Arab Regional Assessment Overview of the Enabling Environment for Big Data

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Agenda

- Relevance of this Work

- Structure of the Work

- Findings

- Recommendations

Data is the essence of Digital Transformation

Digital Transformation is impacting companies and public institutions in every industry and every sector, although not necessarily evenly across the world.
To fuel this transformation, institutions are utilizing big data and AI, they are capturing and processing more and more data across their various experiences: customers, partners, employees, business processes, connected objects and from various other external sources.

Why an ITU Overview for the Arab Region ?
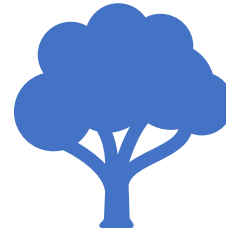
Learn the current environment

Frame the discussion

Promote (awareness on opportunities and challenges)

Help – focus the needed support

Methodology

Expert Advise

Desk Research

[Survey, online questionnaire]

Structure of the Report

- Big Data definitions and evolution
- Why Now
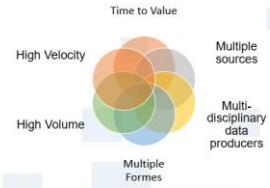- Opportunities
- Challenges and Risks
- Enabling Environment
- Arab Countries Environment Landscape
- Recommendations

What is Big Data?

Time to Value

High Velocity — Multiple sources

High Volume — Multi-disciplinary data producers

Multiple Formes

"A paradigm for enabling the collection, storage, management, analysis and visualization, potentially under real-time constraints, of extensive datasets with heterogeneous characteristics."
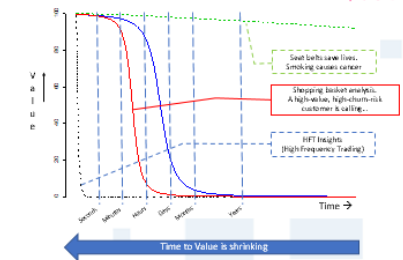
[Recommendation ITU-T Y.3600]
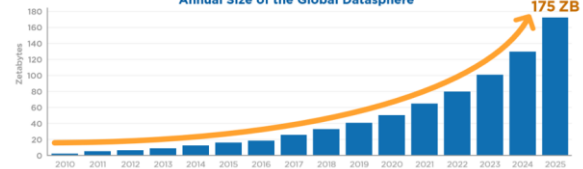

Big Data: Velocity

5 GB for an autonomous car!

Big Data : Variety
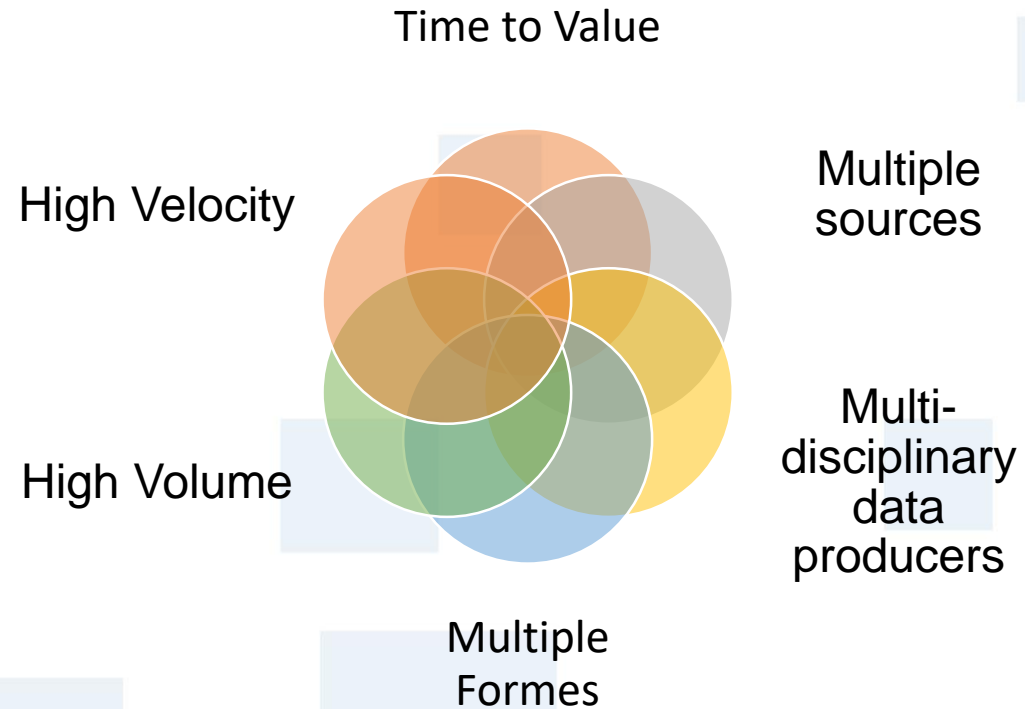
Structured Data — Data base, Textual Data

Unstructured Data — Social, Video, Text, Tweet, Voice, Images, Mapping

Various Sources — Sensors, Devices, Applications, Web, Public Data, GPS

Various Disciplines and Domains — Health, Weather, Finance, Social, Environment, ...

Big Data: VALUE

Time to Value

Seat belts save lives. Smoking causes cancer.

Shopping basket analysis. A high-value, high-churn-risk customer is calling.

HFT Insights (High Frequency Trading)

Time →

Time to Value is shrinking

Annual Size of the Global Datasphere

175 ZB

Zettabytes: 180, 160, 140, 120, 100, 80, 60, 40, 20, 0

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018

What is Big Data?

Time to Value

High Velocity

Multiple sources

Multi-disciplinary data producers

High Volume

Multiple Formes
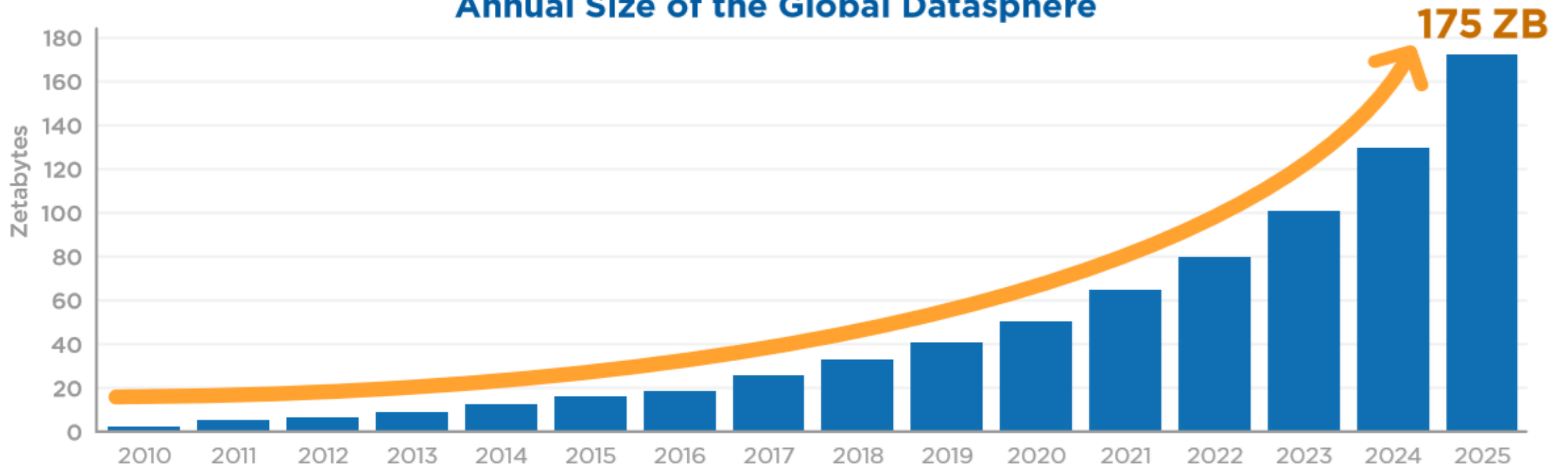
"A paradigm for enabling the collection, storage, management, analysis and visualization, potentially under real-time constraints, of extensive datasets with heterogeneous characteristics."

[Recommendation ITU-T Y.3600]

Annual Size of the Global Datasphere

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Source: Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018

Big Data: Velocity

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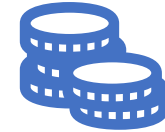# Big Data : Variety

Structured Data

Data bases
Transactional

Unstructured Data

Social
Video
Text
Tweet
Voice
Images
Mapping

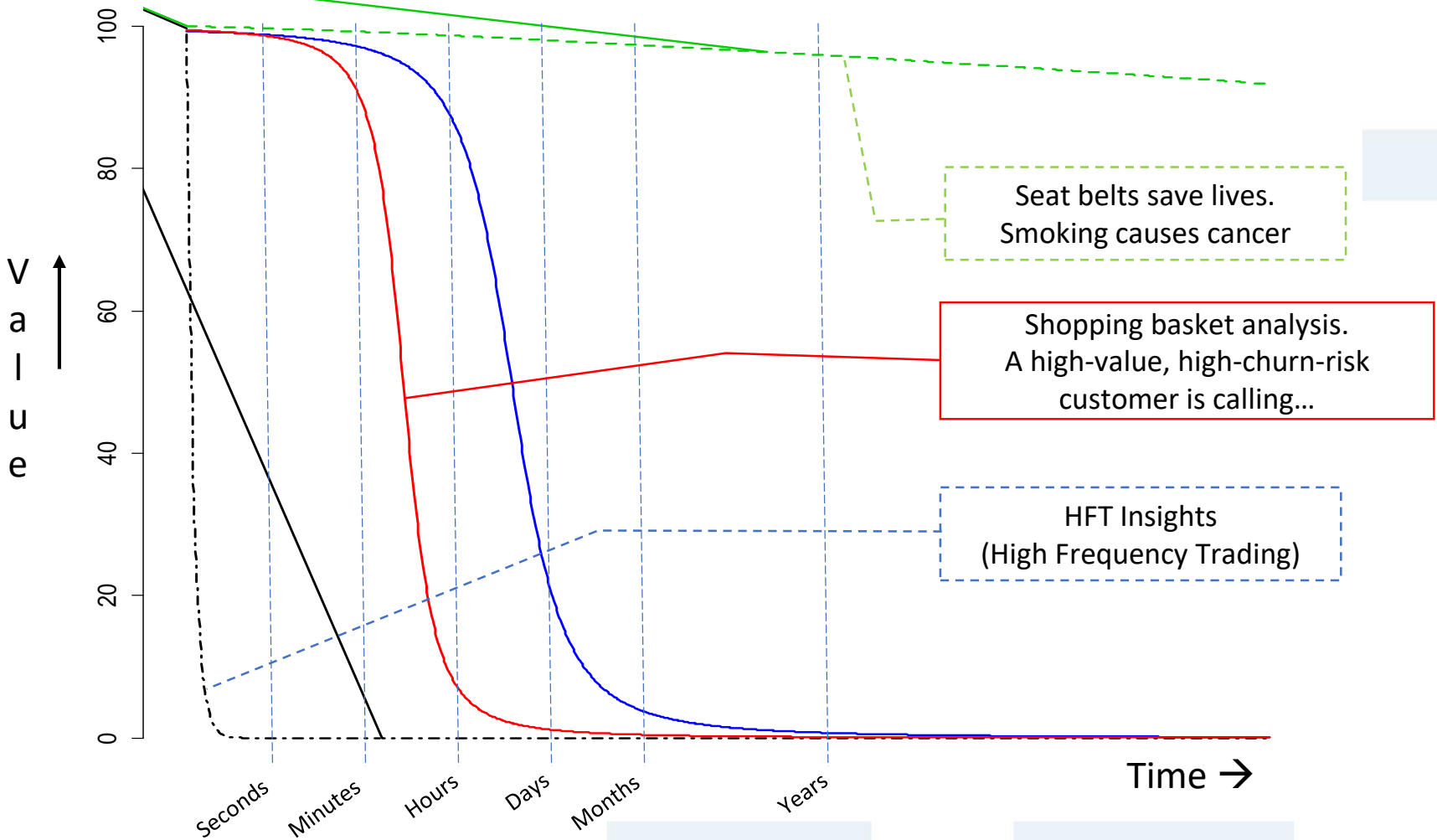**Various Sources**

Sensors
Devices
Applications
Web
Public Data
GPS

Various Disciplines and Domains

Health
Weather
Finance
Social
Environment
…

Big Data: VALUE

Time to Value

Seat belts save lives.
Smoking causes cancer

Shopping basket analysis.
A high-value, high-churn-risk
customer is calling...

HFT Insights
(High Frequency Trading)

Value

Time →

Seconds Minutes Hours Days Months Years

100 80 60 40 20 0

Time to Value is shrinking

Lesvos in Greece – Venus C

The University of the Aegean in Greece developed the VENUS-C Fire app—featuring Bing Maps, Microsoft Silverlight, and Windows Azure—to determine the daily wildfire risk and fire propagation in the vulnerable island of Lesvos during its dry season.

Fire App Fights
Wildfires with Data

Geography of Natural Disasters Laboratory at the University of the Aegean in Greece to calculate and visualize the risk of wildfire ignition and to simulate fire propagation.

Data is the new Oil! Really?

95% of data in Oil&Gaz is lost before it gets to business leaders!

How many leaders treat their data as Oil? How many measure its value? How many show their Data value in their financial reports, do they report the value to their board? …

Data is pretty different from Oil!
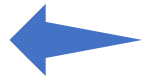
Abundance   Reusable   Replicable   Zero Weight   Instantly transferable   Exponential benefits

Why Now ?

Data availability
- It is here
- Many sources
- Open Data

Shrinking Costs
- Acquisition
- Storage
- Compute

Technology
- Easy
- Accessible
- Democratized

Time
- Time to value relationship of Insight
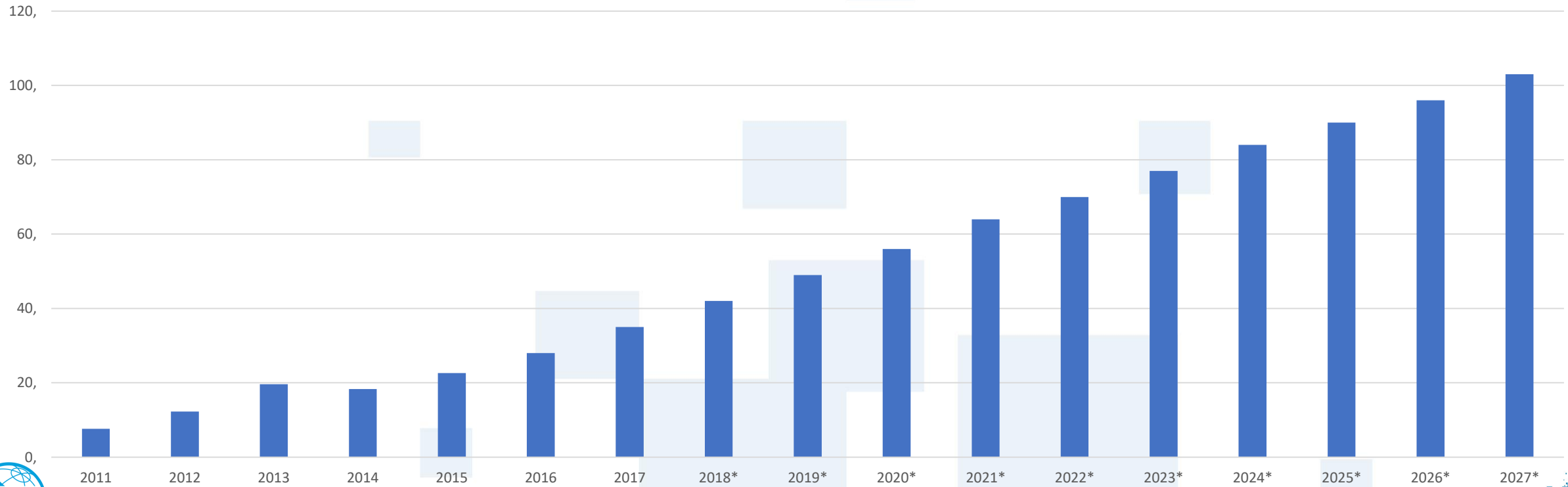- From Weeks to minutes

New Questions
- What's the social sentiment of my citizens?
- How do I optimize my services based on patterns of weather, traffic, etc.?
- How do I better predict future outcomes?

Big data market size revenue forecast worldwide.

Forecast revenue big data market worldwide 2011-2027 (in billion U.S. dollars)

« *The data revolution was recognized as an enabler of the 2030 Agenda. It can not only help to monitor progress towards the SDGs, but it also engages multiple stakeholders to advance* **evidence-based policies and programmes** *aimed to reach the most vulnerable and leave no one behind.* »
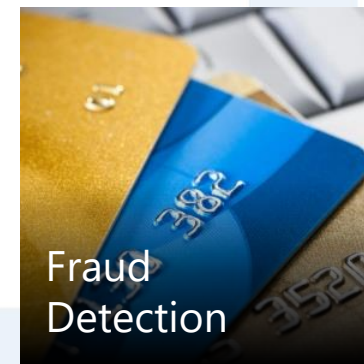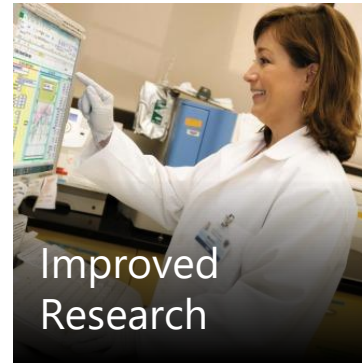
Opportunities

BIG DATA & THE SDGs

How data science and analytics can contribute to sustainable development

① NO POVERTY
Spending patterns on mobile phone services can provide proxy indicators of income levels

② ZERO HUNGER
Crowdsourcing or tracking of food prices listed online can help monitor food security in near real-time

③ GOOD HEALTH AND WELL-BEING
Mapping the movement of mobile phone users can help predict the spread of infectious diseases

④ QUALITY EDUCATION
Citizen reporting can reveal reasons for student drop-out rates

⑤ GENDER EQUALITY
Analysis of financial transactions can reveal the spending patterns and different impacts of economic shocks on men and women

⑥ CLEAN WATER AND SANITATION
Sensors connected to water pumps can track access to clean water

⑦ AFFORDABLE AND CLEAN ENERGY
Smart metering allows utility companies to increase or restrict the flow of electricity, gas or water to reduce waste and ensure adequate supply at peak periods

⑧ DECENT WORK AND ECONOMIC GROWTH
Patterns in global postal traffic can provide indicators such as economic growth, remittances, trade and GDP

⑨ INDUSTRY, INNOVATION AND INFRASTRUCTURE
Data from GPS devices can be used for traffic control and to improve public transport

⑩ REDUCED INEQUALITY
Speech-to-text analytics on local radio content can reveal discrimination concerns and support policy response

⑪ SUSTAINABLE CITIES AND COMMUNITIES
Satellite remote sensing can track encroachment on public land or spaces such as parks and forests

⑫ RESPONSIBLE CONSUMPTION AND PRODUCTION
Online search patterns or e-commerce transactions can reveal the pace of transition to energy efficient products

⑬ CLIMATE ACTION
Combining satellite imagery, crowd-sourced witness accounts and open data can help track deforestation

⑭ LIFE BELOW WATER
Maritime vessel tracking data can reveal illegal, unregulated and unreported fishing activities

⑮ LIFE ON LAND
Social media monitoring can support disaster management with real-time information on victim location, effects and strength of forest fires or haze

⑯ PEACE, JUSTICE AND STRONG INSTITUTIONS
Sentiment analysis of social media can reveal public opinion on effective governance, public service delivery or human rights

⑰ PARTNERSHIPS FOR THE GOALS
Partnerships to enable the combining of statistics, mobile and internet data can provide a better and real-time understanding of today's hyper-connected world

GLOBAL PULSE

www.unglobalpulse.org
@UNGlobalPulse   2017

What can Big Data do for Government?

Transportation Optimization

Natural Event Preparedness

Improved Research

Logistics Planning

Pandemic Tracking

Environmental Sustainability

Social Network Awareness

Employment Analysis

Fraud Detection

Economic Forecasting

New Opportunities for Cities

Pandemic Tracking

Natural Event Preparedness

Social Network Awareness
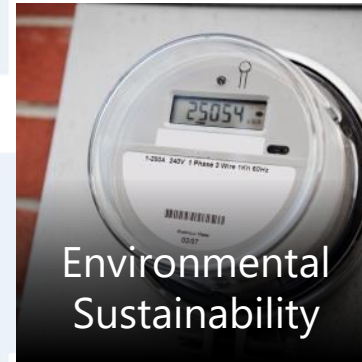
Employment Analysis

Fraud Detection

Eye On Earth

Fire Prevention

VENUS-C Fire Greece
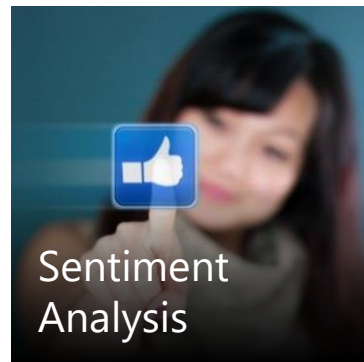
Environmental Sustainability

Issy Grid

Transportation Optimization

London Transport

New Opportunities for Businesses …

Fraud Detection

Sentiment Analysis

Economic Forecasting

Credit Risk

Advertising

Predictive Consumption & Maintenance
Blackout & shortage Prevention
Crisis Management
Faster & Better Decisions

Energy

Dubai Electricity and Water Authority
UNITED ARAB EMIRATES

Water

Zweckverband Bodensee-Wasserversorgung
GERMANY

Public Transport

Swiss Transjurane
SWITZERLAND

Challenges and risks

Security and Data Breaches

Bias

Limits of usage

Consumer / Citizen rights

Control

Sharing

Enabling Environment

Infrastructure

Skills and Competencies

Innovation Ecosystem

Trust Ecosystem

Regional Approach

🌍	North Africa	Morocco, Algeria, Tunisia, Libya
🚀	Gulf	Saudi, UAE, Kuwait, Qatar, Bahrain, Oman
📍	Middle East	Egypt
	Levant	Lebanon, Jordan, Iraq, Syria
🧍	LDC	Sudan, Comoros, Mauritania, Yemen, Somalia, Palestine, Djibouti

Infrastructure

Capture

at any point (IoT, sensors, mobile, drones, apps, people …)
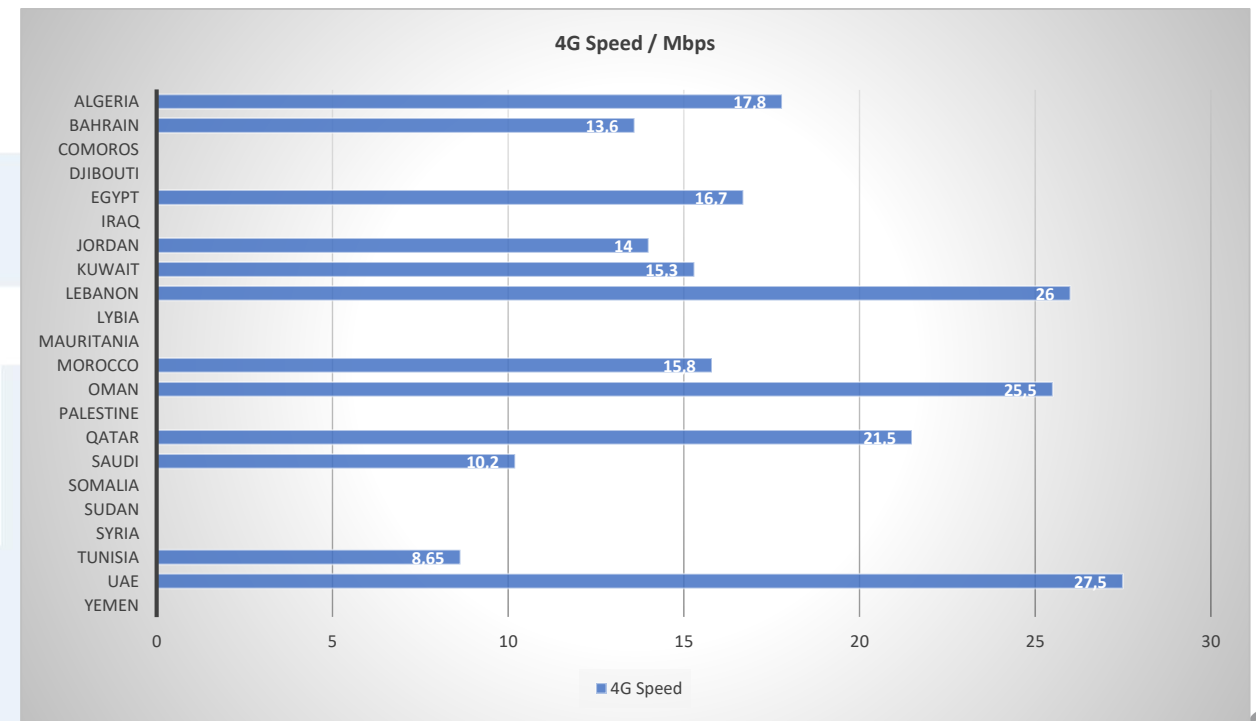
Move

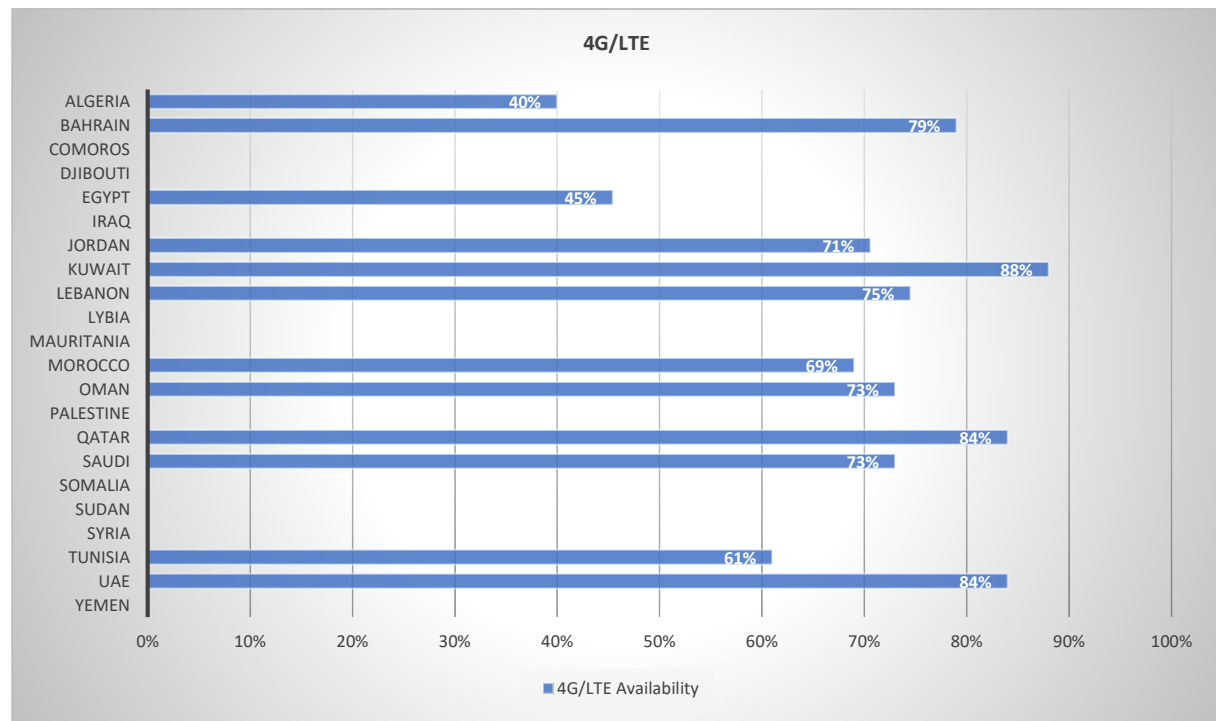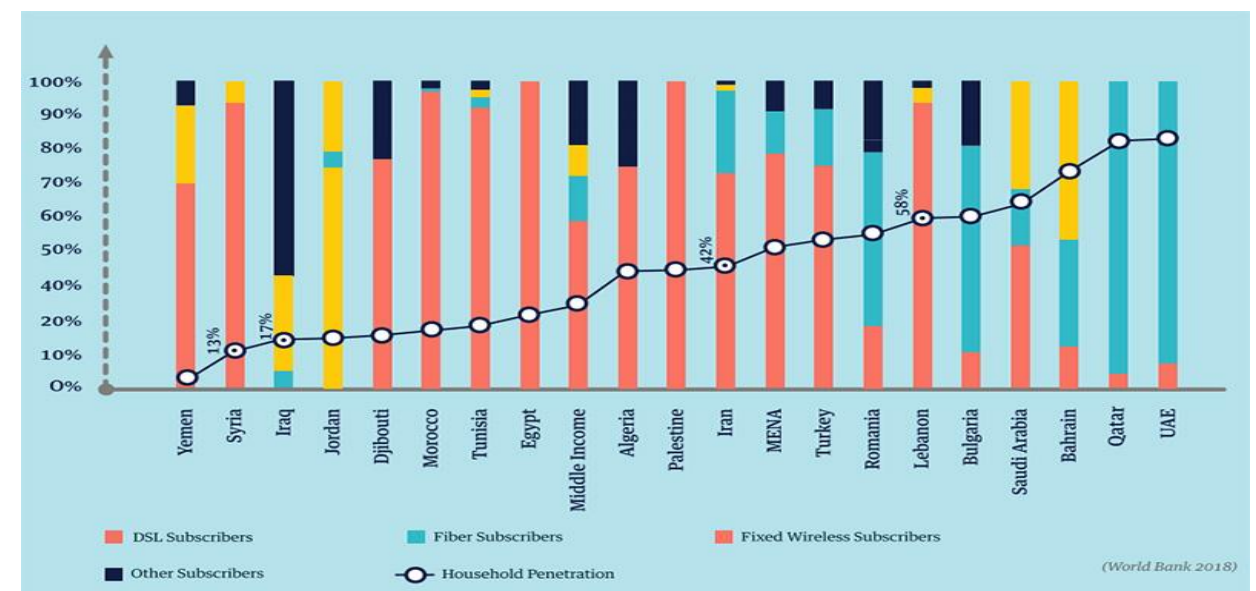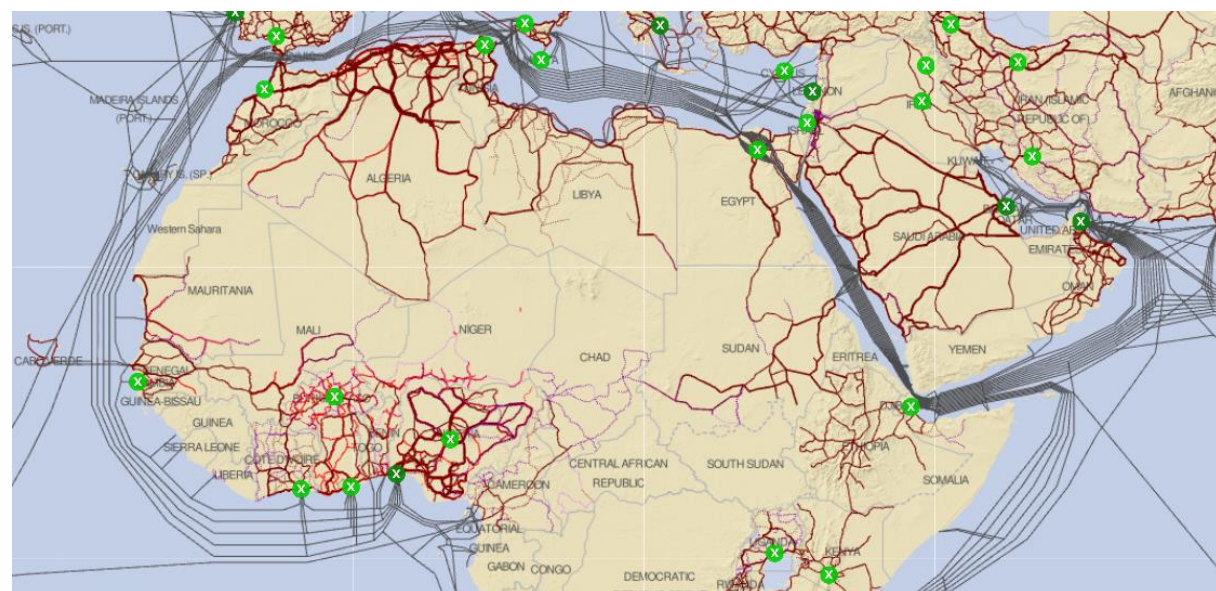over a data driven network to central locations

Process

in Cloud computing alike architecture

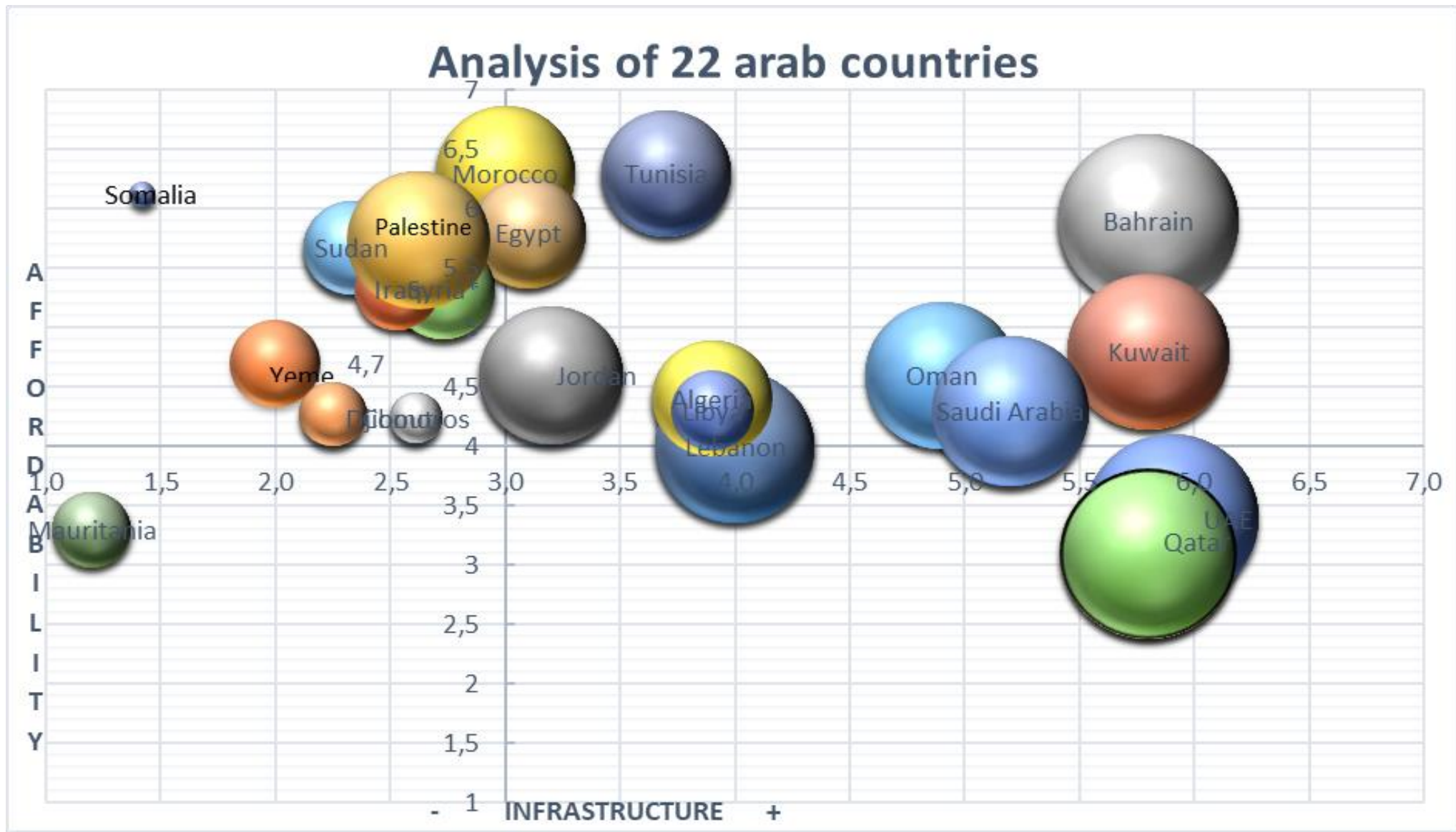**Share**

over an open data platform across different ecosystems

Trusted infrastructure, with built-in security, privacy and availability.

DSL Subscribers Fiber Subscribers Fixed Wireless Subscribers

Other Subscribers Household Penetration

(World Bank 2018)

4G/LTE

Country	4G/LTE Availability
ALGERIA	40%
BAHRAIN	79%
COMOROS	
DJIBOUTI	
EGYPT	45%
IRAQ	
JORDAN	71%
KUWAIT	88%
LEBANON	75%
LYBIA	
MAURITANIA	
MOROCCO	69%
OMAN	73%
PALESTINE	
QATAR	84%
SAUDI	73%
SOMALIA	
SUDAN	
SYRIA	
TUNISIA	61%
UAE	84%
YEMEN	

4G Speed / Mbps

Country	4G Speed
ALGERIA	17.8
BAHRAIN	13.6
COMOROS	
DJIBOUTI	
EGYPT	16.7
IRAQ	
JORDAN	14
KUWAIT	15.3
LEBANON	26
LYBIA	
MAURITANIA	
MOROCCO	15.8
OMAN	25.5
PALESTINE	
QATAR	21.5
SAUDI	10.2
SOMALIA	
SUDAN	
SYRIA	
TUNISIA	8.65
UAE	27.5
YEMEN	

Analysis of 22 arab countries

Aminova, M. (2019). *Entrepreneurship and Innovation Ecosystem in 22 Arab countries: the Status Quo, Impediments and the Ways Forward.*
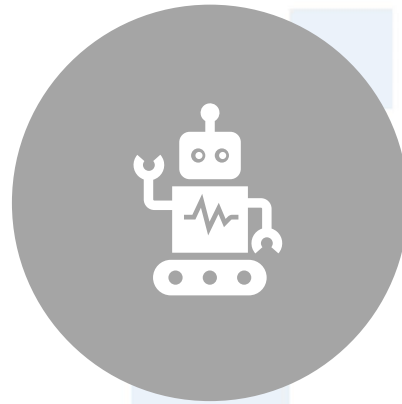
Data Centers, Cloud in the Arab Region ?

Skills and competencies

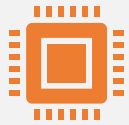TRADITIONAL TECHNICAL
EXPERTISE

NEW TECHNICAL
EXPETISE

NEW NON TECHNICAL (IT)
EXPERTISE

Skills in the Arab Region ?

Innovation Ecosystem

Innovating the Technology

Advancing the limits of the technology and the underlying concepts

Tools, Algorithms, Concepts, Platforms, …

Google, IBM, Microsoft, Oracle, Tableau, …

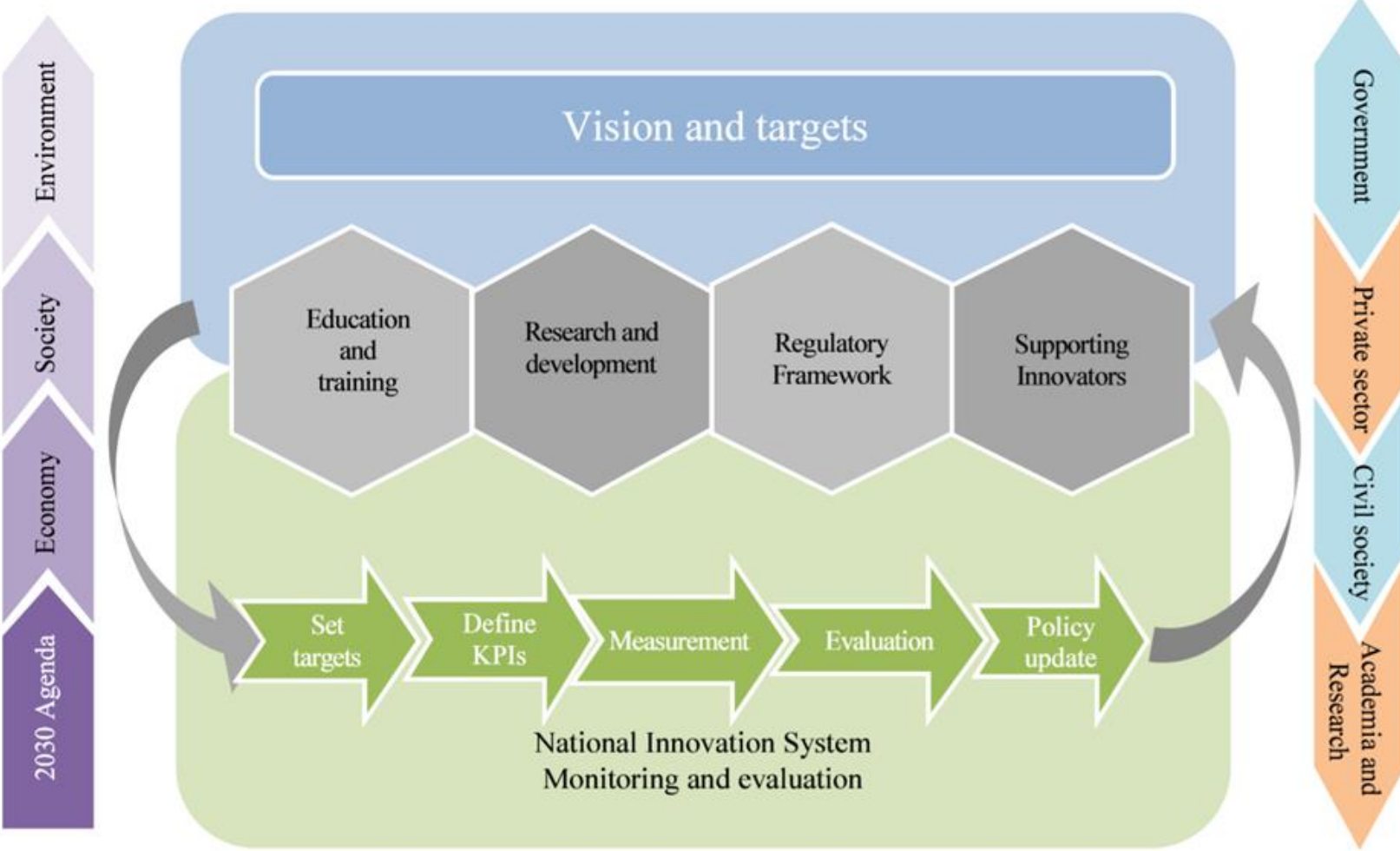University researches

Innovating WITH the Technology

Businesses across the sectors

Governments

Universities
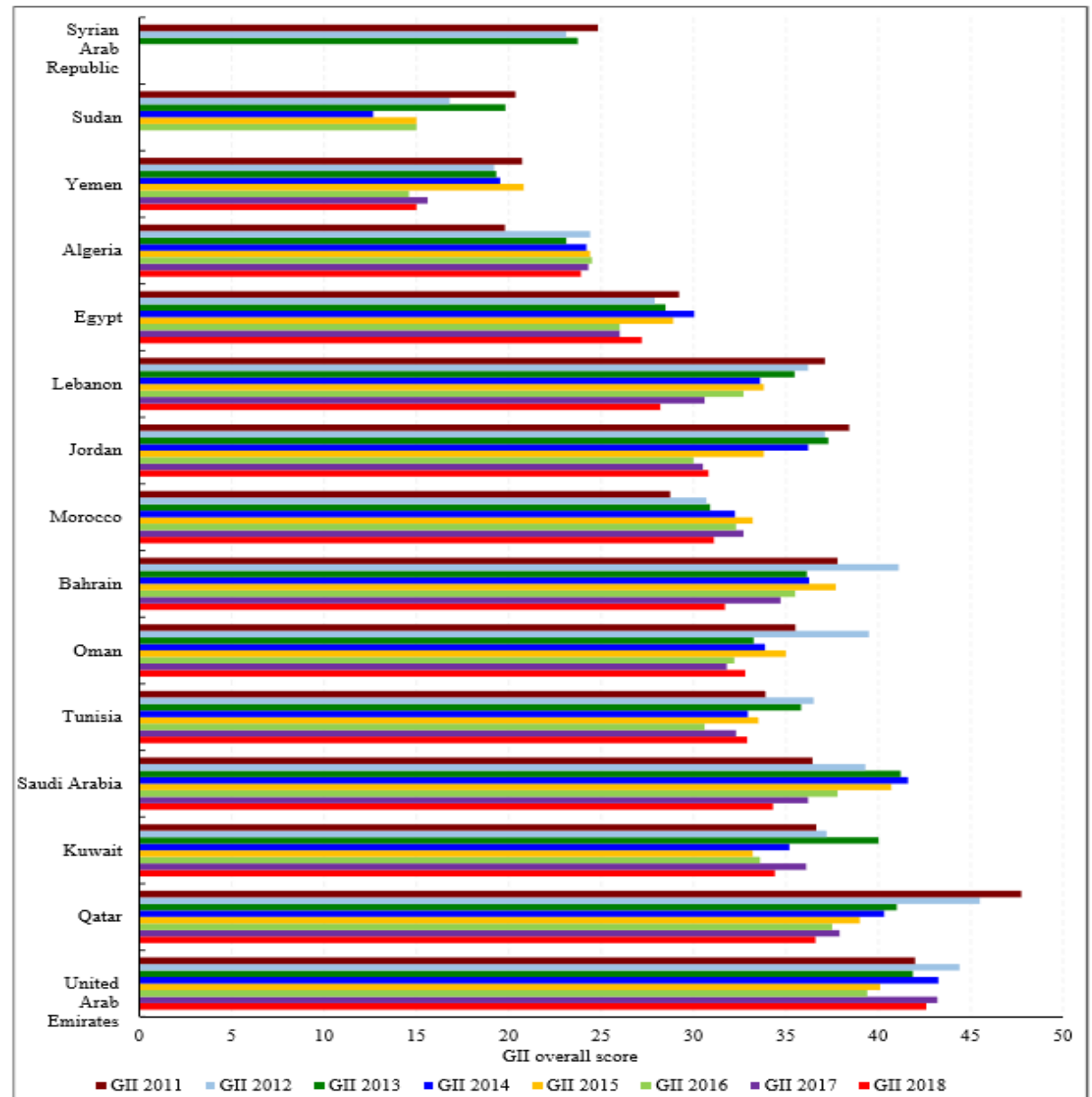
Upstarts

Open Data

Innovation Policy

Supporting innovators

Finance

Regulations and Policies

Ecosystems

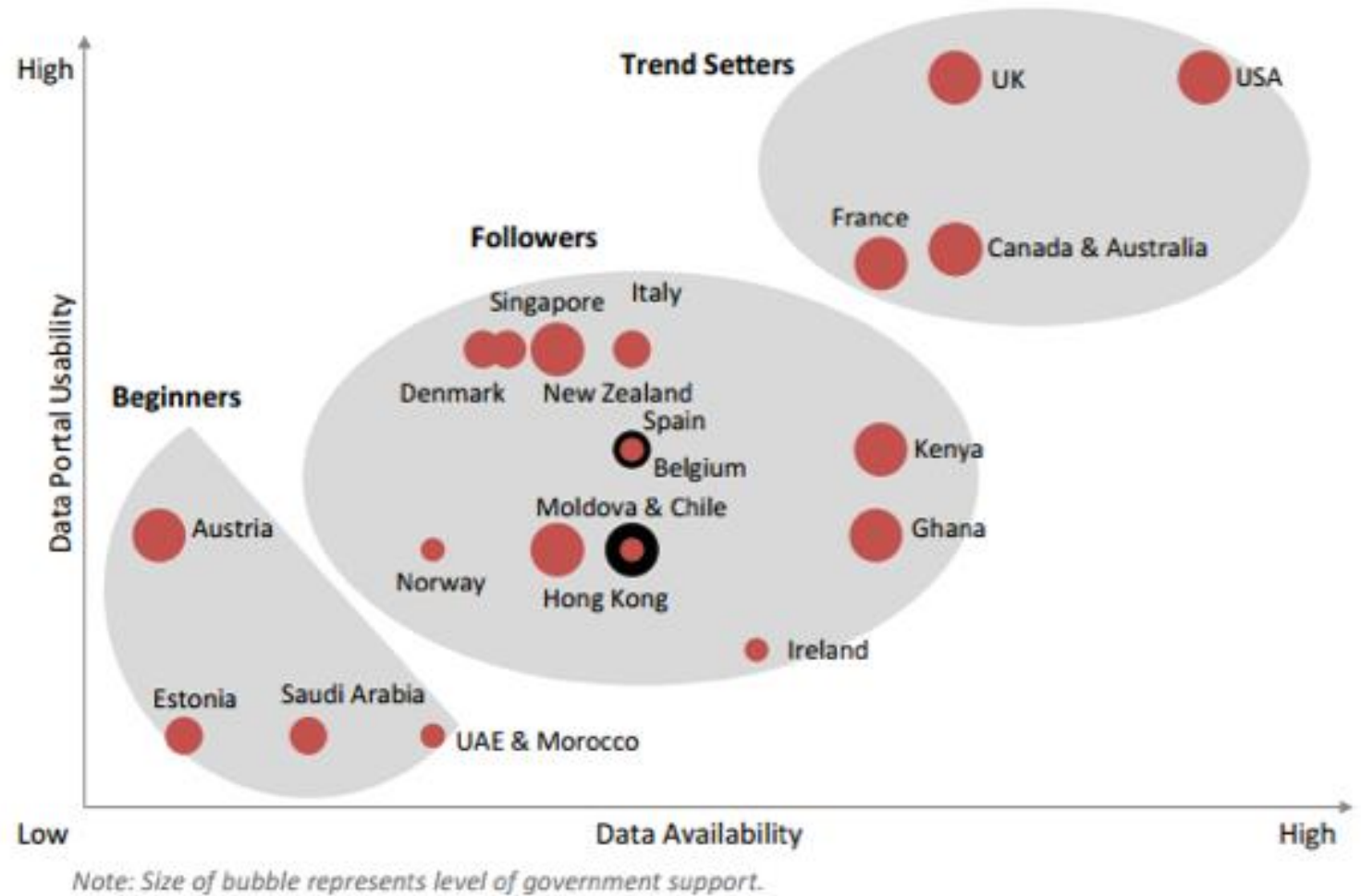# ESCWA Innovation Policy Framework

Innovation policy framework for inclusive sustainable development (ESCWA, 2017)

Innovation

Evolution of the Global Innovation Index in Arab countries, 2011-2018 (ESCWA, 2018)

Open Data

Benchmarking of Open Data Initiatives, Arab Business Review, 2018

Source: Microsoft

Data Privacy Legislation

Data Protection and Privacy Legislation Worldwide

Legislation
Draft Legislation
No Legislation
No Data

Source: UNCTAD, 27/03/2019
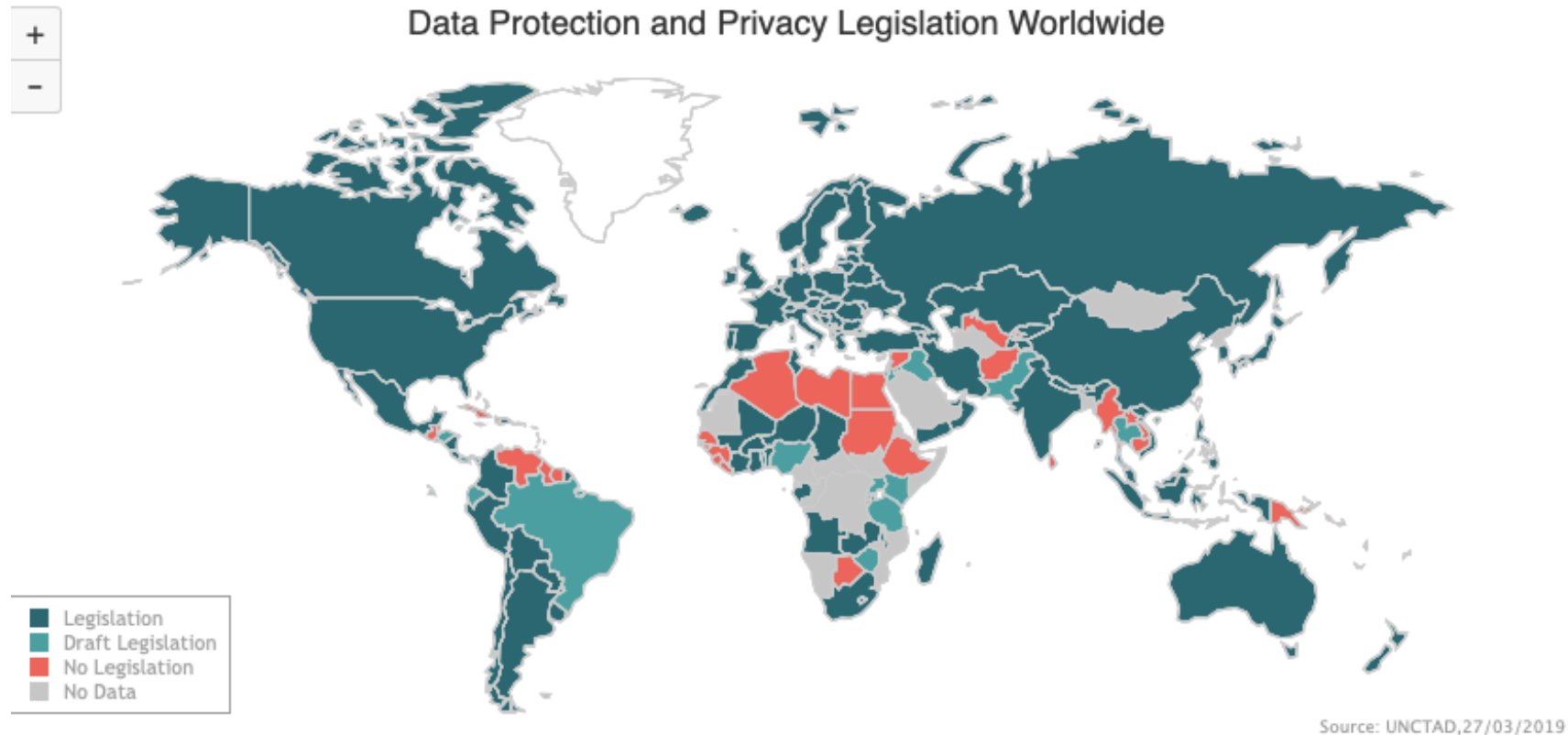
Source: Data Protection and Privacy Legislation Worldwide (UN Conference on Trade and Development, 2019)

Recommendations

Infrastructure

Develop PPP

System of trust for investors

Skills

Launch Big Data education

Initiate programs to build capacity for business and government leaders

In partnership with Private sector

Innovation

Launch Data intensive initiatives

Innovation Events (developers, researchers, start-ups, students to create awareness and simulate ideas and innovations)

UN SDGs

Review and modernize Innovation policies

System of Trust

Develop Open Data Policies

Develop Data Privacy Policy

Develop a harmonized data privacy framework and Harmonize around it (à la GDPR)