges remain
- Major challenges remain
- [information unavailable]

Source: Africa SDG Index and Dashboards Report 2019
https://sdgcafrica.org/wp-content/uploads/2019/06/SDGS_INDEX_REPORT_2019WEB.pdf

Innovation (eco) systems readiness for I4.0 (3/6)

MSMEs readiness for Industry 4.0 : opportunities & challenges

Innovation opportunities in I4.0 <i>(examples)</i>	Innovation challenges in I4.0 <i>(examples)</i>
Traceability and Product customization,	Awareness, Technology literacy
Maintenance and (agricultural) Logistics/ Supply chains	Funding and (connectivity) Infrastructure
Reduce participation in hazardous processes and Energy costs	Knowledge & Technology diffusion
Broader markets and Integration into regional and global value chains	Technology watch and Market intelligence
	Sharing practices & Knowledge sharing (social/cultural barriers)

Innovation (eco) systems readiness for I4.0 (4/6)

MSMEs readiness for Industry 4.0 : IP challenges*

- ➔ Lack of understanding of IP protection
- ➔ Fear of IP theft, Trade secrets can be preferred
- ➔ Scarcity of IP law specialists
- ➔ Cost (vs returns) of IP

* Insights from Daniels C., Dosso M., Amadi-Echendu J. (eds., forthcoming 2020), **Handbook of Entrepreneurship, Technology Commercialization & Innovation**, Springer Nature (16 chap.)

Innovation (eco) systems readiness for I4.0 (5/6): case studies* - Views sharing from West Africa

Ovillage (Tech Hub) Côte d'Ivoire: challenges for tech. commercialization

- Digital literacy
- Acceptation of digital products/services prices by local customers
- Continuity of Policy Leadership and Commitment

Mr. Cyriac Gbogou, Chief Innovation Officer and co-Founder

* Special Chapter in Daniels C., Dosso M., Amadi-Echendu J. (eds., forthcoming 2020), **Handbook of Entrepreneurship, Technology Commercialization & Innovation policy**, Springer Nature (16 chap.)



Télétravail
Afriworkers



Philosophie du Libre
Communauté des Logiciels Libres



Cartographies librement nos territoires
Openstreetmap Côte d'Ivoire



Production collaborative de savoirs
Wikimedia Community User Group Côte d'Ivoire



Innovation (eco) systems readiness for I4.0 (6/6): case studies* - Views from West Africa

OUAGALAB (FabLab) – Burkina Faso: ecosystem challenges

- Offline access to education contents
- Interoperability Payment systems (& links to web-platforms)
- Intra-sectoral networking (entrepreneurs)
- Learning by failing

Mr. Guiella Gildas, President and Founder

* Special Chapter in Daniels C., Dosso M., Amadi-Echendu J. (eds., forthcoming 2020), *Handbook of Entrepreneurship, Technology Commercialization & Innovation policy*, Springer Nature (16 chap.)



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3. Further perspectives: IP, Sustainability & African Innovations (eco)systems in I4.0

Further perspectives (I)

- **Intermediaries and Stakeholders readiness/awareness for I4.0**
 - Universities and Research centres: infrastructure, knowledge access, computational and modelling capabilities; etc.
 - Administrations local & national : holistic policy approach, collection & analytical capabilities (skills and infrastructure)
 - Association and Chambers of Commerce
 - Users – citizens and businesses - *User-Producer*
- **Demand effects of I4.0 in (urban) Africa:** customization, access to products & services/ information, predictive consumers behaviours, informal sector, etc.

Further perspectives (II)

- **IP enforcement in I4.0 and Sustainability in Africa:** potential tensions or contentious areas ?
 - Informal sector (innovation) ([see Open AIR collaborative network](#))
 - Makerspaces, Indigenous and local entrepreneurs ([see Open AIR collaborative network](#))
 - Traditional Knowledge and Innovation (Kaboré F., Dosso M. and Muchie M. (December 2019) **“Innovation for Sustainable Development in Sub-Saharan Africa: multi-sectoral perspectives”** *Special Issue in African Journal of STI and Development* [TREE for Africa conference](#))

Thank You For Your Attention



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