Internet Governance: exploring the development link

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Communications Strategies

June 2005

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Abstract: This paper seeks to explore the issues of Internet governance from a development perspective. The WSIS process and the report of the UN Working group on Internet Governance provide an initial framework within which to develop the issues. These issues not only concern the equitable distribution of Internet resources and the ways in which a secure and reliable function of the Internet can be achieved, but also include issues of multi-lingualism and local content as well as the institutional setting of Internet governance mechanisms and participation. The paper observers that realising the contribution of the Internet to development goals requires a shift in policy focus away from supply side initiatives in the telecommunications sector to more co-ordinated approaches.
Key words: Internet governance, development, Internet resources, access

As a result of its rapid diffusion and growing use, the Internet has become an increasingly significant medium for economic and social development. Whilst much of the euphoria of the dotcom bubble, especially for many investors, still appears to have been short-lived, there exists an increasing body of evidence, from a wide range of countries that clearly demonstrates the force of the Internet as a platform for economic and social development. As a consequence, the Internet has become an icon in the development liturgy, especially where the framework is that of an information society.

Here, the Internet is seen as being the key medium in bridging the many divides that weaken the impact of development projects, whether it is access to information (such as in e-health projects, e-education), or giving greater visibility to prices in a market or allowing access to new high income markets, as well as introducing new levels of political accountability. The

(*) The author wishes to acknowledge the considerable support of Don MacLean in shaping the structure of this paper. The author also wishes to thank members of the WGIG for their support and encouragement in preparing this paper.

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Internet is offered up as a tool with which it is possible to overcome the tyranny of geography and asymmetric information, to assert greater power of primary producers over the intermediaries and, to increase the transparency with which government and private sector organisations operate. Ultimately, the Internet has become a powerful medium for delivering economic and social development.

Given this perspective, access to and the factors shaping the use of the Internet are central features of the development debate and, in particular, the debate about Information and Communications Technology (ICT) and development. As a consequence, the circumscription of the ICT and development debate around the specific issues of telecommunications sector reform and private sector investment is profoundly misguided. Increasingly contemporary ICT policy frameworks need to be based on concepts of Internet Governance rather that vertical policy silos, such as fixed telephony, mobile telecommunications and broadcasting. However, Internet governance is a complex policy domain involving not only a wide range of national policy issues, but also international policy processes, including those where there are clear issues of extra-territoriality.

This paper seeks to examine two key areas of Internet policy development and issues of development. The first area is to review the work of the UN Working group on Internet governance and development of these issues within WSIS. The second area is to look at a number of the key issues and their impact on certain elements of the debate on access to and use of the Internet within developing countries. Here, the paper comprises four sections, (i) institutional arrangements for the equitable distribution of Internet resources and a stable and secure functioning of the Internet, (ii) Internet access and international transit arrangements (iii) safe and reliable Internet and network security and (iv) multilingualism and local content.

■ WSIS and Internet governance

The antecedents to WSIS are many. Yet all focus on the centrality of ICTs in the development process and, in effect, the additionality that is provided by ICTs when they are integrated into the development process. The UN ICT Taskforce locates ICTs at the centre of the development process and thus declares, in its guiding principles, that: "Everyone can

benefit from the opportunities that ICTs can offer" [1] and that this means improving access, enhancing connectivity and promoting equal opportunities derived from universal access [2].

The overall goal of the WSIS process is to harness the development of the Internet and other information and communication technologies (ICTs) to sustainable global development goals – particularly the Millennium Development Goals (MDGs) [3]. The work of the UN Working Group on Internet Governance (WGIG) needs to be interpreted within this broader development context and hence the debates on Internet governance within WSIS are more than a debate about the institutional structures that govern the Internet. The WSIS process also places emphasis on the inclusion and active participation of a diversity of stakeholders, including governments, the private sector and civil society.

However, the political realities of the WSIS during the first phase, which culminated with the summit in Geneva in December 2003, meant that a number of key issues were left unresolved. Of note were the issues of financing ICT for development and the question of Internet governance. Unlike the financing task force the Working Group on Internet Governance was set up under the auspices of the UN Secretary General, and not under the Chair of WSIS.

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[1] Extracts from the UN ICT Task Force Principles:
"19. We are resolute in our quest to ensure that everyone can benefit from the opportunities that ICTs can offer. We agree that to meet these challenges, all stakeholders should work together to: improve access to information and communication infrastructure and technologies…
21. Connectivity is a central enabling agent in building the Information Society. Universal, ubiquitous, equitable and affordable access to ICT infrastructure and services, constitutes one of the challenges of the Information Society and should be an objective of all stakeholders…
28. We strive to promote universal access with equal opportunities for all to scientific knowledge and the creation and dissemination of scientific and technical information, including open access initiatives for scientific publishing."

[2] http://www.unicttaskforce.org/about/principle.asp.

[3] Para 1 of the WSIS Declaration of Principles: "declare our common desire and commitment to build a people-centred, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights".

The WGIG mandate

The negotiators at WSIS-I asked the UNSG to set up a working group with a mandate to: "Investigate and make proposals for action, as appropriate, on the governance of the Internet", inter alia by:

- developing a working definition of Internet governance;
- identifying the public policy issues relevant to Internet governance;
- developing a common understanding of the respective roles and responsibilities of governments, existing intergovernmental and international organizations and other forums, as well as the private sector and civil society of both developing and developed countries;
- preparing a report on the results of this activity to be presented for consideration and appropriate action for the second phase of WSIS [4].

Although WSIS-I was unable to conclude negotiations with regard to Internet governance coordination and action lines, the Declaration of Principles (DoP) adopted by the Geneva phase of the summit nevertheless contains provisions that largely answer the question of "who should govern the Internet and why?" In particular, the DoP sets out three frameworks that WGIG has used to structure its debates and open consultations; of particular note are paragraphs 48 and 49.

Paragraph 48 asserts that:

> "The Internet has evolved into a global facility available to the public and its governance should constitute a core issue of the Information Society agenda."

The paragraph then argues that:

> "The international management of the Internet should be multilateral, transparent and democratic, with the full involvement of governments, the private sector, civil society and international organizations."

Finally, the paragraph states that that Internet governance:

> "… should ensure an equitable distribution of resources, facilitate access for all and ensure a stable and secure functioning of the Internet, taking into account multilingualism".

Paragraph 49 states that:

[4] Source: Para 13 WSIS Action Plan.

> "The management of the Internet encompasses both technical and public policy issues"

and goes on to specify the roles that States, the private sector, civil society, intergovernmental organizations, and other international organizations should play in Internet governance. The text is important as it specifically says:

> "The management of the Internet encompasses both technical and public policy issues and should involve all stakeholders and relevant intergovernmental and international organizations. In this respect it is recognized that:
>
> a) Policy authority for Internet-related public policy issues is the sovereign right of States. They have rights and responsibilities for international Internet-related public policy issues
>
> b) The private sector has had and should continue to have an important role in the development of the Internet, both in the technical and economic fields
>
> c) Civil society has also played an important role in Internet matters, especially at community level, and should continue to play such a role
>
> d) Intergovernmental organizations have had and should continue to have a facilitating role in the coordination of Internet-related public policy issues
>
> e) International organizations have also had and should continue to have an important role in the development of Internet-related technical standards and relevant policies."

The WGIG working procedures, working papers and results of the open consultation process have all been made publicly available (www.wgig.org). Although an agreement was reached towards the end of its activities, the WGIG produced a working definition of Internet governance as:

> "Internet Governance is the development and application by governments, private sector and civil society in their respective roles of shared principles, norms, rules, decision making procedures and programmes that shape the evolution and use of the Internet." [5]

Using this broad definition of Internet governance, the working group clustered Internet-related public policy issues into five groups, in recognition of the fact that different kinds of governance solutions are likely to be required in different areas [6]. The five clusters are [7]:

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[5] WGIG Report, July 2005, www.wgig.org.

[6] For a fuller discussion of the working of the WGIG, see for example, MacLEAN, 2005.

- issues related to physical infrastructure (i.e. mainly ITU-related issues),
- issues related to logical infrastructure (i.e. mainly ICANN-related issues),
- issues related to the use and misuse of the Internet, such as spam, and information and network security,
- issues that have Internet-related aspects, but are much broader in scope, such as intellectual property rights, trade and commerce, privacy, and freedom of expression,
- development-related issues, including human, financial, and technical capacity-building, which cut across the other four clusters.

In many ways the debate within the WGIG process reflected the divisions that prevented the WSIS-I from reaching a consensus. However, although it is too early to evaluate the success of the WGIG, it has sought to enlarge the 'middle ground' whilst not attempting to negotiate common ground between differing opinions.

Throughout the discussions the question of the legitimacy of the existing Internet governance arrangements continued to be of central concern, and in particular, there was a focus on issues surrounding the legitimacy Internet governance arrangements, which centred on ICANN (Internet Corporation for assigned Names and Numbers) and the contracts issued by the United States government (USG) for the 'management' of the Internet. Questions over the legitimacy of the existing arrangement brought into focus the need for greater co-ordination between existing institutions, particularly at the international level, and a need for greater accountability on the part of existing institutions. As part of the reflection on the need for greater co-ordination, the WGIG raised the need for a broad policy forum that would include all stakeholders and become a formal mechanism whereby the Internet community would surface and debate key public policy issues. Whilst the institutional setting of such a forum remains ambiguous, there was a strong preference for the forum to be hosted within the UN and a significant number ofsome members WGIG members were in supportive of favour of the ITU hosting such a policy forum.

In terms of increased accountability, the debate largely focused on an 'oversight' function for ICANN and the extent to which its decisions are subject to review. In some ways this oversight function would act as a

7 See detailed analysis in the WGIG Background Paper, July 2005, www.wgig.org.

substitute for the existing contractual arrangements between the USG and ICANN. For some members of WGIG this review committee would, in effect, crystallise a more formalised role for the GAC (the Government Advisor Committee) and the adoption by such a group of a number of functions including auditing and arbitration. For others the oversight committee would be a full treaty based inter-governmental organisation, while for others, at the other extreme a forum whereby accountability and audit would be exercised through transparency of process and multi-stakeholder inclusiveness. The role of such a review committee in shaping actual ICANN policy and becoming a mechanism for increasing inter-governmental involvement in Internet governance remains controversial [8].

The development of Internet governance mechanisms
A historical perspective

The current debate over Internet governance and public policy issues cannot be separated from an understanding the history of the Internet. However, there is no single history of the Internet. The ever-changing interplay of technological, economic and social forces that have shaped the development of the Internet means that its history is being redefined and rewritten. Furthermore, an understanding of the history of the Internet is also determined by the central unit of analysis. Conventionally history has been written in terms of timelines (for example, Hobbes), but other approaches have adopted the perspective of key individuals (an approach that seems especially insightful in tracking early developments) [9] or that of the role of institutions. Clearly these histories are interwoven and, in the final analysis, cannot be separated. However, it is interesting to note that, to date, very little attention has been paid to the history of the Internet in terms of the treatment of public policy issues.

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[8] It was recognised throughout the WGIG process that a reality check would always be provided by the United States Government with regard to its Prepcom 3 negotiating position and its view as to fundamental questions about the efficacy of Internet governance mechanisms and questions of their legitimacy - information that was never provided beyond the comments in open session at the WGIG consultative meetings in Geneva.

[9] The Internet Society offers up several histories of the Internet, many of which have been written by individuals who now have iconic status, including Barry M. Leiner, Vinton G. Cerf, David D. Clark, Robert G. Khan, Leonard Kleinrock, Daniel C. Lynch, Jon Potsel, Lawrence G. Roberts, and Stephen Wolff. See for example, (www.isoc.org/Internet/history).

In the early years of its development the Internet community coalesced around a few key individuals and working groups, where frequent technological developments were freely made available to the community ensuring their rapid diffusion. In many ways this was a relatively homogenous group in which user interests were closely aligned to the development of technology and in which policy subsumed and resolved within technological debate and the decision-making process. Thus, for example, the design rules promulgated in 1973, "Contemplated a total of 256 networks" (Vinton Cerf, 1993) so to resolve the increasing pressure on the address space as the number of networks expanded Class A, B, and C addresses were invented – a technological solution to a policy problem.

However, the close knit Internet community also was unable, not unreasonably at the time, to anticipate how technical solutions would lay the foundations of some of the major public policy issues today. Thus, for example, the designation of email addresses and the associated standards, in particular SMTP (simple mail transfer protocol), made no attempt to provide guarantees that the sender was who they purported to be.

The original technical and institutional settings of the Internet meant that trust was conferred on an individual user not within the technical structures of the network, but by the social and institutional considerations, such as an enforceable acceptable use policy (AUP), peer group pressure, the association with specific organisations and its funding mechanisms for supporting Internet development. These social mechanisms for building trust within the Internet community ensured that basic issues of user verification and authentication were secondary in designing basic email protocols. The result was that:

> "Forgery was (and still is) very easy to be exploited by viruses and worms, and by security frauds and spammers forging identities" (PETER, p. 18).

Likewise, the incorporation of the American Standard Code for Information Interchange (ASCII) into the design of the DNS was seen as non-contentious. The research community decisions merely reflected the realities of the linguistic traditions of the community (i.e. the dominance of English language) and the efficacy of ASCII in handling communications in English and other European languages.

The invention of TCP/IP can be seen as interlinked to other debates about understanding network architectures, most importantly the debate about the layered model of OSI (Open Standards Inter-Operability). The

promotion of OSI [10] by governments played a significant part in redefining the understanding of networks and the separation of the physical, logical and application layers in a network. This division of the network into layers has slowly created different communication markets and encouraged innovation at different layers. A contemporary reflection of this layering of the network is in the development by telephone companies of NGNs (next generation networks) and the creation of an independent services (applications) layer, including voice. These layers are beginning to be provided by different firms in the market and accordingly priced differentially.

The institutional setting of the Internet has evolved in light of the ever-changing technical options and demand. The original institutional structure was an integral part of the US Department of Defence (DoD) under its research programme, DARPA (Defense Advanced Research Projects Agency). As it became clear that this research network was of broader significance to the research community in the USA, and to a wider international community of academic researchers, so the institutional setting of the Internet moved from DoD to the US National Science Foundation (NSF). Under the auspices of the NSF the Internet began to take on genuinely global characteristics and the intrinsic ability of the network to facilitate new forms of communication between people started to gain commercial significance. The success of the NSF in managing the globalisation of the Internet during the late 1980s also laid the foundations of the commercial Internet as we understand it today and thus the need for the renewal of its institutional setting. The management of the Internet was handed over to the US Department of Commerce (1994-1995) who, in turn, sought to reorganise the governance mechanisms, in particular with the use of public private partnerships based on contracts. The three key contracts are with ICANN (for the DNS) and two with Verisign (for the management of .com and the root servers file). These arrangements established by the Department of Commerce are at the heart of the contemporary debate about redefining the mechanisms for Internet governance.

Finally, the rapid and early diffusion of the Internet across the globe was, in part, a result of the growth of community networks and the actions of civil society; a phenomenon that underpins the contemporary claim by civil society to be a part of the multi-stakeholder environment. Coupling the

[10] OSI comprises seven layers, namely (i) physical, (ii) link (iii) network (iv) transport (v) session (vi) presentation (vii) application. TCP/IP can be seen, within the OSI framework, as a layer 3 standard.

relatively low cost and power of personal computers with the communications capability of the Internet created new models for networking. Early pioneering 'community' networks include Fidonet, community networks, Freenets (where the disseminators of information paid for free access for end-users) and activist networks (global communities of interest). A pioneering activist network was the Association for Progressive Communications, an amalgamation of PeaceNet, Econet (both centred in San Francisco) and GreenNet in the UK. As commented by Peter:

> "By the end of 1992, largely due to the pioneering efforts of people like Carlos Afonso in South America and Mike Jensen and Karen Banks in Africa, close to 100 countries were connected to activist networks – just a few more countries than the more mainstream academic and research networks." (PETER, p. 27).

As with all histories, there are folktales and myths. Many of these are unfounded, most notably the ideas that the Internet was designed to ensure that the military command and control systems in the USA survived a nuclear attack; that the Internet has prospered because governments have not been involved and that the Internet is decentralised. However, what does emerge from these varying histories of the Internet is that the importance of a robust, multi-faceted and effective policy community is central to the effective development of the Internet. However, as the policy issues surrounding the development of the Internet increasingly become more clearly defined as public policy issues, so the contemporary structures of Internet governance and the technological approach to problem solving have become increasingly subject to question.

■ Development issues and Internet governance

Increasingly it is being recognised that access to ICT resources, including the Internet, is paramount to empowering all citizens to self-determine their lives in economic, political, social, cultural and environmental sectors of society. Hence, for many, particularly the debate within WSIS, access and use of ICTs, including the Internet, is becoming fundamental to the delivery of the MDGs. From the early work of the Maitland Commission (1985), The Missing Link, there has been a concern that differentiated access to ICT resources is reinforcing a 'digital divide,' a structural divide between developed and developing countries, and within a country between urban and rural communities, rich and poor, young and old, able and disabled and

women and men. Whilst there is some criticism of this perspective, see for example, KENNY (2002), and/or of the mechanism to address this divide, especially in the policy arena, see for example MacLEAN, SOUTER *et al* (2002), addressing the digital divide has long been a policy priority for the international community as well as national governments.

Within the context of WSIS the link between the evolution and use of the Internet, Internet governance and economic and social development is articulated in the Declaration of Principles (*op. cit*). The implication of this commitment in the DoP is to enable: "Individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life". Hence not only are there myriad issues within this development framework, but also many of the issues are cross-cutting in nature and therefore manifest themselves in other policy debates. Issues of concern include [11]:

- facilitating participation of all in the 'information age',
- promoting national economic, political and social cohesion,
- supporting information and communication rights for all,
- reducing urban-rural disparity,
- contributing to poverty alleviation,
- taking up challenges posed by global technological and economic trends,
- preventing the marginalisation or people and communities from the global networked economy,
- delivering on economic and social developmental objectives.

However, one of the overarching concerns is with access. At one level access refers to the terms and conditions under which countries, firms and individuals gain access to the Internet. These terms and conditions not only include the immediate conditions such as the availability, quality and cost of access and the capability of users to exploit the Internet, but also a wide range of institutional issues.

Such institutional issues include the processes by which critical Internet resources managed, the security and safety of the Internet and its users, as well as Internet relates aspects of other debates, for example trade, intellectual property rights and consumers rights.

[11] This list follows the work of WGIG and the background papers.

Institutional arrangements for the equitable distribution of Internet resources and a stable and secure functioning of the Internet.

For many developing countries the twin objectives of the equitable distribution of Internet resources and a stable and secure functioning of the Internet are not perceived as current realities; hence the clarion call of some in the Internet community who argue 'it ain't broke don't fix it' is seen by many in the developing countries as the articulation of a particular view of Internet governance that perpetuates the existing elites.

In terms of the equitable distribution of Internet resources the current mechanisms around the governance of the domain name system, IP addresses and the operation of the root servers have become the focal point of much debate, especially for developing countries. For some the allocation of Internet resources by market-based mechanisms is seen to be highly effective; for others the opposite is the case.

The existing system, however, is predicated on the assumption that at any one time all players have an equal capacity and equal resources to engage in and seek critical Internet resources. Hence the allocation system is one of adjudicating between competing proposals, all of which, in principle, are founded on broader similar capabilities and information symmetries. Such conditions are rarely met, thus raising questions of how to balance market-based mechanisms with those that prioritise public interest issues.

Despite the complexity of the institutional map of the Internet, the focal point of this debate on the equitable distribution of resources has been focused on ICANN (the Internet Corporation for Assigned Names and Numbers).

Technically ICANN is a company established under Californian law as a non-profit organisation and operates under a contract from the US Department of Commerce. The by-laws of ICANN explicitly exclude the rights of governments to have direct involvement in its operations and this restriction for example precludes any government representative becoming a board member of ICANN. For those who argue that ICANN has effectively assumed responsibility for a set on international public policy issues the current institutional setting of the organisation in increasingly untenable. The argument is that, as the number of users grows, so the separation of an Internet user community from a broader political polity, the exclusion of

governments from issues of Internet governance and questions about the legitimacy of ICANN and its accountability increase [12].

However, the modus operandi of ICANN seeks to aspire, albeit informally, to the WSIS principles of being multilateral, transparent and democratic and ensuring the involvement of governments, the private sector and civil society. Thus, at a pragmatic level ICANN can, in many ways, be seen as a remarkable organisation that has consistently transformed itself to meet the challenges of a rapidly expanding Internet. It has created an environment where those who can contribute to substantive debate are able to do so without the cost often associated with attending and participating in international meetings. However, for some it remains a California company undertaking task on behalf of the government of the USA.

There is growing momentum around changing the structure, constitution, by-laws and organisational nature of ICANN. Given that the contract between the US DoC and ICANN expires in 2006 the status quo is unlikely to be maintained. Whilst not the basis of full international consensus, there is increasing support for three broad areas of reform, namely (i) increasing the role of governments through changes in the Government Advisory Committee or something comparable, (ii) the establishment of an open policy forum which would seek to identify and define key public policy issues and (iii) greater co-ordination between existing international agencies coupled with an understanding that there is no need for a new international and inter-governmental agency.

For developing countries there are a number of significant issues in ensuring the fair and equitable distribution of critical Internet resources. Whilst at one level the exact institutional arrangements surrounding ICANN and the nature of the policy forum and the review committee are of some concern, the actual process by which resources are allocated is of material importance. In some ways these issues are well illustrated by the migration to IPv6, which represents a major issue for developing countries, not only in terms of the assignment and administration of the address space, but also in terms of the transitional arrangements. The arrival of IPv6 presents a number of potential challenges to operators and networked enterprises,

[12] Outside the scope of this paper are key questions about the nature of the behaviour of ICANN in certain circumstances, such as (i) to what extent does ICANN act as an agent of the US government, (ii) what happens to ICANN if it were to become insolvent. In the latter case preliminary opinion suggests that there is considerable ambiguity about the formal ownership of domain names.

especially those in developing countries. The key challenges not only involved access to and use of critical Internet resources, but access to new investment funds and the ability to establish new business models

Internet access and international transit arrangements

Access to the Internet is a function of national telecommunication policy, especially as it pertains to consumers. However, access to international connectivity and transit services for end-to-end connectivity throughout the entire Internet community is a major issue for developing countries. The significance of the issue has been recognised with WSIS, for example the Action Plan (Clause 2. 9. k) notes that:

> "Internet transit and interconnection costs should be oriented towards objective, transparent and non-discriminatory parameters."

All ISPs have to buy transit services in order to provide end-to-end connectivity for their users, in developing countries these transit services involve the purchase of significant international capacity and the associated commercial arrangements are redefining the traditional relationships between carriers that have and underpin the flow of international voice traffic. Although the international voice settlement regime based on cost and revenue sharing agreements based on traffic flows is being reformed, the arrangements still result in a net flow of revenues into developing countries. The ITU has estimated that between 1992 and 1998 the North-South flow of money through the international settlement regime was around USD 40 billion.

With international Internet circuit arrangements, the cost sharing arrangements are considerably different, based on a so-called "full-circuit" model. The rationale is that the any ISP needs to purchase 'transit' from its suppliers in order to provide any-to-any connectivity across the Internet. Hence an Internet Service Provider in a developing country wishing to interconnect to the global Internet must buy transit services and thus typically pay for the full costs of international leased line circuits to backbone providers. As a consequence, the ISP bears the full costs of both inbound and outbound traffic onto its network [13].

[13] At ITU, Study Group 3 of the Telecommunication Standardization Sector (ITU-T) has carried out extensive investigation and discussions on international Internet connectivity since 1998. In 2000, ITU-T Recommendation D.50 was adopted, representing a delicate balance between

The situation is further aggravated by poor telecommunications infrastructure in some developing countries (e.g., landlocked countries, isolated island states and others without direct access to undersea cables), lack of economies of scale (e.g., in the least developed countries - LDCs) and poor interregional links (e.g., Africa). The result is that international bandwidth is also used to exchange traffic that could, with better infrastructure available, have stayed on national or regional networks. For example, Internet traffic between two African countries often transits via Europe or the United States. The result is that international Internet connectivity can be a significant cost for service providers in developing economies and this is inhibiting the growth of Internet usage in much of the developing world, particularly the LDCs. The concern is that, if the cost of Internet access is higher in developing countries, then the digital divide will grow wider.

The underlying drivers for this realignment in the costs of access for international transit and connectivity services are manifold. The international arrangements that currently apply to global Internet interconnections have emerged not only from the historic development of the Internet (US and European centric) and its technical characteristics (such as the dynamic paths and multi-homing), but also from business models and the dynamic economies of major Internet operators. Thus, part of issue is reshaping the business models of ISPs. However, several key drivers can be identified of which perhaps the most important are the volume and nature of Internet users within a country, the nature of local content, the relatively transactional cost of using Internet resources in other countries to support a wide range of Internet applications and national and regional market for exchanging Internet traffic. Empirical evidence shows that policy interventions that stimulate increase the number of Internet users (for example, by encouraging the use of relatively low cost WiFi access networks), local content and local exchange of Internet traffic reduce the cost of international transit and connectivity. This solution has been recognised within WSIS and the Action Plan (C2. 9. j) notes:

> "The creation and development of regional ICT backbones and Internet exchange points, to reduce interconnection costs and broaden network access."

diverse interests. It calls for arrangements to be negotiated and agreed upon on a commercial basis, taking into account the possible need for compensation for elements such as, inter alia, traffic flow, number of routes, geographical coverage and the cost of international transmission.

In terms of consumer access to the Internet the key issues are not just the availability, quality and cost of the telecommunications infrastructure but also two other related issues; firstly, the availability and affordability of relevant consumer technologies and capacity to use such technologies and, secondly, the nature of demand and supply of information. Some preliminary evidence from Southern Africa suggests that in rural areas the demand for data, using SMS texts as proxy measure, show that the levl of demand may be just 5% around of that in urban areas [14]. In many ways national ICT policy frameworks seeks to address the first issue of increased service availability but fail to address in a coherent manner issues related to the adoption and use of Internet technologies and services.

In developing countries, however, access to basic telecommunications infrastructure remains one of the major constraints to Internet access. Current best international best practice demonstrates that a strengthened role for the private sector in increasing access through a blend of market liberalisation and pubic policy interventions, for example through the use of 'smart subsides', addresses the need for increasing access to basic telecommunication services [15]. The conceptual differentiation between a 'market' gap and 'access' has enabled many consumers to rapidly enjoy the benefits of telephony, often through the rapid diffusion of mobile networks. However, in terms of translating this increased access in telephony into increased access to the Internet and, in particular access to broadband services is not a straight-forward, linear relationship. Thus for many developing countries there remains a significant public policy issue in terms of the availability, quality and cost of broadband services.

However, whilst there are many new 'last mile' technologies, such as those based on wireless, there is an emerging bottleneck with developing and between developing countries in terms of the capacity and quality of backbone networks. As with consumer access to Internet services, so it is widely recognised that in many cases the market provides an effective solution to the development of backbone infrastructure and the removal of regulatory restrictions can lead to significant new investments. Furthermore, policy measures can encourage the development of Alternative Telecommunications Networks (ATNs). Many countries have extensive

14 Preliminary evidence presented to the Vodafone Social and Economic Impact Panel.

15 Considerable evidence from Latin America has documented how both market liberalization and ‘smart subsidies’ can successfully leverage additional investment and reduce the broad access gap.

backbone capacity (including dark fibre) that exists as a result of investments by firms in other sectors, for example electricity and railways. Such capacity can form the basis of new backbone infrastructure and increase Internet connectivity. Exploiting this capability includes not only creating the technical capacity to use these resources as public telecommunications networks but also the necessary national and international policy barriers to interconnection and use.

The lack of an adequate national and regional backbone may reflect market failure and require public policy intervention both in terms of funding and policy reform. In such cases there are clear international public policy issues and a need for donor support. Recent initiatives, such as that in East Africa for example, have demonstrated that market failures in the provision of backbone can be effectively addressed through donor based funding. As with transit and international connectivity, the development of local and regional Internet exchange points can leverage additional value of new backbone investments.

Finally, the combination of increased availability of broadband services for consumers (and at wholesale level for new entrants) and the nature of these Internet related transit and international connectivity agreements exacerbate the impact of VoIP on voice operators in national markets. Thus not only do these transit arrangements impact the development of the Internet in developing countries, but they also spill over into the voice market. In effect, in buying transit ISPs are paying the full cost of international connectivity for VoIP calls and shifting the basis of payment from per minute charges to bandwidth charges. Where tariffs remain significantly unbalanced, or the cost of broadband services is competitively priced, the incentives to use VoIP can be considerable. At one level the ability to separate voice services from network is illustrated by Skype downloads, a crude measure of VoIP uptake in the retail market. Current figures suggest that, worldwide, there are broadly the same number of Skype downloads as there are broadband connections. The OCED estimated 118 broadband lines in January 2005 versus 118 million downloads of Skype (June 2005). Further evidence of the challenge to voice revenues comes from the comparison of basic DSL prices with the distribution of monthly expenditure on voice telephony. Recent evidence from South East Asia suggests that whilst less than 20% of consumers would find it economical to switch to DSL and VoIP services, these consumers often represent 30% of revenues in the voice market.

Safe and reliable Internet and network security

Here the issues are essentially twofold. One set of issues can be seen as concerning a broad range of activities that amount to a 'denial of service' attack. On the other hand, the issues are about the way in which the Internet can facilitate organised activity designed to harm or cause damage to users, including crime and the distribution of morally offensive material, such as pornography. Thus, the range of issues here includes the following [16]:

- spam,
- cybersecurity, cybercrime,
- security of network and information systems,
- critical infrastructure protection.

From a developing country perspective, these issues have a disproportionate effect and typically the operational experience is that of a 'denial of service' attack. The combination of these attacks and the limited capacity of developing countries to respond is debilitating for users in developing countries – a phenomena that undermines consumer demand for the Internet and demand stimulation measures by government. Hence the failure to address this broad range of issues can create such conditions of uncertainty that the transition to an information society is severely compromised.

One of the key issue facing developing countries in dealing with these issues is the genuinely international scope of the activity and the absence of any global governance arrangements in place to deal with spam and other emerging threats to the stable and secure functioning of the Internet. Though there are a range of initiatives being promulgated on an international level, for example, by the OECD and the European Union, arriving at common definitions of, for example, SPAM and pornography are highly problematic and inhibiting the establishment of common international frameworks. Furthermore, the difficulty of reaching an agreement on definitions is further compounded when these definitions form the basis for policy interventions in the operation and use of the Internet.

Thus, for example, whilst agreement could be reached on the basis of concerns about the original content producers, there is little consensus regarding the interpretation of these agreements with respect to ISPs and network operators; such a situation exists with regard to the production of

16 Following the WGIG strcuture.

pornography and its distribution over the Internet (see, for example, the work of the Internet Watch Foundation in the UK).

In terms of information and network security, the first line of defence in many countries is the Computer Emergency Response Team (CERT) when there is a breach, potential or otherwise, in information and network security. CERTs are typically made up of technical experts who are in communication with other CERTs to share knowledge and best practices and to warn of impending attacks. In some countries CERTs are part of a government department; in other countries they may be in private sector organizations such as companies or universities. Many CERTs belong to the Forum of Incident Response and Security Teams (FIRST) as membership enables a more effective response. However, for many developing countries, the ability to maintain a credible technical and regulatory capacity with regard to CERT is highly problematic. Inevitably, 'denial of service' attacks involve highly innovative technologies that exploit weaknesses in the existing networks. As a result, the technical resources needed to address these issues need to have equivalent and highly innovative technical capability and the ability to implement clear and coherent national policies.

There is a growing consensus that the experience of countries that have been pioneers in responding to these threats shows that a "multi-stakeholder toolkit" approach is needed to deal with these kinds of problems - i.e. that to be effective, laws and regulations prohibiting harmful activities must be accompanied by public education, industry codes of conduct, and cooperative international enforcement arrangements, for example to help build technical and regulatory capacity.

Some commentators, such as the WSIS Gender caucus, argue that the focus on a safe and secure Internet and issues of network security place too much emphasis on technology and insufficient attention on the social and human rights issues involved. HUYER [17] (2005) comments that it is important to ensure that:

> "The Information Society enables women's empowerment and their full participation on the basis of full equality in all spheres of society and in all aspects of decision making processes […] for women to be truly included in the information society, there must be support and

[17] Sophia HUYER, "New technologies creating newopportunities for women - An international perspective", Women in Global Science and Technology And Gender Advisory Board, UN Commission on Science and Technology for Development. Comments to the WGIG, 10th February 2005; Draft Working Papers Identifying Issues for Internet Governance.

> promotion of technology capacity building for women so that they can participate in the management, design, manipulation and building of the information society. It is important that, rather than recipients of information women are active participants in and designers of an Information Society that meets the needs of and empowers both women and men." [18]

Huyer argues that the gender issues involved in a secure Internet include:

- Exploitation, trafficking, and abuse of women and children, where, for example, the Internet and its 'virtual world' becomes a vehicle for exploitation in a social world, such as with sex tourism.
- Threats to privacy, for example through the surveillance and unlawful distribution of images whether this information is created informally or through formal government institutions.

Multilingualism and local content.

Multilingualism and access to content raises a broad range of issues ranging from the technical structure of the DNS through to the accessible, in local languages, of local content.

In terms of multilingualism within the DNS governance issues associated with multilingualism are closely linked with DNS governance issues. However, at the heart of the DNS is a set of legacy decisions that have enshrined ASCII and, to a large extent, the English language. The extent to which these technical standards are embedded in the core operational procedures, in effect, determines the structural nature of the issues surrounding multilingualism. From developing countries, whilst these issues are of profound important, the key decision and technical developments lie within the competence of other countries, institutions and organisations, for example, IETF in its role in the development and promulgation of technical standards and ICANN in its role with regard to the confirmation of language code tables and the policies designed to foster multilingual TLDs. Other organisations involved, for example, include the Multilingual Internet Names Consortium [19].

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[18] Source: open comment to WGIG Feb 2005, available from www.wgig.org.

[19] MINC is the Multilingual Internet Names Consortium, whose work dates back to 1994 and which was officially formed in June 2000 to promote the Multilingualization of the Internet, the

For some commentators the issues of multilingualism open up the possibility of treating part of the DNS as a global public good and that this perspective, in turn, would suggest that global public services do exist. These views would lead to a global policy initiative such as an obligation on the part of gTLDs (generic Top Level Domain) to support all scripts, even where these are minority scripts that are of limited commercial significance. The decision in June 2005 by ICANN to approve. CAT can be seen at an important step in recognising the importance of language commutates within the Internet. The concern is that, without addressing issues of multi-lingualism, the existing level of language diversity may be undermined.

For many the issues of multilingualism are more about access to content in local languages within and between countries. Under such conditions the issue is one of creating and sustaining a local content industry that supports multilingualism and cultural diversity and here the role of government policy in encouraging indigenous activity is paramount. The role of public policy is particularly crucial when the applications are those central to the development of an information society such as e-health, e-education and e-government. Public policy is important in determining the available of information within a country; for example free and open access to policy documents in local languages within a country, as well as similar access to publicly funded research.

■ Conclusions

The Internet opens up new opportunities for linking ICT and development activities and for reaching the MDCs. However, the integration of the Internet into the development process highlights that issues of Internet governance cannot be treated in isolation within a country or in terms of a single policy dimension. Thus, at a very practical level, the integration of the Internet into

internationalization of Internet names including, but not limited to, multilingual Internet domain names and keywords. Over the years, MINC has established a wide range of links with international organizations, stakeholder organizations and other processes including The United Nations, the World Summit on Information Society (WSIS), ICANN, ITU, WIPO, IETF, as well as language groups such as JDNA (Japanese), CDNA (Chinese), INFITT (Tamil), EuroLINC (European Languages), CYINC (Cyrillic), GLWG (Georgian), RLWG (Russian) as well as The Arabic language and scripts WG (Arabic) and ULWG (Urdu). Our language groups develop their own language and variant tables, and coordinate with each other on these tables. They also discuss other IDN related issues like the development of Dispute Resolution Policies and the use of IDN in software applications. http://www.minc.org.

the development process undermines those development strategies where ICT sector reform concentrates on the telecommunications sector alone and, in particular, an agenda heavily biased towards supply side initiatives. Whilst such supply side policies are an important starting point for sector reform, they can no longer be seen as meeting both the necessary and sufficient conditions for realising the opportunities presented by the Internet.

The range of issues that allow the Internet to shape development processes requires a new level of co-ordination and integration of policy development. In particular, the intertwining of increased access, the equitable distribution of Internet resources, the safe and secure operation of the Internet and multilingualism bring to the fore a wide range of issues that need to be addressed simultaneously.

In terms of Internet governance these policy challenges highlight the limitations of existing institutional activity. The WSIS provides an opportunity to address many of these issues and ensure that the institutional setting for securing the development opportunities flowing from the Internet can be realised. Whilst the outcome of WSIS may not result in immediate reform, there is the opportunity to define new directions for the process of Internet governance and hence the role of Internet in development processes.

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