CHAPTER – 2

SCIENTIFIC DEVELOPMENT AND THE LAW OF COPYRIGHT

As witnessed in the foregoing discussion in the previous chapter the law of copyright as a means of protection to the works of creative authors has proved to be of immense economic importance. It is evident from the previous discussion that the copyright is no longer looked at, from a legal perspective only but is rather looked at or is being realized as an important economic activity. The law of copyright not only provides legal protection to the works of creative artist or authors but also helps them recover the labour, skill and capital invested by them and also the market value of their work. It also helps the creative authors to have access to the markets for transacting the copyrighted goods and product and also helps them to price discriminate and to obtain monopoly for their works in the market.

The emergence of technological devices and equipments have as witnessed changed all the earlier notions of creations, reproduction and transmission of the creative works hence requirement for reviewing the existing norms of law of copyright is greatly felt.

These scientific equipments have the capacity to perform various activities in respect of the copyrighted works which if done without
permission from the owners of copyright in the particular work, can result in infringement of copyright in the work.

2.1 Scientific Developments in the field of copyright:

2.1.1 Printing Press: printing technology revolutionized the social and legal infrastructure of the book market.

All the works which are written or printed i.e., literary works can be created and reproduced by or with the help of the printing press. Recently modern printing press have been developed by scientist called as offset press. Any literary work can now be created on a computer and a master of that work can be injurted into the offset press and thousands of copies of that work can be made in a very short time. If such creation and reproduction of the work are done without taking permission from the owners of creative work, might result into infringement of copyright in that work.

Piracy of literary works means illegal reproduction of books and other printed materials and distribution/selling of these for profit. In

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53 The printing press was invented in the Holy Roman Empire by the German Johannes Gutenberg around 1440, based on existing screw presses. Gutenberg, a goldsmith by profession, developed a complete printing system, which perfected the printing process through all of its stages by adapting existing technologies to the printing purposes, as well as making groundbreaking inventions of his own. His newly devised hand mould made for the first time possible the precise and rapid creation of metal movable type in large quantities, a key element in the profitability of the whole printing enterprise. http://en.wikipedia.org/wiki/printing_press.
India, the journals/magazines and other periodicals are not pirated much. Here piracy of literary works generally takes place in three principal ways: 

(i) wholesale reprinting of text and trade books,
(ii) unauthorized translations, and
(iii) commercial photocopying of books/journals.

Many a time piracy takes the form of publishing fake books, where authors shown in books are not the real authors. Book piracy, in India, primarily depends on two factors, namely, the price of the book and its popularity. These two factors positively contribute to piracy. Piracy is generally confined to foreign and good indigenous books. Because these books are demanded in large quantities and are also priced high. The types of books pirated mostly are medical, engineering and other professional books, encyclopedia and popular fictions. The piracy is also wide spread with respect to books published by National Council of Educational Research & Training (NCERT), National Open School and Board(s) of Secondary Education. These books even if priced low are having large demand. The pirates first identify books to be pirated and then get the same printed in large numbers through unscrupulous printers. The pirated books are normally sold with other (legitimate) books by usual retailers identified by the pirates. The number of printers/sellers involved in piracy is
generally less. The piracy is also seasonal in nature. The entire process of printing through selling get over within a month or two.

Besides the above, piracy in the form of mass photocopying of books is largely prevalent in India, especially in and around educational institutions. Students borrow books from libraries and then get these photocopied from the photocopier kept at the institution where from the books are borrowed. While copyright law permits photocopying of literary works for limited private uses such as research, review or criticism what happens, many a time is that the entire book is photocopied including the cover pages. In the process student community and the photocopy operators gain, but the publishers lose a huge revenue. Unfortunately, the institutions turn a blind eye to this. Sometimes even some renowned publishers involve themselves in piracy by way of selling books beyond the contract period. This happens when an Indian publisher buys re-print rights from some foreign publishers and keeps on selling books even after the expiry of the period mentioned in the agreement. This is done in the pretext of clearing old stock. Thus an impression is created that books are printed during the contract period but in reality are sold beyond the contract period just to exhaust the old stock. The other way through which piracy takes place is printing/selling of books
meant for review. Many foreign publishers send books to India for review. The pirates somehow get access to such books and make quick prints to sell in Indian market. All these happen much before the authorized Indian distributors get their copies for selling in India. Naturally, the distributors’ sales get affected adversely.

Piracy of literary works leads to loss of revenue to publishers (in terms of less sales), authors (non-payment of royalty) and the national exchequer (non-payment of income tax and other levies payable by publishers/authors). While it is believed that book piracy is high in India, it is very difficult to arrive at an estimate. Only information from secondary sources (e.g. publishers, police records etc.) can be gathered to form a rough idea on piracy. But that would reflect only the tip of the iceberg. In terms of percentage, it is believed that about 20-25 percent of books sold (in number) in the country are pirated. Actual monetary loss due to piracy is any body’s guess. Anti piracy drive with respect to books is generally weak in India. The industry associations are not very active in this regard. Whatever action is taken is done by the respective publishers. The enforcement machineries (such as police) are also not very active in controlling piracy for a variety of reasons. The public awareness is also very poor.
Besides the above, Indian books are also pirated abroad, especially in the neighbouring countries such as Pakistan, Bangladesh etc. India exports books to a large number of countries including developed countries from Europe. During 1995-96 India exported books to the tune of Rs.1120 million. Exports earnings could have been much more in the absence of wide spread piracy of Indian works abroad. Similarly, foreign literary works are pirated in India. Given the low and rapidly declining value of rupee in terms of hard currencies good foreign books (e.g. US books) cost very high in India. As a result majority of the readers individually can not afford to buy these books. In such circumstances, piracy provides the escape route, because a pirated foreign book in India can be as cheap as half the original price or even less.

2.1.2 Photocopyer Machine\textsuperscript{54}:

Photocopying has its origin in photography during the late 19\textsuperscript{th} century. Although early photo duplication was expensive, very sensitive to damage by touch, and not suited to document photography, the pace

\textsuperscript{54}Most current photocopiers use a technology called xerography, a dry process using heat. Xerographic office photocopying was introduced by Xerox in 1959 and it gradually replaced copies made by Verifax, Photostat, carbon paper, mimeograph machines and other duplicating machines. The prevalence of its use is one of the factors that prevented the development of the paperless office heralded early in the digital revolution. Photocopying is widely used in business, education, and government. There have been many predictions that photocopiers will eventually become obsolete as information workers continue to increase their digital document creation and distribution, and rely less on distributing actual pieces of paper. ---- http://en.wikipedia.org/wiki/printing_press.
of invention increased after the turn of the century. Chester F. Carlson received a patent for an electro static machine in 1940, naming his technique of copying without moist paper or chemicals 'xerography'. Not until 1959 was the first commercially successful photocopier, the XEROX 914, introduced. Today, it endures as the bedrock of the immense world wide copying industry which produces billion and billions of copies every year and generates millions of dollars annually. Thus, it is rightly stated that in the age of Xerox, every man is a publisher.

This large scale photocopying has resulted in huge loss of revenue to the publishers because of low circulation. Instead of having individual copies users began to copy works at very low cost and were freed from the task of individual copies. It also increased the number of articles and journals or books a researcher can read since the researcher can make copies of them and read them at his leisure. The main culprits in systematic and large-scale photocopying were libraries and copy shops

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58 This has been called as the substitution effect.
59 This referred to as the exposure effect.
adjacent to educational situations. They prefer to rely on major central libraries for loan copies or photocopies. What then happens is that major library buys a single copy of particular journal and produces a master microfiche, which is then used in turn to produce duplicate microfiche that are used for making further photocopies and supplying to other libraries who in turn will make duplicate copies. Industrial and commercial enterprises use the system to the full, and in most cases, instead of purchasing a copy of the periodical, they borrow a copy or order a photocopy from the central library and then themselves prepare as many photocopies as they need. In fact, if the activities of major libraries in developed countries are analyzed, it is evident that most of their request originate from large commercial and academic users. Thus, the large scale use of Xerox has resulted in complete mystification of the scenario.

2.1.3 Audio & Video Recorder:

The next challenge was from the audio and video home recorders. It has long been common practice for private individuals to make audio

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61 Id. at p. 279
home recordings of copyrighted works. With the development of video
tape recorders, off-the-air video home recording of copyrighted work has
also become commonplace. The interest of authors and film producers,
broadcasters and distributors, along with those of educational
institutions, libraries, video-equipment manufacturers, and private users,
have all become embroiled in a struggle over the control, and the
intellectual benefits and economic profits derived there from, of material
broadcast via television to the general public. The problem simply put,
is that copyright holders feel that their rights are being infringed by
home and educational video recording of their material, while most
users believe that they are excluded from liability due to the traditional
leeway granted to educational and private copying. Thus, the legal
scenario was obliged to redefine the traditional notion of private use to a
great extent. This was really a challenging attempt, because right to
privacy, in addition to be a copyright privilege, was a fundamental right
assured by birth in all legislations by the law of land.

63 Melville B. Nimmer, Copyright Liability for Audio Home Recording: Dispelling The Betamax Myth, 68
64 Jeffrey Scott Glover, "Emerging International Copyright Laws on Off-The Air Home and Educational
Video Recording: An Analysis", 28 BULL. CR. SOC, 457(1981)
65 Copyright holders of televised films, such as the large motion picture studios, fear that the loss of
control by the broadcaster over the times televised material can be viewed by the public, due to the use
of video recorders, will cause them serious economic harm.
**Sound recording piracy:**

The sound recording industry faces three types of piracy. First, there is a simple way by which songs from different legitimate cassettes/CDs (and thus different right holders) are copied and put in a single cassette/CD. These are then packaged to look different from the original products and sold in the market. Second, there is counterfeiting, when songs are copied into and packaged to look as close to the original as possible using the same label, logos etc. These products are misleading in the sense that ordinary end users think that they are buying original products. The third form of music piracy is bootlegging, where unauthorised recordings of performance by artists are made and subsequently reproduced and sold in the market. All these happen without the knowledge of the performers, composer or the recording company. Earlier the music piracy was confined to cassette tapes only. With the advent of CDs in the eighties it was thought that piracy of sound recordings would become things of the past. But in reality CD piracy is the greatest threat to today’s music world. In fact, with CDs piracy has got an international vigour. Fortunately or unfortunately, CD industry is still in its nascent stage in India. At present CD market is just 2 to 3 percent of the overall music market in the country. CDs have not taken off mainly because of high prices. In India CDs are sold on an average price ranging between Rs.150 to Rs.550. Considering price of cassettes, the price
differential (between cassettes and CDs) is quite high and prohibitive for ordinary music lovers.

Cassette piracy in India is as old as the cassette industry itself. Govt. policy put music industry in the small scale category and volume of a record company’s cassette production was restricted to 300,000 units per annum. This led to a wide gap in the demand supply front which was ultimately bridged by the pirates. Even if music piracy percentage has declined from a high of 95% in 1985 to about 30% in 1995, India is the world’s sixth largest pirate market in value terms but third in volume terms. In 1995, more than 128 million pirated cassettes/CDs were sold as against the sale of 325 millions of legitimate audio products. The sale of pirated cassettes/CDs (both in number & value) is also on the rise in the country. However in contrast to many developed countries piracy of CDs is low in India. The popularity of Indian music has gone beyond the national boundaries. There is large demand for Indian music in the neighbouring countries such as Pakistan, West Asia as well as far off countries like USA, Canada and the UK. Indian music is also pirated in some of these foreign countries, the notable among these being Pakistan and the West Asia. Similarly, foreign audio products are also subject to piracy in Indian soil.
2.1.4 Computer:

Computer technology plays an increasingly important role in modern society. Computer programs in object code form share the copyright status of other literary and artistic works stored in computer systems in machine-readable form. While they are unintelligible in object code, they can be retrieved "decompiled" into source code form where they are intelligible. It is generally recognized that all categories of works are protected against storage in digital form, because such storage is a reproduction, and in this respect it does not matter that, for example, a musical work cannot be perceived directly from a CD, but only after a "decompilation" has taken place in a CD-player.

The normal prerequisite for copyright protection, that a work must be original, is well suited to be applied to computer programs. Although most programs consist of sub-routine elements which often in themselves would hardly qualify as original works, the combination of such elements and the structuring of the programs — with the exception of a few very simple programs — make them sufficiently creative. Ideas and abstract methods for solving problems (the so-called "algorithms") are not protected under copyright, which limits the protection to the expression of such ideas and algorithms, but this is actually a desirable
consequence of copyright protection: an appropriate protection is offered without creating unreasonable obstacles to the independent creation of such programs.

Copyright law protects only the expression of the idea of the holder of the copyright and not the idea. In India, Computer software falls under copyright law and therefore, only the expression of the idea behind the software can be protected.\textsuperscript{66}

It has been argued that the term of protection for literary works, that is, 50 years after the death of the author, under the Berne Convention,\textsuperscript{67} is too long in relation to computer programs, because such programs usually become outdated in a much shorter time. The same argument applies to several other categories of literary and artistic works. The reality is that if a work is obsolete, it will not be used and therefore, protection will also not be invoked. The term under the Berne Convention should be considered nothing other than an upper limit for those works which actually remain of interest to users.

\textsuperscript{66} Nandan Kamath, Law Relating to Computers, Internet & E-commerce, Universal Law Publishing Co. 4\textsuperscript{th} Ed. 2009, p.125

\textsuperscript{67} Berne Convention 1886, Art. 7
The piracy in computer software simply means copying and distribution of computer programmes without the copyright holders permission. The software industry, generally, consists of creation and distribution of computer programmes. Creation of computer programme is similar to writing a novel or other literary works and it requires intellectual skill and training in software programming. Though a software can be written by individual programmer, most of the major software’s are the outcome of group efforts, where medium to large sized teams spend months or even years to write a complete programme distribution of computer programmes in most of the developed countries occurs through a two-tiered system of wholesalers and dealers, similar to that of many other industries. The software publishers make a substantial amount of their shipments to a small number of distributors in any given country, who maintain well-stocked warehouses and can respond quickly to orders from hundreds or thousands of individual retail dealers or resellers. The dealers market and provide the software products directly to end-users of computers. The end users can be individuals, commercial enterprises, educational institutions and government establishments. Sometimes, software publishers also deal directly with a small number of the largest dealers or resellers in an individual country. Licensing is a
common practice in software industries. The publisher of a software generally authorizes its end users through the mechanism of the shrink-wrap license contained in the package. Like other copyright based industries, the software industry also faces several forms of piracy. In fact, piracy in software is more than in others because it is relatively easy to copy a software in computers especially in PCs and for all practical purposes the pirated version looks and performs in an identical manner as the original. The five principal types of software piracy involve (1) counterfeiters (2) resellers (3) mail order houses (4) bulletin boards and (5) end-user piracy. Counterfeiters are relatively new phenomenon in the software industry and most flagrant software counterfeiters produce disks, documentation and packaging that look very similar to those of the software publisher. Reseller piracy occurs in the software distribution channel, when distributors or dealers either make copies of software onto floppy disks, or the internal storage device or the “hard disk” of computers that they are selling, without authorization from the software publisher. Mail-order piracy consists of the unauthorized copying of software onto diskettes, CDs, or other media and distribution of such software by post. Bulletin board pirates engage in unauthorized reproduction and distribution of software via
telecommunication. Typically, this involves an individual computer user who has installed a number of software programmes on his computer, and who allows other users to connect to his computer through the telephone line via modem and copy the programmes onto discs. The pirate in most cases has copied the programme onto his own computer without authorization of the copyright holder’s consent is also a copyright violation. End-user piracy takes place when a user copying software onto hard disks of more computers than the number authorized by the publisher. This form of piracy perhaps takes place on a wider scale than other forms because end-users often make substantial copies of the software’s possessed by them and then distribute or exchange the same. Though this harms the interests of right holders, end-users definitely gain out of it because this leads to obvious economic advantages for them.

Identifying a pirated software is not an easy task. This is primarily for two reasons. First, as mentioned earlier there is hardly any difference between an original software and a pirated software, once it is copied onto a hardware. Second, detection of piracy requires access to software or hardware or both, which may not be feasible in many cases. However, there are some ways through which an unauthorized copy of a software can be identified. Many a
times publishers supply software's in packaged form which contain software on diskettes with printed labels giving manufacturer’s name, full product name, version number, trade mark and copyright notices. Besides these, the packages also typically, contain professionally printed documentation, a keyboard template, enduser license and registration cards and other printed materials pursuant to a standard bill of materials that would apply to all packages of that particular product. In such cases, the most simple pirated copies may be spotted easily on “black-disks”, which do not contain manufacture’s label but rather type written, hand-written or crudely printed labels indicating the programmes contained on the diskettes. In case of installed software it is more difficult to identify a pirated copy. Once a computer is searched, the programmes copied onto it can be found and identified. Then users can be asked to produce the proof of original possession (e.g. original packages, documentation, purchase record, license cards etc.) of such programmes. If users fail to do so, there is a prima facie case of infringement. In some cases even test purchases can be made to secure evidence of piracy.

2.1.5 Internet :

The Internet is one of the most important developments made by the man till date. It is a global network of interconnected computers and
computer networks. With its unprecedented ability to provide an easy, relatively inexpensive and flawless means to create and distribute copyright material to a mass audience throughout the world, it has threatened the rights of the copyright owners.68

Copyright owners perceive Internet as threat to their exclusive rights due to the following reasons: (i) wide distribution is relatively simpler and quicker on the Internet; (ii) anyone can distribute to a mass audience; (iii) the quality of copies is virtually indistinguishable from the original; (iv) distribution is almost costless; (v) users can easily and cheaply obtain some copyright material on the Internet. The Internet may impair the exclusive rights of the copyright owners by transforming the nature and means of publication and making their works extremely vulnerable to Internet piracy. Another problem is the decentralized nature of the Internet's management, which makes it possible for any user to widely disseminate a work on the electronic network through any number of channels.

The increasing use of the Internet has posed numerous legal disputes. The analysis and outcomes of many legal issues, inter alia,

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68A.K. Koul & V.K. Ahuja, Law of Copyright: from Gutenberg's Invention to Internet. (Faculty of Law, Delhi University Publication, 2001)p.23.
copyright infringement in this context are, complicated because some or all of the activities engaged in have taken place on digital networks. Today, courts, national legislatures and international organizations are experiencing difficulty in tackling the complex issues that the Internet creates for copyright law.

There is no doubt that the Internet provides entrepreneurs and creators with the opportunity to make profit in a new, rapidly growing medium. However, the very nature of the Internet creates enormous legal issues relating to copyright law because much of the material found on the Internet is subject matter protected by the copyright law. Not only simple information but also the pictures, movies, software, musical works, multimedia works and audio-visual works can easily be accessed through the Internet. Further, the aforesaid material can easily be downloaded from the Internet and also uploaded on it without having spent any money in most of the cases.\textsuperscript{69}

This is the genesis of all intellectual property rights (IPRs). These rights refer to the property that is a creation of the mind, investigations, literary and artistic works, symbols, names, images, and designs used in

\textsuperscript{69} Uploading refers to the transfer of information from a user's personal computer to a computer network, usually via a bulletin board, while downloading refers to the transfer of information from a bulletin board of the Internet to one's personal computer.
commerce. Among the other IPRs the copyright play an important role on the internet.  

Treaties were also adopted in the field of neighboring rights. These are the Rome convention, Geneva Convention and Burssels Convention.

Apart from this, in 1994 "TRIPs Agreement was adopted as part of the final act embodying the results of the Uruguay Round of multilateral Trade Negotiations. The objectives of TRIPs Agreement are inter-alia to reduce distortions and impediments to international trade, to promote adequate and effective protection of Intellectual Property Rights and to ensure that measures and procedures to on force Intellectual Property Rights do not themselves become barriers to legitimate trade.

2.2 Impact of Digital Technology on the Copyright Law:

The emergence of digital technology has changed all the earlier notions relating to the law of Copyright. It has changed the way the creative

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71 The Expression Neighboring rights and related right’s are used alternatively in legal literature.
73 Convention for the protection of producers of phonograms against Unauthorized Duplication of their phonograms; Geneva 1972.
74 Convention relating to Distribution of programs – carry Signals Transmitted by satellite, Brussels 1974.
75 Agreement on trade Related Aspects of Intellectual Property Rights including trade in counterifet goods(1994)
works are created, reproduced, communicated and transmitted across the globe on the digital media. Before the advent of digital technology, the creative works could not be reproduced and distributed as easily as now with the help of digital technology. Now the binary language of zero & one has made it possible that the creative works such as text, graphics, music, films and computer program etc. can be easily created by the use of digital technology and can also be reproduced and transmitted very easily in no time from one place to the other place on this earth. Such a new development poses a serious threat before the owners of copyrighted works if such acts are done without taking permission from such owners.

The prominent copyright issues in the digital era can be classified into three groups:-

1. Evolution to whole new set of works such as computer programs, databases and multimedia works and specific requirements for their protection.

2. The reproduction, transmission and communication of copyrighted works to the public through digital media and internet; and

3. Issues relating to the infringement, management and technological measures of protection of digital work.

2.2.1 New Works Produced Through Digital Media:
The application of new technology has given birth to new form of creative works and expressions of creative ideas, which are to be protected under the domain of copyright. Like the invention of photography gave rise to a new category of photographs, recording of sounds created musical copyrights, analogue technology produced a new class called 'phonograms' and advent of video graphic technique culminated in a new set of works called cinematography and video films. Similarly the widespread application of digital technologies gave birth to a myriad of new forms of works such as computer programs, databases, and multimedia works.

**Computer Programme:**

Computer programs are generally understood as a set of instructions capable of, when incorporated in a machine-readable medium, causing a machine having information processing capabilities to indicate. Perform or achieve a particular function, task or result.\(^76\)

In India section 2 (ff) (c) of the Act defines computer program as "a set of instructions expressed in words, codes, schemes or in any other form, including a machine readable medium, capable of causing a computer to perform a particular task or achieve a particular result". Computer is

\(^76\) WIPO publication no. 223(E).
defined in the Act as, "including any electronic or similar device having information processing capabilities." Therefore we can consider the definition of computer program in Indian Act up to date and in consonance with the international standards.

There were several arguments advanced on various international forum for the appropriate mode of protection for computer programs, some experts also argued for giving patent protection to computer programs. But Uruguay round of the Multi Lateral Trade Negotiations finally decided on this issue when agreement on TRIPS provided, "computer programs, whether in source or object code, shall be protected as literary work under the Berne Convention." This was reiterated in the WCT that copyright protection applies to computer programs whatever may be the mode or form of the expression.

Interestingly Indian legislature has extended copyright protection to computer programs much before the TRIPS agreement of 1994. In India the 1984 amendment of the Act inserted an inclusive definition of copyright to include computer programs. Further the 1994 amendment of the Act extended the protection to computer programs, tables, and

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77 Section. 2(ffb) of the Indian Copyright Act, 1957.
78 TRIPS, Art. 10.1
79 WCT, Art.4.
80 Copyright Act 1957, sec.2(o).
compilations including computer databases. These provisions were enacted in light of Berne Convention where definition of literary and artistic work includes, "every production in the literary, scientific and artistic domain, whatever be the form of mode of its expression."

There are some other provisions specifically enacted for dealing with computer programs, such as section 14(b) bestows in computer programs rights of sale and rental in addition to the rights granted to them as literary work. Amendment of 1999 provided that commercial rental right will not be applicable with respect of those computer programs where the program itself is not the essential object of rental.

The fair dealing provisions under section 52 of the Act also provide for some specific clauses related to computer programs permitting certain types of uses, adaptations, decompilation and reverse engineering.

Further the Act also provides that informed use of infringing copies of computer program to be an offence. The Act also defines the author of a computer program separately "as a person who causes the work to be created."

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81 Copyright Act, 1957, Sec-2(o).
82 Berne Convention, Art. 2.
83 Proviso to sec. 14(b)(ii) of the Act; TRIPs, Art.11.
84 Copyright Act, 1957, Sec. 52(aa) to (ad)
85 Ibid, Sec. 63B.
86 Ibid, Sec. 2(d).
Digital Databases:

In the digital context database means a collection of independent works, data or other materials arranged in a systematic or methodical way and capable of being individually accessed by electronic or other means.\(^{87}\) Manual preparation of a database is a very hectic and expensive work but digital technology made it much easier and user friendly. The database has basically two parts, first the program, which is used to control and manage the data and other is the data itself. The underlying program will get protection under the expression 'literary work' and the doubt regarding protection of the data contained therein was settled by the agreement on TRIPS which categorically provided that, "compilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such."\(^{88}\) In its article 5 WCT also reiterated this position. The criteria required for the protection of database as such is the criteria of originality, i.e. the database should be the result of intellectual effort of the creator and should not have been copied from some other work or database, but the standards of originality differs in different jurisdictions.

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\(^{87}\) T.C. James, "Indian Copyright Law and Digital Technologies", 7 JIPR(2002) 428.

\(^{88}\) TRIPS, Art.10.1.
In India the computer databases are covered by the expression 'literary work' and thus all original computer databases enjoy copyright protection in India. The standard of originality required for copyright protection in India is low and the basic requirements of investment of sufficient skill, labour and judgment in the creation will suffice for granting the protection.

The problem that confronted the copyright community during the negotiations of WCT was the protection of non-original databases. In USA and the European Union attempts were made towards protecting databases where investment of time, money and efforts were made by the maker of the databases irrespective of the innovativeness of the database itself. There was also a proposal made by WIPO for a sui generis system of protection for the non-original databases in which 'substantial investment in collection, assembly, verification, organization or presentation of contents of the database' was made, but this proposal failed to take any shape because of lack of consensus as the major issue involved behind such protection is not intellectual property but economic investment only.

89 WIPO Document
Multimedia Works:

Digital technology brought about a revolutionary change in copyrightable material as it made possible the mixing, integration, splicing etc. of different categories of copyrightable works. A multimedia work is a combination or inputs of different types of media, for example, audio and visual works, along with a computer program which is responsible for its final form of presentation to the user. Therefore the crucial feature of multimedia work is the 'user interface'\(^{90}\) which is determined by the computer program underlying the multimedia work. It is settled that the underlying computer program will get copyright protection as literary work and the contents will get separate protection as musical and/or artistic work, but the major question related to the protection of the multimedia work as such, and if yes, who shall be the owner of the copyright in multimedia work? Since it is an integrated work, the contributors of its contents are usually different persons and the creator of the underlying computer program is another person, further more the producer may be another person. These questions are still unanswered and positions in some of the countries are discussed below.

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\(^{90}\) User interface means that the computer program acts as a bridge between the user and the contents of the multimedia work and also guides the navigation by the user through those inputs.
In USA, the Federal Supreme Court in *John Richardson Computers Ltd. v. Flanders*\(^91\) opined that in a multimedia work the final screen display is merely a product of the underlying computer program and not itself the literary work which is entitled to copyright protection as such. Court further explained that this did not preclude the possibility that a screen display (visual user interface element) may attract separate copyright protection as an aesthetic work in form of a photo, film, or being a reproduction of an artistic work.

The Australian Copyright Law Review Committee in paragraph 9.33 of its 'Software Report'\(^92\) recommended that protection of computer program should not extend to non-literal aspects, but these non-literal aspects should be protected in their own right.

In UK any collection of dramatic or musical works cannot qualify as a compilation because in copyright law a compilation is qualified for protection under 'literary work' which expressly excludes dramatic and musical works and by same reasoning artistic work also cannot be protected as a compilation.\(^93\)

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\(^91\) 1993 FSR 497
\(^93\) Copinger and Skone James, Copinger on copyright, 3-14(2005).
The issue of authorship and ownership in case of multimedia work is to some extent controversial. Since producing a multimedia is not a job of a single person but it is the concerted effort of several individuals having their indispensable contributions in the final output, for ex. the producer, designer, project manager, content creators, programs and technical specialists. There is no satisfactory solution offered by any single category for the protection of multimedia works.

In case of a computer program underlying a multimedia work is eligible for copyright protection as a literary work. However, the notion of computer program does not extend to visual user interface features and the comprising digital data and further more this subcategory of literary work does not incorporate many features of a multimedia work, for ex. the multiple digital media that are combined together, the way those digital inputs are integrated and how a user may interact with those digital media. Moreover the author and owner of a multimedia work, if it is protected as a computer program, would be limited to the programmer and would ignore the other creative contributors of the final work.

The concept of joint authorship can be invoked in such a case as it is a collaboration of more than one authors and their respective contribution are significant, original and not distinct and thus the
authorship and ownership rules for sui generic databases, dramatic (audiovisual) works, cinematographic work in digital form have the potential to accommodate a significant number of multimedia contributors. This concept of joint authorship of multimedia work is in a way beneficial for their protection as the duration for protection will be the statutory term\(^\text{94}\) provided after the death of the last surviving contributor.

2.2.2 Reproduction, transmission and communication of copyrighted works to the public through digital media and internet:

The biggest challenge posed to the copyright regime by digital technology is that after conversion of any work into digital form it can be transmitted throughout the world within seconds. The digital form of any work can easily be copied on CDs, DVDs, and other portable storage devices and the biggest threat is the internet through which any work can be easily downloaded, uploaded and shared with the whole world and multiple copies can be easily downloaded, uploaded and shared with the whole world and multiple copies can be produced without application of much skill, labour and judgment.

\(^{94}\) It is sixty years in India, (explanation to sec.22, Copyright Act 1957.)
The inherent characteristics of digital technology pose a number of challenges to copyright. A summary of the major challenges are as follows:

(i) Ease of replication – the technology used to create and view or sue a digital work can be sued to make multiple copies of that work.

(ii) Ease of transmission and multiple use - the networked computers potentially facility the wide spread piracy of work. The development and implementation of broad bandwidth, fixed and mobile networks to deliver content rich multimedia works facilitates this further.

(iii) Plasticity of digital media – the users can easily modify, enhance or adopt works in digital form.

(iv) Equivalence of work in digital form – all works in the digital form look alike once in the digital code, this means it is easy to combine digital works into new products such as 'multimedia'. This is also an aspect of convergence i.e. the manger of media, technology and networks in are such as the Internet, digital broadcasting, and cable service and so on.

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(v) Compactness of work in digital form – a whole library an be stored on a few CD-ROMs; this feature also assists in the creation of new works or assemblages of printed and graphic material.

(vi) New search and link capabilities: - Internet sites be easily linked, for example.

(vii) No human author (sometimes)-: the digital work may be computer-generated as opposed to being created with the aid of computer, copyright law is rooted in the concept of an identifiable personal author.

To illustrate how multiple violations of copyright place on the internet we can consider what steps are taking place; The first violation takes place when a copyrighted work is converted to a digital form and uploaded on a webpage or website. Once converted in electronic form the work can be stored numerous further copies can be made, for example on to the hard disk and RAM\textsuperscript{96} of the computer. Further if somebody views that work on his computer the download will create anther infringing copy on the concerned server and transitory copies will also be made in the RAM\textsuperscript{97} and on the screen of that person's computer,

\textsuperscript{96} Random Access Memory.
\textsuperscript{97} The issue of whether transitory images of data stored in RAM constitute copies is unsettled under current United States case law, the language of copyright Treaties recently adopted by the WIPO in 1996 leaving the issues unclear as well.
these copies will also be considered as infringing copies of the copyrighted work.

The Internet is best viewed as a global network which allows computers networked therein to talk to each other. The browser's computer transmits a request to the server computer holding the website which is being browsed to forward a copy of some particular material that it is strong. The mode of transmission of the so requested information over the internet is quite simple: the information is transmitted through the Internet using a technique known broadly as "packet switching". Specifically, data to be transmitted through the network is broken up into smaller units or packets of information, which are in effect labeled as to their proper order. The packets are then sent through the network as discrete units, often through multiple different paths and often at different times. As the packets are released and forwarded through the network, each "router" computer makes a temporary (ephemeral) copy of each packet and transmits it to the next router according to the best path available at that instant until it arrives at its destination.

One more problem posed by the Internet to copyright regime is regarding the territoriality principle of Intellectual property Laws. Over the Internet such copying can take place simultaneously at several places in the word and because of the different degrees of protection provided in different jurisdictions the control over such unauthorized copying is not possible at present.

2.2.3 Issues relating to the infringement, management and technological measures of protection of digital work:

INFRINGEMENT OF COPYRIGHT ON INTERNET

Infringement of copyright on the Internet has become a common phenomenon. Infringement of copyright on the Internet takes place either by ignorance or willfully. In a tangible medium, it is easy to determine whether a 'copy' of a protected work has been made, or whether infringement of any of the exclusive rights of the copyright owner has occurred. However, in the digital environment, it is a debatable issue whether data transmitted through the various nodes of the networks comprising the World Wide Web (www) is 'copied' for the purposes of copyright law. Even if one assumes that a 'copy' has been made, determining where that copy actually exists in the network may prove extremely difficult. Thus, determining that whether the 'copy' has
been distributed or displayed publicly becomes difficult. Once it is proved that a copy has been made and exists in digital form somewhere on the computer network, it may be considered that the digital copy is an infringing copy of the original copy and the exclusive rights of the copyright owner have been violated. Copyright infringement in cyberspace may be categorized as follows:

(i) Posting or uploading of materials on the website;

(ii) Linking;

(iii) Framing;

(iv) Caching; and

(v) Archiving.⁹⁹

(i) Posting or Uploading of Materials on the Website

Copyright in a work is infringed where the copyright material is uploaded on one's website without the prior permission of the copyright owner. There is a mixed response of the judiciary on the issue of uploading or posting copyright material on the website without the

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permission of copyright owner. Courts have arrived at different conclusions on the basis of the facts and circumstances of the individual cases. For example, in *Playboy Enterprises Inc v. Frena*\(^{100}\), the US District Court has found liability where a person merely created and managed a Bulletin Board Service (BBS)\(^{101}\) on to which infringing materials were posted by others without the knowledge of the BBS operator. The court observed that there was irrefutable evidence of direct copyright infringement. It did not matter that defendant was unaware of the copyright infringement. Intent to infringe was not needed to find copyright infringement\(^{102}\).

In *Sega Enterprises Ltd v. MAPHIA*\(^{103}\), the court granted permanent injunction against the defendant, which was a BBS operator and had solicited the uploading and downloading of plaintiff’s videogames on to the BBS. The downloading of videogames was allowed either in exchange for the uploading of videogames or payment. While holding the defendant liable, the court observed that the defendant

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\(^{100}\) 839 F Supp 1552 (MD FLA 1993)

\(^{101}\) Through Bulletin Board Service (BBS), the users may post not only the messages, but also images, software and other material on the bulletin board which is in fact an electronic bulletin board. Once the aforesaid materials are posted, the same can be downloaded by other users from anywhere throughout the world. The problem arises when the user post copyright material on the bulletin board without the previous permission of the copyright owner, for others to download.

\(^{102}\) 839 F Supp 1552, p 1559 (MD Fla 1993).

\(^{103}\) 857 FSupp 679 (ND Cal 1994)
had knowledge of the infringement and encouraged infringement knowingly and also derived a profit.104

In *Playboy Enterprises Inc v. Webb World Inc*,105 while holding the Webb World liable, the court held that vicarious copyright infringement arose where a defendant had a direct financial interest in the infringing activity and the right and ability to supervise the activity.106

In *Religious Technology Center v Netcom On-line Communication Services Inc*107, however, the court required something more than mere creations of the forum in order to impose liability. In this case, a Netcom subscriber posted some copyright material of Religious Technology Center on the bulletin board without its permission. The Religious Technology Center filed a suit against the Netcom, an Internet Services Provider (ISP), BBS Operator and the Netcom subscriber for the alleged infringement of its copyright. The court did not hold the Netcom and the BBS operator liable for the infringement of copyright as neither of them had performed any affirmative conduct except for providing access to the Internet and thereby to the newsgroups on the BBS. The court also observed that

105 986 F Supp 1171 (ND tax 1997)
106 Ibid, pp 1176-77
107 907FSupp 1361 (ND Cal 1995)
direct copyright infringement needed the presence of some element of volition or causation and that condition did not exist in that case as Netcom was merely creating, storing and transmitting copies of materials posted by third parties.\textsuperscript{108} Netcom was not held liable even for its subscriber's conduct as it was receiving only a fixed fee and not a share of the subscriber's profits.

In some cases, the doctrine of fair use has successfully been invoked\textsuperscript{109}, which has been discussed in detail subsequently.

(ii) Linking

Linking is a feature in the original site, which automatically connects the user to a linked site. Linking provides the user, access to a page or site through the original site, without typing universal resource locator (URL)\textsuperscript{110} in another browser. The user is required to click on the page or the site, which is displayed as a link on that original site. Linking, which allows a user to move from site to site is a very important medium of conducting research on the Internet. However,

\ \textsuperscript{108} 907 FSupp 1361 (NDCal 1995), p 1373.
\textsuperscript{109} Religious Technology Center v FACT NET, Inc 901 F Supp 1519 (p col 1995); Religious Technology Center v Lerma 40 US PQ 2d 1569 (ED va 1996).
\textsuperscript{110} A universal resource locator (URL) is the address of a file, ie, resource accessible on the Internet. The URL contains the name of the protocol required to access the resource, a domain name that identifies a specific computer on the Internet, and a pathname on the computer.
linking of web pages of one website to that of another may cause legal
difficulties having legal consequences.

*Types of Linking*

There may be two types of linking: (a) surface linking; and (b) deep linking.
In surface linking, the user may access the home page of another site
through a link of that site provided in the original site which has been visited
by the user. In deep linking, the user may access the inner pages of another
site through links provided on original site which has been visited by the
user, without accessing the home page of that another site.

In case of surface linking, the linking site owner may not be held
liable for copyright infringement of the material available on the linked
site as he is providing a link to the home page of the linked site and not
to the inner pages of that site or the materials contained therein. Thus,
surface links may be deemed as addresses designating the location of a
document on the web and may be treated as references provided in the
footnotes or library card index.\(^\text{111}\) However, the liability may be
considered where the link itself contains copyright material, for ex.

\(^{111}\) *Ticket Master v Ticket.com* sited in *Kabiszyn Smith Margarat, Emerging Legal Guidance on Deep
Court held that hyper linking did not itself involve a violation of a copyright since no copying was
involved. The customer was automatically transferred to the particular genuine web page of the
original audior. There was no deception in what was happening. That was analogous to using a library
card index to get reference to particular items, albeit faster and more efficiently.
where the linking document links to a specific phrase, picture or other copyright material which has their own URL address.

In *Shetland Times Ltd v. Dr Jonathan Wills and Zet News Ltd*, the defendant included on his website, Shetland News, exact reproductions of the headlines of *Shetland Times* which were hyperlinks and when selected, the user was linked to the text of the relevant story on the *Shetland Times* website. Being deep links, they bypassed the home page of *Shetland Times*, and any advertising on that page. The plaintiff argued that the headlines made available by them on their website are cable programmes and the headlines were literary works. They argued that the defendant had infringed their copyright by storing the work in the electronic means. The court granted interim injunction on the basis of copyright protection. Lord Hamilton observed that all access to the substantive material on the website of plaintiffs should be obtained exclusively by accessing their website through the homepage and that there should not be deep linking.

(iii) Framing

Framing allows one website to incorporate the contents from another website into a window or frame of its own in a manner wherein

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the framing site appears as the original website. In framing, each frame functions independently so that the information downloaded into that frame goes within the frame and does not go into the other frame or overlap onto the frame itself.\textsuperscript{113}

In case of framing, the user remains at the framing website and views the contents from the framing and framed websites. The user may not even know that the content in the frame comes from another framed website. The reason is that contents from the framed website are reduced to fit into the frame of framing website.

In \textit{Washington Post Co v. Total News, Inc}\textsuperscript{114}, the website of defendant Total News site was designed to consolidate over 1200 news sources into one location. The framed column containing names of several of the plaintiffs' news organizations appeared on the left side of the page and the URL totalnews.com appeared at the top of the web page. The plaintiff's website was also framed by the defendant. When a browser of Total News site clicked on one of the linkers, the text of the files of the plaintiff's website appeared but not its URL. The plaintiff alleged that the defendant had violated its copyright material. The

\textsuperscript{113} Microsoft Press Computer Dictionary, third edn, p 207.

\textsuperscript{114} No 97 Civ 1190 (PKL) (SDNY 1197).
defendant agreed to stop the framing practices and the parties reached an out of court settlement. In *Futuredontics v. Applied Anagramics, Inc.*,\(^{115}\) the court held that the defendant was liable for the infringement of copyright on the ground that it created an unauthorised derivative work through framing.

**(iv) Caching**

A cache is a place where something is stored temporarily. Computers include caches at several levels of operation, including cache memory and a disk cache. Caching is an activity in which a copy of the material from an original source is stored in cache for later use, when the same material is requested again. Caching generally increases the speed of accessing materials, which are repeatedly requested. Cached material is generally stored in a cached memory available to the user for a temporary period\(^{116}\).

There are three types of caching. The first type of caching involves the copying of document that is currently displayed on the screen of the personal computer while the user is browsing the web. The second type

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\(^{115}\) 45 USPQ 2d (BNA) 2005 (CD Ca 1998).

is where a personal computer not only makes a copy of the documents that are currently being displayed, but also temporarily retains copies of documents which are reviewed by the user in the past. When the computer receives a request for the documents which were previously viewed, it will bring up the cached copy rather than retrieve the documents from the Internet. In the third type of caching, instead of storing the materials on the personal computer, the documents are stored by an Internet Service Provider (ISP) or by the operator on the website. When the user requests a web page, the ISP checks if the documents are already stored in his machine and if he has stored it, the server sends this cached copy of the documents to the browser. This may cause some problems, eg, the users may not view the current copy of the requested website even when the website owner has already updated the information. Further, caching can cause damage to a site's reputation and may also reduce advertising.117

(v) Archiving

Archiving is the process of downloading and storing the materials of one website in another so that the second website can provide its users with the materials of the first website in its own website, without having

117 Biju TM, ‘Copyright in Cyberspace’ in AK Koul and VK Ahuja, Law of Copyright: From Gutenberg’s Invention to Internet, 2001, p.298 — 99.
to hyperlink to the former to retrieve the materials. When the user clicks on the hyperlinks, instead of going to that website, the user will be taken to another area of the same site, where the materials are stored. This may result in copyright infringement, as the copyright materials of one website are stored by the owner of another website in his website without prior permission of the owner of the former website.118

**Peer to Peer Networking**119

P2P can be defined as two or more computers connected by a software, which enables them to transfer files or data to other connected computers. It describes applications in which users can use the Internet to exchange files with each other directly or through a mediating server. It is a type of transient Internet network that allows a group of computer users with the same networking program to connect with each other and directly access files from one another's hard drives, in such a linked files are going from one another's hard drives, in such a linked files are going from one computer to the other without any mediating server storing the data being transferred. In some P2P communications are implemented by giving each communication node both server and client capabilities. The increasing use of broad band technologies to deliver real time audio and

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118 Ibid, p 299.
119 Hereinafter referred as P2P.
video streaming reflect the popularity and rapid implementation of P2P communications protocol.

The famous Napster case made this technology popular. In this case Napster established P2P which enabled its users to upload and share music (mp3 files) online, and since this sharing is not monitored by any central server the facility became a hub for major copyright violations of global music industry by its users as the Napster user community is enabled to transfer and make copies of such files on their own computer. In addition Napster provided technical support and infrastructure to search for copyrighted music files and also maintained a directory of such files. The Napster engine would search its database and display the location of the desired song along with the download option. Infringement cases were lodged by various parties in various jurisdictions. The ill-Fame, court cases and international pressure compelled Napster to shut down its facility, but this incident provided a platform to P2P which is now becoming synonymous to online copyright infringement, thought the use and not the technology itself is responsible for the ill fame.

Digital Rights Management 121

DRM is a new, emerging and revolutionary technology applied and used for restricting the free use and transfer of digital content. It is basically an aggregation of technologies which specifies, manages and enforces rules in all aspects of usage and distribution of digital content. By using this technique the right holder in a specific work, be it audio or video can manage his copyrighted material and the terms & conditions on which it is made available to the user.

This technology emerged in response to the rampant online piracy of copyrighted works. Internet because of its misuse and abuse became a gigantic copying machine enabling copying of content without compromising on the standards of quality. Added to this, there is a phenomenal improvement in compression techniques such as mp3, wav, mpeg, files etc. reduced the time and effort in copying the digital content over the Internet. Further more the concept of sharing on the Internet and P2P seriously prejudiced the interest of copyright holder.

In the wake of all this online piracy and unauthorized P2P sharing DRM appears as an answer. In India the music industry first initiated the movement to adopt DRM as a tool to protect them from digital copyright

121 Hereinafter referred as DRM.
infringement, they have formed an association called the Secure Digital Music Initiative. In addition to protecting piracy DRM is an alternative to protect right to privacy over the Internet which India is recognized as a fundamental right.

**Components of DRM:**\(^{122}\)

Some broad indications of the steps and techniques which can be considered as components of DRM are:

(a) Business objective and Piracy: the basic need of DRM in intellectual Property regime is business motive of the entities holding the IP. The threat of violation by the digital technology, such as piracy gives the impetus and decides the strategy to be adopted for the DRM mechanism.

(b) Planning the product, identifying the rights and related documents: Prior planning before the introduction (launch) of a product of work and prior identification of the rights which are to be protected through DRM are to be devised.

(c) Basis of use of such rights: the type of violation apprehended by the misuse of digital technology it is to be kept in mind and accordingly the strategies are to be adopted for protection.

\(^{122}\text{Bhatt, C. Vidyadhar, : Digital Management" Digital Rights Management", 2 Andhra Law Times, 17 (Journal section), (2008)}\)
(d) Management of legal and other rights: this will include setting up of rights management policies, their periodic refining, drafting and managing of agreements, managing the information on rights acquired and knowledge of how broad these rights are, control and enforcement of licenses and assignments and also revenue collection.

PROTECTION OF TECHNOLOGICAL MEASURES:

The technology has provided the copyright owners new tools such as conditional access systems and encryption by which they can limit access to and use of works to those users who are willing to accept certain obligations and make payments for such use. It must be recognized, however, that such systems may be circumvented, and that the tools for such circumvention, such as computer programs that break encryption codes or otherwise provide unauthorized access, may be made widely available through digital networks.

To address this issue, the WIPO Copyright Treaty (WCT) obligated the contracting parties to protect the rights of the copyright owner by providing legal protection against the circumvention of technological measures that are used by the authors. Article 11 of the WCT provides:
Contracting Parties shall provide adequate legal protection and effective legal remedies against the circumvention of effective technological measures that are used by authors in connection with the exercise of their rights under this Treaty or the Berne Convention and that restrict acts, in respect of their works, which are not authorized by the authors concerned or permitted by law.

Thus, contracting parties are under an obligation to provide in their national laws 'adequate legal protection' and 'effective legal remedies' against the circumvention of effective technological measures. A similar worded provision has also been made in the WIPO Performances and Phonograms Treaty (WPPT) in respect of the rights of performers and producers of phonograms.\(^{123}\)

**LIABILITY OF INTERNET SERVICE PROVIDER:**

The Internet service providers (ISPs) take the users to the world of cyberspace. They provide online access to the users. In United States, the 'service provider' means an entity offering the transmission, routing or providing of connections for digital online communications, between or among points specified by a user, of material of the user's choosing.

\(^{123}\) WIPO Performances and Phonograms Treaty 1996, art 18.
without modification to the content of the material as sent or received.\textsuperscript{124} In India, "network service provider' means an intermediary.\textsuperscript{125}

**Types of Liability**

There can be three types of liabilities: (i) direct liability; (ii) vicarious liability; (iii) contributory liability. Direct liability arises when a person infringes any exclusive right of a copyright owner. Vicarious liability arises when a person fails to prevent infringement when he can and has a duty to do so and is directly benefited by such infringement. Contributory liability arises when a person participates in the act of direct infringement and has knowledge of infringing activity. Fixing the liability of an ISP has been a very contentious issue.

The preceding discussion traces the evolution of scientific developments and technological devices and how these developments affect or have the potential of affecting the copyrighted works and thus also the rights of owners of such works, if an activity with the helps of such technology is done with the creative works without taking permission from the owners or authors of copyrighted works.

\textsuperscript{124} 17 USC 512(k)(1).
\textsuperscript{125} Information Technology Act 2000, sec. 79