Technologies of Time Dilation

Mir Ahad Mahmood

Royal College of Art
Postgraduate Art and Design

GID GLOBAL INNOVATION DESIGN

Abstract

Time is a fascinating phenomenon. It is both a deeply personal experience and a tool for incredible coordination. Our tools describe time rigidly, whereas our experience of it is elastic. I may have intuitively understood this, but the turbulence of the Covid-19 pandemic made me acutely aware of time's ability to expand and contract. Days stretched into years and months collapsed into minutes. This felt like an expanded experience of using a smartphone; a device that undoubtably mediates our time. A glance at the screen easily unfolds into sixty minutes without notice.

Primarily through conducting a literature review and through primary observations, this dissertation examines the mechanics and the political ramifications of three technologies that revolutionized humanity's relationship with time; the mechanical clock, artificial light and digital communication (exemplified through the smartphone). The mechanical clock and artificial light are case studies in how we derive our sense of time through our environment and the historical precedence of time-mediation to assert power. The smartphone has demonstrably effective methods of distorting our sense of space and time, resulting in significant implications for the power dynamics between device and user: In this relationship, we are not in the position of power.

Keywords: Time, technology, power, phone, elasticity

Contents

Elastic Time

"We inhabit time like fish swim in water"[1] - Carlo Rovelli

Time is weird. It's one of those things that we feel like we know, but we struggle to articulate. It permeates every facet of our being, but has no tangible or corporeal qualities. In many ways, we feel time as we feel flavor; it's not a sense by itself, instead, it's an experience. Our feeling of time is borne of a complex mix of sensory inputs and psychological processes, giving rise to a fluid, intuitive understanding of it. However, we tend express time extremely differently to the way we perceive it; as philosopher Byung-Chul Han delineates, "the sensation of time is not the consciousness of time"[2]. We tend to subdivide time into discrete units; little rigid blocks of duration; seconds, minutes, hours, days, weeks, months, years, etc.). These units of duration create a time that has no reflection of our experience, because, fundamentally, *our experience of time is elastic and deeply individual*[3]. We live in our personal elastic bubbles of time. Bubbles that we are constantly constructing and reconstructing through our senses and through our lived experience, an experience and memory that is subject to heavy manipulation.

Historically, there are several key technologies that have changed humanity's relationship with time whenever they have been imposed, introduced or adopted. Two of the most transformational technologies relative to our view of time are the mechanical clock and industrial light. Each has made strides in moving us away from a natural, communal sense of time to a modality that is far more artificial and individual. They have done so by fundamentally changing our relationship with space. Our perception of time is derived from our sense of space, so through altering how our environment behaves, or what it means to us, we thus alter our experience of time itself. As a result of introducing dissonance to our intuitive instruments of temporal perception, the mechanical clock and industrial light a have left behind a fissure in our relationship with time. This fissure has been exploited for centuries, from industrializing workforces to asserting political control. Time and methods of its mediation have been instruments of interpersonal power for capitalists, colonists and individuals alike[4].

When a transformative technology becomes interwoven with a society, it redefines it. Whilst we may see technology evolve incrementally, the result is complete social redefinition. Media theorist Neil Postman points out, "after the printing press was invented, you did not have old Europe plus the printing press. You had a different Europe"[5]. That is to say, after any definitive technology is introduced, the sociological topography mutates; we aren't just adding a building to the skyline, we're changing the shape of the ground. Fundamentally, Postman posits that "technological change is not additive; it is ecological"[6].

Now, in 2021, we are witnessing yet another revolution in the way we perceive time and the methods by which it is being weaponized. Covid has exposed the rift in our relationship with time. As we've been navigating lockdowns, cultural movements and technological turbulence, many of us have noticed that some days of 2020 felt like decades and some months like minutes. But like many fractures in our society, Covid didn't create them, it just put them under a spotlight. As electronic communication is maturing, it is driving a wedge into the fissure opened centuries earlier. Digital technology, epitomized in the smartphone, has immense potential to undermine the faculties through which we perceive time, and to then commodify it to an extent never seen before. Without needing to require explicit labor to generate profits from individual's time, our digital infrastructure has evolved to simulate space and trap us in an attention-hacking cycle; dilating a person's quick glance at their phone into hours lost without them even noticing. Stepping back and looking through the lens of historical precedent, this represents an act of hostility towards the individual. Big tech is flexing and asserting their power over us. And in the kaleidoscope of our digital time dilation, we don't even have the capacity to notice.

Time is an index of autonomy, and its mediation is a proxy of power. Although we may not always be able to intellectualize time, we are acutely aware that the time lost is unrecoverable. Many cultures have viewed time to be cyclical, and our society's linear view of time is a historical anomaly[7]. Even so, in cultures with cyclic views of time, revisiting an 'event' is usually relegated to another life. Time usually becomes cyclical on a macro scale. On an individual level, time flows in one direction, albeit often at different paces. The flow of time is integral to our experience of life; it is the lens through which we experience the world. As a compound sense; a sense constructed out of all the others, time gives narrative to our life. Through ordering events, or changes in environmental state, we make sense of the world. Our lives are constructed from our experience of time, and our psyche reconstructs time through memory. So when our experience of time is manipulated against our will, the effect can be dehumanizing. To impede on our time is to impede on our autonomy. Our time is precious, because it's all we really have.

The Mechanical Clock

"Time was chiseled to fit snug to the clock"[8] - Jay Griffiths

The mechanical clock was the first invention that revolutionized our relationship with time, with historian Lewis Mumford claiming that "the clock, not the steam engine, is the key machine of the modern age"[9]. The ultimate triumph of the mechanical clock was how it disentangled time from space. Prior to its invention, all other time measuring (or 'keeping') instruments relied on some form of environmental condition; sundials need the sun and water-clocks need above freezing temperatures (and to be manually reset). A mechanical clock however, ticks on, regardless of the world around it. The mechanical clock brought about a societal shift from a natural time, borne of the world we inhabit, to an "artificial time"[10], a time we have created. But what kind of time does a mechanical clock actually measure?

The clock subdivides a full rotation of the Earth into twenty-four hours, each hour into sixty minutes and each minute, into sixty seconds. What was once a cycle of day and night, the balance of which shifted with the seasons, became a visual and numerical abstraction. Along with its abstraction of space, the time of the clock "is separated from the rhythms of human experience"[11], as media theorist Marshall McLuhan notes in Understanding Media.

Consider how a quick look at your phone may collapse forty-five minutes into what feels like sixty seconds or how a tab of LSD will "expand our experience of time onto an epic or magical scale"[12] (according to theoretical physicist Carlo Rovelli). Similarly, a day in winter does not have the same duration as a day in summer. But both human time and Mother Earth's time are not reflected in the clock, which turns time into duration. Defining the medium, McLuhan states that "the mechanical clock... helps to create the image of a numerically quantified and mechanically powered universe"[13]. Once this mechanical conception of time, duration, was codified, it could then used, by capitalists and colonialists alike, to industrialize labor and assert power across the world[14].

The mechanization of time allows for precise coordination of action and lends itself naturally to industrializing labor. Consolidating the mechanism of coordination into a single object, the clock, grants the person in control of it ownership over its product[15]. This is particularly apparent when others are subjected to abiding by the time referenced by a given clock. Early factory workers were required to follow their manager's clock, and were completely vulnerable to its manipulation. These factory workers were painfully aware that "instead of [clocks] being instruments for the measurement of time, they instead were used as cloaks for cheaters and oppression"[16]. Fundamentally, "industrialization not only meant the

mechanization of the world, but also the disciplining of human beings"[17]. Control of clocks didn't just encourage efficiency, it allowed "power over peoples time" to be "taken away from them and put into the hands of the factory owners".[18]

As time, rather than labor or output, became the industrial unit of 'work', it was only fitting that time use was contorted and stitched into to the concept of 'productivity'. In her history of time, *Pip Pip: A Sideways Look at Time*, historian Jay Griffiths argues that "though the middle classes pretended productive time-use was about morality, it was actually about class politics and power"[19] because "the middle classes made their money out of other peoples time".[20] In 24/7, Jonathan Crary's analysis of capitalism's dogma of time control for profit, he suggests that along with mass production, one of the important developments of the industrial revolution was the "the various systems of management and control of human beings".[21] Tapping into this concept years earlier, Theodor Adorno expresses how this control is exerted through the artificial fragmentation and dictation of individual time, arguing that even 'free' time "is becoming a parody of itself"[22] and "is nothing more than a shadowy continuation of labour"[23]. Cultural critic Byung-Chul Han offers insight into Adorno's claim, through his suggestion that free time just serves "the purpose of re-establishing the ability to work"[24]. Even time designated as personal becomes a way to impose upon the individual; designated blocks of time diminishes personal agency because the individual is not truly free to sculpt time as they wish. Designated free time is more of a lease than a mortgage. Controlling or imposing on the 'ownership' of an individual's time inherently creates a drastic power dynamic, one that extends far beyond industry and labor dynamics.

As western imperialists spread across the world, one of their tools of subjugation was their model of artificial time. Aside from giving colonialists the advantage of industrial efficiency and precise coordination, clocks created a system for colonialists to impose upon their subjects. As railroads were constructed, authorities started to have significant issues coordinating trains because each town ran on its independent local time. In an effort to consolidate these communal times, the British created the GMT 'universal' time, something only possible due to synchronized clocks. As the British empire expanded, they took their 'universal time' with them, as Griffiths notes:

The first global export was time itself, GMT. As this became the universal time measurement, it signaled the destruction of other ways of counting times and marked the hegemony of the one, Western - specifically British - way, dictated by British imperial power.[25]

She expands upon this, chronicling how the Chinese, British, Romans and Soviets all imposed their calendar and time structures as a way to assert their dominance over conquered peoples[26].

On an interpersonal level, respect (or lack thereof) for personal time often reflects the power dynamics in a given society. Griffiths illustrates how keeping one waiting is often considered rude, and how interruption can serve as an act of dominance. She notes that in patriarchal societies, "men overwhelmingly interrupt women, though rarely interrupt each other", and similarly "parents are far more likely to interrupt their daughters than their sons".[27] Similarly, people are far more hesitant to interrupt figures of authority than perceived subordinates. Consider this relative to the near-constant barrage of non-essential notifications from our phones; its interruption can be viewed as an act of hostility. If the phone really worked in our service, we should be interrupting it, not the other way around. We must recognize that an object's free interruption and imposition on our time is an act of subjugation. Our attitudes towards sovereignty of time permeate every social interaction. Even socially, "time is an index of power"[28].

Ultimately, the clock revolutionized the way we comprehend time. It moved us from a natural rhythm of time to an artificial mechanical one. Without any true reference to the environment or our experience, clocks equate time with duration; a steady, inelastic unit. And like any significant technological change, there are "always winners and losers"[29]; that is to say, "every technology has a prejudice"[30] and effects the population disproportionately. Even seemingly benign technologies can be weaponized and use to create, enhance or leverage sociopolitical power structures. As the mechanical clock illustrates, the power imbalance technology can create may be far reaching and create an epochal shift. Fundamentally, irrespective of social, technological or political medium, mediating time is a raw exercise of power, power over nature, and power over each other.

Artificial Light

"In the dark, light is life"[31] *- Wolfgang Shivelbusch*

Since we discovered fire, the "origin of artificial light"[32], we have been trying to assert our dominance over the day. Initially fueled by the Earth's forests, we eventually separated the functions of fire (cooking/crafting, heat and light) and started turning to alternative fuels and methods to create illumination. Blubber, coal, gas, oil, nuclear, solar and wind followed, first letting us igniting a brighter flame, then electrifying our built environment. Now, we don't even need to flip a switch to turn on the light to relieve our environment of its 'restrictive' darkness.

In *Disenchanted Night*, historian Wolfgang Schivelbusch chronicles the industrialization of light and its ensuing effects on civilization. For over two-hundred-thousand years, prior to the industrialization of light, humans lived daily life relatively unchanged; we were always subject to the rhythms of the day and the light of the sun. Throughout this period, and up until the invention of the mechanical clock, we measured time through the light of day, the change of seasons and the relative movement of the cosmos. In essence, we derived time through our environment and how the environment changed or how it remained the same. We saw the cyclic patterns of our planet, and thus developed concepts of time that simultaneously returned to the same point and moved forward. Most importantly, our instrument of time, our environment, was communal.

Even with fire, illuminating the night was extremely costly, as wood (and eventually candles and oil lamps) consumed vast quantities of fuel without providing large amounts of light, and was resultantly "employed in a rational, economical way"[33], primarily used for work and essential functions. This meant that the entirety of an individual's immediate society was experiencing the same light, and had the same sense of day. Though our individual experiences of time may be flowing at different rates, we were still bound by a locally universal environmental cue; light. As we started to industrialize artificial light, we atomized a once communal time.

As lighting technology improved through the invention of oil, gas and eventually electric lamps, the "frontiers of the night... were discovered and thrown open at once"[34]. First, artificial light "emancipated the working day from its dependence on natural daylight",[35] then eventually, as industrial light worked its way into commercial, residential and entertainment applications, it freed anyone with access or means from depending on the cycle of the sun. Early uses of industrial light were focused on optimizing labor, but as it reached into the house, it meant that the hours of recreation, work and study could be extended well into the night. Of course, this had political ramifications, where Schivelbusch observes that "the later one began one's

day, the higher one's social rank"[36]. In part, this was because wealth meant a greater ability to acquire and pay for the use of improved lighting. But light in and of itself is not a true benefit; the real value the light afforded was agency over time. Once you have the ability to defy the darkness of night, you could claim ownership and autonomy over your time; the natural barriers of the night had been removed.

Contrastingly to artificial light's liberating effect, the manipulation of light has precedent of being a method of subjugation and torture precisely because of its distortion of time. Through light, you can assert dominance over another by claiming ownership, and depriving someone of their personal time. In the United States' Guantanamo Bay prison, "Inmates are required to live in windowless cells that are always lit... to preclude any awareness of night and day"[37]. Without any natural variation in environmental cues, inmates lose their sense of time, and are unable to say how long they were kept in such a state[38]. Recalling events, they cannot explain how long an event may have been and tend to relate stories without a strong sense of order. Byung-Chul Han concludes "de-temporalization leads to the disappearance of all narrative tension"[39]; memories become a blur. De-temporalization results in dehumanization. The US military clearly has an established practice of using time mediation through lighting as a systematic method of dehumanization. Clearly, the power dynamics of time are not lost on the Guantanamo Bay torture team, nor is the fact that we derive our sense of time from our sense of space.

Your Phone

"What happens if we place a drop of red dye into a beaker of clear water? ...We have a new coloration to every molecule of water"[40] *- Neil Postman*

How many times have you looked at your phone while reading this? If you said zero, did you at least think about it? Did you feel a phantom notification, cozying up to you in your pocket? If you did, don't feel too bad; it's not your fault. The compulsion for you to think about it is by design.

The phone is the cultural equivalent of a vat of red dye being poured into Postman's beaker of water; like any definitive technology, "it changes everything"[41]. There are few better recent examples of a technology that has cause a complete ecological shift. Rarely more than an arms reach from us, the smartphone is so deeply and directly integrated into our lives, far beyond any preceding digital technology. We wake up, it's by our side. It sits next to us all day. It even tucks us in at night. There is the world with smartphones, and there was the world before. Without a doubt, they are different.

One of the many major consequences of the smartphone is how it has revolutionized our relationship with time. In addition to using the same time-dilation techniques as the clock and industrial light, the phone leverages its interactive and spaceless qualities to become the primary mediator of our experience of time, and in doing so, creates a power dynamic that is very much not in our favor.

The phone is such an incredibly powerful time-mediation device because it can undermine so many of the faculties through which we sense time. Like the mechanical clock's time, *screentime* is a time independent of the natural world. It is an evolution of the clock's artificial time; it is completely synthetic. The clock subdivides the day into blocks of duration; numerically-defined periods that while abstract, are still beholden to universal physical and mathematical laws (practically speaking at least; Einstein's special and general relativity don't play a hugely noticeable role in our day to day experience). *Screentime* however, is beholden only to the individual device and how the device manipulates its user. Similar to how industrial light made people shift away from a communal time to a household time, the phone marks the shift from a household time to an individual time, mediated through the screen. This happens because, as a personal, pocket-sized device, only one person is using it at a time. Your monogamous relationship with your phone is coupled with its powerful personalization engine so it can deliver a bespoke *screentime*, in short increments, to amass hours of your day without notice.

Quite literally, the screen is a source of light. While McLuhan described light as eliminating "time and space factors in human association"[42] in reference to how light removed the individual relying on the rhythm of the sun, the phone removes the

individual from the immediate environment of the room itself. Cultural critic Fran Leibowitz is irate at this, as she constantly bumps into people on the streets of New York, she perceptively observes; "I don't care where you actually are, when you are on your phone, that's where you are now"[43]. Anyone who has spent much time in front of a screen, whether its a tv, computer or phone, is too familiar with the disorienting experience of looking up, suddenly realizing the room is now dark, and asking themselves how long they had been there for and how they hadn't noticed. Someone on the other side of the room, may have a very different awareness of the time passing (unless they were absorbed by their screen too). By making us look into the source of the light, the removes the necessity for our vision to engage with the environment and actively encourages us to ignore it. The phone doesn't need to cast light on the rest of the world to hold back darkness, instead, it drags our eyes straight to the source.

Once the illuminating screen has hooked our vision, it simulates space. We 'navigate' the interface with our fingertips, scrolling left, right, up and down. It even has dimension; we can zoom in and out, moving on a third axis. The touchscreen maps visual cyberspace to both our cognitive model of the activity and to the physical movement of our fingers and thumbs[44]. As we pinch or scroll, the screen tricks our brains into believing we are moving through space. Of all our senses, touch is the one that confirms existence; we were just looking at the screen, now we can touch it and move through it. But, crucially, cyberspace is not real space. Cyberspace is a space without gravity and without time. In fact, it is really a space without space; the representation of dimensional space in a digital system is only there to make it easier for us to understand. Scrolling through your app of choice, whether its Instagram, TikTok, The New York Times, etc., is much more akin to walking on a treadmill than going for a hike. Fundamentally, "the internet and electronic mail let geography, even the Earth itself, disappear"[45]; cyberspace is constantly reinventing itself beneath our fingertips. No digital artifact, or 'content' inherently carries a "mark indicating the place from which it was sent; it is without space"[46].

The screen's simulated space has another key difference to reality as it pertains to time; we jump from space to space. Griffiths outlines how patient movement helps create a sensation of time by giving us a sense of spatial evolution; walking allows us to connect with our environment and notice variation whereas driving turns the environment into a blur, creating a surprisingly monotonous experience[47]. Slowness also grants us choice; we can meander as we walk, but at speed, we are "driven by roads"[48], following their paths. With

the epochal shift that phones created, we don't move through cyberspace quickly or slowly. We would need to cover distance over time to establish speed. Cyberspace has neither. Instead, we jump from Gmail to Spotify to WhatsApp back to Gmail in the span of a couple seconds. There is no finality as "we are constantly asked to begin anew"[49] without really completing any action or leaving a space. The phone has no spatial or temporal orientation, or *gravity*. To abstract Einstein's theory of relativity; gravity binds space and time together, it creates orientation.

The events and cyberspaces are not ordered. In cyberspace, we are in a simultaneous present; concurrently inhabiting all spaces and times without a shred of direction. Through digital memory, the past can be recalled to the present without the patina of aging. Similarly, we can send emails to be sent in the future, even preemptively responding to messages we haven't received yet. In *The Scent of Time*, Han claims that "due to this de-temporailzation, there is no narrative progress"[50]. Narrative requires order; the glass falls, the glass shatters. It could be reversed to an interesting effect; the glass shatters, the glass falls. Our brains immediately order the events to make sense of the words, even if the imagery feels reversed. But in text, the two events cannot possibly be expressed simultaneously; even 'the glass shatters while the glass falls' conjures images of a (slightly confused) narrative sequence. Language, like most forms of communication, is a narrative medium[51]. Infused with time, narrative comes naturally to us, with Sapiens author Yuval Noah Hariri arguing that humans are a narratively driven species[52]. Simultaneously existing in the infinite simulates spaces of our phones produces an "inability to produce a narrative synthesis, which is also an incapacity for temporal synthesis"[53]. Narrative is a fundamental way for us to comprehend and express time as we experience it, in all its elasticity.

The weaving in and out of different digital spaces becomes even more disorienting when we are subjected to what Nir Eyal refers to as the "variable reward"[54] model of digital interaction. Eyal uses the analogy of opening a fridge to illustrate the concept. Imagine that every time you open your fridge, you find new food in it without any intervention. You learn to expect a reward (new food in this case), but the variability of the specific items creates intrigue. This process creates a dopamine surge in the brain and "suppresses the areas of the brain associated with judgment and reason"[55]. This strategy is heavily applied to content-based media streams (e.g. social media or news feeds), so that every time we flick back to one of these spaces, it has reinvented itself, offering a blur of monotony under the guise of continuous novelty. It never takes much scrolling to

realize things haven't actually changed, so we often jump to the next cyberspace instead of putting the device down. Looking at the behavior pattern of jumping from feed to feed, it becomes apparent that "the internet space does not consist of phases of continuity and transition, but of discontinuous events or facts"[56], and as a result, Han argues, "the time of internet space is a discontinuous and point-like Now-time"[57]. The granular pseudo-space of the phone creates a fragmented, atomized time, and in terms of our experience, much like in this sentence; "space and time no longer mean very much"[58].

Through completely disconnecting us from our immediate environment and trapping us in a false one, the phone places us in a state where "time itself is frozen"[59]. It becomes a sedative that promises mild, monotonous reward; a digital Soma from Aldous Huxley's Brave New World. But The most disturbing nature of this sedation lies in its coercion; the phone is wildly effective at lulling us into an atemporal state, whether we are looking for it or not. With any coercive time-mediation, a power dynamic is at play; with the phone, we're the victims being subjugated.

So What?

"The smartphone promises freedom, but it radiates a fatal compulsion"[60] *- Byung-Chul Han*

The phone is a perfect example of *reflexive technology*; technology that exists to perpetuate its own use. We (generally) don't use a hammer for the sake of using a hammer, we use it to put a nail in a wall and put it down once that need has been met. This makes a hammer a tool. The same process can be said of the phone, but if it that was the primary way we use it, then we would spend far less time on it. Although, Crary is referring to the system of technological in general, his statement rings true in reference to the phone; "rather than being a means to a larger set of ends, the apparatus is the end itself"[61]. This may not inherently be a problem, but given that the phone is a powerful time-mediation technology, this opens the door to an extremely dangerous feedback loop.

Throughout his work, Byung-Chul Han argues that digital technology suspends our experience of time. Using the past time-mediation technologies as a model, we can see the sociopolitical ramifications of this time suspension, and a core way it may be carried out. Artificial light provides an example of how time-mediation may be carried out; light is a primary way we internalize and develop a sense of time. Light connects us to our environment and creates a shared experience. Artificial light can then fragment and distort that environment, and the sense of time we derive from it. The phone builds upon the mechanisms of artificial light; not only does it alter space, it simulates space, pushing us to exist in multiple places at once, creating a simultaneous present. This perpetual sense of presence destroys any narrative structure we try to create, disorienting us and leaving our time-experience in an even more vulnerable and malleable state. The mechanical clock illustrates how time is infused with interpersonal power, from imposing a specific definition of time to the sanctity and 'ownership' of it. Combining these two precedents, we can see how the phone is coercing us into letting it mediate our time and how the resulting act of coercive time dilation is an act of hostility and control. It is robbing us of our autonomy and agency, even if we 'opt-in' to the technology.

The phone has become a runaway experiment in self-engineering. We have created a reflexive technology with the ability to exploit and undermine the very instruments we use to safeguard against its use. The bizarre part of all this is that the phone itself has no opinion or agenda, it is utterly indifferent; we designed it to exploit our own time, and now we cant really stop ourselves from getting exploited. Countless companies, most notably Facebook, explicitly profit from the time we spend on the platform, further fueling the feedback loop. Looking at the historical precedence of the mechanical clock, it is clear that a user's time cannot be used as a metric for success unless the explicit goal is their subjugation. If you want to make

money, the metric of success is revenue or profit. If you want to connect people, then maybe the metric is the quality of interpersonal relationships. Maximal time spent on the platform is not actually an essential function of either goal. Similarly, any technology that significantly isolates an individual and dislocates them from their environment will always be asserting power over them through the manipulation of the individuals space and time perception. It is not inherently problematic to dislocate the user from their space, after all, "all forms of art happen in an atemporal state"[62], but it is blatantly unethical to coerce someone into an atemporal state because, by definition, they lose a core element of self-awareness. It will never be possible to truly give informed consent of spending time on such platforms, if, like the phone, the platform is concurrently undermining the value and perception of the asset it is trying to extract. If the technology is extracting value from your time spent using it, while diminishing your perception of time, there is no possible way for it to work in an ethical manner.

More than ever, "human temporality approaches the temporality of machines"[63], where we are contorting our space and time to conform to the machine. However, unlike humans, "a computer does not hesitate"[64], "it can be accelerated to any degree because it does not possess a meaningful structure, or rhythm, of its own"[65]. Human time, however, is full of rhythms, cycles, ebbs and flows; there will always be a fundamental incompatibility with trying to match human time to the synthetic time of the machine.

Through reviewing many cultural perspectives on time throughout history, Jay Griffiths theorizes that "the view which any age has of time has something of the quality of self-portraiture; time is a mirror held up to human nature"[66]. In the last ten years, the smartphone has ushered in a new cultural perspective on time that is still settling in. This perspective is characterized by disorientation and atemporality. It is a perspective of a subject. When we consider the question, 'who serves who?' relative to us and our smartphones; the time-mediation lens answers that we are the servants and the smartphone the master. It's no surprise that the companies who produce, design and shape this medium have enormous influence over society, and these companies often suggest that it is up to the user to opt-in and decide how to use their product. To borrow a phrase from Marshall McLuhan, that "is the numb stance of the technological idiot"[67]; the medium itself, not its use or content, is the element worth criticizing. Postman is right, definitive technology ushers in a new ecological state, and the smartphone has certainly done that. The cultural topology that exists today is exceeding difficult to navigate without a smartphone. The topology that exists in the near

future is one even more dominated by the phone; in emerging economies, "smartphones are increasingly the most common mobile phone"[68] and are becoming the primary method of accessing the internet. If the medium of the phone remains to be one of time-mediation, then society will increasingly be its subject. This is nothing short of *technological colonialism*, where we are the victims and our technology is our ruler. Even those who create the technology cannot escape it.

Historically, the mechanical clock and artificial light are the two technologies that have most transformed our relationship with time. Both technologies not only redefined how we perceived and experienced time, but they reconstructed how we view it; each technology had far reaching and wildly significant political ramifications. Digital technology, currently manifested in the smartphone, represents the third major technology in this pattern and is the most pertinent to modern civilization; we are living through the revolution as participants and subjects. Importantly, digital technology also has the potential to be the most destructive or liberating; it combines the power dynamics of time ownership created by the watch with the time dilating qualities of artificial light with ruthless efficiency. Postman elegantly warns us that "the consequences of technological change are always vast, often unpredictable and largely irreversible"[69]. We do not know what the exact political implications of digital technology will be as it evolves, but the phone can be a good litmus test. The potency of the phone's time-mediation provides an enlightening insight into how digital technology may run amok and how we can be powerless to push back; in its current form, it already targets our vulnerabilities with surgical precision. We are coerced to opt-in, which is to say, we have no agency in the matter at all. It is clear that McLuhan's prophetic assertion, "the medium is the message"[70], is true as ever. Although "media tend to become mythic"[71], digital technology is still an artificial invention and it is in its infancy. If we want to reclaim our autonomy and move towards a world where we are not subjugated by our own inventions, we need to sculpt our technology to be respectful of our time. As a society navigating a moment of temporal turbulence and redefinition, it is essential to be acutely aware that "we describe ourselves when we think we describe time"[72]. If we continue to disregard the value of our time, we will inevitably disregard our own humanity.

Thank you for your time.

End Notes

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