PS&D
SEPTEMBER 2017

Private Sector & Development

PROPARCO'S MAGAZINE

PRIVATE SECTOR AND DIGITAL INNOVATION: CATALYSTS FOR DEVELOPMENT

Internet - Digital divide - Mobile telephony
Mobile banking - Smart cities

IDEAS FOR DEVELOPMENT
Blog coordinated by the Agence Française de Développement

SPECIAL ISSUE

PROPARCO
GROUPE AGENCE FRANÇAISE DE DÉVELOPPEMENT

PRIVATE SECTOR & DEVELOPMENT
is published by Proparco,
Agence Française
de Développement Group,
share capital of EUR 693,079,200,
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75001 Paris - France
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Editorial office
(:?!;)DOUBLEPONCTUATION,
www.doubleponctuation.com
Animal Pensant

Photo credit (front cover)
iStock / Getty Images

Printing on recycled paper
Pure Impression

ISSN 2103-334X
Legal deposit at publication
23 June 2009

SUMMARY

Harnessing digital innovation to development

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Chief Digital Officer
at AFD

Anne-Sophie Rakoutz

Head of Proparco's Private
Equity Division

Digital innovation and the "disruption" it causes have a huge impact on society, both North and South. Digital technology provides an innovative basis for sharing knowledge and it can deliver solutions that accelerate the achievement of Sustainable Development Goals (SDGs): enhancing financial inclusion through mobile money; emancipating and untethering young people by giving them access to e-education; protecting the environment and partnering the energy transition through smarter use of resources (smart grids, e-agriculture); or improving access to healthcare through telemedecine and smartphone-based medical diagnosis. The current digital innovation boom in developing countries can drive technological leapfrogging to the benefit of the economies in question. And it can also provide inspiration for France and Europe in general: we have a lot to learn from the cross-fertilisation processes at work in development projects.

The rapid take-up of innovation has been made possible notably by the enhanced connectivity of various different populations. Nearly 3.7 billion people throughout the planet now have access to the Internet. Africa alone counts 600 million mobile phone users and 250 million cybernauts. In certain countries, households have much better access to mobile phones than to basic requirements like electricity or running water. Despite the exponential increase in digital practices witnessed in a very short time, "e-penetration" on the African Continent still needs to be stepped up. Bandwith must be increased and e-inclusion enhanced for the less well-off. Africa has produced some amazing success stories – take M-Pesa (mobile banking) or M-Kopa Solar (pay as you go solar power) in Kenya, for example – but these tend to mask problems with securing support and financing.

It is vital to grow the Digital Transition and make it both more inclusive and equitable, and obviously the whole AFD Group is investing extensively in this process at a number of different levels. AFD has for example been funding a number of initiatives to promote digital innovation via the Afric'Innov incubator network and the Digital Africa competition. We are also partnering several e-solution developers and stakeholders in a number of sectors (mobile banking, e-government, e-education, broadband infrastructure, etc.). And the same goes for Proparco, which has put money into several venture-capital projects over the past two years, including three whose business models involve developing a specific digital technology.

Our strategic focuses here could not be clearer: guaranteeing secure, affordable Internet access for everyone; accelerating roll-out of SDGs by harnessing e-technology in all sectors; and promoting digital innovation by supporting all of the stakeholders in a given sector, i.e., private entities, incubators, and start-ups and their ecosystems in Southern countries. Financial backers have a key role to play in partnering these transitions, maximising the impact of these dynamic innovations, managing the risks associated with our increasingly digitalised societies and facilitating exchanges and the dissemination of best practices between North and South. ■

Pierre-Arnaud Barthel,
Senior project manager, AFD

Pierre-Arnaud Barthel is senior project manager and lead expert in the Local Governments and Urban Development Division of the AFD, in charge of digital issues in urban development. He was previously a senior lecturer in urban planning at the Institut Français d'Urbanisme (University of Paris-East) and wrote several papers and edited collective publications focusing on Arab Mediterranean Countries such as: "*Expérimenter la 'ville durable' au Sud de la Méditerrannée*" and "Arab cities, sustainable cities?".

Seth Berkley,
CEO of Gavi, the Vaccine Alliance

As a medical doctor and epidemiologist, Dr Seth Berkley joined Gavi, the Vaccine Alliance as its CEO in August 2011, spearheading its mission to protect the world's poorest children by improving access to new and underused vaccines. Prior to Gavi, Dr Berkley founded the International AIDS Vaccine Initiative (IAVI) in 1996, the first vaccine product development public-private sector partnership, where he served as president and CEO for 15 years.

Erwan Le Quentrec,
Manager, Sociology and Economics of Networks and Services (SENSE) Department, Orange Labs

Erwan Le Quentrec leads a team of researchers specialized in the role and impacts of ICT in various fields: education and vocational training, work, health, customer relations management. In addition to his management activities, he coordinates collaborative innovation in the education sector for the Africa, Middle East (AMEA) region. He holds a PhD in Economics from the Université de Bourgogne.

Jean-Luc Perron,
Former Executive Officer, Grameen Crédit Agricole Microfinance Foundation

Jean-Luc Perron was one of the driving forces behind Fondation Grameen Crédit Agricole where he has been Executive Officer since 2008. After working as a financial advisor to the French Ministry of Agriculture, he joined Crédit Agricole in 1985. He is a graduate of École nationale d'administration (ENA) and of the Stanford Executive Program.

Pierre Casal Ribeiro,
Project manager, Pacifica and Grameen Crédit Agricole Microfinance Foundation

Pierre Casal Ribeiro joined Pacifica and the Grameen Crédit Agricole Foundation in October 2014 as a Research Officer in agricultural insurance, within the framework of his PhD in management at Paris Ouest – Nanterre La Défense University. His research interests lies in the business models of agricultural insurance and public-private partnerships. Previously, Pierre worked in sustainable development consulting and for several NGOs. In particular, he worked for the MFI Fondesurco in Peru, and for PlaNet Finance in Paris and Dakar. Pierre holds a Master degree from ESCP Europe and is also a graduate from the European Microfinance Programme of the Solvay Business School in Brussels.

Jean-Michel Huet,
Partner, BearingPoint

Jean-Michel Huet is a Partner with BearingPoint and Head of its emerging countries business. He has worked for a number of international development institutions, mostly in Africa. Jean-Michel is the author of a number of French language publications, including *What if telecoms didn't exist?* (Pearson, 2010) and *Digital Africa* (Michel Lafon, 2017), as well as numerous articles focusing particularly on market entry strategies, management and convergence.

Gwenael Prié,
Senior project manager, AFD

Gwenael Prié is in charge of managing ICT projects in several African countries. As an engineer from Telecom ParisTech, Gwenael Prié began his carrier as a telecommunications consultant, before launching an independent activity to raise awarenessness about ICT4D and help NGOs adopt mobile applications in Africa. He is also the co-founder of the "Start-Up Africa Paris" collective and the co-author of "The Water Travellers", an award-winning book about his travel around the world to raise awareness of water-related issues

The blog ID4D is intended for all stakeholders in the development sector, from both the North and South, and the public interested in development. ID4D is an exchange forum that aims to foster constructive debate of ideas in a constructive spirit. The contributors to the blog are experts from AFD or other institutions (research institutes, universities, NGOs, international institutions, Ministries...).

Since 2009, Proparco has coordinated the Private Sector & Development (PS&D) initiative, examining the role of the private sector in southern countries. Issued as a quarterly themed magazine and specialist blog, the PS&D initiative presents the ideas and experiences of researchers and actors in the private sector who are bringing true added value to local and regional development.

What role for the private sector in the booming digital sector in developing countries?

Jean-Michel Huet, *Partner, BearingPoint*

The spread of digital technology has been one of the most striking African success stories over the past 15 years and although the public sector has made an important contribution (e.g., funding of underwater cables by financial backers, development of e-government services), the role of the private sector has clearly been crucial to the whole process. However, with the boom in the platform-based economy, this phenomenon is now present far beyond the shores of Africa.

This article was first published in a shortened form in June 2017 on the *Private Sector & Development* blog.

To set up a digital business, you first need a functioning telecoms network and the boom in mobile phone networks in the late 1990s was a massive game changer. Now that over two-thirds of Africans have a phone connection[1] and access to Internet from their mobile phones, people are far less cut off than before.

> "Now that over two-thirds of Africans have a phone connection and access to Internet from their mobile phones, people are far less cut off than before."

This success has largely been driven by telecoms service providers, and in particular the private operators who dominate the African market (MTN, Vodafone, Orange, etc.). Maroc Télécom, with the backing of its UAE-based shareholder Etisalat, is the only operator to have enjoyed sustained Pan-African success. By building a massive indirect distribution network and offering prepaid services, operators have enabled the African telecommunications sector to boom as never before.

1 ▸ We need to beware of official figures and certain mobile phone penetration rates in excess of 100% that disregard the fact that some people have several telephones.

THE MOBILE PAYMENT REVOLUTION

The emergence of mobile payment (or m-payment) systems heralds one of the other great digital revolutions and here again it was private sector operators that first marketed the offering – Safaricom in Kenya with M-Pesa, MTN in Côte d'Ivoire, or Orange in Western Africa – together with banks who rolled out similar-type solutions.

A big chunk of the growth in the digital economy has also been driven by a few major international groups that began providing services in North America and Europe before moving into Africa: Uber the iconic car transporter does business in around 15 African countries; Facebook is also providing services in Africa, sometimes in "light mode" (using texting for example). Up to now, one sector appeared to have bucked this trend, namely online retailing. While the Amazon behemoth is still finding its feet on the Continent, the arrival of local players like Jumia or Afrimarket has given a big boost to African-style e-commerce. On a smaller scale, digital start-ups are just as common. Along with energy and FinTechs, digital business is the key focus of African start-ups and some have even emerged in the large-scale production of handsets (tablets, smartphones, etc.) where they have been a breath of fresh air for the Continent.

> "The impact of this African revolution is being felt beyond the shores of the Continent itself as other developing countries start to wonder if the African "m-payment" model could work in their markets as well."

However, the impact of this African revolution is being felt beyond the shores of the Continent itself as other developing countries start to wonder if the African "m-payment" model could work in their markets as well. Some central banks have even mooted the possibility of e-money replacing paper money over the next 15 years or so. But as a first step, several national governments (e.g., Pakistan, Tanzania and Morocco) have committed to building their own m-payment platforms.→

FOCUS
BEARINGPOINT

BearingPoint is a Dutch-based European management and technology consulting business with a footprint in 70 countries through its 160 partners and 4,500 consultants. It has an international network of partners and a solid presence in France where it is one of the leaders in business operations consulting. BearingPoint has been working with major businesses listed on the French CAC 40 stock market index and large government departments for over 15 years.

THE KEY ROLE OF PUBLIC-PRIVATE PARTNERSHIPS

These are perfect examples of the key role that the private sector plays in growing digital businesses. Nevertheless, we shouldn't think that this happens without the help of the public sector, usually in the regulatory phase or, more rarely, to pave the way for service interoperability (in Tanzania or Morocco, for example). If we return to the example of our start-ups, government bodies may also be stakeholders in this transformation by helping to establish business incubators (in Dakar or Brazzaville, etc.) or by assisting specific sectors such as education or healthcare. Public investment in e-government (or e-administration) is a striking example of what the public sector can do to grow the digital economy.

> "Digital Africa also has its own PPPs (public-private partnerships). They represent a key project funding mechanism."

Digital Africa also has its own PPPs (public-private partnerships). They represent a key project funding mechanism and major projects to overhaul national governance practices often avail of them. Using digital and biometric technologies for personal and administrative documents (national identity cards, passports, etc.) is a good example of this. In the digital arena, this often means deploying a platform-based approach if we apply the definition used in Platform Revolution[2]: *"A platform is a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them.*

2 ▸ Geoffrey G. Parker, Marshall W. Van Alstyne, Sangeet Paul Choudary, *Platform Revolution: How Networked Markets Are Transforming the Economy--And How to Make Them Work for You*, New York, W.W.Norton & company, 336 pages, 2016.

3 ▸ The National Rural Electric Cooperative Association was set up in 1942 and represents 900 electricity cooperatives in 47 rural US states. It supplies nearly 50 million Americans with power and is historically non-viable from an economic perspective with related negative impacts on rural development in America.

A NECESSARY JOINT EFFORT

African economic development, which requires the public and private sectors to work hand in hand, is generally very well-suited to just such a platform-based approach where different components need to be brought together from public and private stakeholders and start-up-type structures in order to develop services for different customers/users/citizens. Models currently being developed for smart cities that position various different public or private sector operators around new services (transport, energy, water, technology, health services, security, public services, etc.) lie at the heart of these examples of platform-based approaches. Therefore, the next phase in African digital development will involve a concerted joint effort by these different stakeholders around digital platforms.

These platforms, which serve as good examples of new business models and joint public-private sector initiatives, are also proving their mettle in developing countries outside of Africa. For example, the UK operator BT, which has been a private company for the past 33 years, is vying to become the monetization platform for a number of European smart cities (MK Smart City and Dublin, in the UK and Ireland, respectively). Even more interestingly, its solution is already effective enough to be applied in emerging sectors in developing countries. BT is offering to recast the business model of the chronically loss-making National Rural Electric Cooperative Association[3] to enable it to diversify its revenue streams. All of these examples illustrate the nice fit that can exist between public and private stakeholders in pursuit of development by harnessing digital solutions.

> “They will involve the key issue of data monetization and, to develop sustainable business models, the ability of both public and private operators to monetize these new services and the data collected will be absolutely crucial.”

Learning provides another example of this break with the past. As of this year, the Edx.org micro-masters learning platform initiated by Harvard and MIT, and funded mostly privately, is being exported to Latin America, the Middle-East and Asia (notably to India and China).

The resulting applications will be many and varied. In particular they will involve the key issue of data monetization and, to develop sustainable business models, the ability of both public and private operators to monetize these new services and the data collected will be absolutely crucial. Here again, coordination between the public and private sectors will be key. Sustainability will be contingent on ability to monetize data (in a defined regulatory framework) and thence to deploy platforms that make it possible to juggle between public sector-type services and others more suited to the private sphere. Digital technology can now make both types of service compatible and easily modifiable based on degree of maturity and development. ■

Yield and climate-linked insurance: a boon for small farmers

Pierre Casal Ribeiro, *Project manager, Pacifica and Grameen Crédit Agricole Microfinance Foundation*
Jean-Luc Perron, *Former Executive Officer Grameen Crédit Agricole Microfinance Foundation, Yunus Centre*

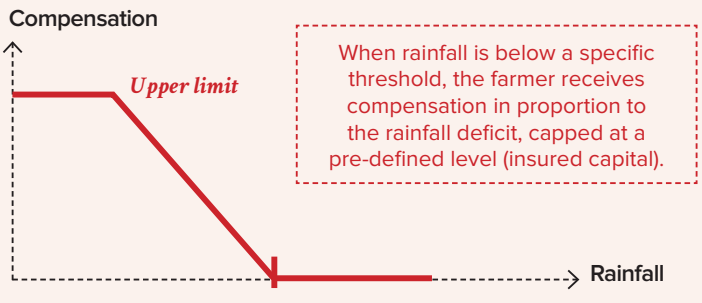
Insurance based on yield or weather indexes is a way of protecting small farmers in developing countries against natural risks. This innovation has the potential to improve their living conditions and enhance both food security and climate change adaptation. Expanding its coverage is a key challenge and one that calls for close, long-term cooperation between the public and private sectors.

This article was first published in issue 25 of *Private Sector & Development*

There are a total of 430 million farming units of less than two hectares in developing countries. The vast majority have neither private insurance cover nor access to public compensation schemes for agricultural disasters. To reduce their exposure to natural risks, these producers rely on community solidarity, precautionary savings and diversification – of crops and revenue sources. However, these practices provide only very limited protection and they have an implicit cost in the form of under-investment and lower yields.

Until recently such farmers were regarded as uninsurable: the sums to be covered were too low and the costs of administration, marketing and claims processing were too high. However, the advent of index-based insurance **(box opposite)** has been a game-changer. Unlike traditional insurance, which requires the services of a local expert to assess economic loss with respect to a claim, index-based insurance draws on biometric data (supplied by satellite imagery or by surface weather stations) or on average yield data to model losses arising, for example, from insufficient rainfall **(figure below)**. By reducing administration, distribution and transaction costs, this innovative approach makes agricultural insurance affordable for small farms in developing countries.

Rainfall-based index insurance



Source: authors

THE BENEFITS OF INDEX-BASED AGRICULTURAL INSURANCE

Index-based insurance circumvents the problems of adverse selection[1] and moral hazard[2] inherent in traditional insurance. The insured farmer does not have any influence over the index, which is based on objective data. The lower operating costs make it possible to insure small sums for very small farms and to compensate beneficiaries swiftly. Moreover, farmers are incentivised to achieve optimum output and to implement preventive measures because their compensation is based not on their individual situation but on the index. By assuming some of the risk, insurance effectively unlocks the investment capacity of these small-scale producers who can deploy more profitable strategies and thus secure crop loans more easily.

> “Until recently farmers in developing countries were regarded as uninsurable. The advent of index-based insurance has been a game-changer.”

Consequently, insurance helps drive development and farm modernisation. Moreover, when the insurance is linked to a loan, the outstanding principal is repaid directly to the financial institution in the event of a claim. This means that the borrower remains creditworthy for the following year and the risk of default by the farmer is significantly reduced. →

Timeline of index-based insurance

Economists Harold Halcrow (1948) and Hematala Dandekar (1977) developed the concept of index-based insurance, based on a yield index.

1993: The first index-based insurance pilot scheme is introduced in the United States.

1999: After several years experimenting with yield indexes, India rolls out its National Agricultural Insurance Program.

2003: Private insurers enter the Indian agricultural insurance market and the first weather index-based product is marketed by ICICI Lombard.

2000s: Multiple pilot schemes are introduced worldwide.

2009: Creation of the Global Index Insurance Facility, a multi-donor trust fund managed by World Bank Group and supporting the development of the index-based insurance market.

2015: The first Global Index Insurance Conference is held in Paris.

FOCUS
THE GRAMEEN CRÉDIT AGRICOLE MICROFINANCE FOUNDATION

The Grameen Crédit Agricole Microfinance Foundation was set up in 2008 as an initiative of Crédit Agricole in partnership with Professor Muhammad Yunus, winner of the Nobel Peace Prize in 2006 and founder of the Grameen Bank in Bangladesh. The Foundation – which was given an endowment of €50 million by Crédit Agricole – provides loans, equity capital and technical support to 47 microfinance institutions and 13 social businesses in 27 developing countries, mainly in sub-Saharan Africa and South Asia.

1 ▸ When insurers are unable to select beneficiaries according to their level of risk they apply standard conditions (premium, compensation) for everyone.
2 ▸ Moral hazard refers to opportunistic practices by individuals who, knowing that they are insured, limit their preventive efforts and increase their exposure to risk.

A complex chain of players

Source: authors

MODELLING RISK REMAINS A CHALLENGE

Distribution of this new type of product can encounter some obstacles. Index-based insurance requires reliable data covering an adequate historic timeframe. Modelling the risk to be insured is the basis for setting the insurance rates so accuracy depends on the quality of the data collected. In many countries such data is lacking, mainly because the regional network of weather stations is defective. Basis risk – the potential differential between the loss estimated by the index and the actual loss suffered by the farmer – is the main challenge posed by index-based insurance. This differential can arise due to an index calibration error, to data of insufficient quality, or to topographical factors.

Index-based agricultural insurance also necessarily involves a complex chain of actors **(figure ⊕ above)** from across multiple fields of expertise (climatologists, agronomists, actuaries[3]). This complexity requires specialists **(box 💡 opposite)** who can simultaneously fulfil the role of consultants and insurance agents.

Index-based insurance is not suitable for managing certain types of risk such as price risk. It is used to supplement other instruments of a financial (e.g., appropriate types of savings products) or agronomic nature (drought-resistant seeds, improved cultivation techniques, etc.).

Finally, even though administration and distribution costs are low, price may still constitute a barrier – particularly as the very concept of insurance is often unfamiliar to small farmers and something they view with a great deal of suspicion. Local insurers also need to be able to source sufficient reinsurance capacity from the major global reinsurers at an acceptable cost.

NEEDED: PROACTIVE GOVERNMENT POLICIES

The deployment of autonomous, low-cost weather stations will undoubtedly improve the quality, regularity and granularity[4] of the data collected, and technological innovations will definitely make it possible to reduce the basis risk. However, developing index-based insurance more widely will require strong and sustainable support from governments or development finance institutions as well as close cooperation between major stakeholders from the public and private sectors.

3 ▸ An actuary specializes in applying probability theory and statistics to questions relating to insurance, finance and social security.
4 ▸ i.e., the level of detail in a set of data.

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It should also be noted that some major countries (e.g., India, China and Mexico) have introduced very pro-active government policies in support of index-based insurance. In January 2016, India announced its intention to increase the annual state crop insurance budget to more than US$1 billion with the aim of insuring 50% of total land area under cultivation (compared with 23% at present). Government support can also involve subsidising insurance premiums as well as investing in the public infrastructure necessary to develop index-based insurance – meteorological infrastructure, data, research and development – or even in additional overall reinsurance or securitisation capacities.

Although financial intervention by public authorities will undoubtedly be controversial, we need hardly point out that crop insurance is massively subsidised in most developed countries – to the tune of US$5.6 billion per year since 2007 in the United States, for example.

State financial support will achieve its objectives all the more effectively if it maintains a level playing field and remains predictable over the long term, encouraging private stakeholders to fully commit to developing this promising market.

In other countries, the development of index-based insurance products and the creation of specialist operators are supported by international organisations – a prime example being the International Finance Corporation which manages a dedicated trust fund in this field, the Global Index Insurance Facility. Thanks to technological innovation and close, long-term cooperation between the public and private sector, a potential insurance market of some 430 million farming units is opening up with important knock-on effects in terms of food security.

> “Developing index-based insurance more widely will require strong and sustainable support from governments or development finance institutions as well as close cooperation between major stakeholders from the public and private sectors.”

Impact studies undertaken in several countries (China, India, Ghana, Malawi and Ethiopia) demonstrate the positive effects of agricultural insurance for farmers: increases in the land area cultivated, demand for loans, investment and income (De Bock and Ontiveros, 2013; J-PAL and coll., 2016). Governments, international organisations and private stakeholders can use agricultural insurance as a driver to help fight poverty and improve food security. It is also a promising vector for climate change adaptation, as mentioned in the Paris Agreement in the wake of COP 21. Moreover, because of its economic and social benefits, agricultural insurance in developing countries is also an excellent candidate for funding from the Green Climate Fund. ■

A “replanting guarantee”: the example of ACRE-Africa

ACRE-Africa is a Syngenta Foundation initiative established in Kenya in 2014 to develop a “replanting guarantee” in liaison with seed suppliers. The insurance premium is included in the price of a bag of seed which contains a card with a unique code. Farmers send this code by SMS to activate their cover. This also registers the farm location and initiates a three-week sowing and germination period. If the indexes show a lack of rainfall resulting in germination failure during this period, the farmer receives compensation for the cost of the seed or a voucher to obtain another bag of seed for replanting during the same season.

Internet throughout the world: what's the state of play?

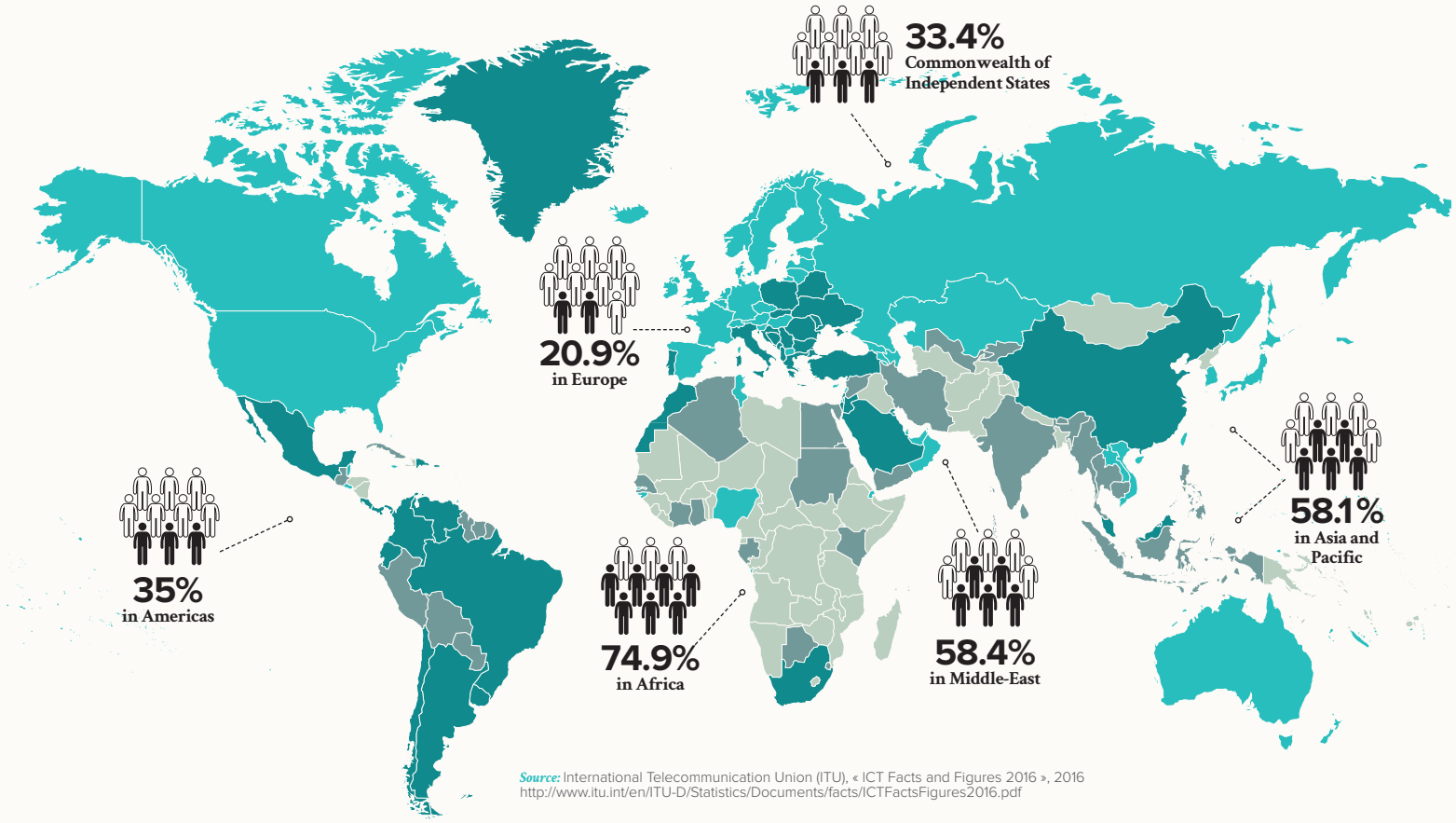
The number of users is constantly increasing

Nearly 3.7 billion people throughout the planet have access to the Internet in 2017. Asia – the world's most connected region – counts 1.8 billion cybernauts. By way of comparison, Africa is a much less connected place with around 353 million users.

Source: Internet World Stats, http://www.internetworldstats.com/

The World's offline population

In late 2016, nearly 3.9 billion people throughout the World were not using the Internet. 75% of Africa's population is either without access to, or does not use Internet. 0 - 25% 26 - 50% 51 - 75% 76 - 100%

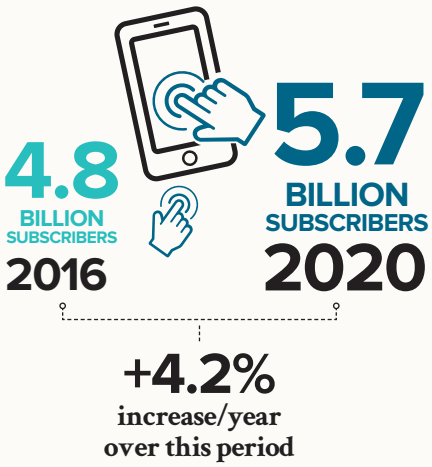


Source: International Telecommunication Union (ITU), « ICT Facts and Figures 2016 », 2016
http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf

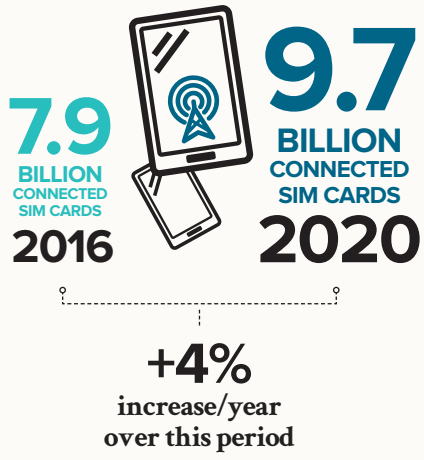
Mobile phones: developing countries are increasingly hooked up

Big increase in the number of mobile phone users

From 4.8 billion in 2016, the number of mobile phone users is forecast to rise to 5.7 billion by 2020, i.e., an increase of 4.2%.



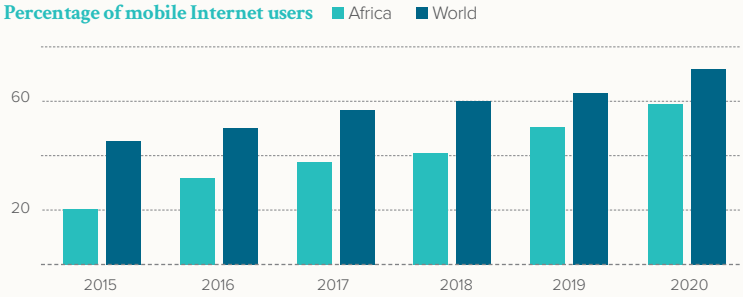
7.9 billion SIM cards had been activated throughout the World in 2016; there should be 9.7 billion by 2020. That's more than the planet's entire population!



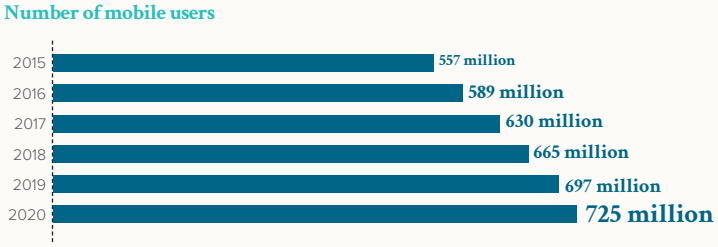
Source: GSMA, The Mobile Economy 2017

In Africa, there are more and more mobile phone users

There were almost 557 million in 2015 and this number is forecast to rise to 725 million by 2020. Over the same period, the number of Africans accessing the Internet from their mobile phones is set to almost double – from 23% in 2015, to nearly 57%.



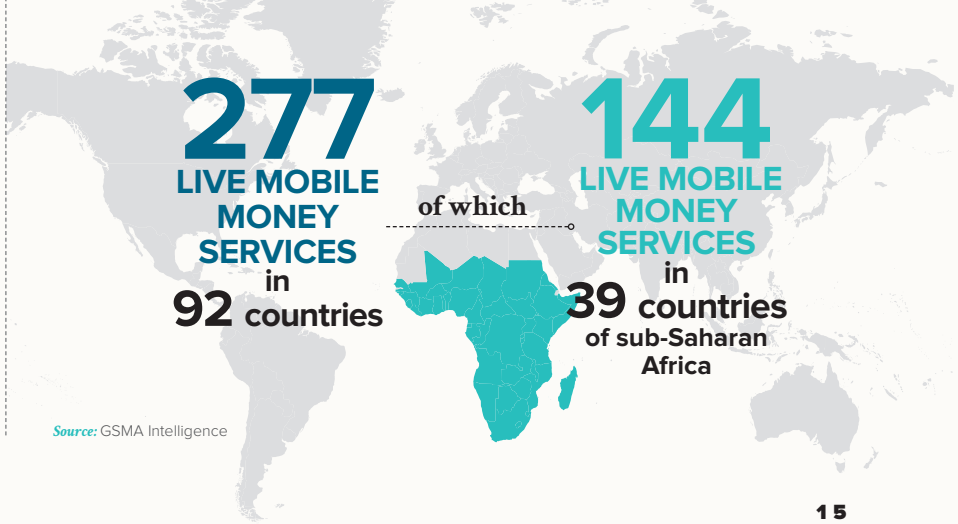
Source: GSMA Intelligence / The Atlas



Source: GSMA Intelligence / The Atlas

Mobile Internet access is helping to drive socio-economic development

In 2017, there were 277 mobile banking (or mobile payment) services available in 92 countries throughout the World – Sub-Saharan Africa alone counted 144 in 39 countries – providing banking services to people with no bank accounts.



Source: GSMA Intelligence

Digital education in Africa: Time to scale up

Erwan Le Quentrec, *manager, Sociology and Economics of Networks and Services (SENSE) Department, Orange Labs*

Information and communication technology in education (ICTE) gives rise to a lot of hope concerning the many challenges faced by education systems in Africa. What conditions must be satisfied to facilitate the scaling up of a number of promising initiatives?

This article was initially published on 29 October 2015, on *ideas4development.org*

In 2015, the mobile penetration rate in Africa stands at about 80 % and its single subscriber rate at over 40 %. By 2017, it is estimated that some 350 million smartphones will be connected. This dynamism benefits all sectors: it already has an impact on agriculture, health, finance and education. Call centers that give advice to farmers, medical feedback by text message and mobile payment solutions make a major change to the lives of users.

In the field of education, there are also real prospects on the horizon: provision of quality content tailored to target publics, improvement in teacher training, promotion of learner-centered teaching, facilitation of evaluations and feedback, and data collection for the management of the education system. By 2020, the mobile education market should experience an annual growth rate of over 50 % in Africa.

The encouraging feedback and evaluations have now prompted donors and governments to support this momentum. For example, the Francophone initiative for open-distance teacher training (IFADEM), conducted in Madagascar between 2012 and 2013 and coordinated by Agence Universitaire de la Francophonie (AUF), was implemented in partnership with Madagascar's National Institute of Vocational Training (INFP), Orange and Agence Française de Développement (AFD). This government and financial support is essential for scaling up the many initiatives implemented over the past five years. But it is not sufficient.

PROMOTING ACCESS TO ENERGY

In Sub-Saharan Africa, some 500 million people (out of a billion inhabitants) do not have access to electricity. Consequently, the focus on ICTE requires meeting this energy need, especially to power smartphones and tablets, which consume more than basic cellphones. The fact that the economic equation is increasingly positive for solar power is encouraging. Between 2007 and 2014, the cost of a solar panel dropped to 50 cents per watt, whereas it stood at about 4 dollars per watt in the early 2000s.

This pressing need for energy will most likely be met by a combination of different sources of power generation (fossil, solar and hydro) and by an extension of grid and off-grid power plants. The development of small decentralized grids based on renewable energies will be particularly suitable in Sub-Saharan Africa in view of the vast areas that need to be covered.

> “The development of small decentralized grids based on renewable energies will be particularly suitable in Sub-Saharan Africa in view of the vast areas that need to be covered.”

This investment in access to energy will need to be combined with capacity building for maintenance. These mini-grid power systems will not last if there is no maintenance or training for local technicians.

SETTING UP AFTER-SALES SERVICES

Many experiences in the 2000s failed due to the lack of equipment maintenance. Setting up equipment maintenance services is therefore a key factor of success. The after-sales service for these new terminals – which are technically more sophisticated – requires more specialized skills than for the maintenance of basic cellphones. Setting up these after-sales services therefore provides a real opportunity to create skilled jobs with added value for young people, who are increasingly following secondary education. →

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ORANGE LABS

Orange Labs' research aims to identify how these technologies affect – in the short or in the long run, progressively or radically – social and economic activities. This research guides Orange in the design of innovative digital services that meet social expectations.

INNOVATING IN FINANCING MECHANISMS

The nomadic nature of the new tools (tablets, laptops, 3G connectivity, etc.) and the fact that families are now widely equipped with them – or are getting equipped with them – radically change the relevance of their standard method of financing, equipment and use (prior definition of ICTE needs, public procurement, restricting the use of this equipment to within education institutions). Would it not now be advisable to promote the sharing of this equipment (BYOD – bring your own device) between families and schools? This interpenetration of uses will have consequences on cost sharing between public authorities, families and companies.

Again, in terms of digital media, new business models should be devised. The example of textbooks illustrates this need. The bulk of the costs to produce them in a digital format is incurred during the initial design phase. As dematerialization allows a reproduction at little or no cost, it will no longer be possible to produce or invoice these teaching resources in the same way.

This digitization also makes it necessary to rethink instruments for public intervention (public production, call on the market via public/private partnerships and boost community dynamics for the creation of open resources). We will need to find the right balance between these three instruments.

> “Mobile learning has already brought about considerable changes and ICTE would appear to have huge potential. The challenge now lies in bringing about changes in position.”

SUPPORTING TEACHERS AND HEAD TEACHERS

Technologies alone cannot be a miracle solution. The analysis of the already long history of educational systems that use them – the radio and TV come to mind – reminds us that teaching opportunities with learners are multiplied by the diversity of multimedia tools. Yet the integration of ICTE does not depend so much on technological progress but on its ownership in education. This not only requires promoting training in technical content, but also developing what could be called a digital culture. Mobile learning has already brought about considerable changes and ICTE would appear to have huge potential. The challenge now lies in bringing about changes in position and innovative coalitions of stakeholders from diverse backgrounds. ■

Immunization coverage: innovating differently with the private sector

Seth Berkley, *CEO of Gavi, the Vaccine Alliance*

Delivering vaccines by drone in isolated areas, planning supply schedules thanks to mobile and satellite technologies... The private sector offers innovative solutions to extend immunization coverage in developing countries.

The private sector plays a crucial role in the development of the poorest countries. It generates innovations, employment and growth and, in many cases, is an essential partner for international organizations, NGOs and public institutions working in the field. For example, in the health sector, especially for immunization, the private sector is a key player in developing innovative solutions to reach children who are excluded from access to essential vaccines for geographical or social reasons.

Indeed, there is still a long way to go in terms of immunization. Child mortality has halved since 1990, and immunization rates have now reached record levels in low-income countries – immunization coverage stands at around 82% in these countries, which are priority targets for GAVI. However, despite this progress, 1.5 million children under the age of five still die every year around the world of diseases such as diphtheria, whooping cough, pneumococcal pneumonia and rotavirus diarrhea. These are diseases which can be avoided with immunization. Measles alone, which is currently prevalent in Europe, causes some 135,000 deaths every year around the world, mainly among children under the age of five.

So today, we still do not always manage to reach the "5th child" with basic vaccines, the child who remains outside health circuits. Children who are not protected by vaccines have their future destroyed by these diseases, which place a burden on the family budget and therefore, more broadly, on the economies of the countries in question. Any solution to reach these children is therefore a good solution, and this is where the private sector's expertise is crucial, especially its technological and digital expertise. →

> "In the health sector, especially for immunization, the private sector is a key player in developing innovative solutions."

This article was initially published on 27 April 2017, on *ideas4development.org*

DELIVERING VACCINES BY DRONES IN HARD-TO-REACH AREAS

> "Drones are currently used in emergency situations, but could soon be tested on a larger scale."

Drones can be a solution for reaching this "5th child" and, for example, for optimizing the delivery of vaccines in the most remote areas in certain countries. While their commercial use is still under debate in developed countries, last year, Rwanda, in partnership with the American company Zipline International and with the financial support of the delivery company UPS and GAVI, launched an emergency delivery service for medical supplies by drones. For example, blood bags to meet transfusion needs are transported from the capital Kigali to the most remote areas nestled in the heart of Rwanda's mountains. Rabies vaccines will soon be delivered, as this vaccine must be injected rapidly when someone is bitten by an infected animal. This technology is currently used in emergency situations, but could soon be tested on a larger scale, particularly in the context of the Rwandan Ministry of Health's target of routine immunization.

Another example of innovation in delivery is to be found in Kenya, where a partnership has been forged between the logistics group DHL and Kenyan Ministry of Health to improve the provision of vaccines in the country. DHL's expertise will make it possible to identify and remove the bottlenecks which disrupt the cold chain during the delivery of vaccines. Indeed, an efficient vaccine is a vaccine which, from manufacturing to injection, has been maintained at a constant temperature, often of about 5 degrees. This is one of the biggest challenges for immunization in developing countries. DHL's knowledge of express deliveries will benefit Kenya's health system and avoid the efforts made to ensure the availability of vaccines being ruined over the last kilometers of the delivery. This partnership will be extended to other countries supported by GAVI, depending on the results over the next three years.

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GAVI, THE VACCINE ALLIANCE

Gavi, the Vaccine Alliance is a public-private partnership committed to saving children's lives and protecting people's health by increasing access to immunization in poor countries. The Vaccine Alliance brings together developing country and donor governments, the World Health Organization, UNICEF, the World Bank, the vaccine industry, technical agencies, civil society, the Bill & Melinda Gates Foundation and other private sector partners. Gavi uses innovative finance mechanisms, including co-financing by recipient countries, to secure sustainable funding and adequate supply of quality vaccines.

EXTENDING IMMUNIZATION COVERAGE WITH THE HELP OF PHONES AND SATELLITES

Efficiently managing vaccine stocks and improving the cold chain are two critical points in immunization programs for which private expertise is essential. With 850 million users and a penetration rate of 74% in Africa, where the vast majority of children who are not reached by immunization are to be found, mobile phones provide a key tool for action on these two points. For example, by allowing parents to declare the birth of their child, they make it possible for immunization managers to more effectively plan their supply schedule and stock of vaccines. Data sent in real time is thereby collected, which ensures that there is no shortage in health centers. Phones also facilitate the transmission of information, such as epidemiological data or information on the causes of mortalities or on immunization rates.

In Pakistan, in Punjab Province, over 3,700 health staff responsible for immunization were equipped with phones called E-vacc for several months. This enabled them to collect information on the ages of children, the type of vaccine used, and the immunization coverage rate. This technology also allowed them, thanks to a satellite imagery system the phones are equipped with, to identify the exact areas where the non-vaccinated children were living and to direct immunization campaigns towards these areas. The immunization program was thus able to reach an additional 500,000 children in a year. This success can be put down to mobile technology, but also to the private companies which made it available to the Government of Punjab.

“This technology also allowed them, thanks to a satellite imagery system the phones are equipped with, to identify the exact areas where the non-vaccinated children were living.”

“INFUSE”: THE BUSINESS SERVICE PLATFORM

However, in order to bring private sector expertise and technologies to the field, it is necessary to be familiar with them and finance them. In 2016, the “Innovation for Uptake, Scale and Equity in Immunisation (INFUSE)” initiative was launched at the World Economic Forum in Davos. INFUSE is a platform which creates networks among innovators and financiers in order to identify solutions to reduce inequalities in access to vaccines; and allow innovators to develop these solutions by mobilizing additional private financing.

For example, Nexleaf Analytics, one of the flagship projects selected by INFUSE last year, received assistance via the platform to establish a partnership with Google.org. The innovation lies in a wireless remote temperature monitoring system for vaccine refrigerators to ensure that vaccines have not been exposed to heat and are therefore high quality and effective. Google.org is going to contribute USD 2 million to the project (technical and financial assistance). Nexleaf and Google are now working together on this technology which could have a major impact on immunization coverage rates in the poorest countries. Building on the success of 2016, in early 2017, INFUSE launched its second call for projects for innovative projects capable of improving health services in developing countries. ■

“INFUSE is a platform which creates networks among innovators and financiers in order to identify solutions to reduce inequalities in access to vaccines.”

Digital revolution(s): Cities on the front line

Pierre-Arnaud Barthel, *senior project manager, AFD*
Gwenael Prié, *senior project manager, AFD*

As digital data becomes a key resource to build sustainable and smart cities, all urban stakeholders need to adapt. Development actors must step up efforts to integrate this new paradigm and broker impactful and inclusive partnerships around urban data.

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AFD

AFD is France's inclusive public development bank. It commits financing and technical assistance to projects that genuinely improve everyday life, both in developing and emerging countries and in the French overseas provinces. In keeping with the United Nations Sustainable Development Goals, AFD works in many sectors — energy, healthcare, biodiversity, water, digital technology, professional training, among others — to assist with transitions towards a safer, more equitable, and more sustainable world : a world in common. Through its network of 85 field offices, AFD currently finances, monitors, and assists more than 2,500 development projects in 108 countries. In 2016, AFD allocated €9.4 billion to finance projects in developing countries and in French Overseas Territories.

This article was initially published on 7 March 2017, on *ideas4development.org*

For several years now, the rapid spread of digital technologies and services has been causing major upheavals in every sphere of the economy and society. This revolution has led to an exponential quantity of data being produced by all sorts of connected objects and the information systems they are linked to. The mobile phone is the first such object. In 2000, less than 1 billion people were using a mobile phone around the world; in comparison there are some 5 billion mobile phone users globally today, mostly in developing countries. Never before has a technological device reached so many people in such a short timeframe. Never before has technology had such an impact on so many sectors at the same time. And with the wide adoption of smartphones, digital applications have been increasingly integrated into many aspects of our lives.

Cities are at the forefront of this digital revolution: they provide the best connections, they are home to public and private innovators, and to the early adopters of their solutions — such as citizens using mobile applications to access their bank account or to shop online, for example. Moreover, urban equipment and networks are increasingly joining the connected world. It is in this context that the use of the term "smart city" has spread like wildfire in recent years. There is no consensus as to the definition of the concept, but there is, however, a common denominator: the "smart city" is a "city managed by data."

URBAN DIGITAL DATA: A RESOURCE FOR SUSTAINABLE DEVELOPMENT

For development stakeholders, maintaining our traditional ways of working is not an option in the face of the digital revolution. We have to leverage the power of urban data to give us much more detailed knowledge of the city and its residents, for example in terms of mobility, socio-economic indicators, or for poverty analysis. This new opportunity should allow us to produce better field diagnostics; design and structure more inclusive and sustainable urban projects; and better monitor and evaluate them.

To adapt to this new context and support this transition, we need to move in two directions. The first is to support the production of urban digital data — by cities themselves, but also by local companies, associations and citizens. The second is to reinforce their use for an extremely wide variety of purposes, including the optimization of tax collection, open access to municipal administrative documents, and real-time reactions to pollution or congestion peaks.

Let's take an example of this process. In the city of Accra, Ghana, as in most African cities, transport is all about minibuses, known locally as "tro tros." Tens of thousands of them crisscross the city every day. Yet, until recently, there was no map of these tro tro lines. In 2015, the French development agency, Agence Française de Développement, or AFD, decided to work with the Municipality of Accra to learn more about this network by financing geolocated data collection by a group of investigators equipped with simple smartphones. Thanks to the data collected, the municipality has been able to produce and share the very first tro tro network map. In addition, to follow this approach through, the data collected has been made available to Ghanaian students and entrepreneurs, who have consequently been able to propose the development of new applications for mobility in their city based on the tro tro data.

> "We have to leverage the power of urban data to give us much more detailed knowledge of the city and its residents."

DATA EXPLOITATION: THE NEED FOR NEW PARTNERSHIPS AND STRONG DATA GOVERNANCE

The opportunities of digital transition must not make us forget the new challenges and risks associated with data. It does, of course, involve protecting the confidentiality of personal data. It also means ensuring the inclusiveness of data-driven projects, so that nobody is excluded from new services because they don't have access to connectivity, or are left outside the discussions by their lack of digital literacy. As data increasingly enters conversations about urban development, every stakeholder needs to learn this new language. This is particularly true for the public sphere: as private actors such as digital platforms increasingly produce and manipulate urban data, we need to make sure public actors are not marginalized in the increasingly digital mechanisms that help to both create and understand cities.

Our aim is first to bring together private and public actors around data via, for example, open data platforms, data sharing clauses in public procurement contracts, or partnerships for the use of private sector data for public goods. One such initiative is the Open Algorithms, or OPAL project, where telecom operators, statistical institutes and researchers will work together to produce new development indicators in Senegal and Colombia.

Furthermore, our role as a donor must be to ensure that national public authorities and local authorities alike have the capacity and willingness to take on a leading role in those discussions. We have to not only reinforce the capacity of those actors, but also help them initiate and lead the increasingly data-driven discussions that are crucial to both understanding and creating sustainable cities. ■

> "As private actors such as digital platforms increasingly produce and manipulate urban data, we need to make sure public actors are not marginalized in the increasingly digital mechanisms that help to both create and understand cities."

Universal access to the Internet: what role for tech giants?

Editorial team of ID4D

Facebook and Google are eager promoters of universal access to the internet. Each of them is devising new ways to close the digital divide. Doing so, they position themselves as development players. But these new ambitions are raising concerns.

This article was initially published on 25 April 2017, on *ideas4development.org*

The internet and related technologies are key tools for economic and human development. They enable people to work more efficiently, learn, seek employment, and get health care from a distance thanks to telemedicine… From the two thirds of the world's population that do not benefit from them, the demand for universal access to the internet is stronger than ever. Facebook and Google are trying to meet this need. But the strategies they employ could call the principle of net neutrality into question.

AQUILA, FREE BASICS, AND LOON: TOWARDS THE END OF THE DIGITAL DIVIDE?

In February 2017, the X laboratory, owned by Google via its mothership Alphabet, presented the latest developments of its mysterious "Loon" project. Revealed in 2013, this project intends to bring the internet to the most isolated rural populations, thanks to high-altitude relay balloons propelled by the wind. The first tests were carried out in New Zealand in 2013. Since then, the laboratory has announced the signing of partnerships with Australia, Brazil, Indonesia and Sri Lanka.

> "The internet.org initiative [...] aims at 'connecting the world' thanks to several tools."

Facebook is not outdone. The internet.org initiative, launched by the social network in 2013, aims at "connecting the world" thanks to several tools. Facebook is notably developing a class of solar drones that are supposed to deliver internet access to remote areas. Called "Aquila", these devices are still at the experimental stage. The Californian company is also developing the Free Basics mobile app, for the poorest to access a selection of basic websites for free: a selection that includes Facebook, but not Google. To expand its service offering, Facebook forges partnerships with local mobile operators, country

by country. Operators provide bandwidth, betting on the expectation that this limited access will make people want to upgrade and pay for full internet access. Free Basics is already available in about fifty countries throughout Africa, the Middle-East, Latin America and Asia.

> “One can indeed wonder about the implications of such privatization of the Web.”

A DEVELOPMENT REVOLUTION OR A HUGE MARKETING PLAN?

But Facebook and Google’s ambitions have aroused many misgivings. One can indeed wonder about the implications of such privatization of the Web, which would allow the Silicon Valley giants, who provide internet access, service and content at the same time, to take unprecedented control over the information exchanged online.

In late 2015 for instance, India rejected Facebook’s proposal to help it expand its internet network with Free Basics. Concerned about the advent of a supposedly universal access to the internet that would actually be restricted and controlled by the social network, the Telecom Regulatory Authority of India deemed the project inadmissible and underlined the necessity to protect net neutrality, so that web users do not get to see the world only through the prism of a single company’s commercial interests. However, the Indian precedent has not prevented Facebook from launching Free Basics in other countries, including in Nigeria in May 2016.

On the other hand, the aerial solutions developed by Google and Facebook are still far from finalized: low autonomy, imprecise navigation control… At its February 2017 press briefing, Google’s X laboratory refused to specify when its stratospheric balloons would be tested by real users. As for Facebook, it took them several months to admit that Aquila had crashed during its first flight test, in June 2015. The company had initially described this first flight as a success in the international media. ■

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ID4D

This blog is intended for all development actors, from both the North and South, and the public interested in development. The aim of ID4D, a platform for exchange par excellence, is to promote a debate of ideas in a constructive spirit. The contributors to the blog are experts from AFD or other institutions (research institutes, universities, NGOs, international institutions, Ministries…).

By Romain De Oliveira, Deputy Editor of *Private Sector & Development*

Paying using your smartphone; using drones to deliver vaccines or drugs to out of the way places; surfing the web on your mobile phone… These innovations – frequently made-to-measure in order to tackle specific needs, are enjoying a boom in developing countries, underpinned by a private sector that has stepped in to act as indispensable partner.

> "These digital innovations are possibly even more of a revolution for Southern than for Northern countries. In the former, they can represent formidable growth drivers."

There is no doubt that Africa is blazing a trail in this domain. At the end of 2016, when there were almost 300 million mobile telephone users in the United States, the entire Sub-Saharan African region counted 572 million subscribers. This illustrates the momentum within the Continent and the fact that these innovations – designed by and for Northern countries – have proven their effectiveness in the least well-off countries. Take the banking sector for example and the mobile banking (or mobile payment) revolution: Africa is now one of the leaders in this whole area and has even cut a pioneering figure via Kenyan-based M-Pesa. In 2017, 10 years after the service was launched by the Kenyan telecoms operator, Safaricom, nearly 70% of the country's adult population are regular users of this m-payment platform.

A number of different articles in this issue show how this dynamism is helping many different sectors of business. In agriculture for example, there is a new type of index-based insurance (*pages 10-13*) that uses both yield indices and raw weather data to make agricultural insurance affordable for smallholders in developing countries who had previously been shut out of this segment. Such digital innovations are also being seen in the field of education with web-based learning. As Erwan Le Quentrec points out in his article (*pages 16-18*), between now and 2020, the booming African mobile learning market is forecast to grow by over 50% a year. Tech innovations backed by private sector stakeholders are also providing developing countries with enormous hope in the health sector: Dr Seth Berkley, CEO of Gavi, the Vaccine Alliance (*pages 19-21*), recounts how in Pakistan's Punjab province, improved vaccine availability using drones, mobile phones and satellites no longer belongs to some far-off future time.

These digital innovations are possibly even more of a revolution for Southern than for Northern countries. In the former, they can represent formidable growth drivers. It is absolutely essential to help these innovations to get to market so that both populations and institutions can reap the benefits, and improving – or simply building – the telecoms infrastructure needed to provide internet access is one of the key steps involved. The Silicon Valley giants – Google and Facebook – understand this perfectly and they have been backing projects designed to reduce the digital divide for quite some time. According to a World Bank report[1], almost

1 ▸ World Report, *"World development report 2016: digital dividends"*, 2016

four billion people throughout the world still did not have access to the Internet in 2016.

For digital technology and its related innovations to benefit as many people as possible in developing countries, an environment that is more conducive to new technologies is needed, i.e., suitable regulations that can unleash the full potential of a strong and dynamic private sector working closely with government institutions and bodies.

PS&D

Since 2009, Proparco has coordinated the Private Sector & Development (PS&D) initiative, examining the role of the private sector in Southern countries.

Issued as a quarterly themed magazine and specialist blog, the PS&D initiative presents the ideas and experiences of researchers and actors in the private sector who are bringing true added value to the development of the countries.

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PS&D
SEPTEMBER 2017

Private Sector & Development

Private Sector & Development (PS&D) is a quarterly publication that provides analyses of the mechanisms through which the private sector can support the development of Southern countries. Each issue compares the views of experts in different fields, from academia to the private sector, development institutions and civil society. An extension of the magazine, the PS&D blog offers a wider forum for discussion on private sector and development issues.

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