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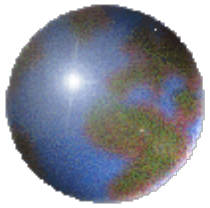

Session 2.2

The Impact of Convergence on the Regulatory Framework

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Agenda

- Convergence
- Regulatory Framework Checklist
- Institutional Design
- Broadcasting and Other Media
- Next Generation Networks
- Public Policy Issues and Implications
- Conclusion

Convergence: Definition

- Convergence has been defined as the ability of one or different networks to carry different services. Or the bringing together of industries in the communications area, which were previously viewed as separate and distinct in both the commercial and the technological sense.
- Examples are the provision of Internet access and TV to mobiles and triple or quad play services offered by ISPs or Cable TV Operators.

Convergence: Benefits

- Convergence creates possibilities for companies to develop and deliver services across technology platforms, and for users to get access to new kinds of communication and media services
- Promotes the expansion of competition, allowing the introduction of inter-modal competition where networks and technologies compete with each other with no technological or regulatory restrictions;
- Technology convergence provides the possibility for new competitors to enter the markets. Telephony can be offered by cable TV operators, TV to telephony providers
- Reduces costs of telecommunications services;
- Fosters the development of more efficient technologies and services;
- Opens the door for new ways for people to obtain Internet access

Impact on Regulatory Frameworks

- As convergence takes a firm hold in the communications industry, the process raises specific regulatory challenges given the merging of firms, and facilities.
- Adapting regulatory frameworks to convergence is not an easy task.
- Traditional frameworks were designed for an era when clear functional differences existed between services and infrastructure and were not designed for the this new environment of converged networks and services where functional differences no longer exist.
- Governments cannot and should not favor one technology, one network, or one service over another, nor should any operator restrict the use of any technology, network or service.
- Countries around the global have taken vastly different approaches to convergences starting with how they regulate Internet communications.

Regulatory Framework Checklist

- Regulators need to ask certain questions to make sure their frameworks are up-to-date.
- Does the regulatory framework facilitate the provision of different services over different platforms?
- Does the regulatory framework support full competition?
- Does the regulatory framework allow service providers to offer multiple services?
- What are the regulatory policies for these new technologies and services with regard to numbering, spectrum, universal service, emergency services and interconnection?
- Does the country's legal framework contain the necessary legislation to support an ICT environment (*e.g.*, intellectual property laws, computer crime, electronic transactions, data privacy and security)?

Involve Stakeholders in Regulatory Process

- Regulators need to involve all stakeholders in the regulatory process
  - Consultation is an essential part of the decision-making process.
    - Enhances confidence in the regulator.
    - Increases consensus and support for regulatory decisions.
    - Provides a mechanism for input and feedback from stakeholders.
    - Reinforces regulatory autonomy and accountability.

Essential elements of an effective regulatory framework in a converged services environment:

- Implement a well-defined and consistent regulatory framework for telecommunications, broadcasting, and ICT.
- Regulatory framework must give regulator the authority and means to effectively define and apply regulations in a market.
  - These characteristics are important, especially in markets where incumbent operators have extensive political and financial power.
  - Framework must provide for regulatory flexibility to adapt to the unanticipated needs and use of new technologies and services

Neutrality Guidelines

- Need to create clear definitions for Technology, Service, and Network neutrality.
  - Technology neutrality is basically the principle that rules should not discriminate in favor of any technology.
  - Service neutrality is that rules should not discriminate in favor of any particular service.
  - Network neutrality is the principle that Internet users should be in control of what content they view and what applications they use on the Internet. It is about equal access to the Internet. Broadband carriers should not be permitted to use their market power to discriminate against competing applications or content.

Challenges to the Regulatory Framework Posed by Convergence

- Many Policymakers and regulators around the world are already responding to these challenges though with varying degrees of success, depending on the scope and depth of their changes, i.e, India, the EU, the US and Canada.
- They have done this by evaluating policy goals and regulations in the context of converged communications
  - What type of regulation is needed
    - The role of the regulator is not to promote or 'accelerate' convergence, but to establish an environment for fair competition, i.e. a 'level playing field' so that if there is a demand for convergent services, such services can develop in the market and compete fairly with one another, bringing consumers the benefits of innovation, convenience and choice.

Regulatory Frameworks

- Often times, countries have adopted new regulatory frameworks that have attempted to take convergence into account, often create new regulations that could end up stifling competition and halting the spread of innovations and new uses of technology
- As an example, the European Regulatory Group (ERG) – made up of European member state regulators issued such a document. This document views a wide range of Internet communication as traditional "telephony service" and suggests applying the same traditional telephone regulation to the Internet – including services that link web sites to the PSTN.

Regulatory Framework

- Internet-enabled communications, such as VoIP, can increase competition, provide a platform for innovation, drive broadband deployment, and enable economic growth.
  - IP telephony is not a new kind of telephone service, but a whole new frontier in communications.
    - VoIP is much more than a substitute for traditional circuit-switched telephone service.
    - It permits the integration of voice, data, and other IP applications enabling a host of breakthrough applications and services not possible with traditional circuit-switched networks.

Regulatory Quagmires

- What does all this mean?
  - It means that if a consumer or others write a website or blog and if they then include a click to call link (VOIP link that initiates an internet call) then that website or blog could suddenly have to abide by a whole range of different (and perhaps conflicting) European legacy telephone rules -- from providing emergency access to ensuring quality of service.
  - Buttons or functions on gaming consoles, such as the PSP, Xbox, or other similar product that add voice to the game were never conceived to be substitutes for telephony services nor would people assume or think that they would be and that they should be able to connect to emergency services.
  - Similarly, Click to call buttons on website, blogs, or social media pages networks, such as Facebook were never intended to be substitute for telephony service.

Regulatory Quagmires

- If consumers had to comply with 27 sets of potentially conflicting rules from the 27 countries that make up the European Union just to include such a link or add-on it will make consumers think twice before making these innovative services available even here in the US where these rules do not apply.
- Ambiguities and confusion about VoIP service classification have allowed incumbent phone companies to unilaterally block or restrict the ability of any entity, foreign or domestic, to supply VoIP services over their broadband network.
- In some cases the limitations on licenses over a borderless communication medium or access to and the cost of telephone number fees have proven to be a significant barrier to market entry, as is the ability to interconnect to the legacy PSTN network.
- Making VOIP services illegal is preventing a broader adoption of broadband in rural areas

Country Examples

- In India regulators prevent VoIP services from connecting to the Indian phone network.
- Brazil has special licenses for VOIP and many other countries have copied this example
- China has created strict licensing criteria for VOIP
- The United Arab Emirates blocks access to a variety of VoIP services.
- In Paraguay while VOIP technology is legal, calling over the network is not.
- Armenian regulators allow VoIP blocking.
- Saudi Telecom, the monopoly provider, continues to use IP tracking technology to block VoIP calls.

Institutional Design

- Three primary institutional designs for Regulatory entities:
  - Single-sector regulator: sole function is to oversee the telecommunication sector.
  - "Converged" regulator: tend to have oversight for all aspects of the ICT sector
  - Multi-sector regulatory authority: usually encompasses various industry sectors considered to be public utilities, *e.g.*, telecom, water, electricity, and transportation.

MSRAs: Strengths & Weaknesses

- Is the MSRA model the appropriate model for developing countries? In theory, the model seems to provide a solution to address many of the constraints faced by regulators in developing countries. But it is too early to assess the effectiveness of the model.
- MSRAs allow developing countries the potential to achieve greater efficiencies in regulation, by benefiting from shared knowledge and resources, including a common infrastructure, administrative set-ups, and specialized human resource skills, such as those of accountants, economists, engineers, and other professionals across sectors.
- Regulatory performance & efficiency is highly dependent on the regulator's ability to understand its priorities & follow a plan of action that is coherent within the context of the country & its sector's development goals.

MSRAs: Strengths & Weaknesses

- The research on multi-sector regulation is mixed on whether the MSRA model indeed provides the expected gains, such as increased efficiency, effective regulation and eventually tangible contribution to network and economic development in a country.
- MSRAs may optimize scarce resources, such as human resources, public finances, and technical knowledge or expertise. But when staff resources are limited, the need to operate in different and complex sectors simultaneously increases demands on qualified staff and may also compromise the ability to develop sector-specific knowledge at an adequate pace and contribute to delays in appropriate regulatory interventions.

Broadcasting and other Media

- The ITU defines Broadcasting as a radio-communication service whose transmissions are intended for direct reception by the general public.
- Broadcasting often has substantial content regulation because it is perceived as playing a special role in the cultural life of a country and in developing a national identity.
  - As such, it was often regulated differently than telecom and sometimes even by a different regulatory entity
- Convergence has resulted in new technologies and services that often are not encompassed in existing service definitions and regulation. As such it requires changes to be made in broadcasting regulations to ensure consistency in policy and regulation with telecom regulation

Content Regulation

- ISPs and Internet data centers are often not required to review, monitor or classify the content they host, and are therefore not held liable for the transmission of prohibited or illegal content unless they have specific knowledge of the illegal content or fail to report and take corrective action.
- The opposite it true for broadcasters, they are held liable for the content they host, hence the challenge to regulators when broadcasters become ISPs or when ISPs or telcos become broadcasters.
- Protection of intellectual property is another issue of concern.
  - The sale and exchange of copyrighted material in digital format needs to be protected to ensure the continued investment and growth of the ICT sector.

Copyright & Data Protection

- Some of the most significant issues arising from the extension of copyright protection in the digital environment are:
  - Scope of copyright protection in the digital environment;
  - Responsibility of online providers;
  - Rights of performers in the digital environment;
  - Rights of digital broadcasters, such as webcasting and digital film and television online;
  - Linking of copyright information online, including deep-linking and framing;
  - Protection of databases;
  - Peer-to-peer file sharing systems
- The digitalization of information and the ease of procuring it illegally and using it against people has led many countries to enact Data Privacy and Data Protection to protect the confidentiality of consumer information.

Next Generation Network

- Next Generation Network is a broad term that describes key architectural evolutions in core and access IP based networks.
  - It refers to the future networks that support fixed, mobile and nomadic users and able to carry voice, data and multimedia services.
  - It is based on IPV6 and MPLS technologies and protocols.
- The technological innovations that have resulted in the convergence of telecom, information and broadcasting have raised numerous regulatory issues regarding interconnection.
  - Effective interconnection arrangements are crucial in fostering the development of integrated ICT markets
- Convergence has forced a reassessment of this policy taking into account the interconnection of different types of networks and service providers (*e.g.*, cable television/content providers and IP networks/ISPs).

Interconnection in an IP World

- Traditional interconnection regulation was established for telecommunications operators with interconnection rates generally based on time (*i.e.,* per minute).
- Services based on IP protocol, however, do not fit within the traditional schemes of switched voice interconnection and require different kinds of access (*e.g.,* interconnection at an IP level) and different kinds of charges.
- Countries are addressing these needs by introducing: (i) a symmetrical or asymmetrical interconnection, (ii) new kinds of "access" through interconnection regulation and (iii) a technology-neutral interconnection charging system based on capacity, instead of time and distance.

Challenges to Interconnection Regime

- One example of the challenges caused by new Interconnection regulations is the wide spread use of text messages or SMS. Today SMS is not only between users within the same mobile operator but can be transmitted from call centers and websites, and even be received by fixed line users.
- This has pushed the boundaries of voice-focused interconnection policies and has forced regulators to consider whether traditional interconnection regulations should apply to SMS traffic between mobile operators, content providers and fixed line operators. In Bahrain, Venezuela, and Mexico, regulators ordered interconnection for SMS providers.
- Another challenge is the emergence of multimedia applications and other applications on mobile phones, prompting questions as to whether mobile operators are ISPs and whether there should be any limitations on the ability of users to access mobile portals.

Public Policy Implications

- As convergence takes a firm hold in the communications industry, the process raises specific regulatory challenges
- Public Policy Issues
  - Universal Service
  - Licensing and Authorization
  - Spectrum Management
  - Numbering and Portability
  - Interconnection
  - Network Reliability/Network Security
  - Law Enforcement
  - Media Ownership
  - Accessibility
  - Access to Emergency Services
  - Service & Content Regulation
  - Consumer Protection

Universal Service

- Universal Service: Convergence challenges the traditional way Universal Service/Access is delivered in several ways:
  - Funding of universal service is usually obtained through extra charges imposed on certain telecom services e.g. access charges or interconnection charges.
  - Many countries are beginning to include broadband in the definition of universal services?
    - Is this this best way of stimulating Internet penetration or should a wider range of access possibilities be offered.
  - Should VOIP providers be required to offer services in all rural or high-cost areas
  - Should there be different definitions for broadband access urban as opposed to rural areas of the country
  - What is the best way of ensuring that all citizens have access to the Internet and to broadband?

Authorizations and Licensing

- Traditionally, the number of licensed voice telephony or broadcasting operators has been limited.
- Previously, authorization and licensing of service providers was based on the type of service (voice, data, and video) or technology (cellular, fixed telephony, terrestrial broadcasting).
- However, in a converged setting, it is difficult to maintain these boundaries because of overlaps, broadcasters are offering telecom services (Internet, voice), while telecom service providers (e.g. phone companies) are offering broadcasting services (IPTV). Further, cellular operators are providing mobile television services.

Licensing

- Many regulators and policymakers have already modified their licensing regimes from the traditional one-service or technology license to a technology neutral, simplified set of licensing categories, and in some cases, a unified (single) license or market entry procedure for all technologies and services.
- Many countries are combining this simplification with the introduction of flexible licenses that use a technology and service neutral approach to determine the rights and obligations granted by the licenses.
  - These update the obligations for Interconnection, numbering, universal service and consumer protection rules to the new environment of convergence
- Along with a new licensing structure, it is also necessary to simplify market entry procedures as well as to simplify the administrative requirements for all telecom operators.

Licenses

- There are five classes of licenses
- Individual
- Class
- Registrations
- Notifications
- Open Entry

License Classes

- Individual Licenses are the most complex and require the regulator to consider each license individually.
- Class Licenses are less complex since they require only an approval process for a broad category of service.
- Registration requires the operator to formally register with the regulator before operation of the service.
- Notification requires the operator simply to notify the regulator of the service, but no regulatory approval is necessary.
- Lastly, open entry is the most flexible and requires neither notification nor registration.

Licensing

- As with licensing regimes, new advanced technologies and converged services that use spectrum are demanding more flexible and service/technology neutral frameworks
- Need to keep in mind that spectrum management is about addressing the problems of potential interference between different users, which is why regulators have created different classes of licenses.
- Consideration should also be given to whether there should be flexibility in spectrum allocation to take full advantage of new services and new technologies for existing services that may evolve with time.
  - A technology- or service-neutral approach to spectrum use might be another good option to consider.

Spectrum Management

- All services require spectrum to operate making spectrum management a more daunting and crucial task than ever before.
- The problem here is how to reconcile the entry of the license holder into new service areas.
- Unencumbered frequency bands used for communications services were once widely available; now they are a relatively scarce commodity in an increasingly spectrum-dependent world.
- As new spectrum technologies unfold and proliferate, spectrum managers and regulators have to adapt and evolve to continue to manage the increasing crowded spectrum resource in a responsible, fair, and technology-neutral manner.
- Current regulatory regimes based on national and international frequency allocations, providing for exclusive use of frequencies will need to be continuously reviewed.

Spectrum Management

- The current trend is to develop new spectrum-efficient technologies that allow new users of spectrum to be accommodated while at the same time reducing the cost per user per hertz by increasing the number of users that can access a given portion of spectrum.
- New technologies are evolving that allow for the sharing of spectrum more efficiently, the leasing of unused spectrum to other companies, and the auctioning of white spaces between spectrum licenses that previously were thought to not be usable.
- New and emerging technologies will spur an increase in demand for spectrum-dependent wireless services, challenging regulators and users alike.

Regulatory Framework for Radio Spectrum

- Telecom Regulators will need to create a roadmap for how to proceed.
  - Define a clear roadmap for access to spectrum to support current and next generation services on a technology neutral basis;
  - Embrace and define new capabilities and technological change into the management of the radio spectrum;
  - Adapt and modify the telecom regulatory framework to accommodate the flexibility of the new technology in providing telecom goods and services;
  - Enable the introduction of new and different services over existing infrastructure by ensuring a level playing field to all current and future operators; and
  - Enable and encourage deployment of broadband wireless access

Numbering

- Numbering issues span almost all the sections of the industry – from IP addresses for ISPs to channel numbers in television or cable networks to phone numbers in telecom networks.
- Numbering policies and regulations were developed to address voice telephony services and not data or multimedia.
- As a result, voice telephone numbers were divided into different ranges and by geographic areas.
- This differentiation had a twofold function of informing end users of the charges of the calls and maintaining the interconnection cost structure based on services (i.e., mobile voice service vis-à-vis fixed voice service) and distance.

Numbering

- However, with the advent of Mobile phones and VOIP calling, people are no longer calling a place, but a person who could be located anywhere.
- With Mobile phones, the cost to reach the person is calculated in the cost of the call, but with VOIP or other disruptive technologies it is difficult to determine the cost of the call as it may appear to be local, but in reality it can be international.
- This has raised questions among regulators as to whether numbering resources should be assigned for VOIP and whether traditional telephone service operator obligations should be imposed on VOIP providers.

Numbering

- The primary argument in favor of allocating geographic numbers to VOIP services is that these numbers may be considered to support competition, particularly if they are combined with number portability, as they are in the US and elsewhere.
- Some governments have decided to open new number ranges for movable VOIP services
  - Countries such as Singapore, Japan, South Korea and some EU Member states (e.g., Ireland, France, Germany, and Austria), have created a specific numbering range for VOIP services because of its nomadic use.

Numbering

- While other countries, such as Japan, Spain, and the United Kingdom, have combined both measures, and grant geographic numbers to VOIP providers if they operate under the voice service regime (i.e., voice quality of service, lawful interception obligations, access to emergency services), and specific number ranges if VOIP providers operate under the "information service" regime.
- Many VOIP service providers have opposed number ranges that are distinct from existing number ranges for traditional circuit-switched voice services as these will likely hinder competition.

Portability

- Number portability is a primary enabler of competition by allowing users to retain their phone numbers when they change service providers.
- This allow consumers to switch to VOIP providers or other alternative providers without losing their phone number, thereby enhancing competition among telephony providers whether they be mobile, VOIP, cable, or wireline.
- Governments view number portability as a key facilitator of consumer choice and competition and need to consider whether number portability is possible for all services.

Interconnection

- Traditionally interconnection regulation was established for switched voice services, where rates were generally based on a per minute charge
- Converged Services, most notably those based on the IP protocol, require interconnection rights and new interconnection schemes with different types of access and charges to ensure that everyone can interconnect regardless of the type of network they are using.
- Newer interconnection pricing involved symmetrical interconnection costs, where any operator, regardless of network type, is obliged to interconnect with any other operator.

Interconnection

- Other types of interconnection pricing is based on access to parts of the infrastructure (e.g., the local loop or directory services databases), or to allow the provision of wholesale services (e.g., wholesale Internet access service or mobile roaming).
- Some have even adopted a technology neutral interconnection charging system based on capacity, instead of the traditional metrics of time and distance.
  - Here operators may request a specific capacity for interconnection and pay a flat-rate charge that reflects the fixed-cost nature of the interconnection capacity

Network Security

- Network Security
  - Governments consider that providers of publicly available communications services should take appropriate measures to safeguard the security of their services.
    - For VOIP services, this could include measures to protect against viruses and denial-of-service attacks.
    - Governments may also require VOIP providers to inform their users of possible security risks.

Law Enforcement

- Law Enforcement
  - The ability for law enforcement authorities to access communications networks (often referred to as Lawful Intercept) is an issue of great concern to governments, especially as terrorism threats grow and multiply.
  - Governments have adopted different regulations to enable them to have access to all types of networks, mobile, Internet, and Cable TV.

Media Ownership

- Media Ownership limits are in place to enable diversity in the content and ideas presented by the media.
- Technology convergence means that asymmetric regulation might classify video provided to mobile phones as broadcasting and thus subject to Broadcasting rules, such as carriage requirements.

Accessibility

- Accessibility
  - In a converged environment, where some sectors are no longer regulated, e.g., VOIP or IPTV services are not subject to obligations such as teletype relay or closed captioning, how do you ensure that everyone can access these services.
  - Need to have certain standards that all operators must follow to ensure that the services are accessible to people with disabilities.

Emergency Services

- Regulators world-wide need to decide how to ensure that IP telephones that are replacements or complete substitutes for voice telephony will work to connect these networks to emergency service operators and display the correct location of the caller.
- As discussed earlier, many countries have adopted rules that ensure that all IP phone providers can connect to emergency services.
- The key here is to identify which IP telephony services are substitutes for telephony and thus subject to regulation, and which are additional new services that people would never consider ever needing to call emergency services, e.g., gaming consules, blogs, e-commerce sites.

Quality of Service Regulation

- Regulatory frameworks need to be modified so as to take full advantage of these new converged services and still maintain a certain level of QoS,
  - In the traditional regulatory framework ensuring certain QoS standards has been a main function of the regulator. However in a converged environment, new technologies have blurred the boundaries between the broadcasting and telecommunications sectors.
  - Quality of Service Standards
    - New QoS standards must be created for converged services since each of the services has very different QoS requirements. Telecom has more stringent QoS standards because it has to be always available, but broadcasting because it was one to many and not one to one had very different requirements. Traditionally broadcasters have not allocated resources dynamically. Instead, broadcasting towers, satellite networks, serve customers in a static fashion since signal transmission is independent of the usage.
  - Today, IP networks are carrying broadcasting services that compete for the same users served by over-the-air and cable television. And 3G video services and mobile television provide a new capability to satisfy users –mobility.

Regulatory Framework: Service & Content

- The main trend in this area has been to split the regulation of the transmission network and technology from the regulation of the content.
  - Success will only occur if regulators and policymakers observe the key principles of service and technology neutrality as well as establishing and insisting upon transparency, and enforce the appropriate licensing rights and obligations.

Consumer Protection

- In a converged environment, regulations need to be modified to provide for the informed decision making and for added consumer protection.
  - For example, Regulators and policymakers have introduced requirements that providers of new converged services inform consumers of the differences between these services and traditional telecom services so they can make informed decisions.
  - Also that provisions are in place for emergency service.

Consumer Protection

- Consumers also need to be protected against fraudulent or bankrupt operators. This is an important new function of today's regulator.
  - How do you provide protection to consumers in an area where neither the services nor the technology are regulated.
  - Real challenge here is protect the phone service and phone numbers of consumers who went with an operator who is now bankrupt, by preserving their access to their phone number.

Conclusion

- Governments and regulators play a key role in stimulating demand for ICT services and applications, in the framework of broader strategic goals, such as connecting public institutions, businesses and residential users with broadband, promoting economic development, digital inclusion, social cohesion and equality of opportunity.
- Regulators need to be attentive to the challenges stemming from convergence to pave the way for the establishing a regulatory environment that is transparent, conducive to investment and growth, fosters fair and greater competition and innovation, stimulates the deployment of infrastructure, promotes the development of new services, protects consumers, and is security conscious.
- Regulators should adopt appropriate regulation on interconnection and access, including pricing, taking into account the relevant technological market developments including the roll-out of Next Generation Networks in the core and in the access layer.

Conclusion

- Governments need to build an adaptive regulatory framework by adopting a technology neutral approach, and a simplified and flexible licensing regime that provides for easy market entry of new players, such as through general authorizations and multiservice/unified licenses.
- Foster competition in converged services over wireless networks through efficient and integrated spectrum management
- Establish appropriate policy goals and refrain from imposing regulatory restrictions except when strictly necessary to promote competition and consumer protection, and that are proportionate to the established policy goals.

Questions, Comments, Suggestions?

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Thank You