Nyetwork:
Soviet Cyberpolicy and the role of Computer Networks in the Collapse of the Soviet Union

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“Censorship is saying: 'I'm the one who says the last sentence. Whatever you say, the conclusion is mine.' But the internet is like a tree that is growing. The people will always have the last word - even if someone has a very weak, quiet voice. Such power will collapse because of a whisper.”

— Ai Wei Wei, “China's censorship can never defeat the internet,” 2012

Introduction

There is a saying often repeated in cyberlibertarian circles: "the Net interprets censorship as damage and routes around it." Since the inception of the first public global computer networks in the late 1970s, activists the world over have realized its potential as a tool to fight censorship and organize dissent. Many of the early adopters of national and global computer networks were cyberlibertarians, people who viewed the net as a radically free and democratizing force, and they had a large hand in shaping both the usage of the modern internet and the historical perception of it. This has resulted in a somewhat revisionist popular history of computer networks that emphasizes the achievements and innovations of individuals while downplaying the reality that the internet as we know it could not have existed without massive government investment, and that most of the innovations that made this global network possible were conceived of for military purposes during the Cold War.

Much scholarly attention has been devoted to the impact of computer networks on revolutions and liberation movements around the world. Unfortunately, scant attention has been paid to computer networking in the Soviet Union, and I could not find a single scholarly article addressing the role of these networks in the Union's collapse in either the

Russian or English historical literature, despite a treasure trove of primary sources on the topic, many of which are readily available online.

To understand the influence of various computer networks on the late Soviet culture, one must first understand the background of the Soviet society into which these networks were reaching, which is a mammoth task on its own. The Soviet Union was already clearly stagnating by the beginning of the 1980s. The argument made in this paper will not be that computer networks were a primary cause of the decline or fall of the Soviet Union, which was the result of myriad factors and is still a topic of much academic debate, but rather that these computer networks were a powerful conduit and enabler of these influences.

There is a remarkable amount of data available on this topic, multiple orders of magnitude more than could reasonably be sifted through for a college-level thesis. A particular challenge with combing through the data comes from the fact that while an enormous number of messages were shared over computer networks like PeaceNet, Usenet, and Relcom, this data is not held in a single archive, but in a variety of sources with varying levels of accessibility. The most accessible of these messages are those on archived Usenet forums, which are available to the public through Google's internet archives (though even this data set presents challenges, due to the sheer volume of archived materials). On the opposite end of the spectrum, many of the relevant communications still live in personal email accounts. Indeed, due to the recency of the events discussed herein, the most complete history would involve a considerable oral history with those involved. I did attempt to reach out to several people involved with Usenet and Relcom, but I had little

success. Above all, this paper should be read as a demonstration that there is clearly significance to these computer networks, and as a call to action for further research to be done in this incredibly rich and relatively unexplored subject area.

Because there is very little secondary literature on this direct topic, this thesis will analyse primary sources through frameworks provided by historical, anthropological, and sociological works on the histories of computing, the Cold War, and the late Soviet Union. There is a rich historiographical tradition in each of these areas, and the theoretical frameworks they provide make possible the weaving of a profound and intricate analysis of the many factors that produced computer networks in the Soviet Union and, ultimately, their impact on its fall.

The first chapter of this thesis will trace the efforts in the US and USSR to build computer networks, from roughly the end of World War II until 1980, culminating in the USSR's failure to develop a national network, and thus the victory of the United States in what I have dubbed the networking race. The second chapter will analyze the soft power influence of American computer networks that breached the Iron Curtain over the course of the 1980s. The final chapter will illustrate the more direct and immediate impact of computer networks on the disintegration of the Soviet Union from 1989 to 1991. By the conclusion, this thesis will establish that the absolute victory of the United State over the Soviet Union in the networking race was ultimately a significant contributing factor to the collapse of the Soviet Union.

Chapter 1: How the USSR Lost the Networking Race

The Soviet Union and the United States participated in many competitions with one another over the course of the Cold War. The arms race and the space race are probably the most familiar of these contests. Yet, there is another race, arguably more crucial, more connected to their citizens' everyday lives, and more key to the eventual fall of the Soviet Union — the networking race. The race to develop digital information networks — what we today would call the internet — was one of the USSR's most abject failures. By the year 1980, despite a significant investment of financial, physical, and human resources, the USSR had failed to create any sort of national information network, whereas the US had ARPANET as well as a variety of thriving private information networks. This chapter will examine why the USSR failed where the US succeeded, laying the groundwork for American networks to breach and transform Soviet territory in the 1980s.

The history of the computer arguably began in the 19th century, but the first devices that resembled anything similar to our modern machines were conceived of and built in the mid-20th century. World War II was a critical development in computational history. The USSR, Germany, Great Britain, and the U.S. all realized what an advantage computers and

computing networks could be to their war efforts, and the campaign to out-maneuver each other in the field of computer engineering became an important arena in the war, most notably in the cryptography battle between the Nazi's Enigma machine and Great Britain's Bombe machine.[1]

After the war, the computing industry worldwide benefitted from both the advancements to computer technology made during the war, as well as increased government funding as a result of the success brought by computing during the war. In the U.S., post-war advancements in the sphere of computing were the result of the combined efforts of government scientists, academics (whose projects were often funded by the government) and private companies like Rand, Hewlett-Packard, and Bell Laboratories. Of course, the relationship between these entities was not always completely symbiotic or friendly, as demonstrated by the landmark patent case *Honeywell vs. Sperry Rand*, which was essentially a fight over whether or not the computer could be patented (the courts decided it could not be). Although the existence of the litigation demonstrates the discord that sometimes existed between different engineers and organizations, the resulting decision that the computer could not be patented also ensured the ability for innovation to come from many different sources, and also reaffirmed the ability of individuals and entities to work together.[2] Indeed, virtually every major computing and networking

[1]"1941: Timeline of Computer History," ComputerHistory.org, Computer History Museum, Accessed December 2, 2019, https://www.computerhistory.org/timeline/1941/.

[2]"Atanasoff-Berry Computer Court Case," John Vincent Atanasoff and the Birth of Electronic Digital Computing, Iowa State University, last modified 2011, http://jva.cs.iastate.edu/courtcase.php.

achievement made in the U.S. during the Cold War was the result of multiple sectors, organizations, and individuals working together.

For example, the Semi-Automatic Ground Environment (S.A.G.E.), arguably the first major predecessor to the modern Internet, was a massive undertaking, only achievable by the combined efforts of the U.S. Air Force and Navy, several private companies including Western Electric and IBM, and contracted individuals such as Jay Forrester, an MIT professor. S.A.G.E., deployed in 1958, was the result of nearly a decade of work and billions of dollars, making it more expensive than even the Manhattan Project. Like most computer innovations during the Cold War, its creation was motivated by Cold War competition. Its primary purpose was to detect incoming nuclear missiles. Never actually having been called upon to serve that purpose, however, S.A.G.E.'s true legacy lies in the far more influential project that it inspired — ARPANET.[3]

ARPANET was the project whose success definitively proved the US as the winner in the networking race. The idea at the heart of ARPANET was the need for a totally decentralized computerized communications system. One of the core limitations of S.A.G.E. and other networks that preceded ARPANET is that they all had a hub or headquarters where information had to be processed, meaning that the whole system could be compromised if the headquarters was compromised. The revolutionary idea behind ARPANET was the creation of a communications network with no central mainframe, and therefore no hierarchy. Any computer connected to the network could communicate with any other computer. Plans were announced in 1967, the private company BBN won a

[3]Earnest, Lester D, "The Internet's Grandfather, an Inventive Fraudster with Many Descendants," Stanford University, January 25, 2014, https://web.stanford.edu/~learnest/nets/sage.htm.

contract to develop the project in 1968, and ARPANET first came online in 1969. Within the span of a decade, researchers from the government, private companies, and universities had conceived of and implemented an idea that would forever change how information is shared and used.[4]

This is strikingly different from the dysfunction of the Soviet system, where the dream for a Soviet national network, called OGAS, officially died in 1970, just a year after ARPANET came online. Whereas the success of the American networking effort can be attributed to consistent government investment as well as successful cooperation between different sectors, institutions, and individuals, the failure of OGAS — and Soviet networking more broadly — can be attributed to inconsistent and mercurial government policy and competition between different arms of the Soviet establishment.

Although the Soviet Union did make some developments in the field of computer science in the earlier half of the 20th century, they lagged behind their Western adversaries for several reasons. The first and most obvious is that the USSR had far greater social upheaval and far fewer available resources for most of this period. What resources they did have were far more likely to be funnelled towards industrial production, the benefits of which were more practical and immediate than the theoretical benefits of computer science. Another, less obvious reason for the Soviets' more limited progress is Stalin's distrust for computers, and cybernetics in particular. Stalin viewed computers as "bourgeois objects" and cybernetics, a science originally developed in the capitalist West, as

[4] Featherly, Kevin, "ARPANET." *Encyclopædia Britannica*, November 28, 2016, https://www.britannica.com/topic/ARPANET.

a "pseudo-science." Cybernetics was ridiculed in the press, banned from study at Moscow State University, and cybernetics projects were given virtually no government funding. This sentiment did not totally halt computer science progress in the USSR, but it did slow it significantly.[5]

It is of little surprise, therefore, that interest and investment in the field of cybernetics increased dramatically soon after Stalin's death in early 1953. The first notable attempts to rehabilitate the field's image in the press began in 1955.[6] In 1956, at the 20th Congress of the Communist Party, the same Congress where Nikita Khrushchev gave his famous "Secret Speech," he also gave a less scandalous speech praising the principles of cybernetics and encouraging the further development of computer science and the automation of factories and industry. Five years later, at the 22nd Congress, Khrushchev took it even further, referring to cybernetic science as "one of the major tools of the creation of a communist society."[7] Soviet interest in cybernetics was at least in part a response to American cyber achievements. In 1958, news of SAGE greatly alarmed many key figures in the Soviet military, prompting a number of similar Soviet computer networking projects.

In 1959, cybernetics hit its first major scandal since the death of Stalin. The affair centered around Anatoly Kitov, commonly known as the father of Soviet cybernetics, who

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[5]Benjamin Peters, *How Not to Network a Nation: The Uneasy History of the Soviet Internet*, (MIT Press, 2016), 15-56.

[6]Salva Gerovitch, "InterNyet: Why the Soviet Union Did Not Build a Nationwide Computer Network." *History and Technology,* 24 (April, 2008): 335–350.

[7] George Paloczi-Horvath, *Khruschev: The Making of a Dictator* (New York: Little, Brown, 1960), 201-205.

had swiftly risen through the ranks of the military to become the director of Computational Center-1 of the Ministry of Defense. Kitov had aspirations for a networked computer system on a national level, an idea that was revolutionary at the time. In the fall of 1959, Kitov sent a letter to the Party leadership, which would become known as the "Red Book" letter. The exact contents of the letter are unknown because it was performatively destroyed by a later military tribunal, but the basic idea that Kitov proposed was a "unified automatic computer network" which would direct both military and economic affairs. Essentially, Kitov wished to replace much of the Soviet bureaucracy with a multipurpose computer network which could make objective calculations about resource allocation and other state concerns. It perhaps displays some naivety on the part of Kitov that he thought such a proposal would be well-received by the very bureaucrats it sought to replace.

In actuality, the letter was seized by military leadership, and Kitov was subjected to a show trial. Kitov was quickly found guilty of breaching military protocol and failing to fulfill his duties. In punishment, he was stripped of his military honors, removed from his position as director of Computational Center-1 of the Ministry of Defense, and expelled from the Communist Party.[8]

Although official approval and funding for cybernetics projects continued, Kitov's show trial made it clear that even in the more open and less violent Khrushchev era, there were still limitations to the kinds of cybernetics projects that could be proposed, and the Party bureaucracy would continue to be an obstacle on the pathway towards cybernetic progress. It was in this climate and with this looming threat that Institute of Cybernetics

[8] Peters, *How Not to Network a Nation,* 81-105.

under Viktor Glushkov set out to create the successor to Kitov's radical idea, the Общегосударственная автоматизированная система учёта и обработки информации (OGAS).

OGAS was proposed in 1962, and the resources of the entire Institute were focused on its creation from then until 1970. The Soviet government funnelled large amounts of money into the project, even building the Institute a massive new campus just outside of Kiev. The team was almost entirely made up of young men — Glushkov, the oldest member of the team, was only 39 when the project began, and most of the men were in their 20s — with a rather naive view of Soviet politics. They founded a secret society based on a fictional utopia dubbed "Cybertonia." Cybertonia was a futuristic vision of what the Soviet Union could be if the OGAS project came to fruition. It was a version of the Soviet Union where computers and computer networks totally replaced the bureaucratic structures, creating true communism through the perfectly computer-calculated distribution of goods and services.[9]

In 1970, hopes were high for the project when Glushkov attended a meeting at the Kremlin to present the early successes of OGAS and request funding to continue the project. Unfortunately for Glushkov, his staunchest allies were missing from the meeting, and his opponents in the military seized upon the opportunity to deny further funding and completely shut down the OGAS project. The move blindsided Glushkov and the Institute,

[9]Vera Glushkov and Sergei Zhabin "Virtualnaya strana Kibertonia v institute kibernetiki (60–70 gg, XX vek)" Ukrainia i svit: gumanitarno-tekhnicheska elita ta sotsialnyi progress: tezi dopov 3, 81–83. Kharkiv: NTU Kharkiv, 2012

but they were too afraid of raising the military's ire to further pursue the matter. Thus, with a single meeting, the Soviet dream of a national computer network was dead.

The primary reason OGAS lost its funding was bureaucratic infighting over limited resources. The ideas represented by Cybertonia, however, demonstrate why OGAS was so unlikely from the beginning to succeed. The cyberneticists building OGAS dreamed of a world in which networked computers ran the Soviet Union, allocating resources and directing labor with the precision and objectivity only a computer could achieve. This idea was not a threat to socialism or to the Soviet Union, but it was a threat to the current party leadership, which was potentially even more intolerable.

In his seminal book on this history, *How Not to Network a Nation*, Benjamin Peters argues that "The first global civilian computer networks developed among cooperative capitalists, not among competitive socialists."[10] He emphasized that it was the cooperation between different government agencies, private corporations, public institutions, and individuals that made the American project successful, and the competition between various factions that made the Soviet project a failure. This difference was key, but Peters, who is not a Soviet historian, does not quite manage to frame this argument in the larger context of Soviet political history. The irregular support from the government was not simply a result of competition between different apparati, but also of a political order that was fundamentally threatened by the concept of a decentralized network. Competition between agencies was an unavoidable fact of life in the Soviet Union, which certainly

[10] Peters, *How Not to Network a Nation:* 2.

caused inefficiencies everywhere, but many other large-scale scientific projects flourished despite that.

The total failure of OGAS is an outlier for the Soviet Union in the Cold War competition, because it was the product not simply of government inefficiencies, but of a specific objection to the project itself. In the US, the proposal to create ARPANET was relatively uncontroversial. All of the early networking systems were immediately identified for their beneficial military applications, and there was little hesitance to approve a commercial version of ARPANET in 1973, just four short years after ARPANET's creation. There was some limited opposition to SAGE within the military command, and particularly the Air Force, due to fears that it could upend traditional military hierarchies, but this opposition was nowhere near as powerful as it had been in the Soviet Union.[11]

The American government never saw a decentralized network as having the power to threaten the political order, because a computer could never replace a democracy. A democracy is founded on the choices of the people, whereas the Soviet dictatorship was founded on the choices of the state. A computer could serve the same function as the head of an authoritarian state, but it can't take the function of any player in a democratic system. For an authoritarian, one-party system like the Soviet Union, however, a computer very well could replace the decision making body, as Anatoly Kitov proposed in 1956. It was this danger to the political order that doomed the dream of OGAS.

[11]Paul N. Edwards, *The Closed World,* (MIT Press, Cambridge, 1996), 75-113.

Chapter 2: American Cultural Influence Through Computer Networking and The Disintegration of Soviet Society in the 1980s

While the development of a national computer network hit bureaucratic stumbling blocks in the Soviet Union, information and networking technology was advancing at a lightning pace in the military, commercial, and academic spheres in the United States. ARPANET continued to rapidly expand over the course of the 1970s, growing to include academic and other non-governmental computers in its network; by 1974, millions of packets (essentially, collections of data encoded to be shared over networks) were being shared over ARPANET each day. The ease and relative security of communication that these networks provided was revolutionary, and paved the way for further developments in computational science and engineering. [12]

[12] "1973: Timeline of Computer History," ComputerHistory.org, Computer History Museum, Accessed December 2, 2019., https://www.computerhistory.org/timeline/1941/.

In 1972, computer scientists from several western countries met in Washington, D.C. and formed the International Network Working Group. The next year, at a conference at the University of Sussex in England, they would debut what is arguably the single most important development in the history of computer networks: Transmission Control Protocol (TCP). TCP solved the most pressing problem of early computer networks, which is that it was difficult to communicate between computers and computer networks with different kinds of protocols. TCP solved this problem by creating a universal protocol to which all connections could adhere. This was what enabled the creation of what we now know today as the Internet, which still runs using TCP/IP (Internet Protocol) to make connections.[13]

The first purely commercial packet-switching computer network, Telenet, went online in 1974. Meanwhile, new developments in computer infrastructure, spurred on by the developments in networking technologies, were making it possible for smaller computers to be built and marketed for individual or small business use. Apple Computer Company (later Apple Inc.) was founded in 1976 and released the Apple II, the first personal computer with cell-based color graphics and open architecture, in 1977. By 1982, other countries were getting in on the personal computing craze, and the computer was named Man of the Year by Time magazine, a clear demonstration of computing's immense and growing cultural influence. The personal computing revolution had begun, paving the

[13]Alexander Mackenzie, "INWG and the Conception of the Internet: An Eyewitness Account," Annals of the History of Computing, The Institute of Electrical and Electronics Engineers, Accessed March 15th 2020, http://alexmckenzie.weebly.com/inwg-and-the-conception-of-the-internet-an-eyewitness-account.html.

way for computer networks to connect individuals, non-governmental organizations, and civilians, not just academic institutions and government agencies.[14]

During this time, a considerable number of limited international computer networks were developed, a number of which had at least one connection to the Soviet Union, despite a limited number of computers in the USSR and some efforts from Soviet leadership to limit network access by civilians in the Soviet sphere.[15] Cataloging all of these networks and their myriad influences is a task that has unfortunately not yet been undertaken, and one that is far beyond the scope of this paper. By far the most influential of these seems to have been USENET, which came online in the US in 1980 but does not seem to have penetrated the USSR until the late 1980s, and RELCOM, which was the late Soviet-native successor to USENET. Both of these networks will come into greater focus in the next chapter, which will deal with the ultimate collapse of the Soviet Union and the role that networks such as USENET and RELCOM played in organizing activists and allowing them to communicate with one another and the outside world.

The period from 1964 to 1984 in the USSR is often referred to as the era of stagnation. Economic growth was limited during this period and Brezhnev, who led the country for most of the era, was a largely inept and listless leader. Perhaps most importantly, for the purposes of this chapter, there was also a sense of stagnation amongst

[14]Owen Linzmayer, *Apple Confidential 2.0*, (San Francisco: No Starch Press, 2004), 47-61.
[15]Natalia Konradova, "The Usenet Coup: How the USSR Discovered the Internet in 1991," openDemocracy, last modified August 16, 2016, https://www.opendemocracy.net/en/odr/usenet-coup/.

the people. Crime rates and addiction went up during this period, despite the increased standard of living relative to earlier episodes of Soviet history.[16]

In 1985, Mikhail Gorbachev came to power and issued a series of sweeping reforms as part of his policies of perestroika (rebuilding) and glasnost (opening). These policies have a complex and mixed legacy, but for the purposes of this thesis it is mainly important to understand that they had the twin effects of opening Soviet society to greater Western influence and of turning stagnation into chaos. As Stephen Kotkin argues in his authoritative book on the topic, *Uncivil Society*, deep dysfunction within the Soviet elite led to not only economic but also social and political stagnation under Brezhnev, and, ultimately, societal collapse which began with elite mismanagement, but was ushered to completion by mass unrest and discontent.[17]

This popular sense of stagnation within the USSR and the Eastern Bloc was matched and made more profound by a popular sense of rapid technological growth in the US and the West. As previously discussed, the 1980s featured a massive computer boom in the United States and other capitalist countries, especially in the form of the personal computer, first developed by IBM in 1981 and then matched by Apple in 1984. Personal computers exploded in popularity as IBM and Apple competed to make ever more user-friendly and commercially viable personal computers. Early commercial computer networks like USENET also facilitated connections between computers and between users across the world, transforming mass communications and yielding closer connections

[16]Alexei Serov, *Leonid Brezhnev: the Period of Stagnation*, (Moscow: Novosti Press Agency, 1989) 64-73.
[17]Stephen Kotkin, *Uncivil Society: 1989 and the Implosion of the Communist Establishment*, (New York: Modern Library, 2010).

between users of computer rich societies, from the US to Japan. This commercial computer battle served both to transform and accelerate business transactions in capitalist countries, and it also began to alter the fabric of society and the common imagination of what was possible. Above all, these technological accomplishments and their increasing visibility in people's daily lives permeated Western society with a sense of achievement and technical superiority.[18]

The USSR, in the meantime, continued to fall behind the West when it came to computer development. The unavailability of personal computers and the lack of widespread computing networks in the USSR was not, as many contemporary scholars and politicians had assumed, due mainly to government restrictions on computers, but rather due to a lack of resources and bureaucratic dysfunction. Brezhnev had approved the first plans for developing personal computers shortly before his death, but these plans suffered under the confusion and short lived reigns of his next two successors. Gorbachev revamped these plans and approved RELCOM, the nascent commercial computer network that will feature in the following chapter, but these efforts were largely too little, too late. Western technical superiority had already been cemented in the minds of the Soviet populace.[19]

This disparity was made clear to the Soviet people through an increasing contact with the outside world and American cultural influences. For instance, the import of American television into Soviet homes provides a more widespread and academically

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[18]Jeffrey Yost, *The Computer Industry: the personal computer and personal-computer software, 1975-1990,* (Westport, CT: Greenwood Press, 2005) 14-35.

[19] Vladimir Zakharov, "Computers and Their Application in the USSR in the Middle of the 1980s: Situation, Actions Taken, Predictions of Development," (paper presented at the Third International Conference on Computer Technology in Russia and the Former Soviet Union, Kazan, 2014), 53-60.

researched example of technology being both a medium for Western influence and a symbol of Western supremacy. The television itself was, of course, a Western import, and one that was already widespread in many capitalist countries by the time mass production began in the USSR in the 1970s. It was not just the physical infrastructure that was borrowed from the West, however, but also much of the programming. Perhaps the single most popular Soviet television trend of the 1980s were Jane Fonda workout knock-offs. Showing Jane Fonda herself was too taboo for government censors, but countless programs were developed with nameless young Soviet women, styled to look exactly like Fonda, and performing her exercise routines. Despite not actually being on TV there, Fonda became incredibly popular with the young women of the USSR, who sought to emulate her and looked to her as an emblem of a beauty and vitality that felt lacking in the late Soviet space, as well as an open sexuality that had been deeply taboo in Soviet society up until that point.[20]

In his paper *Ordinary and Paranormal: The Soviet Television Set,* Alexander Golubev argued that the widespread introduction of televisions in the late 1970s altered Soviet social organization and conception of selfhood. Not only did it bring greater Western influence directly into Soviet homes, but it also helped merge the public and private spheres by bringing public events and figures into the living room. The concept of public versus private spheres is critical in Soviet ethnography and historiography, because crowded conditions and the threat of government surveillance made privacy a limited and highly sought after commodity. Golubev argues that by merging the public and private

[20] Alexei Ivanitskii, "Ritmicheskaia gimnastika na TV," (Moscow: Sovetskii sport, 1989), 3–4.

spheres, television helped to collapse one of the most essential boundaries of Soviet society.[21]

Examining computers through this paradigm, computer networks could embody an even more drastic collapse of the public/private boundary, because they provided not just a one-way connection like the television, but a two-way connection. Not only could the public be introduced into the private sphere, but the private could be introduced into the public sphere.

One example of the contact created by computer networks in the 1980s that I will illustrate here was the satellite and telephone line-based PeaceNet international computer network. PeaceNet was developed by the Institute for Global Communications in Berkeley, California in 1985 with the intent of connecting people around the world to promote peace and uplift communities whose voices were often silenced. One of its first connections was with the Soviet Union. By 1991, PeaceNet had at least 75 connections in the USSR. Because computers in the USSR at the time were generally shared, public utilities — belonging, for example, to an entire school or community — this meant thousands of potential users. [22]

PeaceNet served a variety of purposes, from delivering information to journalists to connecting NGOs, but one of its more interesting functions was as a pen pal service. PeaceNet connected young people from across borders, bringing together otherwise very foreign worlds. For example, in 1988 PeaceNet was used to connect elementary school

[21]Alexei Golubev, "Ordinary and Paranormal: The Soviet Television Set," (paper presented at Materials and Materiality in Russia and the Soviet Union, Toronto, May 30 2019).

[22]Rory O'Connor, "Keeping the Soviet Lines of Communication Open," *The Baltimore Sun*, September 9, 1991, https://www.baltimoresun.com/news/bs-xpm-1991-09-02-1991245087-story.html.

children in Salt Lake City and Troitsk, a small city just south of Moscow. The children exchanged messages for a year, culminating in an expedition of Soviet scientists and civilians to Salt Lake City in 1989.[23]

Although the numbers of people who communicated through PeaceNet were clearly limited relative to the overall population, communications through PeaceNet likely had ripple effects. As Alexei Yurchak demonstrates in his book *Everything Was Forever, Until It Was No More*, 2nd and 3rd degree connections to the West were often prized, and they helped form what Yurchak dubbed the "Imaginary West," a constructed vision of a utopian West. It was something to always be striving towards, just out of reach. This idealistic imagery was often contrasted with a bleak Soviet reality.[24]

In the case of PeaceNet and other computer networks, communication with the US could help build the Imaginary West not only for those directly participating in the communications, but also the friends, relatives, and community members who were exposed to them. These connections could help to proliferate an idealistic view of the West as a land of plenty, where items that were rare and precious in the Soviet Union, like computers, were ubiquitous.

Thus, as Soviet society and the Soviet economy were stagnating, Soviet citizens were barraged with images of a growing, wealthy, and technologically superior West, which

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[23]"Soviets Get a Glimpse of LDS Lifestyles," Church News Archives, Church of the Latter Day Saints, November 25, 1989, https://www.thechurchnews.com/archives/1989-11-25/soviets-get-a-glimpse-of-lds-lifestyles-150143.

[24] Alexei Yurchak, *Everything Was Forever, Until It Was No More: The Last Soviet Generation.* (Princeton: Princeton University Press, 2005), 158-206.

captivated the minds of the Soviet youth. Computer networks were a prime channel for this influence, projecting Western superiority not only in the content of their messages, but in the method of communication itself.

Chapter 3: Revolutions, Political and Technical

While Peacenet and other small networks began to penetrate the Iron Curtain, the rest of the world was being swept by a mammoth new global computer network: the user's network, Usenet. Usenet was conceived of by graduate students at the University of North Carolina - Chapel Hill and Duke University in 1979 and later established in 1980. By the year 1990, Usenet was in nearly every country and most likely hosted hundreds of thousands if not millions of users. It was the first global, mass-used, civilian computer network.[25][26]

[25] *Encyclopædia Britannica*, s. v. "USENET," 2008, https://www.britannica.com/technology/USENET.
[26] Due to Usenet's decentralized structure, it would be difficult (if not impossible) to track exactly how many people have ever accessed it, and I could not find any reliable source that had attempted to do so. One can get a very approximate sense, however, based on the many millions of threads and comments that already existed on Usenet at this point and which can still be viewed in the Usenet archives.

Usenet's significance in the field of computer history is less about its technological sophistication — technologically speaking, it did very little to innovate on existing unix architecture or TCP/IP connection protocols — and more about its political and cultural implications. The imprint of Usenet in the modern web is still clear: many terms like "spam" and "troll" originated there, as well as the format of threads and forums which still dominate the internet. Most crucially, however, both to its influence in the USSR and its importance in computer history, was the philosophy behind it.

Usenet differentiated itself from other early commercial networks because it was completely decentralized — not only in that there was no central server or activity hub, but also in that there was no sort of central moderating system whatsoever. Usenet's creators and most of its users were proponents of a completely democratized system of global communications. They engaged in what anthropologist Christopher Kelty would later dub "recursive publics." In the words of Kelty, a recursive public "is vitally concerned with the material and practical maintenance and modification of the technical, legal, practical, and conceptual means of its own existence as a public; it is a collective, independent of other forms of constituted power and is capable of speaking to existing forms of power through the production of actually existing alternatives."[27] The radical conceit of Usenet was its totally amorphous and non-hierarchical structure, which underwent constant revision and reconfiguration by its users.

[27]Christopher M. Kelty, *Two Bits: the Cultural Significance of Free Software*, (Duke University Press, 2008)

For Usenetters, this was no trivial thing. Usenet was at the heart of a cyberlibertarian movement in the 1980s, accompanied by ideas like Free Software, open-source, and copyleft. This movement conceived of computer networks as a radically democratizing force. Usenetters envisioned a world in which recursive publics would transform the way people shared and consumed information, thereby changing the balance of power.

In a way, one could argue that what unfolded in cyberspace over the course of the 1980s was a battle for the soul of the internet. It would be inaccurate to say that the Usenetters fully won this battle: the internet today is far from totally free or decentralized, and the open-source, copyleft, and the Free Software movement have met legal and financial stumbling blocks. Nonetheless, the legacy of Usenet's radical ideas lives on not only in the rhetoric of a free and open internet, but in the reality of movements like the Arab Spring, Black Lives Matter, and the 2019 Hong Kong protests, all of which relied on the internet to organize and magnify their voices and bring international attention to their struggles.

Usenet's impact on democratic movements within the USSR was far more direct. As aforementioned, Usenet did not initially pierce the Iron Curtain. This was true for a variety of reasons: on the most basic level, Soviet citizens were far, far less likely to have personal computers, due largely to resource constraints (and not, as is a common misconception, due to a total ban on them); anti-Western sentiment created discouragement from the Soviet government for researchers and officials who did have computer access; anti-Soviet sentiment caused the American government to disapprove of computer network

connections with the USSR; and finally, anti-Soviet bias even clouded the views of many of Usenet's creators, moderators, and users, who worried that anti-democratic Soviet plants would corrupt their recursive publics. For these reasons, in the first several years of its existence, Usenet's rapid spread in the early to mid-1980s stopped at the Soviet sphere of influence.

In 1984, an incident now known as the Kremvax hoax was the first seed of Soviet involvement in Usenet. On April 1st, a Dutch Usenetter named Piet Beertema impersonated Konstantin Chernenko, the General Secretary of the Communist Party at the time, on a Usenet forum, with a letter declaring that "this is at last the Socialist Union of Soviet Republics joining the Usenet network [...] to have a means of having an open discussion forum with the American and European people..."[28]

Many Usenetters immediately recognized it as the prank that it was, but others were tricked (or, at the very least, open to the possibility) by the Kremlin server and Moscow location ID that Beertema had spoofed. Among those who took notice were Pentagon analysts, although reports vary on how seriously they took Beertema's prank. Regardless, the incident led to a great deal of discussion, both amongst Usenetters and in the government, about how to respond to real Soviets, should they appear. Many Usenetters responded with an instinctive "get off our network!" to Beertema's original post, fearing anti-democratic infiltration, while others thought that this might be an opportunity to open

[28]Zach Schonfeld, "'Kremvax': The Strange Story of The Internet's First April Fools' Prank," *Newsweek*, April 1, 2015, https://www.newsweek.com/april-fools-day-april-fools-kremvax-kremlin-soviet-union-usenet-piet-beertema-318451.

the Soviet bloc to the West and the anti-authoritarian and radical cyberliberterian political views of many Usenetters.[29]

Despite their lack of access to it, many Soviets — particularly among the intelligentsia — were aware of Usenet's existence and longed to participate. This dream was made a reality in 1989, during perestroika, when researchers at the Kurchatov Institute of Atomic Energy in Moscow were able to connect to it using Demos, a unix-based operating system. The presence of Soviets on Usenet had become such a recurring joke at that point that many Usenetters did not initially believe that the Demos users were real.[30]

After having been convinced of Demos's authenticity, however, the reaction was much different than it had been five years earlier to Beertema's prank. A combination of the discourse sparked by Beertema and shifting societal views on the Soviet Union thanks to Gorbachev's glasnost and perestroika programs had softened many Usenetters' views on the USSR and sparked greater curiosity. Now, the Soviet users were inundated with questions about life and technology in the USSR, and they were largely welcomed into Usenet.[31]

The years 1989-1991 saw a massive influx of personal computers into the Soviet Union as Gorbachev allowed more international trade and personal autonomy. This in turn meant that for the first time ever there was a market of users for computer networks beyond just academics and government workers. Personal computer ownership was still

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[29]Schonfeld, "'Kremvax': The Strange Story of The Internet's First April Fools' Prank"

[30] "The Usenet Coup: How the USSR Discovered the Internet in 1991," OpenDemocracy, August 16, 2016, http://ezproxy.cul.columbia.edu/login?url=https://search-proquest-com.ezproxy.cul.columbia.edu/docview/1811598170?accountid=10226.

[31]"The Usenet Coup: How the USSR Discovered the Internet in 1991."

much lower in the USSR than it was in most developed capitalist countries, but ownership continued to grow very rapidly, and with it grew the demand for a home-grown computer network.[32]

In 1991, such a network was born: Relcom. Created by the same researchers who had created Demos, Relcom was a Soviet-based computer network that was capable of connecting to Usenet and other international networks through connections in Finland. Relcom was eagerly and swiftly adopted; by August 1991, 40,000 messages were being shared over it every day. The users of Relcom were fairly diverse in terms of location, ethnicity, and gender, although most of them were young people in favor of democratization and information sharing. Pro-democracy organizations, activists, and journalists were among the most active users.[33] This brings us to the most direct role that computer networks played in the collapse of the Soviet Union: the August 1991 coup attempt.

On August19th, 1991, the KGB and various high level members of the Communist party attempted to stage a coup against Gorbachev in an effort to curb his reforms and preserve an intact, communist Union. The ultimate failure of the coup is commonly viewed as the death knell of the USSR by many Soviet historians.

When the coup was initiated, the KGB attempted to cut off all communications, both within the country and with the wider world, by jamming radio signals, taking control of

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[32] Joel Snyder, "Technological Reflections: The Absorption of Networks in the Soviet Union," (PhD diss., University of Arizona, 1993), 243-310.

[33] Alexander E. Voiskounsky, "The Relcom Network: an Investigation of Its Users," *Journal of Computer-Mediated Communication*, Volume 2, Issue 4, (March1, 1997), https://doi-org.ezproxy.cul.columbia.edu/10.1111/j.1083-6101.1997.tb00198.x.

the television airwaves, stopping the post, and bugging telephones. They somehow managed to miss the main communication tool of pro-democracy activists: Relcom. During the coup, tens of thousands of messages still flowed over Relcom every day, many of which went through Helsinki to the wider world.

One of the most striking messages in the Usenet archives is from a Soviet activist, Polina Antonov, to American academic Larry Press: "Don't worry; we're OK, though frightened and angry. Moscow is full of tanks and military vehicles, I hate them. They are trying to close all mass media, they shut down CNN an hour ago, and Soviet TV is showing opera and old movies. But, thank Heavens, they don't think of Relcom as part of the media, or perhaps they have simply forgotten about us. Now we are transmitting enough information to put us in prison for the rest of our lives :-)."[34]

Antonov's blasé tone belies the incredible content of her message. The perpetrators of the coup had succeeded in physically taking control of Moscow, in cutting off all sources of news or communication via radio, television, letter, or phone, and yet they had left one gaping hole that activists were readily taking advantage of. During the coup, Relcom was used both to pass information between the USSR and the wider and to organize resistance efforts within the Soviet Union, particularly in Moscow. For Soviet computer activists, one phrase became a mantra: "*Keep the line open!"*[35] At all costs, keep the line open. There was a sense that communication with each other and the outside world — having someone to

[34]Polina Antonov, "Cheers," email, Google archives, August 21, 1991.
[35]Irina Borogan and Andrei Soldatov, "An Act of Courage on the Soviet Internet," *Slate,* August 19, 2016,
https://slate.com/technology/2016/08/the-1991-soviet-internet-helped-stop-a-coup-and-spread-a-message-of-freedom.html.

stand witness — was the difference between life and death, victory for democracy or military totalitarianism.

The coup attempt ultimately failed after only 3 days, thanks in part to mismanagement and internal strife on the side of the KGB and in part to popular resistance, a significant amount of which had been organized with the aid of Relcom. By this point, it had become increasingly clear that the era of the USSR was past. The era of the internet, however, was just beginning.

Conclusion

Since the fall of the Soviet Union, there has been a continuous cat-and-mouse game between Russian internet users and activists and the government of the Russian Federation. The FSB has surveilled, arrested, and disappeared a number of activists. The Federal Assembly, Russia's parliament, has passed multiple laws aimed at limiting privacy on the internet and increasing government control. Most well known to American audiences, the government has even attempted to make the stubbornly open internet work in its favor by using bots and paid trolls to try to influence American elections. The most recent escalation of this war on the internet was the passing of a law commonly referred to as Sovereign Runet, which gives the government the authority to take unprecedented control of data that passes through network connection in Russia, although many computer

engineers and cybersecurity experts have expressed serious doubt that the government is physically capable of doing so.[36]

Despite the many attempts of the government to censor the internet, however, it has continued to flourish as a site of free expression and popular dissent. Much of the organization and publicizing of the 2011-2013 pro-democracy protests and the 2017-2018 anti-corruption protests took place online, through social media and communication apps. Despite how long it took for Russians to gain computer network access in the first place, Russian is the second most common language for original content on the internet.[37]

The history of computer networking in Russia and the Soviet Union is certainly a rich one, the surface of which has barely been scraped by historians. Despite the total failure of the Soviet Union to create their own national computer network, they were, through the Cold War, the major impetus for the United States' creation of SAGE and ARPANET, which led to the creation of the modern internet. The influence of American computer networks on the collapse of the Soviet Union was only possible because the USSR had simultaneously failed to create home grown networks while inadvertently encouraging the US to develop global networks. Ultimately, the Soviets were the authors of their own demise.

[36]Ilona Stadnik, (2019), "Sovereign RUnet: What Does it Mean?" *Internet Governance Project*, 1-7.
[37]"Usage Statistics of Content Languages for Websites," W3Techs, Q-Success, Accessed April 24, 2020, https://w3techs.com/technologies/overview/content_language.

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