Technological Determinism: Perspectives on Technology and Social Change

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Abstract

This article will discuss the theory of technological determinism and whether technology has been an agent of social change or caused a cultural shift in the way society functions. Technology, whether for a beneficial purpose (Computers, modern transportation etc.) or with a destructive intent (The atom bomb, fire arms etc.) has continuously changed the way we lead our lives and has left an indelible mark in history and society. From the basic telephone to the modern-day satellite communication and mobile phone, technology has assisted in enabling a quicker and more efficient means of living and working conditions. What impact have these innovations had on the society as whole? Have our social interactions changed with the introduction of technologies or have technologies been introduced to meet the needs of society?

The Indian society today is still witness to conditions where a farmer on one hand relies on the traditional methods of ploughing the field by using bullock carts while another uses other basic or advanced technological systems to undertake the same task. The final outcome being the yield or produce could perhaps vary substantially between the two farms in quantity and quality as well. The reliance on technology or innovations brings about social change in one form or another. Does the farmer using technology create a better life for himself or does he need to innovate so that he can meet his own particular needs?
The age-old analogy of which came first, the chicken or the egg is perhaps apt here. Did society feel the need for new technology or was new technology first presented to society and thereafter utilised?

This paper attempts to understand and outline the theory of 'technology determinism', its counter narratives and whether technology has any impact on legislation and policy making or the society on the whole. The article will further delve into aspects of the synergetic relationship that society and technology share.
KEYWORDS: Technological Determinism, Social Determinism, Information Technology, Right to Privacy

Introduction

The utilisation of technology and technological growth is a fair indication as to why there exists a divide[1], whether economic or social, between developed, developing and least developed countries. As a matter of common knowledge, given technological advances, anyone who resides in a developed country would find efficacy in everyday life far greater than those living in developing or least developed

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[1]*Bridging Digital Divide Between Industrialized and Developing Countries*, Committee on Information, Twenty-Third Session- UN Press Release PI/1339,(1st May, 2001),http://www.un.org/News/Press/docs/2001/pi1339.doc.htm

countries. Could this be regarded as an indication of the impact that innovation and technology has on society?

The Internet, a tool that was initially conceptualised as an "*idea that there would be multiple independent networks of rather arbitrary design*"[2] soon grew into one of the most influential and widely used technologies of all times.The growth of the internet over the last two decades has been remarkable with the technology rapidly changing and evolving as also influencing the way people across the globe communicate and do business. The constant changing nature of the world wide web is far from stopping, it is and will continue to evolve into something much bigger than what we perceive it to be today. The internet is, as some authors suggest, "*an organism that can evolve*".[3]

Society's habits of engaging with one another, shopping for essential and non-essential items and functioning generally are all more technology driven than ever before. From the Internet to '*The Internet of Things*'[4] our dependence on technology and resulting behavioural patterns are changing in light of the various technologies made available to us.

Methodology

This paperundertakes a doctrinal and analytical approach to understand the concept of technology determinism and its influence on society. International conventions, Indian legislation and judicial pronouncements are studied here to correlate the impact of technology on society.

Technological Determinism

TheNorwegian-American Sociologist and Economist, Thorstein Bunde Veblen (1857-1929), is credited to have coined the term 'technological determinism'.[5] At the heart of the discussion on the theory of technological determinism lies the premise that technology is the basis for shaping society and any important event in society is based

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[2] Barry M. Leiner et. al., *Brief History of the Internet*, (1997), http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

[3] Michael Gillings, Darrell Kemp and Martin Hilbert, '*Not so science fiction after all, the internet could out-evolve humanity*' The Conversation (15th January, 2016), https://theconversation.com/not-so-science-fiction-after-all-the-internet-could-out-evolve-humanity-53162

[4] For a reading on the subject see Karen Rose, Scott Eldridge and Lyman Chapin, '*The Internet of Things: An Overview-Understanding the Issues and Challenges of a More Connected World*', (October 2015), https://www.internetsociety.org/sites/default/files/ISOC-IoT-Overview-20151014_0.pdf

[5] Daniel Chandler, *Technological or Media Determinism*(18th September, 1995), http://visual-memory.co.uk/daniel/Documents/tecdet/

on the result of some innovation. A reductionist[6] theory, technological determinism stems from a "*belief in technology being the key governing force in society*"[7].

The rationale behind this understanding being that technology more than any other factor, plays an extremely significant part in influencing society and the way it functions and is governed or governs itself.Authors have suggested that the development of technology does determine social change.[8]

While an impact on society is something that technology may be in a position to determine, the fact that it has an impact on cultural norms and behaviour as well is something that is generally seen around the world. For example, in any setting of a social gathering, basic human interaction was the key engagement and prior to the advent of mobile communications interactions seen between the individuals seemed a lot more on a face to face basis. However, as experience suggests and through studies[9] undertaken in this regard one can gather the impact, adverse or otherwise, that such social interactions have had after the introduction of mobile communications.

There seems to have been a cultural shift in the way individuals in the age of mobile communications interact as part of a social evening. It now literally seems to be the norm to engage more with technologiesby continuously messaging or talking on the mobile phone while attending a social gathering.

The Deterministic Views

The theory of technological determinism brings with it different views in itself. Schools of thought by the various commentators have, in a manner of speaking, categorized the theory into "hard" and "soft" views.[10] The commentators of the theory who hold the soft view stipulate that "*technological change drives social change but at the same time responds discriminatingly to social pressures*"[11]. The proponents of the hard view on technological determinism state that development of technologyis "*an autonomous force,completely independent of social constraints*"[12].

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[6] See *Reductionism,* The Basics of Philosophy,
http://www.philosophybasics.com/branch_reductionism.html

[7] Merritt Roe Smith, *Technological Determinism in American Culture,* in Does Technology Drive History?: The Dilemma of Technological Determinism 2 (Merritt Roe Smith& Leo Marx eds., MIT Press, 1994).

[8] Bruce Bimber, *Three Faces of Technological Determinism*in Does Technology Drive History?: The Dilemma of Technological Determinism 80, (Merritt Roe Smith& Leo Marx eds., MIT Press, 1994).

[9] Manuel Castells et. al., *The Mobile Communication Society: A cross-cultural analysis of available evidence on the social uses of wireless communication technology*,
https://pdfs.semanticscholar.org/f006/5d9a99555da8a38cd9be7aacfe302e3c0b2d.pdf

[10] Paul S. Adler, *Technological Determinism*, (2006) http://www-bcf.usc.edu/~padler/research/revisingTechnological%20Determinism.pdf

[11]*Supra* note 7.

[12]*Ibid*.

Amongst the two schools of thought, the soft view adopts a more balanced approach to technological determinism. While the hard view advocates the belief that technology and its development are completely responsible for social change and society plays no role in it, the soft view determinists argue that technology and society are mutually dependent.[13] The soft view determinists posit that technology is a "*key factor that may facilitate change*"[14].

The position of the soft view considering it as a balanced approach seems to be more favourable as it allows for the possibility of the influence of society and social factors vis-à-vis the introduction of technology. The hard view determinists on the other hand however would lead us to believe that the technological progress is beyond the control of man and "*technology has gotten out of control and it follows its own course, independent of human direction*"[15]. What the advocates of this hard view suggest is that "*technology is on a run-away course and is autonomous of human agency*"[16] that is to say that the possibility of free will of societyin identifying and opting for specific technologies for its consumption is no longer relevant. To stipulate this is to postulate that mankind has no hand in the development of technologies, a statement which does not hold much water.

Given such a view one might possibly suggest that the needs of society and its influences at any given point in time have no bearing on technological development and progress. While society as a whole constantly looks to improve living conditions, seek more efficient technologies to accelerate their productivity and output, the hard view on technology determinismseems to render that need and perspective of mankind redundant.

In any event, whether it is the hard or soft technological deterministic view, one conclusion that may be drawn from these theories is that technology in any event plays a vital role in shaping society and through that, its cultural norms and behaviour. This would to be the theme and basic foundation of technological determinism in any case.

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[13] Stefan Fritsch, *Conceptualizing the Ambivalent Role of Technology in International Relations: Between Systemic Change and Continuity,* in The Global Politics of Science and Technology - Vol. 1: Concepts from International Relations and Other Disciplines, 119 (Maximilian Mayer, Mariana Carpes and Ruth Knoblich eds., Springer, 2014).

[14] David J. Gunkel, *Second thoughts: toward a critique of the digital divide*, 5(4) New Media & Society, 499, 510 (2003).

[15] Brian M. O'Connell, *Electronic Monitoring in the American Academy*, in Electronic Monitoring in the Workplace: Controversies and Solutions, 187 (John Weckert ed., IGI Global, 2005).

[16] Edmund F. Byrne, *The Labour-Saving Device: Evidence of Responsibility?,* in From Artifact to Habitat: Studies in the Critical Engagement of Technology, 132 (Gayle L. Ormiston ed., Lehigh University Press, 1990).

A counter narrative on technological determinism

An opposing view or counter to the theory of technological determinism is the theory of 'social construction or social determinism'.[17] What this theory basically stipulates is that society or social factors are responsible for leading to technological developments and technology is shaped by societal needs rather than technology determining what society needs. Social determinism is the counter narrative and an opposing view to technological determinism.

The social determinism view "*formulates the idea that the influence of technology can only be understood in terms of the importance or meaning that humans attribute to it*"[18]. This model of the deterministic stand on studies of technology proposes "*that technology does not follow its own momentum nor a rational goal-directed problem-solving path but is instead shaped by social factors*"[19]. The essential element of this view is that society as a whole determines the extent to which technology would be shaped, and human intervention is responsible for what type of technology would find its use in society.

Although both the deterministic models have seen criticism in their own right, they continue to be influential theories when dealing with the relationship between society and technology. What is of relevance is that a balance between these two opposing views would be a more favourable approach to the study between the nature of the relationship between technologies impact on society and vice versa.

Technology Impact

As various technologies are introduced, their impact on society can be felt, both in the negative and a positive sense.[20] The introduction of the internet for instance opened up a whole new set of possibilities. Communication for example became quicker and simpler because of the introduction of the e-mail. People no longer needed to wait for days or weeks to hear from their loved ones. Communication even across borders to the other end of the world, which took several weeks through regular mail, was made possible within seconds of it being sent.

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[17] Trevor J. Pinch & Wiebe E. Bijker, *The Social Construction of Facts and Artefacts: Or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other*, 14(3) Social Studies of Science, 399-441 (1984).

[18] Michael Friedewald, *The Continuous Construction of the Computer User: Visions and User Models in the History of Human-Computer Interaction*in Total Interaction: Theory and Practice of a New Paradigm for the Design Disciplines, 27 (Gerhard M. Buurman ed., Birkhäuser, 2005).

[19] Wiebe E. Bijke, *Democratization of Technology, Who are the Experts?*, (January 1996),http://www.angelfire.com/la/esst/bijker.html

[20] Karehka Ramey, *Technology and Society – Impact of Technology on Society*, (12th November, 2012) https://www.useoftechnology.com/technology-society-impact-technology-society/

The ability to communicate faster and with substantial cost reduction came at its own cost. Consumers were introduced to spam "*and suddenly, the innovation wasn't so great*"[21].

There arenumerous problems and issues ranging from health to social behaviour that come with the use of modern technologies. Studies[22] undertaken in this regard highlight the various negative implications because of our use of technologies.

There have also been growing concerns in the academic and medical circles of internet addiction which is broadly defined as "*the inability of individuals to control their internet use, resulting in marked distress and/or functional impairment in daily life*"[23].Studies on internet addiction have also been linked to various psychiatric disorders and range from issues of drug and alcohol abuse to physical and mental health hazards.[24]

The engagement with the virtual world can get extremely dangerous as in the case of a three-month old infant in Korea who starved to death because her parents neglected her and instead chose to raise a virtual child in an online game.[25]

Parents who are worried about their children being addicted to video games also sometimes take certain unusual measures to intervene. A father in China who was concerned with his sons online gaming addiction hired a virtual assassin tasked with killing his son's online avatar in the hopes of getting him to stop playing as much.[26]

Noted American author, educator and, critic Neil Postman (1931-2003) at a talk he delivered in 1998[27] stated that any technology change is essentially a trade-off and which he called a '*Faustian bargain*'[28]. He suggests that introduction of technology in

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[21]Jeffrey Beall, *Predatory publishers are corrupting open access*, 489 Nature, 179 (2012).

[22] Mohammad Bani Younes &Samer Al-Zoubi, *The Impact of Technologies on Society: A Review*, 20(2) IOSR-JHSS, 82-86 (2015).

[23]Ronald Pies,*Should DSM-V Designate "Internet Addiction" a Mental Disorder?* 6(2)Psychiatry (Edgmont), 31–37(2009).

[24] Aviv Weinstein et. al., *Chapter 5-Internet Addiction Disorder: Overview and Controversies* in Behavioral Addictions- Criteria, Evidence, and Treatment, 99, 103-104 (Kenneth Rosenberg and Laura Feder eds., Elsevier Inc,2014).

[25]*S Korea child 'starves as parents raise virtual baby'*, BBC News (5th March, 2010),http://news.bbc.co.uk/1/hi/8551122.stm

[26] Zoe Kleinman, *Gamers hired by father to 'kill' son in online games*, (7th January, 2013),http://www.bbc.com/news/technology-20931304

[27] Neil Postman, *Five Things We Need to Know About Technological Change*, Talk delivered in Denver, Colorado (28thMarch, 1998) http://web.cs.ucdavis.edu/~rogaway/classes/188/materials/postman.pdf

[28]*A pact whereby a person trades something of supreme moral or spiritual importance, such as personal values or the soul, for some worldly or material benefit, such as knowledge, power, or riches*.https://www.britannica.com/topic/Faustian-bargain

society comes with great disadvantages that can outweigh the pros its usage brings, citing examples of automobiles and pollution among others, Postman goes on state that "*the greater the wonders of a technology, the greater will be its negative consequences*"[29].

Influence on Legislation and Judicial Pronouncements

There has been a growing recognition that domestic and international legislation would need to keep pace with technological development and solutions and/or problems offered/faced by such technical developments. Over two decades ago India was introduced to the internet technology, evolution in legislation as also policy initiatives naturally followed.

The rapid growth of the internet had brought with it, amongst other things, a new method of doing business. Having connected people from around the world and having made communication easier, the internet was seen as a fastand fairly efficient method to transact and conduct business. The result of such a system saw the emergence of increased activity for online transactions also termed as e-commerce or electronic commerce.

Seeing the development and increased activity and use of the internet and with it international commerce to a certain extent, in 1996, the United Nations Commission on International Trade Law (UNICTRAL) adopted a model law on e-commerce[30].

The rationale behind the model law[31] was to enable countries to adopt legislation at the domestic level that would help them in the implementation of issues arising as a result of transacting online. It was also seen and intended as model legislation that would be an alternative to dealing with contracts etc. in the online (internet) environment.

Based on the UNICTRAL model law, India adopted the Information Technology Act in 2000.[32]

The preamble to the act inter alia states:

> "*An Act to provide legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involve the use of alternatives to paper-based methods of communication and storage of information....*"

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[29]*Supra* note 27.

[30] Catherine L. Mann, Sue E. Eckert & Sarah Cleeland Knight, *Global Electronic Commerce: A Policy Primer,* 146 (Institute for International Economics, 2000).

[31]*The Model Law has been enacted in various jurisdictions from both developed and developing countries and is widely regarded as the most authoritative set of international legal standards for electronic commerce.*-World Summit on the Information Society,Document WSIS/PC-2/CONTR/66-E, (17th January, 2003) www.itu.int/dms_pub/itu-s/md/03/wsispc2/c/S03-WSISPC2-C-0066!!MSW-E.doc

[32] Act 21 of 2000.

However, after having enacted legislation related to e-commerce and the rules and regulations under the act, the Government of India had failed to take a more technology neutral stand on the use of digital signatures as was outlined in the UNICITRAL model law with respect to electronic commerce.

The problem with making legislation which deals with technology which is specific is that it would take away the aspects of utilizing new systems and technologies, in this case for the use of online commerce. Such systems would not be legally recognised due to lack of legislation in spite of probably being more secure methods of communication and transactions.

Nevertheless, the Government of India vide the Information Technology (Amendment), 2008[33] brought in provisions that made the law technology neutral among other things.

The act had also facilitated the filing of documents in the electronic format with various Government bodies. Systems that have evolved in this regard have made it simpler for citizens to conduct various activities which would have otherwise required individuals to be physically present.

Just as technology has played a part inthe enactment of legislation, so too with jurisprudence can one see its effect. A recent landmark judgment in India has seen the influence of technology play a key role in its pronouncement.

The Supreme Court of India on 24th August 2017unanimously granted to the citizens of India the right to privacy as a fundamental rightguaranteed under the Indian Constitution.[34]The case,*Justice K S Puttaswamy (Retd.), and Anr. v. Union of India And Ors.*[35], overruled two previous judgments[36] of the Supreme Court which had held that privacy cannot be a considered a fundamental right under the Constitution.

The impact of technological advances played a critical role in the Judges unanimously agreeing to grant privacy as a fundamental right. The court held that information technology had an all-pervasive nature and felt its task was to "*impart constitutional meaning to individual liberty in an interconnected world*"[37].

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[33] Act 10 of 2009.

[34]Prasanna S, *Technology and the law: SC verdict on right to privacy is a major relief*, The Indian Express (24th August 2017) http://indianexpress.com/article/opinion/technology-and-the-law-supreme-court-verdict-on-right-to-privacy-is-a-major-relief-4811773/

[35]Writ Petition (Civil) No. 494 OF 2012, http://supremecourtofindia.nic.in/supremecourt/2012/35071/35071_2012_Judgement_24-Aug-2017.pdf

[36] *M.P. Sharma v. Satish Chandra, District Magistrate, Delhi*,1954 AIR 300; *Kharak Singh v. The State of U. P. & Others*, 1963 AIR 1295.

[37]*Supra* note 35, Part A- The Reference.

It was observed that the technology prevalent at the time of the framing of the Constitution was very different from what is experienced today and that even in relation to our recent past "*technology reshapes our fundamental understanding of information, knowledge and human relationships*"[38].

The Court in its conclusions found that given the rapid growth of technology the "*interpretation of the Constitution must be resilient and flexibleto allow future generations to adapt its content bearing in mind its basic or essential features*"[39].This observation of the Court bodes well for enabling jurisprudence to further develop in light of technologies that could be made available to us in future.

Given the very recent nature of this landmark judgment, only time will tell what sort of an impactit would have in regards to the rapid change in the overall technological landscape.For now, it would suffice to say that this judgment would indeed have far reaching consequences for the citizens of India vis-à-vis informational privacy.

Conclusion

The words of Marshall McLuhan (1911-1980), a Canadian philosopher and professor, are rather prophetic. In his work,The Medium is the Massage, he says:

> "*The medium, or process, of our time—electric technology—is reshaping and restructuring patterns of social interdependence and every aspect of our personal life. It is forcing us to reconsider and reevaluate practically every thought, every action, and every institution formerly taken for granted. Everything is changing—you, your family, your neighborhood, your education, your job, your government, your relation to "the others". And they're changing dramatically*"[40].

The evolution of technical systems and technology as has been seen above brings with it social, political, economic and regulatory ramifications. One of the greatest innovations in the last few decades, the internet, is a sound model of technology which can help in the study of society's dependence of technology and vice versa. While the growth of the internet and the resultant by-product of e-commerce may be regarded as a societal need for more efficient systems of communication and transactions, the added negative aspect that the internet has brought with it could be regarded as the lack of human intervention to put checks and balances in place to control the outcomes of this technology.

The view that technology is the driving force behind history and therefore has an impact on society or shapes society may not be the absolute truth and cannot be viewed stringently. A truly balanced approach between the needs of society for technological development and thereafter a need for its control arises and is something that should be investigated and studied further. One aspect which favours

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[38]*Id.*, Part M- Constituent Assembly and privacy: limits of originalist interpretation, para 149.

[39]*Id.*, Part T- Our Conclusions, para 3(G).

[40]Marshall McLuhan and Quentin Fiore, *The Medium is the Massage: An Inventory of Effects*, 8(Gingko Press, 1967).

the technological deterministic view is the fact that legislation dealing with technology is the result of the technological innovation in the first place.

Given the fact that society at certain points in time and history has evolved technology and thereafter seen it go beyond the attributes of human intervention would indicate that societal needs and technological development need to strike a balance. One element that is brought to the forefront is that technology has its consequences in the behavioural, legislative, social, political and, economic arena among others.

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