

Convergence of Broadcasting and Telecommunication Technology Regulatory Framework in Pakistan

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Abstract: This research sheds light over the issues of current regulatory framework structure of broadcasting and telecommunication technology of Pakistan. The study finds out that there are many issues which are barriers in the convergence of broadcasting and telecommunication technology, like content issue, spectrum issue, public interests issue, pricing issue, licensing issue etc which come from distinct multiple regulatory bodies regulatory framework. As convergence between telecommunication and broadcasting technology is not only mandatory for modern business but also for the welfare of public, there fore this research was done with the aim to put a solution to the convergence issues. The study rejects the Current Regulatory framework and proposed a new regulatory framework model which should be done by Supreme Regulatory Authority.

Keywords: Current Telecommunication and Broadcasting Regulatory Framework (CTBRF), Pakistan Telecommunication Authority (PTA), Pakistan Electronic Media Regulatory Authority (PEMRA), Frequency Allocation Board (FAB), Supreme Regulatory Authority (SRA), Technology Convergence (TC).

1. INTRODUCTION

The issue of different telecom, media broadcasting, internet etc services and technology convergence is a debate of modern time all over the world. It is because of the growth and development of various elements of the sector. Technically, convergence is defined as adaptation of a strategy which offers to pass many services through many networks [1] [2]. In telecommunication sector, it means “A combination of many telecom technology and services in order to minimize market and industry barriers.” [3]. Technology Convergence (TC) is a new concept. When the traditional networks changed from analog to digital set up, the scientists and experts of the field started to articulate and manage the situation by some legislative framework (LF) for assisting the regulators to face and deal the challenges and issues of modern innovations in the field. With the development of new technology, facilities and services in media and telecommunication, it is obligatory to review all the policies, legislation and regulations in such a sophisticated way to solve the issues and challenges of new technology and their services. Under the Act of Pakistan telecommunication, 1996, an organization was established for regulating all of the telecom system and services in the country [4].

In Pakistan there are three distinct bodies which perform responsibilities of regulation regarding telecommunications and broadcasting.

1. PTA (Pakistan Telecommunication Authority)
2. PEMRA (Pakistan Electronic Media Regulatory Authority)
3. FAB (Frequency Allocation Board)

This research is going to address the current telecommunication and broadcasting regulatory framework issues. This study will explore various broadcasting technology and telecom services convergence issues and challenges and will develop a

broadcasting technology and telecommunication regulatory framework which better suits the environment of Pakistan. The following are the main objectives of the research.

- a) To study the current regulatory practices in Pakistan.
- b) To identify the issues relating to broadcasting and Telecommunication Technology convergence.
- c) To modify the current or develop a new regulatory framework for Telecommunication and broadcasting technology.

2. LITERATURE REVIEW

1. Technology Convergence (TC)

Modern innovations and development of technology not only improves the standard of living of humans but also leads them to face some important issues and challenges in life, coming from these developments. One of the most important issues is TC. TC has many advantages for the market, for the industry and for the technology sector itself. It has also a great impact over the regulatory bodies and over the society. There fore it will be not useless to say that technology convergence initiates many opportunities on one side and many challenges from both regulatory and business perspectives [5].

TC has also many benefits for new services and products developments and expands the consumer choice at large. It is a source of information market expansion, world economy integration and marketing globally [6].

Regulatory and policy framework varies form country to country to address and solve the new and future challenges arising from the TC. Depend upon the trend, need and issue; they design their regulations and policies, and technology convergence framework in a way to cover the need effectively [7]. Due to TC, organizations adopted new technologies, improve their existing capabilities and services [8].

Convergence is not only a phenomenon relating to regulations but it covers many subject areas like designing and planning policies, e-commerce etc which are also regulated by specific governmental institutions [6].

As the broadcasting and telecommunication technology in Pakistan is going to be converged to a greater extant and is getting convergence very rabidly so there is a need to find a solution to the issues of current regulatory framework. This research is going to discuss the important issues which create hurdles and difficulties in the convergence of telecommunication and broadcasting technology and put a solution to the problems, the convergence of the sectors are facing.

2. Telecommunication and Media Regulatory Bodies in Pakistan

a. Pakistan Telecommunication Authority:

Pakistan Telecommunication Authority came into being Pakistan Telecommunication Re-Organization Act, 1996 which was amended in 2006 [9] . It is responsible and in charge to regulate, legislates and makes policy for operation, establishment and maintenance all telecommunication business.

PTA regulates the telecom industry and its services in such a way to protect the consumer rights and the rights of the service providers. Not only has it kept its eye on the affordability of the service but also on its quality. It is the authorized body to investigate and judge any lodged complaints against the telecom sector companies. PTA encourages competition and discourages monopolies of one or some telecom services provider. This encouragement policy not only modernize the telecommunication industry but also helps in the development of the country, promotes new developments and innovations, assists in the service production in an effective way, produces the services in consumer affordable price and let the providers to maximize their coverage. It also assists the government of Pakistan regarding new policy to be established for telecommunication industry.

PTA issues licenses to telecommunication organization for telecom systems and services. It can also renew or reject the license issued to a firm. In addition, it is the responsibility of PTA to decide about the terms and conditions or any

modification of license. It charges a specific amount for issuing a license and some other amount decided by the Cabinet Committee.

PTA approves the capabilities of an installer and its equipments by prescribing and ensuring specific standards of all telecommunication equipments and installers. Telecommunication services tariffs are also regulated by it. It may also issues summon any relevant authority if an enquiry has been made against the relevant person or licensees for an investigation.

Planning for national telecommunication numbering development is also the duty of PTA. It gathers national and international information about telecommunications and analyses it deeply in order to find out its impact and influence on Pakistan. Shortly, it regulates all of the functions described above in such a way to promote investment, to protect and ensures consumers interests and rights, to endorse and maximize competition, to provide and guarantee the quality of ICT services; and to establish a reasonable regulatory regime.

Up to now PTA has made several important policies for telecommunication industry. Among them the most important are the following:

1. Deregulation Policy (DP) [10]
2. Mobile cellular Policy (MCP) [11]
3. Broadband Policy (BBP) [12]
4. Global Mobile Personal Communication by Satellite (GMPCS) [13]

b. Pakistan Electronic Media Regulatory Authority:

Pakistan Electronic Media Regulatory Authority (PEMRA) is an organization for facilitation and regulation of electronic media. It was established in 2002, under PEMRA Ordinance [14]. It works for the betterment of electronic broadcasting. It maximizes the quality of information and entertainment. It has its mandate to increase the variety of available media for news, religious knowledge, science and technology, economic and social development, entertainments, sports etc. its aim is to make sure the media accessibility to the people. For the above main objectives, PEMRA found transparency and first class governance which agrees to the accountability of PEMRA. But there is a clause of protection in the PEMRA Ordinance which makes the liability and accountability of its employees unclear.

The main functions of PEMRA are:

1. To facilitate electronic media
2. To establish regulation for electronic broadcast media
3. To operate and distribute the broadcast media which are created for the people of Pakistan and for international audiences?

The PEMRA ordinance gives some important power to the body regarding licensing, policy making and regulations. It has the power to make regulations for broadcast media and make decisions according to the power granted to it by the ordinance. Issuing of broadcast media license is also the responsibility of this body, along with the power to reject or cancel the license if broadcast license holder fails to fulfill the standards prescribed by the ordinance. It is the duty of PEMRA to issue the prescribed documents, which tell the details of facilities distribution, installation and operation for transmission of broadcast media along the license to the licensee. It decides all the terms and conditions for issuing a license like license fee and the eligibility of broadcast operator. Not only PEMRA set standards for broadcasting facilities but it has also the power and function to keep an eye over the process of broadcasting and find out weather the operator meet the prescribed standards or not. It also regulates for the contents to be broadcasted and decides which contents should be broadcasted and which not. PEMRA is active in formation of rules and regulation regarding electronic media telecommunication.

The following are the main documents, up to now make by it:

1. Regulations for TV Broadcast Operations (2012) [15]
2. Regulations for Radio Broadcast Operations (2012) [16]
3. Regulations for Distribution Service Operations (2011) [17]

4. Councils of Complaints Rules (2010) [18]
5. PEMRA Rules (2009) [19]
6. Code of Conduct [20]

c. Frequency Allocation Board:

Frequency Allocation Board (FAB) is a body established by the federal government replaced the Pakistan Wireless Board, for making regulations according to the choice of federal government after its approval [21]. It works under the candle of Pakistan Telecom Act 1996 and under the guidelines of International Telecommunication Union [23].

FAB has the authority, given to it by the government of Pakistan to assign and allocate a specific spectrum of radio frequency to government of Pakistan, to telecommunication services and systems providers, for broadcasting of radio and television operations and other wireless operators etc [21].

After receiving an application for radio frequency, FAB decides weather frequency spectrum will be allotted and assigned to the applicant or not. The board classifies the telecommunication services and allocates the specific frequency spectrum according to the application and availability [21].

3. Issues in the Current Regulatory Framework in Pakistan

In Pakistan there are three main bodies which regulates for the telecommunication and media sectors. They consist of PTA, PEMRA and FAB. But it is a fact that their strategy of regulation is based on their own priorities and conditions. Although they are well defined distinct bodies, they are functioning for regulating the single sector, e.g. Telecommunication Industry. It is necessary to address here the common objects for all of them. Now days the wired telecommunication equipments are also offering IPTV and many more such offers which are directly related to the PEMRA regulation. FAB consultation is needed for any telecom service production and with out it is impossible for any service provider to start or offer their services to consumers. Frequency slot allotted to EVO, FM etc have a strong relationship with FAB.

It is very hard and difficult to regulate same activities of different organizations which are easily follow-able etc [22]. For example how can we separate network and content regulation? This situation leads us to confusions concerning the way the regulatory bodies do regulate the telecom sector under the phenomenon of convergence [24]. This research is going to find out which regulatory framework is more beneficial for Pakistan. If we converge multi-sectors providing or assisting telecommunication or media services then which framework will work better than the other one. Lack of Standards does not support Interoperability and Interconnection of Converging Networks:

There are many complexities and issues arising from individual sector regulation strategy in Pakistan. The following are some of them.

A. Issues of Licensing:

Licensing is also a main issue CTBRF in Pakistan. Any one who wants to open an organization for telecommunication and broadcasting services in the country should first get license from FAB then from PTA or PEMRA. Getting license from many bodies is not an easy process. It requires more efforts, money and time. Sometime there are severe restrictions over issuing of the license in one body which has a great impact over the operations or services of the other body; and most of the time with out such a license operations becomes impossible.

In Pakistan, as there is not only difference in license issuing of telecommunication and media sectors, but there are differences with in each sectors. Like there are many Television Channels which have limited geographic transmission, some offers news, some sports while some other entertainments. These differences create many other complexities with in each sector policy, rules and regulation planning. For example there is difference in news and entertainment channels, or whether the telecommunication service provider offers 2G services or 3G services. For each type of services to be provided by the operator need specific license which consist of its own rule and regulations etc.

These points develop the view that the CTBRF of Pakistan is not providing easiness and opportunistic environment for investors to get license easily as it is needed for the development of the sectors and welfare of the people.

B. *Issues of Content:*

Perhaps, this is the most important element for telecommunication and media users and consumers. It has a direct influence over the society and human mind. It makes human a terrorist and a terrorist, an excellent person. Generally, there is an agreement between contents providers and its carriers. There should be such environment which does not disturb competition between the service providers or broadcasters, in such a way not to be an issue for consumer choice and general availability.

As in this research we are focusing over the environment of Pakistan, which is a religious and democratic country and Islamic religion has a great impact over its laws and policy making and makers along with its citizens. As Islam has many laws regarding the protection of minorities and put certain obligations over the government to protect the minority interests, there is an issue arising in the implementation of the current regulations to protect them and sometime fails to protect their interests but hurts them through various content which either get transmitted through telecommunication or broadcasting media.

On the other hand, there are many other issues relating to the contents of telecommunication and media services. For example, there are many web sites which are not only harmful for human behavior but directly violate the basics of Islam and humanity, i.e. porn sites. Again it would be better to clarify here that the constitution of Pakistan says that there should be no law, policy etc against Islam. So again come to Islamic teachings, which like many other religions have a complete code of conduct for living, forbid every thing which is harmful to human mind and their behaviors. There are many websites which have strong negative impact over human mind and behavior. Any one from any where can upload any thing here with out any hurdles. Same is the case of media. The "Picture Content" of many programs, films and dramas has a very bad and unhumanistic impact over the individual behavior, people, society and human mind.

In recent era, there are hundreds of documentaries available on internet, which are recorded by the terrorists to spread fear in the world especially in Pakistan and to change the behaviors of the people by providing them false interpretations of Islam and Sunnah. Therefore content regulation is one of the most important elements of telecommunication and broadcasting technology convergence in Pakistan.

But it is a fact that there are well defined and well mannered regulations regarding "content" formulated by PEMRA. All content what is said to be harmful of any kind to individual behavior, harms thoughts of any ethnic group or religious group, violates the ideology of Pakistan and basics of Islamic teachings and tends to leads the people to violence and misbehaviors are not acceptable to be broadcasted according to the PEMRA rule. The details of such regulations are attached in the appendices of the research [20].

This shows the importance of further content regulation inside and outside Pakistan in telecommunication and media sectors. The present regulations regarding the issues in PEMRA are not enough to give positive results.

C. *Issues of the Frequency Spectrum:*

One of the most important issues of telecommunication is bandwidth. It is equally important for both mobile communication and broadcasting. The importance and need for frequency allocation was not even decreased by the convergence of telecommunication networks. Due to its all time importance regulation regarding frequency allocation, its licensing, it's assigning are still in daily debates of telecommunication and broadcasting sectors.

It is also a fact that in Pakistani telecommunication market, where there is open competition for every player to provide better services at better price with high quality, every operator wants to get more bandwidth for its smooth operations. This situation creates many other hurdles and pressures for the FAB to regulate and deal with the arising issues.

In today telecommunication market it has its weight in the areas like satellite communications, mobile internet access, online services and other communication with personal computer and delivery to television etc. It is also significant in wireless local loops and Universal Telecom services (UMTS). It is a fact that most of the broadcasters get frequency at low or free of cost where as a telecommunication service providers get frequency spectrum at high price for its services.

This discussion shows that Frequency Spectrum has its importance in modern telecommunication and media industry. For the development of a country it can play a significant role as it can provide finance for the national treasury.

D. *The Standards Issue:*

With modern developments and innovations in technology, consumers want to avail services related to telecommunication and media services from a single terminal. They have no concern with technology type or geographical point for getting access to the services. As it is clear, telecommunication and broadcasting can be availed by same technology to a greater extent; there is a need to standardize the industries of telecommunications, consumer electronics and information technology and the services they are producing. Standardization of the above three main elements will help in reinforcing the sector policy and its regulatory framework by providing data security, personal secrets etc.

E. *The Pricing Issue:*

Pricing varies from area to areas in telecommunication, media and information technology. In Pakistan there is no fee for launching a website or opening a site for internet use. For broadcasting a channel, there is only a license fee for opening TV channels, which has the objective to ensure the service availability affordable for viewers. In some cases, for example there is no fee for radio broadcasting.

Therefore each TV channel or radio broadcaster wants to get many listeners and viewers as there is no other charges' regarding to their services. In contrast in the telecommunication sector, which is high competitive also, has to pay many other charges in addition to the license fee. In telecommunication sector the price control vests in the operators which lead to many other issues in the sector. Some of the price related issues are the price of interconnection, price of voice services and price for the usage of infrastructure.

Therefore for the convergence of telecommunication and electronic media services there is a need to regulate it in such a way which will not make the service available to the consumer at a single terminal but at an affordable price.

F. *Issues of Public Interests:*

Technology and its development have brought tremendous advantages for human welfare by offering them thousands of benefits of technology use. Telecommunication technology connected thousands of kilometers dispersed people and turn the world into a global room in which every one can see and share its view with others. But it is known that each country and nation has its own interests and always trying to make it safe and achievable. For achieving such interests usually they do not care for others interests and so they violate the natural law. Internet is the main source for achieving such goals by uploading and transmitting materials of their own choices.

Broadcasting and media services have to promote its own culture and traditions along with its protection. But unfortunately broadcasters failed to do so in Pakistan. Foreign culture invaded our own culture and instead to develop ours destroy it. It is reported in one newspaper that due to cultural invasion and harmful broadcasting of Star Plus Television resulted twenty seven cases of divorce in Lahore only. There are many other television channels which have brought extremely modernism in their transmission process if we compare them with their transmission process of ten years ago. The way television anchors appear and their dresses have very negative impact over the public interests and their culture.

There is distinct rule for achieving public interest in PTA, FAB and PEMRA. For example PTA has no policy over the contents of data transmitted or communicated through telecommunication service providers except some. For example Youtube.com and some other websites were blocked after the intervention of Federal Government. PEMRA has rules and policy regarding the contents of broadcasting materials. Some radio frequency modulation channels in Pakistan are also using frequency spectrum illegally as used by Taliban etc.

On one side it is an irrevocable fact that there are many similar objectives of the above organizations concerning public interests like economic interest etc. on other side it is the very need of today that clear and unrigged rules and regulations are necessary to defend our culture, to secure individual privacy, to promote and suits the Islamic principles and constitution of Pakistan; and which is hundred percent fit for the smooth running of government.

Therefore it would be better to change the current regulatory framework style of the above discussed bodies, in order to make such regulations through which the objectives of public interest could be achieved properly.

G. Issues of Foreign Services:

It is clear in the PEMRA rules that with out permission of landing rights no foreign channel will be allowed for broadcasting its services. But for such purpose every channel is bound to get a license from the authority [20]. Now let see the telecommunication sector, although there is permission for interconnection, foreign calling etc, yet there is no rules or law for internet and all those services which are offered through it.

This shows a clear difference between PTA and PEMRA. It should be clear that why PEMRA has such rules and PTA has not. After reading the PEMRA rules two things come into minds. First is license fee and related to finance and the second is due to its content. As most of the foreign channel have got their license under their own country law, which may directly contradict with the basic law of Islam and Pakistan; and they have no interests in the interests of Pakistan and its people. Keeping these issues in mind PEMRA has formulated its rule that no foreign channel shall be allowed for broadcasting its services with out taking permission from PEMRA.

On the other hands, let's reminds whether the telecommunication services provided by foreign providers have respect for the interests of Pakistan, its people and Islam or not. They answer is very clear and is "no." Any one from anywhere can transmit what come in his/her mind through internet and other telecommunication equipments. There fore there should be clear and rigid rules for all of the operations which come under PTA to protect the culture, interests and ideology of Pakistan, promote Islamic teaching and secure the people from violence and evil deeds.

Therefore, it is suggested here that this issue can be overcome if there is a single regulatory body for both, broadcasting and telecommunication sectors. Based on this discussion the research proposes convergence of telecommunication and broadcasting sectors regulatory bodies and framework.

3. DISCUSSION

It is observed in the above literature review that the regulatory framework of Pakistan is full of many complexities. As many issues were discussed with the multiple regulatory bodies, it is mandatory to study the regulatory framework which consists of a single supreme body with high regulatory powers. There are many countries which have supreme regulators; among them the following are more important to discuss here.

In United Kingdom, there is one body which regulates both telecommunication and media services. This regulator was established with passing of the Communication Act-2003 with the name of "The Office of Communication" (Ofcom) [24]. It has the power to set rules and regulation for television and radios channels through its Broadcasting Code, which makes the broadcasters bound for its following and gives protection to the viewers; and all other stake holders of the process. In short, it is a supreme regulator and has the previous responsibilities of the following different regulators.

- i. Broadcasting Standard Commission (BSC)
- ii. Radio Communication Agency
- iii. Independent Television Commission
- iv. Radio Authority
- v. Office of Telecommunication

In Australia, also there is one regulatory body, which is responsible for setting the regulations and policy of the internet, broadcasting, telecommunications and radio communications. The body is known as "The Australian Communications and Media Authority (ACMA) [25]."

In both of the above countries the supreme regulator, regulates the telecommunication and broadcasting sectors and have minimized the issues arising from the framework of many regulator to a considerable extent.

4. CONCLUSION

This research studies the issues of multiple regulatory bodies, which are hurdles in the convergence of broadcasting and media technology and services and due to which the telecommunication and media sector organizations fails to satisfy the need and duty in a healthy manner. The above discussion shows that the current regulatory framework in Pakistan is also incompetent regarding regulation of Islamic, cultural, minority, content and national issues. There are many issues which come from this multiple body individual sector regulatory framework like PTA, FAB and PEMRA. Currently, PTA fails to decide about the regulation of content and other internet communication. PEMRA is unable to implement its rules and regulation over the TV channels regarding culture and public interests. Then who will decide about the convergence regulation of both of the technology?

One of the important problems with the current situation is that all of the three bodies, PEMRA, PTA and FAB belong to different ministries along with the influence of Finance and Privatization Ministries etc. There fore each element in the whole system of government has its own distinct objectives related to telecommunication and media industry. In short the use of both media and telecommunication is less than its misuse.

This shows that, the present regulatory framework of broadcasting and telecommunication in Islamic Republic of Pakistan fails to satisfy the need of the public and fails to play its role as it should be in the contemporary world. So it is concluded that it should be re-engineered and new regulatory framework and regulation should be constituted for the convergence of broadcasting and telecommunication technology according to the need of the people of Pakistan.

5. RECOMMENDATIONS

After carrying out the research, the following recommendations were made by the authors.

1. All of the regulatory bodies, PTA, PEMRA and FAB should be converged; and should be replaced by another Supreme Regulatory Authority, which has the power to look after the telecommunication and media sectors.
2. The Supreme Regulatory Authority should be responsible for all of the functions currently doing by the FAB, PTA and PEMRA regarding licensing, frequency allocation, policy and regulation development and public awareness etc.
3. Direct influence from several ministries should be erased from the Supreme Regulatory Authority and it should work under single ministry assigned by the federal government.
4. The objectives of the Supreme Regulatory Authority should not be money making or industry development alone, but cultural safety and promotion, consumers and public guidance, interests should also be in the mottos.
5. The Supreme Regulatory Authority should be supreme in its policy making, regulation designing and strategy formulation but it should be made clear that all it is doing does not violate the basic teaching of Islam.
6. Islamic Jurists and Cultural experts should be the members of the team, which formulate the code of conduct for the telecommunication and media sector.
7. The Supreme Regulatory Authority should make sure high investment by providing more competitive and suitable market to the investors.
8. In short, it should be the duty of the Supreme Regulatory Authority to articulate code of conduct, policy and regulations in such a manner to:
 - i. Make sure the standardization of telecommunication and media systems.
 - ii. Make sure that the telecommunication and media broadcasting licensing and pricing are not too high nor its getting a complex process.
 - iii. Make sure that both of the services should be in reach of common people every where in Pakistan.

- iv. Make sure that the content being transmitted through telecommunication and broadcasting does not violate the Islamic Code of Conduct Law and Pakistani Law.
- v. Make sure that every thing in the broadcasting and communication process is good for the welfare of the individuals, people and country respect and dignity.

REFERENCES

- [1] Blackman, C.R. (1998), 'Convergence between telecommunications and other media: how should regulation adapt?', Telecommunications Policy, Vol. 22, No. 3, pp. 163-170.
- [2] Tadayoni, R. and Kristensen, T. (1999), 'Universal access in broadcasting: solving the information problems of the digital age?' Paper presented at the 9th annual INET conference, San Jose.
- [3] Lind, Jonas (2004) "The Convergence hype cycle:usage in management practice during an impending market re-definition", ITS Biannual Conference, Berlin, Sep 5 – 7.
- [4] Pakistan Telecommunication Act, 1996.
- [5] European Commission (1997), Green Paper on the convergence of the telecommunications, media and information technology sectors, and the implications for regulation towards an information society approach, COM(97) 623, Brussels.
- [6] Implication of convergence on the regulatory regime, June 2004. Nhlanhla Mlitwa Link. Centre-Wits University.
- [7] The challenges of compliance [technology convergence]. Jeziorny, R.; Manufacturing Engineer , Publication Year: 2006, Page(s): 44 – 47, IET journals.
- [8] Rikkiev, Andrei; Mäkinen, Saku. 2009 Succes Factors for Technology Integration Convergence Collaborations: Empirical Assessment. Proceedings of the Portland International Center for Management of Engineering and Technology (PICMET), Portland, Oregon, USA, 2-6 August 2009.
- [9] Pakistan Telecommunication (Re-Organization) Act 1996 (Amended 2006)
- [10] [http://www.pta.gov.pk/ media / Mobile Cellular Policy Jan 28_2004. pdf](http://www.pta.gov.pk/media/Mobile%20Cellular%20Policy%20Jan%2028%202004.pdf)
- [11] [[http://www.pta.gov.pk/ media/ telecom act 170510. pdf](http://www.pta.gov.pk/media/telecom%20act%20170510.pdf)]
- [12] [http://www.pta.gov.pk / media / bbp. pdf](http://www.pta.gov.pk/media/bbp.pdf)
- [13] [http://www.pta.gov.pk /media / gmpcs. pdf](http://www.pta.gov.pk/media/gmpcs.pdf)
- [14] Pakistan Electronic Media Regulatory Authority Ordinance 2002, as amended by the Pakistan Electronic Media Regulatory Authority (Amendment) Act 2007 [Act No. II of 2007] [www. pemra. gov. pk/ pemra/](http://www.pemra.gov.pk/pemra/)
- [15] [http://www.pemra.gov.pk/ pemra / images / docs / regulations / Television Broadcast Station Operations Regulations 2012. pdf](http://www.pemra.gov.pk/pemra/images/docs/regulations/Television%20Broadcast%20Station%20Operations%20Regulations%202012.pdf)
- [16] [http://www.pemra.gov.pk / pemra / images / docs / regulations / Radio Broadcast Station Operations Regulation 2012. pdf](http://www.pemra.gov.pk/pemra/images/docs/regulations/Radio%20Broadcast%20Station%20Operations%20Regulation%202012.pdf)
- [17] [http://www.pemra.gov.pk/ pemra /images /docs / regulations / Distribution Service Operations Regulations 2011. pdf](http://www.pemra.gov.pk/pemra/images/docs/regulations/Distribution%20Service%20Operations%20Regulations%202011.pdf)
- [18] [http://www.pemra.gov.pk/ pemra / images / docs / legislation / Complaint Rules .pdf](http://www.pemra.gov.pk/pemra/images/docs/legislation/Complaint%20Rules.pdf)
- [19] [http://www.pemra.gov.pk/ pemra / images / docs / legislation / PEMRA Rules 2009. pdf](http://www.pemra.gov.pk/pemra/images/docs/legislation/PEMRA%20Rules%202009.pdf)
- [20] [http://www.pemra.gov.pk/ pemra / images / docs / legislation / Code of Conduct. pdf](http://www.pemra.gov.pk/pemra/images/docs/legislation/Code%20of%20Conduct.pdf)
- [21] Garnham, N. (1996), 'Regulatory issues', paper presented at a meeting organized by the European Commission, Legal Advisory Board, on "Convergence between telecommunications and audiovisual: consequences for the rules governing the information market", April, Brussels.
- [22] Clements, B. (1998), 'The impact of convergence on regulatory policy in Europe', Telecommunications Policy, Vol. 22, No. 3, pp. 197-205.
- [23] Pakistan Deregulation Policy 2003
- [24] Ofcom. (2006).Communications: The next decade. A collection of essays prepared for the UK Office of Communications. London: Ofcom.
- [25] The Australian Communications and Media Authority (ACMA) . pdf