

**DIGITAL
WORLD
FORUM**

**TO
CONNECT
THE UNCONNECTED**



UMP Partner



Final Event's Press Kit

***30 September 2009,
Brussels, Belgium***

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www.digitalworldforum.eu/events/68-final



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MEDIA ADVISORY: USING LOW-COST TECHNOLOGIES TO "CONNECT THE UNCONNECTED"

The Digital World Forum EU project presents its findings and future work plans on 30 September 2009, in Brussels

<http://www.digitalworldforum.eu/> -- 11 September 2009 - The [Digital World Forum \(DWF\) EU project](#) is holding its [closing event](#) on Wednesday 30 September 2009, in Brussels, Belgium. The goal of this one-day event is to present the project's findings and to recommend future directions of work **to help bridge the digital divide in developing countries**. The DWF project partners have explored the use of low-cost technologies to "connect the unconnected". They focused their research work on the following topics:

- **mobile Web for development** (led by the W3C Mobile Web Initiative),
- **low-cost access devices** (led by CSIR/Meraka),
- and **low-cost broadband infrastructure** (led by Orange Labs).

This [event](#), free of charge, will include talks, debates, and panel sessions about the potential of one or more of the above mentioned low-cost technologies in development, and the need for future funding and research. Invited keynote [speakers](#) will provide perspectives from the academic, industry and ICT for development domains. They include: Jean-François Soupizet, Deputy Head of the International Relations Unit in the European Commission's DG Information Society; Serge Ferré, Nokia Vice-President; Ashok Jhunjhunwala, IUT Madras Professor; Charles McCathieNevile, Opera Software Chief Standards Officer; Nii Quaynor, ICANN Director; Georges Sadowsky, Digital Divide Expert; and Joy Tang, oneVillage Foundation President. Additional speakers are expected to be confirmed shortly and will appear on the [agenda](#) page.

The DWF partners wish to thank the Gold Sponsor Nokia for its generous support of this meeting. The [sponsorship program](#) is designed to enable participation by individuals and organizations with particular expertise, but who might not otherwise be able to attend due to travel costs. The deadline for taking part in this opportunity is 21 September 2009

ICT Access to Foster Social and Economic Development

Information and Communication Technologies (ICTs) are a great opportunity for the developing world. Providing minimal services (health, education, business, government, etc.) to rural communities and under-privileged populations is of major importance to improve people lives, and to sustain development.

But, how to better connect people in developing countries? How can they directly benefit from



access to ICT? Which easy-to-use device will help rural communities in their daily lives? What are the most promising broadband technologies to solve the "last mile" issue? What are the challenges to make the mobile Web accessible, relevant, usable and useful in development actions?

Logistics and Contact Information

Date: Wednesday 30 September 2009

Time: from 9 a.m. until 6 p.m.

Location: [The International Auditorium](#), Boulevard du Roi Albert II, No. 5 / 2, 1210 Brussels, Belgium (Tel.: +32 (0)2 2240254)

Registration: All participants must register in advance, using the [online registration form](#). There is no registration fee.

Event's Web page: <http://www.digitalworldforum.eu/events/68-final> (includes links to the full [agenda](#), the list of [speakers](#), the [sponsorship package](#), and the [press corner](#))

Press Contacts:

- Elodie Laloum, Agence RP Melodik, <elodie.laloum@melodik.fr>, +33 1 42 01 74 54
- Marie-Claire Forgue, W3C, <mcf@w3.org>, +33 6 76 86 33 41

About the Digital World Forum [DWF]

The Digital World Forum on Accessible and Inclusive ICT ('Digital World Forum') is a FP7 European project focusing on the use of ICT to leverage economic development in Africa and Latin America. Providing minimal services (health, education, business, government, etc.) to rural communities and under-privileged populations is of major importance to improve people lives, and to sustain development. The objectives of the DWF project is to demonstrate that using ICT is the easiest and possibly only way to develop and deploy those basic services in developing countries.



Managed by [ERCIM](#), DWF is run by the following 6 partners: [W3C Mobile Web Initiative](#), [Orange/France Telecom R&D](#), [CiberVoluntarios](#), [CSIR/Meraka Institute](#), [oneVillage Foundation](#), and [Kusamotu&Kusamotu](#).

For more information, see <http://www.digitalworldforum.eu/>

ALERTE MEDIA : UTILISATION DES TECHNOLOGIES À FAIBLE COÛT POUR « CONNECTER LES NON CONNECTÉS »

Le projet Digital World Forum de l'Union Européenne présente ses résultats et plans de travail futurs le 30 septembre 2009 à Bruxelles.

<http://www.digitalworldforum.eu> - Le 11 septembre 2009 – Le projet Digital World Forum (DWF) de l'Union Européenne organise un [événement de clôture](#) le mercredi 30 septembre 2009, à Bruxelles en Belgique. Lors de cette journée, le DWF présentera ses résultats et ses recommandations pour de futures orientations de travail destinées à **combler le fossé numérique** dans les pays en voie de développement. Les partenaires du projet DWF ont exploré l'utilisation des technologies à bas coût pour « connecter les non connectés ». Leur travail de recherche s'est porté sur les sujets suivants :

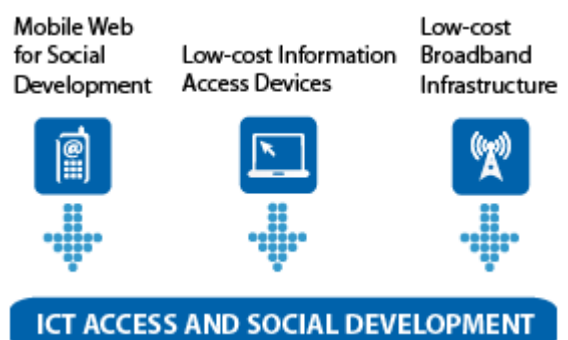
- le **Web mobile en faveur du développement** (mené par l'Initiative Web mobile du W3C),
- les **périphériques d'accès à faible coût** (mené par CSIR/Meraka),
- et l'**infrastructure à large bande à faible coût** (mené par Orange Labs).

Cet [événement gratuit](#) englobe des discussions, des débats et des sessions de table ronde sur le potentiel que recèlent une ou plusieurs des technologies à faible coût pour le développement, citées ci-dessus, et la nécessité des recherches et financements futurs. Les [orateurs invités](#) présenteront leurs points de vue. Seront présents notamment : Jean-François Soupizet, chef de l'unité Relations Internationales, Direction générale de la Société de l'information à la Commission Européenne ; Serge Ferré, vice-président de Nokia ; Ashok Jhunjunwala, professeur à l'IUT de Madras ; Charles McCathieNevile, directeur des standards chez Opera Software ; Nii Quaynor, directeur de l'ICANN ; Georges Sadowsky, expert de la fracture numérique ; et Joy Tang, présidente de oneVillage Foundation. D'autres orateurs devraient confirmer leur présence très prochainement.

Les partenaires du DWF tiennent à remercier Nokia (parrain Gold) pour sa généreuse contribution à cet événement. Le [programme de parrainage](#) vise à soutenir la participation des particuliers et des entreprises ayant une expertise particulière à apporter mais qui ne disposent pas forcément des moyens financiers pour couvrir leurs frais de déplacement. La date limite d'inscription pour participer à cet événement est le 21 septembre 2009.

L'accès aux TIC pour promouvoir le développement social et économique

Les technologies de l'information et de la communication (TIC) ouvrent de nouveaux horizons aux pays en développement. L'offre de services minimaux (santé, éducation, entreprise,



administration, etc.) aux communautés rurales et populations économiquement faibles revêt une importance primordiale pour améliorer la vie de ces personnes et soutenir le développement.

Or comment mieux connecter les personnes dans les pays en développement ? Comment peuvent-elles bénéficier directement de l'accès aux TIC ? Quels périphériques faciles à utiliser aideront les communautés rurales dans leur quotidien ? Quelles sont les technologies à large bande les plus prometteuses pour répondre au problème du « dernier kilomètre » ? Quels sont les défis pour rendre le Web mobile accessible, pertinent, utilisable et utile dans les actions de développement ?

Informations de contact et logistique

Date : mercredi 30 septembre 2009

Heure : de 9H à 18H

Lieu : [Auditorium international](#), Boulevard du Roi Albert II, No. 5 / 2, 1210 Bruxelles, Belgique (Tél. : +32 (0)2 2240254)

Inscription : tous les participants doivent s'inscrire à l'avance à l'aide du [formulaire d'inscription en ligne](#). Il n'y a pas de frais d'inscription.

Page Web de l'événement : <http://www.digitalworldforum.eu/events/68-final> (incluant des liens à l'[ordre du jour complet](#), la [liste des orateurs](#), le [programme de parrainage](#) et le [point presse](#)).

Contacts Presse :

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- Marie-Claire Forgue, W3C, <mcf@w3.org>, +33 6 76 86 33 41

À propos du Digital World Forum [DWF]

Le forum mondial numérique sur les TIC inclusives et accessibles (Digital World Forum) est un projet du 7^{ème} Programme-cadre pour la recherche et le développement technologique (PCRD) de l'Union Européenne portant sur l'utilisation des TIC pour promouvoir le développement économique en Afrique et en Amérique latine. L'offre de services minimaux (santé, éducation, entreprise, administration, etc.) aux communautés rurales et populations économiquement faibles revêt une importance primordiale pour améliorer la vie de ces personnes et soutenir le développement. Le projet DWF vise à démontrer que l'utilisation des TIC est le moyen le plus facile (et vraisemblablement le seul) pour développer et mettre en œuvre ces services de base dans les pays en développement.



Géré par [ERCIM](#), le DWF est réalisé par les 6 partenaires suivants : [L'Initiative Web mobile du W3C](#), [Orange Labs](#), [CiberVoluntarios](#), [CSIR/Meraka Institute](#), [oneVillage Foundation](#), et [Kusamotu&Kusamotu](#).

Pour plus d'informations, visitez <http://www.digitalworldforum.eu/>

“TO CONNECT THE UNCONNECTED” EVENT – AGENDA

Chair: Stéphane Boyera, scientific coordinator of the DWF project

EU Time	Schedule of Events
9h00-9h30	Registration
9h30-10h30	Keynotes (part I)
	<ul style="list-style-type: none"> • Jean-François Soupizet, Head of the International Relations Unit in the European Commission • Web Presence for every Mobile User Interface, by Nii Quaynor, Network Computer Systems • Affordable Broadband for Developing Countries: An Indian Perspective, by Ashok Jhunjhunwala, IUT de Madras • Some Implications of Mobile Access for Development, by George Sadowsky
10h30-11h00	Coffee Break
11h00-12h30	Keynotes (part II)
	<ul style="list-style-type: none"> • Serge Ferré, Nokia Vice-President • Charles McCathieNevile, Chief Standards Officer at Opera Software • Scaling-Up Low Cost Assistive Technologies: A Latin American Example, by Fernando H.F. Botelho, Literacy Bridge • Dissemination of Innovation: the new relationship among design, development and deployment in the ICT4D, by Joy Tang, oneVillage Foundation
12h30-14h00	Lunch Buffet
14h00-14h30	DWF: a successful international cooperation , with the DWF partners (Irene Gomez, Bruno Conquet, Cleophas Dzinotyiweyi, Stéphane Boyera, Kafui Prebbie, Ayo Kusamotu, Jacob B. Odame)
14h30-16h00	<p>[PANEL] Future of Low-Cost technologies to bridge the Digital Divide</p> <ul style="list-style-type: none"> • Mobile Web to Forster Social and Economic Development, by Stéphane Boyera, W3C Mobile Web for Development [slides] • Low-cost Information Access Devices, by Cleophas Dzinotyiweyi, CSIR/Meraka • Low-cost Broadband Infrastructure, by Mona Badran and Ayman Ibrahim, Orange Labs
16h00-16h30	Coffee Break
16h30-17h30	<p>[PANEL] Perspective - Next steps? with the participation of Stéphan Martin (Business Analyst at Nokia Siemens Network), Hussein El Gueretly (Orange Labs), Jean-François Soupizet (EU Commission), Karl Jonas (Fraunhofer), George Sadowsky, Rudi Vansnick (ISOC Belgium), Eric Osiakwan (AfrISPA), Ayman Ibrahim (Orange Labs) .</p>
17h30	Cocktail

“TO CONNECT THE UNCONNECTED” EVENT – SPEAKERS

Fernando H.F. Botelho



Fernando Botelho is an international consultant who manages projects in the areas of trade development, poverty reduction, technology, and disability. He specializes in tools and strategies that are inherently scalable. Fernando is currently working with Literacy Bridge and a ‘Live USB’ project he is calling F123org. Fernando's experience includes managing the Visionaris Award, a partnership between Ashoka and UBS AG, in Argentina, Brazil, and Mexico. Before coming to UBS Philanthropy Services in Zurich, Fernando worked for the International Trade Centre UNCTAD/WTO, an agency of the United Nations in Geneva. Before joining ITC, Fernando was Director of Technology at a New York NGO where he led the development of eSight.org, a groundbreaking online community for the professional advancement of people with disabilities. Fernando has degrees from Georgetown University and Cornell University.

Mona Bradan



Dr. Mona F. Badran obtained her B.S.C. with high honors from the Faculty of Economics and Political Science, Cairo University in 1992. Then, in 2003, Mona completed her M.A. in Economics from Georgia State University in Atlanta, Georgia, USA, with a thesis titled “The Transition From Controlled to Open Spectrum Wireless Network in The United States Telecom Market”. She was awarded the Carol Keels scholarship based on Merit from the same university for her achievements in economics. Finally, she completed her Ph.D. at Cairo University, Egypt in 2009 with dissertation title "Competition in Telecom Services, a study on unbundling policies of local loop with an empirical study on broadband penetration in Egypt and some emerging countries". In 2007, Mona published a part of her dissertation "What determines broadband uptake in emerging countries, an Empirical Study" by the ITU and it was accepted, a modified version, for the IFIP conference in Dubai 2009. In 2008, Dr. Mona Badran received Cairo University's International Publications Award. Dr. Mona has been appointed as lecturer at the Faculty of Economics and Political Science, Cairo University, specializing in Telecom Economics. Currently, Dr. Mona Badran is engaged with Orange Labs as an economy and usage expert.

Hussein El-Gueretly



Hussein El-Gueretly is the CEO of Orange Labs Cairo, one of Orange's (France Telecom Group's) international R&D Labs, which aim at enhancing the group's capacity to deliver innovative services to the emerging markets, primarily in the Middle East and Africa region. He is also a member in the Board of Directors of National Bank of Egypt, the largest bank in Egypt. Prior to his current responsibilities, he has held a number of senior positions in multi-national IT companies, namely “Managing Director”, Oracle Egypt Ltd, “General Manager”, NCR Corporation, Dubai, and Marketing Director, AT&T Global Information Solutions, Middle East/Africa, out of Cyprus. Eng. Gueretly holds an MBA from McGill University and a Bachelor of Science from the Faculty of Engineering (Architectural Department), Cairo University.

Serge Ferré



Serge Ferré is Nokia's Vice-President, and Head of Nokia EU Representative Office in Brussels in charge of Nokia EU Affairs. Serge holds a Master degree in Law from Paris C. University, an MBA from University of Toronto, and a Finance and Certificate in Investment Banking. From 1985 to 1991, Serge Ferré worked at BANG & OLUFSEN France as Managing Director. From 1991 to 2003, he joined NOKIA France where he served as Managing Director, and Directeur Général. He was appointed in April 2003 Vice-President Strategy & Délégué Général Nokia France, until January 2007. Serge Ferré is also Knight in the Order of Arts & Lettres.

Ayman Ibrahim



Dr. Ayman Ali-Maher Ibrahim joined Orange Labs in Cairo in July 2008 as Head of Network Solutions & Techo-Economic Expertise. Before that, Dr. Ibrahim was with the National Telecommunication Institute as the Director of the e-Learning Center. Previous to this position, Dr. Ibrahim was with the French University in Egypt. He established and chaired the ICT Department, at the Faculty of Engineering. He was also the Chief Information Officer of the University. From 1999-2005, Dr. Ibrahim was leading the Mobility Architecture Team and was the Mobility Champion for Shell IT International, in the Hague, the Netherlands. He holds a Ph.D. in Multimedia Networks from the Ecole Nationale Supérieure des Télécommunications (ENST-Bretagne), France. Dr. Ibrahim was for several years a Lead ICT and human development advisor for several multinational organizations and NGOs.

Ashok Jhunjhunwala



Dr. Ashok Jhunjhunwala is teaching at IIT, Madras, where he leads the Telecommunications and Computer Networks group (TeNeT). This group works with industry in the development of technologies relevant to India. He also chairs the Rural Technology and Business Incubator (RTBI) at IIT Madras and the Mobile Payment Forum of India (MPFI). Dr. Jhunjhunwala is a Director in the Board of State Bank of India, TTML, BEL, Polaris, 3i Infotech, Sasken, Tejas, IDRBT, Tata Communications and Exicom. He is also a member of the Prime Minister's Scientific Advisory Committee.

Karl Jonas



Prof. Dr. Karl Jonas holds a diploma and a doctor of engineering degree in computer science from the Technical University of Berlin. In 1994, he joined the German National Research Centre for Information Technology (GMD), installing a research group for multimedia Internet services. In 1998, at the NEC research laboratory in Heidelberg, Karl focused his work on multimedia applications, multipoint services and mobility support for real-time applications. Since 2001, he is a professor for multimedia communication at the University for Applied Science in Bonn-Rhein-Sieg University, and head of the Fraunhofer FOKUS competence center for network research. He has participated in many ICT projects since the RACE program, and acted as task leader, workpackage leader and technical manager in FP6 and FP7. A focus of current

activities is the creation of a Fraunhofer International Center for ICT in Developing Countries.

Stéphan Martin



Stéphan is a Business analyst on New Growth Markets Development at Nokia Siemens Networks. His work revolves around understanding the dynamics and specifics of emerging markets under Nokia Siemens Network business program ‘Internet for the next billion’. He also supports the development of new solutions and business models targeting consumers in emerging markets, and contributes to multi-stakeholder co-operation. Stéphan holds an MBA from the Helsinki School of Economics, Finland, and a B.A. (Sociology & Development Studies) from the University of Sussex, Great Britain.

Charles McCathieNevile



Charles McCathieNevile has been Chief Standards Officer at Opera since 2005, and is responsible for Opera's leading role in ensuring that the best of Web development is available to the world in the form of open standards. With more than two decades of experience in both commercial and academic hypertext systems, his personal interests are broad but include accessibility of the web to all people from all devices, and better ways to make information help people reach more of their goals more easily. He is chair of the W3C WebAPI working group, and involved personally in several W3C working groups. Before joining Opera, Charles worked on the Staff of W3C. In his spare time, Charles is Vice President of the Iberoamerican Web accessibility group Sidar.

Eric Osiakwan



Eric Osiakwan is the executive secretary both of the African Internet Service Providers Association (AfrISPA) and Ghana Internet Service Providers Association (GISPA). He is a Visiting Fellow at the Berkman Centre for Internet and Society at Harvard University. He co-founded the Ghana New Ventures Competition (GNVC) and served as the project’s Chief Operating Officer for 2 years. From 2001 to 2003, he produced and presented “ICT World,” a radio program on the role of ICTs as a tool for accelerating the growth of Ghana’s economy and was invited by the government of Ghana to join the policy team that developed a framework for the Integrated ICT-led Socio-Economic Development Policy. Mr. Osiakwan published a research document on Ghana’s Internet Industry and co-wrote “The Internet in Ghana” with the Mosaic group. He’s also co-author of the Ghana Chapter of Negotiating The Net (NTN) – the Politics of Internet Diffusion in Africa and was invited by the Royal African Society to contribute ideas to Prime Minister Tony Blairs’ Commission for Africa.

Nii Quaynor



Nii Quaynor is the At-Large Director of ICANN chosen from the African region. He has played an important role in the telecommunications industry in West Africa by introducing Value Added Networks in the region through the introduction of the SWIFT, Internet and Commerce networks whilst building human resources across the continent. He is Chairman and Chief Executive Officer of Network Computer Systems. Nii established the computer Science Department at the

University of Cape-Coast in Ghana. He also is a member of the United Nations Secretary General Advisory Group on ICT, Chair and of the OAU Internet Task Force, Chairman of the AfriNIC, member of the Worldbank Infodev TAP, member of the ITU Telecom Board, President of the Internet Society of Ghana, and member of the Council of the University of Ghana. Nii received a B.A. in engineering science from Dartmouth College in 1972 and received a Bachelor of Engineering degree from Thayer School of Engineering in 1973. He obtained M.S. and Ph.D degrees in Computer Science in 1974 and 1977 respectively from State University of New York at StonyBrook.

George Sadowsky



George Sadowsky studied and taught mathematics at Harvard and received his Ph.D. in Economics from Yale. He worked as a mathematician and programmer, and headed computing centers at the Brookings Institution, Northwestern University and New York University. At the United Nations, he supported technical assistance projects and has worked in more than 50 developing countries. He has been a consultant to, inter alia, the U.S. Treasury, UNDP, USAID, W3C, the Swiss Government, and the World Bank. He has served on Boards of Applied Theory Corporation, educational networks CREN and NYSERNet, and the Internet Society where he directed ISOC's Developing Country Network Training Workshops. More recently, he was nominated member of the Board of Directors of ICANN. He has written and lectured extensively on ICT and development.

Jean-François Soupizet



Jean-François Soupizet is Head of the International Relations Unit in the European Commission's DG Information Society, and more particularly responsible for the World Summit of the Information Society and issues related to the digital divide. Before joining the EC, he occupied several positions in the French Administration and the Intergovernmental Office for Informatics (IBI) - an international organization based in Rome and working under the aegis of UNESCO. Jean-François graduated from the French National School of Statistics and Economic Administration (ENSAE -1969) in Paris, Doctor of economic sciences of the Université libre de Bruxelles (ULB - 2003). JF Soupizet is a member of Futuribles International, a French think tank. He has published several papers on information technologies in the context of development. Jean-François Soupizet is also the author of « La fracture numérique Nord Sud », published in October 2004 by Economica, Paris.

Joy Tang



Joy Tang is President, Executive Director and Board Chair of OneVillage Foundation. She holds a MA in International Marketing Communication. At Cisco Systems, she held positions in market development & sales. As a Cisco Fellow, she assisted in the development of low-income ICT program in the United States working with oneEconomy.net. In emerging markets, she aided the establishment of Teachers Without Borders. She now combines her diverse knowledge and experiences as a global community builder; connecting various multi-sector initiatives.

Rudi Vansnick



Rudi Vansnick studied economics at the EICS Enghien (Belgium) and started his professional career in the Belgian government and quickly became involved in the digitisation process of government administration. After a few years government he moved to the private sector, gaining experience in local as well as in international environments at various levels of company hierarchy. Since 2000, Rudi is very active in the Internet world through organisations such as ISOC (chair ISOC Belgium) and ICANN (member ALAC-EURALO). With a critical eye on topics as child protection on the net, cyber crime, domain name abuse and many other issues, he is often asked at national and international conference (FOSI, World Summit Award, Global Forum, WSIS Tunis, Internet Governance Forum). His expertise is gained by the World Summit Award, where is the national expert and member of the world grand jury selecting the 40 best e-Content projects across the world.



Brussels, Belgium
30 September 2009

DWF thanks the Gold Sponsor



for its generous support

THE DIGITAL WORLD FORUM (DWF) PROJECT

1. Short Project Description

Digital World Forum (DWF) on Accessible and Inclusive ICT is a FP7 European project focusing on the use of ICT to leverage economic development in Africa and Latin America.

The project explored how to take advantage of the new paradigm of low-cost technologies in broadband infrastructure, low-cost laptops, and mobile phones to bridge the digital divide and connect the unconnected.



The project's objectives were to make a state-of-the-art in the above mentioned domains, identify the challenges, and propose a roadmap to tackle them. A particular focus is on involving local actors from industry, research and academic communities and non-governmental organizations, who have field expertise and who will provide feedback on the key factors of adoption.



<http://www.digitalworldforum.eu>

2. Challenges of ICT Access, Nowadays



Mobile Web for Development

- 4+ billions of mobile phones subscribers in the world compared to 1.5 billions of Web users
- In Africa, 22% penetration rate of mobile vs 3% penetration rate of Internet
- Mobile phones as an ICT platform has a huge potential
- Early stories demonstrated that simple services on mobile phones can improve people's lives. Success stories exist in various domains, including health, agriculture, government services, human rights watch, education, etc.

However:

- Still a very limited number of services available at the worldwide level
- Still a very limited number of authors and service providers of mobile ICT services compared to the number of actors in the development sectors that could improve their impact by integrating mobile technologies in their work
- Still a very limited number of people having access to any mobile services compared to the needs



Low-cost Access Devices

- Personal Computers (PC's) are the most widely used vector of deployment of Internet and Web Access, in addition to being used as standalone or network computing or information access devices
- Not an affordable option for people in the developing world
- Low cost information access device initiatives exist (for example, XO created by the OLPC initiative)
- Numerous EU players working on components



Low-cost Broadband Infrastructure

While Africa as a whole is characterized by a very low penetration rate of fixed networks (e.g. 0.7% in Senegal, 3% in Cameroon), a significant and rising part of the population owns a mobile phone: 25% on average. Both the rurality of the population and its insolvency is acting as a brake upon prospective deployment of fixed infrastructures taking into account the huge investments necessary to install wired solutions. A growing set of alternative wireless technologies have emerged or are emerging and could be used to serve the local loop: WiFi, WiMAX, CDMA, HSPA, LTE, etc. These technologies raise hope for ambitious broadband access roll-outs through contained capital expenditure, so that a consensus has emerged that mobile broadband will take the mass market in Africa.

3. DWF Partners



In allowing any user with any device the freedom and power to use the Web anywhere and at any time, the W3C Mobile Web Initiative (MWI) is a key component of W3C's "One Web" vision. While mobile Web is bringing mobile telephony into convergence with the Web, MWI believes that the mobile Web in developing countries is a mean towards bridging the digital divide. More information at <http://www.w3.org/Mobile/>



Orange is the key brand of France Telecom, one of the world's major telecommunications operators. The Group's strategy, which is characterized by a strong focus on innovation, convergence and effective cost management, aims to establish Orange as the leading integrated operator in Europe and as a strong contributor to the development of telecommunications services in Africa. More information at: <http://www.orange.com/>



The oneVillage Foundation (OVF) sees the challenge and opportunity of using Information Communication Technology (ICT) to address World Urgent Issues, by providing a platform for an integrated approach to sustainable development known as the oneVillage Initiative. For more information: <http://www.onevillagefoundation.org/>



ERCIM ERCIM - the European Research Consortium for Informatics and Mathematics - aims to foster collaborative work within the European research community and to increase co-operation with European industry. Leading research institutes from twenty European countries are members of ERCIM. More information at <http://www.ercim.org/>



Kusamotu & Kusamotu is the Project Lead for Creative Commons in Nigeria in porting the Licences into local law. Creative Commons promulgates the utilisation of flexible copyright licences which aims to facilitate knowledge sharing and collaboration in all spheres including education and health. Kusamotu & Kusamotu specialises in Information, Communications, Technology and Intellectual Property Law. More at <http://www.kusamotu.com/>



The Council for Scientific and Industrial Research (CSIR) in South Africa is one of the leading scientific and technology research, development and implementation organisations in Africa. It undertakes directed research and development for socio-economic growth. For more information: <http://www.csir.co.za/>



Fundación Cibervoluntarios is a non-profit organization whose main objective is to use new technologies in order to solve social problems and empower people. We work day by day to promote that all people have the opportunity to access, understand and use New Technologies to overcome the digital divide and promote Knowledge Society. For more information: <http://www.cibervoluntarios.org/>

1. Mobile Web for Development



The aim of this section is to summarize the major findings of the Mobile Web for Development work (as part of the W3C Mobile Web Initiative, and within the DWF project) and give an overview of the different actions recommended. There are two major objectives: 1) identify challenges that are impacting either developers or users of mobile services and content, and 2) investigate the potential of existing technologies to meet (part of) these challenges.

The technologies considered in the scope of this document are split in three categories, depending on the type of infrastructure considered. Networks can actually offer up to three channels of communication:

- **Voice channel:** that's the channel used for person-to-person voice communications, and usable by voice applications
- **Signaling channel:** Mobile networks have a dedicated channel, called signaling channel, which is used to monitor network operations, and monitor activities on the other channels (voice and data). This is the channel used by [SMS](#), and also a lesser-known technology called [USSD](#), used e.g. for recharging prepaid subscriptions, or to get an account balance.
- **Data Channel:** the data channel is the channel used by most of applications to communicate with remote computers, and, in general, to access the Internet.

For each of the identified challenge in the roadmap, we investigate how it is handled by each of these categories of applications.

Future Directions to explore

For each of the challenges identified in the section 6.1 and 6.2, the roadmap identifies future directions to explore or actions to launch. Those actions are of three types: R&D actions, Support Actions, Recommendations.

1. R&D Actions

R&D actions are proposed for challenges that require further researches, investigations or standardizations. The R&D actions suggested in roadmap are:

- Building a community on the theme of interfaces for people with low-reading skill, and develop and standardize guidelines and best practices for such interfaces, in particular how to design meaningful icons

- Adding support to more languages: identify best language targets, develop guidelines for extending the number of languages supported
- Exploring new paradigm in user interface that could lower the impact of computer illiteracy such as widget stores
- Establishing micro-payment on the Web
- Developing off-line capabilities of Mobile Web Browsers
- Developing usability guidelines for Voice applications
- Developing usability guidelines and design principles for integrating ICT services in rural and underprivileged population without prior ICT experience
- Developing guidelines and best practices on how to build trust in service usage among targeted populations

2. Support Actions

The support actions are proposed for challenges that require actions of dissemination, capacity building or tools development. The support actions suggested in roadmap are:

- Raising awareness on the potential of mobile technologies in the entrepreneurs and NGOs communities
- Raising awareness on the potential of VoiceXML applications and building community around the theme of voice for Development
- Building capacities on:
 - Mobile technologies, at least SMS, VoiceXML, Mobile Web
 - Accessibility guidelines and how to design accessible content
- Identifying gaps in tools for the different technologies, and launch community open source development
- Developing further a comprehensive repository of resources with stories and use-cases with in-depth analysis and lessons learnt, and links to relevant tools for different tasks

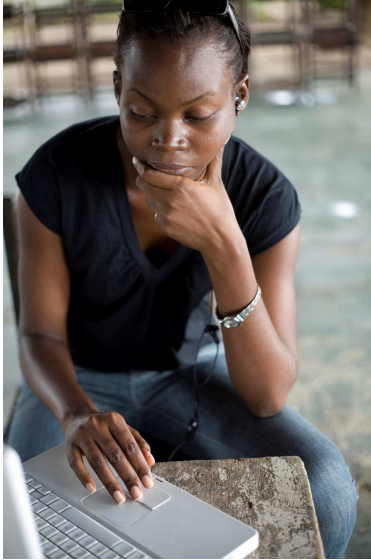
3. Recommendations

Recommendations are specific messages sent to specific actors or stakeholders of the domain. The roadmap makes the following recommendations:

- **Targeted at network operators**
 - Developing and extending Data Service, even low-bandwidth data service such as GPRS with a stable and reliable service at low-cost
 - Implementing Unicode support on signaling channel on all network
- **Targeted at handset manufacturers**
 - All handsets should have at least GPRS access and a J2ME/MIDP stack or a standards-compliant browser
 - Handsets should be extensible to support external/new character sets and to be usable in all languages of the world
- **Targeted at public authorities**
 - Considering the mobile platform as the most widely available option to deliver ICT services to people

- Developing policy framework that ease the work of potential service authors, particularly entrepreneurs
 - Developing policy framework that enforces availability of minimal data service at low-costs everywhere
 - Enforcing requirements on accessible and usable content for people with disabilities, with low-reading skills, or who speak a non-supported language
 - Building national or regional platforms to enable Voice services
- **Targeted at service developers**
 - Share, cooperate, collaborate and document work and projects so that the whole community could benefit from the experience of others. In that regard, before engaging in new projects, one should investigate what is existing and what extensions are needed, without redeveloping pieces that are already available
 - Implement and Rely on documented open data formats that would allow aggregation of information from different small systems as well as provide a global overview on what is happening locally

2. Low-cost Access Devices



This document presents the roadmap for application of and research into low cost information access devices (LCIAD). The term information access device is used as an abstraction of electronic devices that provide computing, communication as well as information storage and representation capabilities for people to use. Examples of existing information access devices, therefore, include personal computers (PCs); laptop computers, Netbook computers, and even mobile phones. Lowering the cost information access devices is seen as an integral element of facilitating bridging of the digital divide between industrialised and developing economies.

The target audience of the roadmap includes: researchers, innovators, manufacturers, designers, entrepreneurs, policy makers and socio-economic development agencies who are interested in the application of information and communication technologies (ICT) for socio-economic development.

The roadmap that is described in this document is premised on the view that the cost of general purpose information access devices is not yet low enough for massive diffusion into the developing world. It is through research, technology development and innovation that the cost can be lowered to the extent that larger proportions of people who live in the developing world can benefit.

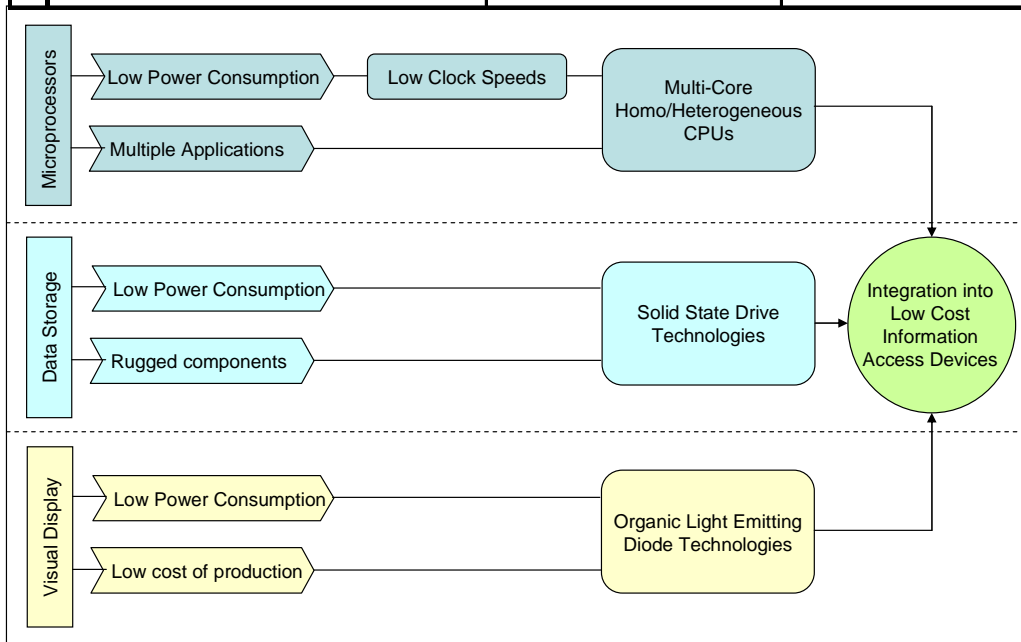
The processes of developing the roadmap involved the following steps:

- Analysis of the current state-of-the-art in low cost information access devices;
- Soliciting views of stakeholders of the low cost information access device domain, by questionnaire, and
- Gathering views of stakeholders through an electronic discussion forum administered via the project website, www.digitalworldforum.eu, to triangulate the results from the other two methods.

From the information that was gathering through the consultative process, a visionary context for lowering the cost of information access was defined according to following social, economic and political targets:

- Equitable availability and accessibility of information access devices between the industrialised and developing worlds;
- Sustainable improvement of the economic status of the developing world through trade and investments in ICT;
- Formulation and action on policies that facilitate collaboration on the creation, application and diffusion of ICT between the industrialised and developing world

	Trends	Driver	Vision
Social	<ul style="list-style-type: none"> High population growth Large proportions of population in rural areas Low literacy and education enrolment rates Limited employment opportunities in rural areas Limited public infrastructure, healthcare and education facilities Rapid growth of access to ICT through mobile telephony 	Enhancing human capacity through efficient and effective access to education, healthcare and economic opportunities	Equitable access and availability of information access devices
Economics	<ul style="list-style-type: none"> Robust economic growth in terms of GNI and GDP High growth in emerging IT services and IT-enabled services global industry Attracting foreign direct investment into local ICT industry Above average growth in export and import trade in ICT goods and services 	Global trade, foreign direct investment and local economic growth	Sustainable improvement of the economic status of the developing world through ICT
Political	<ul style="list-style-type: none"> Prioritisation of ICT in socio-economic development strategies Recognition of Science and Technology as the new paradigm of ICT for development Integration of ICT research in education, healthcare and business improvement initiatives 	Research, Technology Development and Innovation	Implementation of policies that facilitate international collaboration on ICT for development
Power Consumption	<ul style="list-style-type: none"> Usage undermined by low income per capita due to inefficient power consumption Usage undermined by limited access to power grids Harnessing alternative low cost power sources 	Equitable availability and accessibility of information access devices	Overall device power consumption of below 1 Watt
	Concerns about large carbon footprint due to inefficient consumption	International collaboration on ICT for development	
Production	<ul style="list-style-type: none"> Emergence of new device types that cost much less than conventional types A rapidly developing IT production and services industry in the developing world New approaches to lower the production and integration costs of computing components 	Equitable availability and accessibility of information access devices	Devices that are commercially sustainable at prices of less than US\$50
		International collaboration on ICT for development; and Improvement of economic status	



The social, economic and political targets were formulated into technology capability targets by considering the key factors of device cost that influence the accessibility and availability of information access devices in the developing world. Device power consumption and production cost were determined to be such key factors. Through detailed analysis of the state-of-the-art in information access devices the trends, drivers and technology development paths that can lead to further lowering of device costs were determined. The figure above summarises the roadmap that is the outcome of this process.

The following recommendations derived from the roadmap:

- **Researchers/Innovators:** it is recommended that technology researchers and innovators should focus on improving the power efficiency and production costs of information access devices. Further research into technologies such as low clock speed multi-core processors, solid state drives and organic light emitting diodes (OLED) should lead to improvements in the performance and cost of devices.
- **Manufacturers/Designers:** it is recommended that designers of components and complete information access devices should focus on lowering production costs to the extent that the devices can be produced within the localities of developing countries.
- **Entrepreneurs:** it is recommended that entrepreneurs should also look out for IT-enabled services that may be enabled by the wide accessibility and availability of low cost information access devices.
- **Donors and socio-economic development agencies:** It is recommended that donors and socio-economic development agencies should consider carefully the operational costs of devices when they fund diffusion into poor rural areas as these could undermine the effectiveness of their initiatives.

Policy makers: it is recommended that policy makers should continue to formulate policies that encourage the creation, application and diffusion of low cost information access devices for socio-economic development.

3. Low-cost Broadband Infrastructure



The goal of this document is to leverage the main findings of Digital World Forum's 3rd work package, with a view to defining relevant initiatives to be undertaken in the next few years, so that broadband Internet can be deployed on a large scale in Africa and Latin America. More specifically, the document aims to elaborate on a number of recommendations for local stakeholders, and research directions to be explored in the near to medium future.

Recommendations for infrastructure sharing from the point of view of different stakeholders:

Infrastructure sharing is the means to expedite the migration to mobile broadband access to the Internet, and to promote the universal access to ICT networks. It offers affordable both fixed and mobile broadband services by reducing construction costs. In light of under-developed markets and the high costs associated with network deployment, carefully crafted sharing policy recommendations can introduce new forms of competition into the market and stimulate demand for ICT services.

The following recommendations widely rely on the ICT Regulation Toolkit¹, a joint production of infoDev and the ITU which is authoritative in the domain. It is to be noted that while these recommendations are of a generic nature, the core of the document goes into the practical and technical details of infrastructure sharing.

Stakeholder	Recommendations for infrastructure and CPE sharing
National policy-makers	<ul style="list-style-type: none"> • Introduce incentives for infrastructure investment; • Endorse enabling regulations to facilitate the build-out of national infrastructure; • Revise licensing and interconnection policies to enable open access; • Coordinate with other government departments to ensure that the country's non-telecommunications infrastructure can be leveraged to facilitate telecommunications network deployment; • Reflect on a policy to separate the retail and wholesale functions of network infrastructure.
Local governments	<ul style="list-style-type: none"> • Support telecommunications operators to gain rights of way and access to poles; • Ensure information related to target sites is publicly available.

Regulators	<ul style="list-style-type: none"> • Engage in consultation processes to assess the market need for open access, propose open access rules; • Implement licensing/authorization frameworks to allow open access; • Improve transparency requirements for operators to publish relevant information for infrastructure sharing; • Determine where essential facilities are, make this information publicly available, and explore the option of duplicating these facilities; • Create websites that indicate the location of towers and other sites that may be suitable for infrastructure sharing.
Service providers	<ul style="list-style-type: none"> • Assess the business case for sharing as compared to operating a wholly-owned network; • Cooperate with other operators on information sharing (nature of facilities available for sharing) and operational implementation; • Work closely with CPE vendors on developing tailored CPE's for shared market; • Agree with CPE vendors on a relevant billing method related to actual end-user's utilization.

The following recommendations for regulators and policy makers address the issues related to international bandwidth and local contents:

- Promote the end of monopolies on bandwidth; decrease the cost of licenses and all types of fees and taxes paid by cyber-café's and ISPs.
- Revise the licensing scheme to match the era of convergence of services.
- Increase the number of (International Exchange Points) IXPs to boost the production of local content-related services.
- Identify the needs that can be satisfied through internet use. Some features of African countries can help anticipate these needs. These features include the dominance of youth population, high unemployment rates and the dependence on limited types of activities for living.
- Develop solutions enabling "infopreneurs" (ICT-enabled entrepreneurs) to use the Internet to send information to mobile users (through SMS or voice messages). Such information can include health information, finance and currency exchange rates, etc.
- Promote solutions based on shared access, such as cyber café's or other public points of access, to keep access costs per user down.
- Encourage regulatory practices that serve the deployment of m-commerce and m-payment solutions. These solutions need close coordination with banking and financial regulators, often including the nation's central banks.
- Support the idea of Village Phone (mobile phone used collectively), and develop more content-based uses for it. Solutions that support pricing, billing, and information security must be developed for these use cases.
- Encourage all practices that boost the upgrade of mobile phones, to increase people's ability to access internet and use m-content services, including the support of second-hand phone markets. Regulators can support operators' programmes to replace subscribers with more advanced units.

1. Recommendations for regulators and policy makers concerning the Digital Divide:

The unprecedented amount of spectrum which will be freed in the switchover from analogue to digital TV, known as the Digital Dividend (DD), opens the door for various kinds of technologies to be introduced for new services. While a growing set of wireless technologies have emerged or are emerging which could be used to serve the local loop (WiFi, WiMAX, CDMA, HSPA, ...), the recent trend is increasingly favoring LTE as a new technology to be deployed in the freed spectrum, giving African operators the opportunity to leapfrog from 2G to 4G in mobile communications.

Our recommendation is that African Regulators should seriously explore the benefits of the Digital Switch Over (DSO). Although the DSO in general entails large costs in the transition from analogue to digital broadcasting, these costs are, however, borne in the beginning of the migration and, once paid for, the additional transitional costs will not be high. Actually, licenses for new services in the freed spectrum will provide additional revenues, as new revenue streams for the African countries.

2. Recommendations for policy makers and industry players concerning energy efficiency:

Two (complementary) approaches are possible when addressing energy issues in emerging markets. The first approach consists in multiplying and diversifying energy sources and storage capacities. Another perspective consists in minimizing energy consumption. In both domains, promising R&D work has been undertaken, and further significant research challenges are looming.

Recent cost reductions on solar modules raise hope for a rapid uptake of solar electricity production on a global scale. As regards storage techniques, notable progress has also been made recently, with lower-cost batteries capable of absorbing large amounts of electricity, as is required in the case of solar energy. It is our recommendation that operators and manufacturers should endeavour to get involved in future R&D programmes steered by solar cell manufacturers and battery makers, so as to take swift advantage of future progress that will be made in these fields.

Next generation base station equipments can drive down power consumption significantly. In the medium term, through intensive R&D efforts, it is possible to envisage the reduction of base stations' power consumption to few tens of Watts, enabling them to be powered solely based on renewable energy sources. As regards the improvement of the cooling function, innovative cooling techniques, as well as high temperatures electronics, are two very interesting R&D challenges. Another very promising research track is related to energy-efficient radio resource management algorithms (RRM).