REPORT 2018

BY THE m-POWERING DEVELOPMENT INITIATIVE ADVISORY BOARD

m-POWERING FOR DEVELOPMENT:
TURNING OPPORTUNITIES INTO REALITY

m-POWERING DEVELOPMENT INITIATIVE

TELECOMMUNICATION DEVELOPMENT BUREAU

This report was prepared by members of the Working Groups on Global Advocacy and Dialogue, Innovation, and Resource Mobilization of the m-Powering Development Initiative (www.itu.int/en/ITU-D/Initiatives/m-Powering/Pages/default.aspx) launched by the International Telecommunication Union (ITU), Telecommunication Development Bureau (BDT), in 2012 and further developed in 2015 to explore innovative and collaborative ways of harnessing the full potential of ICTs for the benefit of all worldwide.

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www.itu.int/m-powering

PREFACE

I believe that all readers will be inspired by the latest report of the m-Powering Development Initiative I launched in 2012. The Initiative sets out to harness mobile technologies to empower people, especially the poorest and most disadvantaged.

As you will see from the many initiatives and projects described in this report – in public and private sectors and sometimes through a partnership of the two – very real progress is being made. As a result, the lives of millions are being changed for the better in countries around the world.

Take for example the newly connected farmer whose livelihood is now more stable and secure; or the child, hungry to learn, who can now access precious educational resources; the citizen who can access government services in agriculture, utilities, healthcare, energy, education and employment; or the previously unbanked now transferring money with ease; or individuals living in rural areas now enjoying mobile coverage courtesy of an imaginative new business model; and low-income women newly empowered through mobile phone ownership. This report tells these very human stories and many, many more.

Powerful as these examples are in their own right, they demonstrate clearly how very real and within reach the opportunity represented by mobile technology has become. So let us build on the progress already achieved – and see this progress as powerful encouragement to increase momentum still further in the years to come, as we redouble our efforts to achieve the 2030 Agenda for Sustainable Development.

I commend the work of the m-Powering Development Initiative Advisory Board and offer sincere thanks to Mr Sam Pitroda, Chairman, and all Advisory Board and Working Group Members for their excellent work.

Brahima Sanou
Director
Telecommunication Development Bureau
International Telecommunication Union

ACKNOWLEDGEMENTS

This report documents the achievements of the three Working Groups of the m-Powering Development Initiative. In response to both the challenges and the opportunities from information and communication technology (ICT) contributions to political, social, economic and environmental development, the advice of the Working Groups support the work of International Telecommunication Union (ITU) by sharing recommendations within the framework of the m-Powering Development Initiative.

ITU would like to thank Mr Sam Pitroda, Chairman of the m-Powering Development Initiative Advisory Board, for his continuing leadership and oversight resulting in the publication of this new report. ITU would also like to thank the Chairman of each Working Group for their advice, guidance and efforts in compiling this report.

The Chairmen of the Working Groups are: Dr Ram Sewak Sharma, Chairman of the Access and Affordability Working Group; Mr Lawrence Yanovitch, Chairman of the Advocacy Working Group; and Mr Bocar Ba, Chairman of the Partnerships Working Group.

ITU would like to thank the m-Powering Development Initiative Advisory Board Members of each Working Group for their hard work, commitment and recommendations in producing the contents of this report.

FOREWORD

Mobile communications and technology are transforming the lives of millions, and increasingly represent an immense opportunity to transform the lives of billions more who today remain excluded from such an opportunity.

In 2012, the Director of the Telecommunication Development Bureau (BDT) of the International Telecommunication Union (ITU) established the m-Powering Development Initiative as an international, multi-stakeholder platform that brings together various actors, programmes and strategies and which charts the way forward. Twenty-four experts from government, private sector and academia form the m-Powering Development Initiative Advisory Board.

I am proud to be involved in this important undertaking as Chairman of the Advisory Board.

The report published in 2016 examined how advocacy, innovation and resource mobilization can contribute to overall progress. This 2018 report builds further on that work and is structured into three sections, each produced by a dedicated Working Group committed to producing innovative thinking, compelling examples and above all a range of highly practical recommendations based on what is working well today in countries around the world.

These sections address core challenges that must be met in order to sustain and accelerate momentum:

- Advocacy – what is the opportunity, why is it important, and how can we advocate for it?
- Access and Affordability – how do we bring the opportunity within reach of everyone?
- Partnerships – who can help transform the opportunity into reality?

In the 2016 report, I noted that we were at the beginning of a long road. While this remains true, the journey has indeed begun, as this report so emphatically underlines. With each month that passes, the opportunity increases. New thinking, new technologies, new business models, new forms of partnership proliferate and thrive. They are making possible today what we considered out of the question yesterday.

But we must hurry. Progress is not fast enough. This work is important work. Too many people are waiting too long. Too much human capital is wasting away with each day that passes. So, more than ever, we need to spread the word; to educate and advocate – and while our conversations with governments and decision-makers must reference innovation and the advance of technology, we should press home the real goal in our endeavour – the empowerment of billions more citizens through their full inclusion in tomorrow's digital society.

Sam Pitroda
Chairman
m-Powering Development Initiative Advisory Board

EXECUTIVE SUMMARY

This report sets out the great promise of mobile technology and communications that is now opening up to developing economies. Widespread ownership and use of the mobile phone can fast-track progress towards a digital age, transforming the daily lives of millions – especially impacting women, the poor and those in remote and rural areas – and igniting the growth of their economies for the benefit of all. The promise is very real – and importantly, as this report vividly demonstrates, it is within reach.

But how best can this great journey be undertaken? Why invest time, effort and resources? What assets are needed? And who can help? Questions abound. But the value of this report lies in its insistence on clear-eyed, practical ways forward – on specifics and real-life examples where countries and projects have succeeded and are succeeding in forging real, positive change. So the report charts a clear path forward, not only informing but convincing too. Above all it enables, inspires – and empowers.

Through its three sections, the report addresses the core challenges that must be met if the journey is to be successful:

- What is the opportunity, why is it important, and how can we advocate for it?
- How do we bring the opportunity within reach of everyone?
- Who can help transform the opportunity into reality?

The three sections provide detailed guidance and specifics on each. Together they constitute a powerful, hands-on toolkit designed to help developing countries embrace this huge opportunity and step confidently onto the mobile technology highway – and to an inclusive digital economy from which all citizens will benefit.

What is the opportunity, why is it important, and how can we advocate for it?

This section, developed by the Working Group on Advocacy, sets out a powerful framework of ten key messages for use by senior officials, policy-makers and decision-makers in governments, UN agencies and international organizations. It speaks also to private sector stakeholders, financial institutions, bilateral and multilateral donors, foundations, and NGOs both international and local. In addition, the section lays out five commonly occurring roadblocks together with guidance on how to navigate past them.

This definitive messaging framework lays out clear responses to questions which are central to all advocacy – what, why, how, who and when. As such it enables senior leaders to set out the case for mobile ICT and its important role in empowering development. These advocates will be equipped to take the conversation forward in a highly focused, informed, consistent and compelling way – sparking a conversation with all ICT stakeholders in the drive towards achieving the Sustainable Development Goals (SDGs).

Each of the ten messages is clearly articulated. Each has a supporting narrative and a host of detailed proof points that reinforce and legitimize the overarching message.

How do we bring the opportunity within reach of everyone?

This section, developed by the Working Group on Access and Affordability, lays out the content, applications and services which will best advance access and affordability to mobile technology and devices. It has a sharp focus on how ICTs can empower the poorest and most marginalized population groups – looking at cost reduction and the improved delivery of public services such as m-Health, m-Learning, m-Governance and m-Commerce to those living in remote or underdeveloped parts of the world.

The section is packed with examples of inspiring projects and initiatives, and offers a wide range of resources designed to support measurable progress towards the widespread use and deployment of affordable mobile technology. These resources include how to identify stakeholders, technologies, devices and barriers (technical, regulatory and commercial); new incentive mechanisms for connectivity and uptake; innovative projects already in production and delivering results for people and economies around the world; the great potential of unified platforms – and innovative business models. Importantly, the section offers a seven-point action plan that charts the way forward to greater access and affordability. Consistent with the rest of this report, the emphasis is on providing practical, credible and concrete help.

Who can help transform the opportunity into reality?

This section, developed by the Working Group on Partnerships, analyses the dynamics of successful partnership models in the specific context of harnessing ICT in achieving the SDGs – and with a further focus on ICT for Development (ICT4D) services. Once again, the approach is to offer guidance that is clear-eyed, practical and credible: the section identifies key partnership models and their supporting mechanisms, together with factors that typically contribute to partnership success – and those that heighten risk and failure.

To speed the setting up of a partnership and maximize its chances of success, the section offers a ready-crafted, high-level partnership framework and two model Memoranda of Understanding, together with user guidance. These ready-to-go models are intended for use by a government organization or international organization partnering with a mobile operator and/or a service provider. The memoranda form the basis for further discussions among potential partners and help identify relationships and touch-points, responsibilities and structures on which multi-stakeholder (or multi-sector) partnerships (MSPs) can be built. Together the framework and memoranda represent a significant advance in risk limitation, and a much increased likelihood of partnership success – helping any ICT4D project to hit the ground running.

PART I

ADVOCACY AND MESSAGING FRAMEWORK

Powerful messaging that advocates for mobile ICTs in development

Part I sets out a powerful messaging framework for use by senior government officials and decision-makers – including Ministers of Finance as well as Ministers of Communications and Regulators. It is relevant also for leaders in other UN agencies and international organizations.

The framework enables senior leaders to advocate powerfully for the role that mobile ICTs play in empowering development – engaging and bringing together all stakeholders harnessing ICTs in making progress towards the Sustainable Development Goals (SDGs).

About the messaging framework

This version will evolve as a living document and any m-Powering Development Board Member can contribute messaging content to it (including supporting information and figures), and resources. In this way, the content will remain available as an open resource for any m-Powering Development Board Member or other interested stakeholder to draw from – and provide to senior leaders seeking inputs on speaking points related to mobiles and development issues.

Part I is organized by theme and includes a list of resources that can be continually built upon. Future versions may organize key messages around the SDGs, adding brief Q&A points around themes such as affordability, access and scalability.

The path that led to this messaging framework

The Working Group on Advocacy is a sub-group of the m-Powering Development Initiative Advisory Board. The group is tasked with advocating the role that mobile ICTs play in empowering development by engaging, extending and bringing together all stakeholders of the ICT-for-SDGs system around issues that relate to the m-Powering Development Initiative.

Previously, the m-Powering Advocacy WG had identified these audiences:

- Primary audience: senior government officials and other UN agencies
- Secondary audience: major private sector stakeholders, major financial institutions, bilateral and multilateral donors, foundations, and international NGOs (INGOs)
- Tertiary audience: other organizations, local NGOs

The Working Group noted that because technology is changing so quickly, government officials and policy-makers need to understand the fundamental issues, and opportunities regarding mobile and SDGs, to be able to keep pace from a policy perspective. Noted too was senior government officials' need for talking points on the topic of technology and ICTs for the Sustainable Development Goals (a sign of success and progress in overall global advocacy). This framework will do much to satisfy both of these needs.

Ten key messages and five roadblocks

Mobile technology offers very special transformational promise in emerging markets where large sections of the population cannot access basic services. It is the reach of mobile infrastructure and networks that places the industry in a unique position to connect these populations to services such as health, finance and education.

The messaging framework set out below consists of ten key messages and five roadblocks to progress. Together they will enable senior advocates to communicate forcefully, consistently and credibly on mobile-related topics in the context of development.

While the messages have technology as their starting point, the opportunities they point to are of transcendent importance to humanity and our shared future on the planet.

Note: 'mobile technology' encompasses both mobile networks and mobile services.

Message: A massive and accelerated effort is needed to connect the 4 billion who remain offline, 2.6 billion of whom are covered by mobile – the benefits of doing so are many and enormous.

Narrative:

- Most of humanity is still 'offline' and a third are offline even though covered by mobile. The divide between those connected and those offline is profound and stark – and represents a huge opportunity for humanity as a whole. The majority of people in the world (almost 4 billion) remain offline, unable to participate in and unaware of the opportunities represented by the digital economy – a colossal waste of human capital. Of these, 2.6 billion are covered but not connected! In contrast, 3.3 billion people are online through mobile[1], directly benefiting from and contributing to the digital economy.
- Transformational dividend for governments and people. Being connected delivers a transformational dividend both for individual citizens and their governments. Internet will transform people's lives by enabling access to a broad range of services that are currently out of reach, including banking, health, education and government services. Governments and NGOs will benefit by implementing mobile-based paperless solutions which are more efficient and less costly, whilst bringing about very significant positive socio-economic benefits to end users.

Proof points:

- The reality – 2.6 billion of the world's population are covered but not connected, and 1.2 billion are not covered at all[2].
- More than 50% of the world's population is within the reach of a 4G network and 84% are covered by 3G[3] compared to 979 million fixed broadband subscriptions[4].
- Despite this, there is a connectivity gap of 3.8 billion people who remain offline and excluded from participating in the digital economy and unreachable by e-government services[5]. Access, affordability, gender equality, skills and pertinent content are all key enablers to full connectivity.

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1 The Mobile Economy 2018 https://www.gsmaintelligence.com/research/?file=061ad2d2417d6ed1ab002da0dbc9ce22&download

2 Enabling Rural Coverage https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/02/Enabling_Rural_Coverage_English_February_2018.pdf

3 Enabling Rural Coverage https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/02/Enabling_Rural_Coverage_English_February_2018.pdf

4 ITU Statistics https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf

5 ITU Internet users data, https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx

Message: Mobile technology can help solve the identity problem that penalizes 1.1 billion people – of particular impact on women, the poor and those in rural areas of Asia and Sub-Saharan Africa.

Narrative:

- More than a billion people have no formal ID – and as result suffer great disadvantage. Without proof of identity, 1.1 billion people are shut out of basic services and their greater social, political and economic inclusion is greatly handicapped. Both people and their societies are greatly disadvantaged as a result. This 'identity gap' disproportionately impacts specific constituencies: the poor, women, and those living in rural areas in Asia and Sub-Saharan Africa.
- Trusted, scalable mobile solutions can solve the problem, by providing secure digital authentication and identity to those who lack official identification[6], bringing visibility to the people and places where it matters most.
- Progress is being made – Uganda, Nigeria, Tanzania, Senegal and Pakistan are leading the way.

Proof points:

- It is estimated 1.1 billion people lack formal identification, predominantly in developing countries across Sub-Saharan Africa and Asia[7].
- Countries including Uganda, Nigeria (15 million births registered), Tanzania, Senegal and Pakistan are leading the way, mandating and using official digital authentication systems and partnering with mobile network operators or organizations such as UNICEF to provide mobile solutions to address the identity gap.
- In all such initiatives, priority must be accorded to mitigating potential abuses of digital identities and to ensuring high levels of data security.

Message: Mobile financial services can deliver greater financial inclusion and economic empowerment to the 2 billion who remain 'unbanked' – and offer substantial gains too, to governments in revenue collection.

Narrative:

- Mobile financial services can transform the lives of the two billion people who remain unbanked, through greater financial inclusion and economic empowerment. They will access financial services which are safe, secure and affordable and which will enable them to send and receive money, and to make payments.
- Government exchequers will benefit. Governments can make considerable gains in efficient revenue collection as such services gain traction and become widespread.
- Mobile money momentum is strong. It is the leading payment platform for the digital economy in many emerging markets, and increasing numbers of government services are becoming available online.

6 Enabling Access to Mobile Services for the Forcibly Displaced: Policy and Regulatory Considerations for Addressing Identity Related Challenges in Humanitarian Contexts https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/09/Policy-Note-FDPs-and-Mobile-Access.pdf

7 Enabling Access to Mobile Services for the Forcibly Displaced: Policy and Regulatory Considerations for Addressing Identity Related Challenges in Humanitarian Contexts https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/09/Policy-Note-FDPs-and-Mobile-Access.pdf

Proof points:

- Mobile money is now the leading payment platform for the digital economy in many emerging markets[8] with some 690 million registered accounts worldwide.
- E-government in Kenya is blazing a trail, with more than 250 government services now available digitally through the country's e-government platform, e-Citizen. Over 90 per cent of all digital payments on e-Citizen are made through mobile money[9]
- There are significant potential revenue dividends for government authorities – after digitizing all its services through the e-Citizen platform, Kenya's National Transportation Safety Authority doubled revenue collection between July 2015 and October 2016, from an average of USD 1.1 million to USD 2 million per month[10].
- Today's mobile money industry is mature and reliable, processing a billion dollars a day and generating direct revenues of over USD 2.4 billion[11].

Message: Governments and industry together can harness mobile connectivity to empower the poor and underserved in rural communities

Narrative:

- Mobile technology is the way forward – mobile networks already cover more than 95 per cent of the global population – and a digital future for all is within reach if governments and industry collaborate to deliver access to mobile connectivity in rural areas, as well as services that empower and lift the lives of the underserved. Such endeavour will also support the achievement of the SDGs.
- A focused approach on rural areas will deliver results. A strategic focus on rural regions of Asia and sub-Saharan Africa can potentially deliver outstanding results in connecting billions more – most of the 38% of people with no mobile subscription live in these rural regions, have low incomes, and make up the majority of the 4.2 billion not yet on the Internet[12].

Proof points:

- Despite rapid urbanization over the past few decades, there are 3.4 billion people living in rural areas[13], the majority of whom are in developing countries.
- Mobile networks covered 95% of the global population in 2016, delivering at least a 2G signal to 4.6 billion unique mobile subscribers[14].
- By 2025, 65% of mobile subscribers will have mobile broadband service.

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8 GSMA Mobile Money https://www.gsma.com/mobilefordevelopment/programme/mobile-money/video-2017-state-of-the-industry-report-on-mobile-money/

9 GSMA Mobile Money https://www.gsma.com/mobilefordevelopment/programme/mobile-money/video-2017-state-of-the-industry-report-on-mobile-money/

10 GSMA Mobile Money https://www.gsma.com/mobilefordevelopment/programme/mobile-money/video-2017-state-of-the-industry-report-on-mobile-money/

11 GSMA Mobile Money https://www.gsma.com/mobilefordevelopment/programme/mobile-money/video-2017-state-of-the-industry-report-on-mobile-money/

12 ITU Measuring the Information Society, 2016, https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx.

13 World Bank https://data.worldbank.org/indicator/SP.RUR.TOTL?page=1

14 https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx

- Mobile is the way forward. Terrestrial technologies for the provision of broadband require substantial investments in infrastructure and are therefore financially burdensome if not cost-prohibitive in regions of low population density, such as rural communities. Hybrid mobile-satellite solutions have been used to address the digital divide, the most common approach is to leverage satellite technology for mobile networks through satellite backhaul.

Message: Bringing more women in low-and-middle-income countries into the digital economy represents an important opportunity for women, for society as a whole and for business growth.

Narrative:

- Women are being excluded from the digital economy. In today's increasingly connected world, women are being excluded from the digital economy at the most fundamental level and are being left behind. The figures tell the story. 184 million fewer women own mobile phones than men in low-and-middle-income countries. Women are, on average, 26% less likely to use mobile Internet than men. This significant gender gap disempowers women and hinders growth for the mobile industry.
- Mobiles can help empower women, raise household incomes and unlock a substantial market opportunity. Addressing the mobile gender gap will bring benefits to society, to the economy in general and to individual women and families, while also contributing to the achievement of the SDGs.

Proof points:

- Women in low- and middle-income countries are, on average, 10% less likely to own a mobile phone than men, which translates into 184 million fewer women owning mobile phone[15].
- Over 1.2 billion women in low- and middle-income countries do not use mobile Internet. Women are, on average, 26% less likely to use mobile Internet than men. Even among mobile owners, women are 18% less likely than men to use mobile Internet[16].
- Connecting women to mobile can have a positive impact on economic activity and earnings. For example, in Ugandan households where at least one female adult owns and uses a mobile phone, the incomes are UGX 700k higher than households where nobody owns and uses a mobile phone[17].

Message: Safe access to mobile technology not only enriches children's lives, but empowers them to explore and exercise their rights as individuals – of particular importance now as three in every ten of the next billion users connecting to the Internet will be children.

Narrative:

- Enable confident, enriching and safe access. We must empower all young people with the skills and knowledge to use the power of mobile technology in a responsible and

15 The Mobile Gender Gap Report 2018 https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/03/GSMA_The_Mobile_Gender_Gap_Report_2018_Final_210218.pdf

16 The Mobile Gender Gap Report 2018 https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/03/GSMA_The_Mobile_Gender_Gap_Report_2018_Final_210218.pdf

17 https://doi.org/10.1016/j.foodpol.2017.10.004

enriching way. We should ensure also we mitigate the negative aspects of its use and take into account the risks posed by cybersecurity.

- Mobiles can help enable children's rights – with access to new and richer opportunities for education, new means to access and share information, affording also ways to relax, play and take part in a wide range of cultural and artistic opportunities.

Proof points:

- Three in every ten of the next billion users connecting to the Internet will be children – an estimated 300 million.
- Mobile services and the Internet will powerfully enable children to explore and exercise their rights as individuals – including the right to learn, to access information safely (without their data being exploited) the right to be heard and the right to peaceful assembly.
- The industry is engaged in efforts to develop collaborative approaches to safe and responsible use of the Internet[18]. Together with a broad range of partners including UNICEF, International Centre for Missing and Exploited Children (ICMEC) and the International Association of Internet Hotlines (INHOPE), it is hosting national and regional multi-stakeholder workshops, involving policy-makers, NGOs, law enforcement and representatives of industry.

Message: In doing more to enable affordable mobile access to the poorest and most marginalised, governments will help ensure their countries participate in the multi-trillion dollar economic dividend that mobile technology is delivering globally – through GDP growth, higher levels of employment and increased government revenues.

Narrative:

- Engine of economic growth in developing economies. Mobile technology has proved itself an impressive global engine of growth – in 2017 it generated USD 3.6 trillion of economic value. The industry can drive rapid economic expansion in developing economies, growing GDP, growing employment, creating value-added services and upping contributions to government revenues.
- Investment, competition and innovation. When policymakers and regulators encourage investment, competition and innovation, the digital economy will expand, generating prosperity, opportunity and employment.
- But the poorest must not be left behind. Governments and industry must do more to ensure that the poorest and most marginalized have affordable access to mobiles so that they too can benefit from the growth in the digital economy sparked by mobile.

Supporting information:

- In 2017, mobile technologies and services generated USD 3.6 trillion of economic value[19] -
- 4.5% of GDP globally.

18 Mobile Policy Handbook https://www.gsma.com/publicpolicy/wp-content/uploads/2018/02/Mobile_Policy_Handbook_2018_EN_single_pages.pdf

19 The Mobile Economy 2018 https://www.gsmaintelligence.com/research/?file=061ad2d2417d6ed1ab002da0dbc9ce22&download

- In 2017, the wider mobile ecosystem boosts contributions to the public sector, with almost USD 500 billion raised through general taxation and USD 25 billion through mobile spectrum auctions[20].
- The mobile industry directly and indirectly supported 29 million jobs in 2017[21].

Message: Widespread mobile coverage offers an outstanding opportunity for utility services to build on gains being made in emerging markets and make improvements in the reliability of delivery, customer service and payment systems.

Narrative:

- Utility services can leverage wide mobile infrastructure to improve service levels. The coverage of mobile connectivity is greater than the coverage of basic utility services in many emerging markets where many people cannot access essential utility services such as electricity, improved drinking water and improved sanitation facilities. Making use of this existing infrastructure and digitizing utility companies can lead to improvements in the efficiency of water delivery, overcoming challenges such as bill payment and collection, reliability, and improving customer service.

Proof points:

- By mid-2017, over 1.6 million PAYG solar units had been sold and an estimated 8.5 million individuals had benefitted from access to clean and reliable energy in their homes[22].
- Ineffective billing and payment collection in the energy sector accounts for an annual loss of USD 500 million. Mobile systems can have a positive impact on payment systems.
- In Kenya, Wonderkid, developed digital tools for utilities, providing more reliable access to water for over 500,000 people[23].

Message: Innovative use of mobile technology is contributing significantly to disaster and humanitarian preparedness and response – but work remains to be done to take full advantage of existing mobile infrastructure. Governments, the mobile industry and the humanitarian sector need to build on progress already made.

Narrative:

- Good progress has been made with mobile technology being used innovatively in disaster and humanitarian preparedness and response.
- Impressive examples of this include 'super base stations', connectivity provision for displaced populations, humanitarian call-centres and digitized response to country-wide Early Warning Systems.

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20 The Mobile Economy 2018 https://www.gsmaintelligence.com/research/?file=061ad2d2417d6ed1ab002da0dbc9ce22&download

21 The Mobile Economy 2018 https://www.gsmaintelligence.com/research/?file=061ad2d2417d6ed1ab002da0dbc9ce22&download

22 Mobile for Development Utilities Achieving SDGs 6 and 7: The promise and impact of mobile technology https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/01/Achieving-SDGs-6-and-7-The-promise-and-impact-of-mobile-technology.pdf

23 Mobile for Development Utilities Achieving SDGs 6 and 7: The promise and impact of mobile technology https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2018/01/Achieving-SDGs-6-and-7-The-promise-and-impact-of-mobile-technology.pdf

- More remains to be done: it is essential that both the mobile industry and the humanitarian sector continue to innovate, expanding their capacity to deal with crises, and ensure that the needs of affected populations can be met.

Proof points:

- Mobile infrastructure exists and can be exploited. 75% of refugee households already have a phone, and the most significant function of a phone is for connecting them to friends and family[24]
- In place for more than a decade – earthquake and tsunami warning system: NTT Docomo has operated the Area Mail Disaster Information Service since 2007, broadcasting earthquake and tsunami warning messages and evacuation information issued by national and regional public institutions[25].
- In Nepal, Ncell and NTC provided free or subsidized services to those in affected areas following the 2015 earthquakes, to ensure communication with loved ones[26].
- Hybrid satellite/mobile solutions help restore normal communications. In cases where terrestrial infrastructure has been damaged, hybrid mobile-satellite solutions can be used to provide emergency communications. In 2017, Intelsat partnered with AT&T and Verizon to help return communications to normal levels in Puerto Rico after Hurricanes Irma and Maria[27].

As momentum in global online education builds, mobile learning offers a powerful and cost-effective way forward for anytime, anywhere education – with outstanding benefits to students, parents, teachers and institutions.

Narrative:

- Mobile offers the ultimate flexibility for educational opportunity. Mobile learning can provide anytime, anywhere access to educational tools for students and teachers alike.
- Circumvents many problems hampering education in emerging markets. Online education addresses many of the limitations that characterize conventional educational models in emerging markets – a lack of learning materials, too few trained teachers, gender inequality, and poorly resourced, overcrowded classrooms.
- Keeping students safe. While mobile technology provides a cost-effective way to deliver educational resources, governments must have in place systems and regulation to ensure that children are not exploited and abused through such services.

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24 UNHCR Connecting Refugees 2016 http://www.unhcr.org/en-us/connectivity-for-refugees.html

25 https://www.nttdocomo.co.jp/english/binary/pdf/corporate/technology/rd/technical_journal/bn/vol14_1/vol14_1_058en.pdf

26 Disaster Response Nepal Earthquake Response and Recovery Overview https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/12/GSMA_Disaster-Response_Nepal_Workshop.pdf

27 http://www.intelsat.com/news/press-release/intelsat-supports-hurricane-relief-ops/

Proof points:

- The global online education market is projected to witness a compound annual growth rate of 10.26% during 2018-2023 to reach a total market size of USD 286.62 billion, increasing from USD 159.52 billion in 2017[28].
- In Africa, Eneza Mobile Learning courses have more than 4 million users registered[29].

Five roadblocks to mobile Internet access and use

1. Access and adoption: more needs to be done to expand the mobile network footprint to cover rural areas, and to encourage take-up of mobile services.
    - 1.6 billion people still live outside the footprint of a 3G mobile network, the vast majority in rural locations.
    - This coverage gap is most acute in Africa where only 50% have 3G network coverage.[30]
    - The majority of the unconnected are covered by a network but still don't subscribe to Internet services, due to other issues: affordability, digital skills gaps, cultural views, a lack of locally relevant content and services, and safety concerns.

2. Affordability[31]: the price of devices, services and battery charging needs to be driven lower to help connect lower-income groups – and women in particular.
    - The cost of a handset, mobile data, and battery charging are key impeding factors, especially for lower-income groups. It is estimated that only 43% of the world's population can afford a 500MB bundle of data,[32] and device cost remains a major barrier despite falling prices. A lack of ability or will to pay for Internet is also challenging, coupled with Internet unawareness.
    - Cost as a barrier tends to be quoted more often by women than by men: women often have limited financial independence, lower incomes, and lack access to external sources of finance that are more available to their male peers. As a result, women are often more price sensitive and in many countries are more likely to have lower quality (e.g., 2G) handsets – and to obtain these later than men.

3. Relevance: to enable wider uptake, a much more discerning and targeted approach to content and services is needed – making them relevant, understandable, safe, appropriate and geared towards the needs of women.
    - If people don't see content or services they understand or find relevant on the Internet, they will not come online. The nature of online content is heavily skewed towards those living in the most developed economies, and most (~52%) is in English.[33]
    - The availability of explicit content online, and limited awareness of content filtering tools, can impede women's Internet access. Women can be prevented by husbands

28 https://www.businesswire.com/news/home/20180226006458/en/Global-Online-Education-Market-2018-2023-Type-Technology

29 http://enezaeducation.com/

30 GSMA Connected Society, 2016, Unlocking Rural Coverage: Enablers for commercially sustainable mobile network expansion

31 ITU has extensive ICT price data available in the MISR editions available at https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2016.aspx, and in the WTID, see https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx.

32 A4AI

33 W3Techs Web Technology Surveys, Historical yearly trends in the usage of content languages for websites

and male relatives from coming online, due to fears of their exposure to unsafe or inappropriate content.[34]

- The benefits of online education are many: institutions benefit from more flexible delivery of education, reduced costs, better communication with students, teachers and parents, and better results.
- Momentum is building fast – African outfit Eneza Education now has more than four million students enrolled. As a global sector, online education is maturing, building momentum rapidly – with a broadening range of offerings, across many devices and tailored to different needs
- Policies, products and services must meet women's needs as well as men's. This includes ensuring women are being considered in policies, products and services and that these are developed based on an understanding of women's wants and needs. Moreover, there is a lack of data and need for better gender-disaggregated data and consumer insights on how to increase female uptake and use. Content needs to speak to women's lives.

4. Usability and skills: illiteracy, and the lack of digital and technical confidence constitute a barrier to the take-up of mobile services – and is a key concern for women.
    - Digital illiteracy and lack of Internet awareness undermines people's ability to use the Internet. There are 758 million illiterate adults globally,[35] which is most pronounced across rural areas and marginalized groups, and causes a major challenge in accessing Internet content which is predominately text based.
    - Technical literacy and confidence is a key concern for women, who in many countries are more often illiterate/have lower education levels than men. Women with such disadvantages often lack/believe they lack the digital skills and confidence needed to use mobile and Internet.

5. Safety: although mobile ownership can enhance a woman's security, fears remain that mobile ownership can lead to heightened levels of personal insecurity for women.
    - Safety and harassment realities and fears are significant barriers inhibiting women from benefitting from or even wanting to access the Internet. Relevant concerns range from physical violence, including vulnerability to theft, online harassment and fraud. However, studies also show how mobile ownership and access to services can be used in ways enhancing women's personal security.

34 GSMA qualitative research conducted in South Asia in 2017. Sample: 212 (aged 25-35, mix of urban/rural)

35 UNESCO, 2017, http://uis.unesco.org/en/topic/literacy

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PART II

ACCESS (CONNECTIVITY) AND AFFORDABILITY

1 Introduction and overview of Working Group activities

The m-Powering Development Initiative sets out to create a resource and action plan to deploy critical information and communications technology (ICT) services such as m-Health, m-Learning, m-Governance, m-Commerce and m-Sport.

The Working Group on Access and Affordability is a subgroup of the m-Powering Development Initiative Advisory Board and looks at how to advance access (connectivity) and affordability through mobile technology and devices, taking into consideration the need for relevant content, applications and services. In this process, the Initiative hopes to reduce costs and improve public service delivery to individuals, particularly those living in remote or underdeveloped parts of the world. The Group focuses on how ICTs can empower the poorest and most marginalized population groups. The objective of the Working Group is to provide input to the work of the Advisory Board.[36]

As part of the terms of reference, the Working Group carried out the following activities:

1. Identify key stakeholders and new players;
2. Identify existing technologies and mobile devices that could enable affordable access;
3. Identify potential technical, regulatory and commercial barriers for the implementation of these technologies and devices;
4. Research innovative incentive mechanisms to extend access, connectivity and uptake;
5. Carry out a needs analysis by identifying and surfacing use cases (m-health, m-education, m-banking, m-agriculture, m-governance, etc.);
6. Examine the potential of unified platforms, providing for the integration of databases with application platform and transactional capability, in empowering the poorest and marginalized populations;
7. Identify innovative business models for sustainable connectivity taking into consideration affordability within the targeted group;
8. Draft a work plan for concrete actions;
9. Carry out the activities that will support the implementation of the Initiative work plan.

In the following sections, we elaborate more on what these activities may include.

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36 m-Powering Development Initiative, Terms of Reference for the Working Group on Access (connectivity) and affordability.

2 Key stakeholders and new players

A critical first step in achieving advances in access and affordability in mobile technology is the identification of key stakeholders and new players who need to work together and in parallel. The paragraphs that follow identify the relevant parties.

Federal government

Federal government plays a crucial role in accelerating access and affordability. Governments should initiate universal access planning at national level and assign the task of implementation to requisite ministries. Central government is especially critical in a federal context where it can ensure that all states are adopting technology consistently and can intervene to help states that are struggling.

Both federal and state governments can create large-scale public infrastructure – two examples are set out below involving the National Broadband Network (NBN) in Australia and the Digital India Programme. Federal government initiatives can also encourage faster adoption of digital services using grants or subsidies, especially to smaller players. For example, in India, the Ministry of Micro, Small and Medium Enterprises has issued guidelines for ICT promotion and has set out a framework for providing subsidies to encourage the faster adoption of cloud services.

National Broadband Network – Australia
National Broadband Company Limited (NBN) is owned by the Australian Government and has as its objective the implementation of the National Broadband Network programme – providing all Australians with broadband over optic fibre, fixed wireless and next-generation satellite. Individual retail service providers offer customer services using the NBN infrastructure. The project will provide 93% of Australian homes, schools and businesses with access to the NBN via optic fibre, providing broadband speeds of up to 100 megabits per second (Mbps), with speeds of 1 gigabit (1 000 Mbps) per second planned for later stages.[37]

Digital India Programme – India[38]
The vision of this flagship government programme is to transform India into a digitally empowered society and knowledge economy. In mid 1990s, e-governance broadened out with an emphasis on citizen-centric services. In 2006 the Government launched National e-Governance Plan. Despite the successful implementation of projects across the country, e-governance as a whole has not made the desired impact.

The Government of India has now launched the Digital India programme to help strengthen electronic manufacturing in the country and promote growth that covers electronic services, products, devices and job opportunities. The programme vision is to transform the entire ecosystem of public services through the use of information technology and to make India a digitally empowered society and knowledge economy.

37 Parliament of Australia, National Broadband Network: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201314/NBN

38 http://digitalindia.gov.in

The Digital India programme is centred on three key vision areas:

Digital Infrastructure as a Utility to every Citizen

Availability of high speed internet as a core utility for delivery of services to citizens

Cradle to grave digital identity that is unique, lifelong, online and authenticable to every citizen

Mobile phone & bank account enabling citizen participation in digital & financial space

Easy access to a Common Service Centre

Shareable private space on a public cloud

Safe and secure cyber-space

Governance & Services on Demand

Seamlessly integrated services across departments or jurisdictions

Availability of services in real time from online & mobile platforms

All citizen entitlements to be portable and available on the cloud

Digitally transformed services for improving ease of doing business

Making financial transactions electronic & cashless

Leveraging Geospatial Information Systems (GIS) for decision support systems & development

Digital Empowerment of Citizens

Universal digital literacy

Universally accessible digital resources

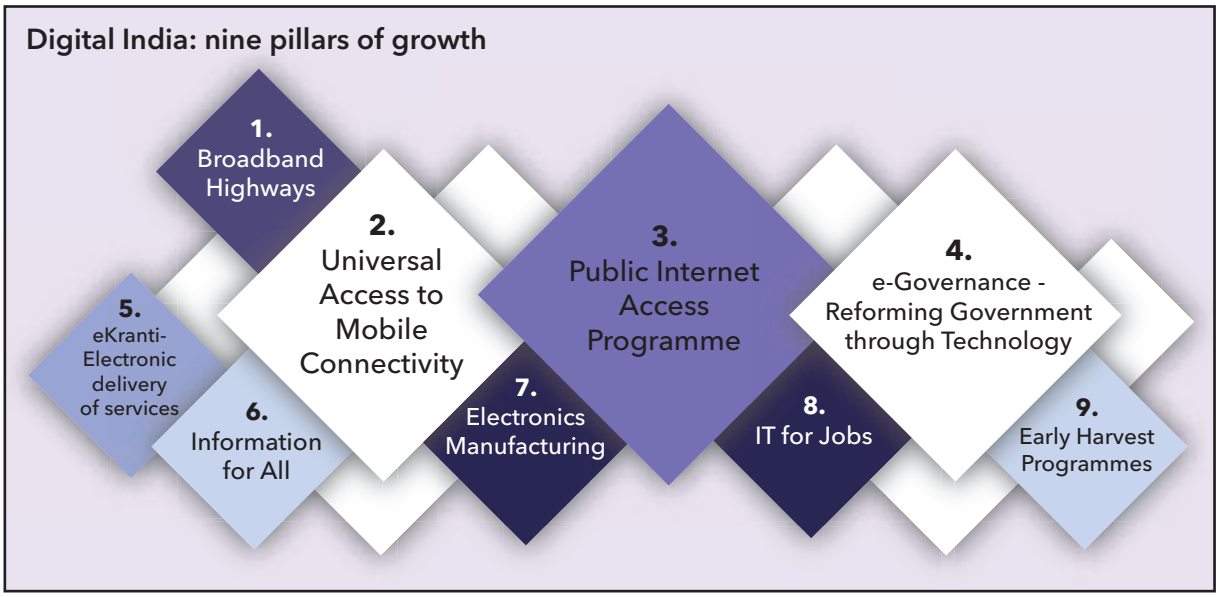
Availability of digital resources / services in Indian languages

Collaborative digital platforms for participative governance

Citizens not required to physically submit Govt. documents / certificates

Achieving Digital India: nine pillars of growth

Digital India covers multiple Government Ministries and Departments. Each element stands on its own, but is also part of the larger picture. Digital India is to be implemented by the entire Government with overall coordination by the Department of Electronics and Information Technology (DeitY). Digital India aims to provide momentum to the nine pillars of growth areas, namely Broadband Highways; Universal Access to Mobile Connectivity; Public Internet Access Programme; e-Governance: Reforming Government through Technology; e-Kranti - Electronic Delivery of Services; Information for All; Electronics Manufacturing; IT for Jobs; and Early Harvest Programmes. Each of these areas is a complex programme in itself and cuts across multiple Ministries and Departments.



Local government

Local governments, including state governments for federal nations, have a key role to play. Local government at the municipal level for cities and towns and local governance structures in rural areas are better placed to understand and identify both the obstacles to affordable mobile access and locally feasible solutions. Increased penetration of mobile technology into rural areas requires local government clearance, – for example right of way. Local government encouragement and cooperation are key to faster project execution and implementation.

Sector regulators

Sector regulators with domain expertise in areas such as telecommunications, information and communication technology provide the enabling environment for adoption and implementation of technologies. They also ensure ease of doing business in the sectors by streamlining processes such as licensing, acquiring operational permits and reporting requirements – and by making spectrum available through fair mechanisms at affordable rates. Sector regulators also protect consumers and act as a channel of communication between consumers and companies.

Competition regulators

Competition regulators' role is especially significant as momentum builds around innovation and new players entering a dynamic mobile technology market. Competition regulators ensure that free and fair competition is promoted even as players seek to capture and create newer markets. Competition regulators can also legally scrutinize new, "disruptive" services and business models adopted by players in an ever-evolving market.

Private sector

The private sector brings in vital infrastructure investment and also provides a lucrative platform enabling financial institutions and technology developers to collaborate, ensuring open competition and an expanded provision of services. New private sector device manufacturers and operating system companies are pointing the way forward, competing with existing players and using innovation as a catalyst for greater affordability and access. For example, new market players such

as Xiaomi and Mozilla have launched affordably priced phones into the market so effectively that global manufacturers (Samsung, HTC) have had to respond, launching their own affordable phones.[39]

Local operators

Local operators' support and involvement is essential in increasing access and affordability in mobile technologies. They are significant stakeholders with the capability and expertise to deploy mobile infrastructure and extend the reach of services into rural and remote areas.

Financial institutions

Financial institutions provide long-term financing in the networks, and credit to low-income groups to increase revenue generation potential for them. Venture capital and private equity funds' astute investments have helped underwrite growth and success for many startups.

Startups

Startups are dynamic and innovative contributors in the telecommunication ecosystem, developing user-friendly applications and introducing new pathways to affordable mobile access. Their important contribution is perhaps best understood through the case study of the mobile startup Jana. Through its application "mCent" launched in 2014, Jana provides free services in emerging markets where people have difficulty affording online access. The application uses a sponsored data model, offering free airtime to users in return for experimenting with its advertisers' applications or products. The success of the model is outstanding: Jana now partners with more than 300 mobile operators in 93 countries and its application (mCent) currently has millions of users. The mCent application helped Jana become profitable in 2015, with revenues in the order of 50 million dollars.[40]

The Indian Government has launched the "Startup India" initiative to boost startup growth and create an enabling environment for them, for example reducing the regulatory burden.[41] The box below details the plans, progress and benefits of this initiative.

Startup India – plans and progress

The Indian Government launched the Startup India programme in January 2016 to build a strong eco-system for encouraging entrepreneurship and provide a hospitable regulatory environment for the setting up and management of startups.

Startup India's 19-Point action plan:

- Self-certification compliance
- Single point of contact via startup India hub

39 World Economic Forum, "Internet for All: A Framework for Accelerating Internet Access and Adoption" (2016): http://www3.weforum.org/docs/WEF_Internet_for_All_Framework_Accelerating_Internet_Access_Adoption_report_2016.pdf

40 World Economic Forum, "Internet for All: A Framework for Accelerating Internet Access and Adoption" (2016): http://www3.weforum.org/docs/WEF_Internet_for_All_Framework_Accelerating_Internet_Access_Adoption_report_2016.pdf

41 Indian Brand Equity Foundation, Start-up- Empowering Start-ups for Growth: https://www.ibef.org/economy/startup-india

- Simplifying processes with mobile app and portal (for registration, filing compliances & information)
- Legal support, fast tracking and 80% reduction in patent registration fee
- Relaxed norms of public procurement
- Easier and faster exit
- Funding support via a fund of USD 1.6 billion
- Credit guarantee funding
- Tax exemption on capital gains
- 3-year income tax exemption
- Tax exemption on investments above fair market value (FMV)
- Annual startup fests (national and international)
- Launch of world-class innovation hubs under Atal Innovation Mission (AIM)
- Set up of country-wide incubator network
- Innovation centres to augment incubation and R&D
- Research parks to propel innovation
- Promote entrepreneurship in biotechnology
- Innovation focused programmes for students
- Annual Incubator Grand Challenge[42]pment has also released an amount of USD 5 876 for each of the 10 Startup Centres. USD 6.6 million has been earmarked and USD 2.6 million already made available to 11 TBIs.[42]

Progress status

- Recognition of startups: 4 536 applications have been recognized as startups by the Government. As of mid-October 2017, nearly 74 startups have been approved for tax benefits by Ministry of Information and Broadcasting.
- Ease in compliance regime: Government has eased the compliance regime to reduce the regulatory cost on startups thereby allowing them to focus on their core business. For instance, new startups falling under the list of 36 "white" category industries will not require environment clearance under environmental legislation.
- Tax benefits: Changes in tax laws incentivize startups' set-up and operation. For instance, the Finance Act, 2016 allows startups tax exemptions for 3 years in a block of 5 years, if they are incorporated between 1st April 2016 and 31st March 2019. In the Union Budget of 2017-18, Government has increased this period of profit-linked deduction to 7 years.

42 Government of India, Department of Industrial Policy and Promotion, Status Report on Startup India: http://startupindia.gov.in/status.php

- Funding: A "fund of funds" of USD 1.6 billion supports innovation-driven startups and is managed by the Small Industries Development Bank of India. Funds will be released over two Finance Commission cycles, by 2025.
- Innovation centres and research parks: 15 Technology Business Incubators (TBIs) and 15 Startup Centres are being set up under this initiative. Eleven TBIs have been approved with four soon to be approved. The Ministry of Human Resource and Development has also released an amount of USD 5 876 for each of the 10 Startup Centres. USD 6.6 million has been earmarked and USD 2.6 million already made available to 11 TBIs.[43]

End users, consumer advocacy groups and civil society

End users' importance in technology ecosystem cannot be stressed enough. Consumer advocacy groups and civil society raise consumer awareness, provide training to end users and protect consumer rights. One recent example was that of net neutrality – civil society and consumer groups created a formidable movement around net neutrality by making technical information available to consumers in accessible language and on relevant platforms such as social media. A similar trend is underway in relation to data protection: privacy enthusiasts and civil society organizations are creating a powerful movement via social media to break down technical information around this issue for end users.

3 Technologies and mobile devices

It is crucial to identify existing technologies that have the potential to make affordable access a reality.

Wireless cellular network

- *3G WCDMA*: Studies show that the increasing penetration of the Internet propelled by both 3G and 4G data networks has led to significant growth in Internet data usage globally. As per a report released by Cisco, mobile data traffic will grow at a compound annual growth rate (CAGR) of 46% between 2016 and 2021, reaching 48.3 exabytes per month by 2021.[43]
- *4G LTE:* Is a fast developing mobile technology with inherent advantages over 3G WCDMA. 4G LTE is more cost efficient due to high spectrum efficiency which leads to higher network capacity. It is also an all-Internet protocol based network and is less expensive for the service provider to run on a daily basis.
- *5G*: Research and development on the next generation of mobile networks is underway and it is expected that 5G will be deployed soon. 5G networks are expected to provide fast speeds with low latency and these connections are likely to enable a host of business applications and smarter Internet of Things (IoT) deployments.

43 Cisco, "The Zettabyte Era: Trends and Analysis" (June 2017): https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html

Wi-Fi

Technology departments across the world are considering freeing up spectrum and making Wi-Fi devices more economical. This would generate affordable Wi-Fi services in public places, and consequently improve broadband penetration. Further, as detailed in subsequent sections of this report, innovative models can be adopted to introduce public Wi-Fi hotspots, with the help of small scale entrepreneurs to provide last mile Internet access at affordable rates. The Cisco findings cited above also state that globally there will be nearly 541.6 million public Wi-Fi hotspots by 2021, up from 94 million hotspots in 2016 – i.e. the world will witness a six-fold increase. The box below sets out the CAGR projection for Wi-Fi speed from2016 to 2021.

Box 4: Projected average Wi-Fi network connection speeds (in Mbps) by region and country

Region	2016	2017	2018	2019	2020	2021	CAGR (2016-2021)
Global	18.2	24.4	29.7	33.1	35.2	37.1	15%
Asia Pacific	19.5	26.7	34.1	36.3	38.4	40.7	16%
Latin America	7.7	9.0	9.5	11.4	12.9	13.9	13%
North America	27.4	37.1	42.4	46.1	48.4	52.3	14%
Western Europe	20.3	25.0	27.8	29.9	31.9	35.1	12%
Central and Eastern Europe	16.7	19.5	22.0	25.0	29.1	31.6	14%
Middle East and Africa	4.9	6.2	7.0	7.8	8.6	9.0	13%

Source: Cisco VNI, 2017.

Unlicensed spectrum

Unlicensed spectrum refers to spectrum that may be used by all without any license fee. This has also paved the way for greater access to Internet services. Regulations in most countries allow unlicensed usage of the 2.4 GHz and the 5.8 GHz bands, leading to the widespread use of Wi-Fi services. The success of the aforementioned bands has led to countries exploring the benefits of delicensing other bands such as the high frequency V (57-64 GHz) and E (70-80 GHz) bands. Availability of such bands coupled with delicensing can be applied for backhaul as well as access purposes and will help in providing broadband connectivity to dense areas at affordable rates.

Satellite and other space-based technologies

Recent developments and innovation in new technologies such as high-throughput satellites (HTS), massive non-geostationary satellite orbit (NGSO) constellations, and high-altitude platform stations (HAPS) have helped build a truly ubiquitous and affordable broadband

ecosystem. Technologies in space and the upper-atmosphere are constantly improving throughput, increasing existing and developing new capabilities, becoming more efficient users of spectrum and orbital resources, and driving down costs. The versatility, innovation, and increasing performance of space-based and upper-atmosphere technologies in particular, allow them to integrate with mobile broadband systems. Their utility is not limited to rural and remote areas: they can contribute to new capabilities and applications in urban and sub-urban, under-connected areas by enabling terrestrial systems and complementing 5G networks. Their ubiquitous coverage, high reliability, high mobility, and high flexibility make space-based and upper-atmosphere technologies ideal solutions for expanding the reach of the global Internet.[44]

Low cost mobile devices

The ownership of mobile-phones has been recognized as an indicator of empowerment within the Sustainable Development Goals (SDGs). Further, the global indicator framework, agreed by the United Nations Statistical Commission in 2016 (ECOSOC, 2016), includes the indicator of "Proportion of individuals who own a mobile telephone, by sex" to assess the implementation of SDG 5 – 'Achieve gender equality and empower all women and girls'. According to data collected by the International Telecommunication Union (ITU), in half of the economies surveyed, more than 75 per cent of the population owns a mobile phone. In the remaining countries, less than 60 per cent of the population own a mobile phone. Asian countries with large populations, such as Bangladesh, India, Indonesia and Pakistan, fall into this latter category. However, among the four least developed countries (LDCs) with data available, the percentage of population that owns a mobile phone is alarmingly small. For instance, only 13 per cent of the population owned a mobile phone in Burundi, 39per cent in Myanmar in 2015, 40per cent in Bangladesh in 2015, and 55per cent in Uganda in 2015.[45] Figure 1 below depicts ITU's projection as related to percentage of population under mobile coverage in LDCs. According to ITU, by 2016, all least developed countries had launched 3G mobile broadband networks and 61 per cent of the population had access to 3G mobile broadband services.[46]

Technological and policy initiatives that encourage the manufacture and sale of low-cost mobile devices are needed to bridge the existing digital divide. Low-cost mobile devices manufactured at cheaper cost price have already made mobile technology affordable and accessible for many. In Africa, low-cost or second-hand feature phones are ubiquitous and most people access the Internet through these devices.[47] In India, initiatives like 'Make in India' can provide the enabling environment for manufacture of cheaper mobile devices of Indian manufacture, not burdened by import duties.[48] Similarly, a number of Chinese manufacturers in recent times have come up with low-cost devices which are now competing for market share with some of the global established players. The private sector has a big role to play here.

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44 Broadband Commission, "Working Group on Technologies in Space and the Upper-Atmosphere: Identifying the potential of new communications technologies for sustainable development", 2017: http://www.broadbandcommission.org/Documents/publications/WG-Technologies-in-Space-Report2017.pdf

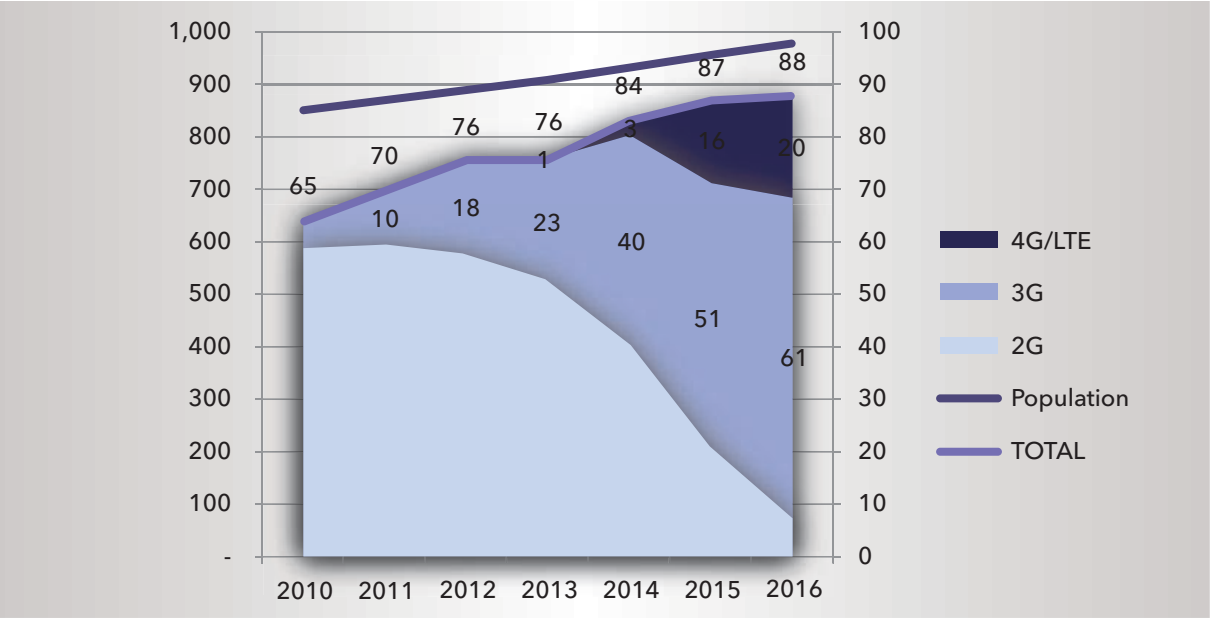
45 International Telecommunication Union, "Measuring the Information Society Report", 2016: https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2016/MISR2016-w4.pdf

46 International Telecommunication Union, "ICTs, LDCs and the SDGs: Achieving universal and affordable Internet in the least developed countries", 2018: http://www.itu.int/en/ITU-D/LDCs/Pages/ICTs-for-SDGs-in-LDCs-Report.aspx

47 Milena Veselinovic and Brandon Clements, CNN, "Africa's mobile web revolution fueled by cheap phones": http://edition.cnn.com/2015/02/19/africa/africa-mobile-internet/index.html

48 RIL in advanced talks with Foxconn to make dual-sim mobile in India, Economic Times, July 21, 2017.

Figure 1: ITU's projection of population under mobile coverage in LDC's



Low-cost access points

As telecom service providers continue to invest in infrastructure, it is important that they earn sufficient returns on such investments in order to provide affordable access to telecom services, especially to individuals in rural areas. Economies of scale in terms of increasing consumers will allow such service providers to pass on benefits to the consumers leading to affordable access points. Innovative public Wi-Fi models as explained later, can serve as alternative models by creating such low-cost access points and ensuring users see economic benefit in accessing these.

4 Technical, regulatory and commercial barriers

The Working Group has identified a number of technical, regulatory and commercial roadblocks handicapping greater accessibility and connectivity.

International gateway access at affordable prices

ITU has defined an international gateway as any facility through which electronic communications (voice, data and video) can be sent between the domestic networks of one country and another. In practice, the gateways provide links either to an international (often submarine) cable system, or to a satellite through an Earth station. Whether terrestrial or space-based, their purpose is to aggregate and distribute incoming and outgoing international voice and data traffic.[49]

These gateways are expensive to set up. They can be potential bottlenecks that may restrict traffic flows and thus cause artificially high prices. To overcome this, regulatory frameworks are needed which introduce new models of sharing and collocation, and which encourage competition through lowering barriers to market entry. Liberalizing these gateways will not only improve general communication between countries, but will also encourage the provision of broadband Internet access, a pillar of a strong global information society.

49 ITU, Liberalizing international gateways: http://www.itu.int/itunews/manager/display.asp?lang=en&year=2009&issue=01&ipage=26

Singapore's experience with international gateways[51]

Singapore introduced frameworks related to international gateways between 2000 and 2004. The country's experience provides an example of how to liberalize international gateways and secure bandwidth capacity at lower prices. The first step was to determine clear goals for liberalization – create a vibrant international market with multiple players, to substantially increase Singapore's international bandwidth capacity, and to ensure significant falls in the cost of international communications:

- Collocation at the landing stations: Singapore has two operators who have four submarine cable landing stations (SCLS) between them. In practice, most cables that land in Singapore do so at the dominant licensee's landing station. Competitors usually need to access this in order to connect their own submarine cable capacity, and to backhaul this capacity to their own exchanges. As a solution, the Info-communications Development Authority of Singapore (IDA) required that the dominant carrier lease space to competitors at its SCLS, at cost-based rates. This is termed "collocation" and it was made mandatory in the dominant licensee's interconnection agreement (RIO) that was approved in 2001. This significant step has allowed operators providing international services to have direct and more efficient access to submarine cables. It has also introduced competition into the backhaul services market, bringing down prices.
- Connection services – another bottleneck: Recognizing this as a problem, in 2002, the IDA made connection services mandatory and required the dominant licensee to provide them at cost-based rates. Since then, charges for connection services have fallen by more than 90 per cent.
- Access to all cables: Before 2004, an operator could access international capacity that it owned on a submarine cable system landing at an SCLS. However, it could not access non-owned capacity in other cables landing at the same station. And it could not gain access on behalf of a third party who did own capacity in these other cables, but lacked the necessary backhaul infrastructure for connection between the SCLS and its exchange premises. These restrictions were seen as increasingly inappropriate in the modern market environment. In 2004, IDA changed the regulations enabling operators to access capacity that is owned (or leased long-term) on any submarine cable at an SCLS. Operators can also access capacity that is owned or leased by third parties, in order to offer them backhaul and transit services.
- The impact on the market: With more players, international direct dialling charges have fallen by more than 90 per cent since 2000, while charges for international private leased circuits have fallen by 95 per cent. By October 2007 (according to IDA figures), Singapore had a total submarine cable capacity of 28 Tbit/s and direct international Internet connectivity of 25 Gbit/s, making it a major communication hub in the region – and globally.

Lack of reliable and affordable access to backbone networks

Since backbone networks have a central role to play in communications globally, they become prime targets for malicious cyber-attacks. A report by the Anti-Phishing Working Group (APWG) found that 2016 was the worst year in history for phishing scams, with the number of attacks increasing by 65% over 2015.[50] As a result, service providers tend to keep the locations and technical details of their backbone networks secret.

To maintain tight control over their country's outgoing backbone connections, governments at times can either censor or completely restrict Internet access to its citizens. Network sharing agreements between large corporations also tend to complicate business dynamics.

The Government and the sector regulator have a role to play in ensuring that investment in backbone networks is affordable. Infrastructure sharing, co-ordination of civil works, increasing fibre reach are some of the ways to address this. Additionally, policy-makers from different geographies can come together and address concerns such as cyber-security. The Universal Service Obligation Fund (USOF) may be used towards this purpose.

Cases of infrastructure sharing can have a significant impact in terms of reducing network deployment times and cutting costs, where governments and regulatory authorities work together to adapt regulation, finance backbone projects or enforce specific obligations – the finding comes from a report published by ITU Telecommunication Development Sector (ITU-D) Study Group 1 on 'Economic policies and methods of determining the costs of services related to national telecommunication/ICT networks, including next-generation networks'. According to the report's guidelines, the following forms of infrastructure sharing are likely to reduce coverage times and costs still further:[51]

- Those based on regulatory changes in support of operators' initiatives;
- Those entailing involvement or intervention of government in funding investment for shared use;
- Those imposing models of obligatory deployment by operators on the basis of shared territory with a requirement for national roaming or active infrastructure sharing, in particular of frequencies.

Emergence of regional hubs

Regional hubs have emerged around the world wherever a large number of cables provide a competitive environment for international capacity. In east Africa for example, Kenya became a regional hub after four different cables landed in Mombasa within the space of only five years.[53] This is seen as the result of Kenya's strategic location, combined with government investment in infrastructure and policy development –along with the general opening up of telecommunication markets in east Africa.

50 APWG, Phishing Activity Trends Report (4th Quarter) 2016: http://docs.apwg.org/reports/apwg_trends_report_q4_2016.pdf

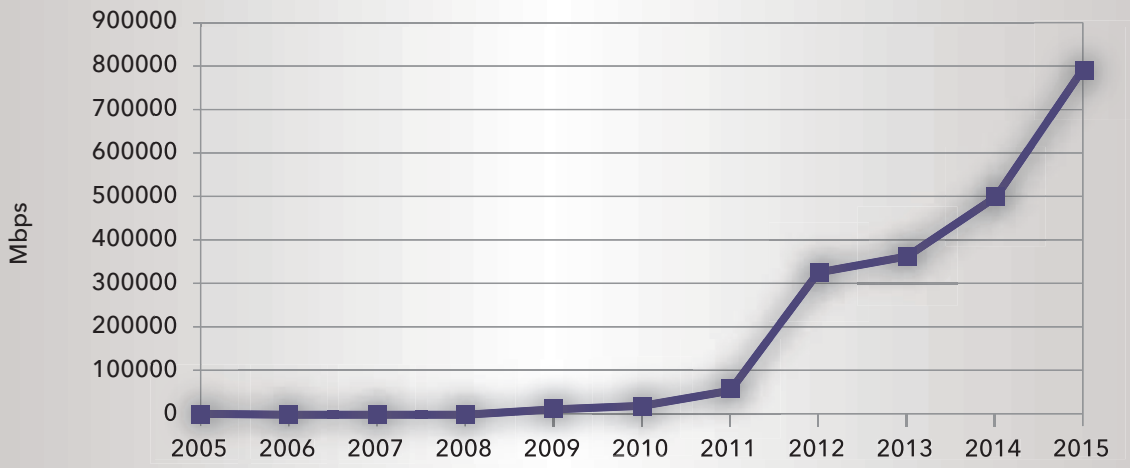
51 ITU-D Study Group 1 on "Economic policies and methods of determining the costs of services related to national telecommunication/ICT networks, including next-generation networks": https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.04.1-2017-PDF-E.pdf

53 SEACOM, TEAMS, EASSy, and France Telecom LION2. Also, soon LiquidSea: https://www.liquidtelecom.com/news-events/news/343-liquid-telecom-to-build-new-undersea-cable.html

With a competitive market for capacity, the cable landings in Kenya also serve as primary routes for landlocked countries – Uganda and Rwanda – as well as additional/backup routes for Burundi, Ethiopia, Somalia and Tanzania. South Sudan is also expected to obtain access via Kenya for some of its international capacity needs in the future.

With low costs of international capacity and a relatively competitive domestic market, Kenya network operators responded to the low cost of international capacity by investing heavily in local and backbone infrastructure. This, along with other local government initiatives caused Kenya's use of international capacity to take off exponentially, from 2010 onward, as shown in the figure below.

International capacity in use in Kenya (Mbit/s)



Source: Telecommunications Authority of Kenya www.ca.gov.ke/index.php/statistics

Lack of competition in Africa

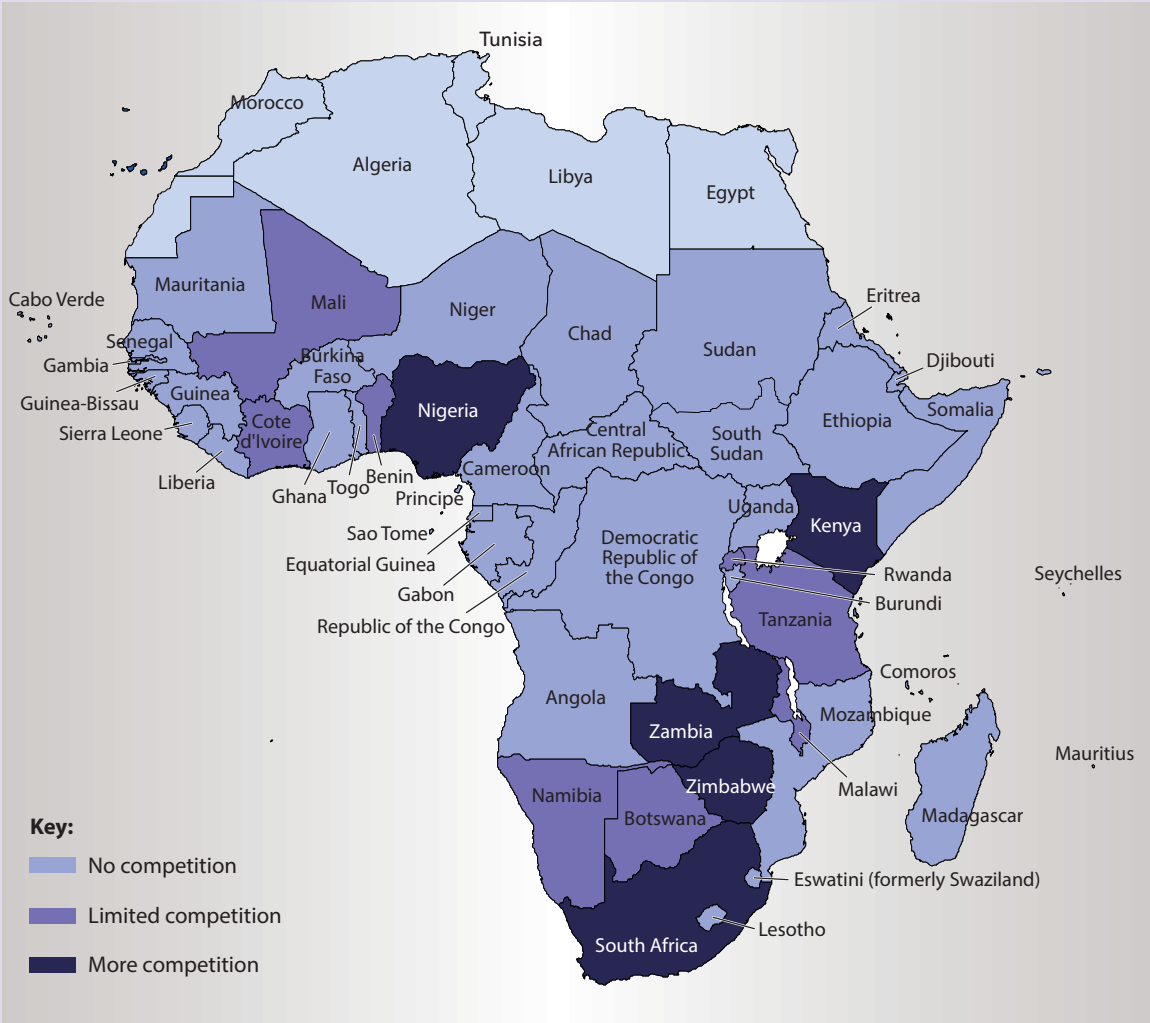
According to Analysys Mason in 2014, there is availability of abundant, inexpensive fibre capacity on the coasts of Africa, but it is not sufficient to enable the provision of broadband services throughout the continent. To achieve this, the continent will also need:

- International terrestrial links to bring connectivity to landlocked countries (there are 16 in the region).
- National fibre networks to link population centres to the international gateways.
- Local broadband networks to deliver "last mile" connectivity.

Every country on the African continent apart from the Central African Republic, Eritrea and South Sudan has some form of fibre connectivity to one or more submarine cable landing stations and a large majority of countries have more than one national fibre network.

However, many of these networks have been built by mobile operators for their own use, rather than for resale, while others are owned by national governments and utility companies that often lack the skills or the inclination to market them effectively to third-party ISPs and other commercial users.

Analysys Mason report that, as of 2014, 35 of the 48 countries in Sub-Saharan Africa have no competition among national fibre providers (see figure below). Eight have limited competition – that is, two providers besides the mobile companies – usually the incumbent fixed-line operator and either the government or the electricity transmission company. Only five countries (Kenya, Nigeria, South Africa, Zambia and Zimbabwe) can be said to have effective competition among multiple players. In countries that lack effective competition, fibre connectivity in cities that are far removed from submarine cable landing stations often costs five or six times as much as it does at the landing station.[54]



54 http://www.analysysmason.com/About-Us/News/Newsletter/Submarine-cables-Africa-Apr2014/#15%20April%202014

Public-private partnerships – the way forward

The World Bank is assisting several public-private partnership (PPP) projects involving the construction of new submarine landing stations and/or high-quality long-distance fibre networks to improve connectivity at the international and national levels, and make it available to potential customers. These World Bank initiatives have demonstrated that there is no single formula or approach that can be applied in every case.

One possible model is that all sector operators unite to form a private company for the purpose of building, owning and operating the national backbone as a wholesale operator. In this approach, the government contributes a subsidy with no related ownership to ensure national coverage, including rural access points, open access, non-discrimination and cost-oriented pricing.

Another possible model is to form a holding company to own the assets while another company is brought in to operate the network on an open-access basis – that is, selling access to anyone who wishes to purchase it. The separation of ownership and operation/sales helps to avoid underutilization of the asset, but there is still a risk that, in the absence of real competition, the operating company may not really be motivated to reduce costs and maximize uptime.[55]

Expanding rural telecommunications network coverage (Democratic Republic of Congo and Intelsat)[56]

In the Democratic Republic of the Congo (DRC), telecommunications provider Vodacom has partnered with Intelsat to expand its coverage area, to meet universal service obligations, expand its user-base, and grow revenue. Vodacom and Intelsat built a plan to expand quickly into rural and remote areas, such as the rugged South Kivu region, at low cost. Together they designed a network of over 800 rural sites connected using Intelsat's Ku-band connectivity. These base stations are easily portable, energy efficient,... powered by solar panel and installed within a single visit. Through Intelsat's new Epic HTS platform, which is backwards compatible with its previous system, Vodacom was also able to offer improved data services without needing to invest in new infrastructure. Through this partnership, Vodacom and Intelsat enabled telecommunications services – both voice and data – to thousands of rural Congolese for the first time, quickly and at low cost.

55 http://www.analysysmason.com/About-Us/News/Newsletter/Submarine-cables-Africa-Apr2014/#15%20April%202014

56 Broadband Commission Working Group on Technologies in Space and the Upper-Atmosphere, "Identifying the potential of new communications technologies for sustainable development", September 2017: http://www.broadbandcommission.org/Documents/publications/WG-Technologies-in-Space-Report2017.pdf

Universal service fund – optic fibre in Pakistan

Following a meeting between the Pakistan Telecom Authority Board and the Universal Service Fund, a new project for the laying of Optical Fibre Cable (OFC) in Khyber Pakhtunkhwa (KPK), Pakistan was agreed. The new OFC KPK will stretch145 kms connecting 29 Tehsils and 19 towns with a population of millions of people. The project will be completed in several phases and a total of 830 kms of optical fibre will be laid throughout the province.

A special project – broadband for low-income women was also given the go-ahead – 30 000 smartphones will be distributed among women beneficiaries of BISP (Benazir Income Support Programme) in eight districts of Balochistan.[57]

Three further sustainable development broadband projects are under discussion:

- Pak Telecom Mobile Limited will move forward with the Kharan-Washuk project – to benefit an unserved population of about 222 000 people, covering 289 Mauzas and an area of 35 100 sq kms.
- Pak Telecom Mobile Limited will move forward with the DeraBugti project targeting an unserved population of about 333 100 people, covering 396 Mauzas and an area of 16 500 sq kms
- Computer labs and skills development training in girls' schools will be set up under the "ICT for Girls" initiative. This project aims to target 138 girls' schools with close to 110 000 students.

High cost of investment, operation and compliance

Telecommunications is a capital-intensive industry, requiring an extensive network infrastructure to provide fixed line and wireless services. Given considerable investment is necessary, it is important that telecommunications operators are not overburdened with operating costs. Governments and regulators should make efforts to liberalize licensed norms and allow the industry to focus on innovation which will ultimately be handed down to consumers in the form of good quality of service at affordable prices

Over-regulation in telecommunication leads to service providers focusing more on meeting regulatory requirements and less on providing good quality of service to the consumers. Regulators worldwide should factor in the costs of compliance while formulating regulation and policy.

Low purchasing power, low usage and seasonal income

While market forces tend to establish balanced prices and tariffs in the market, governments in non-competitive telecom markets may need to regulate tariffs to ensure affordability across different population segments. At the same time consumers should pay for the products and services they use thereby resolving the issue of low usage. A report by ITU-D Study Group 1

57 Pakistan Today, 22 April 2017, "USF approves laying of Optic Fiber Cable in KPK": https://profit.pakistantoday.com.pk/2017/04/22/usf-approves-laying-of-optic-fiber-cable-in-kpk/

offers the following guidelines on reducing tariffs while fostering access to and use of services – all in the context of policies implemented by governments and market regulation:[58]

- Strengthen competition;
- Apply tariff regulation in market segments where market rules do not allow for a tariff-reduction approach;
- Promote initiatives to maximize cost reduction – including active and passive infrastructure sharing, and public and/or private financing in shared-use investment – and ensure that those reductions are reflected in final consumer prices as a result of sound regulatory accounting;
- Promote fiscal, para-fiscal and other incentives to encourage operators to reduce tariffs, including the elimination of customs duties on telecommunication/ICT equipment and terminals;
- Regulate operators' profit margins in cases where competition fails to achieve reductions in price levels. To that end, the requirement to maintain a regulatory accounting system must be enforced;
- Implement strategies for universal access irrespective of category and location of users, and intended in particular to benefit persons with disabilities;
- Develop uses at the level of individuals, enterprises, public authorities, and in terms of government-citizen and government-enterprise relations.

The use of subsidies may be one form of making ICT more accessible to the general consumer and in recent history the Universal Service Obligation Fund has also been used for such purposes. For example, the Universal Service Provision Fund in Malaysia has provided netbooks to low-income households. Smartphones have been made available to youth falling within certain age brackets.[59] These subsidies have helped Malaysia increase broadband usage from 31 per cent in 2009 to 66 per cent in 2013.[60] In Jamaica too, the Universal Service Fund is supporting a national programme to provide tablet computers to students across the country, with a focus on primary and secondary schools.[61]

Taxation regimes in telecommunications

A balanced taxation policy in the telecommunications sector is important but difficult to implement in the face of budget constraints. Governments should ensure that they do not compromise on long-term economic benefits by targeting short-term revenue. In early 2014, the Alliance for Affordable Internet (A4AI) multi-stakeholder coalition in Ghana identified high taxation levels in ICT as a barrier to improved affordability. Taxes at this time constituted some 35 per cent of the total cost of a smartphone – an extremely high level. The Alliance recommended a reduction in import duty on smartphones, later implemented by the Government. A similar effort was taken up in Mozambique to reduce customs duties on telecom equipment from 7.5 per cent to 2.5 per

58 ITU-D Study Group 1, "Economic policies and methods of determining the costs of services related to national telecommunication/ICT networks, including next-generation networks": https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.04.1-2017-PDF-E.pdf

59 Alliance for Affordable Internet (2013), "Affordability Report 2013": http://a4ai.org/wp-content/uploads/2013/12/Affordability-Report-2013-FINAL.pdf

60 http://a4ai.org/wp-content/uploads/2013/12/Affordability-Report-2013-FINAL.pdf

61 E-Learning Jamaica, Tablets in Schools: http://www.elearnja.org/tabletsinschools/

cent.[62] At the same time, it is worth noting that generally, taxation decisions fall within the remit of finance ministries rather than telecommunications ministries.

Security

There is a conflict between making broadband accessible to all while ensuring that the network is secure from cyberattacks. Unfortunately, a more connected world does mean heightened security concerns as more users access networks. As we move forward, it will be important to formulate innovative models which facilitate the integration of security with maximized access and affordability. Various countries have already taken steps to enhance cybersecurity:

Cyber security initiatives across the world

India

Telecom service providers have responsibility for network security under the amended License Agreement for Provision of Unified Access Services Agreement (UASL). They have to ensure that network elements are security against Indian or international security standards – e.g. IT and IT related elements are tested against ISO/IEC 15408 standards; information security management systems are tested against ISO 27000 series standards and telecom and telecom-related elements are tested against 3GP, 3GPP2 security standards, etc.

The Telecommunication Engineering Center (TEC) conducts conformity tests for network security to check that EMI/EMC, safety, security and quality requirements are being met.

The Telecommunications Standards Development Society, India (TSDSI) has constituted a security group to identify those requirements essential to security assurance for cellular mobile telecom networks in India. These are based on 3GPP SECAM SA3 – and the work has been undertaken in consultation with various industry stakeholders.[64]

Singapore

The Infocomm Media Development Authority has drafted a telecommunications cybersecurity code of practice to enhance the cybersecurity preparedness of telecom licensees. This code is mandatory for all service providers. The Authority has also created an emergency response team.[65]

United Kingdom

The position in UK is similar to that of India. Under Section 105A of the Communications Act, 2003, network providers and service providers are required to protect the security of networks and services. Ofcom prescribes the ENISA Technical Guideline on Security Measures to help ensure compliance with section 105A(1) of the Communications Act.[66]

62 Alliance For Affordable Internet, September 2015, "The Policy Tools Making Internet Access More Affordable across the World": http://a4ai.org/the-policy-tools-making-internet-access-more-affordable-across-the-world/

63 Department of Telecommunications, Telecommunications Standards Development Society, India (TSDSI): http://www.dot.gov.in/telecommunications-standards-development-society-india-tsdsi

64 IMDA, Infocomm Security: https://www.imda.gov.sg/regulations-licensing-and-consultations/codes-of-practice-and-guidelines/infocomm-security

65 Ofcom, "Ofcom guidance on security requirements in sections 105A to D of the Communications Act 2003" (2017): https://www.ofcom.org.uk/__data/assets/pdf_file/0021/51474/ofcom-guidance.pdf

Shortage of electrical grids

Unreliable electrical grid supply is one of the biggest challenges faced by the rapidly growing telecommunications tower industry in a number of countries. Telecommunications tower operators facing shortages currently use generators, batteries, and a variety of equipment to address the demand-supply gap. The resulting energy costs account for a major proportion of the total network operating costs, which in turn affects the profitability of the operators.[66] Governments need to encourage the use of alternative renewable energy solutions to overcome these challenges.

GSR-17 Best practice on policy and regulatory incentives for affordable access to digital service[67]

- Strengthening the regulatory foundation for affordable access to digital services
- Recognizing the transformative power of the following regulatory instruments for reducing the cost of ICT infrastructure deployment and the adoption of end-user services, we reiterate their relevance and call for strengthening and further streamlining rules and practices with regard to:
  - Adopting and leverag ing national digital policies, strategies and plans which seek to ensure that broadband and IP technologies are available to as wide a community of users as possible
  - Adopting a flexible, transparent approach to promoting robust competition in the provision of network access and end-user digital services
  - Designing flexible, incentive-based and market-oriented policy and regulatory frameworks with regard to allocation and assignment of spectrum, in particular for broadband services
  - Promoting cross-border fibre networks as well as the build-out of pervasive national backbone networks complemented by terrestrial wireless and satellite infrastructure where necessary
  - Synchronizing domestic network demand with international capacity deployment
  - Encouraging the deployment of Internet exchange points as well as content distribution networks at the national, regional and international levels
  - Removing barriers to market entry at all levels and adopting incentives for open access and infrastructure-sharing at the international and regional levels, with a view to reducing the cost of connectivity to submarine cables, regional fibre backbone and satellite infrastructure

66 GSMA, 2012, "The True Cost of Providing Energy to Telecom Towers in India": https://www.gsma.com/membership/wp-content/uploads/2013/01/true-cost-providing-energy-telecom-towers-india.pdf

67 GSR17 "Best Practice Guidelines on Policy and Regulatory Incentive for Affordable Access to Digital Services": http://www.itu.int/en/ITU-D/Regulatory-Market/Pages/bestpractices.aspx

- Adopting innovative licensing regimes and incentivizing new business models for covering remote and rural areas that more effectively integrate the use of terrestrial, satellite, and submarine telecommunication infrastructure
- Fostering multi-infrastructure mapping and deployment, including working with local government to lift restrictions on infrastructure deployment
- Monitoring and, if necessary, setting mobile and fixed interconnection rates, including through sound regulatory accounting
- Requiring dominant incumbent providers to provide wholesale, unbiased access to its network for the purposes of interconnection and infrastructure sharing
- Enabling number portability over fixed and mobile networks
- Considering the efficiency of licensing and spectrum fees
- Using holistic universal access and service strategies and financing mechanisms for both network expansion, connectivity for public institutions and the community as well as demand stimulation measures, such as end-user subsidies
- Promoting the development of innovative new technologies that enhance rural and remote coverage at lower cost

Additional barriers

Apart from the technological, commercial and regulatoryobstacles mentioned in this part, many challenges need to be overcome in order to deploy broadband access network in developing countries. According to a report published by an ITU study group on Broadband access technologies, including international mobile telecommunication (IMT) for developing countries", these challenges include sociological factors such as policy directives, legacy, economic and social impact, educational issues, awareness and knowledge, standards of living, digital democracy, digital and financial inclusion and physical factors such as remote and rural areas, spectrum constraints and existing infrastructures. The table below lists the specific policy-based recommendations made by this study group.

Recommendations on achieving implementation of broadband access technologies including IMT[68]

- Every country should develop a national plan and periodically revise it in order to create a regulatory framework to encourage the deployment of broadband access technology.
- Developing countries are invited to implement incentive policies that stimulate the development of telecommunications networks – public access points such as telecentres for example. Infrastructure sharing could be implemented to avoid investment duplication in rural and remote areas in developing countries.
- A primary, secondary and tertiary education plan should be developed and operationalized. This will be of help to people who stay in rural areas and will therefore also inhibit the migration of population from rural to urban areas. The need for help in planning ICT education in Broadband Access Deployment may also arise. Remote rural communities will benefit from satellite connections where optical fibre is not available.
- The education plan may require partnership and collaboration between governments, regulators, operators, and other stakeholders in the implementation of telecommunications/ICTs to all layers of the population in their countries.
- Technical, economic and geographical aspects of the project are essential. Here, technological neutrality should be taken into account. For access technology, wireless (2G, 3G, LTE, Wi-Fi, and WiMax) is used most widely, but where very high data rate is demanded wireline solutions should be adopted.
- High-energy performance targeting reduced network energy consumption is a critical requirement especially of IMT-2020 networks – and needs to be carefully investigated. It will reduce the total cost of ownership, facilitates the extension of network connectivity to remote or rural areas and provides network access in a sustainable and more resource-efficient way. IMT-2020 systems with high energy performance would be active and transmit only when needed and where needed.
- Due to the low power consumption (5W) of small cells for outdoors, combining several small cells with directive antennas should be investigated, with a view to extending coverage to 1 km of range. This will be appropriate for rural areas and small villages – and will yield open access (schools, hospitals, police departments, recreational parks).
- When applicable, Memoranda of Understanding (MoU) setting out a general framework for cooperation and collaboration on border interconnection between States are encouraged. Such international MoUs are key to the harmonious, integrated development of economies in the sub-regions by means of an agreed approach to design, implementation, operation and maintenance.

68 ITU study group, "Broadband access technologies, including IMT, for developing countries": https://www.itu.int/dms_pub/itu-d/opb/stg/D-STG-SG01.02.1-2017-PDF-E.pdf

5 Research, innovative and incentive mechanisms

The Working Group has identified the following innovative schemes that can help increase access and connectivity.

Public Wi-Fi hotspots

Innovative models to increase the number of Wi-Fi hotspots must be encouraged. Pay-as-you-use models with interoperability features is one type of innovative model. In India, one innovative model aggregates public data offices (PDOs). An aggregator can provide last mile services through these PDOs, which can be setup by small-scale entrepreneurs without much investment – delivering last mile affordable Internet. In the near future, Li-Fi, which uses visible light spectrum to provide Internet connectivity, may also be explored.[69]

Public Wi-Fi model in India

- In March 2017, the Indian telecom regulator TRAI recommended a new model for public Wi-Fi in India. Under these recommendations, small shops can provide last mile connectivity in rural and remote areas, functioning as Public Data Offices (PDOs).[72]
- Under this model, PDOs would acquire bandwidth from Internet service providers, and sell it to consumers at cheaper rates. Also recommended is the setup of PDO Aggregators (PDOAs), which would aggregate PDOs in a specific area. While it was recommended that PDOAs be registered with the Government, there would be no such need for PDOs.
- The rationale behind this model is to boost Internet use in more rural areas. By easing licensing/registration norms for the last mile, Telecom Regulatory Authority of India (TRAI) believes compliance costs will be minimal and will not burden the small shop owners. PDO owners through their devices would facilitate registration, while authentication and payments would be outsourced to neutral third parties.
- PDOs would not need to invest in major infrastructure. PDOAs will provide infrastructure as well as bandwidth, and will ensure seamless interoperability when a user moves from one PDOA to another. Through this model, TRAI also aims at increasing village-level entrepreneurship and increased employment opportunities in rural areas.

Fixed broadband

Fixed broadband continues to be an untapped source of high-speed Internet use in a number of countries. A number of the lower income countries have a majority of broadband users coming from the wireless sector. This is due to the high cost of setting up optical fibre infrastructure and other issues like right of way which make implementation difficult. Intervention by the Government in the form of subsidies as well as public-private partnerships can help setup this required infrastructure without the private service providers having to take on significant investment. As mentioned in the section on key stakeholders, the Governments in India and

69 Wipro, "Light Fidelity (Li-Fi) - The bright future of 5G visible light communication systems": http://www.wipro.com/blogs/light-fidelity-the-bright-future-of-5g-visible-light-communication-systems/

70 TRAI, Mahanagar Door Sanchar Bhawan, Jawahar Lal Nehru Marg, "Recommendations on Proliferation of Broadband Through Public Wi-Fi Networks": http://www.trai.gov.in/sites/default/files/WiFi_Recommendation_09032017.pdf

Australia have made considerable efforts to increase broadband penetration. Another model that can be used for proliferation is fixed wireless models using wireless unlicensed spectrum such as V-Band and E-Band for last mile connectivity.

National Optical Fibre Plan (NOFN) in India

At the core of governance structure in rural India are the 250 000 Gram Panchayats (GPs), the smallest administrative unit of Governance. They are foundational nodes of information collection and dissemination and the service delivery points for government administration. With this in mind, the NOFN project was approved on October 25, 2011 with the main objective of extending the existing optical fibre network to panchayats by utilizing USOF and creating an institutional mechanism for management and operation of NOFN. Bharat Broadband Network Limited (BBNL), a Special Purpose Vehicle (SPV), was set up by the Government of India in 2011, for the establishment, management and operation of NOFN. The NOFN and its reviewed implementation, in terms of the subsequent changes with BharatNet can be collectively termed as the National Broadband Plan (NBP) to expand the footprint of broadband networks nationally.[72]

The status of NOFN (Bharatnet) as on 14 January 2018 is as below:[73]

Description of Work	Status
Optical fibre cable pipe laid	260081 Kms (1,14,922 GPs)
Optical fibre laid	257694 Kms (1,10,672 GPs)
Optical fibre delivered on site	318909 Kms
Service ready Gram Panchayats	101733

Cable broadband

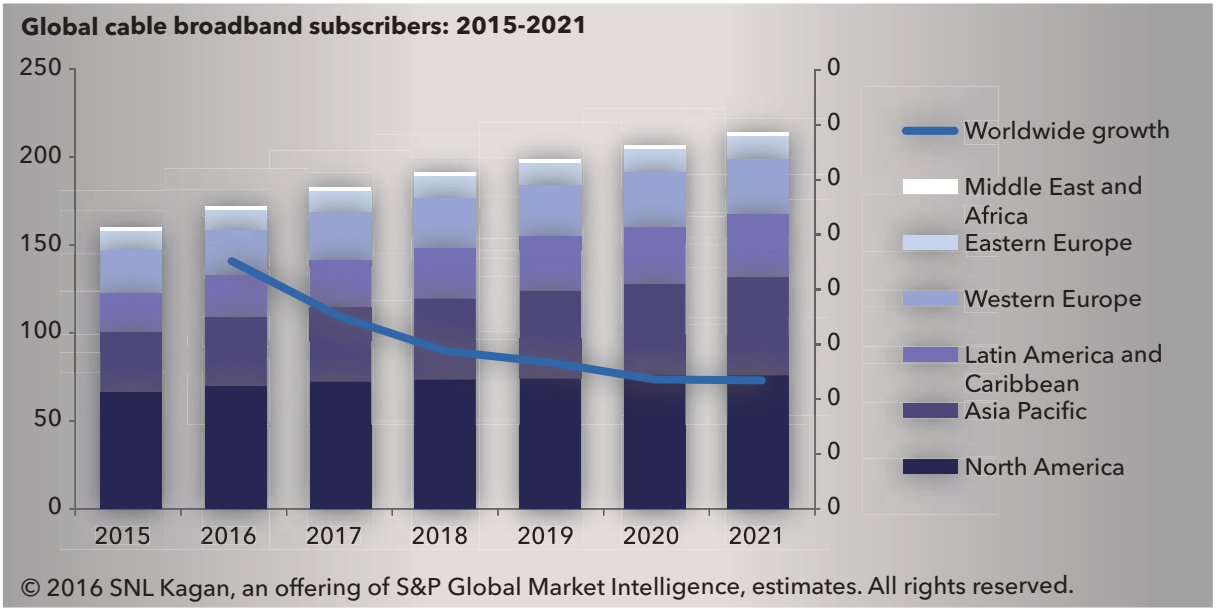
This means of providing broadband makes economic sense since it continues to leverage existing infrastructure to provide fast-speed Internet in the last mile. It also avoids the high costs of complicated civil work required in dense urban environments. As the use of cable broadband is encouraged, more and more small and community entrepreneurs will be able to serve the Internet needs of their community at affordable prices. According to a study by S&P Global Intelligence, the number of cable broadband subscribers is expected to increase from 172.05 million in 2016 to 214.26 million by 2021.[73] Figure 3 below shows the split by continent of cable broadband subscribers.

71 TRAI, "A Twenty Year Odyssey 1997-2017": https://trai.gov.in/sites/default/files/A_TwentyYear_Odyssey_1997_2017.pdf

72 BBNL, Status of Bharatnet as on 17.06.2018: http://www.bbnl.nic.in/index1.aspx?lsid=570&lev=2&lid=467&langid=1

73 S&P Global, Cable's Broadband Boom, By The Numbers: https://marketintelligence.spglobal.com/blog/cable-s-broadband-boom-by-the-numbers

Figure 3: Global Cable Broadband subscribers



Satellite and other space-based technologies

The ability of satellites to provide global, ubiquitous coverage means they can reach sparsely populated and geographically challenging areas where investments in communications infrastructure have been inadequate. Using small mobile and fixed user terminals, satellites can deliver broadband services across the "last mile" directly to individual users. In combination with smaller wireless or wireline networks, they can also provide backhaul links connecting remote networks to the global Internet. However, technological innovation alone will not be sufficient to enable these technologies to reach their full potential. Governments need to step up by sponsoring case studies and fast-tracked pilot projects within their territories. In addition to developing solutions that are customized to a country's particular needs, such studies and pilots will help build the body of evidence required to support legal, regulatory, procurement, and deployment decisions. Also, stakeholders need to promote innovation through support for standards and technology development. The technical community needs to emphasize development of standards that facilitate interoperability or integration among broadband radio services, including through network virtualization.[74]

Voice over Wi-Fi

Operators should be encouraged to offer both voice and Internet Wi-Fi services through one common platform. For example, an operator can set up FTTH for a specific user and also offer a wired or wireless voice connection.

Community and local applications can help both service providers as well as consumers to benefit by providing price information and product availability information. Aggregating platforms like Groupon internationally and JustDial in India help provide consumers with better information about locally available products and services.

74 Broadband Commission Working Group on Technologies in Space and the Upper-Atmosphere, "Identifying the potential of new communications technologies for sustainable development", 2017: http://www.broadbandcommission.org/Documents/publications/WG-Technologies-in-Space-Report2017.pdf

Government-led initiatives

The rationales for government intervention in technological advance and innovation activities include market failure as well as system failure. Research demonstrates ways in which the factors shaping technological progress call for government measures to address system failure – i.e. the lack of coherence among institutions within an innovation system. Further, innovation-related services are vital elements in the innovation process. Providers of such services are universities, government laboratories and joint public/private R&D-institutes as well as private firms.[75] Hence, government-led innovation initiatives, unburdened by a profit motive, can play a crucial role in research and technological advance.

Incentive schemes

There are also a number of incentive schemes that may encourage increased online transactions, some of which can be as below:

- Digital transactions incentive: a seller or a buyer using digital platforms to carry out transactions is rewarded with a tax subsidy or a deferred tax asset. Such schemes need to be thought through and must contribute to the overall economic good.
- Awards: As with tax incentives, service providers as well as the government can award users for carrying out digital transactions. There is a certain "pull factor" associated with awards which may lead to increased use of Internet through a higher number of digital transactions.
- Government services: Governments worldwide are trying to convert from a paper-based service system to a digital one. This would allow savings of cost and space saving. To encourage more people to use online government services, fee waivers or discounts may be considered.

6 Needs analysis – a range of outstanding opportunities

A needs analysis has identified a number of significant opportunities to encourage greater use of affordable Internet and online services. These can help address a variety of major social and cultural barriers including digital literacy, and easy, affordable access to the Internet for all regardless of gender and income level.

Agriculture market applications

For agriculture-intensive countries, national online markets can be developed, allowing for better dissemination of information on local produce as well as on price. Such markets will reduce the problem of information asymmetry in the agricultural sector, and will contribute to the social welfare of farmers as well as traders. The increasing adoption of electronic-based commodity trading is making the lives of farmers and traders easier.

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75 Johan Hauknes and Lennart Nordgren, "Economic rationales of government involvement in innovation and the supply of innovation-related services", STEP Report, 1999: https://brage.bibsys.no/xmlui/bitstream/handle/11250/227570/STEPrapport8-1999.pdf?sequence=1

76 Ministry of Agriculture Government of India, mKisan Portal – Mobile based services for farmers: http://mkisan.gov.in

mKisan Agricultural application in India

The mKisan mobile application in India provides mobile based services to farmers. The Government recognized mobile telephony as the most potent tool for agricultural extension. This project was conceptualized, designed and developed within the Department of Agriculture & Cooperation.

The project has helped scientists, experts and government officers to disseminate information in an effective manner to farmers through mobile telephones. Kisan call-centres have also been setup to provide additional information to farmers. The objectives of the mKisan project are:[77]

- To create an effective two-way communication medium connecting farmers to information providers. SMS and Unstructured Supplementary Service Data (USSD) services have been used for this.
- To maximize outreach by extending coverage to every farming household in rural areas to create a level playing field for small-scale farmers.
- To establish a centralized information database with several language options available to farmers to extract information as well as raise queries.
- To provide effective storage and monitoring of all information flow.
- To bridge the digital divide by allowing farmers to access information through text messages in different languages.

Weather conditions

As with online agriculture markets, information about weather conditions can help farmers plan their cycle of agricultural produce better, leading to more efficiency, reduction in losses and higher revenues. The availability of such information online, coupled with strong educational measures on how to access such information, will benefit the overall state of the sector.

E-governance

Electronic governance is an increasingly used medium that allows citizens to access government services easily and also reduces transaction and other implementation costs of these services. UMANG is an example of such a portal which is used in India to provide electronic services.

UMANG (Unified Mobile Application for New-age Governance)

Developed by the Ministry of Electronics and Information Technology (MeitY) and National e-Governance Division (NeGD) in India, UMANG aims at increasing mobile governance in India.

UMANG provides a single platform for all Indian citizens to access pan-India e-Gov services ranging from central to local government bodies and other citizen-centric services. UMANG intends to provide major services offered by central and state government departments, local bodies and other utility services from private organizations. It provides a unified approach where citizens can install one application to access multiple government services.[78]

UMANG aims to transform Indian citizens' access to government services today, by leveraging the Internet and smartphone penetration in India. It is available on multiple channels including mobile, web, IVR and SMS and can be accessed through smart and feature phones, as well as via tablets and desktops.

UMANG allows users to access services in agriculture, utilities, energy, education, employment and policing. Its multimedia interface is designed for maximizing usability and an enriched user experience.

UMANG App won Best Award in m-Government for Accessible Government category in the 6th World Government Summit 2018 in Dubai.

Direct transfer of benefits

Programmes allowing direct transfer of benefits through bank accounts to segments of the population below the poverty line would bring transparency to the way government-sponsored funds are distributed – to make this possible however, those receiving benefits need to have access to the Internet. Mobile technologies can play a big role here allowing people to view and check the status of their benefits. India is an example of one country where the direct benefit transfer has been implemented so far through the use of Aadhaar for identification and this has resulted in huge savings for the Government.[78]

Skill development applications

Applications helping to develop employment skills can also offer employment opportunities to the poorer sections of the population. These applications may be made available in local dialects to meet the needs of a multilingual society. The availability of such options will help drive the uptake of people using digital and online platforms.

77 Available at: https://web.umang.gov.in/

78 The Economic Times, "Centre to pay out Rs 1 lakh crore via direct benefit transfer scheme in 2017-18": http://economictimes.indiatimes.com/articleshow/58707121.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Money transfer

Today, the Internet allows money transfer readily and quickly. This helps avoid queues at banks and saves cost for banks and their customers. Examples of this include: M-Pesa (see text in accompanying box), launched in Kenya and Tanzania by Vodafone (functionality includes transfer, redeem deposits, view balances); and in India, USSD service by the Government allows transfer of money and ability to view balances through SMS (without using the Internet).

Increased access for persons with disabilities (PwDs)

The United Nations Convention on the Rights of Persons with Disabilities (UN CRPD) includes ICT accessibility as an integral element in a wider range of rights – viewed as critical to equality of participation and opportunities for PwDs. Consequently, enabling affordable access to broadband for PwDs is imperative to ensuring equality and non-discrimination. Furthermore, innovation and development in technology can play an important role in incorporating the specific needs of PwDs and bringing them within the fold of telecommunication and broadband usage. In its report on "Access to telecommunications/ICT services by persons with disabilities and with specific needs", a study group constituted by the ITU has outlined the key ICT issues to be considered for PwDs and those with special needs in developing countries in terms of policy implementation and the regulatory framework. These are set out in the box below:[79]

ICT issues to be considered for PwDs and those with special needs in developing countries in the context of policy implementation and regulatory framework:

- The Universal Service obligation should take into account the needs of persons with disabilities in regard to access to ICTs.
- The Universal Service legal and regulatory framework should include accessibility as an explicit goal for Universal Service and consideration within the Universal Service Fund.
- At all levels of education, the use of accessible ICTs should be promoted by all stakeholders involved in education delivery.
- Any general policies or laws developed or updated that incorporate considerations of accessibility for ICTs should include clear targets and annual reporting on its implementation.
- Involvement of persons with disabilities, their representatives and related bodies/ organizations in the development and implementation of policies, legislation, and regulation, is key to ensuring successful outcomes.

Electronic health facilities

Online platforms that provide health facilities are quickly gathering pace and entrepreneurs are increasingly venturing into the digital health space. Such platforms allow relevant information to be easily available to consumers and offer potential to improve access to medical information and to the healthcare sector generally.

79 ITU- D study group, "Access to telecommunications/ICT services by persons with disabilities and with specific needs": https://www.itu.int/pub/D-STG-SG01.07.4-2017

Peer to peer (P2P) lending

Peer-to-peer lending has gathered significant traction in recent times, providing alternate sources of money to lenders. As these services are transacted online, overhead costs are lower, both for lenders and borrowers. Lenders get higher returns than in conventional structures and investment banks and borrowers are able to raise money which may not have been available via the usual channels. As Internet access continues to increase, so will the demand for such services.

Social occasions and events

Information about local events can be made available through online channels in highly effective ways. This is likely to save administrative and operational costs as well as achieving wider communications reach. The use and availability of over-the-top (OTT) Internet to create local content that is rich and relevant continues to drive the demand for Internet today.

7 Potential of unified platforms

Unified platforms can play a big role in meeting the goals of increased access and connectivity and can help leverage affordable access.

Unlicensed spectrum and local operators

Improving last-mile connectivity can boost Internet penetration in developing countries – something that unlicensed spectrum can help achieve through the creation of public "wireless local area networks" (WLANs). WLANs using Wi-Fi technology can connect various personal computing devices to a local network – achieving Internet connectivity. Cost-saving for such configurations is great: the technology (Wi-Fi) uses unlicensed spectrum, while the equipment is inexpensive and readily available. Equally, maintenance and operational costs are comparatively low. Innovative Wi-Fi models, as discussed above, need to be developed – but such setups offer affordable, scalable and versatile technologies that can accelerate the provision of affordable Internet access in rural as well as urban areas.

Digital platforms

Digital platforms can be leveraged not only for delivering low-cost broadband services over Wi-Fi networks using unlicensed spectrum and local operators but can also help address vexing issues related to activities such as registration, authentication and payments in the provision of affordable Internet access.

Use of biometric systems

Biometric authentication systems are deployed in 230 programmes in more than 80 countries to reduce costs and plug leakages in public welfare programmes.[80] These systems can be used as a means of authentication, reducing the cost of acquiring customers for Internet service providers as well as increasing ease of use for consumers.

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80 Muralidharan et al., 2015, "Building State Capacity: Evidence from Biometric Smartcards in India": https://www.povertyactionlab.org/sites/default/files/publications/Building-State-Capacity_Feb2016.pdf

Payment interfaces

Easy-to-use payment interfaces help resolve issues related to payments for affordable Internet access platforms. M-PESA, a mobile-phone-based money transfer system, was launched in Kenya in 2007 and subsequently in other countries. An M-PESA customer can use his or her mobile phone to move money quickly, securely, and across great distances, directly to another mobile phone user.[81]

M-PESA in Kenya

M-PESA was launched in 2007 by Safaricom, and is now used by more than two-thirds of the adult population in Kenya. As of 2015, more than 25% of the country's gross national product flows through it.[83]

M-PESA was originally designed as a system to allow microfinance-loan repayments to be made by phone, reducing the costs associated with handling cash and thus making possible lower interest rates. After pilot testing, it was broadened to become a general money-transfer scheme. It facilitates transfers via phone or by an in-person visit to a Safaricom agent. This effective transfer mechanism is particularly useful in a country where many city workers send money home to families in rural villages. Electronic transfers save people time, freeing them to spend their time more meaningfully. In addition to this obvious benefit, some Kenyans began to regard M-PESA as a safer place to store their money than banks, which had become entangled in ethnic disputes. Having established a base of initial users, M-PESA then benefitted from the network effect – the more people who used it, the more it made sense for others to subscribe.

M-PESA functionality has since been extended to offer loans and savings products, and can also be used to disburse salaries or pay bills saving users further time and money – no more wasted hours in queues at banks. One study found that in rural Kenyan households that adopted M-PESA, incomes increased by between 5 and 30%. In addition, the availability of a reliable mobile-payments platform has spawned a host of startups in Nairobi, which function using business models built on M-PESA's foundations. Mobile-money schemes in other countries, meanwhile, have been held up by opposition from banks and regulators and concerns over money-laundering. But M-PESA is starting to do well in other countries, including Tanzania and Afghanistan, and was recently launched in India. Some operators are launching similar services in other countries, enabling them to follow Kenya's pioneering path.[84]

A further example of mobile money is the Unified Payments Interface (UPI), developed by the National Payments Corporation of India (NPCI). This interface enables round the clock, secure and seamless fund and payment routing by allowing access to multiple bank accounts through a virtual address and

81 Hughes, Nick, and Susie Lonie, "M-PESA: Mobile Money for the 'Unbanked' Turning Cellphones into 24-Hour Tellers in Kenya" (June 2007): http://www.mitpressjournals.org/doi/abs/10.1162/itgg.2007.2.1-2.63

a single mobile application. Deploying this platform will help leverage existing infrastructure while removing dependence on cash and bank cards.

Bharat Interface for Money (BHIM)

Bharat Interface for Money (BHIM) is an app that uses Unified Payments Interface (UPI), allowing users to make instant bank-to-bank payments using just a mobile number or Virtual Payment Address (UPI ID).[85]

The application is available in India on both Android and IOS platforms and is rich in features:[86]

- Send Money: Send money by entering Virtual Payment Address (UPI ID), Account number and QR Scan.
- Request Money: Collect money by entering Virtual Payment Address (UPI ID). The App can also be used to transfer money using a mobile number.
- Scan & Pay: Transactions can also be carried out by scanning a QR code.
- Transactions: Allows users to check transaction history and file complaints.
- Profile: Users can share necessary information with single click share options.
- Bank Account: Allows users to switch between multiple linked bank accounts.
- Language: Available in 12 languages – Hindi, English, Tamil, Telugu, Malayalam, Bengali, Odia, Kannada, Gujarati, Marathi, Assamese and Bengali.
- Block User: Option to block users.
- Payment Reminders: Allows a user to schedule payments as suits their needs.
- Split Bill: Splitting bills with multiple UPI users at a click of a button.

8 Innovative business models for sustainable connectivity

The poorest billion of the world's population have a monthly average income of USD 45 and, according to the International Telecommunication Union and other analysis, a potential affordable communications spend of USD 2.25 per month. The majority of these people live in Sub-Saharan Africa and the Indian subcontinent. Approximately 75 per cent live in rural regions and depend largely on agriculture for their livelihoods. An estimated 20-40 per cent live out of reach of even the most basic mobile networks.[86] Innovative business models are much needed to provide sustainable connectivity to this constituency. Governments should take a lead in increasing accessibility through encouraging and incentivizing innovation and engaging with the private sector to develop these much needed innovative business models.

82 The Economist, "Why does Kenya lead the world in mobile money?" (March 2015): https://www.economist.com/the-economist-explains/2015/03/02/why-does-kenya-lead-the-world-in-mobile-money

83 The Economist, "Why does Kenya lead the world in mobile money?" (March 2015): https://www.economist.com/the-economist-explains/2015/03/02/why-does-kenya-lead-the-world-in-mobile-money

84 Available at https://www.npci.org.in

85 https://www.npci.org.in

86 Steve Schmida et al., Business Models for the Last Billion: https://mstarproject.files.wordpress.com/2016/05/business-models-for-the-last-billion.pdf

Several examples of innovative business models in action are set out below, each successfully providing affordable Internet access.[87]

Groundbreaking business models in action

- Mozilla and Orange have partnered to launch a USD 40 smartphone in 13 countries; the phone bundle included unlimited texts, unlimited calls and 500 megabytes (MB) of 3G data per month for the first six months.
- Grameenphone in Bangladesh launched a locally manufactured Firefox OS smartphone for just USD 60. The phone came loaded with Telenor Digital's WowBox service, giving users an additional 20 MB of free data per day.
- Managed Rural Coverage, a partnership between MTN Benin and Ericsson, brought mobile coverage to rural areas of Benin through a five-year contract covering 50 sites. Access is provided via low-power consumption Ericsson radio base stations running on solar energy to avoid the costs and emissions of diesel generators. Transmission is provided via satellite to avoid the costs and infrastructure of a microwave backhaul network in remote villages.[90]
- In rural areas of China, China Telecom offers 2G data free to every user, and Taobao provides a "special shopping zone for e-surfing users". Such programmes help make access more affordable while teaching users about the Internet's benefits. Users develop digital skills and the companies involved create customers for their future smart products and services.
- In India, new entrant operator RJio has introduced a USD 25 (INR1500) feature phone. The subscriber can make unlimited voice calls and send unlimited SMSs across the country and can download 2GB data per month at a price of 75 cents a month (INR 49). The main feature of the scheme is that the subscriber recoups her/his initial investment of USD 25 after 3 years, not only increasing accessibility but affordability too.

Going forward, different business models can be explored to ensure sustainable, ubiquitous and affordable Internet access. These business models should address key issues such as de-licensing of spectrum, business viability and logistics to realize these goals.[88]

Infrastructure sharing

The role of Wi-Fi networks in increasing Internet penetration has been discussed previously – technical challenges and cost limitations make it difficult for Internet service providers (ISPs) to provide uninterrupted Wi-Fi coverage across locations. One of several innovative business models looking to address this roadblock involves sharing infrastructure. ISPs, especially new entrants, are well placed to collaborate and enter into contracts for accessing existing infrastructure with other ISPs on a revenue-sharing basis. A further model is the Wi-Fi hub or exchange model, based on the Wireless Roaming Intermediary Exchange (WRIX) standard developed by the

87 World Economic Forum, April 2016, "Internet for All: A Framework for Accelerating Internet Access and Adoption": http://www3.weforum.org/docs/WEF_Internet_for_All_Framework_Accelerating_Internet_Access_Adoption_report_2016.pdf

88 Managed Rural Coverage: https://www.ericsson.com/thecompany/sustainability-corporateresponsibility/enabling-the-low-carbon-economy/managed-rural-coverage

Wireless Broadband Association (WBA). These standards have been adopted by many service providers around the world and their ability to provide a seamless experience is proven.

Aggregation of small Wi-Fi networks

Community Wi-Fi or shared Wi-Fi models already exist in some countries. An outstanding example is the Spanish residential hotspots aggregator Fon Wireless Network, which operates worldwide and claims to operate a network of over 20 million WiFi hot-spots. This model can be replicated elsewhere, especially in developing countries. In India for example, allowing any entity, even small shop owners, to offer Wi-Fi services for a fee using platforms such as Aadhar and UPI will help increase public Wi-Fi usage rapidly. A network of smaller networks will ensure seamless access for users as they move from one location to another. This model can also help in creating employment opportunities without the need for major training since management of these networks is not overly complex.

De-licensing of spectrum in rural/remote areas

De-licensing certain ranges of frequency specifically for rural and remote areas can help provide affordable access. The availability of de-licensed spectrum will reduce capital costs considerably and encourage service providers to enter regions where low returns will mean lower investment.

USO funding

Most countries have policies in place to fund the provision of basic telecom services for rural and remote areas. Governments can deploy a certain percentage of USO funds towards promoting research, development and innovation. For instance, in Australia, the Government provides adaptive technology to persons with disabilities (PWDs) through a government employment assistance fund. In the US, the FCC established four programmes within the Universal Service Fund to implement the principles in the Telecommunications Act of 1996. The four programmes are:[89]

- Connect America Fund for rural areas
- Lifeline (for low-income consumers), including initiatives to expand phone service for residents of Tribal Lands
- Schools and Libraries (E-rate)
- Rural Healthcare

In India, the New Telecom Policy (NTP) stipulates that the Universal Service Obligation (USO) will be met using funds raised through a Universal Access Levy (UAL), a percentage of the revenue of licensed operators. The Universal Service Obligation Fund (USOF) is already being used to fund programmes which will help increase Internet penetration in India. BSNL, India's state-run telecom operator, recently received funding for a project to setup 25 000 Wi-Fi hotspots in rural areas.[90]

89 Federal Communications Commission, Universal Service: https://www.fcc.gov/general/universal-service

90 Bharat Sanchar Nigam Limited, Press release, 9June 2017: http://www.bsnl.co.in/opencms/bsnl/BSNL/press_room/news_details2.html

Business models serving low-income and rural customers

Alternative business models that serve low-income and rural customers include those championed by companies such as AirJaldi in India, Mawingu in Kenya, and Ericsson's Managed Rural Coverage in sub-Saharan Africa.[91]These models are presented as case studies below.

Case study: AirJaldi[92]

AirJaldi is an ISP providing broadband services through fixed wireless and Wi-Fi hotspots. It operates 10 networks in six Indian states, specifically targeting rural areas and serving over 70 000 clients. AirJaldi uses Wi-Fi links and relays (many solar-powered) to extend connectivity from existing infrastructure into rural areas that have little or no access to broadband services. Customers can choose from various packages with broadband speeds ranging from 1Mbps to dedicated lines of 100Mbps or more.

AirJaldi's client-base has grown in response to the demand, creating opportunities for more extensive provision of Internet services and enabling economical scaling of networks. Wide reach, attentive service, high availability, high speed and affordable prices have all contributed to high customer loyalty and uptake. AirJaldi's hotspot services are a profitable means of reaching customers at a lower average revenue per user (ARPU), and are particularly attractive to the many rural consumers who own smartphones but find mobile Internet too expensive.

AirJaldi's networks are managed by local teams thereby generating employment for the local population. It operates training centres to address the challenge of workforce recruitment and retention in rural areas. Local community members undergo a six-month training and internship programme, at the end of which they join AirJaldi as network deployment staff. Over 85 per cent of AirJaldi's workforce has undergone this training programme. Partnerships with Indian government institutions, philanthropic organizations such as the Ford Foundation, and technology companies such as Microsoft and Facebook have been central to the success of this model. AirJaldi has proven that new networks for "last billion" connectivity can be profitable within a short period of 12-18 months.

Case study: Mawingu[93]

Mawingu is a Kenyan startup that operates and sells access to Wi-Fi hotspots in northern Kenya, using a combination of Wi-Fi, microwave relays, TV Whitespace equipment, and renewable energy solutions. It began as a small-scale public private partnership between the United States Agency for International Development (USAID) and Microsoft under the Global Broadband Initiatives Program. While the initial aim was to demonstrate the viability of TV Whitespace technology in northern Kenya, it was soon clear that combined with Wi-Fi and microwave relays, the technology was not only viable but that consumers in these low-income, rural communities were willing to pay for Internet connectivity. The result was a new business that has now received venture capital funding and operates over 100 hotspots, with between 50-100 people paying approximately USD 2.50 per month at each hotspot.

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91 Steve Schmida et al., "Connecting the Next Four Billion: Strengthening the Global Response for Universal Internet Access" (2017): https://www.usaid.gov/sites/default/files/documents/15396/Connecting_the_Next_Four_Billion-20170221_FINAL.pdf

92 Steve Schmida et al., "Business Models for the Last Billion": https://mstarproject.files.wordpress.com/2016/05/business-models-for-the-last-billion.pdf

93 Steve Schmida et al., "Business Models for the Last Billion": https://mstarproject.files.wordpress.com/2016/05/business-models-for-the-last-billion.pdf

Hotspots are placed in high traffic locations in rural communities across northern Kenya and connected back to the grid through point-to-multipoint wireless networks. Mawingu sells access to individual hotspots through local sales agents in each village. These sales agents collect cash and receive a 10% commission on sales. Knowing the local area, they have also been instrumental in understanding the needs and desires of Mawingu's customers, and identifying prime hotspot placements.

The case of Mawingu clearly showcases how multiple stakeholders can work together to finance and scale a viable business model. Initially supported through blended finance from a development entity and a technology company, Mawingu has now received equity funding from International Network Investments, Vulcan, Inc., and Microsoft, as well as debt financing from OPIC. These collaborations demonstrate the potential for cross-sector partners to work together to capture new markets and provide high-quality connectivity to low-income consumers.

Case study: Cooperative PPP model[94]

The telecommunications sector in The Gambia earlier received international data connectivity over a terrestrial fibre optic cable from Senegal. With no competition, the cable owner was able to demand USD 2 000 per Mbps per month for wholesale connectivity, driving up rates for consumers as well. In The Gambia, advisors from MacMillan Keck / Bridgespan Ventures helped a number of telecom and government parties structure the cable management organization as a cooperative public-private partnership (PPP).

Launched in December 2012, the cooperative structure managed The Gambia's access to the Africa Coast to Europe (ACE) submarine cable system. With a total of seven retail telecom operators participating, no operator owned more than 20 per cent of the PPP and was allocated capacity in amounts corresponding to ownership share. After the launch, prices for wholesale capacity dropped to USD 500 per Mbps per month, 25 per cent of original prices. The assumed follow-on decrease in consumer pricing allows for creative delivery of end-user connectivity to bottom of the pyramid (BoP) markets.

The cooperative PPP model used in The Gambia is an approach to structuring investments that seeks to maximize private sector participation and investment while reducing risks of monopolistic and rent-seeking behaviour. In doing so, it creates facilities-based competition on what is ostensibly monopoly infrastructure, increasing the affordability of connectivity in parts of the world where costs are high due to lack of competitive access.

Case study: ViRural[95]

A further innovative business model is that of ViRural, a telecommunications company building out a Wholesale Network for Rural Telephony (WNRT) in remote, rural Nigerian villages that have no grid power, Internet access, or mobile phone coverage.

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94 Steve Schmida et al., "Business Models for the Last Billion": https://mstarproject.files.wordpress.com/2016/05/business-models-for-the-last-billion.pdf

95 Steve Schmida et al., "Business Models for the Last Billion": https://mstarproject.files.wordpress.com/2016/05/business-models-for-the-last-billion.pdf

Using a network of what the company has termed "V-Nodes" – 15-meter masts that produce their own solar power, 10 km of GSM voice access, and 3 km of mobile data coverage – ViRural provides the infrastructure solution for single or multiple network operators in rural areas.

In addition to revenue sharing for "roaming" access on the WNRT which increases the mobile network operators' (MNOs') coverage, ViRural sells device-charging services at each node. V-Nodes will take advantage of local switching as more are installed in proximity to one another. MNOs can buy access to ViRural's network, providing them with an off-balance-sheet means to increase network coverage with limited risk. Assuming the company meets key metrics, it plans to expand to 20 000 villages in rural Nigeria over the next several years. ViRural's business strategy to sell network access to MNOs aligns with key industry trends in which MNOs in many markets are shifting ownership of network infrastructure to third party partners. By effectively taking on the infrastructure and operational risk associated with rural network build-out, ViRural makes it painless for an MNO to acquire rural customers with minimum risk and almost no increase in their annual capital expenditures budget.

In an environment of declining MNO ARPU and skepticism of the commercial viability of rural markets, this approach holds great promise for enabling rural network build-out as it allows network operators to grow incremental revenue with minimal capital expenditure and, effectively, no operating expenditure. Moreover, with its localized presence, ViRural enhances its social corporate responsibility by enabling other social service groups to easily expand their service coverage. By integrating well into existing MNO infrastructure and business models, the ViRural model is well positioned to drive substantial growth in rural connectivity.

Case study: Pegaso Banda Ancha[96]

Despite the fact that Mexico is home to a rapidly expanding telecommunications sector, approximately twenty million Mexicans still live in rural areas with limited or no access to the Internet. Many urban Mexicans enjoy the economic and social opportunities of the Internet, while their rural counterparts are unable to take part in the digital economy. This digital divide exists in large part because terrestrial broadband infrastructure cannot be deployed to Mexico's rural or mountainous areas without incurring significant costs and lengthy rollout timeframes. To help bridge this divide, Hughes, a provider of broadband satellite services, partnered with the Mexican Government and Pegaso Banda Ancha, a Mexican Internet service provider and satellite operator, to deliver high-throughput connectivity to over 5 000 rural schools, hospitals, universities, parks, and government development and disaster prevention agencies. Using the bandwidth efficiency and robust capacity of the Hughes JUPITER system, Pegaso Banda Ancha's satellites were able to swiftly rollout high-speed Internet service across Mexico's rural communities, enabling previously disadvantaged segments of Mexican society in 29 states to reap the economic and social benefits of the digital economy.

9 The way forward – seven key actions

The Working Group on Access and Affordability recommends the following action plan featuring seven key actions to boost increased access (connectivity) and affordability.

96 Broadband Commission Working Group on Technologies in Space and the Upper-Atmosphere, "Identifying the potential of new communications technologies for sustainable development," 2017: http://www.broadbandcommission.org/Documents/publications/WG-Technologies-in-Space-Report2017.pdf

Action 1: Enable collaboration between key stakeholders and new players

The Working Group believes that collaboration and cooperation between key stakeholders and new players is critical to advancing access and affordability in mobile technology. An important first step is to identify the relevant key stakeholders and new players, including both public, private and civil society actors that are likely to have an impact on the mobile technology sector. Thereafter, policy-makers and governments should create platforms and encourage the setting up of multi-stakeholder bodies that can serve as forums for collaboration and cooperation between the stakeholders.

Action 2: Identify and invest in technologies and mobile devices

The Working Group believes that it is critical to identify and invest in technologies and mobile devices that have the potential to make connectivity and affordable access a reality. This process involves identification of cost-effective technologies and devices and creating a regulatory and entrepreneurial environment where the private sector is incentivized to invest in such technologies and devices.

Action 3: Remove regulatory, technical and commercial barriers

The Working Group believes that telecommunications is a cost intensive industry and therefore access and affordability can be ensured by tackling regulatory, technical and commercial barriers. The Working Group recommends reducing the regulatory burden and operating costs for telecom operators and the development of flexible, incentive-based, market-oriented policy and regulatory frameworks with regard to assignment of spectrum, in particular for broadband service and with regard to the manufacture and provision of low-cost devices.

Action 4: Implement innovative incentive mechanisms to increase access and affordability

The Working Group has identified innovative models such as Public-WiFi hotspots, Li-Fi and fixed wireless models using unlicensed wireless spectrum such as V-Band and E-Band for last mile connectivity. Private players can be encouraged to take up some of these new mechanisms through public private partnerships, where risks can be shared across the board. Furthermore, incentive schemes such as digital transaction incentives and discounted e-government services will lead to an increase in Internet usage.

Action 5: Identify real-life examples which are increasing the use of Internet and online services

It is important to identify relevant local challenges that can be readily addressed using ICT. Identification of relevant issues such as timely weather forecasts and efficient government subsidy disbursals, as well as creating solutions which provide tangible benefits to the local population will be a catalyst for increased Internet usage.

Action 6: Leverage unified platforms to meet the goals of increased access and affordability

The Working Group acknowledges that implementation of technologies and business models that lead to increased connectivity and affordable access can be challenging because of cost. Unified platforms such as digital payment interfaces and biometric systems must be utilized to bring down these costs and to ensure affordable access.

Action 7: Nurture and fund innovative business models for sustained connectivity

The Working Group understands that innovative business models play an important role in furthering access and affordability. There are several examples of compelling business models built on sharing infrastructure and technology that have helped in bridging the digital divide. Furthermore, countries should fund such innovative models either through universal service obligations or through the creation of innovation zones where tax and other commercial incentives are available.

Annexure

Abbreviations

A4AI	Alliance for Affordable Internet
AIM	Atal Innovation Mission
APWG	Anti-Phishing Working Group
ARPU	Average revenue per user
BBNL	Bharat Broadband Network Limited
BHIM	Bharat Interface for Money
BISP	Benazir Income Support Programme
BoP	Bottom of the pyramid
CAGR	Compound annual growth rate
DRC	Democratic Republic of Congo
FMV	Fair market value
FTTH	Fibre to the home
GP	Gram Panchayats
HAPS	High-altitude platform stations
HTS	High-throughput satellites
ICT	Information and communications technology
IDA	Info-communications Development Authority of Singapore
IMT	International Mobile Telecommunication
IoT	Internet of Things
ITU	International Telecommunication Union
ITU-D	ITU Telecommunication Development Sector
LDC	Least Developed Country
Mbps	Megabits per second
MeitY	Ministry of Electronics and Information Technology
MNOs	Mobile Network Operators
NBN	National Broadband Network

NeGD	National e-Governance Division
NeGP	National e-Governance Plan
NOFN	National Optical Fibre Plan
NPCI	National Payments Corporation of India
NTP	New Telecom Policy
OFC	Optical Fibre Cable
OTT	Over-the-Top
P2P	Peer-to-Peer
PDOAs	PDO Aggregators
PDOs	Public Data Offices
PDS	Public Distribution System
PPP	Public-Private Partnership
PwDs	Persons with Disabilities
SCLS	Submarine Cable Landing Station
SDG	Sustainable Development Goals
SPV	Special Purpose Vehicle
TBIs	Technology Business Incubators
TEC	Telecommunications Engineering Center
TRAI	Telecom Regulatory Authority of India
TSDSI	Telecommunications Standards Development Society, India
UAL	Universal Access Levy
UMANG	Unified Mobile Application for New-age Governance
UN CRPD	United Nations Convention on the Rights of Persons with Disabilities
UPI	Unified Payments Interface
USAID	United States Agency for International Development
USOF	Universal Service Obligation Fund
USSD	Unstructured Supplementary Service Data
WBA	Wireless Broadband Association
WLAN	Wireless Local Area Network
WNRT	Wholesale Network for Rural Telephony
WRIX	Wireless Roaming Intermediary Exchange

PART III

PARTNERSHIPS FRAMEWORK

1 Introduction

Part III collates inputs and reviews by members of the Working Group on Partnerships[97] as part of the deliberation of the Board of the m-Powering Development Initiative.

Partnerships for delivering development outcomes do not just occur. They require careful crafting and substantial commitment from all those involved if they are to succeed. They are time consuming and necessitate considerable investment. However, they can deliver substantial benefits to all stakeholders, and ultimately deliver development impacts that other pathways are unable to achieve. Substantial research has been undertaken on this important topic.[98]

Partnerships are by no means always the most appropriate way to implement development interventions. The costs of creating the partnership and engaging with many partners often outweigh the benefits that accrue through working in partnerships. In such circumstances, simpler contractual relationships are often more efficient. However, there are many circumstances where the complexity of an Information and Communication Technology for Development ("ICT4D") intervention, coupled with the need to bring together a variety of stakeholders, means that multi-stakeholder (or multi-sector) partnerships (MSPs) are the best way forward.[99]

The market can provide viable solutions using business models that do not necessarily involve partnerships. Equally, the market is unlikely to generate effective interventions in some circumstances – for example in providing mobile broadband services to all geographical areas and social groups in poor countries. In these contexts, MSPs involving governments, civil society, the private sector, international agencies, and other stakeholders are better suited to getting the job done. The challenge is to ensure that those implementing such partnerships have sufficient knowledge of, and expertise in the delivery of such services.

This Part III presents the work of the m-Powering Development Initiative Working Group on Partnerships and sets out its key activities and deliverables, including key guidance on delivering effective partnerships, as well as MoUs between an entity (agency) and a mobile operator and/or a service provider for the provision of m-services.

2 Background: Working Group on Partnerships

The Working Group on Partnerships is a sub-group of the m-Powering Development Initiative Advisory Board, which was tasked with developing partnerships to mobilize resources and

97 The Working Group expresses its thanks to Ms Philbeck, Mr Clarke and Mr AbouReily for their contributions.

98 Good summaries include: Geldof, M., Grimshaw, D.J., Kleine, D., and Unwin, T. (2011) "What are the key lessons for ICT4D partnerships for poverty reduction"?, London: DFID: https://assets.publishing.service.gov.uk/media/57a08aba40f0b6497400072c/DFID_ICT_SR_Final_Report_r5.pdf; Unwin, T. and Wong, A. (2012) Global Education Initiative: Retrospective on Partnerships for Education Development 2003-2011, Geneva: World Economic Forum: http://www3.weforum.org/docs/WEF_GEI_PartnershipsEducationDevelopment_Report_2012.pdf; Unwin, T. (2015) "MultiStakeholder Partnerships in Information and Communication for Development Interventions", in International Encyclopedia of Digital Communication and Society, Chichester: Wiley, pp.634-44; Unwin, T. (2017) Reclaiming Information and Communication Technologies for Development, Oxford: OUP.

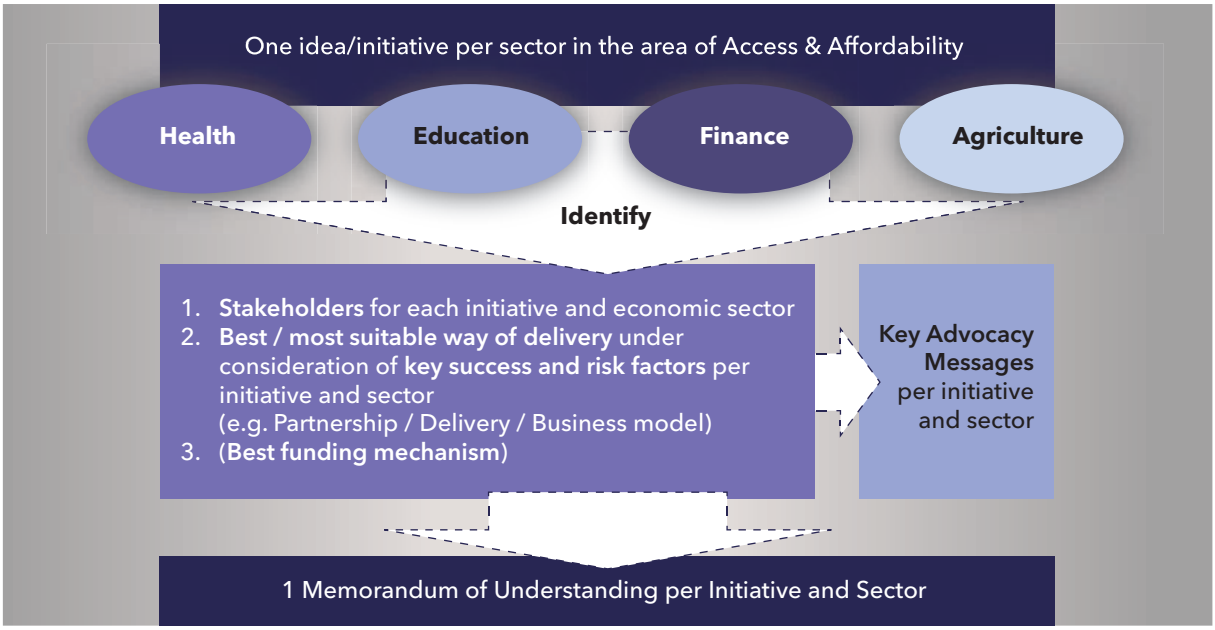
99 The term multi-stakeholder partnerships is often used to indicate greater diversity of partners than just from the private and public sectors, and specifically to include civil society as an important third element. However, the term multi-sector is in many ways a more accurate description of such partnerships, since they combine partners from all three sectors (public, private, and civil society); multi-stakeholder merely means that there are many stakeholders. One challenge with the use of the term multi-sector, though, is that some UN agencies use the word sector to refer to the different silos within them, and so for them multi-sector would mean working across these silos.

support the implementation of the m-Powering action plan. The objective of the Working Group was to provide input to the work of the Advisory Board.

As per its Terms of References, the Working Group identified the following possible activities:

- Identify key stakeholders, potential partners and their respective roles.
- Assess the needs, gaps, and existing mechanisms for sustainable partnerships.
- Identify innovative funding models to encourage and facilitate the large expansion in mobile communications use to address inequalities and stimulate economic and social development.
- Identify draft models for allocating resources to contribute to the ICT for SDG ecosystem/ platform.
- Identify national, regional and global partnership opportunities for allocating resources to m-Powering initiatives.
- Draft a work plan with concrete actions.
- Carry out the activities that will support implementation of the Initiative's work plan. The overall methodological framework adopted by the m-Powering Development Initiative Board, which subsumes the Working Groups on Advocacy, on Access & Affordability and on Partnerships, is shown in Figure 1:

Figure 1a: Methodological Reference Framework



The complexity of partnerships in ICTs requires identification of relevant stakeholders, their interrelations, objectives and motives. As a starting point, the Working Group on Partnerships has focused its efforts on developing MoUs for a linear or simple contractual relationship, which can form part of an overall MSP. This MoU can form the basis for further discussions among potential partners and can help identify relationships and touch-points, responsibilities and structures on which MSPs can be built.

3 Key activities

Since the second meeting of the m-Powering Development Initiative Board (8-9 June 2017, Geneva), the Working Group on Partnerships has focused on the following activities:

- Identification of types of partnership and delivery models, mechanisms and approaches (PPPs, MSPs, contractual relationships, other) and business models that foster the expanded use of mobile communications that address inequality and the need for economic and social development.
- Identification of key success and risk factors of ICT4D partnerships and projects.
- Development of a partnership framework, MoUs and accompanying user guidelines for use between an agency and a mobile operator and/or service provider.

The outcomes of these activities are set out below.

Different types of partnership models for ICT4D

The Working Group on Partnerships has identified two partnership delivery models – the circular and the linear – under which different approaches to partnerships could fall (these are briefly explored in Sections 1.1 and 1.2). There are also variants that include elements of each.

Below is a non-exhaustive list of approaches that could be used to initiate and deliver m-Powering initiatives

- Public-private partnerships
- Multi-stakeholder or multi-sector partnerships
- Public sector delivery
- Civil society intervention
- Private sector delivery
- Circular delivery (long-term partnership maintenance)
- Linear delivery (delivery of interventions that are wound up when the completion of objectives is deemed to have occurred)
- Combination of circular and linear models
- Simple contractual relationship with set objectives

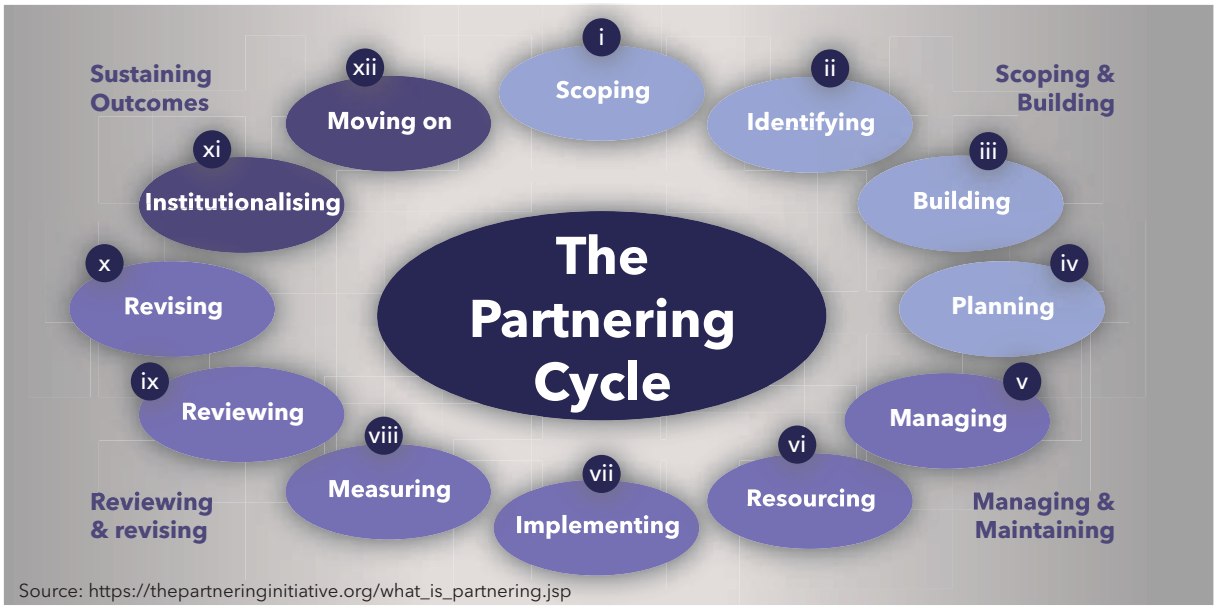
In relation to funding, the following approaches can be explored:

- Cost-sharing models
- Universal Service Fund (USF) funding / ICT technology development fund
- Other government funding / subsidies
- Tax breaks; reduction in tax

Circular partnership model

The circular partnership model[100] developed by the Partnering Initiative focuses on four key stages: scoping and building; managing and maintaining; reviewing and revising; and sustaining outcomes. While it is not explicitly focused on development outcomes, it centres on the partnership itself as a key outcome in the long term. The final stage of "moving on" leads into a further phase of scoping a new basis for collaboration.

Figure 2a: Circular Partnership Model (Partnering Initiative 2013)



Source: https://thepartneringinitiative.org/what_is_partnering.jsp

Linear partnership model

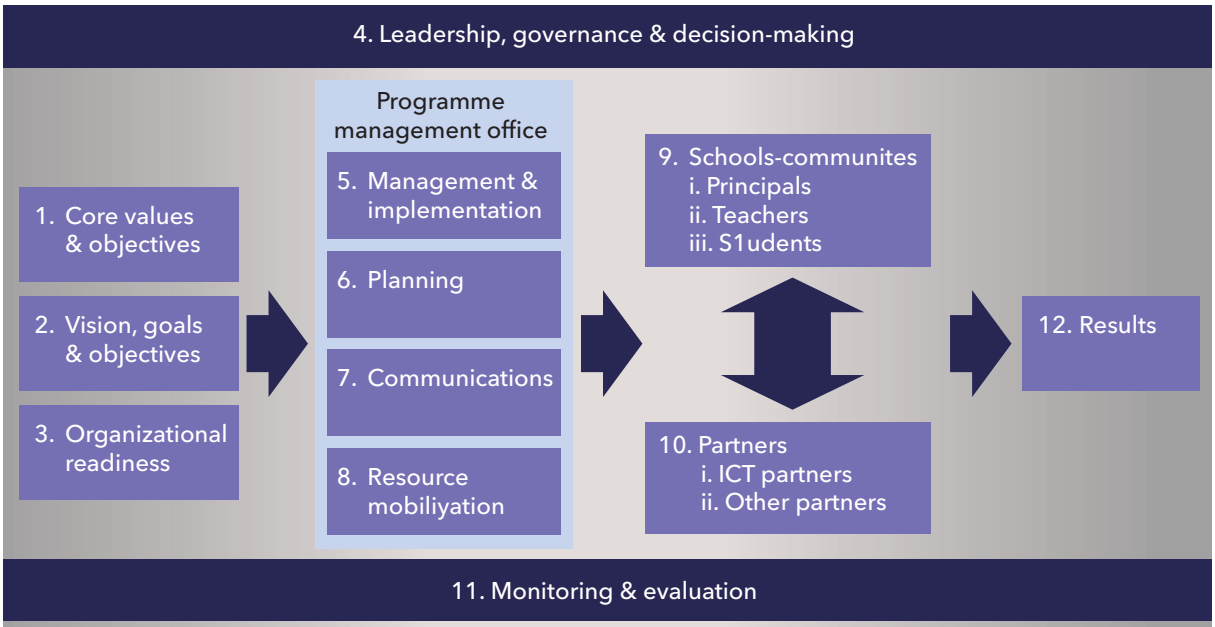
Other models of partnership have concentrated directly on how partnerships can focus on development outcomes (e.g. Cassidy 2007), with a linear structure. The onus is more squarely on the planned outcome and its execution, after which the partnership may be dissolved or discontinued.

What type of partnership model to adopt

It is difficult at the outset to choose the best partnership model. Partnerships are not always the best way of achieving development outcomes. Where the cost of creating partnerships outweighs the benefits, simpler contractual relationships may be better. It is therefore important to evaluate which model is most appropriate.

100 The circular model is captured in the work of Tennyson (2003) and the Partnering Initiative (2013).

Figure 3a: Linear Partnership Model (Cassidy 2007)



Source: Cassidy, T. (2007) The Global Education Initiative (GEI) Model of Effective Partnership Initiatives for Education, Geneva: World Economic Forum.

The circular model is better for implementing sustainable development strategies where long-term and evolutionary agreement is needed. The conventional case for the circular model is "providing affordable connectivity services in remote/open areas", usually funded by Universal Services Funds (USFs).

An innovative example in the field of education/culture could be "Ensuring/promoting affordable access to educational/cultural content, labeled on national or international level such as Wikipedia for example, through zero-rating mechanisms and tax-compensation models".[101]

The circular model is also applicable for the types of initiatives 13 and 14 below (as set out below in section "m-Powering initiatives – inputs to concrete partnership proposals") related to subsidized financial services and digital health services, where public financial incentives and subsidies are considered.

The linear model is more suited to time-bound and scope-bound objectives and projects. There are also combinations of both models when public agencies are acting as a "catalyst" to foster development interventions that, after implementation, rely on market conditions to sustain the activity – the agency maintains however, the role of monitoring service delivery and performance in line with the agreement.

For ICT4D or m-Powering initiatives, the chosen model depends on whether the market can provide a solution without a partnership model – or not – as for example, in providing mobile broadband services to all geographical areas and social groups in poor countries.

101 So far, most regulators prohibit MNO-controlled zero-rating mechanisms but they could be allowed for such partnership models, with service/content providers to be compensated on tax or fees reduction.

In summary, the choice of partnership model depends on whether the "partnership" is a means to an end, or is an end in itself. The objectives, stakeholder interests, time-frame, funding mechanisms, and available resources – all help determine the type of partnership.

Identification of key success / risk factors of partnerships / projects

The Working Group on Partnerships explored the key success and risk factors to partnership models, drawing on extensive literature and past project experience (especially in the field of education), to identify what drives success. This work is reflected in the Model Partnership Agreements.

Factors that make partnerships succeed

The following table sets out some of the key partnership success factors:

Table 1: Key success factors to partnerships (non-exhaustive)[102]

Success Factors	
Multi-Stakeholder-Partnerships (MSPs) over Public-Private Partnerships (PPPs)	Extending PPPs to include the engagement of civil society organizations (such as healthcare workers' unions, local NGOs or teachers' organizations) and better understanding the roles of other donors and foundations will enhance the prospects of successful partnership outcomes
Local context	Paying attention to **local context** and involving the **local community**
Development outcomes	Agree from the outset **clear intended development outcomes**
Sustainability & scalability	**Build sustainability and scalability** into the partnership design from the outset
Foundation of partnerships	Ensure that the partnership is built on **trust, honesty, openness, mutual understanding and respect**
ICT environment	A **supportive wider ICT environment needs to be in place**, both in terms of policy and infrastructure
Project management	**Careful project management**, usually involving the creation of a dedicated project management office, either in a government department or as a separate entity
Partnerships champions	**Have partnership champions** – the critical role played by key individuals, such as CEOs and senior government figures who can act as champions and can guarantee the necessary allocation of resources
Continuity	**Ensure continuity of individuals involved** in implementing the partnerships
Skill-set	**Ensure the right skill-set to deliver on the intended outcomes** –careful selection of partners at the outset of an initiative, and a willingness to engage new partners with specific skill-sets at a later stage

102 See: Tim Unwin, "Multi-Stakeholder Partnerships", Commonwealth Telecommunications Organization and Royal Holloway, University of London, UK, and WEF Insight Report "Global Education Initiative – Retrospective on Partnerships for Education Development 2003-2011": http://www3.weforum.org/docs/WEF_GEI_PartnershipsEducationDevelopment_Report_2012.pdf

Communication strategies	Have in place **clear and coherent internal and external communication strategies**
Commitment	**Long-term commitment** from the start from all stakeholders involved
Strategy	**Clear strategy in place from the start**, but sufficient flexibility in delivery to accommodate changes
Leadership	Ensure **high-level government or public sector leadership** and accountability
Third-party broker	Involving a **trusted third-party broker** – to oversee progress of implementation of objectives
Understanding of the costs	**Realistic understanding of the costs involved** to ensure that appropriate resources can be delivered at all stages through the lifecycle of an initiative (sometimes better achieved through a contractual relationship)

Table 2 sets out the key elements to successful Multi-Stakeholder Partnerships in ICT4D:

Table 2: Key success factors to ICT4D partnerships

Key Success Factors	
Conducive political and infrastructure environment	A political and infrastructural environment that is conducive to the implementation of partnerships (without which there is little point in starting)
Stakeholder engagement	Engagement of all relevant stakeholders as early as possible in the initiative
Champions and leaders	The involvement of a high-level champion and leaders of all of the entities involved
Clear common objectives	The identification of clear and mutually agreed objectives for the partnership at the start
Consistent monitoring and evaluation	Consistent monitoring and evaluation of the partnership and its intended outcomes from the beginning by ensuring a baseline study exists to enable impact and outcomes to be measured effectively
Resourcing framework	A clear and realistic resourcing framework, whereby each partner is explicit about the resources that they are willing to make available and their expectations of the benefits of being involved; mechanisms must also exist for the inclusion of additional partners at stages during the process when new needs are identified
Ethical framework	An ethical framework that emphasizes a focus on transparency and helps build trust within the partnership
Management office	A management office and/or partnership broker that ensures the day-to-day, effective management and delivery of the partnership

Key risk factors to partnerships

The following table sets out key risks to partnerships and initiatives.

Table 3: Key challenges to partnerships

Key Challenges	
Long-term sustainability	Ensuring long-term sustainability can be a challenge
Common vision	The underestimated difficulty of reaching common agreement on the goals and activities to be undertaken in an initiative (Common Vision)
Balancing multi-stakeholder interests	Balancing the varying agendas and interests of multiple stakeholders and changing the culture of stakeholder organization to achieve tailored engagement, contribution and input rather than "off-the-shelf solutions" as inputs
Human resources	Identifying (human and financial) resources and focus
Public-private cooperation	Cooperation between private sector partners and relevant national bodies is needed if partnerships are to be effective
Monitoring and evaluation	Many of those involved in implementing partnerships for education tend to leave the monitoring and evaluation until the end, when there is often little money left

m-Powering initiatives – inputs to concrete partnership proposals

As a starting point, the Working Group on Partnerships identified activities and initiatives that advance SDGs and can be applied across different economic sectors. These are set out below. These initiatives could be based on a more linear delivery model such as "contractual arrangements" between governments / agencies (or other organizations) and telecom operators / service providers:

1. Sending bulk SMS/Voice messages to the overall population or to specific geographies or groups. This can include cell broadcasting for limited geographies or targeting specific groups from the subscribers' database such as "women between the age of 30-49 years living in a specific district" to send them awareness messages on Cervical Cancer for example. The authorization of the Telecom Regulatory and the Personal Data Privacy commissions is of course needed, but leveraging the operators' databases for targeted communication for social purposes can be of great help particularly because in many countries, operators' databases may well be the only available and well maintained database.
2. Providing interactive 2-way communication through SMS, IVR, USSD, etc. with end users. This interactive communication is particularly important for behaviour change programmes, client engagement, data collection, work-flow management, among other services.
3. Provide preferential rates for accredited SDG-related services. Special tariffs or reduction can be sought for services that have social and developmental impact.
4. Providing unlimited data plans to health professionals and health facilities, agriculture extension workers, teachers, for example, with the possibility of bundling devices in the package. Special commercial packages can be designed to address the economic situation of end users and their specific use cases.
5. Send targeted messages for people entering (first presence message) or exiting specific zones where an epidemic or a natural disaster has occurred.
6. Establish "closed calling network" for health professionals or agriculture extension workers or humanitarian workers.
7. Establish call centres and hotlines.

8. Provide appropriate connectivity and intranet infrastructure for remote location such as refugee camps, remote primary health centres, etc.
9. Establish dedicated mobile network code for humanitarian workers, for example, so they can use emergency communication even when the network is not functioning.
10. Providing hosting capabilities and other enterprise solutions such as SMS/IVR gateways, enterprise mobility solutions, mobile ID, etc.
11. Using big data to analyse population movements, density, and usage patterns in case of emergencies, epidemics, etc.
12. Using big data and CDR to analyse credit worthiness of end users who don't have any credit history based on historical call data. Monthly airtime top-up patterns, use of financial services among others can be used to get insights on the economic health and resilience of an individual or community.
13. Provide different types of financial services such as remittances, credit, saving and e-vouchers that can be used to deliver any subsidy in a controlled and secure manner.
14. Support marketing, communication and outreach activities to facilitate the rollout of different digital health services to reach the millions.
15. Empowering children in Arab conflict zones and refugee camps through ICT-based education.

Key Working Group output: partnership framework, memoranda of understanding and user guidelines

Government agencies around the world are undertaking initiatives to help achieve the UN's Sustainable Development Goals. Partnering with mobile technology companies is key in this context. However, implementing legal protections for all parties can prove difficult and time-consuming. Furthermore, the complexity of ICT partnering requires care in setting up the project.

As a first step, the Working Group developed two MoUs as linear / contractual relationships, which can form part of a larger MSP. These can be used as a starting point for setting out legal rights and obligations that will govern the relationship. They can also form the basis for further discussions for a larger MSP, helping to identify relationships and touch-points, responsibilities and structures at national or regional levels.

The key outputs of the Working Group are as follows:

- Partnership framework
- Guidelines for the use of the model agreements
- Specific MoUs

Partnership framework

Governance structure and an overall framework specifying commitments and responsibilities are key. It is essential to invest in discussion time with all parties at the outset, focusing particularly on planned outcomes, and on each partner's contributions. Failure to agree specifics clearly and in detail at the outset is a common cause of project failure.

Key elements in partnership frameworks include:

- Agreement on the overall intended outcomes of the partnership, and why the partnership is necessary to deliver them.
- Open recognition and acceptance amongst all partners as to why each partner wants to belong to the partnership. This requires a clear statement and transparent acknowledgement of the interests of each partner.
- Openness of each partner as to the resources they can commit, and when these will be delivered.
- Commitment by each partner to continuity of individual representation at meetings. A succession of different representatives attending meetings leads to a lack of continuity and understanding.
- The appointment in each organization of a high-level champion who will advocate for the value of the partnership, and will ensure overall commitment is sustained.

Annex 1 provides a model of an enabling partnership framework, which could be developed more formally as a memorandum of understanding. Organizations may not know what resources are required at the beginning of a partnership, and it is important that such agreements are regularly reviewed and revised. The partnership management office should maintain a record of all such signed agreements. This Annex in essence provides guidance on the most basic elements of any agreement.

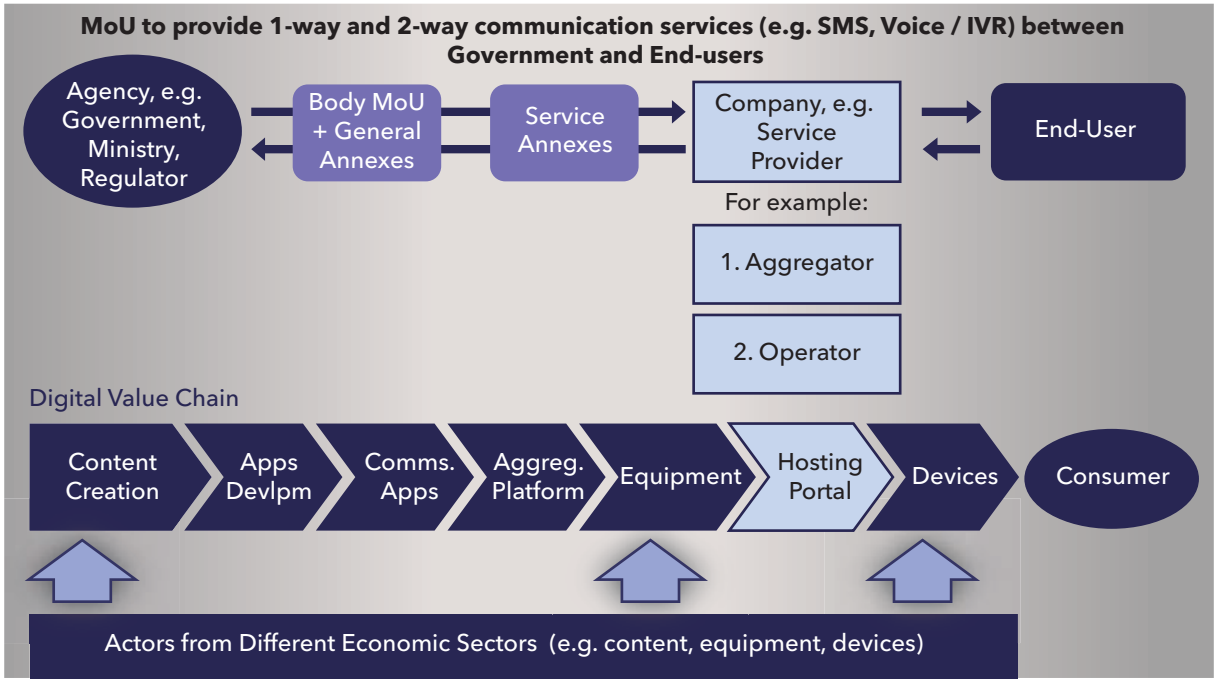
Once a partnership agreement is in place, more detailed agreements can be reached for the practical delivery of particular initiatives as outlined in the ensuing sections. Project management tools can help ensure effective delivery and monitoring.

Memoranda of Understanding – user guidelines

A government initiative might require mobile services that enable communication with the public at large (such as an SMS-based stop smoking initiative), or with a select group of professionals working on the agency's behalf (such as a closed calling group for health workers sending information from the field to the agency). The first scenario will often involve the agency working with a single company, known as an aggregator that can arrange the necessary technical connections with the country's mobile network operators (the aggregator could itself be one of these operators). The second scenario will often involve the agency working directly with a single mobile network operator.[103]

MoUs have been prepared for both of these scenarios – both with short, simple guidelines, designed to assist the agency in understanding which to choose, what they contain, and how they differ. The parties involved can be visually represented as follows:

103 Whichever scenario is involved, the agency may also wish to engage with other stakeholders, to ensure the necessary content, equipment or devices are available for the initiative. This model agreement is not designed to be used as a basis for such a relationship.



Memoranda of understanding

Each model MoU comprises two parts:

1. The main body of the MoU
2. The annexes of the MoU

The model MoUs are attached in Annex 2A and Annex 2B.

The main body of the MoU provides the legal foundations for the establishment and development of an enduring relationship between the parties. It creates a legal relationship on the basis of which the agency can, from time to time, engage the partner company in one or more sustainable development initiatives. It is designed to remain the same whatever the type of services that the partner is charged with providing (e.g. voice communication, SMS communication…). This minimizes the need for re-negotiation of rights and obligations each time a new initiative is undertaken.

The first annexes to each of the MoU set out administrative details on the partnership champions and contract managers that will ensure the collaboration between the parties goes smoothly.

The later annexes concern the services that the partner company agrees to provide. More specifically, Annex C sets out the template to be followed when the parties wish to add new services to the list of services agreed at the outset, while Annexes D onwards are the individual services themselves. The Working Group has provided a range of model annexes that the parties can choose from to suit their own service requirement.

These are:

- For communication with the public at large (MoU with aggregator):
  - Two-way SMS services
  - One-way SMS services
  - USSD services
  - IVR services (in the context of incoming call centres)
- IVR services (in the context of automated outgoing call systems)
- For communication amongst agency staff and contractors (MoU with mobile operator):
  - Voice and SMS – including the option of closed user group pricing
  - Data – including the option of closed user group pricing

How can such MoUs be used?

Government agencies and aggregator partners should see the model MoUs as a useful starting point for negotiating rights and obligations that will govern their relationship. Even if the parties decide not to adopt the model as drafted, discussing its provisions will help the parties address important legal issues.

Note that acting in compliance with the document's provisions does not guarantee compliance with relevant applicable laws – e.g. on the use of personal data. Agencies and their partners should seek independent legal advice before entering into a binding legal agreement.

Further steps

Based on the key outputs as set out above, the Working Group will undertake the following activities:

- Agree a new roadmap, building on the current outputs of the Working Group
- Further develop the catalogue of relevant digital services
- Develop and draft of a circular model MoU / framework
- Provide support on implementation of the model MoUs (eligible countries/projects) through ITU's activities

Abbreviations and acronyms

Various abbreviations and acronyms are used through the document, they are provided here for simplicity.

Abbreviation/acronym	Description
AI	Artificial Intelligence
CAGR	Consolidated Annual Growth Rate
CAPEX	CAPital Expenditure
CDR	Call Detail Record
CEO	Chief Executive Officer
CLEER	Cloud Energy and Emissions Research Model
CSP	Cloud Service Provider
DBMS	Data Base Management System
DC	Data Centre
HW	Hardware
IaaS	Infrastructure as a Service
ICT	Information and Communication Technology
IDC	International Data Corporation
ICT4D	Information and Communication Technology for Development
IoT	Internet of Things
ISO	International Standards Organization
ISV	Independent Software Vendor
IT	Information Technology
ITU	International Telecommunication Union
IVR	Interactive Voice Response
IXP	Internet eXchange Point
JTC1	Joint technical Committee
MNO	Mobile Network Operator
MOOC	Massive Open Online Courses
MSP	Multi-Stakeholder / Multi-Sector Partnership
OECD	Organisation for Economic Co-operation and Development
OPEX	Operational Expenditure
PaaS	Platform as a Service
PC	Personal Computer
PII	Personal Identifying Information
PPP	Public-Private Partnership
SaaS	Software as a Service
SDG	Sustainable Development Goal
SG	Study Group
SLA	Service-Level Agreement
SW	Software
UNCTAD	United Nations Conference on Trade and Development
USF	Universal Service Fund
USSD	Unstructured Supplementary Service Data

Annex 1: Model of enabling partnership framework

1. Organization/Company Name:

   Status of organization (e.g. Limited Company, UN or other International Organization, Civil Society…)

2. Senior Executive with overall responsibility within the organization for the partnership:
   a. Name:
   b. Contact details:
      i. E-mail:
      ii. Telephone:
   c. Confirmation of commitment to attend at least half of the total number of meetings a year in person, and a further quarter of such meetings online for a period of three years (tick box and initial) □

3. Member of staff with responsibility for day to day management of partnership on behalf of the organization:
   a. Name:
   b. Job title:
   c. Contact details:
      i. E-mail:
      ii. Telephone:
   d. Confirmation of commitment to attend all relevant partnership meetings for a period of three years, preferably in person, but online if necessary (tick box and initial) □
   e. Percentage of staff time devoted to the partnership (minimum 10%): ___%

4. Agreement on core intended development outcomes of the partnership (to be confirmed after participation in planning workshops).

   Summary of intended development outcomes (agreed by all partners):

   Confirmed agreement with these outcomes (tick box and initial) □

5. Main interests in belonging to the partnership, and what benefits your organization or company seeks to gain from the partnership

   a. –
   b. –
   c. –
   d. –
   e. –
   f. –
   g. –
   h. –
   i. –
   j. –

6. Resources (financial, in kind, physical…) that your organization or company is willing to contribute and commit to the initiative. These can be broadly offered initially, but need to be defined precisely once the specific resource requirements of the partnership have been defined through the planning workshop processes (to be updated as required, and should note timing of resource requirements):

   a. –
   b. –
   c. –
   d. –
   e. –
   f. –
   g. –
   h. –
   i. –
   j. –

7. Conflicts of interest: all conflicts of interest, either existing or potential should be listed and discussed with partnership office:

8. Communications: Means through which the organization or company will publicize the work of the partnership:

   a. Mention on organization's/company's website (give details):
   b. Mention in organization's/company's social media (give details):
   c. Press releases (give details):
   d. Other (give details):

We agree to the partnership using organization's/company's logo (digital version and agreement of use attached) (tick box and initial) □

Annex 2A: Model agency-company MoU, aggregation scenario, annexes, user guidelines

Why the Working Group on Partnerships has prepared this model MoU

Government agencies around the world are undertaking initiatives designed to help achieve the UN's Sustainable Development Goals. Partnering with mobile technology companies can greatly facilitate the roll-out of these initiatives. However, it can be difficult and time-consuming to put in place the appropriate legal protections for the parties involved.

In this context, the m-Powering Development Initiative Working Group on Partnerships has prepared model MoUs – including this one – for use by agencies and their chosen mobile technology partners, as a starting point for setting out the legal rights and obligations that will govern their relationship.

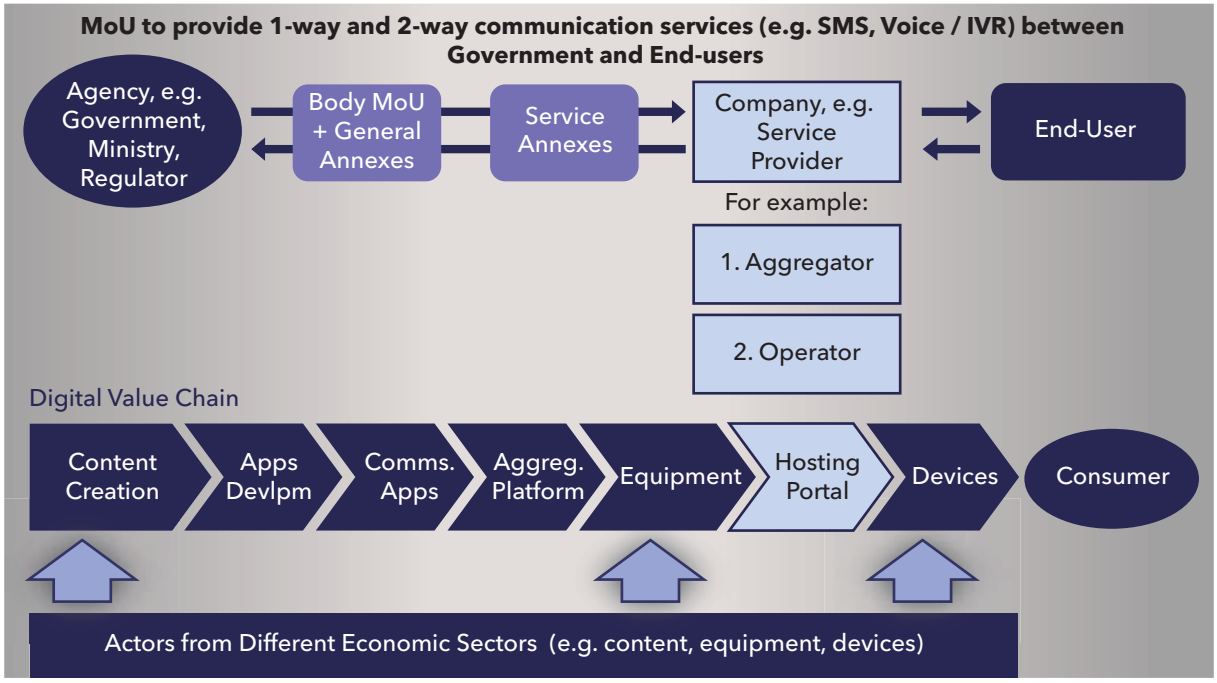
When this MoU should be used

Broadly speaking, a government initiative might require mobile services that enable communication with the public at large (such as an SMS-based stop smoking initiative), or with a select group of professionals working on the agency's behalf (such as health workers sending information from the field to the agency). The first scenario will often involve the agency working with a single company, known as an aggregator that can arrange the necessary technical connections with the country's mobile network operators (the aggregator could itself be one of these operators). The second scenario will often involve the agency working directly with a single mobile network operator.[104]

This model MoU is designed to be used in the first scenario, where the agency wishes to communicate with members of the public regardless of which mobile operator they are associated with.

104 Whichever scenario is involved, the agency may also wish or need to engage with other stakeholders, to ensure the necessary content, equipment or devices are available for the initiative. This model agreement is not designed to be used as a basis for such a relationship.

The parties involved can be visually represented as follows:



What this document contains

The model MoU comprises two main parts: the main body of the MoU and the annexes.

The main body of the MoU provides the legal foundations for the establishment and development of an enduring relationship between the parties. More precisely, it creates a legal relationship on the basis of which the agency can, from time to time, engage the partner company in one or more sustainable development initiatives. It is designed to remain the same whatever the type of services that the partner is charged with providing (e.g. two-way SMS services, USSD services…). This minimizes the need for re-negotiation of rights and obligations each time a new initiative is undertaken.

Annexes A and B set out administrative details on the partnership champions and contract managers that will ensure the collaboration between the parties goes smoothly. Annex C sets out details concerning the data centres in which important data generated during an agency initiative will be stored.

Annexes D onwards concern the services that the aggregator agrees to provide. More precisely, Annex D sets out the template to be followed when the parties wish to add new services to the list of services agreed at the outset, while Annexes E onwards are the individual services themselves. The ITU has provided a range of model annexes that the parties can choose from to suit their own service requirement. These are:

- Annex D: Two-way SMS
- Annex E: One-way SMS
- Annex F: USSD services
- Annex G: IVR services (as part of an incoming call centre system)
- Annex H: IVR services (as part of an automated outgoing call system)

Differences from the model agency-operator MoU

This agency-company template MoU, for aggregation scenarios, is a little longer than the agency-operator template, for non-aggregation scenarios. For example, detailed provisions governing the use and ownership of data generated during the Initiative are required, because the company will be gathering data for use by the agency. There is also reference to "user prices", as there may be occasions on which not just the agency, but also end-users, will be required to pay to use the services being offered.

How to use this document

Government agencies and aggregator partners should see the model MoU as a useful starting point for negotiating the rights and obligations that will govern their relationship. Even if the parties decide not to adopt the model as drafted, talking through its provisions will help ensure that the parties address important legal issues that need to be settled as a base for a successful long-term partnership.

For example, a given service might be considered so important to an agency initiative that they decide a full service-level agreement (SLA) should be agreed on. While that SLA will mean the proposed annex template is redundant, the template will provide a base on which the SLA can be built.

Note that acting in compliance with the document's provisions does not guarantee compliance with relevant applicable laws – e.g. on the use of personal data. Agencies and their partners should seek independent legal advice before entering into a binding legal agreement.

Memorandum of Understanding ("MoU") for the provision of certain telecommunications services (aggregation)

This MoU is made on the _____ day of _____ in the year _____

BETWEEN

(1) [INSERT FULL LEGAL NAME OF GOVERNMENT AGENCY] (the "Agency") and

(2) [INSERT FULL LEGAL NAME OF COMPANY] (the "Company")

Together the "Parties"

PREAMBLE

A The Agency [INSERT DESCRIPTION]

B The Agency is committed to meeting a number of Sustainable Development Goals ("SDGs"). In particular [INSERT DESCRIPTION]

C The Company [INSERT DESCRIPTION]

D The Agency and the Company wish to establish an enduring relationship during which the Agency may:

- from time to time launch initiatives designed to meet one or more SDGs ("Agency Initiatives"); and
- during any given Agency Initiative, request the provision of services by the Company allowing communication with certain telecommunications users.

E Accordingly, the Company is to be appointed under this Agreement to provide telecommunications services intended to help achieve one or more SDGs.

F The main body of this Agreement sets out the relationship between, and the rights and obligations of, the Agency, on the one hand, and the Company, on the other, in relation to the provision of those services.

G The annexes of this Agreement set out, in particular, the telecommunications services to be provided, the performance requirements for such services, and the financial terms of their provision.

SIGNED AS A MoU

Signed for and on behalf of the Agency by: Name: _____

Position: _____

Signature: _____

Signed for and on behalf of the Company by: Name: _____

Position: _____

Signature: _____

Article 1: Definitions

1.1 When used in this MoU, the following terms have the meaning set out below:

Term	Meaning
Memorandum of Understanding	This contract
Agency Charges	The amounts payable by the Agency to the Company for delivery of a Requested Service, as set out in the Annexes to this MoU
End Date	The date on which this MoU ceases to have effect, as set out in Article 2
Expected Standards	The standards that Requested Services must meet, as set out in the Annexes to this MoU
Initiative Data	Data (including meta data) held on the servers of the Agency and/or the Company, generated as a result of communications sent or received during an Agency Initiative
Party	A signatory to this MoU
Payment Timeframe	The list of deadlines by which the Agency must pay the Company the Agency Charges, as set out in the Annexes to this MoU
Performance Indicators	The indicators detailing to what standard the Requested Services are actually being provided, as set out in the Annexes to this MoU
Personal Data	Data (including meta data) held on the servers of the Agency and/or the Company, generated as a result of communications sent or received during an Agency Initiative, and relating to individual Users
Reports	Requested Service performance reports, as referred to Article 4.1
Requested Services	Such of the Available Services that the Agency requests the Company to undertake
Service-Specific Legal Requirements	Legal obligations specific to a given Available Service, as set out in the Annexes to this MoU
Available Services	All the work the Company agrees to undertake if requested by the Agency, as set out in the Annexes to this MoU
Start Date	The date on which this Agreement takes effect, as set out in Article 2
User	A beneficiary of Requested Services, as set out in the Annexes to this MoU
User Prices	The amounts payable, if any, by Users, as set out in the Annexes to this MoU

Article 2: Period of the MoU

Start date and end date

2.1 The MoU starts on _____ (the "Start Date") and ends on _____ or such earlier date as the MoU is lawfully terminated (the "End Date").

Obligations after the end date

2.2 However, the following articles will remain in force after the End Date:

(a) Article 3.5 (handover / wind-down assistance), for a period of [10] business days;

(b) Article 11 (confidential information), for a period of [20] years.

Article 3: Services to be provided by the Company

What services must be provided

3.1 The Company must, upon the launch of an Agency Initiative, provide such of the Available Services as the Agency requests (the "Requested Services").

How the requested services must be provided

3.2 The Company must deliver the Requested Services:

(a) Within the amounts agreed as User Prices, if necessary through arrangements with the relevant network operators;

(b) Within the amounts agreed as Agency Charges, which the Company warrants are below normal commercial rates;

(c) In accordance with the Expected Standards and, more generally, good industry practice;

(d) Where applicable, within the timeframes set out in the Annexes to this MoU;

(e) Where applicable, in coordination with any other company or companies contracted by the Agency to provide goods or services similar or related to the Requested Services, as set out in the Annexes to this Agreement; and

(f) Where applicable, subject to any legal obligations specific to a given Requested Service ("Service-Specific Legal Requirements"), as set out in the Annexes to this Agreement.

Company responsibilities re communications with Users

3.3 The Company will not contact Users in relation to the Requested Services except as specifically authorized by the Agency.

When the Company may engage subcontractors

3.4 The Company must not enter into a contract with any third party to deliver all or any part of the Requested Services without the Agency's prior written approval and, if such approval is given, the Company will remain legally responsible for the delivery of the Requested Services.

Handover / wind-down assistance

3.5 Upon expiry or termination of this Agreement, the Company will, for a period of [10] business days, provide all reasonable assistance and cooperation necessary to facilitate:

(a) A smooth handover of the Requested Services (including any Initiative Data) to the Agency or any person appointed by the Agency; and/or

(b) The orderly winding-down of the Requested Services.

Article 4: Reports to be provided by the Company

Obligation to provide reports

4.1 The Company must, at its own expense, provide the Agency with Requested Service performance reports (the "Reports"), in electronic formats, on a [quarterly] basis, within [15] business days of the end of the relevant period.

Content of reports

4.2 The Reports must describe, for the relevant period:

(a) The performance of the Requested Services, according to the indicators set out in Annex A (the "Performance Indicators");

(b) A description and quantification of the Initiative Data that the Company has in its possession or control; and

(c) The number of User requests for access to Personal Data, within the scope of any Requested Services.

Article 5: Related obligations of the Agency

Agency must consult with company on launch of agency initiatives

5.1 Before launching an Agency Initiative, the Agency must inform the Company of, and provide the Company with a reasonable opportunity to provide feedback on, the possible launch, specifying in particular:

(a) The nature and likely timeframe of the Agency Initiative;

(b) The geographic, demographic, or other area that the Agency Initiative is targeting;

(c) Which of the Available Services are to be provided in the context of the Agency Initiative; and

(d) The specific characteristics of the Available Services required (for example, in the case of an SMS service, whether reverse billing should be available).

5.2 Notwithstanding Articles 3 (Services to be provided by the Company) and 4 (Reports to be provided by the Company) of this Agreement, the Company may decline to participate in a proposed Agency Initiative where that proposed Agency Initiative is manifestly incompatible with the Company's values or unduly puts at risk its good reputation.

Agency responsibilities regarding communications with users

5.3 Where an Agency Initiative is launched, the Agency must ensure that all communications sent to Users:

(a) Avoid material of a violent, pornographic, racist or discriminatory nature, material that could undermine respect for the human person, human dignity or child protection, and material that could incite or encourage the commission of crimes or offences, the use of illicit substances, or acts of suicide or self-harm;

(b) Refrain from promoting goods or services prohibited by law, or in any material way straying from the fundamental objectives of the relevant Agency Initiative;

(c) Are sent only with the consent of the User or, failing that, in compliance with all relevant legislative and regulatory provisions relating to the sending of unsolicited communications. Where applicable, the Agency should also provide the user with the capability to manage inbound communication to his or her device.

Agency must promptly provide information

5.4 The Agency must promptly provide the Company with any information the Company has reasonably requested to enable the delivery of the Requested Services.

Agency must make decisions and give approvals within reasonable timeframes

5.5 The Agency must make decisions and give approvals reasonably required by the Company to enable delivery of the Requested Services, within reasonable timeframes.

Agency not obliged to request services

5.6 The Company acknowledges that the Available Services are to be provided only upon request by the Agency as part of the launch of an Agency Initiative.

5.7 In this context, the Company accepts that, while it is the broad intention of the Agency to launch one or more Agency Initiatives and request Available Services, nothing in this Agreement legally requires the Agency to do so.

Article 6: Payment by the Agency

Agency must pay charges

6.1 The Agency must pay the Company the Agency Charges for the Requested Services according to the Payment Timeframe, once the Company has delivered the Requested Services and invoiced the Agency.

Company must provide valid tax invoices

6.2 However, the Company must provide valid tax invoices for all Agency Charges. The Agency has no obligation to pay any Agency Charges set out in an invoice which is not a valid tax invoice.

Article 7: Urgent situations

7.1 The Parties acknowledge that, during force majeure events of the type described in Article 14.3 that do not materially affect the Company, an Agency Initiative may need to be launched urgently.

7.2 With a view to facilitating the rapid launch of such an Agency Initiative, the Parties agree that, on such occasions, they will immediately and in good faith negotiate to temporarily vary the terms governing the obligations and timeframes applicable to such launch, in a manner proportionate to the urgency of the situation.

Article 8: Smooth partnership

8.1 The Parties acknowledge the importance to the long-term success of the Agreement of establishing, within each Party, a "partnership champion" from within senior management and a "contract manager" from within the team responsible for the delivery of the Requested Services.

8.2 Accordingly, the persons named in Annex A as the "partnership champions" are responsible for championing the Agreement within their organization, including by:

(a) Ensuring staff have the time and resources they need to deliver on their organization's obligations; and

(b) Monitoring their organization's performance of its obligations.

8.3 Similarly, the persons named in Annex A as "contract managers" are responsible for managing the Agreement, including by:

(a) Managing the day-to-day relationship between the Parties;

(b) Acting as first point of contact for any issues that arise; and

(c) Ensuring that a suitable person is available 24 hours a day, 7 days a week, to work with the other Party in the event of an emergency situation.

8.4 The Parties acknowledge the importance of continuity of representation and, as a result, will endeavour to change partnership champions and contract managers as seldom as reasonably possible.

8.5 The Parties acknowledge the importance of active involvement in [face-to-face] meetings and, as a result, agree that:

(a) [Face-to-face] meetings to discuss the Agreement will take place every [quarter]; and

(b) Barring illness or other reasonable excuse:

(i) Contract managers will attend all of these meetings; and

(ii) Partnership champions will attend at least [50%] of these meetings.

Article 9: Initiative data

General principle

9.1 The Parties understand that communications sent or received during an Agency Initiative will generate data (including meta data) held on the servers of the Agency and/or the Company or on server space made available to them by third party providers ("Initiative Data"), as set out in Annex B. For the avoidance of doubt, Initiative Data does not include Personal Data.

Storage of initiative data

9.2 The Company will protect Initiative Data in its possession or under its control by making reasonable security arrangements to prevent unauthorized or accidental access, use, disclosure, copying or destruction.

Access to initiative data

9.3 The Company will provide the Agency with access to any Initiative Data that the Company has in its possession or control, as soon as practicable upon the Agency's written request.

9.4 To the extent it might assist in improving the Requested Services or the provision thereof, the Company will pro-actively and promptly provide to the Agency any analysis it undertakes in relation to any Initiative Data.

Ownership of initiative data

9.5 Any Initiative Data held on the servers of the Agency, or on server space made available to it by third-party providers, is the intellectual property of the Agency.

9.6 Any Initiative Data held on the servers of the Company, or on server space made available to it by third-party providers, is the intellectual property of the Company. However, the Company grants to the Agency a perpetual, non-exclusive, worldwide and royalty-free licence to use such Initiative Data, for any purpose.

Initiative data breaches

9.7 The Company will immediately notify the Agency when the Company becomes aware of a breach of any of its obligations in this Article.

Use of initiative data

9.8 The Company will not use Initiative Data to establish or contribute to a service that competes with an Agency Initiative or otherwise to the detriment of the Agency.

Article 10: Personal data

General principles

10.1 The Parties understand that communications sent or received during an Agency Initiative may generate personal data (including meta data) relating to individual Users held on the servers of the Agency and/or the Company or on server space made available to them by third party providers ("Personal Data"), as set out in Annex B.

10.2 In this context, each Party must strictly comply with all relevant legislative and regulatory provisions relating to the handling of personal data and the protection of privacy.

10.3 In particular, subject to Article 10.4, the Company will only process, use or disclose Personal Data where strictly necessary for the purposes of providing the Requested Services and:

(a) With the prior written consent of the relevant User(s); or

(b) When required by law or an order of a court, but will notify the relevant User(s) as soon as practicable before complying with such law or order.

10.4 The Company will provide Personal Information to the Agency where the Agency advises that it requires such information in order to meet its legal obligations.

Storage of personal data

10.5 The Company will protect Personal Data in its possession or under its control by making reasonable security arrangements to prevent unauthorized or accidental access, use, disclosure, copying or destruction.

Access to personal data

10.6 The Company will provide any User with access to the Personal Data concerning that User that the Company has in its possession or control, as soon as practicable upon the User's written request.

Personal data breaches

10.7 The Company will immediately notify the Agency and the affected User(s) when the Company becomes aware of a breach of any of its obligations in this Article.

10.8 The Company agrees to indemnify the Agency against all actions relating to the Company's breach of its obligations in this Article.

Article 11: Confidential information

11.1 Each Party undertakes not to use the other Party's confidential information, or disclose it to any third person or organization, other than to the extent that such use or disclosure:

(a) Is required by law;

(b) Is authorized by prior written approval of the other Party; or

(c) In the case of the Agency, is necessary to enable the provision of appropriate advice to the government or to the legislature about this Agreement or its performance.

Article 12: Notices/correspondence

Manner of communication

12.1 All notices to a Party related to this Agreement must be delivered by hand or sent by post, courier, fax or e-mail to that Party's address for notices as set out in Annex B.

Identification of sender

12.2 Notices must include the name, title and contact details of the sender and, except in the case of e-mail, be signed.

When notices are deemed to be received

12.3 A notice will be considered to be received:

(a) If delivered by hand or sent by courier, on the date it is delivered;

(b) If sent by domestic post, _____ business days after it was sent;

(c) If sent by international post, _____ business days after it was sent;

(d) If sent by e-mail, _____ business days after it was sent, provided that the sender does not receive any error message relating to the e-mail or any "out of office" or equivalent message relating to the recipient;

(e) If sent by fax, upon the sender receiving a transmission report that it has been successfully sent.

Notices received after [5] pm / [17] H 00

12.4 However, a notice received after [5] pm / [17] H 00 on a given business day will be considered to be received on the next business day.

Article 13: Terminating the MoU

Automatic termination

13.1 This MoU will automatically terminate with immediate effect in the event of the administrative or judicial liquidation, insolvency, dissolution or bankruptcy of either of the Parties.

Termination by mutual consent

13.2 This MoU may be terminated by common consent between the Parties.

Termination by either party

13.3 A Party may, by notice with immediate effect, terminate this MoU if the other Party:

(a) Commits a material breach of its obligations under this MoU which is not capable of being remedied;

(b) Commits a material breach of its obligations under this MoU which is capable of being remedied but which remains unremedied [20] business days after it receives notice from the first Party requesting that the breach be remedied;

(c) Repeatedly fails to comply with its obligations under this MoU whether or not those obligations are minor or material; or

(d) Is unable to deliver the Requested Services, or pay the Agency Charges, in accordance with its obligations for a period of [20] business days or more due to a force majeure event.

Termination by the agency

13.4 The Agency may, by [30] days' notice, terminate this MoU if there is a change of government policy necessitating the termination of the MoU.

Article 14: Force majeure

No fault if failure due to force majeure

14.1 Neither Party will be liable to the other for any failure to perform its obligations under this MoU where the failure is due to a force majeure event.

Nature of a force majeure event

14.2 For the purposes of this MoU a force majeure event is an event that is beyond the reasonable control of the Party affected.

14.3 Force majeure events can include, without limitation, earthquakes, eruptions, floods, storms, fires, acts or war, terrorism, riots, epidemics, and rebellion.

14.4 Force majeure events do not include events that the Party affected could have prevented or overcome by taking reasonable care.

Article 15: General

Agreement to act in good faith

15.1 Both Parties agree:

(a) To act in good faith;

(b) To discuss matters affecting this MoU, including the delivery of the Requested Services or the payment of the Agency Charges, whenever necessary;

(c) To notify one another as soon as possible of any actual or anticipated issues that could significantly impact on the delivery of the Requested Services or the size or payment of the Agency Charges, or that could receive media attention; and

(d) To comply with all applicable laws and regulations.

Variation of the MoU

15.2 This MoU may only be varied by agreement in writing signed by the authorized representatives of both Parties.

Addition of new services

15.3 Given in particular the long-term nature of this MoU, the Parties may from time to time agree to add new services to the Available Services by adding annexes to this MoU, following the template in Annex C. Those new annexes will, when added, form part of this MoU.

15.4 The Parties agree that any request for the addition of new services must be:

(a) Made in good faith; and

(b) Given due consideration by the other Party which, nonetheless and for the avoidance of doubt, retains the right to refuse for any reason.

Entirety of MoU

15.5 This MoU, including any variation, records everything agreed between the Parties relating to the Available Services. It replaces any previous communications, negotiations, arrangements or agreements – whether verbal or in writing – that the Parties had with each other relating to the Available Services before this MoU was signed.

No waiver

15.6 If a Party breaches this MoU and the other Party does not immediately enforce its rights resulting from that breach, the lack of enforcement does not mean that the Party in

breach is released or excused from its obligation, and does not prevent the other Party from exercising its rights resulting from the breach at a later time.

Publicity

15.7 All public statements or disclosures by either Party relating to this MoU, other than those required by law or stock exchange rules, must be agreed between the Parties in writing in advance.

15.8 Article 15.7 does not prevent the Company from making public statements and disclosures relating to operational aspects of the Requested Services.

Article 16: Applicable law and forum

16.1 This Agreement is governed by, and is to be construed in accordance with, the law of _____.

16.2 The courts of _____ have exclusive jurisdiction to decide any legal proceedings brought in relation to this MoU.

Annex A: Partnership champions and contract managers

For the Agency:

Role	Name, position and contact details
Partnership champion	
Contract manager	

For the Company:

Role	Name, position and contact details
Partnership champion	
Contract manager	

Annex B: Data storage locations

Initiative Data and Personal Data will be stored according to the following particulars:

Data centre operator	
Physical address of operator	
Location of data centres where Initiative data and Personal Data will be stored	

Annex C: Party addresses for notices

For the Agency:

Delivery method	Designated address/number
Hand	
Post	
Courier	
Fax	
E-mail	

For the Company:

Delivery method	Designated address/number
Hand	
Post	
Courier	
Fax	
E-mail	

Annex D: Template for additional service annexes

Diagram

[INSERT DIAGRAM OF SERVICE]

Set-up

X.1 The following terms have the meaning set out below:

Term	Meaning

X.2 The Services comprise:

Service component	Requirement

X.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)

X.4 Service-Specific Legal Requirements

Requirement	Description

X.5 The Agency Charges are:

[INSERT AGENCY CHARGES]

X.6 The Payment Timeframe is:

[INSERT PAYMENT TIMEFRAME]

Service

X.7 The following terms have the meaning set out below:

Term	Meaning

X.8 The Services comprise:

Service component	Requirement

X.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

X.10 Service-Specific Legal Requirements

Requirement	Description

X.11 Other contracted parties are:

Name	Address and contact details

X.12 The User Prices are:

[INSERT USER PRICES]

X.13 The Agency Charges are:

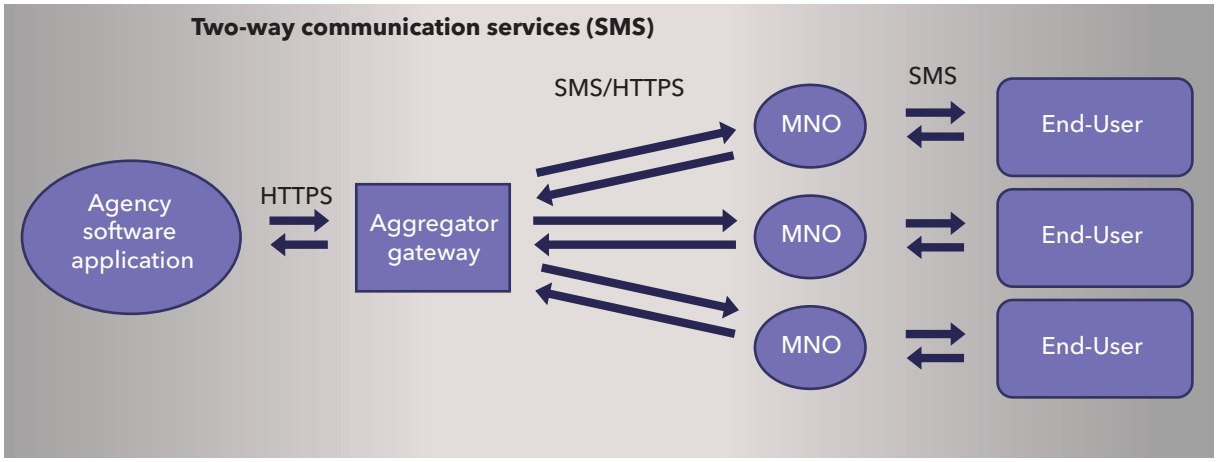
[INSERT AGENCY CHARGES]

X.14 The Payment Timeframe is:

[INSERT PAYMENT TIMEFRAME]

Annex E: Two-way SMS services

Diagram



Set-up

D.1 The following terms have the meaning set out below:

Term	Meaning
User	Any pre-paid or post-paid user of a mobile cellular telecommunications service with whom, for the purposes of an Agency Initiative, the Agency wishes to communicate by use of the Two-Way SMS Services
Agency Platform	The applications, software and/or hardware the Agency uses in connection with the Two-Way SMS Services
Company Platform	The SMS-Centre operated by the Company enabling the routing of SMS to and from the Agency Platform to different mobile cellular networks

D.2 The Two-Way SMS Set-Up Services comprise:

Service component	Requirement
Operator set-up	Within [20] business days of the signature of this Agreement, establish the appropriate technical and contractual relationship with each of the country's mobile cellular network operators to enable the Agency to communicate with any or all Users.
Interface set-up	Within [20] business days of the signature of this Agreement, create an interface solution between the Agency Platform and the Company Platform that will, upon the launch of an Agency Initiative, allow the Agency to communicate with Users.

D.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.5 The Agency Charges are:

Agency Charge for initial set-up following signature

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Establish relationship with operators	0	0	0	[USD]
Create interface solution between platforms	___	___	___	[USD]

D.6 The Payment Timeframe is:

Agency Charge for initial set-up following signature

The Agency Charge for initial set-up following signature of the Agreement will be paid within [20] business days of the issue of the relevant invoice.

Two-way SMS service

D.7 The following terms have the meaning set out below:

Term	Meaning
Dedicated short code number	A number of the format XXX used to access value-added services by SMS
SMS	"Short Message Services", being alphanumeric messages that can be sent and received on a compatible mobile cellular terminal

D.8 The Two-Way SMS Services comprise:

Service component	Requirement
Short code	Within [10] business days of receiving notice of the launch of an Agency Initiative, secure one or more unique, dedicated short code numbers for the Agency's exclusive use during an Agency Initiative. The short code numbers [should]/[should not] have "reverse-billing" capability, to allow Users to send SMS at no charge to themselves.
Interface calibration	Within [10] business days of receiving notice of the launch of an Agency Initiative, ensure that the interface solution has been calibrated to allow SMS communications with the relevant geographic, demographic or other type of User, as specified in the notice of launch.
Outgoing SMS	For the duration of the Agency Initiative, route any relevant outgoing SMS from the Agency Platform to Users through the interface solution.
Incoming SMS	For the duration of the Agency Initiative, route any relevant incoming SMS from Users to the Agency Platform through the interface solution.

D.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)
Availability of Company Platform	[99.90%] of any given month during an Agency Initiative, excluding periods of scheduled maintenance.
Successful delivery of outgoing SMS	Best efforts. In this regard, the Agency acknowledges that the delivery of outgoing SMS to Users depends not just on the Company but also on the relevant cellular mobile network operators.
Successful delivery of incoming SMS	Best efforts. In this regard, the Agency acknowledges that the delivery of outgoing SMS to Users depends not just on the Company but also on the relevant cellular mobile network operators.

D.10 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.11 Other contracted parties are:

Name	Address and contact details

D.12 The User Prices are:

User Price when User is in-country

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of an SMS	0	0	0	[Relevant operator's usual billing currency]
For sending an SMS	[0]	[0]	[0]	[Relevant operator's usual billing currency]

User Price when User is abroad (international roaming)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of an SMS	0	0	0	[Relevant operator's usual billing currency]
For sending an SMS	[Relevant operator's usual price]	[Relevant operator's usual price]	[Relevant operator's usual price]	[Relevant operator's usual billing currency]

D.13 The Agency Charges are:

Agency Charge for set-up for specific Agency Initiative

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Secure short code(s)	___	___	___	[USD]
Interface calibration	___	___	___	[USD]

Agency Charge for routing incoming SMS (SMS-T) from Users

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of incoming SMS	___	___	___	[USD]

Agency Charge for routing outgoing SMS (SMS-O) – to Users of local networks

Number of SMS-O in [calendar month]	Per unit charge	Tax per unit	Total charge per unit	Currency
[1-10,000]	___	___	___	[USD]
[10,001-50,000]	___	___	___	[USD]
[50,001-150,000]	___	___	___	[USD]
[150,001-300,000]	___	___	___	[USD]
[300,001+]	___	___	___	[USD]

The Parties accept that the Agency Charges in the table above apply whether the relevant User receives the outgoing SMS while on his or her own local network, while "national roaming" on another local network, or while "international roaming" on a network in a foreign territory.

Agency Charge for routing outgoing SMS (SMS-O) – to Users of foreign networks

The Parties do not anticipate that SMS will be sent by the Agency to pre-paid or post-paid users of mobile cellular networks established outside _____ [INSERT COUNTRY]. However, in the event that such SMS are sent, the per-unit charge (including tax) will be ___ [USD], irrespective of the destination or the number of SMS sent.

Agency Charge for routing outgoing SMS (SMS-O) – long messages to Users

The Agency may send messages longer than 160 characters to Users. In such cases, the message will be concatenated as multiple SMS, and each SMS in the series will be considered a separate SMS for which the Agency will pay a separate SMS-O charge.

Adjustment of Agency Charge if Expected Standards for availability not met

If the availability of the Company Platform is below the Expected Standards in any given month, the Company will reduce the Agency Charges for that month for the routing of incoming and outgoing SMS according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

D.14 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for set-up for specific Agency Initiative

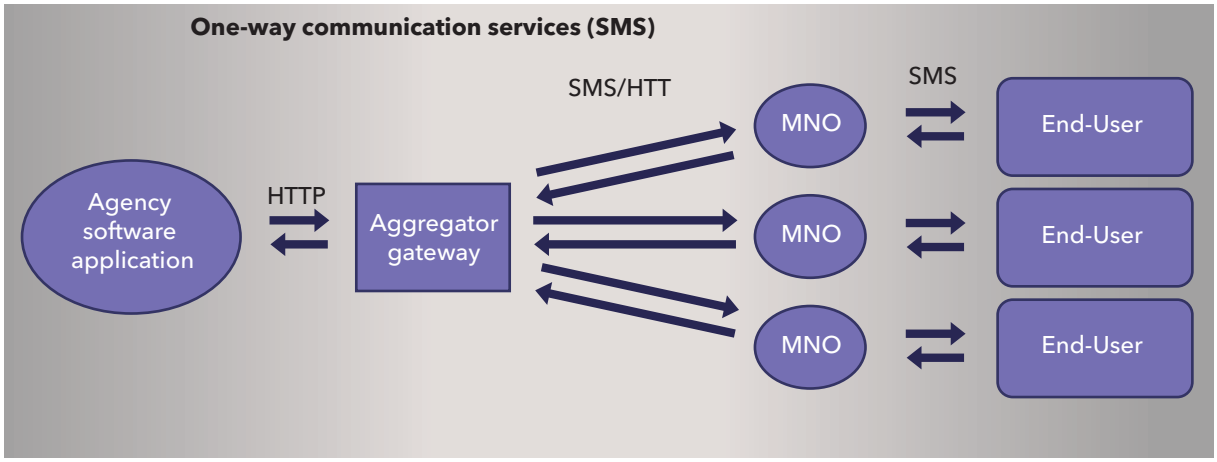
The Agency Charge for set-up following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing incoming SMS (SMS-T) and outgoing SMS (SMS-O)

The Agency Charge for routing SMS will be invoiced on a [quarterly] basis, according to the number of SMS routed. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex F: One-way SMS services

Diagram



Set-up

D.1 The following terms have the meaning set out below:

Term	Meaning
User	Any pre-paid or post-paid user of a mobile cellular telecommunications service with whom, for the purposes of an Agency Initiative, the Agency wishes to communicate by use of the One-Way SMS Services
Agency Platform	The applications, software and/or hardware the Agency uses in connection with the One-Way SMS Services
Company Platform	The SMS-Centre operated by the Company enabling the routing of SMS from the Agency Platform to different mobile cellular networks

D.2 The One-Way SMS Set-Up Services comprise:

Service component	Requirement
Operator set-up	Within [20] business days of the signature of this Agreement, establish the appropriate technical and contractual relationship with each of the country's mobile cellular network operators to enable the Agency to communicate with any or all Users.
Interface set-up	Within [20] business days of the signature of this Agreement, create an interface solution between the Agency Platform and the Company Platform that will, upon the launch of an Agency Initiative, allow the Agency to communicate with Users.

D.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.5 The Agency Charges are:

Agency Charge for initial set-up following signature

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Establish relationship with operators	0	0	0	[USD]
Create interface solution between platforms	___	___	___	[USD]

D.6 The Payment Timeframe is:

Agency Charge for initial set-up following signature

The Agency Charge for initial set-up following signature of the Agreement will be paid within [20] business days of the issue of the relevant invoice.

One-way SMS service

D.7 The following terms have the meaning set out below:

Term	Meaning
Dedicated short code number	A number of the format XXX to be used by the Agency when sending SMS
SMS	"Short Message Services", being alphanumeric messages that can be sent and received on a compatible mobile cellular terminal

D.8 The One-Way SMS Services comprise:

Service component	Requirement
Short code	Within [10] business days of receiving notice of the launch of an Agency Initiative, secure one or more unique, dedicated short code numbers for the Agency's exclusive use during an Agency Initiative.
Interface calibration	Within [10] business days of receiving notice of the launch of an Agency Initiative, ensure that the interface solution has been calibrated to allow SMS communications with the relevant geographic, demographic or other type of User, as specified in the notice of launch.
Outgoing SMS	For the duration of the Agency Initiative, route any relevant outgoing SMS from the Agency Platform to Users through the interface solution.

D.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)
Availability of Company Platform	[99.90%] of any given month during an Agency Initiative, excluding periods of scheduled maintenance.
Successful delivery of outgoing SMS	Best efforts. In this regard, the Agency acknowledges that the delivery of outgoing SMS to Users depends not just on the Company but also on the relevant cellular mobile network operators.

D.10 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.11 Other contracted parties are:

Name	Address and contact details

D.12 The User Prices are:

User Price when User is in-country

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of an SMS	0	0	0	[Relevant operator's usual billing currency]

User Price when User is abroad (international roaming)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of an SMS	0	0	0	[Relevant operator's usual billing currency]

D.13 The Agency Charges are:

Agency Charge for set-up for specific Agency Initiative

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Secure short code(s)	___	___	___	[USD]
Interface calibration	___	___	___	[USD]

Agency Charge for routing outgoing SMS (SMS-O) – to Users of local networks

Number of SMS-O in [calendar month]	Per unit charge	Tax per unit	Total charge per unit	Currency
[1-10,000]	___	___	___	[USD]
[10,001-50,000]	___	___	___	[USD]
[50,001-150,000]	___	___	___	[USD]
[150,001-300,000]	___	___	___	[USD]
[300,001+]	___	___	___	[USD]

The Parties accept that the Agency Charges in the table above apply whether the relevant User receives the outgoing SMS while on his or her own local network, while 'national roaming' on another local network, or while "international roaming" on a network in a foreign territory.

Agency Charge for routing outgoing SMS (SMS-O) – to Users of foreign networks

The Parties do not anticipate that SMS will be sent by the Agency to pre-paid or post-paid users of mobile cellular networks established outside _____ [INSERT COUNTRY]. However, in the event that such SMS are sent, the per-unit charge (including tax) will be ___ [USD], irrespective of the destination or the number of SMS sent.

Agency Charge for routing outgoing SMS (SMS-O) – long messages to Users

The Agency may send messages longer than 160 characters to Users. In such cases, the message will be concatenated as multiple SMS, and each SMS in the series will be considered a separate SMS for which the Agency will pay a separate SMS-O charge.

Adjustment of Agency Charge if Expected Standards for availability not met

If the availability of the Company Platform is below the Expected Standards in any given month, the Company will reduce the Agency Charges for that month for the routing of outgoing SMS according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

D.14 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for set-up for specific Agency Initiative

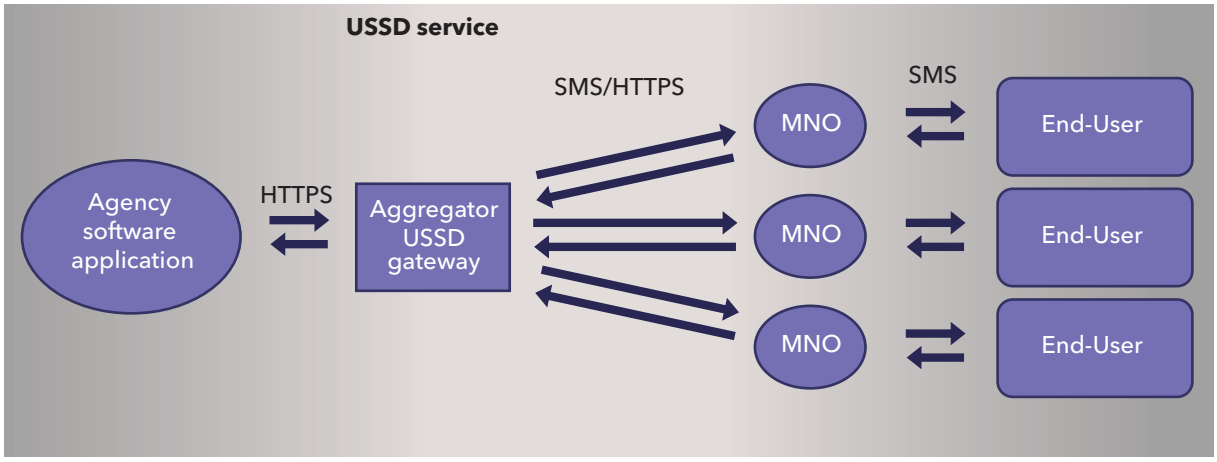
The Agency Charge for set-up following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing outgoing SMS (SMS-O)

The Agency Charge for routing outgoing SMS will be invoiced on a [quarterly] basis, according to the number of SMS routed. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex G: USSD services

Diagram



Set-up

D.1 The following terms have the meaning set out below:

Term	Meaning
User	Any pre-paid or post-paid user of a mobile cellular telecommunications service with whom, for the purposes of an Agency Initiative, the Agency wishes to communicate by use of the USSD Services
Agency Platform	The applications, software and/or hardware the Agency uses in connection with the USSD Services
Company Platform	The USSD gateway operated by the Company enabling the routing of USSD messages between the Agency Platform and different mobile cellular networks

D.2 The USSD Set-Up Services comprise:

Service component	Requirement
Operator set-up	Within [20] business days of the signature of this Agreement, establish the appropriate technical and contractual relationship with each of the country's mobile cellular network operators to enable the Agency to communicate with any or all Users.
Interface set-up	Within [20] business days of the signature of this Agreement, create an interface solution between the Agency Platform and the Company Platform that will, upon the launch of an Agency Initiative, allow the Agency to communicate with Users.

D.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.5 The Agency Charges are:

Agency Charge for initial set-up following signature

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Establish relationship with operators	0	0	0	[USD]
Create interface solution between platforms	___	___	___	[USD]

D.6 The Payment Timeframe is:

Agency Charge for initial set-up following signature

The Agency Charge for initial set-up following signature of the Agreement will be paid within [20] business days of the issue of the relevant invoice.

USSD service

D.7 The following terms have the meaning set out below:

Term	Meaning
Dedicated short code number	A number of the format XXX used to access value-added services by USSD message
USSD	"Unstructured Supplementary Service Data", being a signalling protocol allowing a two-way exchange of data
USSD Pull	The use of USSD to receive messages from Users
USSD Push	The use of USSD to send messages to Users

D.8 The USSD Services comprise:

Service component	Requirement
Short code	Within [10] business days of receiving notice of the launch of an Agency Initiative, secure one or more unique, dedicated short code numbers for the Agency's exclusive use during an Agency Initiative. The short code numbers [should]/[should not] have "reverse-billing" capability, to allow Users to send USSD messages at no charge to themselves.
Interface calibration	Within [10] business days of receiving notice of the launch of an Agency Initiative, ensure that the interface solution has been calibrated to allow USSD communications with the relevant geographic, demographic or other type of User, as specified in the notice of launch.
USSD Pull	For the duration of the Agency Initiative, route any relevant outgoing USSD messages from the Agency Platform to Users through the interface solution.
USSD Push	For the duration of the Agency Initiative, route any relevant incoming USSD messages from Users to the Agency Platform through the interface solution.

D.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)
Availability of Company Platform	[99.90%] of any given month during an Agency Initiative, excluding periods of scheduled maintenance.
Successful routing of USSD Push messages	Best efforts. In this regard, the Agency acknowledges that the delivery of outgoing USSD to Users depends not just on the Company but also on the relevant cellular mobile network operators.
Successful routing of USSD Pull messages	Best efforts. In this regard, the Agency acknowledges that the delivery of outgoing USSD to Users depends not just on the Company but also on the relevant cellular mobile network operators.

D.10 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.11 Other contracted parties are:

Name	Address and contact details

D.12 The User Prices are:

User Price when User is in-country

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of a USSD message	0	0	0	[Relevant operator's usual billing currency]
For sending a USSD message	[0]	[0]	[0]	[Relevant operator's usual billing currency]

User Price when User is abroad (international roaming)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
For receipt of a USSD message	0	0	0	[Relevant operator's usual billing currency]
For sending a USSD message	[Relevant operator's usual price]	[Relevant operator's usual price]	[Relevant operator's usual price]	[Relevant operator's usual billing currency]

D.13 The Agency Charges are:

Agency Charge for set-up for specific Agency Initiative

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Secure short code(s)	___	___	___	[USD]
Interface calibration	___	___	___	[USD]

Agency Charge for routing incoming USSD (USSD-T) from Users

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of USSD Pull messages	___	___	___	[USD]

Agency Charge for routing outgoing USSD (USSD-O) – to Users of local networks

Number of USSD-O in [calendar month]	Per unit charge	Tax per unit	Total charge per unit	Currency
[1-10,000]	___	___	___	[USD]
[10,001-50,000]	___	___	___	[USD]
[50,001-150,000]	___	___	___	[USD]
[150,001-300,000]	___	___	___	[USD]
[300,001+]	___	___	___	[USD]

The Parties accept that the Agency Charges in the table above apply whether the relevant User receives the USSD Push message while on his or her own local network, while "national roaming" on another local network, or while "international roaming" on a network in a foreign territory.

Agency Charge for routing outgoing USSD (USSD-O) – to Users of foreign networks

The Parties do not anticipate that USSD messages will be sent by the Agency to pre-paid or post-paid users of mobile cellular networks established outside _____ [INSERT COUNTRY]. However, in the event that such USSD Push messages are sent, the per-unit charge (including tax) will be ___ [USD], irrespective of the destination or the number of USSD Push messages sent.

Adjustment of Agency Charge if Expected Standards for availability not met

If the availability of the Company Platform is below the Expected Standards in any given month, the Company will reduce the Agency Charges for that month for the routing of USSD Pull and USSD Push according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

D.14 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for set-up for specific Agency Initiative

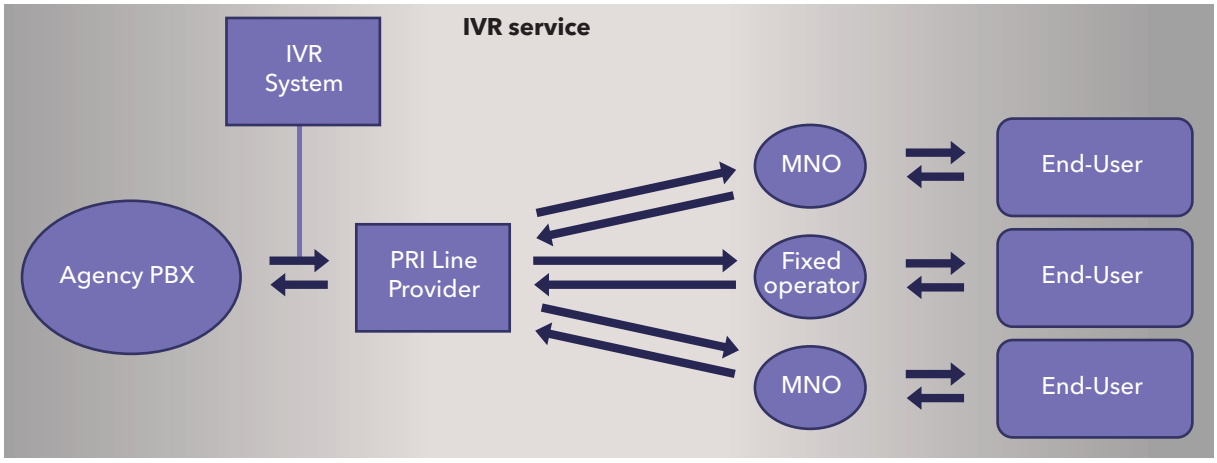
The Agency Charge for set-up following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing USSD Pull (USSD-T) and USSD Push (USSD-O)

The Agency Charge for routing USSD messages will be invoiced on a [quarterly] basis, according to the number of USSD messages routed. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex H: IVR services (as part of incoming call centre)

Diagram



Set-up

D.1 The following terms have the meaning set out below:

Term	Meaning
User	Any pre-paid or post-paid user of a mobile cellular or fixed telecommunications service with whom, for the purposes of an Agency Initiative, the Agency wishes to communicate, through an incoming call made to the Agency by the User
Agency Platform	The applications, software and/or hardware the Agency uses in connection with the IVR Services
Company Platform	The IVR platform operated by the Company enabling the provision of the IVR Services

D.2 The IVR Set-Up Services comprise:

Service component	Requirement
Platform set-up	Within [20] business days of the signature of this Agreement, put in place the Company Platform and ensure its availability for potential Agency Initiatives

D.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.
Agency to arrange PRI line	To establish a call centre, the Agency may also have to contract with a fixed-line telecommunications provider for the provision to the Agency of a "Primary Rate Interface" line, being an end-to-end digital circuit that enables traditional fixed lines to carry voice, data and video traffic, providing up to thirty 64 kbit/s channels on a single access connection.

D.5 The Agency Charges are:

Agency Charge for initial set-up following signature

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Platform set-up	___	___	___	[USD]

D.6 The Payment Timeframe is:

Agency Charge for initial set-up following signature

The Agency Charge for initial set-up following signature of the Agreement will be paid within [20] business days of the issue of the relevant invoice.

IVR service

D.7 The following terms have the meaning set out below:

Term	Meaning
IVR	"Interactive Voice Response", being an application enabling Users to navigate a menu of options, through the recognition of keys pressed [and words spoken], so that they can hear associated audio content.

D.8 The IVR Services comprise:

Service component	Requirement
Content development	Within [20] days of the launch of an Agency Initiative, in collaboration with the Agency, develop the structure and content of the menu that Users will navigate when calling the Agency
IVR launch	Within [30] days of the launch of an Agency Initiative, make the IVR system developed with the Agency available for use

Call direction	For the duration of any Agency Initiative, ensure Users navigating the IVR system are directed to appropriate content by their choice of dialling keys [and their spoken choices]
Voice response	For the duration of any Agency Initiative, ensure appropriate audio content is played to Users

D.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)
Availability of Company Platform	[99.90%] of any given month during an Agency Initiative, excluding periods of scheduled maintenance.
Successful call direction	[Specify as appropriate]
Successful voice response	[Specify as appropriate]

D.10 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.11 Other contracted parties are:

Name	Address and contact details

D.12 The User Prices are:

There are no User Prices generated as a result of the use of the IVR system.

D.13 The Agency Charges are:

Agency Charges for initial set-up following signature

Item	Fee	Tax	Total charge	Currency
Initial set-up	___	___	___	[USD]

Agency Charges for IVR services

Item	Fee	Tax	Total charge	Currency
Content development	___	___	___	[USD]
IVR launch	___	___	___	[USD]
Call direction and voice response	___	___	___	[USD]

Adjustment of Agency Charge if Expected Standards for availability not met

If the availability of the Company Platform is below the Expected Standards in any given month, the Company will reduce the Agency Charges for that month for the routing of IVR Pull and IVR Push according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

D.14 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for set-up for specific Agency Initiative

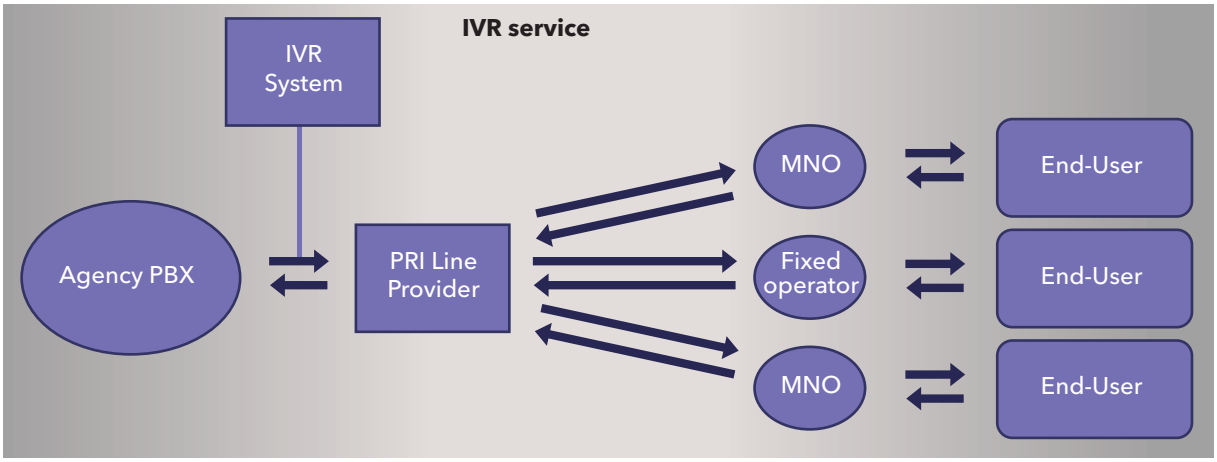
The Agency Charge for set-up following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing IVR Pull (IVR-T) and IVR Push (IVR-O)

The Agency Charge for routing IVR traffic will be invoiced on a [quarterly] basis, according to the number of IVR traffic routed. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex I: IVR services (as part of automated outgoing calling system)

Diagram



Set-up

D.1 The following terms have the meaning set out below:

Term	Meaning
User	Any pre-paid or post-paid user of a mobile cellular service with whom, for the purposes of an Agency Initiative, the Agency wishes to communicate, through an automated outgoing call made to the User by the Agency
Agency Platform	The applications, software and/or hardware the Agency uses in connection with the IVR Services
Company Platform	The IVR platform operated by the Company enabling the provision of the IVR Services

D.2 The IVR Set-Up Services comprise:

Service component	Requirement
Platform set-up	Within [20] business days of the signature of this Agreement, put in place the Company Platform and ensure its availability for potential Agency Initiatives

D.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.
Agency to arrange PRI line	To operate an automated outgoing calling system, the Agency may also have to contract with a fixed-line telecommunications provider for the provision to the Agency of a "Primary Rate Interface" line, being an end-to-end digital circuit that enables traditional fixed lines to carry voice, data and video traffic, providing up to thirty 64 kbit/s channels on a single access connection.

D.5 The Agency Charges are:

Agency Charge for initial set-up following signature

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Platform set-up	___	___	___	[USD]

D.6 The Payment Timeframe is:

Agency Charge for initial set-up following signature

The Agency Charge for initial set-up following signature of the Agreement will be paid within [20] business days of the issue of the relevant invoice.

IVR service

D.7 The following terms have the meaning set out below:

Term	Meaning
IVR	"Interactive Voice Response", being an application enabling Users to navigate a menu of options, through the recognition of keys pressed [and words spoken], so that they can hear associated audio content.

D.8 The IVR Services comprise:

Service component	Requirement
Content development	Within [20] days of the launch of an Agency Initiative, in collaboration with the Agency, develop the structure and content of the menu that Users will navigate when calling the Agency or when receiving an automated call from the Agency
IVR launch	Within [30] days of the launch of an Agency Initiative, make the IVR system developed with the Agency available for use

Outgoing calls	For the duration of any Agency Initiative, make such outgoing calls to Users as requested by the Agency, to deliver the content developed with the Agency
Call direction	For the duration of any Agency Initiative, ensure Users navigating the IVR system are directed to appropriate content by their choice of dialling keys [and their spoken choices]
Voice response	For the duration of any Agency Initiative, ensure appropriate audio content is played to Users

D.9 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard (if applicable)
Availability of Company Platform	[99.90%] of any given month during an Agency Initiative, excluding periods of scheduled maintenance.
Outgoing calls	[Specify as appropriate]
Successful call direction	[Specify as appropriate]
Successful voice response	[Specify as appropriate]

D.10 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Company agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Company Platform that is to take place during the term of this Agreement.

D.11 Other contracted parties are:

Name	Address and contact details

D.12 The User Prices are:

[Specify as appropriate]

D.13 The Agency Charges are:

Agency Charges for initial set-up following signature

Item	Fee	Tax	Total charge	Currency
Initial set-up	___	___	___	[USD]

Agency Charges for outgoing calls

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of Outgoing Call	___	___	___	[Relevant operator's usual billing currency]

Agency Charges for IVR services

Item	Fee	Tax	Total charge	Currency
Content development	___	___	___	[USD]
IVR launch	___	___	___	[USD]

Call direction and voice response	___	___	___	[USD]

Adjustment of Agency Charge if Expected Standards for availability not met

If the availability of the Company Platform is below the Expected Standards in any given month, the Company will reduce the Agency Charges for that month for the routing of outgoing calls according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

D.14 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for set-up for specific Agency Initiative

The Agency Charge for set-up following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing IVR Pull (IVR-T) and IVR Push (IVR-O)

The Agency Charge for routing IVR traffic will be invoiced on a [quarterly] basis, according to the number of IVR traffic routed. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex 2B: Model agency-operator MoU, non-aggregation scenario, annexes, user guidelines

Why the Working Group on Partnerships has prepared this model MoU

Government agencies around the world are undertaking initiatives designed to help achieve the UN's Sustainable Development Goals. Partnering with mobile technology companies can greatly facilitate the roll-out of these initiatives. However, it can be difficult and time-consuming to put in place the appropriate legal protections for the parties involved.

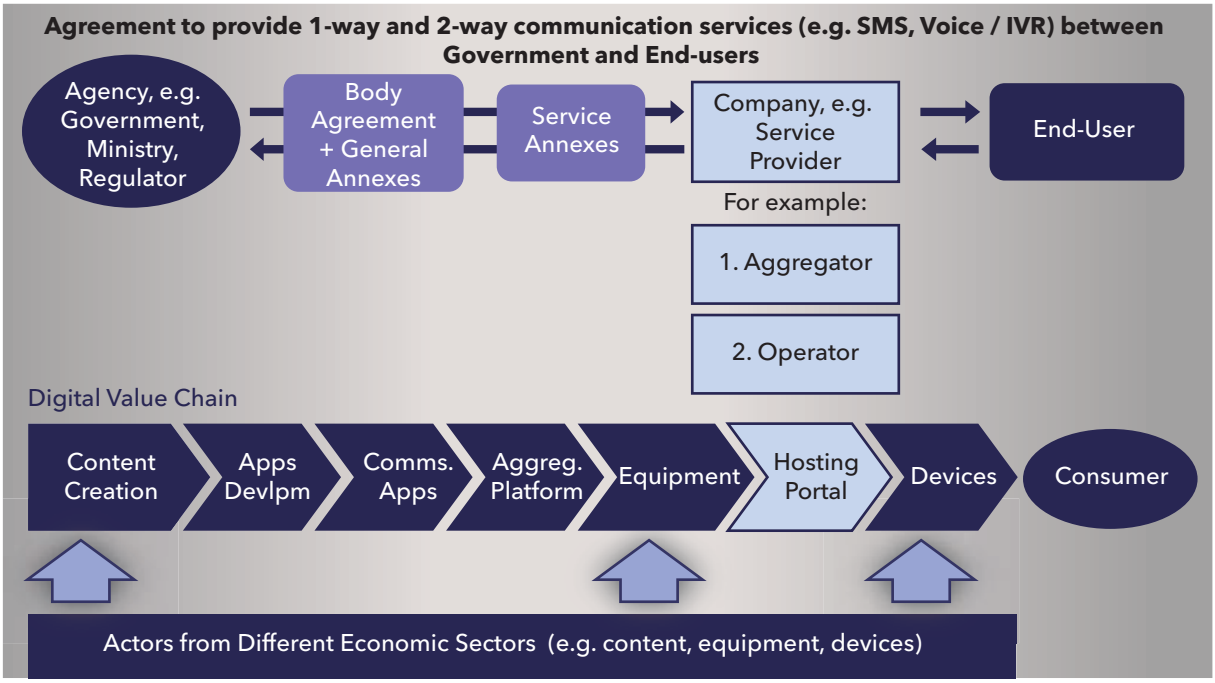
In this context, the ITU with the m-Powering Initiative's Working Group on Partnerships have prepared model agreements – including this one – for use by agencies and their chosen mobile technology partners, as a starting point for setting out the legal rights and obligations that will govern their relationship.

When this agreement should be used

Broadly speaking, a government initiative might require mobile services that enable communication with the public at large (such as an SMS-based stop smoking initiative), or with a select group of professionals working on the agency's behalf (such as health workers sending information from the field to the agency). The first scenario will often involve the agency working with a single company, known as an aggregator that can arrange the necessary technical connections with the country's mobile network operators (the aggregator could itself be one of these operators). The second scenario will often involve the agency working directly with a single mobile network operator.[105]

This model agreement is designed to be used in the second scenario, where the agency wishes to communicate with a select group of professionals working on the agency's behalf.

The parties involved can be visually represented as follows:



What this document contains

The model agreement comprises two main parts: the main body of the agreement and the annexes.

The main body of the agreement provides the legal foundations for the establishment and development of an enduring relationship between the parties. More precisely, it creates a legal relationship on the basis of which the agency can, from time to time, engage the partner company in one or more sustainable development initiatives. It is designed to remain the same whatever the type of services the partner is charged with providing (e.g. voice communication,

105 Whichever scenario is involved, the agency may also wish or need to engage with other stakeholders to ensure the necessary content, equipment or devices are available for the initiative. This model agreement is not designed to be used as a basis for such a relationship.

SMS communication…). This minimizes the need for re-negotiation of rights and obligations each time a new initiative is undertaken.

Annexes A and B set out administrative details on the partnership champions and contract managers who will ensure the collaboration between the parties goes smoothly.

Annexes C onwards concern the services that the operator agrees to provide. More precisely, Annex C sets out the template to be followed when the parties wish to add new services to the list of services agreed at the outset, while Annexes D onwards are the individual services themselves. The ITU has provided two model annexes that the parties can choose from to suit their own service requirement. These are:

- Annex D: Voice and SMS – including the option of closed user group pricing
- Annex E: Data – including the option of closed user group pricing

Differences from the model agency-company agreement

This agency-operator template agreement, for non-aggregation scenarios, is a little shorter than the agency-company template, for aggregation scenarios. For example, detailed provisions governing the use and ownership of data generated during the initiative are not required, because the operator providing the telecommunication services is not gathering data for use by the agency. There is also no reference to "user prices", as it will typically be the agency paying for the services, rather than the individuals using the telecommunications service in the field.

How to use this document

Government agencies and non-aggregator partners (i.e. operators) should see the model agreement as a useful starting point for negotiating the rights and obligations that will govern their relationship. Even if the parties decide not to adopt the model as drafted, talking through its provisions will help ensure that the parties address important legal issues that need to be settled as a base for a successful long-term partnership.

For example, a given service might be considered so complex and so important that they decide a full service-level agreement (SLA) should be agreed on. While that SLA will mean the proposed annex template is redundant, the template will provide a base on which the SLA can be built.

Note that acting in compliance with the document's provisions does not guarantee compliance with relevant applicable laws – e.g. on the use of personal data. Agencies and their partners should seek independent legal advice before entering into a binding legal agreement.

Agreement for the provision of certain telecommunications services (non-aggregation)

This Agreement is made on the _____ day of _____ in the year _____

BETWEEN

(1) [INSERT FULL LEGAL NAME OF GOVERNMENT AGENCY] (the "Agency") and

(2) [INSERT FULL LEGAL NAME OF TELECOMMUNICATIONS OPERATOR] (the "Operator")

Together the "Parties"

PREAMBLE

A The Agency [INSERT DESCRIPTION]

B The Agency is committed to meeting a number of Sustainable Development Goals ("SDGs"). In particular [INSERT DESCRIPTION]

C The Operator [INSERT DESCRIPTION]

D The Agency and the Operator wish to establish an enduring relationship during which the Agency may:

- From time to time launch initiatives designed to meet one or more SDGs ("Agency Initiatives"); and
- During any given Agency Initiative, request the provision of services by the Operator allowing communication with and between certain telecommunications users.

E Accordingly, the Operator is to be appointed under this Agreement to provide telecommunications services intended to help achieve one or more SDGs.

F The main body of this Agreement sets out the relationship between, and the rights and obligations of, the Agency, on the one hand, and the Operator, on the other, in relation to the provision of those services.

G The annexes of this Agreement set out, in particular, the telecommunications services to be provided, the performance requirements for such services, and the financial terms of their provision.

SIGNED AS AN AGREEMENT

Signed for and on behalf of the Agency by: Name: _____

Position: _____

Signature: _____

Signed for and on behalf of the Operator by: Name: _____

Position: _____

Signature: _____

Article 1: Definitions

1.1 When used in this Agreement, the following terms have the meaning set out below:

Term	Meaning
Agreement	This contract
Agency Charges	The amounts payable by the Agency to the Operator for delivery of a Requested Service, as set out in the Annexes to this Agreement
End Date	The date on which this Agreement ceases to have effect, as set out in Article 2
Expected Standards	The standards that Requested Services must meet, as set out in the Annexes to this Agreement
Party	A signatory to this Agreement
Payment Timeframe	The list of deadlines by which the Agency must pay the Operator the Agency Charges, as set out in the Annexes to this Agreement
Performance Indicators	The indicators detailing to what standard the Requested Services are actually being provided, as set out in the Annexes to this Agreement
Reports	Requested Service performance reports, as referred to Article 4.1
Requested Services	Such of the Available Services that the Agency requests the Operator to undertake
Service-Specific Legal Requirements	Legal obligations specific to a given Available Service, as set out in the Annexes to this Agreement
Available Services	All the work the Operator agrees to undertake if requested by the Agency, as set out in the Annexes to this Agreement
Start Date	The date on which this Agreement takes effect, as set out in Article 2

Article 2: Period of the MoU

Start date and end date

2.1 The MoU starts on _____ (the "Start Date") and ends on _____ or such earlier date as the MoU is lawfully terminated (the "End Date").

Obligations after the end date

2.2 However, the following articles will remain in force after the End Date:

(a) Article 3.4 (handover / wind-down assistance), for a period of [10] business days; and

(b) Article 9 (confidential information), for a period of [20] years.

Article 3: Services to be provided by the operator

What services must be provided

3.1 The Operator must, upon the launch of an Agency Initiative, provide such of the Available Services as the Agency requests (the "Requested Services").

How the requested services must be provided

3.2 The Operator must deliver the Requested Services:

(a) Within the amounts agreed as Agency Charges, which the Operator warrants are below normal commercial rates;

(b) In accordance with the Expected Standards and, more generally, good industry practice;

(c) Where applicable, within the timeframes set out in the Annexes to this Agreement;

(d) Where applicable, in coordination with any other company or companies contracted by the Agency to provide goods or services similar or related to the Requested Services, as set out in the Annexes to this Agreement; and

(e) Where applicable, subject to any legal obligations specific to a given Requested Service ("Service-Specific Legal Requirements"), as set out in the Annexes to this Agreement.

When the operator may engage subcontractors

3.3 The Operator must not enter into a contract with any third party to deliver all or any part of the Requested Services without the Agency's prior written approval and, if such approval is given, the Operator will remain legally responsible for the delivery of the Requested Services.

Handover / wind-down assistance

3.4 Upon expiry or termination of this Agreement, the Operator will, for a period of [10] business days, provide all reasonable assistance and cooperation necessary to facilitate:

(a) A smooth handover of the Requested Services (including any Initiative Data) to the Agency or any person appointed by the Agency; and/or

(b) The orderly winding-down of the Requested Services.

Article 4: Reports to be provided by the operator

Obligation to provide reports

4.1 The Operator must, at its own expense, provide the Agency with Requested Service performance reports (the "Reports"), in electronic formats, on a [quarterly] basis, within [15] business days of the end of the relevant period.

Content of reports

4.2 The Reports must describe, for the relevant period, the performance of the Requested Services, according to the indicators set out in Annex A (the "Performance Indicators").

Article 5: Related obligations of the agency

Agency must consult with operator on launch of agency initiatives

5.1 Before launching an Agency Initiative, the Agency must inform the Operator of, and provide the Operator with a reasonable opportunity to provide feedback on, the possible launch, specifying in particular:

(a) The nature and likely timeframe of the Agency Initiative;

(b) Which of the Available Services are to be provided in the context of the Agency Initiative; and

(c) The specific characteristics of the Available Services required.

5.2 Notwithstanding Articles 3 (Services to be provided by the Operator) and 4 (Reports to be provided by the Operator) of this Agreement, the Operator may decline to participate in a proposed Agency Initiative where that proposed Agency Initiative is manifestly incompatible with the Operator's values or unduly puts at risk its good reputation.

Agency must promptly provide information

5.3 The Agency must promptly provide the Operator with any information the Operator has reasonably requested to enable the delivery of the Requested Services.

Agency must make decisions and give approvals within reasonable timeframes

5.4 The Agency must make decisions and give approvals reasonably required by the Operator to enable delivery of the Requested Services, within reasonable timeframes.

Agency not obliged to request services

5.5 The Operator acknowledges that the Available Services are to be provided only upon request by the Agency as part of the launch of an Agency Initiative.

5.6 In this context, the Operator accepts that, while it is the broad intention of the Agency to launch one or more Agency Initiatives and request Available Services, nothing in this Agreement legally requires the Agency to do so.

Article 6: Payment by the agency

Agency must pay charges

6.1 The Agency must pay the Operator the Agency Charges for the Requested Services according to the Payment Timeframe, once the Operator has delivered the Requested Services and invoiced the Agency.

Operator must provide valid tax invoices

6.2 However, the Operator must provide valid tax invoices for all Agency Charges. The Agency has no obligation to pay any Agency Charges set out in an invoice which is not a valid tax invoice.

Article 7: Urgent situations

7.1 The Parties acknowledge that, during force majeure events of the type described in Article 12.3 that do not materially affect the Operator, an Agency Initiative may need to be launched urgently.

7.2 With a view to facilitating the rapid launch of such an Agency Initiative, the Parties agree that, on such occasions, they will immediately and in good faith negotiate to temporarily vary the terms governing the obligations and timeframes applicable to such launch, in a manner proportionate to the urgency of the situation.

Article 8: Smooth partnership

8.1 The Parties acknowledge the importance to the long-term success of the Agreement of establishing, within each Party, a "partnership champion" from within senior management and a "contract manager" from within the team responsible for the delivery of the Requested Services.

8.2 Accordingly, the persons named in Annex A as the "partnership champions" are responsible for championing the Agreement within their organization, including by:

(a) Ensuring staff have the time and resources they need to deliver on their organization's obligations; and

(b) Monitoring their organization's performance of its obligations.

8.3 Similarly, the persons named in Annex A as "contract managers" are responsible for managing the MoU, including by:

(a) Managing the day-to-day relationship between the Parties;

(b) Acting as first point of contact for any issues that arise; and

(c) Ensuring that a suitable person is available 24 hours a day, 7 days a week, to work with the other Party in the event of an emergency situation.

8.4 The Parties acknowledge the importance of continuity of representation and, as a result, will endeavour to change partnership champions and contract managers as seldom as reasonably possible.

8.5 The Parties acknowledge the importance of active involvement in [face-to-face] meetings and, as a result, agree that:

(a) [Face-to-face] meetings to discuss the Agreement will take place every [quarter]; and

(b) Barring illness or other reasonable excuse:

(i) Contract managers will attend all of these meetings; and

(ii) Partnership champions will attend at least [50%] of these meetings.

Article 9: Confidential information

9.1 Each Party undertakes not to use the other Party's confidential information, or disclose it to any third person or organization, other than to the extent that such use or disclosure:

(a) Is required by law;

(b) Is authorized by prior written approval of the other Party; or

(c) In the case of the Agency, is necessary to enable the provision of appropriate advice to the government or to the legislature about this Agreement or its performance.

Article 10: Notices/correspondence

Manner of communication

10.1 All notices to a Party related to this Agreement must be delivered by hand or sent by post, courier, fax or e-mail to that Party's address for notices as set out in Annex B.

Identification of sender

10.2 Notices must include the name, title and contact details of the sender and, except in the case of e-mail, be signed.

When notices are deemed to be received

10.3 A notice will be considered to be received:

(a) If delivered by hand or sent by courier, on the date it is delivered;

(b) If sent by domestic post, _____ business days after it was sent;

(c) If sent by international post, _____ business days after it was sent;

(d) If sent by e-mail, _____ business days after it was sent, provided that the sender does not receive any error message relating to the e-mail or any "out of office" or equivalent message relating to the recipient;

(e) If sent by fax, upon the sender receiving a transmission report that it has been successfully sent.

Notices received after [5] pm / [17] H 00

10.4 However, a notice received after [5] pm / [17] H 00 on a given business day in the recipient's time zone will be considered to be received on the next business day.

Article 11: Terminating the MoU

Automatic termination

11.1 This MoU will automatically terminate with immediate effect in the event of the administrative or judicial liquidation, insolvency, dissolution or bankruptcy of either of the Parties.

Termination by mutual consent

11.2 This MoU may be terminated by common consent between the Parties.

Termination by either party

11.3 A Party may, by notice with immediate effect, terminate this MoU if the other Party:

(a) Commits a material breach of its obligations under this MoU which is not capable of being remedied;

(b) Commits a material breach of its obligations under this MoU which is capable of being remedied but which remains unremedied [20] business days after it receives notice from the first Party requesting that the breach be remedied;

(c) Repeatedly fails to comply with its obligations under this MoU whether or not those obligations are minor or material; or

(d) Is unable to deliver the Requested Services, or pay the Agency Charges, in accordance with its obligations for a period of [20] business days or more due to a force majeure event.

Termination by the agency

11.4 The Agency may, by [30] days' notice, terminate this MoU if there is a change of government policy necessitating the termination of the MoU.

Article 12: Force majeure

No fault if failure due to force majeure

12.1 Neither Party will be liable to the other for any failure to perform its obligations under this MoU where the failure is due to a force majeure event.

Nature of a force majeure event

12.2 For the purposes of this MoU, a force majeure event is an event that is beyond the reasonable control of the Party affected.

12.3 Force majeure events can include, without limitation, earthquakes, eruptions, floods, storms, fires, acts or war, terrorism, riots, epidemics, and rebellion.

12.4 Force majeure events do not include events that the Party affected could have prevented or overcome by taking reasonable care.

Article 13: General

Agreement to act in good faith

13.1 Both Parties agree:

(a) To act in good faith;

(b) To discuss matters affecting this Agreement, including the delivery of the Requested Services or the payment of the Agency Charges, whenever necessary;

(c) To notify one another as soon as possible of any actual or anticipated issues that could significantly impact on the delivery of the Requested Services or the size or payment of the Agency Charges, or that could receive media attention; and

(d) To comply with all applicable laws and regulations, including those relating to personal data.

Variation of the MoU

13.2 This MoU may only be varied by agreement in writing signed by the authorized representatives of both Parties.

Addition of new services

13.3 Given in particular the long-term nature of this MoU, the Parties may from time to time agree to add new services to the Available Services by adding annexes to this Agreement, following the template in Annex C. Those new annexes will, when added, form part of this Agreement.

13.4 The Parties agree that any request for the addition of new services must be:

(a) Made in good faith; and

(b) Given due consideration by the other Party which, nonetheless and for the avoidance of doubt, retains the right to refuse for any reason.

Entirety of MoU

13.5 This MoU, including any variation, records everything agreed between the Parties relating to the Available Services. It replaces any previous communications, negotiations, arrangements or agreements – whether verbal or in writing – that the Parties had with each other relating to the Available Services before this Agreement was signed.

No waiver

13.6 If a Party breaches this MoU and the other Party does not immediately enforce its rights resulting from that breach, the lack of enforcement does not mean that the Party in breach is released or excused from its obligation, and does not prevent the other Party from exercising its rights resulting from the breach at a later time.

Publicity

13.7 All public statements or disclosures by either Party relating to this Agreement, other than those required by law or stock exchange rules, must be agreed between the Parties in writing in advance.

13.8 Article 13.7 does not prevent the Operator from making public statements and disclosures relating to operational aspects of the Requested Services.

Article 14: Applicable law and forum

14.1 This MoU is governed by, and is to be construed in accordance with, the law of _____.

14.2 The courts of _____ have exclusive jurisdiction to decide any legal proceedings brought in relation to this MoU.

Annex A: Partnership champions and contract managers

For the Agency:

Role	Name, position and contact details
Partnership champion	
Contract manager	

For the Operator:

Role	Name, position and contact details
Partnership champion	
Contract manager	

Annex B: Party addresses for notices

For the Agency:

Delivery method	Designated address/number
Hand	
Post	
Courier	
Fax	
E-mail	

For the Operator:

Delivery method	Designated address/number
Hand	
Post	
Courier	
Fax	
E-mail	

Annex C: Template for additional service annexes

Diagram

[INSERT DIAGRAM OF SERVICE]

Service

X.1 The following terms have the meaning set out below:

Term	Meaning

X.2 The Services comprise:

Service component	Requirement

X.3 The Performance Indicators and associated Expected Standards are:

Performance Indicator	Expected Standard

X.4 Service-Specific Legal Requirements

Requirement	Description

X.5 Other contracted parties are:

Name	Address and contact details

X.6 The Agency Charges are:

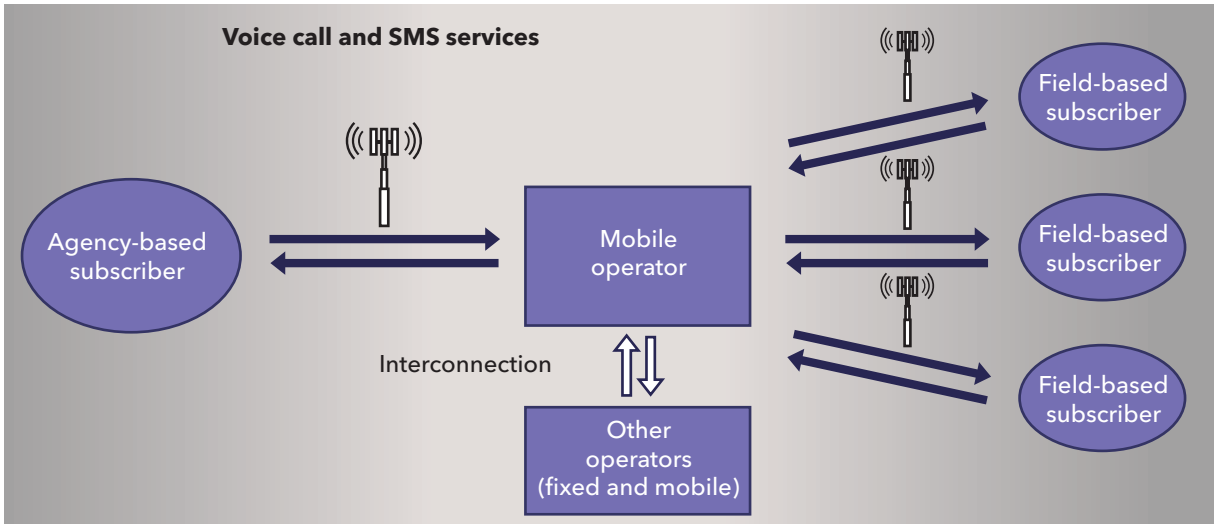
[INSERT AGENCY CHARGES]

X.7 The Payment Timeframe is:

[INSERT PAYMENT TIMEFRAME]

Annex D: Voice and SMS – including option of closed user group

Diagram



Voice and SMS service

D.1 The following terms have the meaning set out below:

Term	Meaning
Operator Network	The mobile cellular network operated by the Operator
Group User	Those persons, designated in the notice of launch of an Agency Initiative, for whom the Agency wishes to facilitate voice communications
Other Operator User	Those pre-paid and post-paid users of the Operator Network who are not Group Users
Outgoing Call	A voice communication initiated by a Group User
Incoming Call	A voice communication made to a Group User
Outgoing SMS	A short message service sent by a Group User
Incoming SMS	A short message service sent to a Group User

D.2 The Voice and SMS Services comprise:

Service component	Requirement
Mobile device provision	Within [10] business days of receiving notice of the launch of an Agency Initiative, provide to the Agency an agreed number of voice- and SMS-supporting mobile devices that will, upon the launch of the Agency Initiative, allow the Group Users to communicate with one another as well as with Other Operator Users and the users of other fixed and mobile cellular networks.
Outgoing Call routing	For the duration of the Agency Initiative, route each Outgoing Call from the relevant Group User to its intended destination.
Incoming Call routing	For the duration of the Agency Initiative, route each Incoming Call to the relevant Group User.
Outgoing SMS routing	For the duration of the Agency Initiative, route each Outgoing SMS from the relevant Group User to its intended destination.
Incoming SMS routing	For the duration of the Agency Initiative, route each Incoming SMS to the relevant Group User.

D.3 The Performance Indicators and associated Expected Standards are:

Network availability

Performance Indicator	Expected Standard (if applicable)
Network Availability	99.90%

On-net calls

Performance Indicator	Expected Standard (if applicable)
Call Set-Up Success Rate	99.50%
Call Set-Up Time	10 seconds
Call Completion Success Rate	99.00%
Call Drop Rate	0.5%

On-net SMS

Performance Indicator	Expected Standard (if applicable)
Successful routing of SMS	99.50%
Delivery time for on-net SMS	60 seconds

Off-net calls

Performance Indicator	Expected Standard (if applicable)
Call Set-Up Success Rate	Best efforts
Call Set-Up Time	Best efforts
Call Completion Success Rate	Best efforts
Call Drop Rate	Best efforts

Off-net SMS

Performance Indicator	Expected Standard (if applicable)
Successful routing of Incoming SMS	Best efforts
Successful routing of Outgoing SMS	Best efforts
Delivery time for off-net SMS	Best efforts

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Operator agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Operator Network that is to take place during the term of this Agreement.
Return of mobile devices	The Agency agrees to return any mobile devices provided by the Operator within [10] business days of the end of an Agency Initiative.

D.5 Other contracted parties are:

Name	Address and contact details

D.6 The Agency Charges are:

Mobile device provision

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Voice- and SMS-supporting device	___	___	___	[Relevant operator's usual billing currency]

Voice calls between Group Users (closed user group, flat rate)

Item	Flat rate per month	Tax	Total charge per month	Currency
Routing of Incoming and Outgoing Calls	0	0	0	[Relevant operator's usual billing currency]

Voice calls between Group Users and Other Operator Users

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming Call	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing Call	___	___	___	[Relevant operator's usual billing currency]
Routing of Incoming SMS	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing SMS	___	___	___	[Relevant operator's usual billing currency]

Voice calls between Group Users and users of other networks (in-country)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming Call	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing Call	___	___	___	[Relevant operator's usual billing currency]
Routing of Incoming SMS	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing SMS	___	___	___	[Relevant operator's usual billing currency]

Voice calls between Group Users and users of foreign networks (relevant third countries, if any)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming Call	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing Call	___	___	___	[Relevant operator's usual billing currency]
Routing of Incoming SMS	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing SMS	___	___	___	[Relevant operator's usual billing currency]

Voice calls made and received by Group Users when abroad (international roaming)

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming Call	___	___	___	[Relevant operator's usual billing currency]
Routing of Outgoing Call	___	___	___	[Relevant operator's usual billing currency]
Routing of Incoming SMS	0	0	0	[Relevant operator's usual billing currency]
Routing of Outgoing SMS	___	___	___	[Relevant operator's usual billing currency]

Adjustment of Agency Charge if Expected Standards for network availability not met

If the availability of the Operator Network is below the Expected Standards in any given month, the Operator will reduce the Agency Charges for that month for the routing of incoming and outgoing voice calls and SMS according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

Adjustment of Agency Charge for high usage (volume discounts)

[Specify as appropriate]

Adjustment of Agency Charge if Expected Standards for on-net calls and SMS not met

[Specify as appropriate]

Adjustment of Agency Charge if Expected Standards for off-net calls and SMS not met

[Specify as appropriate]

D.7 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for mobile device provision

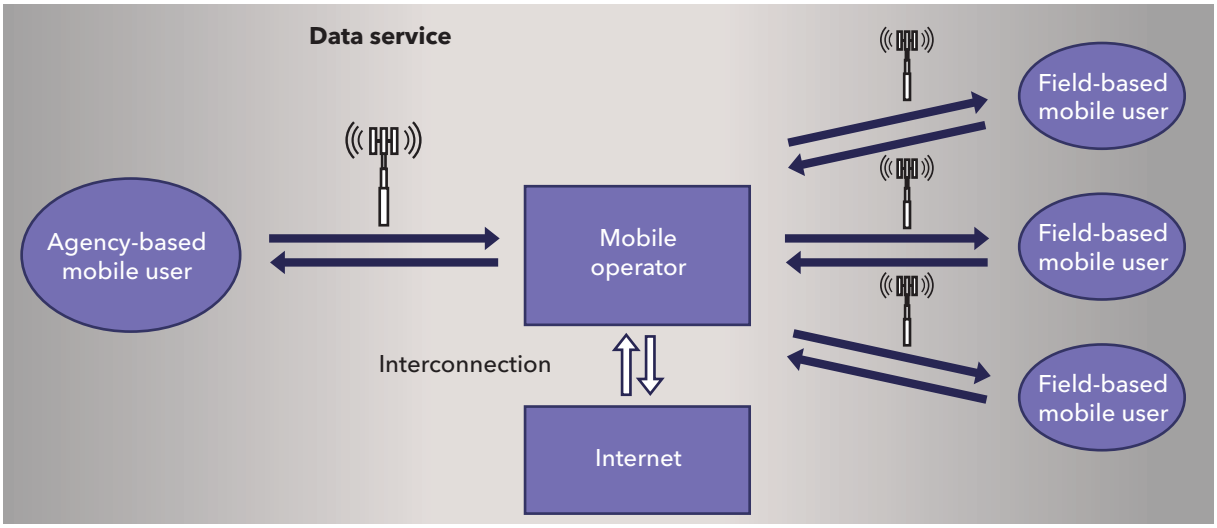
The Agency Charge for provision of mobile devices following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing incoming and outgoing communications

The Agency Charge for routing communications will be invoiced on a [quarterly] basis. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

Annex E: Data – including option of closed user group

Diagram



Data service

D.1 The following terms have the meaning set out below:

Term	Meaning
Operator Network	The mobile cellular network operated by the Operator
Group User	Those persons, designated in the notice of launch of an Agency Initiative, for whom the Agency wishes to facilitate voice communications
Other Operator User	Those pre-paid and post-paid users of the Operator Network who are not Group Users
Outgoing Data	A data communication sent by a Group User (e.g. MMS, e-mail, IM, web traffic)
Incoming Data	A data communication sent to a Group User (e.g. MMS, e-mail, IM, web traffic)

D.2 The Data Service comprises:

Service component	Requirement
Mobile device provision	Within [10] business days of receiving notice of the launch of an Agency Initiative, provide to the Agency an agreed number of data-supporting mobile devices that will, upon the launch of the Agency Initiative, allow the Group Users to (i) communicate with one another as well as with Other Operator Users and the users of other networks e.g. MMS and (ii) access Internet-based applications e.g. e-mail, IM and the World Wide Web.
Outgoing Data routing	For the duration of the Agency Initiative, route all Outgoing Data from the relevant Group User to its intended destination.
Incoming Data routing	For the duration of the Agency Initiative, route all Incoming Data to the relevant Group User.

D.3 The Performance Indicators and associated Expected Standards are:

Network availability

Performance Indicator	Expected Standard (if applicable)
Network Availability	99.90%

Access to Internet-based applications

Performance Indicator	Expected Standard (if applicable)
Data Session Set-Up Success Rate	99.50% (to avoid doubt, the functioning of the application itself is not the Operators' responsibility)
Data Session Set-Up Time	10 seconds (to avoid doubt, the functioning of the application itself is not the Operator's responsibility)

MMS with Group Users and Other Operators Users (on-net MMS)

Performance Indicator	Expected Standard (if applicable)
Successful routing of MMS	99.50%
Delivery time for on-net MMS	60 seconds

MMS with users of other networks (off-net MMS)

Performance Indicator	Expected Standard (if applicable)
Successful routing of Incoming MMS	Best efforts
Successful routing of Outgoing MMS	Best efforts
Delivery time for off-net MMS	Best efforts

D.4 Service-Specific Legal Requirements

Requirement	Description
Maintenance notice	The Operator agrees to provide the Agency with [10] business days' notice of any scheduled maintenance to the Operator Network that is to take place during the term of this Agreement.
Return of mobile devices	The Agency agrees to return any mobile devices provided by the Operator within [10] business days of the end of an Agency Initiative.

D.5 Other contracted parties are:

Name	Address and contact details

D.6 The Agency Charges are:

Mobile device provision

Item	Per unit charge	Tax per unit	Total charge per unit	Currency
Data-supporting device	___	___	___	[Relevant operator's usual billing currency]

Access to Internet-based applications (flat rate)

Item	Flat rate per month	Tax	Total charge per month	Currency
Routing of Incoming and Outgoing Data	___	___	___	[Relevant operator's usual billing currency]

MMS between Group Users (closed user group, flat rate)

Item	Flat rate per month	Tax	Total charge per month	Currency
Routing of Incoming and Outgoing MMS	0	0	0	[Relevant operator's usual billing currency]

MMS between Group Users and Other Operator Users

Item	Per kB charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming and Outgoing MMS	0	0	0	[Relevant operator's usual billing currency]

MMS between Group Users and users of other networks (in-country)

Item	Per kB charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming and Outgoing MMS	0	0	0	[Relevant operator's usual billing currency]

MMS between Group Users and users of other networks (relevant third countries, if any)

Item	Per kB charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming and Outgoing MMS	0	0	0	[Relevant operator's usual billing currency]

MMS sent and received by Group Users when abroad (international roaming)

Item	Per kB charge	Tax per unit	Total charge per unit	Currency
Routing of Incoming and Outgoing MMS	___	___	___	[Relevant operator's usual billing currency]

Adjustment of Agency Charge if Expected Standards for network availability not met

If the availability of the Operator Network is below the Expected Standards in any given month, the Operator will reduce the Agency Charges for that month for the routing of incoming and outgoing data according to the following schedule:

Network Availability	Reduction in Agency Charge
99.80%-99.89%	[5%]
99.70%-99.79%	[10%]
99.60%-99.69%	[15%]
99.50%-99.59%	[25%]
99.49% or less	[50%]

Adjustment of Agency Charge for high usage (volume discounts)

[Specify as appropriate]

Adjustment of Agency Charge if Expected Standards for on-net communications not met

[Specify as appropriate]

Adjustment of Agency Charge if Expected Standards for off-net communications not met

[Specify as appropriate]

D.7 The Payment Timeframe is:

[CONSIDER ADDING PILOT PERIOD WITHOUT CHARGES]

Agency Charge for mobile device provision

The Agency Charge for provision of mobile devices following the launch of a specific Agency Initiative will be paid within [20] business days of the issue of the relevant invoice.

Agency Charge for routing incoming and outgoing communications

The Agency Charge for routing communications will be invoiced on a [quarterly] basis. The Agency must pay this Agency Charge within [20] business days of the issue of the relevant invoice.

ANNEX 3
ADVISORY BOARD MEMBER BIOGRAPHIES

CHAIRMAN OF THE ADVISORY BOARD

Mr Sam Pitroda

Mr. Sam Pitroda is an internationally respected development thinker, policy maker, telecom inventor and entrepreneur who has spent 48 years in information and communications technology (ICT) and related human and national developments.

Credited with having laid the foundation for and ushered in India's technology and telecommunications revolution in the 1980s, Mr. Pitroda has been a leading campaigner to help bridge the global digital divide. During his tenure as Advisor to Prime Minister Rajiv Gandhi, Mr. Pitroda led six technology missions related to telecommunications, water, literacy, immunization, dairy production, and oil seeds. He was also the founder and first Chairman of India's Telecom Commission. In these roles, he helped revolutionize India's development policies and philosophies with a focus on access to technology as the key to social change.

Mr. Pitroda was recently Chairman of India's National Knowledge Commission (2005-2009), set up to provide a blueprint for reform of the knowledge-related institutions and infrastructure in the country. The Commission has offered a series of recommendations on various aspects of the knowledge paradigm to help India meet the challenges of the 21st century.

Currently, Mr. Pitroda is Advisor to the Prime Minister of India on Public Information Infrastructure and Innovation, with the rank of a Cabinet Minister. He serves as the Chairman of the Smart Grid Task Force Committee to reform public broadcasting, modernize railways, deliver e-governance, and other developmental activities. He is also a founding Commissioner of the United Nations Broadband Commission for Digital Development.

Mr. Pitroda holds close to 100 worldwide patents and has published and lectured widely in the United States, Europe, Latin America and Asia.

Mr David Atchoarena

David Atchoarena is the Director of the Division for Policies and Lifelong Learning Systems at UNESCO. His Division covers education policies, higher education, adult and vocational education and training, and ICT in education.

Before joining UNESCO Headquarters, Mr. Atchoarena worked at the UNESCO International Institute for Educational Planning (IIEP). At the Institute, he conducted research and capacity building programmes in the fields of educational planning, lifelong learning, technical and vocational education and higher education. He also contributed to develop the capacities of officials from Ministries of Education as the head of the Training and Education Programmes Unit of IIEP.

Prior to working for UNESCO, Mr. Atchoarena served as Chargé de Mission at the National Agency for Lifelong Education of the French Ministry of Education and as a project coordinator in the Ministry of Finance and Planning in Saint Lucia.

Mr. Atchoarena is a Honorary Professor at the University of Nottingham (UK) and holds a Doctorate in Economics from the University of Paris I, Panthéon-Sorbonne

Mr Bocar A. Ba

Chief Executive Office, SAMENA Telecommunications Council - Dubai

Bocar BA is an advocacy specialist, focused on the promotion of sustainable digital development, ICT infrastructure expansion and investment through collaboration and multi-stakeholder partnerships in the Middle East and Africa regions. BA is the CEO and a board member of SAMENA Telecommunications Council, which serves as a sector-development partner to governments and the telecommunications industry toward jointly creating a sustainable ICT environment as the enabler of a sustainable digital economy.

In his capacity as CEO of SAMENA Council, BA brings together and facilitates the building of alliances between digital ecosystem stakeholders, including regulators and other government bodies, to address critical technocentric, policy, and regulatory issues. His efforts have directly helped drive key regional initiatives, workshops and events in areas including affordable infrastructure, advanced digital services, data and privacy regulation, spectrum management, and industry fees and taxation. BA is a strong advocate of advancing socio-economic progress and contributing to the achievement of the UN's Sustainable Development Goals (SDGs) through ecosystem-wide collaboration on proliferating ICTs, and setting incentives for investment in digitization and advanced communications infrastructure.

BA is a Commissioner of the UN Broadband Commission for Sustainable Development; he serves as the chair of the ITU's Private Sector Chief Regulatory Officers Meeting ("CRO"), and is also chairing ITU-D's newly created Industry Advisory Group for Development Issues ("IAGDI"). BA serves on the m-Powering Development Initiative's Advisory Board, and is the chairman of the m-Powering Development Initiative's Working Group on Partnerships. BA is director and member of the board of several companies, active in the areas of investment, technology, management, and consultancy services. He is actively involved in the privatization processes in the MEA region and drives various investment projects, with the aim to linking new development opportunities in Asia, the Middle East, and Africa.

Mr Andrew Beard

Mr. Beard is CEO and Co-Founder of Vanu, Inc., a provider of innovative wireless infrastructure solutions. Founded in 1998, Vanu, Inc. pioneered the commercialization of software-defined radio and was the first company to receive FCC certification of a software-defined radio. Prior to serving as CEO, Andrew served as Chief Operating Officer from the inception of the company, with responsibility for oversight of all operations, including sales, engineering, support, finance, production. Andrew also has lead strategy for identifying, protecting and monetizing key intellectual property assets. Andrew helped to incubate and launch ventures such as Vanu Rwanda Ltd., working with carriers, regulators and investors to define and implement strategies. Prior to joining Vanu, Inc. Mr. Beard practiced law with Foley Hoag LLP where his practice focused on corporate securities and transactional matters for technology-oriented companies. Mr. Beard has the personal distinction of serving on the m-Powering Development Advisory Board for the ITU.

Mr Evgeny Bondarenko

Born May 02, 1950

Experience: Over 25 years of experience in mobile communications:

2009 – Present : Deputy Director General at Intervale. Main activities: International relations, interaction with state authorities and public organizations in Russia; curation in technology innovations.

2008 - 2009: Lanta-Telecom CJSC, Technical director. Main activities: Development of Moscow WiMax network project; the tendering for the equipment selection.

2006 - 2007: Euroset group. Vice-president on technology development, CJSC "Electrosvyaz" General Director. Main activities: IT infrastructure development and operations in one of the biggest Russian retail companies; communication services for "Euroset" holding (Data transfer, VOIP, B2C services); Mobile Virtual Network Operator (MVNO) project technological development and juridical study.

1992 - 2006: Vimpelcom (Beeline). Deputy Technical Director, Regional Technical Director. Main activities: Moscow network operation management; activity coordination of Headquarter and Regions; regional technical departments establishment and network rollout management; contractors control arrangement; resources redistribution; flawless operation provision; legal provisioning (regulatory agencies requirements satisfaction).

ITU Experience:

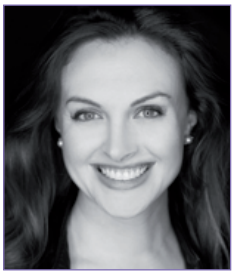
Participation in ITU-T sector SG13 meetings with recommendations for security of mobile financial transactions Y.2740 and Y.2741 proposed by Intervale.

Seven years of active work in SG2 as the Vice-Chairman and Vice-Rapporteur on questions Q17-3/2 and Q1/2. Developed "Toolkit for creating ICT-based services using mobile communications for e-government services", provided a number of contributions on mobile payment systems, held two rapporteurs meetings as a chairman, took part in organization and conducting regional conferences, where also acted as a speaker. Member of "m-Powering Development" Advisory Board, where during the first cycle was a head of "m-Commerce" working group.

Education: Moscow Power Engineering University, specialization - Radio Engineering.

Dr Beate Degen

Dr. Beate Degen is an Advisory partner at Ernst & Young. She currently serves on an honorary capacity as the Chair of the Independent Management Advisory Committee (IMAC) of the International Telecommunication Union (ITU). She has a background in business economics and majored in econometrics and operations research. Before joining EY, Bayer held various management positions at Bayer AG.



Ms Jessica Federer

Recognized as one of the top 100 global CDOs, a “Power-Lady” of the German economy, and a leading Health Tech Influencer, Jessica Federer is adept at translating digital developments into meaningful advancements for both business and society. Federer serves as an advisor for private technology companies, and is the founder of Innovayte. Federer was the Chief Digital Officer at Bayer A.G., a global life sciences leader in consumer health, pharmaceuticals, animal health, and agriculture. While at Bayer, she held positions in Global Regulatory Affairs, Market Access, Communications and Public Affairs. She began her public health career as an analyst at the Agency for Healthcare Research and Quality in the US Department of Health and Human Services. Federer earned a Bachelor of Science from the George Washington University, and a Master of Public Health from Yale. She and her husband live in New York City.

Dr Sayave Gnoumou

Chief Executive Officer and President, Nazounki Global Medical Network

Sayave Gnoumou is the founder of Nazounki Global Medical Network, a company that takes a 360° allinclusive approach in its care of patients seeking treatment abroad. Nazounki uses technology to share with specialists all over the world, medical information of its “patients of the world”. Dr Gnoumou became a leader in the telemedicine field and has been a pioneer in developing ICT tools to provide the best medical care, and in particular to patients in the most remote places going abroad for treatment. As a result, he has become a reference for various organizations (e.g. AU and UNGAID) in the use of ICT in health. Dr Gnoumou has been practicing medicine for over 20 years and specializes in general surgery, micro surgery, and urology.

Ms Anne-Rachel Inné

Executive Director Government Affairs and Public Policy, ARIN

As Executive Director Government Affairs and Public Policy, Anne-Rachel Inné serves as the American Registry for Internet Numbers (ARIN)'s primary link to Governments of US, Canada and 26 Caribbean Economies.

Immediately prior to working for ARIN, Anne-Rachel was ICANN's Vice President Government Engagement in Geneva, Switzerland. She spent 13 years at ICANN in various positions including Policy Analyst/Liaison to Country Code operators and Governments and Regional Relations Manager.

She also worked as the Chief Operations Officer (COO) of the Africa Regional Registry, AFRINIC, taking care of operations and Governments' engagement in the Registry's public policies process.

Anne-Rachel worked at the IICD in The Hague, Netherlands (1998-2001) as several countries Programme Manager directing multi sector social development projects that were early adopters of ICT/Internet. She produced and publicized *Learning by Doing: Lessons emerging from the ICT Stories Projects* for the benefits of the projects and the wider community. She was a member of the Bureau of the African Group at WSIS as a representative of the African Private Sector and a Member of the Gender Coalition during WSIS. She helped write *Creating Your Own National Gender Programme – A Practical Guide*. Anne-Rachel was an entrepreneur and consultant in the ICT4D sector and a founding member of the African Enterprise Network (AEN) in 1997.

Anne-Rachel is featured as ICT Expert in the ILO/IOM book for the AUC: *African Women at the Service of the Union*. She is the recipient of several awards for her demonstrated immense commitment and continued engagement with African communities.

She holds a Master of Literature and an MBA in International Finance/Economics.

Mr Abdoulie Janneh

Abdoulie Janneh is Executive Director, Liaison with Governments and Institutions in Africa for the Mo Ibrahim Foundation; the former UN Under-Secretary-General and Executive Secretary of the Economic Commission for Africa (ECA), prior to which he was UNDP Regional Director for Africa. Mr Janneh is a strong advocate for aligning development efforts to Africa's priorities.

Mr Janneh remains engaged in supporting the African Union vision, NEPAD, the African Peer Review Mechanism and the climate change agenda.

He is chair of the African Governance Institute and serves on the Boards the Coalition for Dialogue on Africa (CoDA), Pax Africana and Africa Forum amongst others.

Mr Navin Kapila

Mr. Navin Kapila has wide ranging experience in the telecommunication sector in both the Government and private sector.

He currently serves as a non-executive Board Member of Telkom South Africa and he is also a Special Adviser for Emergency Communications to International Telecommunications Union -ITU a UN body. He is also a Member of M-Powering Development Board of ITU

He was the Managing Director of Inmarsat India and responsible for the direction and strategy in India. Navin worked as a senior official within the Indian Government's Ministry of Communications and Information Technology and instrumental in the First Telecom Policy which laid the foundation of the Telecom sector in India of today. He was a member of the expert panel for establishing of the Telecom Regulatory Authority of India. He also served as Vice President of Corporate Development at ICO Global Communications (London), and served as its Vice President of Government Affairs and Director of Business Development. He is well known and highly regarded in satellite telecom regulation. Mr. Kapila has also worked on World Bank projects.

His contribution to the field of Emergency Communications starting with the Tampere Convention and before is well known and well acknowledged. Mr. Kapila was presented with the only individual award by then ITU Secretary-General Dr. Hamadoun Touré at the ITU's first Humanitarian Awards ceremony.

Mr Kapila has a passion for motor driving and has many motor driving achievements. His name was in the Guinness Book of World Records for World Circumnavigation by Car, Mr. Kapila also drove from London to Cape Town to raise millions of dollars for Nelson Mandela Children Fund. He is also a winner in the Himalayan Car Rally.

Mr. Kapila was educated at India's Punjab University and Pune Law College.

Dr Marie-Paule Kieny

Dr. Marie-Paule Kieny is currently Director of Research at Inserm (Institut national de la santé et de la recherche médicale) in Paris, where she assists the President on International Institutional Collaborations.

She is also the Chair of the Board of the Drugs for Neglected Diseases Initiative (DNDi, Geneva, Switzerland) and of the Medicines Patent Pool Foundation (MPPF, Geneva, Switzerland) since July and August 2017, respectively. She is also a member of the Board of the Human Vaccine Project (HVP, New York, USA) and a Non-Executive Independent Director of bioMérieux (Lyon, France).

Until June 2017, Dr Kieny served as the Assistant Director-General for Health Systems and Innovation at the World Health Organization. Dr. Kieny also directed the WHO Initiative for Vaccine Research from 2001 to 2010. Key successes under her leadership roles at WHO include coordinating the WHO R&D efforts during the 2014-2016 West-African Ebola epidemic and overseeing the successful implementation of a Phase III efficacy trial of an Ebola vaccine candidate in Guinea. She conceptualized and initiated the WHO R&D Blueprint, a global preparedness plan against emerging diseases' epidemics. She also participated in developing and introducing in sub-Saharan Africa a new vaccine against bacterial meningitis; addressing global supply of pandemic influenza vaccine especially in developing countries through technology transfer and manufacturing; supporting developing countries strengthening their health systems towards Universal Health Coverage. Such initiatives are continuing priorities of Dr. Kieny.

Before joining WHO, Dr. Kieny held top research positions in the public and private sectors in France which included Assistant Scientific Director of Transgene S.A. from 1981 to 1988 and Director of Research and Head of the Hepatitis C Virus Molecular Virology Group at the Institute of Virology, (INSERM) from 1999 to 2000.

Dr. Kieny received her PhD in Microbiology (1980) and University Diploma in Economics from the University of Montpelier; Diplôme d'Habilitation à Diriger des Recherches from the University of Strasbourg in 1995. She has published over 350 articles and reviews, mainly in the areas of infectious diseases, immunology, vaccinology and health systems.

Dr Kieny has been awarded the title of Chevalier dans l'Ordre National de la Légion d'honneur (Knight in the National Order of the Legion of Honour, France) in 2016, and of Chevalier de l'Ordre National du Mérite, au titre du Ministère de la Recherche (Knight of the National Order of Merit, under the Ministry of Research, France) in 2000. She was the recipient of the International Inserm Prize in 2017; the Génération 2000-Impact Médecin Prize in 1994 and of the Innovation Rhône-Poulenc Prize in 1991

Mr Eric Loeb

Eric H. Loeb serves as the Executive Vice President, Government Affairs at Salesforce. Previously, he held several positions at AT&T such as the Senior Vice President for International External and Regulatory Affairs; Vice President of International External Affairs as well as International Law and Policy Director. As Senior Attorney, International Regulatory Law and Policy, his expertise (amongst others) focused on legal, policy and advocacy efforts towards pro-competitive market liberalization, effective enforcement of rules, transparent licensing procedures, non-discriminatory interconnection regimes, and reasonable compliance requirements.

Prior to joining AT&T in 2002, Mr. Loeb had been Global Regulatory Counsel for Concert, the global joint venture between AT&T and British Telecommunications.

He has also served as US Regulatory Counsel for BT. Before joining BT in 1998, Mr. Loeb was associated with the law firm of Hogan & Hartson LLP in Washington, D.C., where he worked in the Communications Practice Group. He received a Juris Doctor degree from the Georgetown University Law Center, and an undergraduate degree from Bowdoin College.

Mr Leslie Maasdorp

Mr. Leslie Maasdorp is Vice President and CFO of the New Development Bank, headquartered in Shanghai.

Over the past 25 years he has occupied senior leadership roles in both private and public sectors. Most recently until May 2014, he served as a Managing Director and President of Bank of America Merrill Lynch for Southern Africa for a period of four years. Prior to that, he served in a dual executive role as Vice Chairman of Barclays Capital and of Absa Capital. In 2002 he was the first African to be appointed as international adviser to Goldman Sachs International, a role he occupied for four years.

He was elected, and served for a period of five years, as Vice President of Business Leadership South Africa (BLSA), an apex business association in South Africa which represents the top 80 listed companies on the Johannesburg Stock Exchange (JSE).

Before his 13 years as a global investment banker, he served in several senior leadership roles in the Government of South Africa. In 1994 after the transition to democracy, he was appointed as Special Adviser to the Minister of Labour and in 1999, in his role as Deputy Director General of the Department of Public Enterprises, he lead the restructuring and privatization of state owned enterprises for the South African Government. From 1992 to 1994, he served as a policy adviser to the Department of Economic Planning of the African National Congress (ANC). His private sector experience includes a stint as senior manager in Strategy at Deloitte Consulting.

He is an experienced non-executive director having served on the Boards of large listed JSE entities such as Absa Group, Johnnic, HCI and Telkom. In addition he was non-executive Chairman and later CEO of Advtech, one of the leading providers of private education in South Africa. In 2002 he was appointed as non-executive Chairman of a state owned enterprise, called Trans Caledon Tunnel Authority (TCTA), the lead provider of bulk raw water infrastructure in South Africa. He served in this role for six years.

In 2007 he was designated by the World Economic Forum as a young global leader. He holds a BA degree in Economics and Psychology from the University of the Western Cape and a Master of Science degree in Economics from the School of Oriental and African Studies, at the University of London. He is an African Leadership Initiative (ALI) fellow of the Aspen Institute.

Mr Patrick Masambu

Director General, ITSO

Mr. Patrick Masambu assumed the post of Director General of the International Telecommunications Satellite Organization (ITSO) on 18th July, 2017. Prior to that, Mr. Masambu served as the Deputy Director General and Director of Technical Affairs at ITSO for a period of 7 years. Mr. Masambu is a Commissioner of the U.N. Broadband Commission for Sustainable Development. He is also a member of the Steering Committee of the World Economic Forum's Internet for All Initiative, as well as a member of the Advisory Boards for the ITU-BDT's m- Powering Development Initiative and the Program on International Communications Regulation and Policy at American University Washington College of Law. Mr. Masambu holds MBA and B.Sc (Engineering)(Hons) degrees; a Postgraduate Diploma in Telecommunications Systems Management and several certificates in specialized disciplines in telecommunications; regulation and ICT.

Mr Philipp Metzger

Philipp Metzger took office as Director General of the Swiss Federal Office of Communications on 1 January 2014. Before that, Philipp Metzger was Deputy to the Director of the Telecommunications Development Bureau at the International Telecommunication Union (ITU) based in Geneva. He had already held previous positions at OFCOM, including Vice-Director and Head of the Telecom Services Division from 2007 and Deputy Director General from 2012.

After passing his bar exam Bern in 1992, Philipp Metzger began his career in major commercial law firms in Geneva and London. From 1996 to 2001, he was a Legal and subsequently Senior Legal Officer at the European Free Trade Association (EFTA) in Brussels and Geneva, mostly dealing with European Economic Area matters. He then served as a Senior Corporate Counsel of a US multinational IT corporation company in Amsterdam and rejoined EFTA in 2002 as the Director of the Trade Relations Division which assists the EFTA States in their free trade negotiations with partner countries worldwide. Philipp Metzger holds a Master of Arts in European Studies degree from the College of Europe (Bruges/Warsaw).

Philipp Metzger is a member of the ITU/UNESCO Broadband Commission for Sustainable Development.

Mr Moktar Mnakri

ICT Management & Governance

Moktar Mnakri, is senior advisor to policy makers and economic players in the sector of ICT.

Moktar has more than 30 years track in the ICT business. He was CEO of Tunisie Telecom Group, incumbent operator in Tunisia (9000p,>1B$) until end 2014 and worked for Alcatel-Lucent (Nokia) for more than 20 years in various management positions, particularly as Head of sales activity in the Middle East, Africa and South Asia regions.

He was the Chairman of World Telecommunications Standardization Assembly WTSA-16 and is member of the Advisory Board of m-Powering Development of the ITU-D, Geneva.

He is particularly contributing at international level to the inception of an appropriate framework for a Sustainable Digital eco-system.

Moktar holds a Masters in Telecommunications from Telecom Paris Tech and an MSc of Civil Aviation & Aerospace from «Ecole Nationale de l'Aviation Civile»,Toulouse, France.

Mr Jean Philbert Nsengimana

Jean Philbert recently joined Smart Africa as a Special Advisor. He is a strong believer in the combined power of leadership, technology, innovation and inclusive partnerships to drive Africa's digital transformation.

Prior to Smart Africa, he served as Cabinet Minister of Youth and Information and Communication Technology (ICT) in the Government of Rwanda for 6 years. In that capacity, he spearheaded several flagship initiatives including TransformAfrica Summits and YouthConnekt Africa Initiative. He led the design and implementation of the Smart Rwanda Master Plan with policies on Broadband for all, Digital Literacy, Cybersecurity, Digital Health, Education, Governance, Data Revolution, Trade, Finance and Innovation in the 4th Industrial Revolution. Phil's 15 years' experience includes successful stints in the private sector, international development and academia where he started his career.

He holds an MBA from Singapore's SP Jain School of Global Business and a Master's of Science in Software Engineering from the University of Rwanda..

Dr Robert Pepper

Head of Global Connectivity Policy and Planning Facebook

Dr. Robert Pepper helps lead Facebook's connectivity and technology policy activities focusing on new technology development, deployment and adoption. Pepper previously was Cisco's Vice President for Global Technology Policy for more than a decade working with governments across the world helping them develop their digital strategies and address areas such as ICT and development, broadband plans, IP enabled services, wireless and spectrum policy, the Internet of Things, security, privacy and Internet governance.

Pepper was Chief of the Office of Plans and Policy and Chief of Policy Development at the FCC for 16 years beginning in 1989 where he led teams designing and implementing the first U.S. spectrum auctions, developing policies promoting the development of the Internet, implementing telecommunications legislation, and planning for the transition to digital television.

His academic appointments included faculty positions at the Universities of Iowa, Indiana, and Pennsylvania, and as a research affiliate at Harvard University. He chairs the U.S. Department of State's Advisory Committee on International Communications and Information Policy and has served on the board of the U.S. Telecommunications Training Institute, the U.S. Department of Commerce's Spectrum Management Advisory Committee and the UK's OFCOM Spectrum Advisory Board.

Pepper received his BA. and Ph.D. from the University of Wisconsin-Madison.

Dr. R.S. Sharma

Dr. R. S. Sharma joined as Chairman, Telecom Regulatory Authority of India (TRAI) on 10th of August, 2015. Prior to joining TRAI Dr. R. S. Sharma was working as Secretary to Government of India in the Department of Electronics and Information Technology. He has also worked as Chief Secretary to the State Government of Jharkhand (India). His other assignments include Director General & Mission Director of the Unique Identification Authority of India (UIDAI) where he was responsible for over-all implementation of this ambitious and challenging project undertaken by the Government of India for providing Unique Identification (christened as "Aadhaar") to all its Residents.

Before his posting at UIDAI, Dr. Sharma worked with the Government of Jharkhand as Principal Secretary of the Departments of Science and Technology, Drinking Water & Sanitation, Information Technology (IT), Rural Development and Human Resources Development. As Principal Secretary of the IT Department, Dr. Sharma was responsible for formulation of State policies in the IT and e-Governance areas. He also over-saw the implementation of various e-Governance Projects in all the Departments of the State Government.

Dr. Sharma has held important positions both in the Government of India and State Governments in the past and has been deeply involved in the administrative reforms and leveraging IT to simplify the administrative processes. During his posting in Government of India, he has worked in the Department of Economic Affairs and has dealt with bilateral and multilateral development agencies like World Bank, ADB, MIGA and GEF. He was also in-charge of Financing of Infrastructure projects in the Highways, Ports, Airports and Telecom sectors. Dr. Sharma's contributions to the IT and e-Governance have been widely recognized both within India and outside. He has been responsible for implementing a number of Projects relating to ICT Infrastructure, Process Re-engineering and Service Delivery in Public Private Partnership (PPP) mode. Dr. Sharma holds Ph.D. from Indian Institute of Technology (IIT), Delhi, a Masters Degree in Mathematics from IIT, Kanpur (India) and another Masters in Computer Science from the University of California (USA).

Mr Abdoulkarim Soumaila

Secretary-General, African Telecommunications Union (ATU)

Mr. Abdoulkarim Soumaila is the current Secretary General of the African Telecommunications Union (ATU) since January 2011. His mandate was renewed for another term of four years having been re-elected by the 4th Ordinary Session of ATU plenipotentiary Conference held in Harare, Zimbabwe in July 2014. He is leading the continental body entrusted with building consensus within African countries and coordinating African Common Proposals in international fora. Prior to his election as the Secretary General of ATU, he was the Director of Information Technologies at the Ministry of Communication, New Information Technologies and Culture in Niger from 2007 to 2010.

Mr. Soumaila in his 20 years as a Telecommunication expert and professional, has acquired a solid experience in Management of Telecommunication networks and service development strategy and has contributed immensely to the implementation of sectorial policies and innovative investment projects in several African countries. He has also diligently managed theaffairs of the Union for the period he has been the Secretary General.

Mr. Soumaila holds a Master of Science degree in Operational Telecommunications from the University of Coventry (UK) and Telecommunications Application Diploma from National Institute of Posts and Telecommunication in Rabat (Morocco).

Mr Mohamed Sharil Tarmizi

Sharil Tarmizi is a now a consultant focused on corporate and regulatory advisory work. He was a former regulator in the internet, telecoms, online media as well as the postal and express delivery industry. Throughout his career as a lawyer and a corporate advisor, he has had two tours of duty serving Malaysia's telecoms, media and postal regulator. He is a passionate supporter of technology start-ups and is also an occasional angel investor. His industry knowledge encompasses broadband, Internet, e-commerce, cybersecurity, telecommunications, ICT products and services as well as the postal and courier services/ express delivery and digital signature services.

He currently serves in his personal capacity on the International Telecommunications Union's mPowering Advisory Board, based out of Geneva and occasionally gets involved in assisting the GSMA out of its London office in certain capacity building projects.

He graduated with an LL.B(Hons) from University College of Wales, Aberystwyth and is a Barrister at Law, Gray's Inn, London. He was also called to the Malaysian Bar and was formerly an Advocate & Solicitor of the High Court of Malaya practicing with Azman Davidson & Co and Zaid Ibrahim & Co early in his career before becoming a partner in an investment advisory firm called BinaFikir Sdn Bhd which was eventually acquired by Maybank Berhad. Thereafter, he held the position of Chairman and Chief Executive of the Malaysian Communications and Multimedia Commission (MCMC), an independent regulatory body set up by a Malaysian Act of Parliament to develop, oversee and regulate the communications and multimedia sector in Malaysia from 16 October 2011 to 31 December 2014 and was also the regulator for the postal and courier industry during the same period.

In the international arena, Dato' Sharil was also a Board Member of the Internet Corporation for Assigned Names and Numbers (ICANN), the global Internet domain name coordinating body and Chairman of ICANN's GAC from 2004 to 2007. Dato' Sharil has worked closely with international organizations such as ICANN, ISOC, ITU, World Bank, the WTO, APT, PITA, CTO, IIC, UPU and UNICEF and remains in an advisory capacity to some of them. In recognition of his contribution to the global internet community, Aberystwyth University conferred an Honorary Fellowship to him in 2017.

He is presently Chairman of Quantephi Sdn Bhd, a boutique investment advisory firm in Malaysia licensed by the Securities Commission of Malaysia and a Senior Advisor to Asean Advisory Pte Ltd, a specialist advisory and consulting firm based in Singapore. He also serves on the Board of Directors of LotusCars UK.

Professor Tim Unwin

Professor Tim Unwin is Emeritus Professor of Geography (since 2011) and Chairholder of the UNESCO Chair in ICT4D (since 2007) at Royal Holloway, University of London. He is also Honorary Professor at Lanzhou University in China. He was Secretary General of the Commonwealth Telecommunications Organisation (CTO) from 2011-2015, and was Chair of the Commonwealth Scholarship Commission from 2009-2014. He serves on the ITU's m-Powering Development Advisory Board, the UK Department for International Development's Digital Advisory Panel, the UN University – Computing and Society International Advisory Board, and the Steering Committee of the World Economic Forum's Internet for All initiative. His edited book Information and Communication Technologies for Development, was published by Cambridge University Press in 2009, and his latest book Reclaiming ICT4D was published by Oxford University Press in 2017. Most of his research and writing currently focuses on the inequalities caused by ICTs and what needs to be done to ensure that the poorest and most marginalised people can also benefit from them. He was appointed a Companion of the Most Distinguished Order of St. Michael and St George (CMG) in the Queen's 90th Birthday Honours list in 2016 for his services to the Commonwealth.

Eng. John N. Waweru

Eng. John N. Waweru is the chairman of MIS Solution Ltd, an ICT consultancy firm.

We undertake Project management on installation of large Telecommunication projects and Consultancy services on Banking products and solutions.

Eng. Waweru was the Director-General of the Communications Commission of Kenya (CCK) between June 2005 and May 2008.

CCK now renamed CAK (Communication Authority of Kenya) is the regulatory authority for the Communication sector in Kenya. It is responsible for facilitating the development of the information and communication sector including broadcasting, multimedia, telecommunication, electronic commerce, postal and courier services.

He was also a Managing Director of the then state-owned fixed telecommunications utility, Telkom Kenya (TKL) from March 2003 to May 2005. Before that he had served as a member of the same Board for 3 years. TKL was then the sole provider of landline phone services. The company operated and maintained the infrastructure over which Kenya's various Internet service providers used.

Eng. Waweru has extensive experience in telecommunications sector spanning close to 40 years.

Born in 1952, Eng Waweru started his career in telecommunications at the defunct Kenya Posts and Telecommunications Corporation (KP&TC) in August 1976 after graduating with a B.Sc in electrical engineering from the University of Nairobi.

In 1988 as a Telecommunication Manager he was responsible for operations, installation and maintenance of various telecommunications equipment's. He served in this position up to November 1990, when he took early retirement.In 1991, Eng. Waweru founded EP Communications Ltd, a telecommunication engineering firm, after retiring from KP&TC.

He is a past chair of the Telecommunication Dealers Association of Kenya (TDAK). Eng. Waweru is a Rotarian, a registered Engineer and also a member of the Institute of Engineers of Kenya. Also a member of the Institute of Directors of Kenya (IOD-K). A Membership organization of practicing and aspiring Directors drawn from both private and the public sectors of our economy.

Eng Waweru served as a Board member of Barclays Bank of Kenya between 2011 to Oct 2013.

Between Nov 2013 to Oct 2016, Eng Waweru chaired the Board of Finserve Africa (also known as Equitel) a subsidiary of Equity Bank. Equitel as an MVNO facilitates the linking of a customer's Bank account to a mobile number. Banking becomes truly mobile as funds can be transferred or received from the bank account.

Mr Lawrence Yanovitch

Lawrence Yanovitch is the president of the GSMA Foundation which supports programmes to connect the underserved to a better future. The Foundation brings together the mobile industry, adjacent industries and the international development community in order to advance commercial business models in connectivity, health, education, banking, women's empowerment, agricultural productivity, identity, and renewable energy.

Mr Yanovitch was previously an officer at the Bill & Melinda Gates Foundation where he managed a portfolio of investments in financial services for the unbanked targeted to reach 80 million households. Prior to that he had a long career in microfinance and philanthropy.

He is a former member of the management team at FINCA and of the faculty of Georgetown University in Washington, D.C.

Lawrence's hobbies include learning new languages and he currently speaks six fluently.

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