OPEN SOURCE POLICY: A COMPETITIVE ALTERNATIVE TO MONOPOLY RIGHTS IN INDIA[1]

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> "Wonderful is your gift of knowledge,
> The more we share, the more it grows,
> The more we hoard it, the more it diminishes"
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> -a hymn to Saraswati, the Goddess of Knowledge

INTRODUCTION

Creating platforms for wider use and dissemination of open source software and the resultant radical impact, especially on a country like India, is of utmost importance, more so when combined with localisation efforts.[2] The open source community has generated tremendous support in India as it has socio-political benefits in a country with a population exceeding one billion[3]. The Indian Institutes of Technology use open source software for their research.[4] Indian governmental organisations are using technologies and applications based on open source software[5]. Red Hat, India has

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[2]Dr. APJ Abdul Kalam, Former President of India, (NASSCOM 2006: India Leadership Forum, Mumbai, 17th February 2006) at a special session on the final day of unveiling his 'World Knowledge < http://specials.rediff.com/money/2006/feb/17kalam.htm> accessed 10 September 2011

[3]Population data according to The Census of India, 2011 < http://censusindia.gov.in/> accessed 10 September 2011

[4]'Workshop on Building Digital Libraries Using Open Source Software' (IIT Roorkee, 27-29, 2008) <http://greenstonesupport.iimk.ac.in/pdf/indest%20brochure_Internet.pdf> accessed 3 September 2011

[5]An example where the national government has acted as a key motivator is its initiative to setup a National Resource Centre for Free and Open Source Software (NRCFOSS) in April 2005, a joint venture between an university-based research lab (AU-KBC Centre) and the Centre for Development of Advanced Computing (C-DAC). Another example is the formation in 2007 of the Institute for Open Technologies and Applications (IOTA) as a joint venture between the state of West Bengal, Jadavpur University and open source industry players (Sun Microsystems and Red Hat). IOTA's mandate is to promote open source software in government and academia. It provides information on OSS and open standards to organizations looking to understand how open source can fit into their IT infrastructure and also offers training on Linux and Open Office.

promoted use of open source in education and financial services and there are plans for e-governance projects too.[6] A report entitled 'Economic Impact of Free and Open Source Software – A Study in India' by IIM-Bangalore, highlights several interesting insights that show that India can save close to Rs 10,000 crore in 2010 by replacing just 50 percent of proprietary software with open source in desktops and servers.[7] Development of open source is also considered critical for information technology education at school level where low cost software is to be the real impetus.[8]

The body of academic literature on open source is growing rapidly. Most of the existing literature tries to gauge the governing structure of open-source projects. Pertinent questions investigated include the reasons behind programmers voluntarily contributing to the good of open source in light of no direct financial rewards. Why do large corporations contribute significant capital investments to open-source projects?[9]

The debate between proprietary software (PS) companies and open source software (OSS) has actually been underway since as early as 1984, when Richard Stallman[10] founded the GNU Project[11] in order to create a free software operating system. Any debate remaining unsolved this long develops myriad nuances, and closed source/open source conflicts are no exception. With a bit of background on the basics of software development, however, one can readily grasp the core copyright and public funding issues at stake in this dispute.[12] Though there has been a long tradition of sharing and cooperation in software development, the boom in the form, shape and formulation of the activity has expanded dramatically with the widespread diffusion of the internet.[13]

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[6]<http://www.redhat.com/about/whyopensource/> accessed 3 September 2011

Also see, draft for the 'Policy on Device Drivers for Procurement of Hardware for e-Governance'.

[7]<http://www.informationweek.in/search.aspx?IndexCatalogue=Search&SearchQuery= Open%20Source%20can%20help%20India%20save%2010,000%20crore,%20says%20IIM-B%20study> accessed 10 September 2011

[8]Priti Suri & Associates, *Open Source And The Law* (LexisNexis Butterworths 2006) 6

[9]Klaus M Schmidt and Monika Schnitzer, 'Public Subsidies For Open Source? Some Economic Policy Issues Of The Software Market' [2003] 16 Harvard Journal of Law & Technology 473, 474

[10]The open source movement originated in 1984, when computer scientist Richard Stallman quit his job at MIT and set up the Free Software Foundation. His aim was to create high-quality software that was freely available to everybody. Stallman's move resonated round the computer science community and now there are thousands of similar projects. For more, see Stallman's website < http://stallman.org/> accessed 10 September 2011

[11]Graham Lawton, 'The Great Giveaway' <http://www.newscientist.com/hottopics/copyleft/copyleftart.jsp> accessed on 9 September 2011

[12]Joseph Scott Miller, 'Allchin's Folly: Exploding Some Myths About Open Source Software' [2002] 20 Cardozo Arts & Entertainment Law Journal 491,494

[13]Josh Lerner and Jean Tirole, 'Some Simple Economics Of Open Source' [2002] 50 (2) Journal of Industrial Economics 197, 213

There is an intense debate in the world of software and information technology concerning OSS, its practicability and propriety software. In many countries (like the US), OSS and PS have co-existed for quite some time. However, can that actually happen successfully in a developing country like India?

COPYRIGHT AND ITS RATIONALE: EXTENDABLE TO OPEN SOURCE

Copyright legitimacy stems from rights accorded to the author, both moral and economic.[14] The rationale behind copyright can be understood from various theories of intellectual property which justify copyright either as a means of incentivising/ rewarding the author or encouraging innovation for the larger public good. Copyright by granting a near monopoly status to the author sorts the problems of free riders.[15] But the eventual aim of the regime is public benefits by an increase in overall stock of knowledge and information.[16] To further augment the argument it is pertinent to comprehend and analyse various theories of intellectual property.

John Locke postulated in **natural rights theory**, that "…the labour of his body and work of his hands, we may say are properly his…"[17] In addition, the natural rights argument holds that 'all human beings who create works of the mind are entitled to the specific right embracing protection of their moral and economic interests and covering all use of their work'.[18] Following Locke's postulation, the author through her intellectual labour, has a right on her own creation.[19] Locke's theory is readily applicable to modern systems where it is often contended that author should be able to reap the fruits of her intellectual labour.[20] However, traditional the argument may be to accept it as a general norm followed by various jurisdictions would be a fallacy. The United States

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[14]Indian Copyright Act 1957 s 57, Moral are available to the author even after economic rights are assigned.

[15]Adrienne K. Goss, 'Codifying The Commons: Copyright, Copyleft, And The Creative Commons Project' [2007] 82 Chi Kent L Rev 963, 966

[16]Adrienne (n 15) 967.

[17]Peter S. Menell, 'Intellectual Property: General Theories' (*Encyclopaedia of Law & Economics: Volume II*) (2000) 157. < http://encyclo.findlaw.com/1600book.pdf> accessed 10 September 2011

[18]JAL Sterling, *World Copyright Law* (Sweet and Maxwell, 2008) 301.

[19]Although Locke was explaining physical property, his arguments are applicable to intellectual property as well.

[20]Lockean labour theory as applied to intellectual labour, i.e., creators should be limited in their property interest to the value they add by applying their labour to things removed from the commons and not to the total value of the resulting product.

Constitution[21] for example, rejects the natural rights theory and categorically mentions that the purpose of the copyright system is to promote progress and not to reward authors.[22] An analogy for refusing ownership in the open software can be drawn from this argument. Anti-copyright sentiment in terms of software may find support from those who view copyright as hegemony of financial interest that presents an overwhelming hindrance to freedom of creation. Coming up with the software is more significant than assigning ownership for the same. Therefore alternative systems like OSS and Free Art License enable the acknowledgement of programmers within a model that includes freedom of exchange and reproduction emphasising collective and distributive creation.[23]

Also, OSS licenses enhance copyright law by demonstrating that copyright's internal logic (the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors[24]) applies not only where personal gain takes the form of cash, but also where it takes the form of the pleasure of successfully confronting a daunting programming challenge or helping your neighbour with some software she needs, as well as the enhancement to your reputation in the software development community.[25]

The **utilitarian theory** initiates an argument which is overlooked by the natural rights theory. It goes beyond rewarding the author and puts forth the primary objective of copyright system (to promote the social good through encouraging creation and dissemination of new works to the public). This theory is based on the Principle of Utility, the ability of an action to please individuals and more particularly its ability to please as many individuals as possible, thereby achieving the 'greatest good of the greatest number'.[26] General public interest will always embrace the author's interest, and this perspective should be applicable in case of a clash between the author's

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[21]<http://www.gnu.org/philosophy/why-free.html> accessed 10 September 2011.

[22]Richard M Stallman, 'Free Software, Free Society' (2nd edn, Free Software Foundation Inc 2010) 39. US Constitution only permits a system of copyright and does not require one. The idea was reiterated by Supreme Court in *Fox Film Corp v Doyal* [1932] 286 US 123,127. It stated "[t]he sole interest of the United States and the primary object in conferring the [copyright] monopoly lie in the general benefits derived by the public from the labors of authors."

[23]Severine Dusollier, 'Open Source And Copyleft: Authorship Reconsidered' [2003] 26 Colum J L & Arts 281, 282

[24]Rebecca Tushnet, 'Economies of Desire: Fair Use And Marketplace Assumptions' [2009] 51 William And Mary Law Review 513, 520

[25]Joseph (n 12) 500

[26]JS Mill and Jeremy Bentham established that human behavior is limited to the extent of avoiding as much pain and seeking as much pleasure as possible by way of action.

interest and that of the rest of the public.[27] Other objectives of copyright regime like encouragement of learning, promotion of economy and cultural promotion are derived from the Utilitarian model, all traits embedded in the OS movement.

The **labour** theory advocates in favour of rewarding the author for the fruits of the intellectual labour but clearly ignores the public interest objective of the copyright law. The individual right has to be clearly balanced with the public good as the public domain should not suffer from overt monopolisation. The Open Source movement which will be discussed later clearly intends to attain this balance.[28]

In addition to the labour theory, **personality** based argument is the justification for allowing property rights in information based on intellect, which states that fruits of intellectual creativity are associated with their author in a peculiarly intimate way that necessitates her having the right to her work. Kant and Hegel's personhood approach is an extension of **personality** theory. Hegel argued that a person's persona, i.e., his physical features, mannerisms and history are an important receptacle for personality, it deserves generous legal protection in spite of the fact that it does not result from labour.[29]

The advocates of OSS rebuff the personality theory favouring proprietary theory argument and denounce it as a mere emotional argument creating a hindrance to the use and adaptation of programs.[30] Open Source Licensing requires that the author of a particular piece of code be acknowledged. This requirement is often satisfied by retaining the author's copyright notice even as the code is passed on and modified further.[31] As described by open source pioneer Eric S. Raymond, this credit-giving is fundamental to perpetuating open source software.[32] Raymond postulates that hackers contribute many

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[27]Sterling (n 18) 71. The Preamble to the WIPO Copyright Treaty refers to "the need to maintain a balance between rights of the authors and larger public interest, particularly education, research and access to information as reflected in the Berne Convention." A similar reference is there in WPPT as well.

[28]Richard Stallman, the founder of the open source movement goes to the extent of proposing names like Imposed Monopoly Privileges (IMPs) and Government Originated Legally Enforced Monopolies (GOLEMs) for Intellectual Property Rights.

[29]William Fisher, 'Theories of Intellectual Property' <http://cyber.law.harvard.edu/people/tfisher/iptheory.pdf> accessed 10 September 2011

[30]Richard (n 22) 55.

[31]Robert W Gomulkiewicz, 'How Copyleft Uses License Rights To Succeed In The Open Source Software Revolution And The Implication For Article 2B' [1999] 36 Houston Law Review 179, 187.

[32]Eric Steven Raymond, 'The Cathedral And The Bazaar' <http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/> accessed 10 September 2011

hours of volunteer labour to a development project because they highly value the reputation it gives them within the hacker community. Without this incentive, the OS movement would not exist on any significant scale.[33]

The French and the German systems are generally associated with the **naturalist** approach.[34] The economic and moral rights conferred on the author under these systems justify the reward and the personality rights elements suggested in Locke's labour theory. Later, developing countries like India also started recognising the moral and economic rights of the author under the copyright regime in accordance with the global trends.[35]

Moral rights relate to mutations of an author's work which subsist in the author even after the author has parted with the copyrighted work. The moral right panorama creates a unique angle in open source software, where contributors built the software before it seeps to the next contributor for further modifications. Open source, though a modern phenomenon, has many parallels with the system of *droit morale* which originated over two hundred years ago in France and grew as a response to the society's need to protect and value creative works of the authors and artists who produced them. In similar fashion, OSS has emerged to protect and value software transparency and freedom. Moral rights seek to protect the creator's personality as embodied in the work. The open source approach similarly protects the transparency necessary to show the programmer's personality in contributing to a project. The moral right of integrity, in some jurisdictions, may apply to software, thus raising questions as to whether it hurts or helps the current copyright-based licensing approach to protecting open source software.

Amidst all the above theories explaining rationale for copyright, the controversy is whether copyright has led to over-protectionism detrimental to the public domain. Has the copyright regime become a hindrance to the streams of inputs necessary for continued artistic and intellectual development? Can the intent to do public good and author's rights coexist? Open source is an attempt at such coexistence where the source code is distributed freely without compromising on authors' right and recognition.

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[33]Robert (n 31) 188.

[34]Under French law, the *droit d'Jauteur* tradition. Under Germany law, the author's moral rights are protected under Article 5 of the *Grundgesetz* (GG), which guarantees freedom of expression, and Article 1 (2) of the GG, which guarantees the author's right to personality. Economic rights are protected as a property right under Article 14 (1) of the GG.

[35]Cross-reference, n 14.

Open source challenges the closed property-based approach of the commercial world by widespread distribution of source amongst programmers across the world. It also challenges the so-called incentive rationale behind copyright as it is not feasible to reward or incentivise the authors. In economic terms, the motivations refer to intrinsic and non pecuniary rewards.

WHAT IS OPEN SOURCE SOFTWARE: AN UNDERSTANDING OF OPEN SOURCE *VIA* OPEN SOURCE VERSUS PROPRIETARY SOFTWARE.

Since the dawn of computing a half-century ago, software has hidden its human-readable source code in non-readable 'object code' that only the computer can interpret. In part, software development technology made object code the preferred mode of distributing and running software. Before the advent of software copyright protection, developers used trade secret law[36] to protect software, relying on non-readable object code to protect the secret. Even after the advent of software copyright protection, lawyers advised clients to conceal source code to prevent others from copying and infringing it. Open source programmers share source code royalty-free and collaborate in ad hoc, self-organizing, interoperable units to develop software.[37]

Source code is written in a computer language such as Java, C, or C++, which is easy to read for an experienced programmer (human being). Subsequently, it has to be translated into machine (object) code, so that it can be processed by the computer. The object code is a sequence of zeros and ones, understandable by computers and very difficult to read for humans, and also difficult and time-consuming to retranslate into source code.[38]

The word 'open' in open source software relates to the source code which is freely available and modifiable, unlike a PS wherein source code is sold like any other good or service.[39] The general public can then not only use OSS, but also extend it, adapt it and subsequently redistribute the modified software to others.

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[36]Thomas M Pitegoff, 'Open Source, Open World: New Possibilities For Computer Software In Business' < http://www.pitlaw.com/pdf/Open%20Source%20Open%20World.pdf> accessed 10 September 2011 "While source code is protected by copyright and may be protected by patent, in practice source code is protected by trade secrecy. Even if the source code copyright is registered…only a small portion of the code need be filed on registration, while most of it typically remains secret."

[37]Greg R Vetter, 'The Collaborative Integrity Of Open Source' [2004] Utah Law Review 563, 587

[38]Klaus (n 9) 480.

[39]*Ibid* 481-83.

Three basic distribution approaches reflecting different choices about a software recipient's right to distribute copies or prepare derivative works, are of interest here:

(1)   First, there can be a disclaiming of all copyright powers as software-source code and object code can be entirely placed in the public domain. Hence, a person can copy the software as many times as desired without any need for permission. In addition, the subsequent recipient can author a new piece of software comprising a modified version of the first software without any permission. Also, the recipient will hold the copyright in this resulting derivative work and therefore will enjoy the same control over others' activities regarding the derivative work.[40]

(2)   Alternatively, the 'closed source' approach can be applied where only the software in object code (denying access to source code) can be distributed under a license that denies the user any authority to redistribute copies, to modify in anyway, or to convert the software-object code into source code. This is the preferred distribution method among mass-market software firms such as Microsoft.

(3)   Finally, software can be distributed with source code accompanying object code under a license that authorizes (a) unlimited redistribution of the source code, object code, and license, (b) unlimited modification of the same, and (c) unlimited distribution of any resulting modified software provided that these conditions are met: the new software must identify both the author of the changes and the changes themselves; and the new software must be distributed under the same license terms and conditions as the original software. This distribution approach is known as 'free software', and it comports with the definition of OSS promulgated in 1998.[41]

An interesting question that germinates from the discussions on open source and its products is whether all open source applications are really 'open' or is there a 'marriage' with some proprietary models?[42] Is coexistence of such commercial softwares critical? Divergence of opinion exists on this aspect, but it is worth pondering over. Of course, understandably, proponents of General Public License (GPL) and Free Software Foundation (FSF) adopt a stringent approach and discourage use of proprietary modules. This is in contrast with the positions of Linus Torvalds[43] and the Indian evangelist, Dr.

[40]Joseph (n 12) 499.

[41]*Ibid* 500.

[42]Priti (n 8) 4.

[43]The young Finnish developer who built Linux in the early 1990s. < www.wipo.int/edocs/mdocs/.../ en/.../wipo_ip_cm_07_www_82577.ppt> accessed 10 September 2011

Phatak,[44] who feel that co-existence between the two are essential. Jim Barton, co-founder of TiVO(r) took this a step further and stated: 'Regardless, the use of propriety modules have contributed greatly to the explosive growth in the use of Linux and GNU software in general and are key to the use of Linux in embedded systems. Had this facility not been available, propriety operating systems would certainly continue to be the norm for most commercial embedded applications'.[45]

WHAT MOTIVATES OPEN SOURCE CONTRIBUTORS? PRESTIGE AND VISIBILITY TO THE PROGRAMMERS

The decision to contribute without pay to open source software may seem mysterious to economists. However, the standard framework of labour economics can be adapted to capture activity in the open source environment.[46] The unpaid programmer working on an open source software development project faces a variety of benefits and costs. The programmer incurs an opportunity cost of time, which can manifest itself in different ways. For example, a programmer [47] who works as an independent on open source projects forgoes the monetary compensation that could otherwise be earned by working for a commercial firm or a university. For a programmer with a commercial company, university or research lab affiliation, the opportunity cost of working on open source software comes from not focusing on other tasks.

IN A SOCIALIST COUNTRY LIKE INDIA

The preamble to the Constitution of India envisages India as

'WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a

SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens.'

thereby adding a strong tang of socialism in all its endeavours. It is in this light and vision that OSS projects have proven to be serious competitors for proprietary software products, as the 'entry barrier' of decreasing average costs is inapplicable on them. A major reason for this successful entry has been that the costs for developing OSS are

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[44]Subrao M Nilekani Chair Professor, Department of CSE, Kanwal Rekhi Bldg, Indian Institute of Technology, Bombay, Mumbai, India.

[45]Priti (n 8) 5.

[46]Josh (n 13) 211.

[47]Josh Lerner, Parag A Pathak and Jean Tirole, 'The Dynamics Of Open-Source Contributors' [2006] 96(2) The Roots Of Innovation: Aea Papers And Proceedings 114

carried by volunteer programmers. Thus, the consumer is entirely spared of paying for product development. This in turn results in a significant cost advantage over the incumbents.[48]

Open source has energized the debate about software quality while reliability problems still challenge traditional software. Accessibility to the source code plays a key role in providing these social benefits. This accessibility is created and enforced by the innovative open-source approach. As India seeks to make its citizens a part of the global digital economy, it faces a formidable set of challenges. India's IT industry may have won accolades all over the world, but many of India's citizens have either no access or very limited access to technology. Unless access to IT is easily available to Indians, many Indians will remain 'digital illiterates'. This will have widespread ramifications on education, e-government and other sectors of the economy.

Open Source in India implies a radical approach to our burgeoning problems. Besides the Linux operating system, LAMP[49] is also catching on in India. OSS is becoming popular among students and developers in general due to its easy availability and widespread community support. Although the adoption of open source solutions in the Indian e-governance sector is primarily being looked at from a State Government perspective, significant support is being extended by the Central Government as well.[50] Governments and companies need to adopt a fresh approach to serve the needs of the 'Bottom of the Pyramid', i.e. the four billion people of the world who live on less than $2 a day[51].

In education, India has 888,000 educational institutions and 350 million children in the age group of 6-19.[52] In the area of e-government, India has to reach out to its one billion plus population at the lowest possible cost. At the individual level, India's per capita income is Rs 20,862 ($474), while PC hardware costs Rs 10,000 ($227) and software costs approximately Rs 11,000 ($250).[53] This means that the cost of hardware and software together is more than the annual income of most Indians! As we seek to modernize our education systems, enable more efficient delivery of e-government services, and empower more Indians with the power of IT, there are compelling political,

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[48]Jurgen Bitzer, 'Commercial Versus Open Source Software: The Role Of Product Heterogeneity In Competition' [2004] 28(4) Economic Systems 369, 370

[49]This term was popular in Germany to define how MySQL was used in conjunction with Linux, Apache, and either Perl, Python, or PHP.

[50]Cross reference n 5.

[51]<http://pubs.iied.org/pdfs/17058IIED.pdf> accessed 10 September 2011

[52]<http://www.redhat.com/magazine/015jan06/features/tapia/> accessed 10 September 2011

[53]<http://thelittlesasi.wikidot.com/foss-edu> accessed 10 September 2011

economic and cultural reasons for India to consider radical approaches to building a national IT infrastructure.

A greater benefit of the OSS in a diverse country like India is the dissemination of the code software into local languages. With education at the local levels churning out local language students, this can prove to be 'one giant step', with the breaking of the language barrier.

ADVANTAGE INDIA

With OSS made available, it is but obvious that positive consequences will follow, which include (a) universal readability of the source code provided the requisite know-how of the technology is fathomable; (b) contributing to the improvement, development and criticism of the software and the resultant produced which can do wonders to India's standing in the world of software; (c) physical distance no longer remaining a barrier for technical excellence. 'Ideas and knowledge which were once accessible in coffee shops in Silicon Valley are now available in Kolhapur and Darjeeling through OSS'[54]; (d) a solution to the enduring struggle of Indian software companies is their apparent inability to come up with innovative products and further to develop them and take their projects to product stage. OSS proves to be an answer to this dilemma, as it reduces the importance of products by raising the importance of services.

Furthermore, with the flourishing of OSS, a generation of Indian software engineers could end up leaving their mark on the software that literally runs the Internet; a major step up on the world stage. It would lead to respect worldwide for their coding skills and would create economic and technological parity between India and the West. Additionally, increasing familiarity with Indian workers and their skills leads to increasing trust, which could lead to a surge in foreign multinationals outsourcing work to Indian companies.

CONCLUSION

Open source is becoming more mainstream in the Indian economy as a result of interest on part of the government, industry and academia in encouraging adoption of open source software. Demand for open source has followed the increase in demand for information technology in all sectors. Liberalization in procurement policy has also contributed to the demand for open source solutions. All of these trends indicate that India is poised to begin to leverage open source software in a bigger way.

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[54]Ajay Shah, 'What Open Source Software means to India' <http://www.mayin.org/ajayshah/MEDIA/1998/free-sw.html> accessed 10 September 2011

While most open source software is still used internally in Indian organizations, the potential for significant contributions back to global open source projects is increasing. As affordable automation using open technologies becomes embedded in the processes of managing and supporting the needs of more than a billion people, useful and significant contributions from India will begin to pour into the global commons of open source software.

As the Internet grows and reaches more of humanity and as it becomes a part of our day to day lives, it is possible that we will become more of a collaborative species instead of a competitive one.