Chapter II
INTERNET GOVERNANCE – AN OVERVIEW

2.1 Introduction:
Internet is a universal network of networks, with communication among networks enabled by a communications protocol suite TCP/IP. The Internet enables computers or telecommunication devices to connect with each other, creating a platform on which software applications can execute. Most commonly associated and dominant application over the net is WWW (World Wide Web), which is based on HTTP (Hypertext Transfer Protocol). This Universal arrangement provides a base for other multiple applications, such as email, file transfer protocol, and a variety of file sharing programs.

Internet includes the hardware, software technical infrastructure, the applications, and the content that is communicated or generated using applications. It incorporates millions of computers running countless applications, generating, manipulating, and retrieving a large amount of information. Internet penetrates through ordinary human life, commerce, communications, entertainment and interpersonal relationships. Internet governance is about the instructing whatever technical systems enable the functioning of the global network of networks as a platform for applications.

Today’s Internet is a collection of technical systems, including TCP/IP, the system of IP numbers that identify individual computers or servers on the net, and the Domain Name System (DNS) that provides alphanumeric equivalents of IP number addresses. The same technical systems enable the
operation of a hardware layer with routers, fibre Optic cable, individual servers, cellular systems, and even satellite links. The same technical systems enable the operation of an applications layer, ranging from the familiar (the World Wide Web, browsers, search engines) to new and modern applications that may become ‘the future great ideas’.

2.2 Historical significance:

The Internet started as a government project. In the late 1960s, the US government sponsored the development of the Defence Advanced Research Project Agency Network (DARPA Net). By the mid-1970s, with the invention of TCP/IP (Transmission Control Protocol/Internet Protocol), this network evolved into what is known today as the Internet.

The Internet Engineering Task Force (IETF), established in 1986, managed the further development of the Internet through a cooperative, consensus-based, decision-making process, involving a wide variety of individuals.

The DNS war (1994–1998)
This decentralised approach began to change as governments and the business sector realised the importance of the global network. In 1994, the US National Science Foundation, which managed the key infrastructure of the Internet, decided to subcontract the management of the domain name system (DNS) to a private US company called Network Solutions Inc. (NSI). This was not well received by the Internet community and led to the so-called DNS war which ended in 1998 with the establishment of a new organisation, the Internet Corporation for Assigned Names and Numbers (ICANN).
WSIS, held in Geneva (2003) and Tunis (2005) officially placed the question of Internet governance on diplomatic agendas. Internet governance was introduced to the WSIS process during the West Asia regional meeting in February 2003. The WSIS Tunis Agenda for the Information Society elaborated on the question of Internet governance, including adopting a definition, listing Internet governance issues, and establishing the Internet Governance Forum (IGF).

Developments in (2008–2009)
The major development of 2008 is the continued influence of Internet governance as well as other policy spheres. In 2008, network neutrality emerged as one of the most important Internet governance issues. A change in the architecture of the Internet triggered by a breach in network neutrality might endanger their business. In November 2009, the fourth IGF was held in Sharm el Sheikh, Egypt. The main theme was the IGF’s future in view of the 2010 review of its mandate.

Developments in 2010
The main development in 2010 was the impact of fast-growing social media on the Internet governance debate, including the protection of privacy of users of social media platforms such as Facebook.

Developments in 2011
In 2011, the main general development was the rise of Internet governance higher on the global politics agenda. The relevance of Internet governance moved closer to other diplomatic issues such as climate change, migration, and food security. Another consequence of the growing political relevance
of the Internet is the gradual shift of national coverage of Internet governance issues from technology (IT, telecoms) to political ministries (diplomacy, prime ministerial cabinets). In addition, the main global media (e.g. The Economist, IHT, Al Jazeera, BBC) were now following Internet governance developments more closely than ever before. In 2011, there were two major conferences on this subject: the Vienna Conference on Human Rights and the Internet, and The Hague Conference on Internet and Freedom.

The Year 2011 was also marked by the Internet governance principles which were proposed by the OECD, the Council of Europe, the EU, Brazil, and other players. The numerous convergences of these principles could be the starting position of a future preamble of a global Internet declaration or similar document that could serve as the framework for Internet governance development.1

2.3 Separate elaboration of ‘internet’ and governance:

Along with the traditional and most accepted definition of ‘internet, i.e.” a global system of interconnected computer networks that use the standard Internet protocol suite to serve several billion users worldwide” many people defined and understood this ‘network of networks’ with a different angle.

A Broader insight of the term ‘governance’ is particularly important while discussing the concept of Internet governance. The term governance sometimes is mistakenly believed to be the acts and duties of the government. No doubt governments play important role in many kinds of governance activities, but here it cannot be solely referred to as a
governmental responsibility. Another source of confusion is the translation of the term ‘governance’ in different languages. In Spanish, the term refers mainly to public activities of government the reference to public activities/government is also noticeable in French. Portuguese follow a similar pattern by referring to the public sector and government. Sometimes understood as collective action by governments, (and/or) the private sector operators of the networks connected by the internet to establish agreements about the standards, policies, rules, and enforcement of the dispute resolution procedures.

2.4 Defining Internet governance:
World Summit on the Information Society (WSIS) proposed the following definition of Internet governance as part of its June 2005 report.

“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”.2

This working definition forces the concept of including Governments, the private sector and civil society in the mechanisms of Internet governance. This working definition also acknowledges that with respect to specific issues of Internet governance each group will have different interests, roles and participation, which in some cases will overlap.

It further states that Internet governance includes more than Internet names and addresses, it also includes other significant public policy issues, such
as critical Internet resources, the security and safety of the Internet, and developmental aspects and issues related to the use of the Internet.

Telecommunication specialists see Internet Governance through the prism of the development of the technical infrastructure. Computer specialists focus on the development of various standards and applications, such as XML or Java. Communication specialists stress the facilitation of communication. Human rights activists view Internet Governance from the perspective of the freedom of expression, privacy, and other basic human rights. Lawyers concentrate on jurisdiction and dispute resolution. Politicians worldwide usually focus on media and issues that play well with their electorates. Diplomats are mainly concerned with the process and protection of national interests.  

All those activities adopted for the management of the critical internet resources and other internet protocol related technologies, applications, resources and services come under Internet governance. It also implies formulation of regulatory and governing policies of shared principles, norms, rules, decision making procedures and programmes that shape the evolution and use of the internet by government in cooperation /consultation with the private sector and civil society concerning their respective roles.

**2.5 The Concept and Evolution:**
The word Internet Governance was officially put forward in The World Summit on the Information Society (WSIS), held in Geneva in December 2003, and placed the questions related to Internet Governance. The
Declaration of Principles and Action Plan adopted at WSIS proposed a number of actions in the field of Internet Governance, including the establishment of a Working Group.

Below is an excerpt on Internet Governance from the WSIS Declaration of Principles:

50. International Internet Governance issues should be addressed in a coordinated manner. We ask the Secretary General of the United Nations to set up a working group on Internet Governance, in an open and inclusive process that ensures a mechanism for the full and active participation of governments, the private sector, and civil society from both developing and developed countries, involving relevant inter-governmental and international organisations and forums, to investigate and make proposals for action, as appropriate, on the governance of Internet by 2005.4

Following is an excerpt on Internet Governance from the WSIS Action Plan:

13. b) We ask the Secretary General of the United Nations to set up a working group on Internet Governance, in an open and inclusive process that ensures a mechanism for the full and active participation of governments, the private sector, and civil society from both developing and developed countries, involving relevant intergovernmental and international organisations and forums, to investigate and make proposals for action, as appropriate, on the governance of Internet by 2005.
   i. develop a working definition of Internet Governance;
   ii. identify the public policy issues that are relevant to Internet Governance;
   iii. develop a common understanding of the respective roles and responsibilities of governments, existing inter-governmental and
international organisations and other forums, as well as the private sector and civil society from both developing and developed countries;
iv. prepare a report on the results of this activity to be presented for consideration and appropriate action for the second phase of WSIS in Tunis in 2005.5

2.6 Brief introduction of internet governing bodies:
Internet governing is a combined effort of a large number of organisations typically concerned with a particular aspect. Standards setting and governance act as a means in the development and advancement of internet. A well defined set of standards and a clear governance structure will provide a way for new systems and technologies to be presented to the masses. Continuous work in this direction helped creation of many national, international, non-profit, for-profit, independent and government funded governing organizations specific to telecommunications and the Internet.

2.6.1 The Technical Organisations:
While the Internet does not have a central government body: it does have a number of inter-connected organisations which govern and administer the technical aspects of the Internet. As internet is a vast area of study, only cables and wires are not included in the technical aspects, many other standardisation procedures are also a part of technical study. A varied range of issues are related to technical organisations i.e. from selection of a protocol suite to the allocation of domain names. As internet data travels using telecommunication lines any communication related technical difficulty directly affects the flow of data on the interconnected network of networks.
2.6.1.1 Internet Corporation for Assigned Names and Numbers (ICANN):

ICANN is a not-for-profit organization which was created by the late Jon Postel in 1998 in response to a policy statement issued by the US Department of Commerce. This statement called for the formation of a private sector not-for-profit Internet stakeholder to administer policy for the Internet name and address system.

It coordinates the Internet DNS (Domain name systems), IP (Internet protocol) addresses and autonomous system numbers, which involves a continued management of these evolving systems and the protocols that are needed by them.

ICANN is responsible for the coordination of the global Internet's systems of unique identifiers and, in particular, ensuring its stable and secure operation. This work includes coordination of the Internet Protocol address spaces (IPv4 and IPv6) and assignment of address blocks to regional Internet registries, for maintaining registries of Internet protocol identifiers, and for the management of the top-level domain name space (DNS root zone), which includes the operation of root name servers.

Much of its work has concerned the DNS policy development for internationalization of the DNS system and introduction of new generic top-level domains (TLDs). Their management of an interoperable Internet covers 180 million domain names, the allocation of more than 4 billion network addresses, and the support of approximately a trillion DNS look-ups everyday across 240 countries.
ICANN's primary principles of operation have been described as helping to preserve the operational stability of the Internet; to promote competition; to achieve broad representation of the global Internet community; and to develop policies appropriate to its mission through bottom-up, consensus-based processes.

Uniform Dispute Resolution Policy (UDRP) attempts to provide a mechanism for rapid, cheap and reasonable resolution of domain name conflicts. UDRP decision patterns has led some to conclude that compulsory domain name arbitration is less likely to give a fair hearing to domain name owners. ICANN's Expert Working Group recommends that ‘whois’, a utility be replaced with a system that discloses information for permissible purposes.

In addition to its supporting organizations, ICANN has a number of advisory committees including the At-Large Advisory Committee (ALAC), charged with helping to organize policy input from civil society; the Root Server System Advisory Committee (RSSAC); the Security and Stability Advisory Committee (SSAC), and the Governmental Advisory Committee (GAC). The latter has membership from about 100 countries and is responsible for providing public policy input to the ICANN board.

2.6.1.2 The Internet Assigned Numbers Authority (IANA):
IANA is a department of ICANN responsible for coordinating some of the key elements that keep the Internet running smoothly. As the Internet is renowned for being a worldwide network free from central coordination, there is a technical need for some key parts of the Internet to be globally coordinated, and this coordination role is undertaken by IANA.
The Mission statement of IANA states:

> The IANA team is responsible for the operational aspects of coordinating the Internet’s unique identifiers and maintaining the trust of the community to provide these services in an unbiased, responsible and effective manner.

Every device on the Internet has an Internet address (either a 32-bit or 128-bit number). The addresses are assigned on the basis of network topology so as to minimize the amount of information that has to be exchanged throughout the Internet to effect the routing of Internet packets from one place to another. IANA allocates blocks of Internet address space to the five RIRs who in turn allocate address space to ISPs or assign address space to qualified end users.

IANA aims not to directly set policy by which it operates, instead implementing agreed policies and principles in a neutral and responsible manner. Using the policy setting forums provided by ICANN, policy development for domain name operations and IP addressing is arrived at by many different participants. “The U.S. Department of Commerce announced its intent to transition key Internet domain name functions to the global multi-stakeholder community”.

To improve its operations, IANA is actively involved in outreach too. As well as in ICANN forums, IANA participates in meetings and discussions with TLD operators, Regional Internet Registries, and other relevant communities. The Authority provides a helpdesk at IETF meetings to allow one-to-one interaction with its largest community of users – protocol developers.
Duties of IANA in short include:

1. Allocation of internet addresses space to RIRs.
2. Looks after the operation of the root name servers.
3. Looks after the DNS including creation of new TLDs, re-delegation of ccTLDs.

2.6.1.3 Internet Architecture Board (IAB):

IAB was created originally by the United States Department of Defence’s Defence Advanced Research Projects Agency with the name Internet Configuration Control Board during 1979; it eventually became the Internet Advisory Board during September, 1984, and then the Internet Activities Board during May, 1986 (the name was changed, while keeping the same acronym). It finally became the Internet Architecture Board, under ISOC, during January, 1992, as part of the Internet's transition from a U.S.-government entity to an international, public entity.

IAB’s responsibilities include:

1. The IAB looks after the occasional commentary on, aspects of the architecture for the protocols and procedures used by the Internet.
2. The IAB looks after the process used to create Internet Standards.
3. The IAB is responsible for editorial management and publication of the request for Comments (RFC) document series.
4. IAB acts as a source of advice and guidance to the Board of Trustees and Officers of the Internet Society concerning technical, architectural, procedural, and (where appropriate) policy matters regarding Internet and its enabling technologies.
2.6.1.4 Internet Engineering Task Force (IETF):
The Internet Engineering Task Force (IETF) was established in 1986 and its secretariat is operative since 1988. It is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. It is open to any interested individual. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.).

The IETF working groups are grouped into areas, and managed by Area Directors, or ADs. The ADs are members of the Internet Engineering Steering Group (IESG). Providing architectural oversight is the Internet Architecture Board, (IAB). The IAB also adjudicates appeals when someone complains that the IESG has failed. The IAB and IESG are chartered by the Internet Society (ISOC) for these purposes. The General Area Director also serves as the chair of the IESG and of the IETF, and is an ex-officio member of the IAB. “IETF develops and promotes Internet standards, cooperating closely with the W3C and ISO/IEC standards bodies and dealing in particular with standards of the Internet protocol suite” \(^{11,12}\) IETF does not have members (nor is it an organisation), the Internet Society provides the financial and legal framework for the activities of the IETF and its sister bodies (IAB, IRTF,...). Recently the IETF has set up an IETF Trust that manages the copyrighted materials produced by the IETF. IETF activities are funded by meeting fees, meeting sponsors and by the Internet Society via its organizational membership and the proceeds of the Public Interest Registry.
2.6.1.5 Internet Research Task Force (IRTF):
Short for the Internet Research Task Force, an organization that forms research groups to explore developments in Internet protocols, applications, architecture and other technology. The organization is chartered by the Internet Architecture Board.

The Internet Research Task Force (IRTF) focuses on longer term research issues related to the Internet while the parallel organization, the Internet Engineering Task Force (IETF), focuses on the shorter term issues of engineering and standards making. The Internet Research Task Force (IRTF) promotes research of importance to the evolution of the Internet by creating focused, long-term research groups working on topics related to Internet protocols, applications, architecture and technology.

The IRTF is a composed of a number of focused and long-term Research Groups. These groups work on topics related to Internet protocols, applications, architecture and technology. Research Groups have the stable long term membership needed to promote the development of research collaboration and teamwork in exploring research issues. Participation is by individual contributors, rather than by representatives of organizations.

The IRTF is managed by the IRTF Chair in consultation with the Internet Research Steering Group (IRSG). The IRSG membership includes the IRTF Chair, the chairs of the various Research Groups and other individuals (“members at large”) from the research community selected by the IRTF Chair.

2.6.1.6 Number Resource Organization (NRO):
The Number Resource Organization (NRO) is a coordinating body for the five Regional Internet Registries (RIRs) that manage the distribution of Internet number resources including IP addresses and Autonomous System
Numbers. Each RIR consists of the Internet community in its region. “Regional Internet Registries are components of the Internet Number Registry System, which is described in IETF RFC 7020”. On 24 October 2003, the four existing RIRs – APNIC, ARIN, LACNIC, and RIPE NCC – entered into a Memorandum of Understanding (MoU) with ICANN to form the NRO. Once AFRINIC was incorporated in April 2005 it signed the MoU and joined the NRO. On 31 October 2003, the RIRs delivered an Open Letter to ICANN advising of the formation of the NRO. The letter included a copy of the NRO MoU and a proposed MoU to form a new ICANN Address Supporting Organization (ASO).

A regional Internet registry (RIR) is an organization that manages the allocation and registration of Internet number resources within a particular region of the world.

The Regional Internet Registry system evolved over time, dividing the world into five RIRs:

1. African Network Information Centre (AfriNIC) for Africa
2. American Registry for Internet Numbers (ARIN) for the United States,
3. Canada, several parts of the Caribbean region, and Antarctica.
4. Asia-Pacific Network Information Centre (APNIC) for Asia, Australia, New Zealand, and neighbouring countries
5. Latin America and Caribbean Network Information Centre (LACNIC) for Latin America and parts of the Caribbean region
6. Network Coordination Centre (RIPE NCC) for Europe, Russia, the Middle East, and Central Asia
2.6.1.7 World Wide Web Consortium (W3C):
The World Wide Web Consortium (W3C) is an international community where Member organizations, a full-time staff, and the public work together to develop Web standards. Led by Web inventor Tim Berners-Lee and CEO Jeffrey Jaffe, W3C's mission is to lead the Web to its full potential.

Basic functions include:

1. Develops Web application standards and guidelines to allow hardware and software used to access the Web to work together.
2. Developed simple mechanism to add style (e.g. fonts, colours, spacing) to web pages via Cascading Style Sheets (CSS).
3. Launched Web Accessibility Initiative to make the Web accessible to all regardless of physical disabilities.
4. Developed XML that allow interoperation between different software applications, running on a variety of platforms.

At present the World Wide Web Consortium (W3C) has 383 members. W3C also engages in education and outreach, develops software and serves as an open forum for discussion about the Web. “In 2012 and 2013, W3C started considering adding DRM-specific Encrypted Media Extensions (EME) to HTML5, which was criticised as being against the openness, interoperability and vendor-neutrality that distinguished websites built using only W3C standards from those requiring proprietary plug-ins like Flash”\(^\text{14,15}\)

2.4.1.8 The Internet Society (ISOC):
The Internet Society (ISOC) is an international, non-profit organization established in 1992 to provide leadership in Internet related standards,
education, and policy. It states that its mission is "to promote the open
development, evolution and use of the Internet for the benefit of all people
throughout the world.

For achieving this mission, the Internet Society:

1. Provides open development of standards, protocols, administration,
and the technical infrastructure of the Internet.
2. Supports education in developing countries specifically, and
wherever the need exists.
3. Promotes professional development and builds community for
participation and leadership in areas important to the evolution of the
Internet.
4. Provides forum for discussion of issues that affect Internet evolution,
development and use in technical, commercial, social, and other
contexts.
5. Creates an environment for international cooperation, community,
and a culture that enables self-governance to work.
6. Serves as a focal point for cooperative efforts to promote the Internet
as a positive tool to benefit all people throughout the world.
7. Provides management and coordination for strategy initiatives and
applies efforts in humanitarian, educational, social, and other
contexts.

The Internet Society has headquarters in USA, and offices in Geneva,
Switzerland. It has a membership base comprising more than 130
organizational and more than 55,000 individual members. Members also
form "chapters" based on either common geographical location or special
interests. There are currently more than 90 chapters around the world.
The Internet Society has a prominent function in Internet governance discussions, including significant involvement in the World Summit on the Information Society (WSIS) and Internet Governance Forum (IGF).

2.6.2 Business Entrepreneurs:
By the term business entrepreneurs, we mean internet entrepreneurs or People or groups having an expertise in exploiting the Internet arena, or someone who is looking at the vast power of the Internet to start or grow a business. Might be a physical merchandising business or provide innovative modern services like domain name allocation.

2.6.2.1 Domain name registrars:
A domain name registrar is a service that allows you to officially register your desired website domain name so that it is unique to you, and no one else can own it. A domain name registrar must be accredited by a generic top-level domain (gTLD) registry and/or a country code top-level domain (ccTLD) registry. The management is done in accordance with the guidelines of the designated domain name registries and to offer such services to the public.

Domain name registrars are accredited by the Internet Corporation for Assigned Names and Numbers (ICANN). ICANN is a private (non-government), non-profit corporation that has been given the responsibility of allocating IP addresses and managing the Domain Name System. The Domain Name System is what allows you to reach a website by typing in its name, rather than its numerical IP address.

Domain registration information is maintained by the domain name registries, which contract with domain registrars to provide registration services to the public. An end user selects a registrar to provide the
registration service, and that registrar becomes the designated registrar for the domain chosen by the user. Only the designated registrar may modify or delete information about domain names in a central registry database. “Go Daddy” is the largest registrar. Other successful registrars include “eNom”, “Tucows”, “Melbourne IT”. A "top-level domain" is the suffix that a domain name ends with, such as .com .org .info and .net. When a registrar registers a .com domain name for an end-user, it must pay a maximum annual fee of US$7.85 to VeriSign, the registry operator for .com, and a US$0.18 annual administration fee to ICANN.

2.6.2.2 Internet service provides (ISP):
ISP refers to a company that provides Internet services, including personal and business access to the Internet. For a monthly fee, the service provider usually provides a software package, username, password and access phone number. Equipped with a modem, you can then log on to the Internet and browse the World Wide Web and USENET, and send and receive e-mail. For broadband access you typically receive the broadband modem hardware or pay a monthly fee for this equipment that is added to your ISP account billing. Many but not all ISPs are telephone companies or other telecommunication providers. For users and small businesses, traditional options include copper wires to provide dial-up, DSL (typically asymmetric digital subscriber line, ADSL), cable modem or Integrated Services Digital Network (ISDN) (typically basic rate interface). Using fiber-optics to end users is called Fiber to the Home or similar names. Wireless access is another option, including satellite Internet access. Many access providers also provide hosting and email services. ISPs may also be called IAPs (Internet Access
Providers). BSNL and MTNL are the two government owned ISPs providing a variety of services.

2.6.3 Common Public Participation:
A large number of non-governmental organizations (NGOs), scientific institutions, community media and others have participated as "civil society" in the preparations for the summit as well as the WSIS itself. They have tried to establish the broadest possible participation of civil society groups at the summit, and to push civil society issues onto the agenda, including human rights, common public development, freedom of speech and press freedom.

2.6.3.1 Internet governance caucus (IGC):
The Internet Governance Caucus (IGC) was originally created by individual and organizational civil society actors who came together in World Summit on the Information Society (WSIS) to promote global public interest objectives in Internet governance policy making.

The mission of the Internet Governance Caucus (IGC) is to provide a forum for discussion, advice, action, and for representation of civil society contributions in Internet governance processes. The caucus intends to provide an open and effective forum for civil society to share opinion, policy options and expertise on Internet governance issues, and to provide a mechanism of advising and to enhance the utilization and influence of Civil Society (CS) and the IGC.

The objectives and tasks of the IGC are to:

1. Inform civil society and other progressive groups/actors on significant developments impacting on Internet governance policies.
2. Provide a ground for open, on-line and face-to-face debate on the range of issues related to Internet governance policies from a civil society perspective.

3. Create informal relationships with various CS groups and individuals with a direct interest in Internet governance policies, including those involved in human rights, intellectual property, international trade and global electronic commerce, access to knowledge, and security.

4. Identify and address emerging issues in the areas of Internet governance and help shape issues and perspectives in a manner that is informed by the stated vision of the IGC.

2.6.3.2 Civil Society Bureau:
The Civil Society Bureau (CSB) was one of the civil society structures that has emerged from the WSIS process. The CSB was the interface between civil society and the intergovernmental Bureau, the Executive Secretariat and others on procedural issues. It did not concern itself with content related issues.

The CSB was comprised of various "families" seen to represent different constituencies within global civil society. Each family had an organizational focal point, whose role was to inform the family about updates regarding the evolution of the WSIS preparation and to facilitate inputs from various family members into the overall process.

2.6.4 United Nations Agencies and funded groups:
An intergovernmental organization established in 1945 to promote international co-operation. Its objectives include maintaining international peace and security, promoting human rights, fostering social and economic
development, protecting the environment, and providing humanitarian aid in cases of famine, natural disaster, and armed conflict. Special agencies of our interest are ITU and the World Bank group; these agencies are responsible for many internet governance related activities.

2.6.4.1 International Telecommunications Union (ITU):
It is an intergovernmental organization through which public and private organizations develop telecommunications. The ITU was founded in 1865 and became a United Nations agency in 1947. It is responsible for adopting international treaties, regulations and standards governing telecommunications.

ITU allocates global radio spectrum and satellite orbits, develop the technical standards that ensure networks and technologies interconnect, and strive to improve access to ICTs to underserved communities worldwide.

The ITU is active in areas including broadband Internet, latest-generation wireless technologies, aeronautical and maritime navigation, radio astronomy, satellite-based meteorology, convergence in fixed-mobile phone, Internet access, data, voice, TV broadcasting, and next-generation networks.

ITU also organizes worldwide and regional exhibitions and forums, such as ITU TELECOM WORLD, bringing together the most influential representatives of government and the telecommunications and ICT industry to exchange ideas, knowledge and technology for the benefit of the global community, and in particular the developing world.
ITU is unique among UN agencies in having both public and private sector memberships, in addition to 193 Member States; ITU membership includes ICT regulators, leading academic institutions and some 700 private companies. The dominance of ITU and some countries has alarmed many within the United States and within the Internet community.\textsuperscript{16,17}

The ITU comprises three sectors, each managing a different aspect of the matters handled by the Union, as well as ITU Telecom:

Radio-communication (ITU-R) Managing the international radio-frequency spectrum and satellite orbit resources is at the heart of the work of the ITU.

Standardization (ITU-T) ITU’s standards-making efforts are its best-known and oldest activity; known prior to 1992 as the International Telephone and Telegraph Consultative Committee or CCITT.

Development (ITU-D) Established to help spread equitable, sustainable and affordable access to information and communication technologies (ICT).

\textbf{2.6.4.2 World summit on Information society (WSIS):}

The UN General Assembly Resolution 56/183 (21 December 2001) endorsed the holding of the World Summit on the Information Society (WSIS) in two phases. The first phase took place in Geneva from 10 to 12 December 2003 and the second phase took place in Tunis, from 16 to 18 November 2005.

The objective of the first phase was to develop a clear statement of political will and take concrete steps to establish the foundations for an Information Society for all. Nearly 50 Heads of state/government and Vice-Presidents, 82 Ministers, and 26 Vice-Ministers from 175 countries as well as high-
level representatives from international organizations, private sector, and civil society attended the Geneva Phase of WSIS and gave political support to the Geneva Declaration of Principles and Geneva Plan of Action that were adopted on 12 December 2003. More than 11,000 participants from 175 countries attended the Summit and related events.

First phase of Summit discussed how to establish the foundations for an Information Society globally. Explored strategies for using ICTs for promoting development goals of the Millennium Declaration. Set up a number of working groups that are exploring issues related to Internet governance, intellectual property rights, management of the DNS, etc. When the 2003 summit failed to agree on the future of Internet governance, the Working Group on Internet Governance (WGIG) was formed to come up with ideas on how to progress.

The objective of the second phase was to put Geneva's Plan of Action into motion as well as to find solutions and reach agreements in the fields of Internet governance, financing mechanisms, and follow-up and implementation of the Geneva and Tunis documents. Nearly 50 Heads of state/government and Vice-Presidents and 197 Ministers, Vice Ministers and Deputy Ministers from 174 countries as well as high-level representatives from international organizations, private sector, and civil society attended the Tunis Phase of WSIS and gave political support to the Tunis Commitment and Tunis Agenda for the Information Society that were adopted on 18 November 2005. More than 19,000 participants from 174 countries attended the Summit and related events. “In the framework of the WSIS Stocktaking Platform, all types of stakeholders can benefit
from the “Global Events Calendar”18, “Global Publication Repository”19, and “Case Studies”20

2.4.4.3 World Group on Internet Governance (WGIG):

This UN Working Group on Internet Governance was established after the 2003 World Summit on the Information Society (WSIS) first phase summit in Geneva which failed to agree on the future of Internet governance.

The main activity of the WGIG was "to investigate and make proposals for action, as appropriate, on the governance of Internet by 2005." The WGIG was asked to present the result of its work in a report "for consideration and appropriate action for the second phase of the WSIS in Tunis 2005."

It was asked to deal with the following issues:

1. Develop a working definition of Internet Governance;
2. Identify the public policy issues that are relevant to Internet Governance;
3. Develop a common understanding of the respective roles and responsibilities of governments, existing international organizations and other forums as well as the private sector and civil society from both developing and developed countries.

Four options for the management of Internet-related public policy issues were proposed in the Report of the WGIG.

1. Create the Global Internet Council (GIC), Ensure that ICANNs Governmental Advisory Committee is an official forum for debate, form International Internet Council (IIC) to manage most aspects of the Internet administration and create three new bodies:
2. The Global Internet Policy Council (GIPC)
3. The World Internet Corporation for Assigned Names and Numbers (WICANN)
4. The Global Internet Governance Forum (GIGF)

2.6.4.4 Internet Governance Forum (IGF):
The establishment of the IGF was formally announced by the United Nations Secretary-General in July 2006. It was first conducted in October–November 2006 and has held an annual meeting since then.
It is forum for policy dialogue on issues of Internet governance. It brings together all those interested in the Internet governance debate, whether they represent governments, the private sector or civil society, including the technical and academic community, on an equal basis and through an open and inclusive process.
Activities take place during IGF meetings are: Main sessions, Workshops, Dynamic Coalition meetings, Best Practice Forums, Open Forums, Inter-regional dialogue sessions, Pre-events, and the IGF Village.
Starting with IGF Egypt in 2009 there have been six standard themes at Main sessions:
(i) Internet governance for development,
(ii) Emerging issues,
(iii) Managing critical Internet resources,
(iv) Security, openness, and privacy,
(v) Access and diversity, and
(vi) Taking stock and the way forward.
Each year starting from 2007, the IGF has hosted a number of workshops.
Examples of workshops held at IGF meetings include
1. Universalization of the Internet - How to reach the next billion
2. Multi-lingualization
3. Evaluating Internet Freedom Initiatives: What works?
4. DNSSEC for ccTLDs: Securing National Domains

Four day IGF meetings have been held in the last quarter of each year starting in 2006. Brief account is given below.

IGF I – Athens, Greece 2006 ‘Internet governance for development’
IGF II- Rio, Brazil 2007 ‘Internet governance for development’
IGF III- Hyderabad, India 2008 ‘Internet for all’
IGF IV- Sharm el sheikh, Egypt 2009 ‘Internet governance –creating Opportunities for all’
IGF V- Vilnius, Lithuania 2010 ‘Developing the future together’
IGF VI- Nairobi, Kenya 2011 ‘Internet as a catalyst for change: access, development, freedoms and innovation’
IGF VII – Baku, Azerbaijan 2012 ‘Internet governance for sustainable human, economic, and social development’
IGF VIII- Bali, Indonesia 2013 ‘upcoming’

2.6.4.5 UNDP:
The United Nations Development Programme (UNDP) is the United Nation’s global development network. “Advocates for change and connects countries to knowledge, experience and resources to help people build a better life. The organization has country offices in 177 countries, where it works with local governments to meet development challenges and develop local capacity. Additionally, the UNDP works internationally to help countries achieve the Millennium Development Goals”. UNDP and APDIP often sponsors technology related conferences to boost the level of technical knowledge and adopt with new Information and communication technologies.
2.6.4.6 Organisation for Economic Co-operation and Development (OECD):

Though not a direct United Nations concern, but actively involved in UN like activities. The basic goal includes promoting policies that will improve the economic and social well-being of people around the world. OECD provides a forum in which governments can work together to share experiences and seek solutions to common problems. The OECD’s core values are Objective, Open, Bold, Pioneering, Ethical. On many occasions OECD worked with other UN bodies for uplifting technology awareness among developing countries and under developed countries. Former Deputy-Secretary General Pierre Vinde estimated in 1997 that the “cost borne by the member countries, such as sending their officials to OECD meetings and maintaining permanent delegations, is equivalent to the cost of running the secretariat”.

2.6.5 Academic Participation:

Academicians are the pioneers of internet development and related technologies. Academic networks and forums are the base of every new invention in the field of internet and its governance. Academicians are the main source of inspiration, innovation and creativity and provide permanent and valuable contribution to the stability, security, functioning and evolution of the Internet.

2.6.5.1 Internet governance project:

IGP is looked after by a group of academicians at Syracuse University USA, they put expertise into practical action in the fields of global governance, internet policy, and information and communication
technology. The Project both researches and publishes analysis of global Internet policy issues.

The goals of the Internet Governance Project (IGP)

1. Inform and shape Internet public policy choices by providing independent analysis and timely recommendations.
2. Identify and analyze new possibilities for improving global governance institutions
3. Develop policy positions guided by the values of globalism, democratic governance and individual rights.

IGP contributes to policy discussions and related debates at the global, international, regional and national levels. The IGP is active in international institutions like the Internet Corporation for Assigned Names and Numbers (ICANN), Regional Internet Registies(RIRs) like ARIN and RIPE, the UN Internet Governance Forum (IGF), and the Organization for Economic Cooperation and Development (OECD-ICCP).

The Internet Governance Project releases regular publications in the form of concept papers, book reviews, seminar reports, and project reports. The Internet Governance Project maintains a Scientific Committee engaged in joint policy analysis. The Project continues to rotate individuals on the Committee as academic collaborations are developed and completed.

2.6.5.2 The Global Internet Governance Academic Network (GigaNet):

In 2005, the final report of the UN Working Group of Internet Governance (WGIG) recognized the important contribution of academics, in addition to other communities, on discussions of Internet governance. Specifically,
33. “the WGIG recognized that the contribution to the Internet of the academic community is very valuable and constitutes one of its main sources of inspiration, innovation and creativity... [and makes] a permanent and valuable contribution to the stability, security, functioning and evolution of the Internet...[interacting] extensively with and within all stakeholder groups.”

47. “The forum should develop partnerships with academic and research institutions to access knowledge resources and expertise on a regular basis. These partnerships should seek to reflect geographic balance and cultural diversity and promote cooperation among all regions.”

Responding to this, the Global Internet Governance Academic Network (GigaNet) was initiated in spring 2006 in conjunction with the initial UN Internet Governance Forum. Its four principal objectives are to:

1. Support the establishment of a global network of scholars specializing in Internet governance issues;
2. Promote the development of Internet governance as a recognized, interdisciplinary field of study;
3. Advance theoretical and applied research on Internet governance, broadly defined;
4. Provide informed dialogue on policy issues and related matters between scholars and Internet governance contributors (governments, international organizations, the private sector, and civil society).
2.6.5.3 DIPLO:
Diplo emerged from a project to introduce information and communication technology (ICT) tools to the practice of diplomacy, initiated in 1992 at the Mediterranean Academy of Diplomatic Studies in Malta. In November 2002, Diplo was established as an independent non-profit foundation by the governments of Malta and Switzerland. Diplo provides systemic capacity development support through online and blended courses, policy research, policy immersion and community support. In the IG processes, Diplo acts on all levels, from local to global, and works together with many others to ensure long-lasting capacity improvement in the sector. The results achieved are as follows.

1. Development of institutional, national and regional capacities for addressing Internet governance issues.
2. A generation of Internet governance leaders and pioneers who represent their countries and communities in Internet policy making, and initiate capacity development work in their own surroundings, multiplying the effect of the original programme.
3. Communities of practice addressing emerging Internet governance and policy issues in local communities, countries and regions worldwide.

2.7 Initiatives by Indian Government:
India is a member of the Multi Stakeholder Advisory Group of the Internet Governance Forum of the United Nations. India’s concern on the issues of public policy on Internet and its Governance is appropriately voiced in the meetings of the IGF through regular participation.
On October 4 and 5, 2012, India hosted ‘India Internet Governance Conference’ (IIGC 2012) with the theme ‘Internet for Social and Economic Development: Building the Future Together’ which took place in New Delhi.

The Conference aimed to provide a platform for an open and inclusive policy dialogue that involves government, business, civil society, the technical community and academia. Bringing together multiple sources of knowledge and expertise from within India and outside, the IIGC thus aimed to identify crucial emerging issues at a domestic and global level for the attention of relevant Indian bodies, as well as to help expand India’s existing internet governance capacity.

India was host to the Third IGF at Hyderabad, 3 - 6 December 2008. The meeting was open to all World Summit on the information Society (WSIS) accredited entities, as well as other institutions and persons with proven expertise and experience in matters related to Internet governance. The overall theme of the conference was ‘internet for all’.

**2.7.1 Specific Initiatives by Ministry of Communications & IT (India)**

Government of India through Ministry of Communications & Information Technology has launched many “Research & Development Initiatives in the areas of Next Generation Network, Application Development, Multilingualisation of the Internet, Web Accessibility for all and Infrastructure establishment”. A Governmental Advisory Committee (GAC) Secretariat of the Internet Corporation for Assigned Names and Numbers (ICANN) has been set up in the Department of Information Technology.
Department of Electronics and Information Technology (DeitY) took some significant initiatives in the following areas. We are representing the key areas from their web portal (deity.gov.in)\textsuperscript{24}


   The project envisages development of Next generation Internet design, deploying the technologies of Optical Networking, Carrier Ethernet, and high-speed communication systems.

2. **Develop a Self-Managed Network Solution – Research & Development in Network to Measurement and QoS.**

   An adaptive, self-configuring network solution and named it EDGE (Enterprise Wide Self-Managed Network Solution) which works with the TCP/IP protocol, applicable to LAN, WAN, Intranet, Extranet and Internet networks.

3. **Migration to IPv6 from IPv4**

   DIT is supporting workshops and seminars on the need for early adoption of IPv6, training of professionals and network operators in deployment of IPv6 and dual stack architectural setup of existing IPv4 network to make the network IPv6 ready and the development of applications and services that would increase the demand for IPv6 in the country.

4. **Mobile IPv6** by ERNET and IISc Bengaluru.

   The project envisages demonstrating the mobility supported by IPv6 Protocol for seamless transfer from one form of network to another such as LAN to WAN, etc.


   The project envisages investigating the various aspects of creation, operation and evolution of Internet Governance System and evolving a new
methodological approach for authentication, authorization and access control for facilitating e voting.


The project envisages development of an Intelligent Knowledge backbone that would help academics, including researchers, students, teachers, academic committees, academic institutions etc.


India has submitted to ICANN its request for Country Code Domain Names in 7 Indian Languages and scripts namely Hindi (Devanagari), Bengali (Bengali), Gujarati (Gujarati), Punjabi (Gurumukhi), Tamil (Tamil) and Telugu (Telugu) under ICANN’s Fast Track Process.

8. Development Implementation of IDN Policies (ABNF & Language Tables) for Registrars and Making IDN 22 Official Languages Compliant by CDAC Pune.

The project is to develop and test all the backend registration processing tools for registration of Domain Names in Indian Languages by Registrar/registry and front-end GUI for registrant and registrar.


The project envisages the development of an open source web browser with voice feedback for the blind with speech facilitation for navigation or data entry in a web page.

10. Establishment of a National Internet Exchange of India (NIXI).

Five additional Internet Exchange Nodes have been operationalised at Ahmedabad (Gujarat), Bengaluru (Karnataka), Hyderabad (Andhra Pradesh), Mohali (Chandigarh) and Lucknow (Uttar Pradesh) to add to the existing NIXI hubs at Chennai, Kolkata, Mumbai and Noida.
11. Establishment of .IN Internet Domain Registry.
The Registry for the country code Top Level Domain (ccTLD) Name .IN is being managed by the National Internet Exchange of India (NIXI). Presently, more than 73 Registrars have been accredited to offer .IN domain name registration worldwide to customers.

12. Awareness Programmes.
Workshops, Trainings for Registrars, Internet Service Providers, Network Service Providers, Technology developers, Human-Machine interface developers, Users, etc on the following issues:
   a. IPv6 concerning deployment and application oriented projects.
   b. .IN Domain Name Registration – registry process and policies, dispute resolution policy, etc.
   c. Domain Names in Indian Languages - registry process and policies, dispute resolution policy, etc.
   d. Internet Governance Issues of Access, Security & Privacy, Openness, Diversity, Critical Internet Resources and their Management principles, Child Online Protection, Capacity Building, Open Standards, etc.

13. ICANN - Governmental Advisory Committee (GAC) Secretariat in DIT, New Delhi.
A Governmental Advisory Committee (GAC) Secretariat of the Internet Corporation for Assigned Names and Numbers (ICANN) has been set up in the Department of Information Technology.

India is a member of the Multi Stakeholder Advisory Group of the Internet Governance Forum of the United Nations.

The project envisages integrating and deploying innovations at the physical and data layer to meet standalone, end-to-end service manifested for cloud computing needs.

The project envisages to initiating and conducting fundamental and applied research to state and re-state Legal Systems and Instruments and its interface with Internet Technology in every branch of Law- Civil, Criminal, Evidential, Fiscal and International and its dissemination amongst Policy makers in Executive/Judiciary/Legislature/Academia/Industry.

17. Deploying Omnipresent Ethernet Based Data-Centers in Actual Networks – Validation of Project Periscope.
The project envisages validating Omnipresent Ethernet Switch developed through the DIT funded project PERISCOPE (Pragmatic Efficient Reliable Internetworking Solution using Consumer centric Omnipresent Ethernet) in a real network through deployment.

The project proposes to study the Impact of Broadband/Internet on the economy, especially to GDP growth, social empowerment including education, healthcare, rural commerce and government services, bring out Case studies on “what is working” and “what is not working” based on samples from States and Union Territories.
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