"ARTIFICIAL INTELLIGENCE, META-DATA AND DEVELOPMENT OF DIGITAL ECONOMY: CHALLENGES AND PROSPECTS FOR THE SUB REGION"

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Agenda:

- Artificial Intelligence
  - *Some applications and challenges*
- Meta/Big-Data
  - *Some applications and challenges*
- Prospects on development of digital economy for the sub-region
- Some recommendations

Artificial Intelligence (AI)

- Artificial intelligence (branch of computer science) is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals.
- For the purpose of this presentation we will talk more about **Machine Learning (ML)** *which is a type of AI whereby a computer programme is able to improve its performance at a given task through repeated iterations*
- ML was first introduced in late 1950s via two AI approaches; *microworlds* & *expert systems* which did not achieve much.
- Development of super processing power of machines, their interconnectedness and better algorithms from the 1990s has given new life to ML and attracted high investments

Artificial Intelligence (AI)

AlphaZero AI beats champion chess program after teaching itself in four hours

Google's artificial intelligence sibling DeepMind repurposes Go-playing AI to conquer chess and shogi without aid of human knowledge

▲ AlphaZero's victory is just the latest in a series of computer triumphs over human players since Computer programs have been able to beat the best IBM's Deep Blue defeated Garry Kasparov in 1997. Photograph: 18percentgrey / Alamy/Alamy

Artificial Intelligence (AI) …

- **Supervised ML** uses labelled datasets to develop models that can accurately predict a pre-defined outcome
- **Unsupervised ML** explores unlabelled data to infer patterns, dependencies and interrelationships
- **ML** works better with very large datasets, it is closely associated with **"big or meta data"**. The exponential growth in generation, transmission and storage of data is a very useful ingredient in AI development and its use cases.
- **Deep Learning** an advanced type of ML is even more promising as it can be used to analyse unstructured data including photos and videos and employs a technique of network of machine learning algorithms.

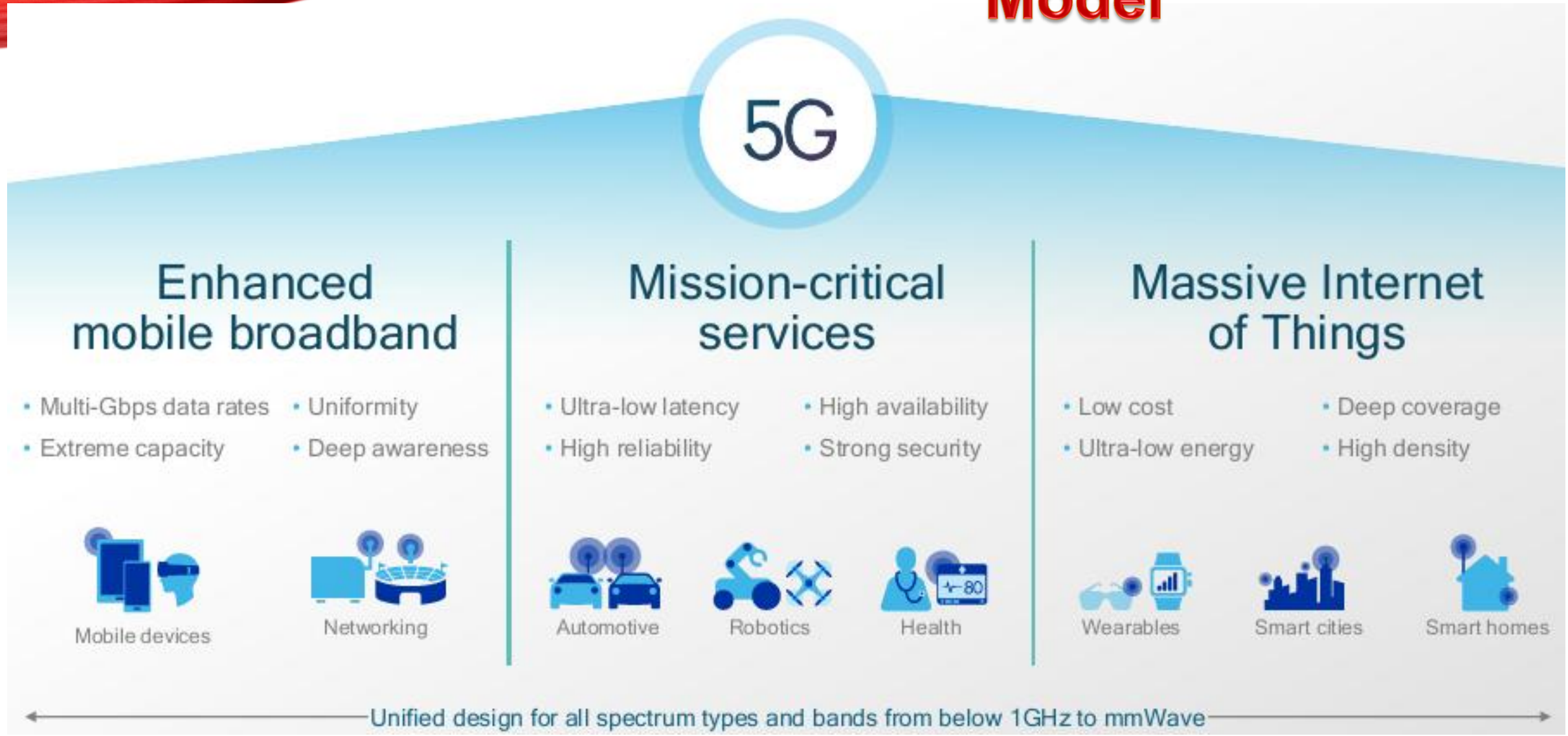
Some ML Applications

- Detect illicit financial transactions: ML can help financial institutions to reduce *false-negatives* and *false-positives* in suspicious activity alerts by developing more accurate models. Banks spend valuable resources investigating suspicious transactions by applying traditional methods that are inherent in biases and can often lead to misleading results.
- Anomaly detection: Unsupervised ML can help governments, financial institutions, manufacturing industries to detect illicit techniques or operations previously unknown to the organisation. *For example, many governments and financial institutions* ***have not been able*** *to fully control money laundering and financing of terrorism because techniques they use turn to be static which criminal techniques evolutive. Machine learning is evolutive.*

Some ML Applications…

- Know Your Customer (KYC) & Know Your Customer's Customer (KYCC): ML-based cluster analysis can use unsupervised data analytical techniques to better segment clients and counterparties.
    - *Does your phone company, bank or government department apply KYC and/or KYCC on you? What of Google? What of T-mobile?*
- Improve compliance teams' analytical abilities:
    - *Detect fake/counterfeit products especially medicines*

AI Applications…5G business Model



Artificial Intelligence (AI) …

- **Challenges and Limitations:**
  - Despite all impressive strides made in the last 2 decades, AI is still an embryonic technology. Today it is applied in "Narrow and specific scenarios" where each model is trained to carry out specific tasks and each task needs to be trained separately.
    - General AI which would allow computers to learn and make decisions across multiple domains remains out of reach. AI is yet to have a near-human brain!! Mastering tasks that are easy for humans can require millions of data points and a lot of manual training for machines by humans
    - Lack of sufficient data to train machines

Meta or Big data

- These are **big datasets** whose size is beyond the ability of typical database software tools to capture, store, manage and analyse *(Manyika et al. 2011)*.
- Three main characteristics (3Vs):
  - High Volume
  - High velocity
  - High variety
- Big data are raw materials of AI systems and of the whole digital economy. *Google search, Google maps, google docs, Gmail, google….. All for free? …….Google is searching for the 3Vs which can then be mined using AI into finished products for sale (advertisement space, valuable business information [not data], etc)*

Meta or Big data…

- Big data and their business cases or applicability depend on:
  - *Digitalisation of Information*: in 2002 only about 25% of data was digitalised and by 2014, 99.5% of stored data digitalised. Imagine the whole British library digitalised
  - *Capacity to transmit & store*: 1986 – 2014 capacity to store and transmit data increased at compound growth rate of 30% globally; storage capacity grew from 2.6 exabytes to 4.6 zettabytes while capacity to transmit grew from 7.5 petabytes to 25 exabytes (Hilbert, 2015)
  - *Ability to compute and understand information*: 1986 – 2007 compound growth rate for general purpose computation grew by 61% and application-specific computation by 86% (Hilbert & Lopez, 2012)
  - *Providing a work environment for users to view & analyse the data*

Some Meta/Big data applications

- *Financial loans*: the decision to grant or refuse a loan depends on many pieces of information (KYC & KYCC) that are typically not in the same place (*income, other loans, health conditions, non-financial wealth, etc*). The use of data lakes makes it easy and possible to pull all the data together for an informed decision.
- *Police and judiciary investigations*
- *Transparency and anti-corruption*
- *Efficient marketing and customer services*
- *Various regulatory compliance schemes*

Meta or Big data…

- **Challenges and Limitations:**
  - Full exploitation of big data maybe be impeded by regulations that restrict data sharing (*cross-institutional data sharing, cross-border data sharing, privacy and confidentiality laws*, etc)
  - National regulators and international organisations must work together to determine whether local privacy and data protection rules can co-exist with integration of datasets and the creation of data lakes. This may require amendment to certain laws and agreements
  - Too important to fail syndrome: hacking threats, redundancy challenges, constant R&D, etc

Implications of AI and Big data: Prospects for our sub-regional development

- **Trust:** Single main ingredient in every transactional economics and cross-border business. Relies on efficient identification of persons (passports, ID cards, profile) and organisations (quality of goods & services). This is Critical for regional integration.
- **Customs and trading**:
  - *identification management of products (help eliminate fake and counterfeit products)*
  - *Authentication, tax payments*
- **Financial institutions and Governance**:
  - *Fight against money laundering, corruption and the financing of terrorism*

Implications of AI and Big data: Prospects for our sub-regional development…

- *Deployment of Data lakes (data centres) and cross-border telecommunications infrastructure. This may require joint-venturing and the alteration of national laws on data protection and privacy to allow for enhanced sharing without bridge of confidentiality & privacy (ID of persons and companies, car identification, intellectual property, etc)*
- *Investment in capacity building (computer engineering programmes and associated courses)*
- *Increased digitalisation of all data: Economic, cultural & touristic, governance, etc*
- *Coordination and concerted fight against cyber-criminality*

Implications of AI and Big data: Prospects for our sub-regional development…

- **Security:** Big data and AI can significantly enhance intelligence sharing
- **Distributed Ledger Technology (DLT)**: *Advanced database technology which combines the strengths of AI, big data and cryptography are currently driving the blockchain technology and have been applied in the following use cases:*
  - *De-risking of financial transactions, cross-border payments and foreign exchange, securities and loan settlements, and derivatives, inter-bank payments*
  - *Financing of start-ups*
  - *DLT has the added advantage of ensuring immutable, transparent, synchronous and traceable real-time transactions which are critical in today's digital economy. Development. Deployment of Data lakes and cross-border telecommunications infrastructure*

Some Recommendations

- *Deployment of Data lakes (data centres) and cross-border telecommunications infrastructure. This may require joint-venturing and the alteration of national laws on data protection and privacy to allow for enhanced sharing without bridge of confidentiality & privacy (ID of persons and companies, car identification, intellectual property, etc)*
- *Investment in capacity building (computer engineering programmes and associated courses)*
- *Increased digitalisation of all data: Economic, cultural & touristic, government, etc*
- *Coordination and concerted fight against cyber-criminality (African Union institutions?)*
- ***Closer political and economic union***

THANK YOU FOR YOUR KIND ATTENTION