



THE MASTER SWITCH
The Rise and Fall of Information Empires

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General Overview:

Every 20th Century American information technology – telephone, radio, television and film – started out first as a level and open playing field where anyone could join in before eventually becoming dominated by some big entity or corporation exercising monopoly control and extracting exorbitant revenues for controlling the master switch.

There is a distinctive Cycle where a bright new communications technology (developed by an outsider) first appears, gains acceptance because of its openness and promise before flaws, kinks and limitations become apparent. At that point, some mogul comes along who promises to make the new technology function better if the technology is centralized and made more orderly. Once the market is closed, that mogul is then able to control the technology and extract a monopolist's premium forever more.

With the bulk of the world's information now traveling over a single network, centralized control of the Internet in the future is a very real danger. Today's great information powers – Google, Apple and a resurgent AT&T – are locked in a battle royal over the Internet's future. With so much of modern life now dependant on that network, this is a battle that freedom and liberty cannot afford to lose.

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The Rise – The First Phase of the Cycle

Whenever a new information technology comes along, it is never developed by an industry insider. It's always pioneered by an outsider who is most certainly innovative but also willing to be disruptive to the established order and to take substantial commercial risks. To illustrate:

Telephone

Alexander Bell first got his prototype telephone working on March 10, 1876. When his new company, the Bell Company, started selling telephones to consumers in 1877, they didn't seem much of a threat to the dominant Western Union, the exclusive owner of the only nationwide telegraph network. Western Union even turned down a chance to buy Bell's patents for \$100,000 in 1877. When it became clear how much consumers liked the telephone, Western Union entered the phone business itself commissioning a promising young inventor named Thomas Edison to design a better telephone. Western Union and Bell then competed aggressively for the new and emerging market. Later, Bell would become American Telephone and Telegraph (AT&T) and with financial backing from J.P. Morgan buy a controlling interest in Western Union.

Radio

Radio started out as a hobby run by amateurs who built their own equipment and then established their own radio stations as early as 1912. From a base of 5 radio stations in 1921, there were 525 running by 1923 as interest in this technology boomed. The British Broadcasting Company or BBC was formed in the UK in the 1920s to build a public broadcasting system but in the United States anyone with an interest in radio could set up and run their own radio station. Later, AT&T would set up in the United States the National Broadcasting System network which used telephone lines to move radio programs from one area to another. Advertising was introduced (by AT&T) and it soon became clear this would be a far more important revenue stream than the one-off profit which came from selling a radio receiver.

Film

Thomas Edison set up what was called the "Film Trust". This was a cartel of ten firms which, at the time, owned all the American patents on motion picture technology. The Film Trust arbitrarily dictated which films could be shown in the United States. A group of independents, led by Carl Laemmle, a moderately successful immigrant, came out in open rebellion against the Film Trust, and started making films using imported film stocks and other materials. These independents fled from New York and established themselves in Los Angeles because it wasn't far for them to head to the Mexican border to escape from injunctions and subpoenas. Over time, the independents grew because they managed to consistently guess which direction the film industry needed to move and to attract capital to their guesses while the Film Trust was ultimately dissolved in 1915 because of antitrust lawsuits.

Television

The first working prototype of a television using a cathode ray tube was shown in 1928 by a San Francisco resident named Philo Farnsworth. At that stage, it was not at all clear what television would be used for, but everyone expected television broadcasting to be big in the future. General Electric and a few other companies opened their own television stations but David Sarnoff, president of RCA and the founder of NBC decided it was important to keep this emerging technology under the control of the radio industry and ideally his firm. Sarnoff lobbied the newly formed Federal Communications Corporation to declare television as nothing more than "radio with pictures" and that only a known entity like the Radio Corporation of America (RCA) should be entrusted to market television sets and television programming. Incredibly, the FCC agreed and declared that television was not suitable for American consumers – which is where matters stood until RCA had a chance to reverse-engineer Farnsworth's original invention and was ready to bring its new technology to the marketplace.

Consolidation – The Second Phase of the Cycle

New communication technologies often start out as disjointed products which are available in a variety of different guises and using an array of different business models. Once the market demand grows sufficiently large, invariably some big player will come along who wants to consolidate and organize the new technology more efficiently. Often these consolidators have state support because of the potential efficiencies which centralization offers. And almost always, the consolidators are the commercial entities which flourished when the most recently superseded communications technologies were at their peak. To illustrate:

Telephone

By 1884, The Bell Company had morphed into AT&T and the company started working aggressively to build telephone networks serving the largest East Coast cities. At the same time, hundreds of independent phone companies were busy setting up local networks to serve their own communities. This was easy because the entry barriers were so low as to be virtually nonexistent. AT&T started out ignoring these independents but by the turn of the century, this was becoming untenable so AT&T instead started undercutting them using profits generated elsewhere in the system. Today, this would be called “predatory pricing” but at that time this practice was not illegal. By 1910, predatory pricing combined with the carrot of offering interconnection agreements with the independents was so successful it attracted the attention of the Justice Department antitrust regulators. In an ingenious move, AT&T asked for the telephone industry to be regulated and for “just and fair” prices to be set by the regulators. A consent decree was signed in 1913 in effect making AT&T America’s public utility for long distance telephone calls. The idea of an open competitive system lost out to AT&T’s vision of an “enlightened, licensed and regulated” monopoly.

Radio

“It is inconceivable that we should allow so great a possibility for service, for news, for entertainment, for education, and for vital commercial purposes to be drowned in the advertising chatter,” said Herbert Hoover, secretary of commerce in 1922. Hoover convened several meetings to try and get all the radio networks and operators to sign up for a voluntary code of practice without success. There was just too much money at stake for everyone to agree advertising should be banned. AT&T had set up the National Broadcasting System in 1924 comprising sixteen stations which reached 65 percent of American homes and promptly set about designing its own radio sets which were engineered to receive only AT&T broadcast frequencies. In 1919, the Radio Corporation of America (RCA) had been formed in the national interest to exploit the patents held by General Electric, Marconi and others. RCA wanted to compete with AT&T in the new and growing radio broadcasting industry so it turned to the antitrust regulators and had them rule AT&T could only handle long distance networking. As a result, AT&T sold its network and radio stations to RCA who then rebranded them as the National Broadcasting Company, Inc. (NBC). In 1927, the Federal Radio Commission (FRC) was formed to tidy up and organize the entire U.S. radio broadcasting industry. The FRC wasted no time in reorganizing the broadcast spectrum to create forty nationwide high-power radio frequencies and fifty regional low-power frequencies. The FRC would explain its decision in this way: “There is not room in the broadcast band for every school of thought, religious, political, social and economic, each to have its own broadcasting station, its mouthpiece in the ether.” U.S. radio broadcasting soon thereafter evolved into a system where there were a handful of nationwide chains or networks supported by commercial advertising and a number of small regional operators who used a variety of different funding and operational models. This appeared to be the antithesis of the First Amendment’s guarantee of free speech rights and was very much a closed system. The industry had concluded the best route to maximization of profits would be if more people listened to fewer stations and the government had accepted that line of reasoning without any apparent reference to the American ideal of freedom of expression.

Film

Despite its distinctive rebel beginnings, it didn't take long for the Hollywood film industry to start figuring out how it could maximize its profits. First up, the studios started telling the theater owners they would only be able to get access to the studio's "star" movies in the future if they agreed to buy en bloc all the movies the studios would produce each year sight unseen. In 1916, Adolph Zukor had taken over Paramount Studios, the largest motion picture company in the United States, and he wanted to establish the star system where recognized actors became the essential asset in films. The only problem was independent theater owners held the most power in the movie industry because they were the gatekeepers for the revenue streams. The theater owners responded by forming their own trade council, First National Exhibitors Circuit. First National then upped the ante by hiring away two of Paramount's biggest stars, Charlie Chaplin and Mary Pickford, with unprecedented million-dollar contracts. Zukor responded by launching a \$10 million stock offering in Paramount Studios and then used the funds to build his own chain of theaters which had preemptive rights to first run movies. The fact Paramount eventually controlled both production and distribution of Hollywood movies would later attract the attention of the Federal Trade Commission's antitrust regulators. The point was over the course of a decade, the motion picture industry went from being one of the most open with hundreds of independents to one of the most closed with just a few major studios who dominated everything. This is a perfect illustration of what can happen when the underlying commodity is information.

Breaking the Monopoly – The Third Phase of the Cycle

After a period of rapid growth and inevitable consolidation, the main players in any communications industry invariably attract the attention of the regulators. The great information empires of the twentieth century all got broken into pieces or fundamentally changed at some point in their history. This is a necessary event because the new openness which comes about then sparks a new and invigorating round of rapid growth which is an important aspect of the Cycle. "By the 1940s the major media industries had all assumed their stable, apparently invincible forms; they seemed to be permanent fixtures of the American landscape, like the Democratic Party or Mount Rushmore. NBC and CBS ruled broadcasting. AT&T ran the telephone system. The Hollywood studios controlled film. Each monopoly or oligopoly had been blessed by the government in one way or another. And within two decades each would lie in the ruins of its former self."

How did these monopolies get broken up?

- Thurman Arnold, a former Yale law professor, took over the antitrust department of the FTC and he brought a lawsuit against the Hollywood studios alleging twenty-eight violations of the Sherman Act. It took a decade but in 1948, the U.S. Supreme Court agreed with the Justice Department that Hollywood was an illegal conspiracy for the restraint of trade and the proper remedy was to uncouple the studios from the theaters which showed the movies. The resulting change of ownership of the theaters in turn paved the way for independent studios to again start selling movies to theaters setting off a flurry of activity in this industry.
- Defense Department researcher J.C.R. Licklider wrote a memo in 1963 which suggested setting up a universal (or "intergalactic" in his words) computer network which would be decentralized so it would be able to withstand the impact of a nuclear attack on the United States. To make this feasible, Licklider noted something called "packet switching" would be required. AT&T had set up its system around "circuit switching" where a single route was used to send information from one point to another. Packet switching suggested it didn't matter which route was used for the data to travel as it would be assembled at the other end. Researchers spent years trying to convince AT&T to build the world's first packet network but AT&T saw this as a serious threat to their existing line of business and refused.

- Cable television came along, starting first in small cities and remote localities the major networks didn't serve all that well. In most countries, cable has occupied a niche as an offshoot of the major networks but the Nixon administration had an entirely different vision for cable. The broadcasters fought cable all the way to the Supreme Court alleging copyright infringement but the court threw the lawsuit out – in effect also throwing the cable industry a lifeline. The broadcasters then went to the Federal Communications Commission who sided with them but in the Nixon White House, Clay Whitehead was appointed to lead the newly created Office of Telecommunications Policy. Ultimately, the Nixon administration came out with a highly idealistic vision of the future of the cable industry. It proposed a strict separations policy or division between ownership of the cable lines and power over the programming. Cable operators could exercise discretion over only one or two channels and the rest would then be freely available for lease by anyone or for public interest programming. It's a matter of conjecture why President Nixon decided on this policy but one fact that cannot be ignored is later in his presidency he took issue with how the networks reported on the war in Vietnam and Watergate. Whether he realized it or not, by setting cable free he was empowering the network's most obvious natural predator. Nixon also instituted the Open Skys Policy which permitted any qualified company to launch a satellite which would later come to liberate not only cable but also long distance calling. By the end of the 1970s, the cable experiment was in full swing.
- One month before President Nixon's resignation, his telecommunications czar, Clay Whitehead, suggested: Unless the would-be monopolist AT&T or the public can demonstrate special public policy considerations that justify monopoly, it should not be permitted. The antitrust laws should be enforced to ensure that regulatory mechanisms cannot become a haven for escape from competition." With that, the FCC started moving towards the idea competition had some place in the telephone system in three areas: long distance services, attachments and data processing services. In rapid succession, the FCC allowed Microwave Communications Inc. (MCI) to start selling microwave long distance services, forced AT&T to start installing RJ-45 telephone jacks so anyone could plug a device into the telephone network without requiring an AT&T technician to do the installation and banned AT&T from directly entering the market for data processing or online services. In total, these moves set off a flurry of innovation. When AT&T fought back, the Justice Department suggested AT&T should be broken up. After years of legal wrangling, a compromise was agreed whereby AT&T was to be divided into eight pieces – seven separate regional operating companies and a much smaller AT&T which would consist of long distance services, Bell Labs and equipment manufacturer Western Electric. The breakup of the world's greatest communications monopoly was announced to the public in 1984.
- While this corporate life-and-death struggle was going on in the telephone industry, researchers working on ARPANET, one of just three packet networks under development, were trying to figure out how to get various computer networks to talk to each other. They came up with something called TCP/IP – Transmission Control Protocol or Internet protocol. Effectively TCP/IP is a key or a "lingua franca" which tells the receiving network the standard for the size and flow rate of individual data packets. TCP/IP makes it feasible for one network to speak with another because the communication protocols have been specified in a systematic way. In 1982, it was decided that if you didn't implement TCP/IP, you're off the Net. It was this ultimatum which would lay the foundation for and make possible what we now describe and commonly use as the Internet. In the mid-1980s, it was uncertain what use the Internet would be. There was no World Wide Web, no Facebook, no eBay, not even Google. The Internet just allowed computers at universities and government agencies to swap data. Computers of that era were massive and were only within the reach of large corporations. For an information revolution to happen, first the computer would have to become personal.

The Perennial Lure of Size and Scale – The Fourth Phase of the Cycle

While the regulators may succeed in breaking up information monopolies in order to break strangleholds and bottlenecks, the era of openness which this brings about is often only short-lived. Soon the broken pieces start to reconstitute themselves into either eerily similar forms or in the guise of conglomerates. There is an irresistible lure which comes only with sheer size and scale which drives the reconsolidation of power. This has happened over and over in information industries. Examples:

- *Telephone*

In 1984, AT&T was broken up into eight regional “Baby Bells”. Furthermore, the Clinton administration pushed through the Telecommunications Act of 1996 which was founded on the principle of “competition everywhere” to replace the 1984 consent decree. That set off a figurative gold rush of consolidation as the regional Bells started working stealthily to eliminate their competitors. Verizon took over MCI and Southwestern Bell, renamed SBC and led by Edward Whitacre Jr., started a guerrilla campaign against competitors that would ultimately be copied by all eight Baby Bells. For example, SBC was legally obliged to offer space for a competitor’s switching equipment inside their local exchanges but the law didn’t specify a rate so SBC would charge \$500,000 for a 10’x10’ space. Or SBC would openly flout interconnection agreements until their competitors were forced to sue. Eventually, SBC bought out several of the other Baby Bells and by 2006, it had renamed itself as AT&T. The new and improved AT&T was eerily similar to its format before the 1984 break-up with the exception the company no longer considered itself to be a public trust or a protected monopoly with public duties. The reincarnated AT&T was strictly a commercial enterprise which was seeking to maximize its profits.

- *Film*

With the rapid rise in production costs for movies to \$100 million or more in the 1980s, a situation now arose where just one or two multi-million-dollar flops at the box office could bring about the downfall of an established movie production company. Whereas at one time directors had been given complete artistic freedom to make the kind of movie they wanted, that was now becoming too risky. To offset those risks, Hollywood tried a few different approaches:

- *Align with conglomerates* – like where Universal (\$5 billion in annual income in 2008) was acquired by General Electric (\$183 billion in income). This meant the prospect of losing \$100 million or \$200 million on a film which bombed at the box office was a pain but not an actual threat to future financial viability.
- *Focus on intellectual property development* – where the bulk of revenues from making a new movie come from merchandising rights, DVD and cable rights, spinoffs, sequel and other derivative works rights rather than box office receipts alone. This made the studios more licensing operations than filmmakers.
- *Look for diamonds in the rough* – go to film festivals and pick up the national and international distribution rights for movies which have already been made. Nearly ten thousand films are made independently in the United States alone each year and the distribution rights for many of these films can be acquired cheaply. Value is then created by adding a big studio’s publicity machine and distribution channels. Miramax grew its way to success using this model.

The whole point is by the year 2000, media conglomerates reigned supreme in Hollywood. Companies that had started as independent movie producers of varying size and scale had given way to very large enterprises that typically included a film studio, some cable networks, broadcast networks, publishing operations and often theme parks as well. Disney, Time Warner, General Electric and Sony have now established themselves as the new giants of Hollywood.

■ *Television*

Even though the Nixon administration had deregulated the cable TV industry, distribution of programming still involved using AT&T's phone lines and their rates made starting up a cable network a losing proposition. Satellites changed all that and in 1976, Ted Turner managed to create the first cable network based around a small UHF station (WTGG) he'd bought in Atlanta in 1970. Within a few years, the Entertainment and Sports programming Network (ESPN), Music Television (MTV) and Turner's own Cable News Network (CNN) were launched, significantly changing the face of television viewing in the United States. Instead of going for the mass markets targeted by ABC, NBC and CBS, cable television has always appealed to niche markets. Cable television has always been commercial rather than public service oriented – which has meant it has been driven by the imperative to do something spectacular to attract attention so more revenue can be raised. The underlying driver of cable television has always been to generate a return on capital rather than to change the world by making more information freely available. “For all its shortcomings, there is no denying that cable shook up the way Americans get information and forever changed the face of television radically. Cable was born commercial, while the Internet was born with no revenue model, or any need of one. Its funding came from research grants, making it, for a long time, the information media equivalent of a public park. And while today it can be used to make money, the network, being quite purely open, can still easily carry content that makes no financial sense, from personal blogs to site like Wikipedia. Oddly enough, that's how many of the most lucrative Internet firms got their start.” – Tim Wu

Applying the Cycle to the Network of Networks – The Internet

Will the Internet usher in a new era of industrial openness or will the Internet, in spite of its radically decentralized design, become the next logical target for the same forces which have dominated the telephone, film, television and radio industries? That's the big question of the current business era. Technologically, the Internet has the potential and capacity to handle all types of data – phone calls, video and television material and any other type of data imaginable. It is a potential replacement for every single information industry which emerged in the twentieth century.

It's very clear there are two fundamental business models which are coming together on the Internet at the present time:

1. *A closed or centralized system* – championed by Apple whereby users purchase their content from iTunes, have their applications vetted by Apple before being offered in the Apple Applications Store, and so forth. The Apple iPad, iPod and iPhone product families are closed devices which are primarily designed for information consumption rather than creation. Apple is a stylish blend of state-of-the-art computers, AT&T and Hollywood all nicely packaged and ready to go.
2. *A decentralized or open system* – championed by Google but with supporting roles played by Amazon, eBay, Facebook, YouTube, Wikipedia and many others. Google helps people find content wherever it is on the Internet and then to access that information without charge or restriction. To continue doing what it does, Google needs the information suppliers to “play nice” – to make their information available to be indexed by Google and then served up to whoever searches for it. At present, Google holds the master switch of the Internet era.

Thus, at the beginning of the decade which started in 2010, the same battle for territory which has happened over and over again in the information industries of the past is shaping up to happen in the Internet. The companies which provide the Internet infrastructure believe they have a say in what happens. The advocates of a centralized Internet are aligned against those who prefer an more open system who rally around the notion “information wants to be free” and ways should be found to encourage and facilitate this.

This battle has been played out many times before but one thing is different this time around. The two sides are much more evenly matched than in past battles. Both the proponents of the closed systems and the advocates of the open system have tremendous resources behind them. Whereas the incumbents held the whip hand in past skirmishes, in this latest reincarnation of the battle both sides have their advantages and disadvantages.

So what can and should be done about this latest turn of the Cycle? What's needed is not a regulatory but more of a constitutional approach to the information economy. Specifically, there needs to be put in place what can be termed a "Separations Principle for the Information Economy."

This Separations Principle would state:

- Those who own the network infrastructure must be entirely different entities from those who control the tools or venues of access and those who create information. No company should be able to be involved in all three types of activities at any one time. If a firm is involved in more than one layer of an information industry, there are always inherent conflicts of interest which come into play. The only way to avoid these is for each player to be a singular network provider, access provider or information creator.
- The government must be constrained not to intervene in the market in favor of one technology, one network monopoly or even in the integration of major functions in the information industry. Such interference, despite the government's best intentions at the time, always ends up being destructive of both a free society and healthy growth in the information economy. This is a situation where a light-handed regulatory approach will bear the most fruit in the future.

A Separations Principle of this ilk would protect and enhance entrepreneurial freedom by preventing stagnation and repression of any information or business innovation which threatens the revenues of an existing firm. It would inject vitality and innovation into every layer of the Internet. It would allow new ideas to continue to come to the surface and get picked up on rather than being required to run any regulatory gauntlet.

"It cannot be denied that the Internet has ushered in a time of unprecedented diversity and ease of communication and commerce, a broadly available way of reaching millions. Yet if we generally like the way things are now, we must also ask whether our current situation is really so different from the open ages of film, radio, or the telephone. The point is we are near the high end of a pendulum arc that, so far, has always begun to swing in the opposite direction – toward greater integration and centralization – with a force that can seem almost inexorable. There is no escaping the reality that we have evolved into a society in which electronic information represents the substrate of much of daily life. And just as our addiction to the benefits of the internal combustion engine led us to such demand for fossil fuels as we could no longer support, so, too, has our dependance on our mobile smart phones, topuchpads, laptops, and other devices delivered us to a moment when our demand for bandwidth – the new black gold – is insatiable. Let us, then, not fail to protect ourselves from the will of those who might seek domination of those resources we cannot do without. If we do not take this moment to secure our sovereignty over the choices that our information age has allowed us to enjoy, we cannot reasonably blame its loss on those who are free to enrich themselves by taking it from us in the manner history has foretold." – Tim Wu