

The John Marshall Journal of Information Technology & Privacy Law

Volume 26
Issue 2 *Journal of Computer & Information Law*
- Winter 2008

Article 1

Winter 2008

Symbiotic Regulation, 26 J. Marshall J. Computer & Info. L. 207 (2008)

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Recommended Citation

Andrew Murray, Symbiotic Regulation, 26 J. Marshall J. Computer & Info. L. 207 (2008)

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ARTICLE

SYMBIOTIC REGULATION

ANDREW MURRAY*

I. INTRODUCTION

Complexity seems to be at the heart of much of the work of academia today. Whether one is a sociologist,¹ a medical researcher,² a computer scientist³ or a legal researcher,⁴ the role of the academic researcher may be defined as studying and modeling complexity in an effort to make it accessible to a wider audience. This article is a segment in this proud tradition and hopefully succeeds, in part, in modeling the complexity of regulatory relationships in communications networks and in particular the Internet. First, this article will model the complexity of the regulatory environment. Next, this article will explain how regulators may harness the power of the network to achieve effective regulatory settlements by harnessing symbiotic regulation. Finally, this article will explain how symbiotic regulation may achieve a greater degree of effectiveness than traditional regulatory models of modern communications-enhanced networks of individuals.

II. BACKGROUND

A. NETWORKS AND COMPLEXITY

The Internet is often thought of as the archetypal modern communications network, yet the Internet known today grew from relatively hum-

* Law Department, London School of Economics. Elements of this paper are taken from Andrew D. Murray, *The Regulation of Cyberspace: Control in the Online Environment* (Oxford ed., Routledge 2006).

1. Michael Crozier and Jean-Claude Thoenig, *The Regulation of Complex Organized Systems*, 21 ADMIN. SCI. Q. 574 (1976).

2. W.R. Gilks et al., *Modelling Complexity: Applications of Gibbs Sampling in Medicine*, 55.1 J. ROYAL STAT. SOC'Y 39 (1993).

3. Vincent D. Blondel & John N. Tsitsiklis, *A Survey of Computational Complexity Results in Systems and Control*, 36 AUTOMATICA 1249 (2000).

4. Louis Kaplow, *A Model of the Optimal Complexity of Legal Rules*, 11 J. L. ECON. & ORG. 150.

ble roots. The Internet's progenitor is the Arpanet project of the United States' Department of Defense Advanced Projects Research Agency. Arpanet was designed in the 1960's as a closed communications network, which allowed United States' based computer researchers to share the processing power of their (at that time, stand-alone) mainframe computers.⁵ The Arpanet was designed to be scalable, robust, and (relatively) inexpensive, but it was not built upon open architecture. This meant that those who wished to use Arpanet had first to obtain a mini-computer known as an Interface Message Processor ("IMP").⁶ These IMPs were leased from Bolt, Beranek, and Newman, who designed and built them, at a cost of almost \$4000 per month,⁷ which put connection to Arpanet in the preserve of institutional subscribers. The difficulty of accessing the Arpanet network led others to design simpler cheaper alternatives. This led to an explosion of interest in network design in the early 1970s. Professor Norm Abramson of the University of Hawaii developed a wireless network named Alohanet, which used low-cost ham radio systems to create a wide area network linking the remote campuses of the University.⁸ Simultaneously, in the United Kingdom, Donald Davies, co-creator of the concept of packet switching,⁹ built a packet switched local area network to serve the National Physical Laboratory in Teddington,¹⁰ while in France, Louis Pouzin designed a network known as Cyclades for the Institut de Recherche d'Informatique et d'Automatique.¹¹

As the number of available computer networks grew, the desire to network the networks became stronger. A project was commenced to inter-network the networks under the direction of Robert Khan and Vint Cerf.¹² The solution they designed was Transmission Control Protocol/Internet Protocol ("TCP/IP"). TCP/IP is an extremely simple software design that allows any computer network to be connected to any other

5. See KATIE HAFNER & MATTHEW LYON, *WHERE WIZARDS STAY UP LATE: THE ORIGINS OF THE INTERNET* (New York, Touchstone 1996) (detailing the history of the Internet).

6. *Id.* at 71-81.

7. FRANK HEART, *ESTIMATE OF INTEGRATED MONTHLY COST FOR IMPS (1970)*, available at <http://www.archive.org/details/EstimateOfIntegratedMonthlyCostForImps>.

8. Hafner & Lyon, *supra* note 5, at 220.

9. D. W. Davies, K. A. Bartlett, R. A. Scantlebury & P. T. Wilkinson, *ACM Symposium on Operating Systems: A Digital Communications Network for Computers Giving Rapid Response at Remote Terminals* (October 1967).

10. Hafner & Lyon, *supra* note 5, at 106.

11. Cyclades was the first network to use datagrams and matching end-to-end protocols, essential components of the modern internet. See Louis Pouzin, *CIGALE, the Packet Switching Machine of the CYCLADES Computer Network*, *PROCEEDINGS OF IFIP 155* (Aug. 1974), available at <http://www.rogerdmoore.ca/PS/CIGALE/CIGALE.html>.

12. Hafner & Lyon, *supra* note 5, at 222.

via the TCP/IP carrier.¹³ TCP/IP is more than simply a piece of software that allows for inter-networking. An understanding of the key principles of TCP/IP and what it allows for, aids the regulator to understand the regulatory environment more clearly, which, in turn, allows for better regulatory design.

At the heart of TCP/IP are two key concepts: open architecture connectivity and end-to-end connectivity.¹⁴ Open architecture connectivity allows any network to connect to the TCP/IP carrier network, it allowed not only for connections between extant networks such as Alohanet, the NPL Local Network and Cyclades, but also allowed for other protocols and software suites to ‘piggy back’ on the TCP/IP protocol suite to reach the wider audience of anyone with a TCP/IP enabled network.¹⁵ This led to a variety of inter-networking applications such as File Transfer Protocol (“FTP”), Simple Mail Transfer Protocol (“SMTP”), Real-time Transport Protocol (“RTP”), and most famously Hypertext Transport Protocol (“HTTP”). Open architecture ensures that the Internet may be used as a foundation for any variety of new network initiatives from simple file transfers (as were allowed by Arpanet) to complex modern network initiatives such as Video on Demand, Hyperlinking, and Voice over IP (“VoIP”) without the need for permission or without changes in the TCP/IP architecture.¹⁶

End-to-end connectivity defines the network as a neutral network. The concept of net neutrality is highly prized by many Internet pioneers. Net neutrality means that all communications on the network are treated equally no matter what the network is carrying (be it a simple e-mail or a complex VoIP conversation) with the network intelligence found at the ends of the network in the ‘hosts.’¹⁷ This prized concept is currently under review, some may even say challenged, as advances in network architecture now allow for intelligent design, because some modern network tools such as streaming video and VoIP are more sensitive to lag than others such as file transfers or simple web browsing, the call has gone out from many quarters for a review of this principle.¹⁸

13. T. Socolofsky & C. Kale, “TCP/IP Tutorial” Network Working Group Request for Comments (RFC)1180 January 1991, *available at* <http://www.faqs.org/rfcs/rfc1180.html>.

14. *Id.*

15. Hafner & Lyon, *supra* note 5, at 244.

16. Internet Society, <http://www.isoc.org/internet/history/brief.shtml> (last visited Apr. 28, 2009).

17. Mark Lemley & Lawrence Lessig, *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*, 48 UCLA L. Rev. 925, 931 (2001).

18. High Tech Broadband Coalition, *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities* (CC Docket No. 96-45 (2002)); High Tech Broadband Coalition, *Appropriate Regulatory Treatment for Broadband Access to the Internet over Cable Facilities* (CC Docket No. 96-45 (2002)). For an excellent discussion of the issues see Barbara van Schewick, *Towards an Economic Framework for Network Neutrality Regula-*

The effect of these two concepts is that the Internet functions somewhat like a mail carrier. It will carry anything from anyone to anyone else as long as it is properly labeled and packaged. A typical communication between two parties across any of the networks that use the TCP/IP protocol and may be properly described as an Internet communication, the TCP/IP sees the original message split into smaller components and sends the message through the network in parts before being recombined at the recipient's computer. This looks somewhat like figure one.

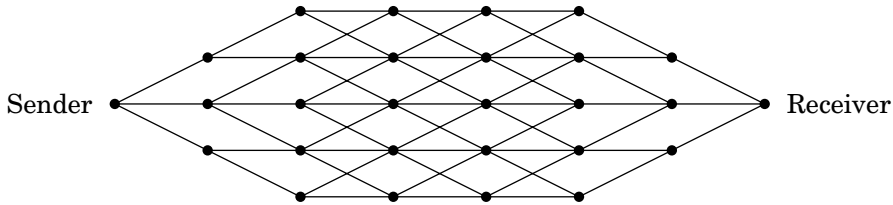


Figure One: Internet Communications Traffic

This design is actually rather atypical among communications networks, and it soon becomes clear that the Internet, far from being an archetypal modern communications network, is actually rather unique in its structure. Imagine the variety of digital communications networks available such as the telephone, fixed and mobile, or broadcast, visual or audio, these communications pass through a central transmission point, or a series of related transmitters, as can be seen in figures two and three.

Even the most cursory examination of these figures allows an insight into the difficulty of regulating the Internet. Whereas traditional broadcast media has a single point of control, the head of the beast so to speak, which may be utilized by regulators as a point of control,¹⁹ the Internet has no equivalent. An attempt to regulate activities or content in cyberspace is exponentially more complex than traditional narrow-casting and broadcasting communications networks. Additionally, there is an almost infinite number of communications nodes available on the Internet, as a result, the usual media-regulatory model of regulating the carrier or enabler approaches the impossible. It is this complexity in the regulatory matrix that led cyber-libertarians such as David Post and

tion, Paper Presented at The 33rd Research Conference on Communication, Information and Internet Policy, The National Center for Technology and Law, George Mason University School of Law 2005.

19. For example, the Ofcom Broadcasting Code, *available at* <http://www.ofcom.org.uk/tv/rf/codes/bcode/>. The code regulates radio and television broadcasters to protect children and ensure broadcast media meets taste and decency standards.

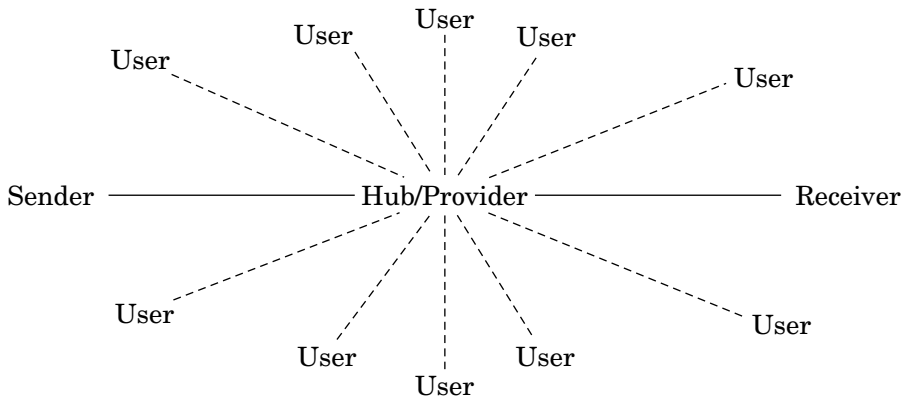


Figure 2 - Telephony Network

David Johnson²⁰ and John Perry Barlow²¹ to develop their theory of cyber-liberalism. Noting that ‘control’ in traditional media regulation emanated at the level of individual networks, they proposed that al-

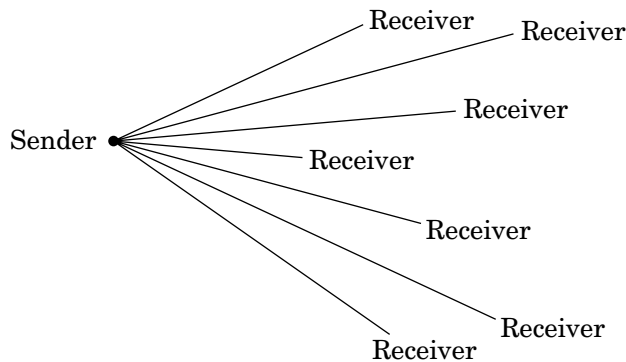


Figure 3 - Broadcast Network

though forms of hierarchical control might be exerted over specific networks, the aggregate range of such rule sets was unlikely to lead to any form of centralized control of cyberspace.²² Accordingly, the ‘Law of Cyberspace’ would largely be determined by a free market in regulation where network users would be able to chose the rule sets network users

20. David Post & David Johnson, *Law and Borders - The Rise of Law in Cyberspace*, 48 STAN. L. REV. 1367 (1996) [hereinafter *Law and Borders*].

21. John Perry Barlow, *A Declaration of Independence for Cyberspace*, Feb. 8, 1996, <http://homes.eff.org/~barlow/Declaration-Final.html>.

22. *Law and Borders*, *supra* note 20, at 1375-76.

found most congenial.²³ Johnson and Post maintain that the various dimensions of inter-networking could be governed by 'decentralized, emergent law' wherein customary and privately produced laws, or rules, would be produced by decentralized collective action leading to the emergence of common standards for mutual coordination.²⁴ In other words, they believe that the decentralized and incorporeal nature of cyberspace means that the only possible regulatory system is one that develops organically with the consent of the majority of the citizens of cyberspace.²⁵

This view was, of course, immediately challenged by the emergent cyber-paternalist school led by Joel Reidenberg,²⁶ Jack Goldsmith,²⁷ and Lawrence Lessig.²⁸ According to the cyber-paternalistic view, Internet related conflicts and controversies reflect a state of flux where the decisions of network designers and established legal regimes intersect.²⁹ The cyber-paternalist school believes that dependence on design choices, the attributes of public oversight associated with regulatory regimes, can be maintained by shifting the focus of government actions away from direct regulation of cyberspace toward influencing changes to its architecture. This approach reached its apex in Lawrence Lessig's monograph *Code and Other Laws of Cyberspace*.³⁰ In his book, Lessig identified four 'modalities of regulation': (1) law (2) market, (3) architecture, and (4) norms which may be used individually or collectively either directly or indirectly by regulators.³¹ To explain, Lessig used a simple example, of smoking, to demonstrate how regulators may use his four modalities.³²

23. *Id.* at 1398-99.

24. *Id.* at 1387-91. This notion parallels the concept of polycentric or non-statist law. See Tom W. Bell *Polycentric Law*, 7 HUMANE STUD. REV. 1, Winter 1991/92 available at <http://osf1.gmu.edu/~ihs/w91issues.html>; Tom W. Bell, *Polycentric Law in the New Millennium* in THE MONT PELERIN SOCIETY (1998), available at <http://www.tomwbell.com/writings/FAH.html>.

25. *Law and Borders*, *supra* note 20; see also David Johnson & David Post, *The New 'Civic Virtue' of the Internet: A Complex Systems Model for the Governance of Cyberspace*, in THE EMERGING INTERNET: THE ANNUAL REVIEW OF THE INSTITUTE FOR INFORMATION STUDIES (Firestone ed. 1998), available at <http://www.temple.edu/lawschool/dpost/Newcivicvirtue.html>.

26. Joel Reidenberg, *Governing Networks and Rule-Making in Cyberspace*, 45 EMORY L. J. 911 (1996) [hereinafter *Governing Networks*]; Joel Reidenberg, *Lex Informatica: The Formation of Information Policy Rules Through Technology*, 76 TEX. L. REV. 553 (1998) [hereinafter *Lex Informatica*].

27. Jack Goldsmith, *Regulation of the Internet: Three Persistent Fallacies*, 73 CHI. KENT L. REV. 1119 (1998).

28. Lawrence Lessig, *The Law of the Horse: What Cyberlaw Might Teach*, 113 HARV. L. REV. 501 (1999) [hereinafter *Law of the Horse*].

29. *Lex Informatica*, *supra* note 26.

30. LAWRENCE LESSIG, *CODE AND OTHER LAWS OF CYBERSPACE* (Basic Books 1999) [hereinafter *CYBERSPACE*].

31. *Id.* at 86-88.

32. *Id.* at 87.

First, using law to regulate the decision to smoke, a regulatory body may promulgate laws to constrain the supply of cigarettes, such as age restrictions, or to regulate the ability to consume cigarettes in certain environments,³³ an example is the recent outright smoking ban in enclosed public places and workplaces in England.³⁴ Second, a market solution may be used,³⁵ such as in the United Kingdom where a robust policy of elevated tobacco duties is used to discourage smoking. Third, architectural solutions may be used: cigarettes with filters may encourage more smoking as they are perceived as being less dangerous while nicotine enhanced cigarettes will prove to be more addictive.³⁶ Fourth, regulators may encourage the development of a certain standard of norms³⁷ such as media campaigns, which demonstrate the dangers of passive smoking, or those designed to paint smokers as generally anti-social. These are designed to encourage a strong, and negative, societal response to smoking, particularly smoking in public places. Each modality thus has a role to play in regulating the decision to smoke.³⁸ Lessig suggests the true regulatory picture is one in which all four modalities are considered together.³⁹ Regulators should design hybrid regulatory models choosing the best mix of the four to achieve the desired outcome.⁴⁰

The problem of the cyber-paternalist, or Lessigian, model of regulation is the cyber-paternalist model makes an error in fact similar to the cyber-libertarian model. The cyber-libertarians erroneously believe that the complexity in the regulatory matrix would naturally defend liberties in cyberspace from external regulatory interventions, whereas the cyber-paternalists believe the lifeblood of the network, its software code, may affect control over network users. In fact, the correct position is complicated by the extant design of the network, the principles of open architecture connectivity and end-to-end connectivity protect the individual network user from external regulatory interventions. These principles removed the concept of a directing or controlling mind from the network from the beginning. The network has no network operator, unlike traditional telecommunications or broadcast networks, but the network may be redesigned. There is no requirement that the network retain these characteristics, and as discussed earlier there is currently an extensive discourse on the future of network neutrality,⁴¹ a discourse that may af-

33. *Id.*

34. Health Act, 2006, c. 28 (Eng.).

35. CYBERSPACE, *supra* note 30, at 87.

36. *Id.*

37. *Id.*

38. *Id.*

39. *Id.*

40. *Id.* at 87-88.

41. Health Act, *supra* note 33.

fect the principle of end-to-end connectivity. To migrate the community from the current network to a network based on a new set of principles, however, requires the agreement and consent of the community. A community who, through their use of the network, comes close to achieving, in practice, Jürgen Habermas's model of the public sphere.⁴² To truly understand how regulation functions on the Internet, we first need to examine the network of Internet users.

B. DOTS, NETWORKS AND COMMUNITIES

A return to the cyber-paternalist approach allows the examination of the first insight into the true model of cyber-regulation. In *Code and Other Laws of Cyberspace*,⁴³ Lawrence Lessig demonstrates the application of his thesis regarding the modalities of regulation by applying the regulation to an imaginary subject he entitles his "pathetic dot." Professor Lessig introduces the dot in a section entitled "A Dot's Life" with the following words:

There are many ways to think about constitutional law and the limits it may impose on government regulation. I want to think about it from the perspective of someone who is regulated or constrained. That someone regulated is represented by this (pathetic) dot – a creature (you or me) subject to the different constraints that might regulate it.⁴⁴

In the of analysis that follows, Professor Lessig sets out his now famous constraints on behavior analysis that places the pathetic dot at the center of a network of constraining modalities (the modalities of Law, Norms, Markets and Architecture discussed above).⁴⁵ These constraining modalities exert their force upon the dot either to constrain the activities or actions of the dot (negative or red-light regulation) or to create an incentive to compel the dot into action (positive or green-light regulation).⁴⁶ Throughout the analysis, Professor Lessig's dot remains a passive observer of the regulatory matrix that surrounds it. Thus, when a government decides it wishes to achieve a policy objective, such as reducing the level of thefts of car stereos, Professor Lessig describes the activities governments may choose to adopt including, increasing the penalty for car radio theft, sentencing to life in prison, and mandating a change in the radio's architecture to design radios that work only with a single car by encoding a security code that electronically locks the radio

42. JÜRGEN HABERMAS, *THE STRUCTURAL TRANSFORMATION OF THE PUBLIC SPHERE: INQUIRY INTO A CATEGORY OF BOURGEOIS SOCIETY* (1992) (stating that the public sphere is, "a network for communicating information and points of view").

43. *CYBERSPACE*, *supra* note 30, at 86.

44. *Id.*

45. *Id.* at 87-88.

46. CAROL HARLOW & RICHARD RAWLINGS, *LAW AND ADMINISTRATION* 29-90 (1997).

to the car so if the radio is removed it will no longer function.⁴⁷ At each point in this discourse, however, the dot remains simply observant of the changes surrounding it. What happens if the dot's role is changed from passive receiver to active transmitter? Now when a government mandates a change in the regulatory environment of the manner described by Lessig the dot responds. Lessig predicts that the dot will respond in a predictable and directed fashion. If you threaten car stereo thieves with life imprisonment they will modify their behavior by no longer stealing car stereos. But another possible response is that the thief, now mindful of the consequences of being caught, carries with him a gun or a knife with the intention to use it against anyone who attempts to apprehend him to ensure his escape. This is an example of an occurrence, which is all too common in the real world and goes by many names, in economics and more widely in the social sciences, the occurrence is often entitled "the law of unintended consequences."⁴⁸ In regulatory theory, it may sometimes be referred to as "regulatory failure."⁴⁹ In either case, the terminology is instructive. Both terms suggest a settled environment where the only variable is the activity of the regulator (i.e. the use of the words *unintended* and *failure*). Where an unintended consequence arises such as the one suggested above, or when a Norwegian teenager reverse engineers the Content Scramble System,⁵⁰ the unintended consequence is seen as the result of a weakness in the regulatory design. This article argues this is not always the case. A regulatory failure, despite its name, may not represent a failure of the regulation itself it may also represent a failure of the model to account for the reactions of the individual or to develop the language of Lawrence Lessig, the not-so-pathetic dot. This raises a further series of questions. Was the dot ever pathetic? When did

47. CYBERSPACE, *supra* note 30.

48. Rob Norton, *Unintended Consequences* in DAVID HEDERSON (ed.) THE CONCISE ENCYCLOPEDIA OF ECONOMICS (1993), available at <http://www.econlib.org/library/Enc/UnintendedConsequences.html>; see also DEEPAK LAL, UNINTENDED CONSEQUENCES: THE IMPACT OF FACTOR ENDOWMENTS, CULTURE, AND POLITICS ON LONG-RUN ECONOMIC PERFORMANCE (The MIT Press 1998); Richard Posner, *Values and Consequences: An Introduction to Economic Analysis of Law* (U. of Chi. L. Law & Econ. Working Paper 2d series, No 53, 1998), available at http://www.law.uchicago.edu/Lawecon/WkngPprs_5175/53.Posner.Values.pdf.

49. Paul Joskow, *Regulatory Failure, Regulatory Reform, and Structural Change in the Electric Power Industry* 1989 BROOKINGS PAPERS ON ECONOMIC ACTIVITY: SPECIAL ISSUE 125, available at <http://www.jstor.org/stable/2534721?>; JAMES BARTH, SUSANNE TRIMBATH & GLENN YAGO THE SAVINGS AND LOAN CRISIS: LESSONS FROM A REGULATORY FAILURE xiii (2004); A.S.G. LUBULWA, THE IMPLICATIONS OF REGULATORY FAILURE FOR RAIL AND ROAD INDUSTRIES (1990).

50. Kristen Eshenfelder & Anuj Desai, *Software as Protest: The Unexpected Resiliency of U.S. based DeCSS Posting and Linking*, 20 U. WIS. THE INFO. SOC'Y 101 (2004); Kristin Eshenfelder, et al., *The Limits of DeCSS Posting: A Comparison of Internet Posting of DVD Circumvention Devices in the European Union and China*, 31 WIS. J. OF INFO. SCI. 317 (2005).

it cease to act in a purely pathetic manner? What caused this evolution? Finally, what can regulators do about the not-so-pathetic dot?

The first of these questions is in many respects the most difficult to answer. It is not the purpose of this article to analyze the nature of identity, individuality, collectivism, and control. Within the confines of the analysis is the adage 'divide and conquer' that stems from the weaknesses observed in individuals when the individuals are separated from the community. Thus, in days past when communications were less efficient and effective than now, it was easier to affect direct control of the type described by Lessig. Likewise, in medieval England it was relatively easy for the King to rule directly because the King was the font of all power (and controlled the organs of state). Additionally, the nobles would follow the King and apply his rule to their tenants. The tenants would not often commune in large groups except in church where the message they received cemented the concept of the Divine Right of the King.⁵¹ Thus, the King ruled, as the populous tended to receive their information from sources loyal to the King. The lack of a cohesive horizontal communications network among the majority of the population meant it was difficult for the populous to form a popular opinion apart from that of the King and state. We cannot say though that the populous was without power.

Despite being mostly passive receivers of regulatory demands, on occasion the populous acted as a transmitter. The most famous (failed) example of this was the Peasants' Revolt of 1381. The revolt began in Essex when locals in Brentwood reacted adversely to an over-zealous tax collector. From Brentwood, resistance to tax collectors spread to neighboring villages, at the same time, armed bands of villagers and townsmen also rose up and attacked manors and religious houses across counties such as Kent, Suffolk, Hertfordshire, and Norfolk. The revolt eventually reached London where the revolutionaries razed the Savoy Palace, but then almost as soon as it had begun the revolt was over. The young King Richard II met the Essex peasants and the peasants pledged their allegiance to the King.⁵² What happened? It is not certain as to all the social, economic and political factors that took hold at the meeting between the King and the Essex peasants, and several eminent authors have spent time analyzing the background to the revolt and the meeting with differing views as to the causes and effects.⁵³ Analyzing just a few of the

51. FRITZ KERN, *KINGSHIP AND LAW IN THE MIDDLE AGES xix-xx* (Oxford Greenwood Press 1985).

52. ALASTAIR DUNN, *THE PEASANTS' REVOLT: ENGLAND'S FAILED REVOLUTION OF 1381*(2004).

53. See R.B. DOBSON, *THE PEASANTS' REVOLT OF 1381* (1983); Christopher Dyer, *The Social and Economic Background to the Rural Revolt of 1381*, in *THE ENGLISH RISING OF 1381* (Rodney Hilton and Trevor Ashton ed., Cambridge University Press 1984); Anthony

fine details of the revolt, though, gives some insight into the way people communicate, both with each other and with those who regulate them. At the outset, the revolt started from a single point then quickly spread through the surrounding area as word of the events in Brentwood spread. The speed with which others in Kent, Suffolk, Hertfordshire, and Norfolk took up in support of the revolt shows there had been an underlying resentment among the members of the community, but despite feelings of isolation and fear of their overlords, they chose to act as passive receivers. Once one group decided the act as transmitters of this resentment the information spread quickly and an isolated local event became one of national concern. The revolt ended when the King met the leaders of the revolt.

The reason for the swift resolution may easily be mapped in terms of regulatory settlement. The revolt was not against the King directly because the revolutionaries believed God appointed the King. All the revolutionaries had been taught since the day they were born was to follow the word of God and the King (in that order) and they were not about to commit Treason by attacking the King. To have attacked the King would have required a step change in the aims of the revolt. By meeting the peasants personally, the King used the weight of authority invested in him by the apparatus of the state to diffuse the situation. The King was Divine. The peasant leaders knew this and knew if they attacked the King their support would fade. Language, communication, and culture was important and knowledge of such signalled the end of the revolt.

What is learned from the tale of the Peasants' Revolt? One may think that reviewing the actions of a group of peasants 626 years ago is of no value in an article examining the regulation of the Internet, but remember that "those who don't know history are destined to repeat it."⁵⁴ Although the exact facts of the Peasants' Revolt are unlikely to re-occur today in the United Kingdom, much can be learned from studying its early development and conclusion. It gives an indication of an answer to the initial question, "was the dot ever pathetic?" The answer is no, the dot was always empowered. What was missing before the age of media and communications or even before modern community was the ability for dots to exert their will on other dots. A single dot may feel a sense of unfairness or injustice but without the support of its community, it would feel powerless to act against the weight of regulation pressing down on it. Additionally, the value of programmed information and reinforcement is learned from the Peasants' Revolt. The peasants were angry

Tuck, *Nobles Commons and the Great Revolt of 1381*, in *THE ENGLISH RISING OF 1381* (Rodney Hilton and Trevor Ashton ed., Cambridge University Press 1984), SIR CHARLES OMAN, *THE GREAT REVOLT OF 1381* (1989).

54. Quote attributed to Edmund Burke, Statesman and Philosopher (1729-1797).

with the regime of their King, yet when faced with the King in person they pledged allegiance. These men were conditioned to the extreme to follow the King; it was programmed into the very heart of what it meant to be an Englishman, and was reinforced by the teachings of Church and State. These lessons still hold true today.

Today's world is obviously very different from the world of Wat Tyler.⁵⁵ The development of the modern networked or "community" dot probably can be traced to the development of collectivism. Collectivism stresses human interdependence and the importance of the collective, rather than the importance of separate individuals, and is usually traced to the social contract theorists, Thomas Hobbes,⁵⁶ John Locke,⁵⁷ and Jean-Jacques Rousseau,⁵⁸ who lived and worked in Europe between 1588 and 1778. Specific significance may be found in the work of Rousseau who developed two distinct social contract theories. The first was an account of the moral and political evolution of humans from a state of nature to modern society.⁵⁹ This is usually termed his naturalized account of the social contract, an account which troubled Rousseau and was developed in his essay, *Discourse on Inequality*,⁶⁰ commonly referred to as the Second Discourse.

Rousseau wrote the Second Discourse in response to an essay contest sponsored by the Academy of Dijon. In it, he described the historical process by which man began in a state of nature and over time progressed into civil society. According to Rousseau, the state of nature was a peaceful and idealistic time; people lived solitary, uncomplicated lives. Nature easily satisfied their few needs. As a result of the abundance of nature and the small size of the population, competition was non-existent, and people rarely even saw one another, much less had reason for conflict or fear. Furthermore, these simple, morally pure persons naturally were endowed with the capacity for pity and therefore were not inclined to bring harm to one another.

As time passed, though, humanity faced certain changes. As the overall population increased, the means by which people could satisfy their individual needs changed. People slowly began to live together in small families, and then in small communities. Divisions of labor were introduced, both within and between families, and discoveries and inventions made life easier, giving rise to leisure time. Leisure time inevitably

55. Wat Tyler was the leader of the Peasants' Revolt of 1381.

56. THOMAS HOBBS, *LEVIATHAN* (1651).

57. JOHN LOCKE, *SECOND TREATISE OF GOVERNMENT* (1690).

58. JEAN-JACQUES ROUSSEAU, *SOCIAL CONTRACT* (Maurice Cranston trans., Penguin Books 2004) (1762) [hereinafter *SOCIAL CONTRACT*].

59. JEAN-JACQUES ROUSSEAU, *DISCOURSE ON THE ORIGIN AND FOUNDATIONS OF INEQUALITY AMONG MEN* (1755).

60. *Id.*

led people to make comparisons between themselves and others, resulting in public values, leading to shame and envy, pride and contempt. Most important according to Rousseau, however, was the invention of private property, which constituted the pivotal moment in humanity's evolution out of a simple, pure state into one characterized by greed, competition, vanity, inequality, and vice. For Rousseau the invention of private property constituted humanity's fall from the state of nature.⁶¹ With the introduction of private property, initial conditions of inequality became more pronounced. Some have property, while others are forced to work for property owners, and the development of social classes began. Eventually, property owners noticed that it would be in their interests to create a government that would protect private property from those who do not own property but might be able to acquire it by force. Thus, governments were established through a contract, which purports to guarantee equality and protection for all, even though its true purpose is to fossilize the very inequalities that private property has produced. In other words, the contract, which claims to be in the interests of everyone equally, is really in the interests of the few who have become stronger and richer as a result of the developments of private property. This is the naturalized social contract, which Rousseau viewed as responsible for the conflict and competition from which modern society suffers.

The second theory is his normative, or idealized, theory of the social contract, and is meant to provide the means by which to alleviate the problems that modern society has created. The normative social contract, argued for by Rousseau in *The Social Contract*,⁶² was meant to respond to the sorry state of affairs and to remedy the social and moral ills that have been produced by the development of society. The distinction between history and justification, between the factual situation of mankind and how it ought to live together, was of the utmost importance to Rousseau. History should not be ignored, nor should the causes of societal problems, Rousseau believed those problems must be resolved through life choices.

The Social Contract begins with the most oft-quoted line from Rousseau's work: "Man is born free, and everywhere he is in chains."⁶³ This claim was the conceptual bridge between the descriptive work of the Second Discourse, and the prescriptive work that was to come. Humans, according to Rousseau, are essentially free, and were free in the state of nature, but the progress of civilization has substituted subservience to

61. *Id.* Rousseau notes: "This was the epoch of a first revolution, which established and distinguished families, and introduced a kind of property, in itself the source of a thousand quarrels and conflicts." JEAN JAQUES ROUSSEAU, DISCOURSE ON INEQUALITY Part II (F. Philip trans., Oxford 1999) (1762).

62. SOCIAL CONTRACT, *supra* note 58.

63. *Id.* at Book I, Ch. 1.

others for that freedom.⁶⁴ Since a return to the state of nature is neither feasible nor desirable, the purpose of politics is to restore freedom, thereby reconciling the natural state of man and the socialization of man. This is the fundamental philosophical problem that *The Social Contract* seeks to address: how can man be free and live together? Or, put another way, how can man live together without succumbing to the force and coercion of others? Man can do so, Rousseau maintains, by submitting our individual, particular wills to the collective or general will, created through agreement with other free and equal persons.⁶⁵ Like Hobbes and Locke before him, Rousseau believed all men are made by nature to be equals; therefore, no one has a natural, or divine, right to govern others and the only justified authority is the authority that is generated out of agreements or covenants.⁶⁶

The most basic covenant, the social pact, is the agreement to come together and form a people, a collective, which by definition is more than and different from a mere aggregation of individual interests and wills. This act, where individual persons become a people is “the true foundation of society.”⁶⁷ Through the collective renunciation of the individual rights and freedoms that one has in the state of nature, and the transfer of these rights to the collective body, a new person is formed. Thus, the sovereign is formed when free and equal persons come together and agree to create themselves anew as a single body directed to the good of all considered together. Just as individual wills are directed towards individual interests, the general will, once formed, is directed towards the common good, understood and agreed to collectively.

Included in this version of the social contract is the idea of reciprocated duties: the sovereign is committed to the good of the individuals who constitute it, and each individual is likewise committed to the good of the whole. Given this, individuals cannot be given liberty to decide whether it is in their own interests to fulfill their duties to the sovereign, while at the same time being allowed to reap the benefits of citizenship. They must be made to conform themselves to the general will or in Rousseau’s words they must be “forced to be free.”⁶⁸ For Rousseau, this implied an extremely strong and direct form of democracy. One cannot transfer one’s will to another as one does in representative democracies. Rather, the general will depended upon the periodic coming together of the entire democratic body, each and every citizen, to decide collectively, and with at least near unanimity, how to live together (i.e. what laws to enact). As it is constituted only by individual wills, these private, indi-

64. *Id.* at Book I, Ch. 2&4.

65. *Id.* at Book VI.

66. *Id.*

67. *Id.* at Book I, Ch 5.

68. *Id.* at Book I, Ch 7.

vidual wills must assemble themselves regularly if the general will is to continue.

One implication of this is that the strong form of democracy consistent with the general will is traditionally only possible in relatively small communities. The people must be able to identify with one another, and at least know who each other are. They cannot live in a large area, too spread out to come together regularly, and they cannot live in such different geographic locations as to be unable to be united under common laws. Although the conditions for true democracy are stringent, they are also the only means, according to Rousseau, to save man, and regain the freedom to which man is naturally entitled. Rousseau's social contract theories together form a single, consistent view of man's moral and political situation. Man is endowed with freedom and equality by nature, but man's nature has been corrupted by contingent social history. Man can overcome this corruption, however, by invoking free will to reconstitute politically, along strongly democratic principles, which is beneficial, both individually and collectively.

III. ANALYSIS

A. COLLECTIVISM AND ONLINE COMMUNICATIONS

If one trusts in social contract thought, and many readers may not, one can see the power of the collective community. Without subscribing to Rousseau's normative social contract, any reader of an article discussing the regulation of the Internet must at least acknowledge the power of the modern telecommunications network. The Internet obviates some of the conditions of Rousseau's strong form of democracy. No longer does man need to live in a narrowly defined geographical area to form a functional community. People can come together at any time, over any space to practice democratic will. Communities, and indeed the principle of collectivism within a community, can band together individuals from different socio-economic backgrounds, from different educational backgrounds and from different cultural backgrounds. Today, people form micro communities, narrow communities focused on a particular aspect of an individual's life. These communities have standards and norms that are designed to reflect the aims and objectives of that community, and are quite distinct from the community values the member recognizes in their everyday (offline) life. In examining micro communities, Manuel Castells notes that the Internet allows people to experience a different kind of community support: support for what he calls "networked individualism."⁶⁹ Network individualism is defined by Castells in two ways. First, it is the creation of new weak ties between people who share some

69. MANUEL CASTELLS, *THE INTERNET GALAXY* 129-33 (2000).

characteristics in common, an example of such a community is SeniorNet, a network designed to bring together elderly people for support and the exchange of information.⁷⁰ Second, through technologies such as e-mail and chat the network provides for the maintenance of existing strong ties such as family ties stretched by geographical relocation. Thus, Castells sees the Internet as primarily a tool of communication that can be used to form and strengthen bonds between people who have common interests or experiences. Communities in cyberspace come together as an extension of communities in real space, with the power of the network being in its ability to shrink distances and time. Should one want to meet with others who share common interests, for example, Ferrari cars, there is no need to travel to meet with others at a common time and place convenient to all. You may “dip in” to a discussion at ferrarichat.com or thescuderia.net at any time and from the comfort of home. This leads Castells to note: “the most important role of the Internet in structuring social relationships is its contribution to the new pattern of sociability based on individualism.”⁷¹

Whether one labels the relationships developed online as network individualism as Castells does, or as the author prefers: weak collectivism, the key to understanding the unique challenges that cyberspace poses to regulators is to be found in these relationships. By returning to some key figures, it will demonstrate these exact challenges. First, back to Lawrence Lessig’s pathetic dot. Lessig graphically explains how the dot is controlled in his book, *Code and Other Laws of Cyberspace*.⁷²

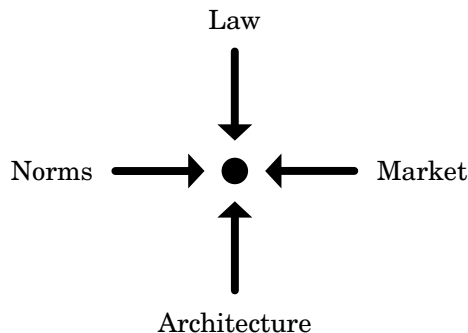


Figure 4 - Lessig’s Pathetic Dot

As depicted the dot sits in the middle of a crush of regulatory modalities and must contend with their combined weight (and effects). There is

70. SeniorNet Home Page, <http://www.seniornet.org>.

71. *Id.* at 130.

72. *CYBERSPACE*, *supra* 30, at 88.

no “wobble room” for the dot. These four modalities led and directed the dot. As with the earlier example of the car stereo, it may be that the regulator gets the balance wrong and finds that the market value of car stereos outweighs the potential penalties that the law imposes. In principle, the collective action of these four regulatory modalities control the dot. The dot, however, is not alone. The dot is part of a community of dots. Where collectivism overcomes individualism, the dots may agitate together as a group. When enough dots come together they form a community, which forms norms and thereby a collective of dots becomes a modality of regulation. Even when the collective falls short of this, however, it effects the regulatory settlement. Network individualism or weak collectivism is an effect of modern communications cultures and is particularly strong in the decentred network that is the Internet. With no single point of control, as is found in other media carriers, the opportunity for regulation through law or code is diminished and the opportunity for communities to set standards and values (short of norms), which challenge regulatory communications from regulatory bodies is enhanced. Thus dots start to coalesce in groups and into communities through the medium of the Internet. These communities then gravitate toward other communities that share similar values and a network of networks begins to develop, as is seen in figure five.

Figure five shows five overlapping yet unique micro communities. One may imagine them to have little in common but the fulcrum which connects them are the sixteen key nodes identified by the white squares. These are individuals who are members of more than one community. By transferring values between the two communities they carry the regulatory transmissions of the one community beyond that community. These nodes represent individual members of the community with no greater significance (to that community) than any other node. But, by transmitting the values of that community to new pastures it allows their values to influence a further community (just as happened in the counties surrounding Essex during the Peasants’ Revolt) where their views may be embraced or rejected by the new community following evaluation. Thus, just as no network on the Internet is completely unaffected by the events in other networks, no community is unaffected by events in other communities.

The Internet is not just a network of networks it is also a network of communities. This is the essential key to understanding regulation within the network. By connecting micro communities through shared points of contact we create a new type of community that allows for collectivism with individuals outside of your community. Although at first this sounds tautological, how can one form a collective position with another whose identity is unknown? In the network it is possible for collectivism to be shared through common nodes or points of contact. This

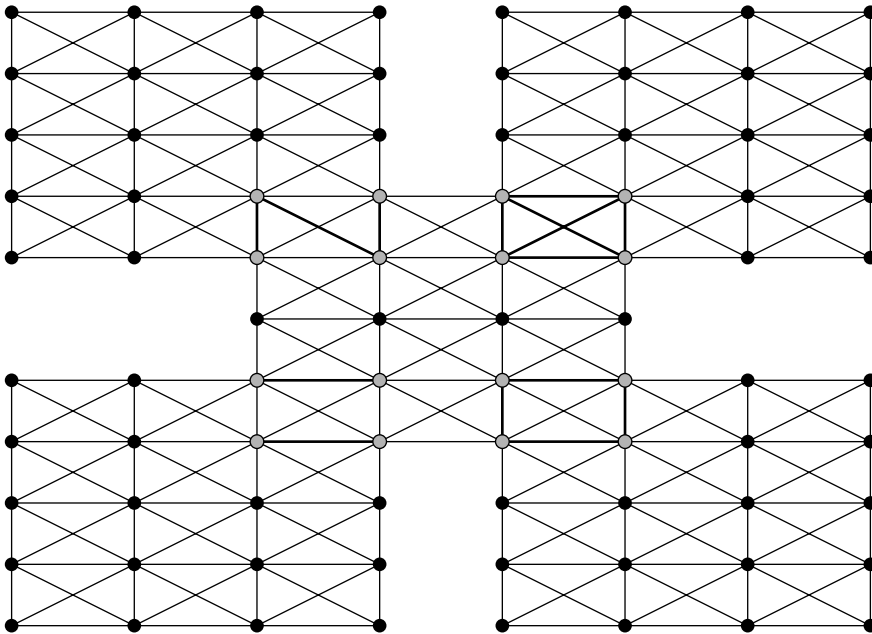


Figure 5 - How People Network

means that when regulators attempt to intervene into a single point in the network, such as peer-to-peer file sharing networks, the effects of their intervention may be felt throughout the network, and nodal responses may arise elsewhere, and more importantly against the background of a different set of community values. This makes traditional command and control regulation highly disruptive. Therefore, the Internet needs a different model.

B. SYMBIOTIC REGULATION

A better approach is a control model that affords all participants in the regulatory matrix an opportunity to shape the evolutionary development of their environment. Evolution rather than revolution is the key to effective regulatory intervention. Therefore, communication between all parties is essential. According to the dynamic regulatory matrix, the best regulatory model is not one built upon an active intervention into the settled regulatory environment, the result of which is likely to be extremely disruptive. Rather it is one that harnesses, as best as possible,⁷³ the relationships already in place between the actors: in other

73. Chaos theory has already implied that complete symbiosis is very unlikely.

words symbiotic regulation. Although complex, the development of symbiotic regulation is not impossible.

How can traditional regulators, who are used to implementing a command and control model, match the complexity of these organic developments? It is suggested that the key component of the solution is found in mapping the communications between regulatory actors and in particular, Niklas Luhmann's theories of autopoietic social systems. Luhmann's thesis of autopoiesis⁷⁴ develops Humberto Maturana and Francisco Varela's biological concept of autonomous living systems⁷⁵ and proposes that social systems are self-referring entities created within their own organizational logic. This approach is a radical departure from mainstream sociological thought, which is based on the premise of collective human agency. According to Luhmann, there is no central organizational body and no hierarchical structure, merely unique subsystems and subsystems within subsystems. A social system emerges wherever two or more actions are connected. At the most basic "level" Luhmann classifies this as "interaction."

But as the complexity of these interactions increase they formalize into distinct subsystems such as organizations or corporations each carrying unique specialization and identity. These societal subsystems self-define "meaning" and in doing so isolate themselves, creating a unique identity through the selection or rejection of relevant or irrelevant "communications."⁷⁶ This process allows an organization to assume its own "life," motivated and justified by its selective communication process. In this way, social systems reduce the overwhelming world complexity, establishing a difference between themselves (the subsystem) and the environment (all other subsystems).⁷⁷ Thus, communication is at the heart of Luhmann's theory. Subsystems evolve and develop through the internalization of information communicated from other subsystems.

It is the author's belief that by treating the regulatory matrix as an autopoietic environment, with each group of actors considered a subsystem, one can begin to understand the regulatory environment more fully. In doing so, however, regulators and regulatory theorists are asked to embrace a much more complex regulatory environment. As within Luhmann's model, the effect of each communication between actors is dependent upon the internal logic of each of the external, self-referring subsystems. Control is the fundamental premise of regulation, but

74. Autopoiesis is a compound word: *auto* meaning oneself and by itself, and *poiesis*, production, creation, and formation. Hence, the word autopoiesis literally is "self-production or self-creation."

75. F. Varela, H. Maturana & R. Uribe, *Autopoiesis: The Organization of Living Systems, Its Characterization and a Model*, 5 *BIOSYSTEMS* 187 (1974).

76. NICKLAUS LUHMANN, *SOZIALE SYSTEME* (1984).

77. NICKLAUS LUHMANN, *THE DIFFERENTIATION OF SOCIETY* (1982).

within an autopoietic model, control becomes a problem of communication where those subsystems required to implement control are cognitively open but operatively closed.⁷⁸ This means that communications between actors can never be certain, but within Luhmann's terms, a communication is a very specific event, allowing an account for these difficulties in this regulatory model.

In an autopoietic context, communication is an "event" comprised of three key aspects: "information," "utterance," and "understanding" that enable the autopoietic process by way of further "communications." Indeed, such communication forms the core of self-referential autopoietic systems and subsystems. Each of these aspects is selected (not necessarily by a person) from numerous possible choices, thereby defining the identity and boundary of the subsystem. Information, as it implies, is the *what* of the message. Utterance is the *how*, the *who* and the *when*. Understanding is the *sense* or *meaning* generated in the receiver. This process of communication leads to further communications relating to the information imparted, both within the subsystem and potentially within the environment (other subsystems). While there are many social connections, self-reference and the memory of previous selections allows a subsystem to focus on specific communications that are relevant or compatible with its identity. Functionally differentiated subsystems within the social systems are thereby concerned and can only be concerned with communications that are relevant to their functioning, autonomous of one another. Thereby, communicative acts effectively say nothing about the world that is not classified by the communication itself. This process ensures the creation of highly defined differences and attaches the rationale that identity is the creation of further, expected communications, which form and stabilize boundaries. An entity builds up a unique backlog of selections made and selections negated. It uses this accumulation of selections, its meanings, as values for making future selections. This is a self-referential, closed process that maintains a circular dynamic. Its repetition, over time, maintains the identity and existence of the individual subsystem.

As Mingers states:

We can visualize the whole subsystem as an ongoing network of interacting and self-referring communications of different types and see how they can be separated from the particular people involved. The people will come and go, and their individual subjective motivations will disappear, but the communicative dynamic will remain.⁷⁹

78. Andrew Dunshire, *Tipping the Balance: Autopoiesis and Governance*, 28 ADMIN. & SOC'Y 299 (1996).

79. JOHN MINGERS, SELF-PRODUCING SYSTEMS: IMPLICATIONS AND APPLICATIONS OF AUTOPOIESIS, CONTEMPORARY SYSTEMS THINKING 144 (1995).

Thus, communication in autopoietic systems is not a process directed by the actions of individuals, rather it is a system where they act as the nodes temporarily located within the communication. People are unable to alter the course of communications as they have formed a self-referential loop where actors play their part rather than write it. In this way, social systems effectively have a life of their own that gives direction to the thought and activity of individuals - a communications dynamic.

IV. CONCLUSION

Therefore, in designing a symbiotic regulatory intervention, the regulator need not actually map the content of all communications, which will take place between subsystems, or nodes. All that is required is for the regulator to map the dynamic of such communication. In so doing, the regulator may anticipate some of the nodal responses to the regulatory intervention and may take steps to alleviate the effects of such communication. In other words, symbiotic regulation need not anticipate the needs of all actors in the regulatory matrix. It need only anticipate the regulatory tensions that are likely to arise when actors communicate. This greatly simplifies the challenge. It means that one can create links or associations between certain actions. One may not understand why a particular result is achieved, but that does not matter, it only matters that it is known.

Equally, regulators may map a direct intervention to curb individual freedom in cyberspace. It is likely to be met with a strong counter-action (or counter-communication), however, unless Netizens⁸⁰ are offered strong social or economic incentives to support this intervention. Further, by mapping the lines of communication most commonly used in a regulatory matrix, one is able to map how this counter-action is likely to manifest itself; perhaps by code attacks, such as hacking or denial of service attacks, perhaps by legal countermeasures such as the ACLU legal challenge to the constitutionality of the Communications Decency Act,⁸¹ or perhaps by other "direct action" such as making available copyright protected material on peer-to-peer networks. Therefore effective, symbiotic regulatory interventions may be designed simply by regulators making two preparatory acts. First, regulators need to produce a *dynamic* model of the regulatory matrix surrounding the action they wish to regulate, including a map of the communications flows already in place. Second, regulators need to produce a regulatory intervention, which harnesses the natural communications flow by offering to the subsystems or nodes, within the matrix a positive communication that encour-

80. MICHAEL HAUBEN & RONDA HAUBEN, NETIZENS: ON THE HISTORY AND IMPACT OF USENET AND THE INTERNET (1997).

81. Reno v. ACLU, 521 U.S. 844 (1997).

ages them to support the regulatory intervention. If successful, the positive feedback that is generated will reinforce the regulatory intervention making it much more likely to succeed.

It is suggested that if regulators were to use this two-stage design mechanism, they could design successful regulatory interventions for the most complex regulatory environment. The problem is that a dynamic modelling technique, such as this, is much more complex to apply during the design phase and requires constant updating to reflect changes in the dynamics of the communications flow caused by social, economical, or technological changes. In addition, this model requires regulators to embrace uncertainty within the regulatory matrix (they may get the effect they wish but not understand why), and as such requires a remarkable leap of faith. The question is: are regulators, commentators, and academics ready to make such a leap?