

# Internet Governance: Theory and First Principles

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For purposes of discussion only

## 1. Introduction

For many years, the Internet was regarded as a space that should not and could not be regulated by governments. This view is poignantly expressed in John Perry Barlow's Declaration of the Freedom of Cyberspace:

“Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of the Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather. ... Your legal concepts of property, expression, identity, movement, and context do not apply to us. They are all based on matter, and there is no matter here.”  
(Perry Barlow 1996).

However, even if one were to subscribe to an anarchic view of cyberspace, this does not imply the absence of any forms of governance altogether. Even the anarchic literature acknowledges that forms of coordination between participants in social processes are necessary, although they are envisioned as decentralized, voluntary, emerging forms of harmonization (Nozick 1974). Any social organization is characterized by a set of specific institutional arrangements. With regard to the Internet, Lessig (1999) pointed out that even in the absence of formal regulation code de facto serves as quasi-regulator, and often in a less transparent manner than more formal rules. Going beyond Lessig's argument, Mueller (2002) pointed out that the many formal and informal rules upon which the Internet community relies in its daily interactions.

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The recognition that the Internet in practice is shaped by forms of governance, has freed the Internet community to engage in a more deliberate and creative discussion of different options as to how these processes could be structured. Lessig (1999) suggested that – much like the constitutions of many nations – some form of government intervention could actually serve to safeguard the freedoms of cyberspace. Mathiason (2004) suggests that a framework convention should be organized to design ground rules for Internet governance. Institutional arrangements can, at least to a certain degree, be shaped by deliberate political action, thus raising the question as to how and by whom they should be designed. With the World Summit on the Information Society (WSIS) and the establishment of the Working Group on Internet Governance (WGIG) a further shift has taken place toward accepting the need for a global, more formal framework (WGIG 2005; WGIG 2005; WSIS 2003; WSIS 2003). While this latest round of talks has brought governments back into the picture, one of the fascinating aspects of the unfolding debate is the strong participation by civic sector groups and, to a lesser degree, industry and its associations.

As a complement to this fascinating international process, this paper explores conceptual and normative foundations that could help embed the multiple dialogues in an overarching framework. Internet governance is analyzed as a problem of coordinating a multi-level, adaptive socio-technical system. Such coordination is required to assure the working of large systems. A broad spectrum of alternative coordination mechanisms is available ranging from reliance on norms and traditions, decentralized market decisions, forms of self- and co-regulation, and forms of government intervention and regulation. In contrast to pundits who propose to restrict the term “Internet governance” to domain name and possibly other technical issues, a broader notion is used in this paper. As will become clear in the course of the paper, such a broader notion is the only logically coherent view of governance; it also puts the problem of governance (to design, as far as possible, a “best” set of processes and practices) into sharper light.

The paper builds on the literature on the governance of large technical systems (Mayntz and Hughes 1988), the literature on policy design in dynamic environment, and more

recent attempts to bridge these strands of thought in the theory of complex adaptive systems (Bauer 2004; Cherry and Bauer 2004). Starting point is a brief review of the notion of governance and the question of whether the Internet can be governed at all. Answering this question with “yes but”, the paper then explores alternative approaches to organize governance and their comparative advantages and disadvantages. This framework is then applied to some of the 21 issues identified by WGIG, in particular to questions related to network infrastructure, network security, and the multi-lingual re-configuration of the Internet.

## **2. Internet governance defined**

The Internet is a large, adaptive socio-technical system. It is, furthermore, a multi-layer system in that it is embedded in and has effects on local, sub-national regional, national, supra-national regional, and global levels (see Hollingsworth, Müller, and Hollingsworth (2002) for a more detailed discussion of multi-layered socio-economic systems). Any large system depends on coordination mechanisms that integrate its multiple sub-systems and assure its working. A broad spectrum of alternative coordination mechanisms is available to solve these coordination tasks. They involve different levels of central planning and range from a reliance on norms and traditions, decentralized market decisions, networks and networked organizations, forms of self- and co-regulation, to forms of government intervention and regulation (Latzer 2002; Ogus 1995).

The notion of governance evolved during the past decades and it may be helpful to define upfront how it will be used throughout this article. After World War II, the emphasis of the debate was on government planning, policy development and implementation (Mayntz 2003). These activities were seen as purposeful actions of the privileged sovereign actor state. Initially, it was neither questioned that the state was capable of steering economy and society nor that it would pursue the public interest. However, beginning as early as in the 1960s but certainly during the 1970s and 1980s, the limits or successful steering became more visible and also shifted the focus of research to a critical examination of actual government behavior.

For example, in the United States, the Chicago and Virginia Schools emphasized different forms of government failure and recommended different remedies. The Chicago School modeled government as a supplier in a market for policies and stressed the capture of public officials by well-organized interest groups. A solution was seen in far-reaching deregulation. The Virginia School argued that the presence of government would inevitably lead to attempts by stakeholders to seek favorable rules and result in a waste of social surplus in unproductive rent-seeking. An appropriate design of constitutional rules was seen as an important remedy of these problems. In Europe, systems theory depicted a polycentric world without any center capable of steering the entire system toward specific outcomes. In parallel with these conceptual currents, forms of coordination other than government, such as voluntary self-regulation, promulgation of codes of behavior by business associations, and co-regulation received renewed attention. These arrangements had existed and were documented for several centuries and were now seen as vehicles to overcome the weaknesses of government. The term “governance” was initially used to describe these non-hierarchical, non-government forms of coordination.

A third, encompassing, concept of governance emerged from the new institutional economics literature (see Williamson (2000) for an attempt to take stock). All mechanisms of coordination are seen as forms of governance. Thus, markets, hierarchies, networks, informal norms are all mechanisms of governance. These mechanisms operate at four different levels of society and time-scales. In Williamson’s model, higher levels impose constraints on the levels immediately below and lower levels provide feedback to higher levels. At the level of social embeddedness, where informal institutions, customs, traditions, norms and religion are situated, change can take very long periods of time, even hundreds or thousands of years. The next lower level defines the institutional environment and encompasses the formal rules of the game, including the specification of property rights and the organization of political institutions. Change on this level may take ten to one hundred years. One level down is the governance structure of a society (the “play of the game”), most importantly contractual arrangements. Aligning

governance structures with the type of transactions is one important task at that level and can take one to ten years. Finally, at the lowest level continuous decisions regarding resource allocation and employment are being made.

The third approach is the logically most consistent view of governance and will be adopted in this paper. It explicitly recognizes that: different types of transactions require different types of governance mechanisms. One important problem of governance is to design mechanisms that are appropriate to the problem at hand. However, not all aspects of the institutional matrix are designed and established by deliberate action. Some institutional arrangements evolve from the repeated interaction of individuals and organizations. Thus, while at the micro-level there will be deliberate decisions by individuals, institutions at higher levels emerge and thus cannot be seen as the result of any deliberate policy design. For example, markets often are the outcomes of numerous smaller deliberate arrangements. They are embedded in these arrangements; in that sense, they are not “spontaneous” arrangements, as claimed by Hayek, but frequently they are not deliberate designs either.

Institutional arrangements provide a framework within which shared mental models of the world are developed and perpetuated (Aoki 2001; Denzau and North 1994). At the same time, they function as lenses to identify problems that might require collective action and narrow the set of possible responses to a sub-set compatible with the existing institutional arrangements. The recent definition of “governance” proposed by WGIG reflects these insights:

“Internet governance is the development and application by Governments, the 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.” (WGIG (2005), p. 4).

However, this definition does not explicitly recognize (although it does not preclude it) that governance mechanisms not only are designed but also emerge without specific

design actions. The institutional matrix of the Internet is a hybrid of governance mechanisms that were designed and some that emerged in an evolutionary process from repeated interactions. This raises the question as to whether a system of Internet governance can be designed, even if there were a will to do so, and at what level it can be designed. Before we address this question, we will briefly discuss whether the Internet should be governed.

### **3. Should the Internet be governed?**

At a fundamental level, this is a futile question. Even if it were possible that the Internet functioned in a purely decentralized mode, it is likely that some norms and conventions, even if they were local or indigenous to specific social networks, would emerge from repeated interactions. These emergent institutional arrangements would then constitute a governance structure. Even the most radical cyberian would probably not have any qualms with such an emergent governance structure. The contested question is whether deliberate collective efforts should be made to design a governance structure for the Internet and if so, how they should be structured. An affirmative answer must rest in the assumption that such a deliberate effort would create a more efficient and/or more equitable Internet or a space that is better suited to the diverse needs of the multiple cultures participating in it. In the heat of the unfolding debate over Internet governance, such basic questions are rarely asked.

There are three main areas where these questions arise: (1) issues related to the network infrastructure upon which the Internet rests; (2) technical coordination issues related to the Internet as a logical layer of protocols, including the organization of the numbering and identifier space; and (3) issues related to the content of the communications, including intellectual property issues. This is not an exhaustive list and other areas that might need explicit governance structures exist, for example, issues related to the applications and services offered using the Internet, including the establishment of legal frameworks for electronic commerce. A detailed discussion of these areas would exceed

the scope of the present paper but it is necessary to review briefly the arguments for and against governance efforts in the first three areas.

Policies adopted at the level of the infrastructure upon which the Internet resides have a direct impact on the Internet. Despite the close interrelation, the policy debates in these areas are not very well linked. In part this is due to the fact that the traditional regulatory debate is conducted primarily within regulatory agencies that do not have jurisdiction over Internet issues or have voluntarily ceded jurisdiction. Internet policy issues are often discussed in different government agencies and by different stakeholders. This divergence is also due in part to the fact that the intellectual and philosophical underpinnings of traditional telecommunication regulation and Internet governance are quite different. In contrast to earlier periods, traditional regulation is increasingly influenced by relatively specialized economic approaches and a strong focus on efficiency and forms of market failure as the main rationale for public policy.

As these models do not allow for an integrated treatment of equity concerns, the importance of these concerns in the regulatory debates is also receding. If they are recognized as legitimate at all, equity issues are relegated to other policy domains. Moreover, trade-offs between efficiency and equity are often declared, putting efficiency goals in conflict with equity goals. Interestingly, legal scholars have been more creative than economists in proposing alternative frameworks to think through pressing policy issues, such as spectrum policy or policies for the emerging broadband environment (Benkler 2003; Frischmann 2005). In contrast, the Internet policy debate encompasses both efficiency and equity issues, drawing from a much broader body of social, legal, and economic theory.

It is important to realize that few of these conventional wisdoms that prevail in traditional telecommunications regulation have strong support in welfare economics. First, the often-invoked trade-off between efficiency and equity ignores the second theorem of welfare economics, which shows that any point on the efficiency frontier (representing, for example, different combinations of equity and efficiency) can be reached via a

competitive equilibrium by varying the initial endowments of agents. These initial endowments will not only include resource endowments but likely also the legal and regulatory frameworks within which market processes unfold. This is but another way of stating an insight of institutional economics and economic sociologists, that markets do not exist in a vacuum but need to be embedded in a legal and regulatory framework. Different such frameworks exist and hence different constellations of institutional arrangements may yield efficient outcomes (North 1990; Swedberg 2003). Second, as Amartya Sen has expressed so eloquently in his prolific writings, comprehensive rationality has to go beyond a given institutional framework and evaluate different designs of such frameworks as well as their consequences. Moreover, it has to critically reflect the values and objectives that are being pursued, rather than rely narrowly on efficiency (Sen 2002). The Internet governance debate thus provides an opportunity to broaden the traditional telecommunications policy discussion.

Within the Internet policy debate, similar arguments can be made with regard to technical issues, domain names, and identifiers. A rationale for deliberate governance is often based in the need to ascertain the functionality of the logical infrastructure of the Internet. This is seemingly self-evident with regard to the need to rely on numbering conventions that are unique (Mueller 2002). However, there are many ways to design and promulgate such a unique identifier space. Market failure as a rationale for coordination of the numbering space fails to capture the problem: the design of the numbering space is a precondition for market forces to work at other related layers of the Internet. The early numbering conventions are a good example of a governance mechanism that emerged from the repeated interactions of a relatively small group of people. However, as the number of participants and stakeholders increases, the transaction costs of this process will increase, perhaps even exponentially and the development of shared norms will likely take much longer, if a sustainable solution can be reached at all. It is therefore nearly inevitable that some form of hierarchical coordination is used. ICANN is one such approach but others are feasible.

The most contested issues are related to the content of communications on the Internet. It is this area where virtual space and physical space are in strenuous relations. One extreme position would be to claim with Barlow that cyberspace is a different frontier and a different world. Another extreme position is cultural relativism, the stance that it is impossible to rank order (local) cultures and political systems. Democratic and dictatorial, tolerant or fundamental nations or societies are of equal value and deserve equal respect. Therefore, no general set of values and norms may exist that holds across the global Internet space. Whereas the first position would argue in favor of no or minimal governance, the second would argue for decentralized governance, essentially mapping nation states onto cyberspace. In practice, the two worlds are not separate and many interactions exist. Physical space and virtual space co-evolve and shape each other and the existing frictions will need to be addressed. Furthermore, national cultures are neither fully independent nor does a truly global culture exist. Some degree of differentiation will thus be inevitable and is probably a desirable feature of the global Internet. This implies that some form of governance is found that balances freedom to communicate with the legitimate need of different cultures to adopt specific policies.

In sum, in all three generic areas there are strong reasons to seek to establish governance mechanisms. Some of these reasons are related to the presence of market failure, but there are even more important reasons related to the need to find solutions to important issues that affect a large number of participants in the Internet. Before we will discuss available options for governance mechanisms and their relative advantages and disadvantages in section five, the next section will briefly review whether the Internet can be governed.

#### **4. Can the Internet be governed?**

Some pundits have argued that even if there were a need and the will to govern the Internet, its diversity, and global reach prevents effective governance. It is often argued that the spatial structure of the political space does not match the spatial nature of the problems: governments operate on a national scale but Internet problems are global in

scope. However, the answer to the question of whether the Internet can be governed is not so straightforward. First, supra-national forms of governance already exist or, if the present forms are insufficient, could be developed (Mathiason et al. 2004). Second, not all policy issues raised by the Internet require necessarily a global solution as some may be solved regionally or even locally. Third, there may be trade-offs between the dynamics of the Internet and the limited adaptability of global governance structures; between the adoption of local solutions and the vision of a truly seamless global Internet space; or between the reliance on spontaneous, decentralized processes and legitimacy of the emergent outcomes. These trade-offs need to be examined carefully before a choice in favor of one or the other solution is made.

At the heart of the issue is the more generic question of whether large technical systems that are also complex adaptive systems can be governed. Bauer (2004) and Bauer and Cherry (2004) address problems of governance in complex adaptive systems. Deliberate governance requires knowledge of a valid policy model that establishes a stable relation between policy instruments and outcomes. In complex adaptive systems, several challenges exist: First, the requisite policy model may not be known with sufficient accuracy. Second, due to the dynamic development of the Internet, the policy model may not be stable. Third, even if the correct model were known and stable, political and economic feasibility constraints may prevent adoption of an effective policy. Fourth, as it is unlikely that the correct model is known or stable, policy interacts with the large technical system in ways that typically lead to unanticipated outcomes.

Under these conditions, it may be difficult or impossible to find a sustainable set of policies. Cherry and Bauer (2004) characterize a sustainable policy as "... rules that are politically *adoptable* and for which the underlying policy goals are reasonably likely to be *achievable*". It might be added that such policies also need to be in the core of the policy game, so that no actor has an incentive to further change the rules. If not such policies exist, it might be possible to achieve sustainable processes with which policies are continuously adapted (dynamic sustainability). The question then is whether such sustainable policies or processes can be found for the issues affecting the Internet.

To answer this question in general terms it is first necessary to briefly discuss the notion of large technical systems and complex systems. The notion of large technical systems was developed by researchers such as Hughes (1983) and the groups of social scientists at the Max Planck Institute for Social Studies in Germany Mayntz and Hughes (1988). One of the key questions raised by this research is whether large technical systems can be controlled or at least steered in certain directions. No unique answer emerged from the research efforts and more optimistic positions were juxtaposed by more pessimistic views (see Hughes (2004) for a high-level discussion of these issues). Nevertheless, the dominant view was that such systems, even if they could not be fine-tuned, could be governed and edged in certain directions.

This discussion was continued by the more recent efforts to describe the dynamics of non-linear systems using computational tools, often clustered under the heading complexity theory. At an abstract level, any system consists of nodes and vertices (links). These links may be physical links as in a communications network or intangible links, as economic interdependencies. Systems come with different degrees of complexity. A null system is one in which the nodes are not connected at all (Potts 2000). Events affecting one node do not have any effects on other nodes of the system. The other extreme is the fully connected system, in which every node is connected directly with every other node. In such a system, events affecting one node may have wide repercussions. Depending on the strength of the links and the time scale of the interaction, such systems can behave in a very unpredictable way as direct and indirect feedback effects percolate through the entire system. Although there are different definitions of the constituent features of complex systems, a system may be considered complex if its overall behavior cannot be predicted other than in rather general terms.

At a very abstract level, Mesarovic, Macko, and Takahara (1970) have investigated and defined the conditions under which multi-level adaptive systems can be successfully coordinated. In this framework, complex adaptive systems need integrating mechanisms or they tend to be unstable. At present, the main coordinating agent at higher system

levels is the regime created to manage domain names. Paradoxically, the monopolistic structure of that regime seems to be the precondition to having any effective governance tools over the Internet. It is not obvious — but also not impossible — that governance mechanisms exist that would achieve successful coordination absent such a centralized intervention point.

At a technical level, the Internet has many of the features of large technical systems and also exhibits some patterns known from complexity research. For example, Barabási (2002) and his collaborators have shown that traffic flows and nodes on the Internet follow a power law distribution, which is typical for many complex adaptive systems. Similar results are also reported by Pastor-Satorras and Vespignani (2004) and Dorogovtsev and Mendes (2003). It is hypothesized here that the Internet governance structure also reveals elements of a complex adaptive system. The degree of complexity of governance interactions is reduced by the existence of centralized nodes, most importantly ICANN and the registries accredited by it. A critical issue in assessing how the Internet should be governed is then whether the designed structure will suffice to achieve the minimally required coordination.

## **5. Alternative approaches to Internet governance**

This section will review several frameworks that could be used to design Internet governance approaches: (1) spontaneous self-organization; (2) forms of self- and co-regulation; (3) the theory of distributed governance; and (4) public interest government intervention.

The notions that large systems can spontaneously self-organize has captivated social researchers since Adam Smith created the famous metaphor of the “invisible hand” in his *Wealth of Nations* and *The Theory of Moral Sentiments*. Economists and practical policy-makers have long relied on this notion that individual self-interest can lead to mutually compatible outcomes that are aligned with the larger public interest, often without

concern for the conditions under which the conclusion holds. Mathematical economics of the Arrow-Debreu general equilibrium type has indicated how strong the conditions are that must be met in order to achieve such an ideal outcome. Among others, these include perfect information, the existence of all present and futures markets, the absence of any forms of public goods and externalities, and the absence of increasing returns. In practice, these conditions are never met, seriously challenging the value of invisible hand theorems. Thus, the intellectual underpinnings often used to hail the superior working of decentralized decision-making processes are an insufficient rationale in support of a similar decentralized approach to the Internet governance.

The notion of spontaneous self-organization has received renewed attention in the work of the Austrian School of economics, in particular F. A. v. Hayek. He saw the main advantage of decentralized decision-making in its superior ability to process incomplete and localized knowledge, thus coining his notion of competition as a “discovery process” (Hayek 1949). More recently, many of the claims made by Hayek have been replicated in experimental models of market coordination. Indeed, this line of work, for the first time, can replicate how coordination in decentralized systems works and the emergent properties it generates. One could thus ask whether the Internet can be characterized in similar terms and whether such decentralized coordination would work. One important obstacle to fully decentralized decision-making is that important aspects of the Internet, for example, the creation and administration of domain names, are not organized as markets. In fact, market organization is seen by many as inimical to the fundamental philosophical principles upon which the Internet is built. Nevertheless, fully decentralized organization seems to be one principally possible approach. A consequence of such a radical step is that many of the features of the Internet at more aggregate levels will be emergent, that is, not directly designed nor controlled. For many, this might be an impossible leap of faith to make. Most likely, it will lead to a more differentiated Internet space in which cultural and political heterogeneity will be reflected. It is by no means certain, that such an Internet would have the technical coherence and end-to-end functionality that is so critical in the present architecture. In as far as participation in such a space yields benefits, voluntary collaboration can be expected.

One might thus expect that such a fully self-regulated Internet will retain a substantial degree of coherence, perhaps even develop higher-level coordination organizations. The main difference to today's arrangements is that this would be a bottom-up approach. The biggest objection against the feasibility of this model is that the status quo ante cannot be eradicated and it is difficult to describe a transition path from here to there.

A second principal model is to rely on forms of self- and co-regulation rather than government intervention. Self-regulation refers to procedures in which private sector actors voluntarily define rules of engagement, such as codes of ethics, standards, or numbering conventions. The present framework of Internet governance is a form of self-regulation, which is nearly always backed by some form of direct or indirect government authority. Co-regulation refers to procedures in which a government body delegates tasks to the private sector but retains the ability to pass enabling legislation, enforce rules, and possibly revoke the delegation. Thus, in co-regulation arrangements the role of the government is more direct. Both self- and co-regulation are widely used in the Internet. Latzer et. al. (2002) discuss the conditions under which they promise effective governance. Among other things, self- and co-regulation work well whenever the stakeholders have congruent interests, when all relevant stakeholders participate, when outcomes are easily measurable, and when there is general public support for these forms of governance.

Two of these four conditions are met with regard to Internet governance: outcomes are measurable and there is broad public support for limited government intervention. It is less clear that the interests of stakeholders are sufficiently congruent. However, the most challenging is to assure that all relevant stakeholders participate. Even more challenging is to ascertain that sustainable agreements are found. This is not impossible, but it may well be that the direct and indirect transaction costs of negotiating such agreements are prohibitively high. Thus, self- and co-regulation are not unworkable per se but possible victims of the large number as well as different backgrounds and interests of the stakeholders that are involved. Some of these possible pitfalls might be overcome if a

hierarchical governance structure were to be established, for example by differentiation between global, regional, and national governance arrangements.

Such a deliberate hierarchical organization is the third generic overall organization of governance. It is also the outcome suggested by the theory of complex adaptive systems to assure a desired level of coherence. However, it raises the question as to how the tasks should be assigned to different layers of the governance structure and how these layers relate to each other. Although a multi-level system does not necessarily have to be a federal system, the theory of federalism may help shed some light on the optimal design of such a framework. A federal system is one in which lower-level actors voluntarily delegate some of their powers to higher-level actors and thus are bound in those areas by higher-level decisions. Another possible configuration is a confederation, where such upward delegation exists but the power to prescribe policies to lower-level units is weakened but nevertheless specified in the specific contractual agreements underlying the confederation. An even weaker form are inter-governmental agreements, which typically come with many reservations and caveats on the part of the signatories. Lastly, a hierarchical system can be based upon voluntary collaboration.

In all these cases, an assignment of tasks to the constituent layers needs to be found. Such an assignment could be based on efficiency and/or equity criteria. One rule that is often used is the subsidiarity principle: decisions should be made at the lowest level at which they can be handled most effectively; only if lower level actors cannot solve issues efficiently, should they be delegated to a higher level. This standard is less clear-cut than would be desirable. Often, it will not be obvious in advance what the optimal level of decision-making is. However, an evolutionary process can be designed that would facilitate discovering the best solution. It would require starting with a fairly decentralized structure; only if it is evident that certain problems cannot be solved in that manner should they be assigned to higher levels. One variant of this approach is to embed the hierarchical structure in the legal framework of the Internet. Proposals to call a constitutional convention to agree of core principles of Internet governance would achieve that purpose. Within that framework, decisions could then be organized initially

in a most decentralized fashion with provisions that would govern their re-assignment to higher levels, if necessary.

A fourth way of organizing governance is the traditional system of governmental regulation. At the international level, this system suffers from the absence of global government. All agreements are inter-governmental in nature with national governments serving as the agents of implementing and enforcing agreements. In all inter-governmental treaties, many reservations and caveats are taken by individual governments. One of the most problematic issues is that governments across the world enjoy different levels of legitimacy and trust from those they govern. Thus, as many surveys demonstrate, European citizens typically have a higher level of confidence that governments act in their interests and are thus willing to give government an important role in social and economic affairs. In contrast, American citizens and many citizens of developing countries consider traditional government as an antagonistic force. Furthermore, the capability of governments to act as enlightened technocrats varies quite significantly across cultures, regions, and nations. Overall, embedding the Internet into the traditional government structure would likely undermine its transformational potential. Nevertheless, in certain areas, such as law enforcement, provisions to facilitate e-commerce, privacy, and intellectual property rights, formal government involvement may be all but inevitable.

## **6. Policy implications and conclusions**

As Williamson (2000) recognizes, identifying possible alternative governance options alone is insufficient. According to his remediability criterion, unless a feasible transition path from the status quo to an alternative arrangement can be identified, the status quo has to be considered superior. Doing so in detail would exceed the scope and purpose of this paper (and possibly the capacity of a single author). As a very modest step in this direction, table 1 relates the 21 key issues identified by WGIG in its preparatory work to its July 2005 report to the four generic frameworks. In each case, a very cautious and tentative assessment is attempted as to whether the task could be effectively solved using

a particular structure. The table illustrates that different issues need different governance structures, thus recalling for a mix of different forms. This is not surprising, as such mixes also evolved in other areas that require global coordination.

Table 1: Governance issues and structures

Issue	Self-organization	Self- and co-regulation	Multi-level governance	Governmental
Administration of Internet names and IP addresses	~	+	+	+
Administration of the Root Server System	—	+	+	+
Peering and Interconnection	+	+	~	—
Telecommunications infrastructure, broadband access, convergence with NGN	+	+	+	—
Cyber security, cyber crime	~	~	+	+
Competition policy, liberalization, privatization, regulations	—	—	—	+
Multilingualization of Internet naming systems	+	+	+	~
Spam	—	—	+	+
Dispute resolution	+	+	—	—
Security of network and information systems	—	+	+	—
Technical standards	+	+	+	—
Affordable and universal service	—	—	~	+
Social dimensions and inclusion	~	~	~	+
VoIP	~	~	+	+
E-commerce	+	+	+	+
Consumer, user protection and privacy	—	~	~	+
Unlawful content and access protection	—	—	~	+
Intellectual property rights	—	+	+	+
Cultural and linguistic diversity	+	~	~	—
Education and human capacity building	+	~	—	+
National policies and regulations	—	—	—	+

Legend: + probably feasible and effective, — probably not feasible or not effective; ~ unknown

Given the need to find feasible solutions, a gradual transformation from the status quo ante is probably the most appropriate approach. Some issues, such as linguistic diversity, may be easily be delegated to decentralized actors. Other issues, which have high potential externalities, such as security issues, may have to be dealt with in a more centralized fashion, albeit with appropriate representation. Nevertheless, more issues than commonly perceived seem to be eligible for delegation to decentralized decision-making. This might even include numbering, as long as a unique framework for allowing the assignment of number to regions and sub-regions is agreed. With the increasing processing power of computers, increased diversity should not pose an obstacle. Proposals such as by McKnight and Mueller (2004) to gradually increase the number of top-level domain names, to introduce more market forces into the numbering regime seem reasonable in this perspective. The highest level of controversy will continue to exist with regard to content and political expression on the Internet. Whereas the Internet has some elements of a disruptive technology, it is unlikely that it will fully undermine traditional forms of government unless supported by other political movements. In the spirit of remediability it might, thus, be most advisable to organize a constitutional process to attempt to flesh out a global constitution for cyberspace. Should such an effort fail, it might be a second-best solution to let the Internet develop in a more decentralized fashion. Whereas this might betray some of the original visions of this space, it would likely maintain a global communications platform of unprecedented reach and transformational power.

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