

**Future of Digitalization: Impacts on NGOs and ICSOs**  
*Strategizing for Digitalization and Connectivity*

11 October 2018

*Partos Innovation Festival*

Dalberg is an impact-focused group of businesses serving the developing world

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Today's complex global problems require new solutions. Each Dalberg business approaches problems differently and all work together to create impact at scale.

We partner with and serve communities, governments and companies throughout the world providing an innovative mix of services.

Dalberg

Dalberg Advisors

Dalberg Capital

Dalberg Data Insights

Dalberg Design

Dalberg Research



## Quick facts

# 2001

Year Dalberg was founded

# 95+

Countries we've worked in

# 50+

Nationalities represented

# 450+

Professional staff globally



# 25

Offices and presences  
... and growing

- Office
- Full Time Staff Presence

# Overview of our Advisory business

## Expertise Areas: *what we know*



Agriculture & food security



Technology & Data



Employment and education



Energy access



Environment



Financial inclusion



Evaluation



Human centered design



Inclusive growth



Investing for development



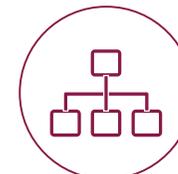
Gender



Health & nutrition



Humanitarian assistance



Organizational effectiveness



Policy & advocacy



Cities



Water & Sanitation



Infrastructure



Strategy



Talent & leadership

# We have completed ~1800 engagements for 600+ clients across private, public, and NGO sectors

## PRIVATE SECTOR



## DFIs



## GOVERNMENTS, GOV'T AGENCIES, UN



## FOUNDATIONS & NGOS





## CONTEXT AND SESSION OBJECTIVES

# Strategizing for Digitalization and Connectivity – session agenda (13:30-15:45)

<b>1</b>	<b>Context and session objectives</b>	<ul style="list-style-type: none"><li>• Scope and objectives of discussion</li><li>• Context for digital trends future-casting</li></ul>	<i>10 mins</i>
<b>2</b>	<b>Future digital megatrends overview</b>	<ul style="list-style-type: none"><li>• Overview of technology landscape and key trends</li><li>• Mega-trend deep-dives – what are the trends, new opportunities, new risks?</li></ul>	<i>30 mins</i>
<b>3</b>	<b>Framing implications for INGOs – thought starters and reflections</b>	<ul style="list-style-type: none"><li>• Framework for iNGO implications</li><li>• Major new opportunities and risks?</li><li>• Thought-starters on implications</li></ul>	<i>10 mins</i>
<b>4</b>	<b>Moderated discussion – Implications for iNGOs</b>	Questions / reflections on presentation	<i>15 mins</i>
		Breakout: Mega-trend deep dives – implications for what iNGOs should work on, how they should work, and their future role	<i>30 mins</i>
		Plenary discussion: Readouts from each group and plenary discussion of implications for iNGO strategies	<i>40 mins</i>

# Reading guide: What this presentation is and what it is not - focus on understanding innovations, less on how best to deal with them

- In digitalization, a vast set of development and innovations arise and evolve constantly
- These technological innovations can (and already do) impact the work of iNGOs in multiple ways: in how they run their own operations (back office), in how they engage with various stakeholders including funders and in service delivery to beneficiaries
- Moreover, these technological innovations rapidly shape the world. iNGOs have an important role to play in ensuring these changes don't have disadvantages – and ideally have advantages – for the people whose lives iNGOs seek to improve. People with less of a voice or less power in policy and business debates stand to gain or to lose from technological innovation and the appropriate use of data, permissions, privacy concerns etc. iNGOs can enable, strengthen and represent these voices in relevant debates. To do so, iNGOs need to understand technological innovations and their potential implications.
- In all these four roles (back-office, stakeholder engagement, service delivery and policy/ voice), technological innovations can be an opportunity for iNGOs or a threat – for the iNGOs purpose and activities and for its organization. For example, innovations offer exciting new ways of reaching remote populations at much lower costs, increasing the potential for equitable access to core services. But they can also lead to a concentration of power and control or, more mundanely, to disintermediation of traditional roles of iNGOs. For example, direct giving is already challenging the iNGO model in some areas.
- This presentation and the discussion around it at the Partos innovation festival is focused on providing an overview of and further insight into the vast array of innovations. Whilst this presentation will not focus on *how* iNGOs can and should deal with these innovations, we have included some upfront questions to guide your reading and understanding.
- The examples mentioned in this presentation are predominantly sourced from the African continent, with many originating in and being developed and managed by local organizations and people (across for-profit and not-for-profit models)

# Core questions to keep in mind when thinking and learning about digitalization

- The pace and diversity of innovations in digitalization can be dizzying and overwhelming
- Although the range of applications for iNGOs is vast and no one single approach will answer all relevant questions, a set of standard questions are helpful to keep in mind:
  - **Purpose:** What is the change you want to achieve in the world with your organization? Or: what is your ideal state of the world?
  - **Opportunity or threat:** How can innovations in digitalization help or impede achieving that purpose? This can be at systemic level, for some of your partner organization or directly for your own organization
  - **Impetus for action:** What does this mean for you as an iNGO? How can/ should you engage to make the opportunity happen and/ or to avoid the threat? Specifically: what is it you are uniquely positioned to do – or what is it that you have to do (as nobody else will do it)?
  - **Need for change:** Taking into account what this ‘lands on your plate’, how do you need to change to be able to do this? What do you need to learn, what skills do you need to acquire, what shifts to your organization are needed? Note that this is particularly relevant if you identify an action you have to take (as nobody else will do it) for which you may not be optimally prepared yet
  - **Need for support and action:** Who can help you achieve this change? What strengths in your own organization and network can you build on, which partnerships do you need to strike? What will you need (resources, time etc.) to make this happen?

# Hold onto your seats.....

- Hopefully, the previous two pages have prepared you for what's to come – and can help you come up for air as and when needed
- Hold onto your seats – the ride into the unknown is about to begin....



# Objectives for this session

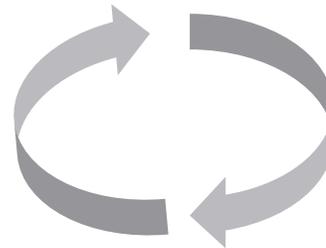
**Objective: Frame and advance the conversation on how long term trends in digitalization, connectivity and adjoining digitally enabled technologies and business models will drive changes in the iNGO sector**

- Define **key terms and context of digital technology disruption**
- Discuss **long-term digital technology megatrends and emerging technologies**, including new technologies that are still on the horizon but may have meaningful impacts in the 10-20 years
- Discuss thought-starters on **new opportunities** for iNGOs and **new risks to be managed** due to digital disruption
- Moderated discussion on **how evolution of digital technologies will affect iNGOs role, what they work on, and how:**
  - What are the new areas of thematic focus?
  - How well prepared are iNGOs institutionally for the changing landscape?
  - How can iNGOs respond to upcoming trends in a more strategic manner?
  - What is the right way to consider prioritization of focus and investment?

# Digital technology trends are just a part of the broader puzzle in considering ultimate strategic implications for iNGOs

## Major trends long-term trends

- Urbanization
- Shifting demographics (youth bulge)
- Rise of a global middle class
- Climate change and its effects
- Economic globalization vs. anti-globalization
- Political disruption – populism, polarization
- Future of work
- 4<sup>th</sup> industrial revolution
- Other...



## Role of digital tech and data innovations

- Provide new tools/solutions for managing emerging challenges
- Accelerate existing trends by reducing costs and “friction”
- Disrupt existing business and operating models – new winners and losers
- Generate new risks and challenges (e.g., data privacy, digital divides, digital ethics)

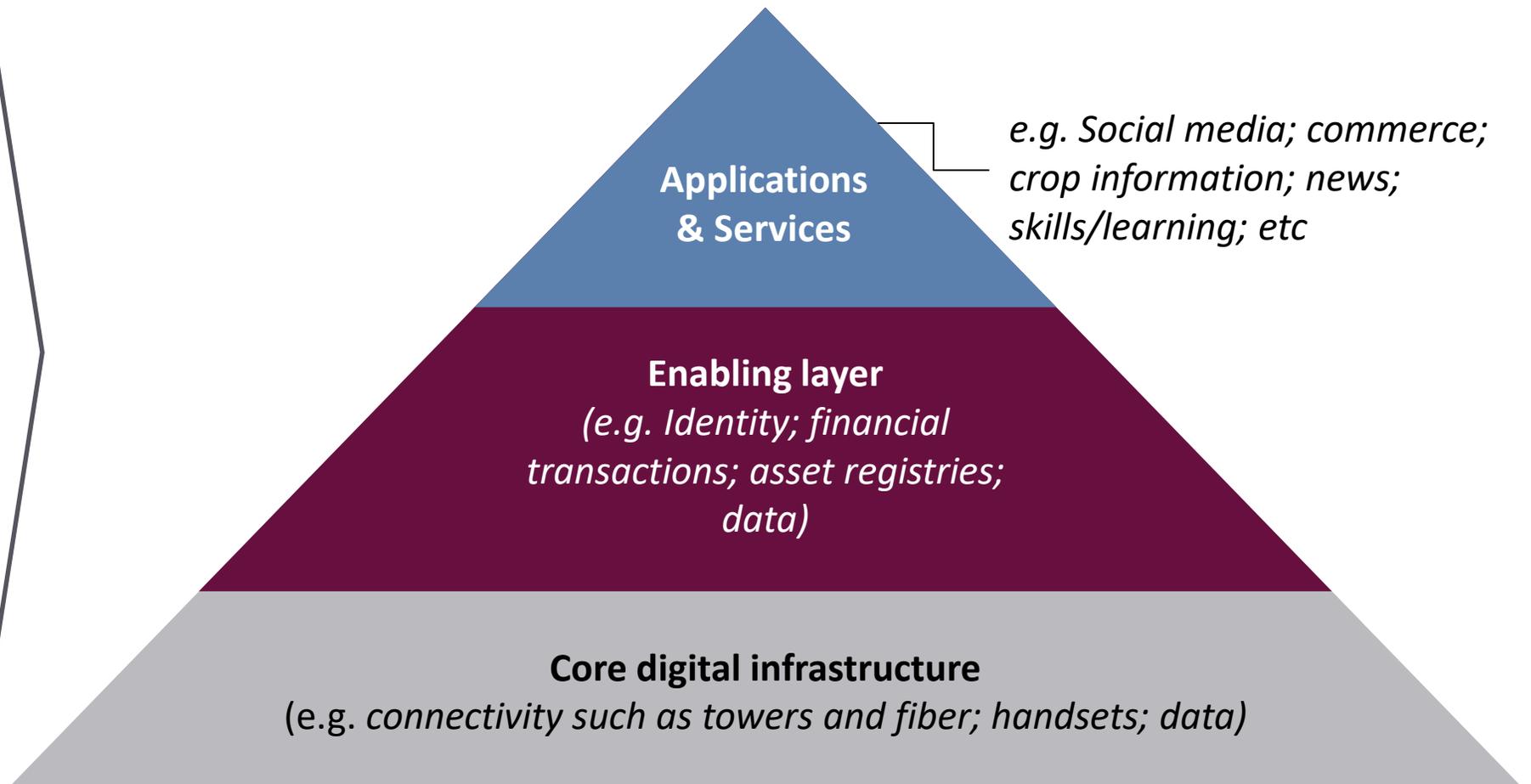
# What do we mean by digitalization and a digital society?

## **A working definition of “Digitalization”**

Ongoing process of global (if uneven) increase in connectivity and interactivity and the spread of digital devices, digital data, and data analytics, in combination with a continued growth in digitally enabled applications and services, including through other related technological advances e.g. in data analytics/AI, computing hardware, 3D printing, remote sensing devices, and robotics/ automation

## **Framework for an inclusive digital society**

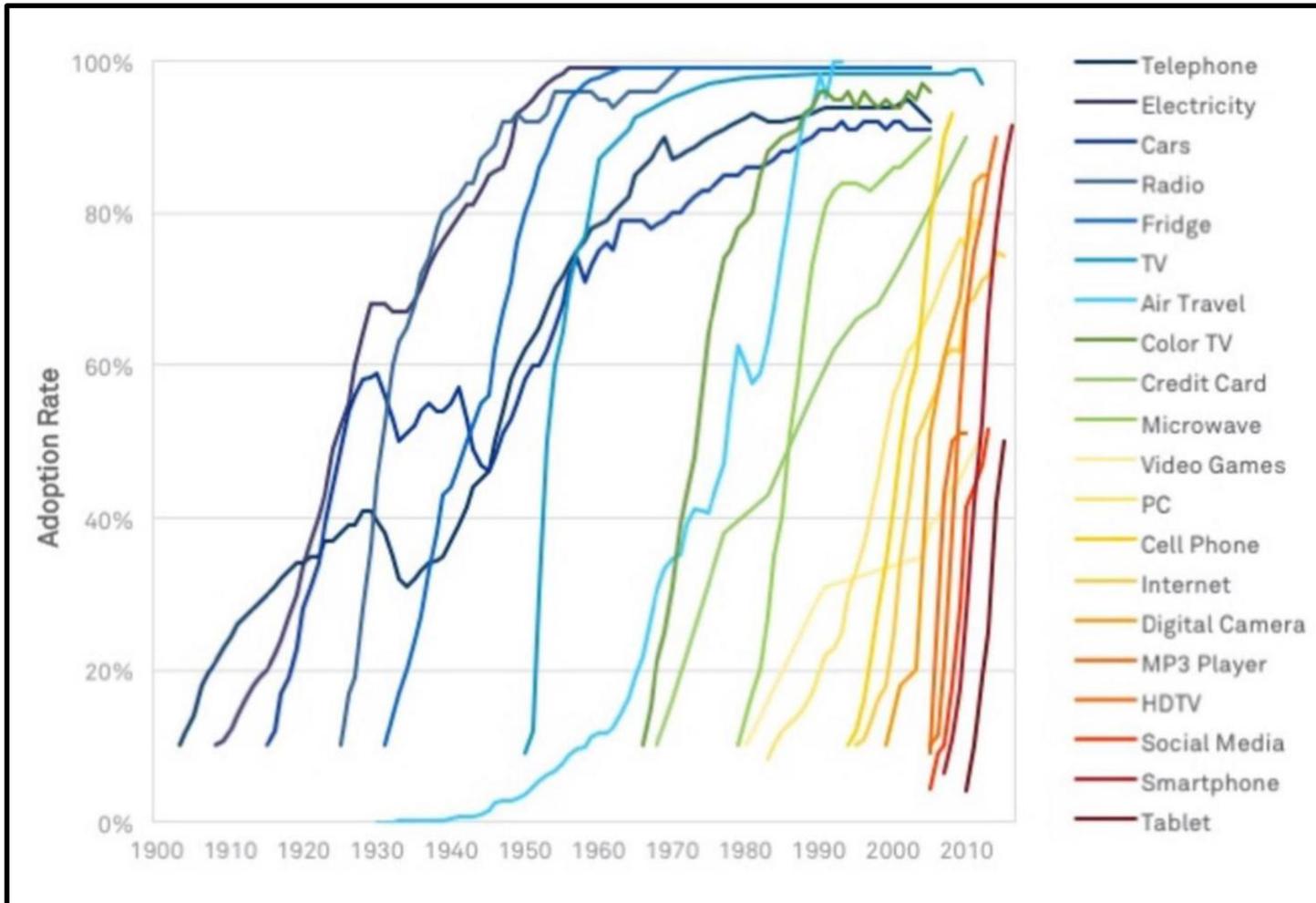
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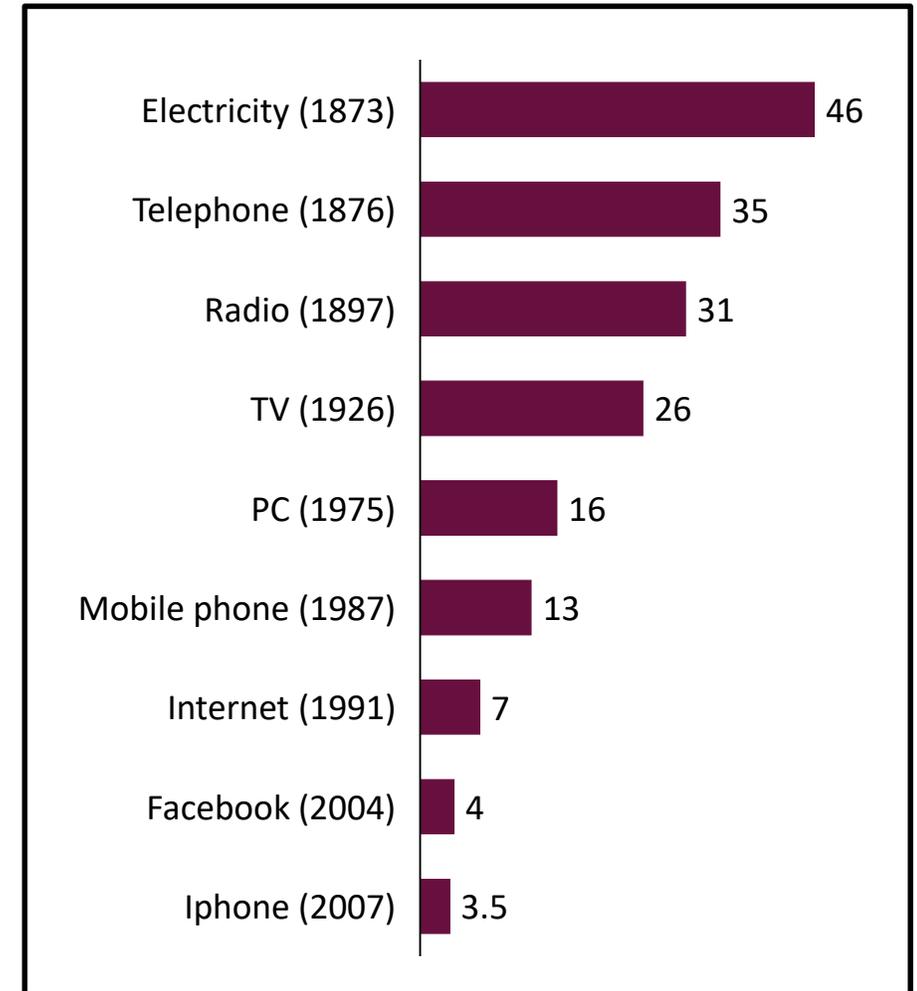


# Technology innovation and adoption rates are accelerating rapidly – this makes long-term predictions for uptake of specific technologies more difficult

## Technology adoption rates for key technologies over the past 120 years



## Years to 25% penetration (US)



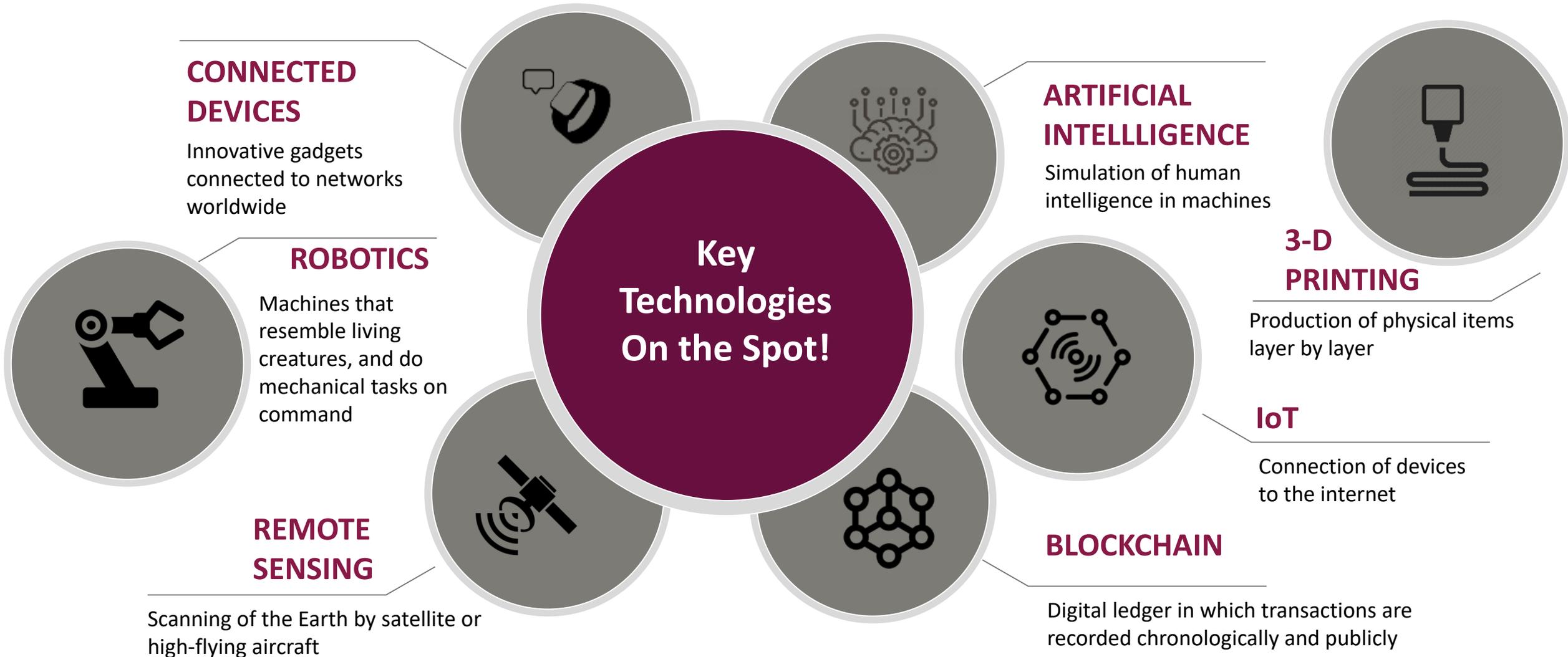


**DIGITAL MEGATRENDS AND FUTURE TECHNOLOGIES**

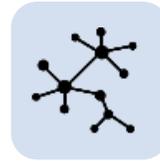
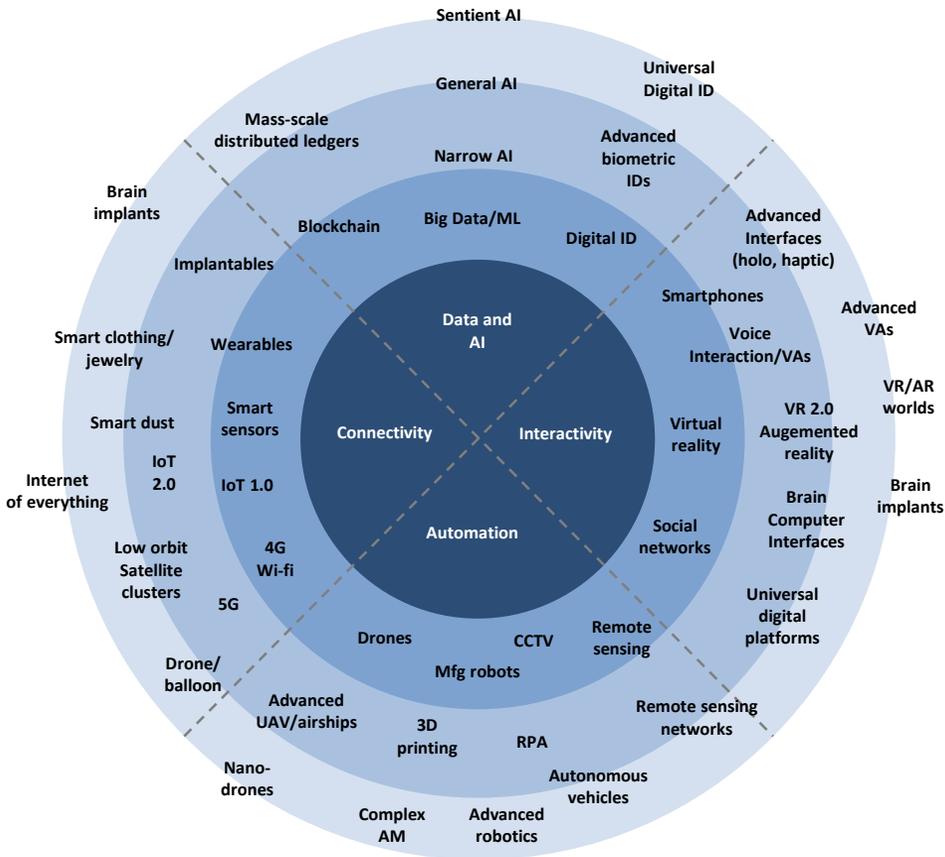
# We believe there are 5 major digital technology trends that, over the next 20 years, will dramatically transform the world and, with it, the work of iNGOs

Megatrends	Description
 <b data-bbox="275 322 491 411">Ubiquitous connectivity</b>	Rapidly increasing and eventually ubiquitous access to connectivity for people and devices due to improvements in connectivity network coverage and speed, reductions in the costs of connectivity/data, and rapid declines in the costs of connectivity devices (phones, tablets, wearables, etc.)
 <b data-bbox="275 511 639 599">Data revolution &amp; Artificial Intelligence</b>	Exponential increases in the volume and velocity of digital data from a variety of sources and a corresponding rise of data analytics capacity that allows us to filter data, analyze and visualize it for insights, and – with the advent of more computing power and AI techniques – to utilize it in new ways to solve problems and deliver services
 <b data-bbox="275 706 550 795">New pathways for interactivity</b>	Rapid innovation in and proliferation of new “channels” and tools for interacting with information, with other human beings, and with institutions (i.e., governments, businesses, NGOs), moving to increasingly complex “universal” digital platforms from social media and new interaction approaches (i.e., voice, VR, AR, haptic feedback)
 <b data-bbox="275 902 563 991">Automation and Robotics</b>	Fast evolution in technologies used to monitor the world (e.g., CCTV, drones, satellites), manufacture products (e.g., 3d printing) and deliver goods and services (e.g., RPA, robot-driven mechanization, autonomous vehicles) in new and low cost ways that augment human activities or replace human activities
 <b data-bbox="275 1106 542 1195">Business model transformation</b>	The rise of radically new business models enabled by the other digital megatrends leading to increasing democratization of access to information/goods/services (e.g., PAYG), greater sharing of assets and knowledge (i.e., shared economy), and decentralization of interactions using new mechanisms for trust-building and communication that can bypass or minimize central nodes of authority (e.g., blockchains, peer-to-peer models)

# Connected devices, artificial intelligence, remote sensing, blockchain, to name a few are interesting technologies which illustrate the underlying drivers of megatrends



# These mega-trends are driven and supported by the evolution of underlying digital technologies and will yield new opportunities for impact for iNGOs and new risks



**Ubiquitous connectivity**



**Data revolution & AI**



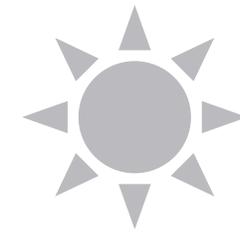
**New pathways for interactivity**



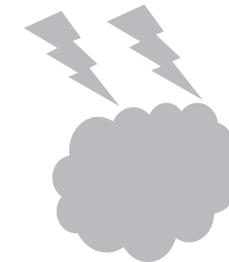
**Automation**



**Business model transformation**



**New tools, capabilities, and operating models for impact**



**New risks to manage for what iNGOs work on and how they operate**

# These provide both cross-cutting ICSSO opportunities and risks from digital technology disruption

## New opportunities from digital tech disruption

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- **Reduced costs** and hence improved affordability services
- Improved ability to delivery and collect information to **drive behavior change**
- **Increased efficiency** of service delivery
- **Improved insights** due to real-time, granular data
- Ability to **leapfrog literacy and skills constraints**
- **Universal Digital Platform** partners as channels for impact and service delivery
- **Low cost delivery** of automated services
- **New fund-raising channels** and approaches

## New risks and challenges to be managed

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- Escalating **data privacy and security** challenges
- **Unethical Artificial Intelligence**
- **Digital totalitarianism and surveillance state**
- Risks of **winner take all models** and monopoly power
- **Jobs lost to automation** resulting in higher unemployment
- Potential for greater **digital divides** in extent and quality of access
- **Low development and public sector capacity** to take advantage of opportunities

# This will affect what you do and how you do things...

## What?

- What are the strategic priorities of iNGOs and where can **digital technologies be piloted and/or scaled** to support impact?
- What roles can iNGOs play to **accelerate the benefits** of digital technologies?
- What activities can iNGOs undertake to **mitigate the harms and risks** from digital disruption?

## How?

- How can iNGOs reimagine their **business models, operations, and processes** to increasingly leverage new digital technologies?
- How should iNGOs address their **capability and talent gaps** to best engage on digital disruption? (e.g., new talent/recruiting approaches, new external partnerships)?
- How can iNGOs adapt **fundraising approaches** to leverage the digital technologies of the future?
- How can iNGOs avoid **disintermediation due to new tech trends** and how should their role evolve?

# Digital megatrends and future technologies



## Ubiquitous connectivity

Data revolution & Artificial Intelligence

New pathways for interactivity

Automation and Robotics

Business model transformation

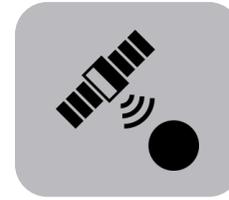
# Emerging technologies have reduced costs and changed the way we think about access

## - driving ubiquitous connectivity

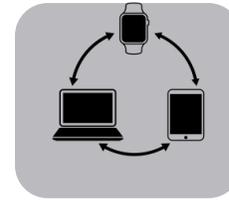
### Underlying trends for ubiquitous connectivity

- **Increase access to fast and reliable connectivity for people and businesses**
- **Widespread adoption of IoT** technologies with rapid extension of connectivity to machines and devices
- **Reduced costs** of access devices and data will make connected devices and connectivity more accessible
- **Evolution in connectivity technologies** including rise of new wireless/radio connectivity technologies and backhaul infrastructure

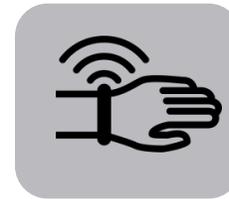
### Technologies underpinning ubiquitous connectivity



**Low cost backhaul and last mile connectivity devices** including evolving technology and reductions in the cost of devices



**Internet of Things** including billions of sensors embedded in appliances, homes, businesses, urban infrastructure, and industrial equipment

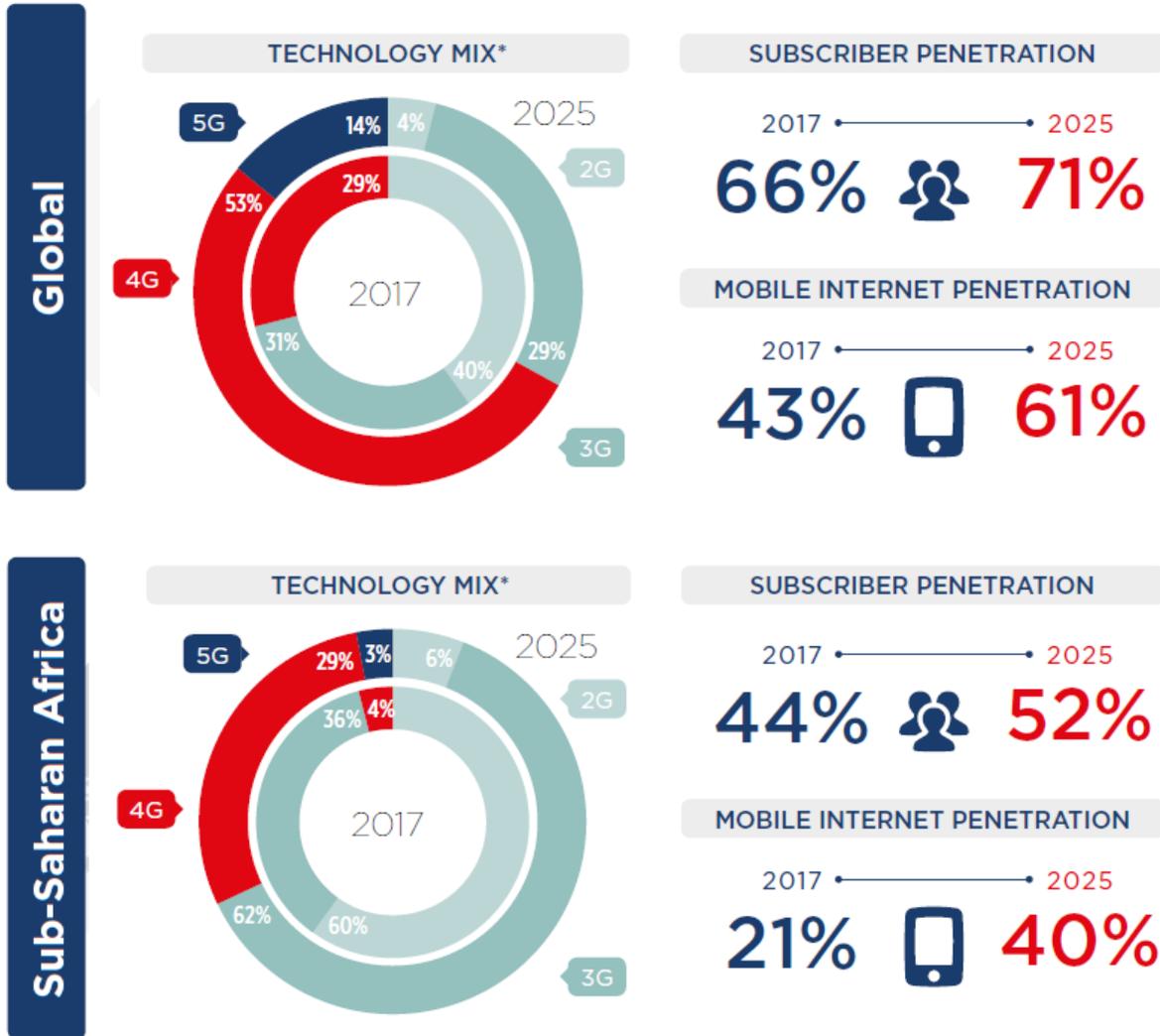


**Wearables** include connected watches, jewelry, clothing, eyeglasses, in-ear devices and contact lenses and brain-computer interfaces



**Implantables** are objects inserted directly into the human body that drive ubiquitous connectivity by transmitting information from within the body

# The continued rapid pace of mobile connectivity growth in the developing world and leaps in connectivity speed and cost reduction over next 20 years



- Global subscriber growth starting to slow, likely reaching **mid-80% penetration by 2040**, but regions like Africa growing quickly
- By **2035-2040**, given ongoing **investments into last mile connectivity innovation**, Africa mobile data reach likely to be in 70%+ range
- **Speed of connectivity should increase dramatically** – 4G likely to be at 80%+ reach by 2040, 5G where at 50-60%+ (5G is 20 times faster than 4G)

# Ubiquitous connectivity of devices and sensors will be a major driver of innovation in the international development context, with most use cases still early stage



The **Internet of Things (IoT)** connects devices such as everyday consumer objects and industrial equipment onto the network, enabling information gathering and management of these devices via software to increase efficiency, enable new services, or achieve other health, safety or environmental benefits

## IoT “for good” use cases

- **BoP utilities** – decentralized energy, water, sanitation BoP infrastructure monitoring and management
- **AgTech** – sensors embedded into smallholder production and post-harvest equipment to improve yields, climate resilience, and reduce losses
- **Climate/environment monitoring** – water, air, etc. sensors for low cost environmental monitoring and surveillance in developing country contexts
- **Humanitarian relief** – food safety, location/action “buttons”, inventory tracking
- **Healthcare** – remote monitoring devices, vaccine/medication tracking and quality control
- **Public safety** – CCTV camera, face recognition, household heat sensors (household fires)



# Implications of ubiquitous connectivity in the development and the iNGO universe

## Opportunities

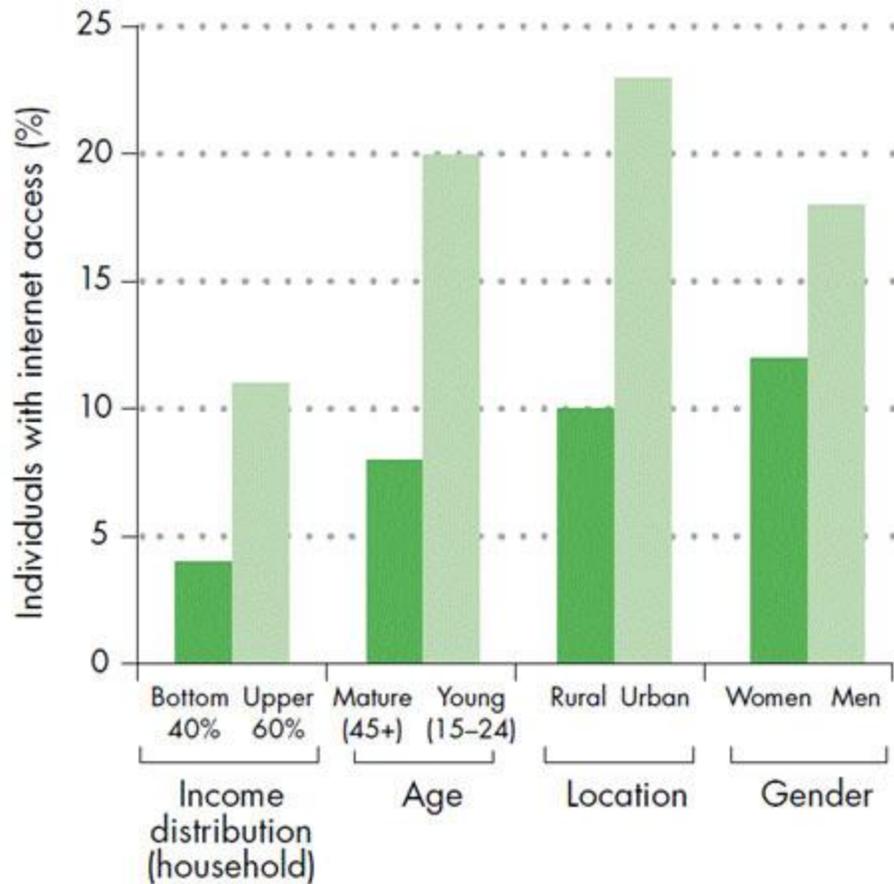
- Innovative technologies yielding lower costs to reach end-beneficiaries with information
- Better data from and about previously hard to reach or poorly understood communities
- New solutions and systems to allow for increased access to identity, asset registry and financial inclusion
- Broader access to digitally enabled services (energy, WASH, health, education, etc.)
- Ability to use connectivity at scale to mobilize populations / advocacy
- Ability to use richer media to relay messages (e.g., graphically rich content, VR) as connectivity costs decline and device sophistication increases

## Challenges and risks

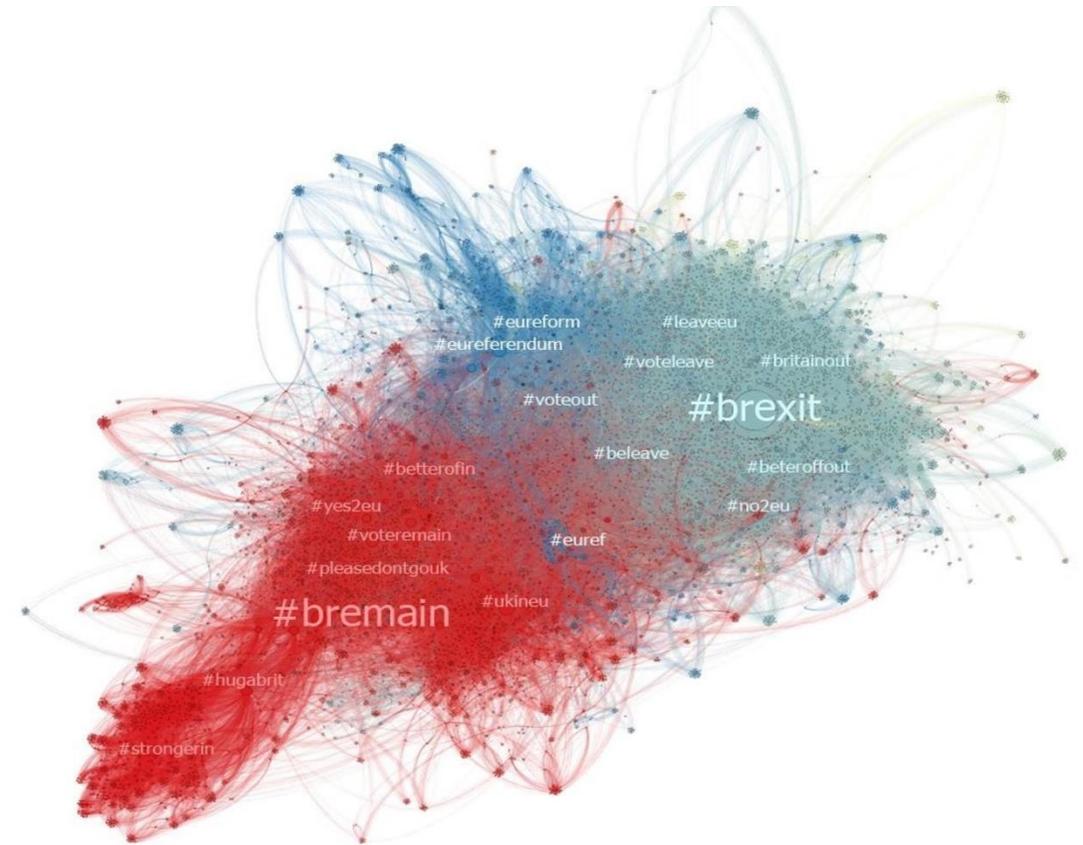
- Potential for greater digital divides in extent and, increasingly, in quality of access (age, rich vs. poor, gender)
- Filtering effect/polarization due to way that connected populations consume info/media/news
- Digital totalitarianism / surveillance state
- Data safety / privacy

# Exploring the dark side of connectivity... major digital divides may narrow but are expected to persist, and “echo chambers” drive populations to extreme sides of issues

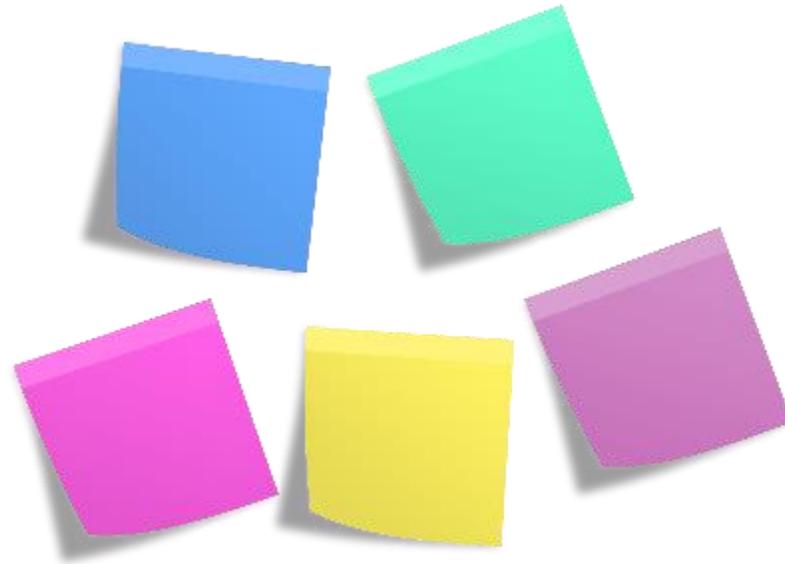
## Digital divides: Africa’s internet access (2016)



## Echo chambers: EU referendum social media postings



Have you planned your  
strategy around ubiquitous  
connectivity?



# Digital megatrends and future technologies

Ubiquitous connectivity



**Data revolution & Artificial Intelligence**

New pathways for interactivity

Automation and Robotics

Business model transformation

# There has been an exponential increase in data collection and analytics, driving the data revolution megatrend

## Underlying trends in data revolution

- Exponential increase in the volume and variety of **digital data** collected
- Introduction of the **digital ID** ecosystem is driving the capture of large volumes of inter-linked data
- Increasingly **powerful and low cost computing devices** are democratizing access to data analytics on demand
- Growing use of **big data analytics** techniques to derive insights from large data sets
- Rapid innovation in **Artificial Intelligence** technologies are capable of generating powerful new data insights and predictions

## Main technologies driving the data revolution



**Digitalization** of information and processes is driving an exponential increase in data volumes



**Cloud storage and analytics** lowering the costs of storing and analyzing large data sets across geographies instead of via local hosting



**Big data analytics** are tools and methods of examining large and varied data sets to uncover useful insights using statistical techniques



**Artificial intelligence (AI)** systems are accelerating the data revolution and unlocking insights and predictions



**Digital IDs** are the electronic equivalent of an ID card that serve as a conduit to financial and other data-rich services

# Emerging technologies – including big data, data analytics, computing power, and AI – are unlocking potential at an exponential growth rate



The world is witnessing an explosion in **Big Data** - we entered the Zettabyte era in 2017 with volume of online data projected to continue exponential growth



**Data Analytics** capacity is growing alongside data volumes: computing power has increased exponentially, and the cost of computing have declined proportionally



**Computing power** is growing at an **unprecedented rate** - today's smartphone compares to the most powerful supercomputer that was developed just 20 years ago

**Artificial Intelligence (AI)** comprises intelligent systems that can sense, think, interact and learn. AI machines can have cognitive, visual, auditory and linguistic, and motor abilities.

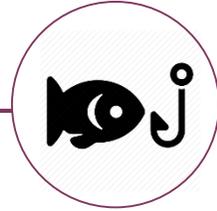
- In 2015, **ANI (Artificial narrow intelligence)** was restricted to one functional area
- By 2020, Intelligence of machines can equal humans. **AGI (Artificial general intelligence)** will cover fields like power of reasoning, problem solving, and abstract thinking
- By 2050, the intelligence of machines surpasses human intelligence across all fields. **ASI (Artificial super intelligence)** is the final stage of the intelligence explosion

# For example, AI is being used to revolutionize different sectors in development; with time this will define how ICSSOs develop solutions for major global problems



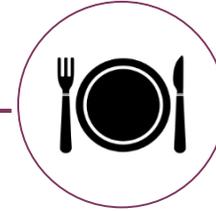
## Health

Predictive modelling of cholera outbreaks can be developed in advance based on algorithms and used to supply vaccines



## Fisheries

Machine learning uses data in fishing vessels to monitor and analyze fishing activity among fleets



## Nutrition

AI uses data from mid-upper arm bands to monitor nutritional status of children, thus informing famine response



## Humanitarian

Big data/ deep learning used to map discrimination against refugees in Europe



## Education

Watson uses learning outcomes of students and help develop confidence to master subjects



## Agriculture

AI used to leverage data from satellites and drones to monitor risks of pest/ disease attacks

# Implications of data revolution in development and the iNGO universe

## Opportunities

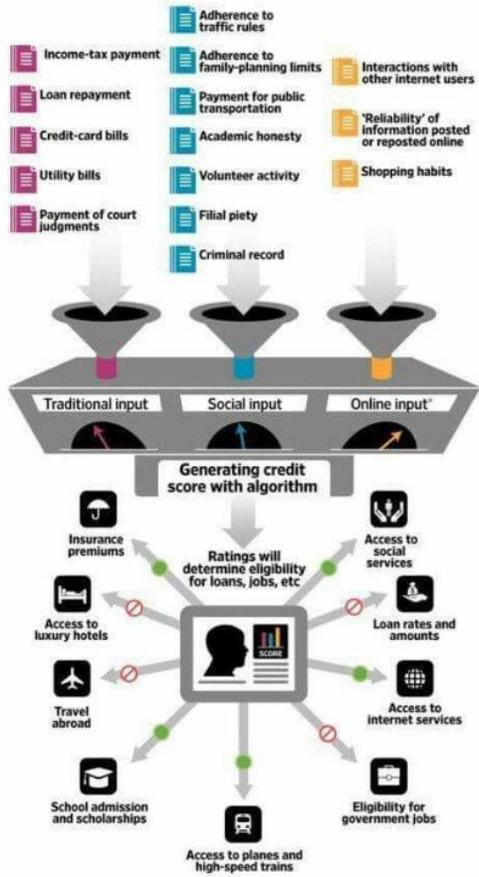
- Improved insights into consumers, markets, and physical phenomena
- Early warnings on human-made & natural disasters
- Real-time, granular data for resource planning and deployment
- Faster and more automated decision-making and service delivery (e.g., chatbots for BoP services)
- Better ability to accurately predict/anticipate future events and trends

## Challenges and risks

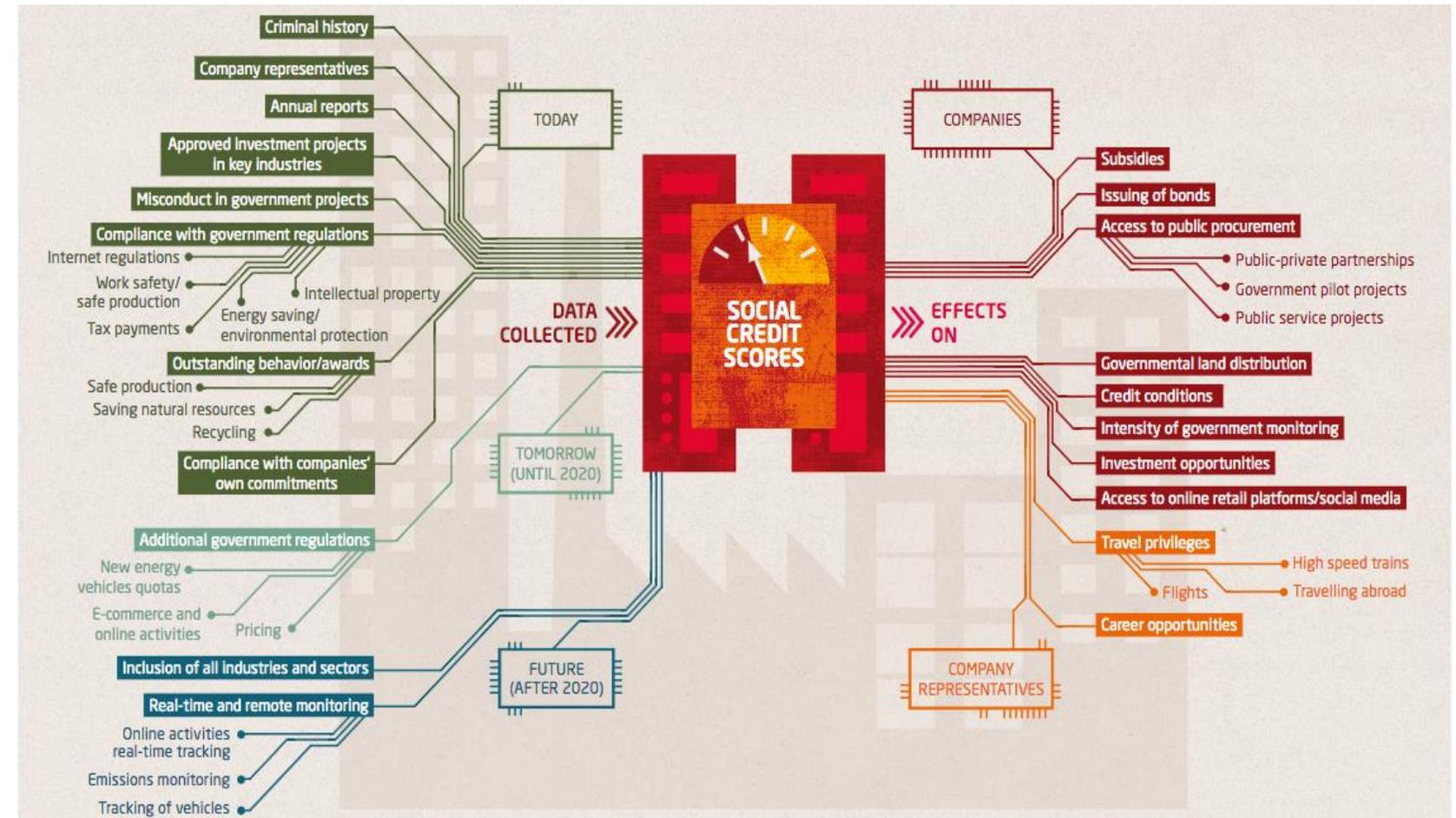
- Elimination of jobs / livelihoods related to artificial intelligence
- Surveillance state and digital totalitarianism (e.g., China Social Credit Score)
- Unethical Artificial Intelligence (exclusion via AI, skewed decisions that don't incorporate needs/wants of excluded populations)
- Weaponization of AI

# Exploring the Dark Side of the data revolution – digital social and political controls and surveillance

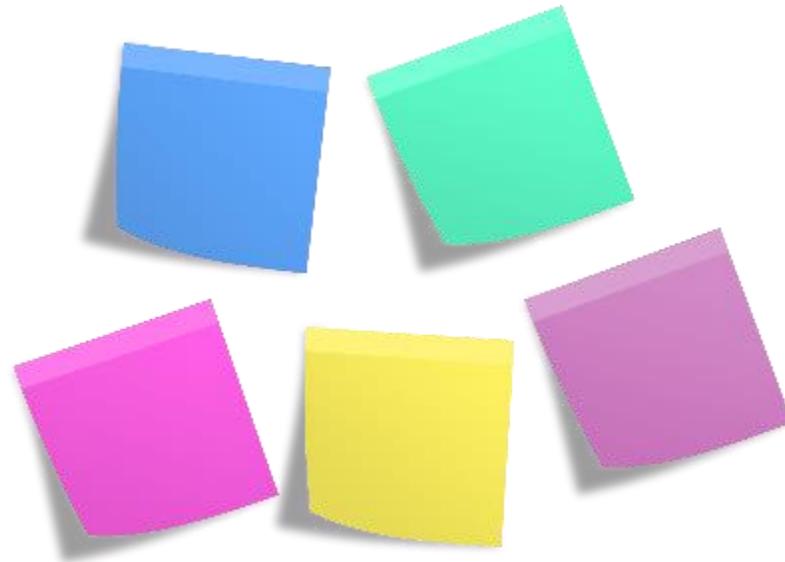
## China Personal Social Credit Scores



## Business Social Credit Scores - a fast evolving and increasingly sophisticated eco-system



Have you planned your  
strategy around  
data revolution?



# Digital megatrends and future technologies

Ubiquitous connectivity

Data revolution & Artificial Intelligence



**New pathways for interactivity**

Automation and Robotics

Business model transformation

# As we become more connected and reliant on machines, new pathways to interactivity are emerging, enabled by new technology developments

## Underlying trends

- **Rapid evolution in voice/speech recognition technology**
- **Aggressive investment into new digital interfaces** by all major technology actors
- **AR/VR are among the fastest growing digital technology sub-segments** across a wide swathe of use cases for entertainment, gaming, and productive uses
- **Use interaction patterns with technology, moving from social media and messaging, to multi-functional platforms** that can provide individualized on demand service across broad needs

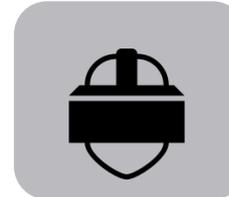
## Major enabling technologies



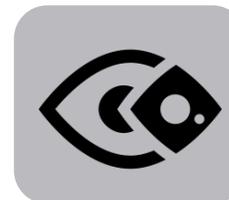
**Advanced digital interfaces** include features like manipulatable holographic displays, 3D gesture recognition, and haptic feedback



**Voice recognition / virtual assistants** interface with humans in a human way, typically joined with Artificial intelligence/Natural language processing capabilities



**Virtual reality** is a simulation of a 3-D environment that can be interacted with in a seemingly real or physical way



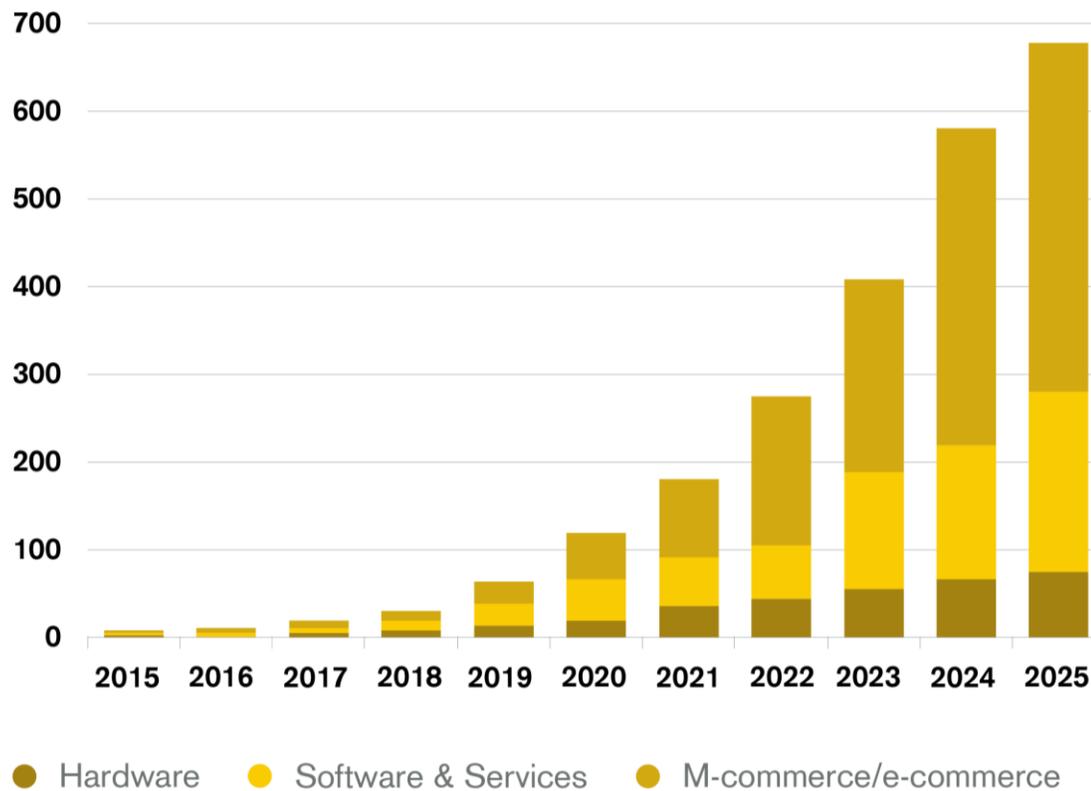
**Augmented reality** projects information over the real world through useful or entertaining graphics over a live image



**Universal digital platforms** enrich the value of existing social media platforms to serve customers holistically, with highly personalized and on-demand services

# Extremely rapid growth is projected for at least the next decade for VR/AR technologies, across both developed and developing markets

VR/AR market could potentially grow to the size of the current smartphone market in USD bin



- Experts project that AR/VR will be **among fastest growing digital techs** over the next two decades
- AR/VR will grow **10X by 2025** and will likely be a **major sector of global economy by 2035** (\$2.16 trillion industry)
- Beyond entertainment and gaming industries, **attention increasingly shifting to AR** given the wide range of corporate efficiency, education, manufacturing, and other productive use cases for augmented reality technologies

# There are many potential use cases for international development and civil society organizations



## Advanced digital interfaces

- Holographic displays to enrich data visualization / presentation
- Haptic feedback interfaces for remote control of devices in humanitarian settings
- Assistive technologies for persons with disabilities



## Virtual reality

- VR storytelling as advocacy and fund-raising tool for engagement and empathy
- VR training simulations for humanitarian aid workers
- Immersive education content in VR to drive behavior change
- Virtual reality tele-presence for multi-stakeholder facilitation



## Augmented reality

- Rapid, remote capacitation / training of low skill, low education workforces
- Upskilling of local professionals or paraprofessionals
- Humanitarian assistance virtual aids
- Behavior change communication or AR-enriched story-telling



## Voice recognition/Virtual assistants

- Next generation of call center services for populations who have limited literacy
- Voice interfaces for smartphones / wearables with development applications



## Universal digital platforms

- Creation of new types of digital platforms to build coalitions, crowd-source funds, etc.
- Integration of social good functionality into existing dominant digital platforms



# Implications for ICSOs from new pathways for interactivity

## Opportunities

- Technologies will increasingly enable ICSOs to leapfrog literacy and digital skills constraints
- New channels (e.g., virtual assistants, VR, AR) for engaging end-beneficiaries attention and driving to behavior change
- New ways of capacitating staff, partners, and local communities with technology-assisted training or vitally needed AR-enabled skills
- Potential to partner with increasingly powerful and ubiquitous Universal Digital Platforms that service end-users holistically and can integrate information, service delivery, logistics, and data insights

## Challenges and risks

- Investment into VR/AR will prioritize entertainment/gaming content rather than creation of public good information and knowledge products
- Virtual assistants / speech recognition technology will not be adapted to local cultural context and languages due to costs
- Low technical capacity of development community to make use of new wave interactivity technologies
- Risks of winner take all models and monopoly power by digital platform winners which may make it harder for ICSOs to engage with them

Have you explored the role of  
interactivity in the future of  
your organization?



# Digital megatrends and future technologies

Ubiquitous connectivity

Data revolution & Artificial Intelligence

New pathways for interactivity



**Automation and Robotics**

Business model transformation

# The automation megatrend is expected to grow, with government spending on robotics is expected to increase until 2025

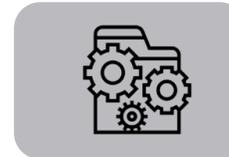
## Underlying trends for automation

- Automation is **creating performance and productivity opportunities for business and the economy**
- It is estimated that nearly **40% of today's US jobs** will be replaced by robots in the 2040
- With workflow automation, the organization **can collect use and analyse big data for decision making**
- The increasing **accessible robotics, machine learning, and AI are pushing the frontier** of machines
- The **increase in computing capacity** has allowed larger and more complex robots and AI to be built

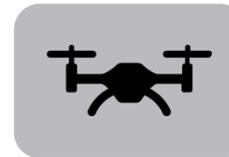
## Main technologies driving automation



**Remote sensing** uses technology to collect information using a satellite or high-flying device



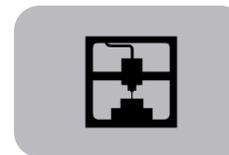
**Robotics processes automation** allows employees to interpret existing applications to analyze and manipulate data



**Drones** are used in situations where a manned flight is considered too risky or difficult to fly



**Wearables** are incorporated into items of clothing and accessories and track information without the need for on-site monitoring



**3D printers** create a physical object from a three-dimensional digital model and allow for the creation of more complex tools/devices

# Drones, robotics, satellites, and 3-D printing are among the leading technologies that are driving automation of multiple industries globally

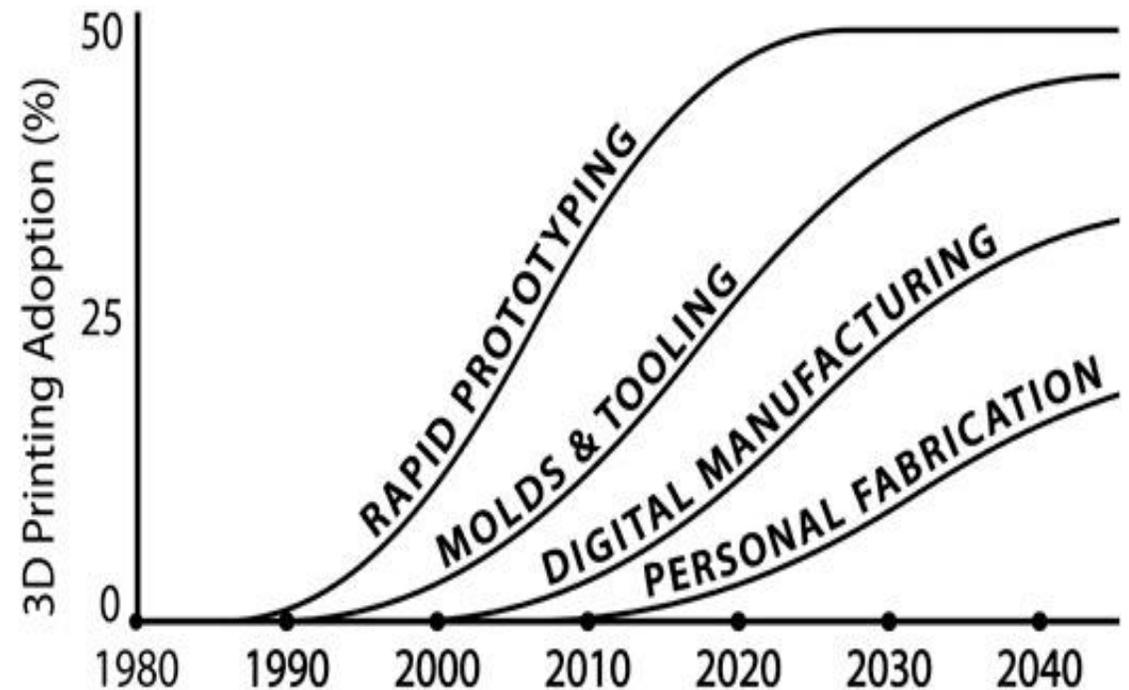
## Satellites

- Satellite broadband is believed to **represent 50% of the projected growth of the global space economy by 2040**
- Satellite data are increasingly **used to measure developing economies** in areas including urban land use, agriculture and the environment

## Drones

- The technological potential with drone is immense; it is predicted that **in 2040 drones will be created by 3D printers to accommodate their increased sophistication**
- **Sophisticated drones could potentially be used for everyday tasks** like monitoring traffic incidents, surveying hard-to-reach places

## 3-D printing adoption curve 1980 - 2040



# For example, 3D printing and AM manufacturing is expected to transform humanitarian aid



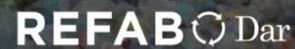
## Replicable global designs

- Digitalization of 3D part catalogues for critical humanitarian assistance needs (e.g., Field Ready work with Oxfam, ICRC, and World Vision to develop 3D part catalogue)



## Efficiency capture from short supply chains

- 3D printing facilities can be used to produce small batch goods that address specific requirements and/or are close to the point of need eliminating long waiting times (e.g., New Story and ICON 3D house part printer, 30% savings on materials and construction costs)



## Local innovation and rapid prototyping

- ReFab Dar, a Tanzania based initiative to explore how plastic waste can power entrepreneurship using 3D printers partnerd with JHPIEGO, Reflow, Cambridge University and 3D4MD to take the next steps in realizing the potential of 3D printing for improving the health ecosystem in Tanzania



## Local assembly/manufacturing to generate jobs

- 3D printing operations in refugee camps (e.g., Refugee Open Ware project in Jordan which trains disabled refugees to produce prosthetic limbs and tools)

# Implications of automation for ICSOs and broader development sector

## Opportunities

- Accelerated productivity growth due to technological advances and automation
- Low cost delivery of automated services (e.g., via RPA/chatbots) where human-staffed service delivery is not economically viable
- Higher accuracy and speed of data analysis for surveillance, customer targeting, product dev't, resource allocation, and service delivery due to drones/remote sensing
- Potential lower costs in productive processes and the possibility of mass customization via 3D printing
- Creation of new local jobs to service new technologies (e.g., 3D printing for local assembly)

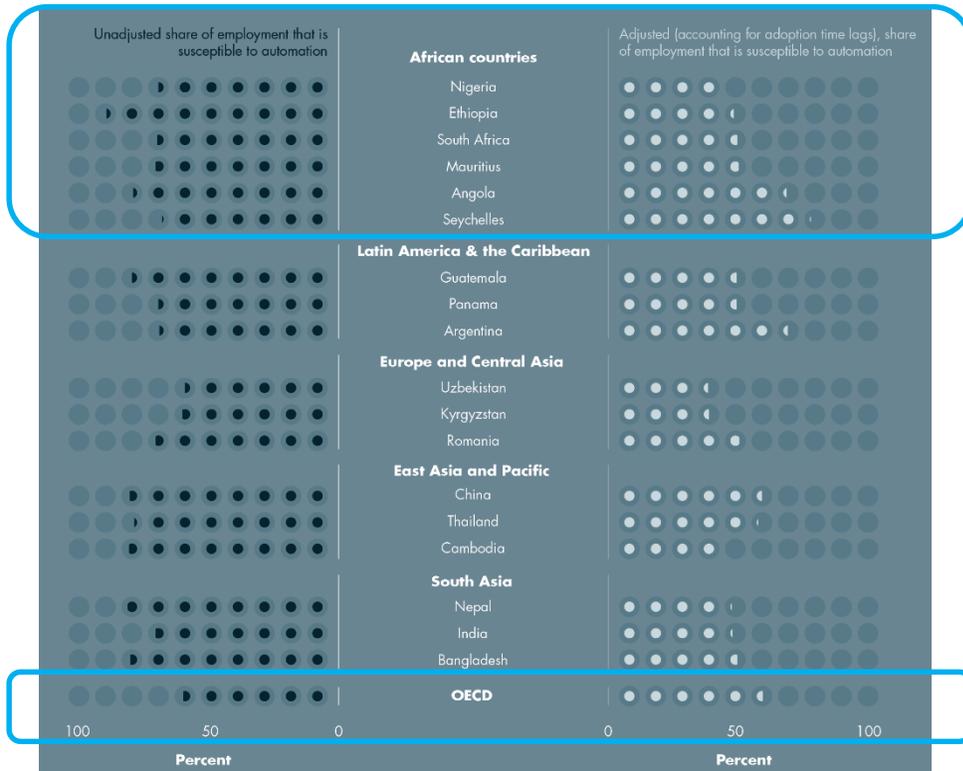
## Challenges and risks

- Jobs lost to automation (especially transactional / predictable activities)
- High-scale workforce transitions (reboots and continuous retraining )
- Large investments required for capital-intensive automation technologies
- Machine potential to exceed human capability
- Change management in tech adoption

# How is automation affecting the labor market, particularly the displacement of jobs across the developing world?

## How susceptible is Africa?

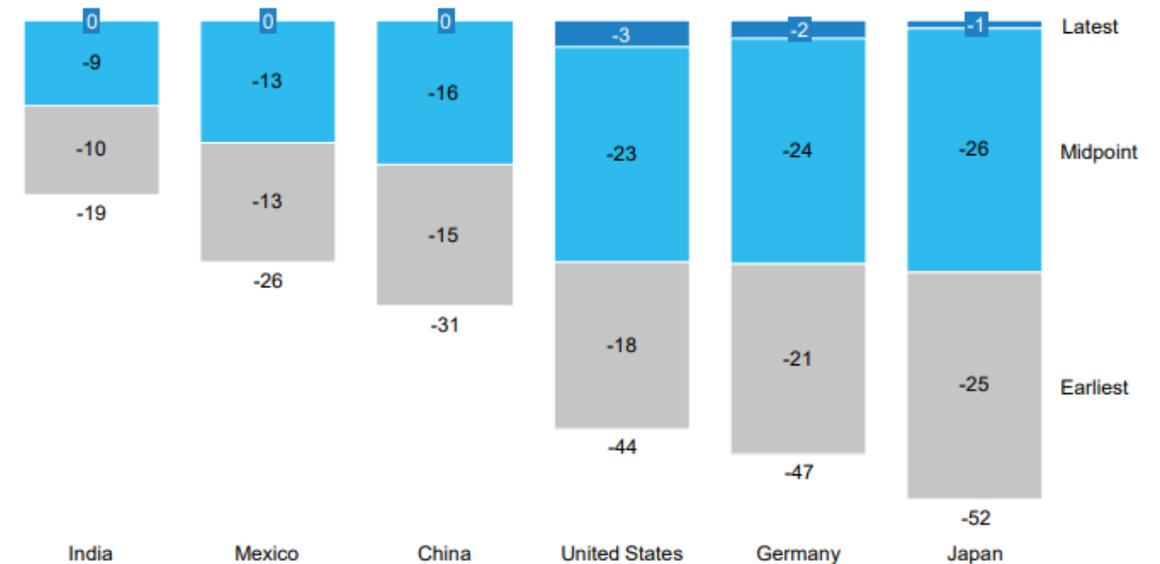
“In Africa, **2/3 of all jobs are susceptible to automation**. Nevertheless, slow adoption of advanced technology and lower wages are likely to shave off automation and its resulting job displacement in developing countries”



## Impact of automation on total employment by 2030

By 2030, in the midpoint adoption scenario, automation could replace up to 9–26% of current work in our focus countries, as high as 19–52% in the earliest adoption scenario and as low as 0–3% in the latest adoption scenario

Projected impact on total employment in midpoint automation scenario, 2016–30  
% of FTE hours with potential to be automated, midpoint scenario (range of automation scenarios, latest to earliest)



NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

How can the power of automation be harnessed for social good?



# Digital megatrends and future technologies

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New pathways for interactivity

Automation and Robotics



**Business model transformation**

# Business model transformation – decentralization and democratization

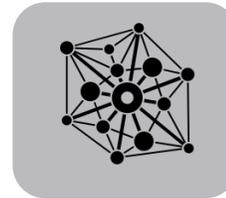
## Underlying trends

- ✓ Decentralization of business models
- ✓ Rise of shared economy models
- ✓ Rise of pay-as-you-go models (PAYG)
- ✓ Bundled services
- ✓ Peer-to-peer models (P2P)
- ✓ Decentralized access to financial services

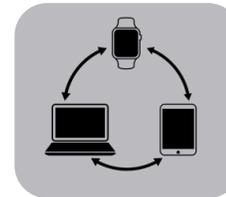
## Main technologies driving the decentralization of technology



**Low cost backhaul and last mile connectivity devices** including continuing development and alternatives; and reductions in the cost of devices



**Big data** refers the underlying data revolution trend that collects and analyses large amounts of data that organizations can use



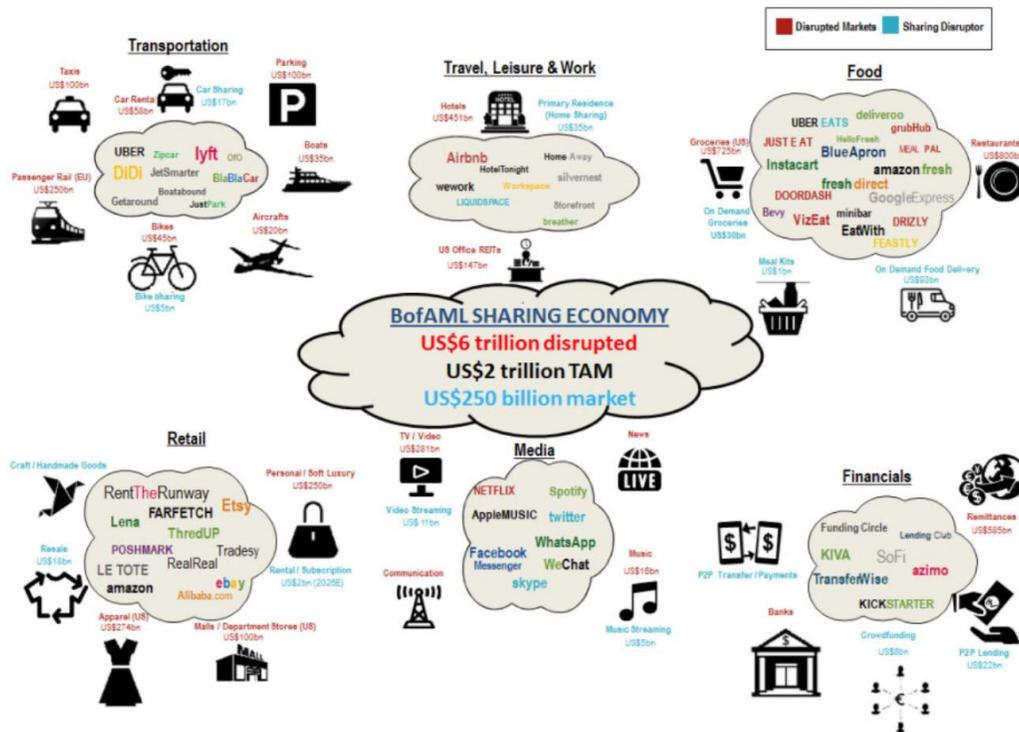
**Internet of Things** including billions of sensors embedded in appliances, homes, businesses, urban infrastructure and industrial equipment



**Blockchain** provides a digital ledger in which transactions are recorded chronologically and publicly, changing business models

# Examples of innovative business models include the circular economy and pay-as-you-go models (PAYG), allowing for decentralized, IoT enabled, data-rich service delivery

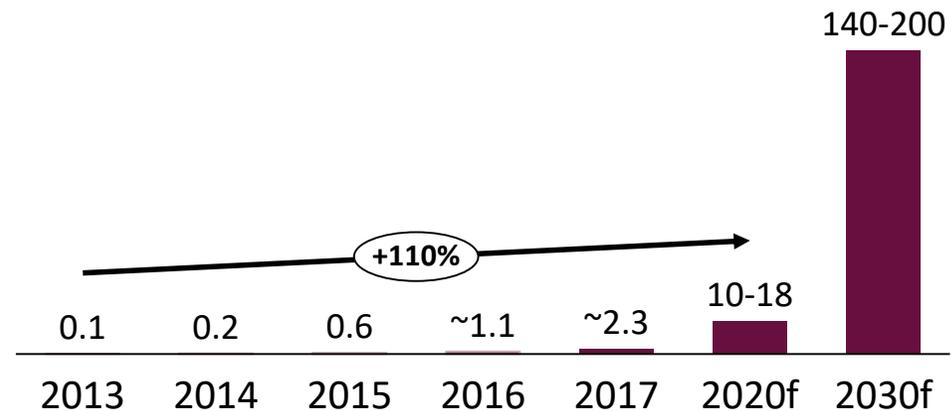
## Defining the sharing economy



## The rise of PAYG to reach the BoP

- ✓ Rapid growth of PAYG models
- ✓ Decentralized delivery models enabled by IoT
- ✓ Leverage of MNO and digital payments infrastructure

## Global cumulative PAYG penetration (millions)



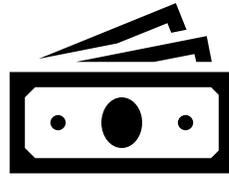
# Blockchain technology is used in applications for ICSSOs and development community – many use cases are still early stage and range of applications is growing quickly

## Selected examples of potential applications



### Identity and property rights

- Digital ID creation or verification
- Register ownership of assets digitally



### Financial services

- Digital wallets
- Financial identity for the unbanked
- Transparency in transactions
- Faster and cheaper transactions



### Supply Chains / Logistics

- Transparency in value chains
- Smart contracts to empower producers
- Quality control and validation for supply chains



### Funding / donations

- Direct giving
- Transparency in donation streams
- Public spending tracking
- Reputation
- Feedback mechanisms



### Peer-to-peer models

- Energy
- WaSH
- Distributed resources / shared economy models for communities

# Implications of business model transformation – democratization and decentralization of technology in development and the iNGO universe

## Opportunities

- Less need to work with central nodes of authority that may be rent-seeking, ineffective, or inefficient
- Higher and faster reach of end-users
- Improved transparency of activities, outcomes, impacts
- Improved resource efficiency
- Higher enterprise competitiveness and more efficient business practices
- Faster go-to market capacity and access to untapped markets at BoP

## Challenges and risks

- Data privacy challenges in highly decentralized ecosystems without clear data owners
- Labor market disruptions and inequitable outcomes (e.g., gig economy downsides from shared economy models)
- Less control of technology by end-user – e.g., everything as a service models where new utilities have monopoly power over users
- Availability of public transactions and data privacy

Have you recently considered a business model transformation?

Have you planned your strategy around democratization of technology?



A satellite with solar panels and antennas is shown in space. The Earth's blue and white horizon is visible on the left, and the Milky Way galaxy is visible in the dark background. A dark red banner is overlaid at the bottom.

## Implications for INGOs and Moderated Discussion

# Digital revolution and the role of ICSOs – how will the role evolve?

## ICSO distinctive strengths

- Strong comparative advantages in policy/advocacy
- Depth of experience across sectors and geographies
- Technical experience in on the ground service delivery
- Pro-poor orientation and mission and deep understanding of end beneficiaries and local contexts

## ICSO challenges

- Fundraising challenge as development landscape shifts
- The weight of the nation state in reinforced, sidelining other emerging governing paradigms
- Increased difficulty accessing vulnerable communities
- Risks of business model disintermediation as new entrants interface with end-beneficiaries (e.g., PAYG service delivery)

## How to adapt to digital disruption?

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- **Take on new thematic issues** to address new risks /challenges arising from digital disruption
- **Build new capabilities** to be able to engage on R&D, pilots, and scale-up partnerships for emerging digital technologies
- **Find new partners** that can accelerate path to experimentation and build capabilities
- **Embrace experimentation with new operating models or mechanisms** that compete with current organization but create potential for re-invention

# Thought-starters on implications for how iNGOs operate (1/2)

## Capabilities

- Invest in **data collection/storage infrastructure and data analytics capabilities** as stepping stone to more sophisticated machine learning / artificial intelligence work
- **Recruit external tech talent** interested in impact/social good or borrow such capabilities
- **Roll-out structured digitalization training** for staff to educate them about available tools and opportunities
- **Enter into partnerships with innovation leaders** exploring next horizon technologies, particularly in areas that will be very difficult to replicate in-house
- Build **capabilities on ethical technology use** and deployment

## Operating models

- **Explore set-up of collaborative platforms** for peer iNGO institutions and other sector partners to capture data and operational synergies and find new modes/channels for end-beneficiary engagement and impact
- **Increase emphasis on external partnerships** to maximize exposure to cutting edge technologies and digital capabilities; will require partnering with new types of players
- Explore implications for **centralization vs. decentralization** from new digital technologies

# Thought-starters on implications for how iNGOs operate (2/2)

## Governance and organization

- **Consider setting up technology advisory councils** to have regular access to high quality advice and perspectives from broad range of tech innovators and experts
- **Create digitalization committees** to guide/oversee digitalization initiatives and track experimentation
- **Assess options to create innovation units** within organization drawing on experience of other development organizations
- Consider hiring/designating **Chief Digital and Chief Data officers** if roles do not already exist in organization
- **Create new roles and processes** around data privacy and ethics as volumes of data and data analytics increase

## Fundraising approaches

- **Explore increased use of new digital story-telling tools for fundraising** e.g., big data visualization as regular part of funder/donor communications and M&E
- **Explore digital innovations for fund-raising and financing** – e.g., digitally-enabled crowd-funding models including new types of blockchain and virtual currency enabled approaches

Have you identified any other opportunities and challenges?  
Will technology make your organization more or less relevant?



# How will future digital disruption affect what ICSOs do and how they do it?

## Q&A

- Immediate reflections or clarifying questions on highlighted digital disruption mega-trends, opportunities, risks?

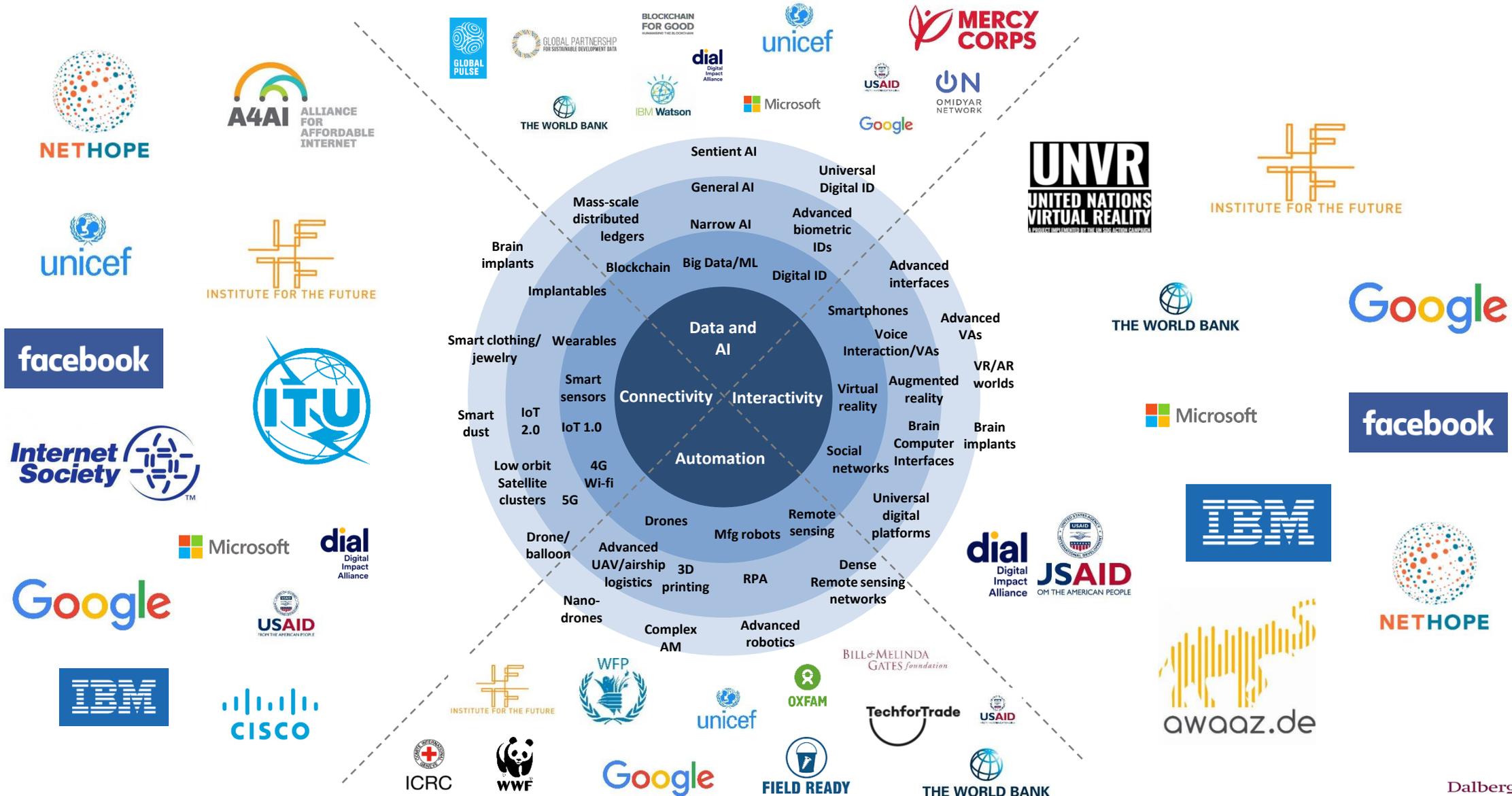
## BREAK OUT SESSION QUESTIONS

- What do these mega-trends mean for our organizations? Split into 5 groups with each tackling a mega-trend to assess opportunities /priorities/implications for their organizations each and reporting back to plenary.
- What new themes should we work on? 5 groups debate priority new issues to take on to accelerate positive aspects of digital disruption (e.g., pilot specific innovations) or manage new digital risks/challenges.
- Implications for how we work? Groups assess implications for capabilities/talent, operating models, governance, partnerships, fundraising?

## PLENARY DISCUSSION

- Are iNGOs more or less relevant in this evolving ecosystem? How will iNGO roles shift due to digital disruption?
- Thought-starters on responding to upcoming digital trends in more strategic manner
- Final reflections/next steps

# Who can iNGOs partner with on specific digital tech opportunities?



Source: Dalberg analysis

**THANK YOU**

[Robin.miller@dalberg.com](mailto:Robin.miller@dalberg.com)

[Carlijn.Nouwen@dalberg.com](mailto:Carlijn.Nouwen@dalberg.com)

