

Review

Cybernetic Hive Minds: A Review

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Abstract: Insect swarms and migratory birds are known to exhibit something known as a hive mind, collective consciousness, and herd mentality, among others. This has inspired a whole new stream of robotics known as swarm intelligence, where small-sized robots perform tasks in coordination. The social media and smartphone revolution have helped people collectively work together and organize in their day-to-day jobs or activism. This revolution has also led to the massive spread of disinformation amplified during the COVID-19 pandemic by alt-right Neo Nazi Cults like QAnon and their counterparts from across the globe, causing increases in the spread of infection and deaths. This paper presents the case for a theoretical cybernetic hive mind to explain how existing cults like QAnon weaponize group think and carry out crimes using social media-based alternate reality games. We also showcase a framework on how cybernetic hive minds have come into existence and how the hive mind might evolve in the future. We also discuss the implications of these hive minds for the future of free will and how different malevolent entities have utilized these technologies to cause problems and inflict harm by various forms of cyber-crimes and predict how these crimes can evolve in the future.

Keywords: AI; hive mind; ethics and AI; human-centric AI; novel interfaces



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1. Introduction

Brain–computer interfaces were pushed into the mainstream after the invention of Neuralink [1] by Elon Musk and his startup of the same name. Although the technology is still in its nascent stages, it has immense potential to take humans to the next step in evolution, according to the transhumanist school of thought. Hive minds have existed in nature since the very dawn of life on earth. Bees, ants, termites, and even migratory birds display characteristics of a hive mind where the entire group behaves as if they are controlled by a single mind and work collectively towards achieving a goal.

This paper looks at the history and applications of several human–computer interfaces like the brain–computer interface, muscle–computer interface, connected devices, social networks, and biomedical devices. We explain how these technologies have led to the rise of cybernetic hive minds of human beings, machines, and machine learning algorithms. We also look at how science fiction and myth have inspired these technologies and how close we realize them.

One of the objectives of this paper is to look at the impact of hive minds on various kinds of cybercrime currently and how these crimes will evolve in the future, and what steps need to be taken to prevent them. We are specifically looking at QAnon, a social media-based ARG, and how the people behind this ARG weaponized group think and conduct crimes en masse. The main problem statement we are trying to solve is explaining how this ARG works as a cybernetic hive mind and the different crimes conducted with it.

We also attempt to classify the various kinds of hive minds and collective consciousness based on our understanding of the research. We also look at the positives and the

perils arising from this technology and suggest a set of regulations to ensure basic ethics like privacy and Free will is not violated.

Review Methodology

This study conducted a systemic review of several research publications from journals and conferences of renowned publishers like Springer, IEEE, Nature, Taylor & Francis, CHI. This study has also taken inputs from several news articles, journalistic publications, and thesis reports of various students. This article presents a thorough assessment of various technological fields that are part of the cybernetic hive mind and explains how these fields are interconnected and how they will improve in the future. In total, 158 academic and research publications from various journals, conferences, thesis reports, books, research reports, and patents were gathered from scientific search engines like Google Scholar, Semantic Scholar, Google Patents, PubMed, SpringerLink, Nature, New Scientist. In addition to this, around 68 press articles were referenced from various accredited press sources like Washington Post, The Guardian, MSN News, Newsweek, and The Independent. We referenced their reports on QAnon and coverage of Trump Rallies and their COVID infection rates.

This article conducted a deep dive on all these research papers and how each of these fields has led to the proto hive mind and how this hive will evolve in the future

2. Technologies Related to the Human-Machine Hive Mind

2.1. Brain-Computer Interface

The term brain-computer interface was first introduced in the year 1973 through the work of Jacques Vidal [2]. However, EEG-based signal classification was used to detect and classify hand gestures [3], facial expressions [4], and even control prostheses [5] for hands and limbs [6] even before the term was coined. Researchers at Honeywell have also used BCI to fly an airplane [7].

Types of Brain-Computer Interfaces

There are several models of classifying brain-computer interfaces; one simple model looks at the invasive nature of the devices, i.e., invasive BCI like Neuralink and non-invasive BCI. There are other models based on the type of device and electrode type, i.e., gel-based electrodes and non-gel-based electrodes [6,8], and the number of electrodes [9]. There is a third type of BCI, which is invasive but is implanted as a stent in the blood vessel closest to the brain called the Stentrodde [10].

2.2. Swarm Robotics

Hive minds have existed in nature since the very dawn of life on earth. Bees, ants, termites, and even migratory birds display characteristics of a hive mind where the entire group behaves as if they are controlled by a single mind and work collectively towards achieving a goal.

The hive minds in nature have inspired roboticists at various places to build swarm robots to perform certain tasks. This coordinated robot interaction has been done at Harvard [11] and through the works of Professor Vijay Kumar [12], who focused on building robot drone swarms to perform coordinated tasks like taking care of agriculture [13].

2.3. Connected Devices and Social Networks

2.3.1. Social Networks

Social networks have become invasive in our day-to-day lives. We live in a day and age when most people depend on social media even for their daily source of news [14]. It has also become the primary means of maintaining connections in the personal and professional aspects of our lives. It has been blamed for rampant depression among teens in the US and adults [15,16]. It has also been blamed for the rampant spread of misinformation [17], but it has also been a force for good in the world [18,19]. Information collected from social

media, especially psychometric data, has been used by malfeasant entities like Cambridge Analytica to stoke fears via targeted misinformation and manipulate people into voting for demagogue politicians [20].

While having the problem of being platforms for creating depression and anxiety among humans through the spread of certain unrealistic beauty standards, faulty products, and pseudoscience remedies, social networks have also been a platform for good via organizing and collectivism. This was especially visible during the Arab Spring movements in Egypt and Tunisia [21], as well as anti-government protests in Iran [22] and the anti-corruption movement in India [23]. Thus, we can say that the social networks connecting humans worldwide have become a proto-collective conscious hive mind(s) of human beings.

2.3.2. Connected Devices

With the rise of the internet of things, we have a lot of smart devices around us like fridges, washing machines, thermostats, cars, and even toasters; these devices can be controlled through the comfort of your smartphone [24]. In the future, we might see all of these devices being controlled through our minds, which has already been demonstrated in certain labs [25]. Thus, we can say that connected devices paired with BCIs will result in a hive mind between humans and machines. Cross-device interactions have found a lot of applications in home automation systems integrated with wearables [26].

2.4. Muscle Computer Interface

Surface electromyography has found applications in device control [27] and in control of prosthetics [28], as well as speech recognition [29] and control of assets in virtual reality [30]. This has been termed muscle computer Interface by Scott Saponas and Desney Tan of Microsoft Research [31]. Here, the input was from the muscles' electrical activity and the muscles, and the output was on a computer. Another project employing surface electromyography named Possessed Hand by Jun Reikimoto and his colleagues at his lab at the University of Tokyo showcased that human stimuli can be controlled via a computer or a machine interface [32]. Note that these devices are still in their nascent stage. Their accuracy depends on several conditions; for example, sweating might cause problems with the signal quality [33,34]; this area, like brain-computer interfaces, should be further inspected and studied.

2.5. Cyborg Insects and Animals

Since the dawn of intelligence and consciousness, humans have been obsessed with the idea of flight; insects are one such creature capable of it. They have a unique structure with an exoskeleton as part of the muscular-skeletal system, combined with a protein-based muscle and a simplistic nervous system for movement, including flight and survival. Their simplistic nervous system enabled scientists to hack them and control them to a certain degree of success. This was exhibited in the open-source project RoboRoach [35] and the cyborg insects from the lab of Dr. Hirotaka Sato at the Nanyang Technological University [36].

There have also been projects conducted on the motor cognition skills of other animals like cats, frogs, primates [37], and even fruit flies [38].

2.6. Hypnotic Computer Interface

In our previous work, we coined the term hypnotic computer interface, where we showcased an educational prototype of how hypnosis is conducted where the user is the hypnotist and the machine, a voice assistant named GEORGIE, performs certain tasks upon the action of certain set triggers [39]. We also showed that other researchers in the past had demonstrated a hypnotic smartwatch [40] to alleviate anxiety and other conditions, a machine that puts patients into a trance-like state [41], and an anti-hypnotic device for truck drivers [42]. We would also like to highlight the work of the journalist George F Will who

coined the term electronic morphine [43] to describe the gambling addiction happening at casinos, a trend we have seen now move towards mobile gaming applications and social media, which has borrowed ideas from the casino industry [44]. The interactions in these devices put their end-users in a trance-like state that causes addiction [45]. The therapy for this is severe in some cases, the controversial transcranial magnetic [46] stimulation, which has really bad side effects, including seizures.

2.7. Microbots and Artificial Cells

Richard Feynman famously said there is plenty of room at the bottom while introducing the whole world to the concept of nanotechnology [47]. We should also be looking at the enhancements being done on a micro-level. Scientists at the University of Vermont have made the first form of cellular robots using genetically modified frog embryo cells known as Xeno-bots [48]. Scientists at Cornell have built microbots using a new class of voltage-controllable electrochemical actuators known as marionettes [49]. Artificial red blood cells known as respirocytes have also been made in several labs [50], and nanorobots have been used for precision drug delivery [51].

2.8. Biohacking

Biohacking is a small but growing group of fitness plus personal health enthusiasts who have embraced technology for physical and mental wellness. They have used chips to monitor vitals and implanted customized earbuds [52] in their bodies. Biohackers also utilize the technologies mentioned in the above sections as part of self-enhancement techniques like neuroplasticity, which claims that one can improve brain functioning by solving puzzles based on solid pseudoscience [53]. The FDA has approved an implantable continuous glucose monitor [54], which has opened a gateway for a variety of other transdermal implants.

2.9. Augmented, Virtual and Mixed Reality

Extended reality-based headwear has gained a lot of traction in recent days. Although Google Glass failed to gain traction in the consumer space, it has been used in several industrial applications in aerospace [55] and supply chain warehousing [56]. Head-mounted tablets and near-to-eye devices have also been used in industrial products like offshore oil and gas rigs [57], automotive industries [58], and telemedicine [59]. VR and MR headsets have been used as museum guides [60] and even for industrial and scientific training [61]. The form factor of these devices remains a big problem. However, this could be solved soon as scientists have already built a single-pixel contact lens that has been tested on rabbits [62]. Powering these devices and ensuring that they do not have any long-term effects on the eyes needs to be studied and investigated further.

BCI's have been used to control AR, VR, and MR headsets [63], and fMRI 60 has also been used to control VR interfaces [64]. Transcranial stimulation has been reported to project images directly into human retinas [65]. There are also reports of electric stimulation using implanted electrodes that have caused visual activity [66]. Thus, we can easily understand that XR technologies will be a crucial part of the hive mind devices in the future.

2.10. Machine Learning Algorithms/Artificial Intelligence

Machine learning algorithms, popularly known as artificial intelligence, are pervasive in our day-to-day lives. They are used for targeted advertising in our IoT devices [67] and mobile phone applications like replika.ai [68]. In the application replika the machine learning algorithms begin to learn more about you through constant chats and begin to become more like the user. Machine learning algorithms are also used in regulating behavior in cyberspace, and social media has used these algorithms to filter content deemed dangerous [69]. Machine learning has also been helpful in home automation devices [70], and learning user behavioral patterns have been helpful in creating power-saving mechanisms and lighting adjustments [71]. Swarm intelligence also utilizes machine learning algorithms

to teach robot swarms to solve problems collectively [72]. Real-life swarm intelligence seen in ants has also inspired ML scientists to create algorithms based on them to solve unique problems [73]. ML algorithms have enabled anomaly detection in large-scale IoT Systems [74].

Machine learning algorithms play a big role in hive minds on social media. We have seen how machine learning algorithms have played a major role in the Cambridge Analytica scandal [75]. The recommendation algorithms were highly influential in creating echo chambers of hate by targetting users with advertisements and posts on social media [76].

3. The Advantages and Disadvantages of the Hive Mind

3.1. Applications of the Cybernetic Hive Mind

Collectivism has contributed to human evolution and the rise of civilizations, although there are a few examples in history where this has gone wrong. Cybernetic hive minds do possess a lot of applications. A Google Glass-based hive mind was experimented on users to perform a set of tasks to great success [77]. This shows that electronic HIVE minds can definitely improve efficiency and productivity. Considering the promise telematics holds for us, it can be safe to assume that one day possibly, we could lie down with a VR and BCI suit and control bionic devices across the globe and maybe even one day in space. Telematics has been applied for the control of the Robonaut in ISS [78] and by the company RAVN through their AR headset [79] that allows ground troops to command and control multiple drones on the battlefield plus take informed decisions based on the live feed shown to control them.

The prosthetics, enhancement, therapies, and machines to simplify our lives mentioned in the prior sections are on the verge of becoming mainstream in a few years. Some companies are already manufacturing drones with swarm intelligence that are used in agriculture and are EEG and sEMG-based. Several firms are using prosthetic limbs to rehabilitate war veterans who have been injured in the line of duty. DARPA is leading the efforts on this front. The FDA has approved implantable electronics for glucose monitoring and vital tracking for people suffering from critical illnesses. IoT devices have simplified our lives and have helped us save time to focus on other crucial aspects of our lives. Social networks have been a force for collectivism and organizing. There are excellent applications of the various technologies that will lead to the hive mind, and these applications are further explained in Figure 1 individually. These technologies individually might seem harmless, but things might get a little scary when they work in sync.

Soon, we would have achieved a means to bring the XR technologies to a contact lens-based device controlled via a neural implant woven across your brain. Social media, games, and other forms of material are projected directly into your retina. Humans would then go in for more augmentations to improve their abilities. Then you would have groups of people with similar augmentations based on their profession or a role in society. For example, a set of humans working at high altitudes may implant themselves with respirocytes to improve breathing.

People would then opt for genetic modifications and other bioelectrical implants. This would create new and several different classes of humans who would be complete cyborgs and superior to normal humans in several ways. This, coupled with the fact that all their minds will be connected via the Internet, or its successors, means that humanity would bring a hive mind into existence much akin to an insect hive or an ant colony which could then start to nudge humans to work towards tackling various collective goals like survival of the species, task collaboration, coordinated movements, discussions.

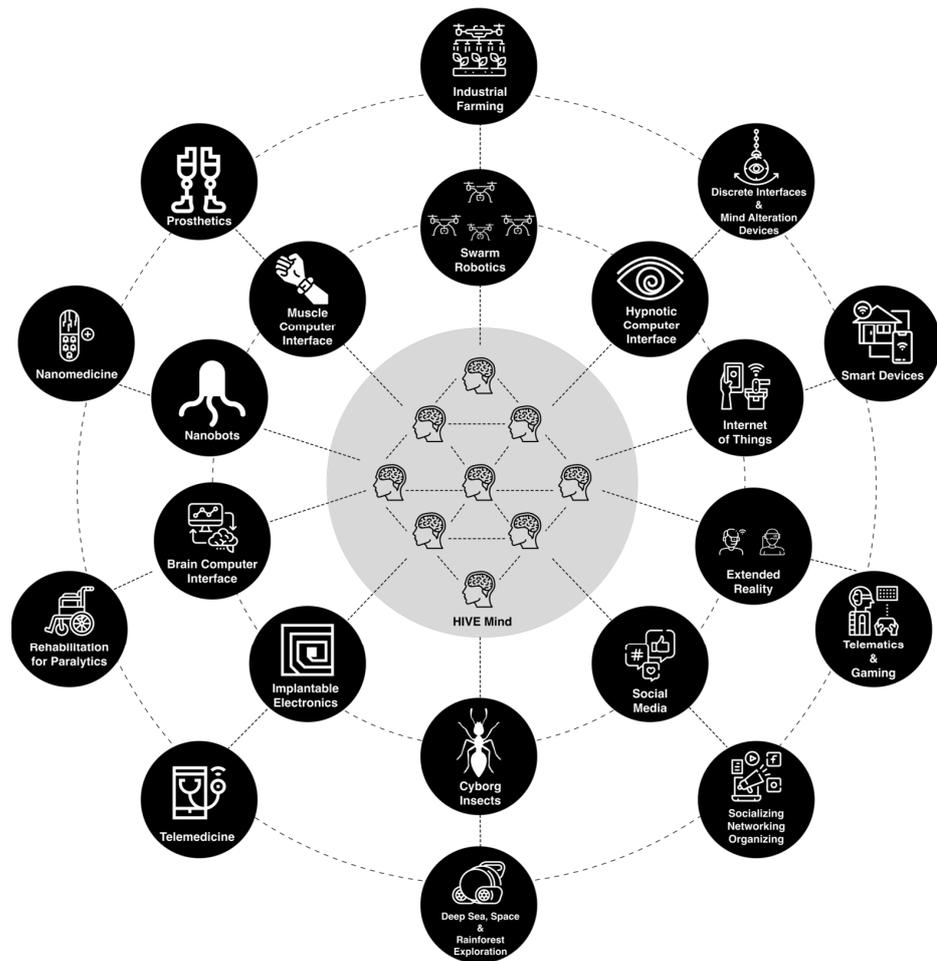


Figure 1. Information and technologies leading to the human-machine hive mind in the future.

3.2. Problems with the Digital Cybernetic Hive Mind of the Future

Post the Snowden leaks; several online companies have begun claiming to use end-to-end encryption for their data. However, we know that these firms use many psychometric data to market various products and political viewpoints. This is right now being done for all mobile and computing products. In a future where we have technologies, IoT systems permeating every aspect of our lives, BCIs, muCIs, cybernetic insects and animals, and artificial cells that are controlled by implants, there would be even more data generated through all these devices and technologies. This data can be used for various forms of manipulation, which are further explained in Figure 2. The other problems of the cybernetic hive mind are described in the following sections.

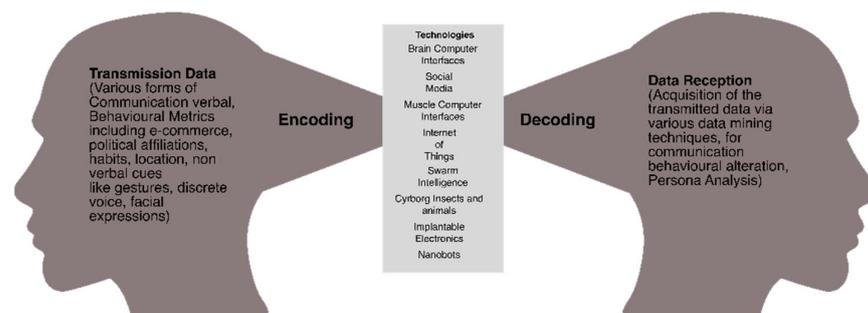


Figure 2. The various data gathered via various hive-mind technologies and how they could be misused.

4. Cybernetic Hive Minds

The rise of consumer-based BCIs will result in our lives being changed forever. For starters, this will result in computing machines becoming another layer in our consciousness, a process that will turn us into cyborgs. This is already underway through the smartphone revolution that is turning us into psychological cyborgs [80]. A few researchers think we already have a hive mind [81], and a few others think we are just a node in an electronic hive mind [82]. However, this revolution will inevitably give rise to a lot of problems in the future, much like the problems arising from the personal computer and internet. This technology could also give ways and means to malicious entities to create havoc based on existing knowledge of psychiatry and peeking into the world of fiction, fantasy and myth. The researchers of this paper attempt to classify the problems that may arise through this technology and define how consciousness might change in the future. In the following few sections, we will briefly discuss the impact this would have on our idea of consciousness and how we will transcend into a post-human stage in human evolution.

4.1. Consciousness and the Hive Mind

A few psychologists divide the human psyche into consciousness, subconsciousness, and unconsciousness. Each of these components forms a specific portion of our personality; researchers agree that AI would become another layer in our consciousness, and we are all connected via brain–computer interfaces over the internet. It could have a very interesting effect on our psyche; imagine a group of people thinking they are all the same entity. We can see a glimpse of this with the QAnon movement, where the slogan ‘we are all Q’ is chanted by the followers, and this herd has collectively become the root cause of increased COVID-19 infections in the western world. In a world where technology can make you feel like another person or impinge psychological disease like anxiety on you, it makes you feel like the gateway experience has been amplified.

The gateway experience has been described as pseudoscience and as a pathway to psychosis. It is also interesting that the CIA dossier of the same name [83] openly states meditation as a form of self-hypnosis. If conducted without proper guidance or care, it can result in severe neurological damage. It also mentions that Lee Sannella M.D. describes the process of Kundalini awakening as a psychotic episode [84]. The dossier further shows that other forms of transcendental meditation are self-hypnosis. Hypnosis, as a process, has been in the interest of neuroscience for a long time. If done properly in a guided manner through a licensed and certified practitioner, it can even help people heal pain, as demonstrated by [85] and a few other neuroscientists.

Cults have used social media to increase the spread of such practices, re-branding them as spiritual therapies. This has served two purposes: brainwashing and the second being increasing the number of followers. Such social media-based cult hive minds have most of their members with severe psychosis.

Despite warnings that only licensed professionals from a credited institute can use hypnosis in practice, several agencies have used untested techniques on unsuspecting people in the public, marketed as meditation therapy and other psychotherapies. This has resulted in psychotic episodes for several people, and certain reality distortions can become permanent and sometimes even impinged onto other people as well through these techniques [86]. This and the fact that belief in God and religious practices is a form of schizophrenia [87], coupled with the outreach of social media, have resulted in a myriad of problems.

4.2. The Musk–Oxley Model of Human Machine Hives

Based on our understanding, these are the following types of hive minds that could arise in the future. We are naming this model after Elon Musk and Dr. Thomas Oxley for bringing BCIs to the mainstream. Distributed cognition is an undeniable future of the human race, and it has immense applications in several areas like space travel, deep-sea exploration, therapy, military equipment, nature studies, construction, gaming, and much

more. Parts of this are already happening due to telematics and virtual reality. We may see this expanded to other avenues as well.

1. Single human to machine(s).
2. Multiple humans to machine(s).
3. Single human to multiple humans.
4. Multiple humans to single human.
5. Multiple humans to multiple humans.
6. Singular AI cybernetic being to humans.
7. Multiple AI cybernetic beings to humans.
8. Human–animal cybernetic hive mind.

5. New Age Viruses of the Hive Mind

This section is an attempt to foresee the future and predict what sort of problems might arise due to these technologies. Please note that almost all of them are based on existing problems and extrapolating them.

5.1. Ghosts and Phantasms

People who experience psychosis have reported several instances of being in touch with the paranormal, like seeing shapes floating, figures, people, and even ghosts and other mythical beings. They have reported hallucinations happening across all the senses; people with sleep paralysis have reported undergoing hallucinations that involve some sort of apparition sitting on their chest where they feel the full force on their chest, which results in breathing problems. Although we know that these hallucinations happen because of some electrical stimuli being sent to the eyes from the brain, these above-described effects can also be achieved by stimulating the brain using various techniques like EEG-based BCI and transcranial magnetic stimulation.

We do not need a full-scale anthropomorphic ghost to be classified as a cybernetic phantasm virus. In the below diagram, we are showcasing an example of how a small apparition paired with a sound begins to appear in the vision area of your AR device like a contact lens can be classified as a new form of computer virus Figure 3, even though the effects are being induced by a line of computer code and not a genetic mutation or psychedelics. Maybe future pandemics would be tackling computer viruses that would leave people with implanted AR devices with such distortions.

5.2. Possession Episodes and Loss of Free Will

Based on the demonstration of Jun Reikimoto and other neuroscientists, it is clear that electric stimuli can be used to control muscular movement. In nature, the Emerald Wasp targets the dopamine receptors in the simplistic insect brain of the cockroach and turns it into a zombified state. Thus, it is no surprise that using stimulation techniques like sEMG; machines can take over transcranial stimulation control. The researcher Jaron Lanier has also said that one of the reasons he is not on social media is the loss of free will [88].

Cicada 3310 was one of the toughest online puzzles to appear. Some would even describe the puzzle as a form of alternate reality gaming. Microsoft also used the base form of this gaming to promote the film AI and the game Halo. Cults whose sole aim and purpose are massive recruitment would also try out methods that would enable them to override a person's free will through a combination of social media, alternate reality gaming, and surveillance.

This can enable them to track people who prescribe their dogma through all channels and attempt a form of mind control which can include several techniques, including but not limited to hypnosis and what is being termed spiritual psychotherapy, which in reality could have drastic cognitive and psychological effects as mentioned by the CIA dossier and other sources cited above.

Structure of the Q Anon Cybernetic Hive Mind Cult

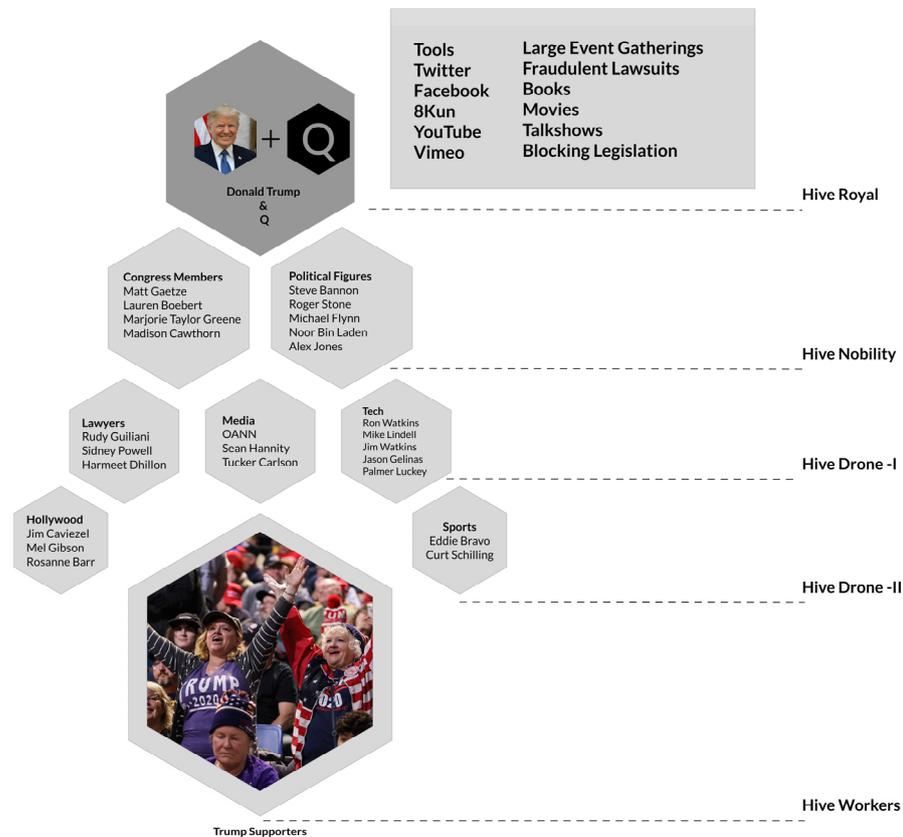


Figure 3. The hierarchical structure of QAnon, its puppet masters, their roles, and manipulation tools.

5.3. Alternate Reality Gaming for Mass Experimentation and Eugenics

5.3.1. Alternate Reality Gaming

Any game that spins a narrative that involves transcending into different media is known as an alternate reality game or an ARG. These games follow the down the rabbit hole narrative to engage the end-user. The types of media in ARGs are usually web, print, telephony, radio, and travel to physical locations. Microsoft had released an ARG as a promo for the game Halo, and the movie AI also had an ARG as a promo. The ARG Cicada3301 was one of the toughest puzzles in the modern-day that first appeared in the community 4chan.

5.3.2. QAnon

QAnon is a bizarre conspiracy that started as a joke to sell T-shirts and other merchandise to unwitting Trump supporters, which was then taken over by the Russian mob who had connections to Trump. This bizarre conspiracy then morphed into an online alternate reality game that spun out of the discussion boards of 8Kun into mainstream social media like Twitter and Facebook [89]. This movement adheres to several conspiracy theories as the belief systems and has attracted followers from all walks of life, including people from new-age spirituality, and they are spewing antisemitic and racist rhetoric. They have also been pushing anti-vax sentiments on social media, which has caused a lot of distrust, and this movement has been blamed for the spike in the infection rate in the US due to the delta variant. In the next few sections, we will be looking at the origins of this movement, how it morphed into a large ARG, the merging of various conspiracies together, and how all of this contributed to the increase in the spread of the virus.

Pre QAnon Conspiracy Theories

Ancient aliens and UFO mania: Ancient aliens is a fringe conspiracy theory based on the belief that life on earth was seeded by technologically advanced aliens who have supposedly been secretly guiding humanity by selectively releasing technology to the world [90]. This conspiracy theory went into the mainstream via the pseudoscience show of the same name on the History channel [91].

The craze for UFOs goes back to the period 1947–1967 when several reports of unidentified crafts were being mentioned in the newspapers [92]. Over time several such sightings have been reported, but most of them have been debunked as military drones [93], weather balloons, clouds, and in one sighting, a police officer mistook the planet Venus to be a UFO [94]. The UFO fandom in the US has a large fan following, and fans of the theories have a UFO trail across various states they follow, making their nation look like a large theme park [95,96].

Anti-vaccine movement: The conspiracy theory that vaccines cause autism and other disorders is based on a scientific study that has been debunked by several experts in the medical field [97]. This theory was promoted by several celebrities and politicians [98]. Leading medical experts agree that this is a subtle form of bioterrorism [99].

Anti-Semitism: The oldest of all conspiracies is the one where the Jews are said to be the puppet masters and Satan worshipers. The other anti-Semitic conspiracies include Jews controlling the weather, Jews being greedy and evil, and manipulating the stock market [100]. Prominent supporters of liberal causes like George Soros are a target of such conspiracy theories [101].

Anti-Islam: There is a certain mainstream view of Islam in the West [102], which is mainly defined by Salafism and Wahhabism [103] originating in Saudi Arabia. Islam also has a large following of Hydari, Nizari Ismailis [104,105], and Bohras, whose views of Islam are more liberal than the extreme form of Wahhabism in Saudi Arabia and the other Gulf Nations like UAE, Qatar, and others. Conspiracy theories that Muslims want Sharia law everywhere or that Muslims are inherently violent and the immigrants from Muslim nations would bring diseases to their country had been amplified in the west post the 9/11 era [106].

Anti-science. Several conspiracy theories like fluoride in water is a mind-control drug [107], anti-GMO movements [108], quack cures, and fringe new age therapies all fall in this category. Regulatory agencies try to intervene via public warnings, which have little to no effect [109]. The members of the alt-right fringe were also promoting such distrust in public health measures and are still encouraging their adherents to follow specific diet regimens of OTC medications [110], which is similar to the process of indoctrination practiced by cults as described by the psychiatrist Joost M Meerlo [111]. A few anti-biotech activists like Vandana Shiva went on to spread conspiracy theories that GMOs were behind the COVID-19 pandemic. [112]

Xenophobic and racist conspiracy theories. Racist beliefs that the Chinese are schemers [113] and belief in phrenology by white supremacists to discriminate against African Americans [114] were very common in the extreme right-wing spectrum of US Politics.

QAnon Autopsy of an ARG

Followers from all walks of life: QAnon started on the boards of 8kun and slowly gathered support from followers from all walks of life. People from the LGBT community [115] were involved in its activities and people from different religions, including Osama Bin Laden's niece Noor Bin Laden [116]. It was primarily driven by the heads of the Republican party, a few ex-military generals like Michael Flynn, Right Wing propaganda outlets like OANN, Fox News hosts like Tucker Carlson, Sean Hannity [117–119], conspiracy theorists like Alex Jones [120], Shiva Ayyadurai [121], and other. New age spirituality followers who usually peddle products were also drawn into it and began spreading this conspiracy along with other conspiracies about 5G, UFOs, anti-vax theories, and conspiracy theories on Bill Gates creating COVID-19 to implant chips, etc. [122].

Transcending media: Every ARG has the common trait of transcending different media; in QAnon, there are message boards at 8Kun that send people to various Youtube videos to look for hidden 'clues' which were supposedly left by Q. The boards would also ask them to read several books published by a few of the key puppet masters that supposedly had more clues [123]. Social media websites like Facebook, Twitter, Reddit, and video streaming platforms like Vimeo and Youtube, are also a source of conspiracy theories [124]. Many of the books published by the QAnon 'puppet masters' were bestsellers on Amazon [125]. QAnon has also had several physical events encouraging followers to gather at various places for supposedly more clues [126].

Down the rabbit hole narrative: This endless rabbit hole was then spouting out endless conspiracy theories partially based on real-life events like the death of the highly influential pedophile Jeffery Epstein [39,127] and the rampant sexual abuse and pedophilia problem in Hollywood due to Scientology [128].

The rabbit hole narrative would then lead them into an alternate reality that would ask its participants to distrust media, government, and mainstream science. They slowly make their followers think that the entire world is controlled by a cult or a cabal of pedophile Satan worshiping aliens from another dimension who have occupied high positions in government, and the QAnon believers call them the 'Deep State' [129]. The QAnon conspiracy began slowly merging with various other forms of conspiracies [130]. The problem escalated during the COVID-19 pandemic. There are also slogans in the grouplike WWG1WGA which stands for where we go one we go all, [131] which was used as a marketing mantra to gather more support. They have also been blamed for hijacking the Save the Children movement and using it for recruitment [132]. The proponents of QAnon were traffickers themselves [133], and hijacking this movement provided cover for the criminals to continue their crimes.

Puppet Masters of the QAnon ARG: In any ARG there are players who control the narrative from behind the scene. These are the people who create the path or rabbit hole through which the players traverse through the media transcending ARG. QAnon has quite a few puppet masters; one of the most famous ones is the Q Map creator named Jason Gelinas, a former employee of Citibank [134]. The other two known puppet-masters are Ron and Jim Watkins, who run the imageboard 8Kun [135]. Conspiracy theorists like James O'Keefe [136], Ali Alexander [137] have endorsed QAnon, and alt-right political leaders like Mike Flynn [138] and Roger Stone [139] have all pledged allegiance to QAnon. Crowdsourced intelligence points out Jim Watkins being Q, but other theorists say that there are several other figures who decide the narrative of the game who are in touch with Watkins based on email leaks [140,141]. The figure below gives a hierarchical view of the QAnon cult, their roles, and manipulation tools in the ARG. We are theorizing this as an insect hive/herd structure to better understand their functioning.

Mergers and Acquisitions of the conspiracy theory world: Anti-vax, anti-semitic, anti-Muslim, and anti-science conspiracy theories were famous in the underground fringe neo-nazi circles. The QAnon conspiracy theories slowly began merging with these other conspiracy theories. Trump himself had supported the anti-vax movement, and it was the first time that a head of a state had endorsed such conspiracies. The new age spiritual movement, which had endorsed several anti-vax and anti-science movements, had also attracted followers to QAnon. They were peddling OTC medications and other supplements via social media. The alt-right conspiracy theorist's endorsing QAnon had e-commerce websites where they were peddling supplements. We noticed that a couple of these supplements, like krill oil, have been flagged for microplastic contamination [142]. Microplastics are composed of forever chemicals; if a person has higher concentrations of these in their bodies, their chances of dying via COVID-19 are very high [143]. This merger and acquisition exclusively to increase Donald Trump's political footprint had major consequences during the COVID-19 pandemic. The misinformation and peddling of quack cures for COVID-19 in the QAnon circles had major consequences.

Hijack of the law enforcement apparatus: The GOP and the QAnon faction of the Republican party slowly took over the entire party apparatus. The once-fringe and underground Neo Nazis surfaced in the mainstream and were elected to Congress. Candidates like Matt Gaetz, Marjorie Taylor Greene, and Tina Forte have all endorsed QAnon [144], and some have been elected to the US Government. Harmeet Dhillon, a lawyer of QAnon abiding James O’Keefe was a central figure in the anti-mask movement as she filed several unsuccessful lawsuits to counter California’s mask mandates [145] and has been actively campaigning against vaccine mandates [146]. The lawyers of the Republican Party and the GOP tried to stall the confirmation of the current US President by filing several unsuccessful lawsuits based on the conspiracy theory that the election was rigged [147]. It is widely agreed that the people behind QAnon have hijacked the entire Republican Party apparatus, and effectively it is certain that Republican Party is the party of QAnon. Harmeet Dhillon’s other associate Andy Ngo is well-known for framing activists from the left and center of the political spectrum [148].

Role of religion: Churches were COVID-19 hotspots and have contributed to the spread of the disease; religious gatherings like indoor prayer and outdoor masses have also resulted in massive infections [149]. The alt-right has its roots in hardline views of Christianity, and several people from the Church were actively into COVID-19 denial. Several Evangelicals and Catholic church figures were also peddling false cures for COVID-19 [150]. A thorough research analysis using AI to compare narratives of COVID-19 conspiracy theories with traditional Danish Christian folklore has found a lot of similarities [151]. Thus, religion and adherence to religious beliefs had a major role in the narrative of Qanon and COVID-19 conspiracy theories. Trump was portrayed like a messianic figure akin to Jesus Christ in the new testament who would save the world from evil forces; ironically, the words of this messiah were killing them.

Damage to public health: There were massive spikes in Covid19 infection rates due to the rampant misinformation on the social media by the alt-right. A study from a research group at Stanford concluded that 18 of Donald Trump’s rallies resulted in around 30,000 infections and 600 deaths. Here we are accounting for the long-term physical and mental health damage afflicted on society due to the spread of COVID-19. In Table 1, we are looking at data from various studies about COVID-19 infections associated with Trump rallies.

Table 1. Estimates of COVID-19 infections stemming from Q Anon and Donald Trump-related policies and events.

SNo	Publication	Authors	Total Infections	Total Deaths
1	Biden, Trump, and COVID-19 Infection Rates: Don’t be	Melton RJ, Sinclair RC [152]	Mean value 39,743.36/Per Million in Trump states	Mean value 721.73/Per Million in Trump States
2	The effects of large group meetings on the spread of COVID-19: The case of Trump rallies	Bernheim BD, Buchmann N, Freitas-Groff Z [153]	30000 infections resulting directly from 18 Trump Rallies	700 deaths resulting directly from 18 Trump rallies
3	The contagion externality of a super spreading event: The Sturgis motorcycle rally and COVID-19	Dave D, Mc- Nichols D, Sabia JJ [154]	15,283 and 266,796 directly via the Sturgis Rally	-
4	Differential Effects of Intervention Timing on COVID-19 Spread in the United States	Pei S, Kan- dula S, Shaman J [155]	600,000 cases directly attributed to the Trump Policies	35,000 deaths attributed directly to Trump policies
5	Spreading the disease: Protest in times of pandemics	Lange M, Monscheuer O [156]	21,000 infections attributed to QAnon related misinformation in Germany	19 deaths attributed to QAnon misinformation in Germany

Table 1. Cont.

SNo	Publication	Authors	Total Infections	Total Deaths
6	Risk avoidance, offset-ting community effects, and COVID-19: Evidence from an indoor political rally	Dave DM, Friedson AI, Matsuzawa K, et al. [157]	13,076 to 20,862 infections due to the Tulsa Rally	-
7	Trump's COVID-19 inaction killed Americans. Here's a counter that shows how many.	Jarecki E [158]	-	435,908 deaths at-tributed to Trump's inactions

Physical health damage due to COVID-19 misinformation: COVID-19 causes permanent cardiac tissue [159] and lung tissue damage [160], as per several reports. It also causes damage to the epithelial cells in the digestive tissue [161] and renal tissue damage [162]. The condition known as long COVID [163] affects a certain portion of the people who get affected by it. These symptoms persist for a long duration post the infection and affect the normal daily functioning of the patients [164].

Mental health damage due to the spread of COVID-19 misinformation: Post COVID-19 induced psychosis [165] and neurosis [166] have been reported by several studies. Long COVID affects the cognitive well-being of the patient and logical thinking skills [167]. People suffering from long COVID might find it difficult to carry on with their day-to-day work. Therefore, this can have long-term consequences for the survivors of the infection. Figure 3 illustrates the various physiological and psychological damage caused by Covid19.

Arguments towards Medical Malpractice by the Republican Party

The Republicans and the people in their close circles have been profiting off the pandemic in an ugly manner. They have been charged with purchasing shares in the company Gilead life sciences, which makes the debunked cure for COVID-19 Remedesivir, and profiting off of it in the pandemic [168]. Trump had shares in Gilead as per his 2017 tax returns [169]. The Republican party has been peddling Ivermectin, an anti-parasite drug used in horses and sheep, as a potential cure for COVID-19 [170]. A few hospitals have reported poisoning and deaths where people ate the ones meant for livestock [171]. This behavior of peddling false cures with the aim of profiteering via increased sales is a form of medical malpractice. Pushing anti-mask and anti-vaccine propaganda and thus ensuring more people fall sick coupled with quack cures which lead to deaths and therefore increase the stock prices via increased sales of drugs. The alt-right has also been promoting false propaganda on several media outlets purporting to be from whistleblowers to affect the stock prices of various firms. Pfizer has been a target of this scheme, resulting in its stock price losing points due to fake stories like their CEO being arrested [172], and debunked articles about the efficacy of their vaccine [173]. Leaked emails of America's Frontline Doctors, an organization with ties to several alt-right entities, proved they profited heavily by prescribing unproven cures for COVID-19 [174]. This proves that the alt-right profited heavily from mass deaths by spreading misinformation. They can be charged with a highly unique crime of our time a 'highly profit-driven genocide using Alternate Reality Gaming'.

Arguments for Assigning the Bio Terrorist Status to QAnon Adherents, the Alt-Right, and the Republican Party

Bioterrorism, by definition, is the purposeful spread of disease-causing bacteria, viruses, and biological toxins in the environment and contributing to actions increasing the spread of the disease-causing agents [175]. In this definition, the affected include humans and cattle, plants, and wild animals. There are several bioterrorist incidents in history that have had a significant impact on historical events. The most recent one is in China; the African Swine flu epidemic [176] was worsened by crime syndicates known as Triads. They were using drones to spray the virus on pig farms [177]. This had caused losses of several billion dollars [178]. There were other bioterrorist events like the Rajneesh

bioterror attack in Oregon [179], where a few buffet joints were purposely infected with salmonella to affect the local election outcome.

Purposeful hosting of superspreader events and flouting COVID-19 safety measures like masking and social distancing: The Trump campaign pushed lies that the virus was just the flu and pushed for the reopening of places despite repeated warnings from public health officials, which led to massive spikes in infections [180]. The Trump supporters openly flouted public health warnings, leading to massive spikes in infections [181]. This would count as a purposeful release of the virus into the environment by ensuring sick people assemble in crowded events and contribute to the increase in the spread of the virus.

Anti-COVID-19 safety measures campaigns by the alt-right: The lawyers in the alt-right tried to derail the implementation of COVID-19 restrictions during the beginning of the pandemic. They were actively pushing against mask mandates [182] and the reopening of Churches even though Churches and religious events were hotspots for COVID-19 infections [183]. These campaigns by the alt-right effectively increased the spread of the virus, resulting in massive spikes and a high death rate among their supporters. [184].

Using Social Media for misinformation: The alt-right relied heavily on using social media platforms to spread misinformation regarding the virus. Platforms like Rumble funded by alt-right scion Peter Thiel [185], are a hotbed of COVID-19 [186] related misinformation and vaccine conspiracy theories and have found a massive outreach in the pandemic. The analysis of QAnon social media accounts clearly proves that the misinformation was rampant and their blinded followers were infected. [187].

Dark Enlightenment

Steve Bannon, one of the key figures in the alt-right, is aligned with a Neo Nazi-Fascist philosophy known as Dark Enlightenment which calls for the genocide of people [188]. Alt-right Silicon Valley figures like Peter Thiel and other high-profile Silicon Valley CEOs have also aligned themselves to this philosophy. In ref [189], Peter Thiel has investments and is on the board of directors of social media firms like Facebook [190] and Rumble [191]. His firm Palantir has had ties to Cambridge Analytica, and their former chief psychologist is spearheading the COVID-19 misinformation campaign [192,193]. It is not surprising to see them killing people via the spread of misinformation since they adhere to this philosophy.

It is not surprising to see Silicon Valley firms like Verdaka, which hosted super spreader parties during COVID-19 [194], which says they clearly lack respect for the lives of others. They also had a history of sexual assault [195]. The fact that Verdaka used the FBI to harass the people who exposed this shows how badly the hijack of the law enforcement by the AltRight has taken place.

Parallels between Nazis and Other Bioterrorist Entities

The Nazis had purposefully infected the Jews and Romas with diseases in the concentration camp. The purposeful misinformation spread via QAnon, which increased the COVID-19 infections, can be equated to the same. It is also curious to see that a Trump appointee to HHS, Paul Alexander, pushed for the debunked way of achieving herd immunity by increasing the number of people infected with the virus [196]. This, coupled with the fact that QAnon misinformation led to large-scale infections, should not be ignored.

The Rajneeshis and Aum Shirinkoyo [197] purposefully used biological agents to cause harm to the masses. The purposeful spread of misinformation that contributed to the virus's increased spread is the modern-day equivalent of the Rajneeshi and Aum Shirinkoyo terrorist attacks.

Table 2 compares past cult-led mass suicides, bioterrorist, and chemical terrorist events with the overall deaths caused by the COVID-19 misinformation campaigns conducted by the alt-right via QAnon and Donald Trump.

Table 2. A comparison of various biological and chemical terrorist events, including mass suicides orchestrated by various cults and terrorist outfits and comparing them with the Covid-19 infections resulting from Trump Rallies and QAnon misinformation.

SNo	Event Name	Event Type	Perpetrators	Toxin/Biological Entity	Infections	Deaths	Source
1	Oregon diner poisonings (1984)	Bioterrorist plot to alter election outcome	Rajneeshis	Salmonella	750	0	Homeland Security Digital Library [198]
2	Botox poisonings (1990)	Bioterrorist plot	Aum Shirinkoyo	Botulinum Toxin	0	0	Sugishima [199]
3	Kameiido Incident (1993)	Bioterrorist plot	Aum Shirinkoyo	Bacillus Anthracis	0	0	Takashi et.al. [200]
4	Tokyo Subway Nerve Gas (1995)	Bioterrorist plot	Aum Shirinkoyo	Sarin Gas	5000	12	Anthony T Tu [201]
5	Jonestown mass suicide (1978)	Mass suicide	Peoples Temple	Cyanide	0	900+	Eldridge [202]
6	Heavens Gate (1997)	Mass suicide	Heavens gate	Phenobarbital	0	39	Delloye [203]
7	Marea Chemical attack (2016)	Chemical terrorism	IS	Mustard Gas	50	0	Naylor [204]
8	Matsumoto Attack (1994)	Bioterrorist plot	Aum Shirinkoyo	Sarin Gas	500	8	Olson [205]
9	al-Hasakah (2015)	Chemical terrorism	IS	Chlorine	12	0	Buluous [206]
10	Erbil Incident (2016)	Chemical terrorism	IS	Mustard Gas	35	0	Reuters [207]
11	Taza Chemical Attack (2016)	Chemical terrorism	IS	Mustard Gas	600	0	AP [208]
12	Unit Experiments (1932–1945)	Biowarfare	Japanese Imperial Army	<i>B. anthracis, Neisseria meningi-tidis, Vibrio cholerae, Shigella spp., and Shigella Yersinia pestis</i>	-	10,000	Riedel [209]
13	SmallPox outbreak among Native American Mandan tribes (1837)	Biowarfare	US Army	Variola Major	-	125,000	Churchill [210]
14	Anthrax Letter (2001)	Bioterrorist plot	Unknown	Bacillus Anthracis	22	5	Barras Greub [211]
15	Ningbo Plague (1940–1941)	Biowarfare	Japanese Imperial Army	Yersinia Pestis	-	3000	Carus [212]
16	Sydney Smallpox outbreak (1789)	Biowarfare	British Imperial Navy	Variola Major	-	50–70% of Aborigines population	Mear [213]
17	Fort Pitt Smallpox blankets (1763)	Biowarfare	British Imperial	Variola Major	-	Close to 100	Ranlet [214]
18	Covid deaths attributed to Donald Trump (2020–2021)	Bioterrorist plot	Donald Trump, the Republican Party and QAnon	SARS-CoV2	-	435,908	Jacrecki [158]

5.3.3. Loss of Individuality

Individuality is defined as the quality or traits that help distinguish one individual over the other. We all know that the use of social media through the above-explained sections brings about a loss of free will. This would empower cult-like organizations to brainwash people to think in a singular stream of thought, thereby the complete and total loss of individuality as we know it. This would be of concern to law enforcement agencies and human rights agencies. We will be discussing the tools and technologies needed for protecting free will in the next few sections.

5.3.4. Altered States of Reality

Suppose we can immerse ourselves visually in Paris today using a standard HMD VR display set. In that case, we easily understand the future, as shown in the short film SIGHT, which shows a future of cybernetic humans with AR and BCI deeply embedded in our lives. It is also easily possible to have altered states akin to the guided imagery-based hypnosis used by the cults and implant post-hypnotic suggestions, which can lead to confusion and hysterical states over which the end-user might have no control.

5.3.5. Comatose Virtual Reality and Alternate Reality Limbo

Imagine playing your favorite VR game, and you have just finished a mission, and you have landed in your safehouse. You decide to exit the game, and suddenly you find you are not able to. The floor begins to meld into a black void, and you find yourself falling into it. You remember your ancestors used to have something known as VR HMD you could take it off. Still, your 8th Generation Brain Wave XR Implant from a certain company is within your body, and you need to call the paramedics and police to help you out. What would you do?

5.3.6. Memory Erasure, False Memory Implantation and Hyper Brainwashing

This is a widely agreed concept in psychiatry and neuroscience that memories can be erased, and new ones can be implanted using methods of hypnosis [215], certain psychotherapies, and certain anti-psychotic drugs can cause memory loss as well [216]. In the case of a BCI model of the brain where all that we see, hear, feel, smell, and even taste can be monitored, should we be worried that some malicious entities might implant false memories and cause memory erasure with much more ease? Or, much worse, manipulated for their own self-interests to turn us into some post-modern transhuman race of slaves controlled via machines in cyberspace?

5.3.7. Cyber Activated Biological Viruses and Prions

Tiktok is being blamed for causing a pandemic within a pandemic, as per a few publications. The addictive social media platform has caused Tourette-like tic disorders in people [217]. This would be the first case of a psychiatric condition being manifested on a large scale by using a social media application. Facebook and Instagram have caused depression among youngsters [218]. In the future, we might see the cyber origin of various diseases.

Viruses are a few lines of genetic code; they are simplistic structures of having a protein shell storing a small fraction of RNA code or DNA code. Some of them can lie dormant in our body only to be reactivated much later, in a future where humans and machines have integrated biologically to a great extent. Is it safe to say that malicious entities could possibly infect humans or trigger a dormant virus by a few lines of code uploaded into our brain-computer interface without their knowledge.

A dormant HSV virus can be reactivated using stress [219] induced via hacking a brain-computer implant or stress-inducing acoustics via hacking your cellphone's microphone [220]. PCOD is a disease that solely affects females; industrial endocrine disruptors like Bisphenol-A can trigger PCOD in women [221]. Bad faith actors can use a combination of social media

engineering to purchase products with high quantities and trigger stress via hacked mobiles to cause this disease.

6. Ethics for the Development of Technologies Leading to the Hive Mind

The QAnon cult is an example of how collectivism can go wrong and cause harm to several people in society. Platforms like Facebook, Twitter, YouTube, and other tech giants have contributed to this issue and are still not held accountable by governmental agencies.

6.1. Privacy before Profits

The end user's privacy and data privacy should be prioritized before profits. For example, social media algorithms are well known to go through people's messages for targeted advertising. This should be avoided as future bionic interfaces will become mainstream.

6.2. Data Encryption and Destruction

End-to-end data encryption and data destruction exist in a few messaging applications. However, we need mechanisms to ensure that specific psychometric data should be destroyed after being used for purposes the end-user has provided consent for, especially for medical devices.

6.3. Voluntary Disclosure of Secrets to Preventing Corporate and Governmental Malfeasance

There must be laws to protect hackers, information activists, and people within organizations who leak information to the public to highlight practices of wrongdoing. Punishing the truth-tellers only enables the abusers and people who promote irrational, illogical ideologies that focus solely on control and profit.

6.4. Facts before Feelings

Manipulators on social media use people's feelings of hatred against themselves to further their nefarious agendas and create echo chambers. Although there must be mechanisms to prevent people from manipulating people by presenting half-truths, fact-checking tools and algorithms that are not successful have been misused by the far-right activists to shut truth-tellers. AI needs to be assistive and should not aim to replace the user. An excellent example of this is the autopilot mode in airplanes. It does not replace the pilot but rather frees up their cognitive and motor load to monitor the aircraft's vitals.

6.5. Identifying and Defusing Mass Human and Animal Experimentation

Cambridge Analytica is one of the biggest mass experiments on human beings via psychographics. Even though the firm was shut down, the employees went on to form smaller firms and began continuing the same work. There must be mechanisms that can prevent such experimentation. Strict penalties should be levied on former employees, and political parties should not be allowed on social media. In addition, there need to be other mechanisms to prevent such events from happening in the future.

6.6. New Technology Needs to Be Accessible to All

Any new technology needs to be made accessible to all regardless of their social status or disabilities. This will ensure that society develops on the foundation of equality.

6.7. Interfaces and Interactions That Promote Psychological Well-Being

Tik Tok's infinite scroll is the digital form of electronic morphine used in casino slot machines. This was one of the primary reasons why it is very addictive. However, the other interactions on social media have been known to promote depression and fatigue. This needs to be changed drastically. There need to be time limits placed within social media that automatically log out the user after a daily quota. The interactions and mechanisms of influence like likes and retweets need to be changed to feel positive after sharing content.

6.8. Breakdown of Big Tech

One of the big reasons we have the problem of fake news is because tech companies are becoming behemothic. Therefore, it becomes impossible to monitor them effectively. Thus, it is not a surprise that YouTube's and Facebook's algorithms were recommending conspiracy theories, and QAnon books were the bestsellers on Amazon. Big tech is a problem for humankind because they prioritize profits over public mental health. This was also a significant reason why these companies promoted conspiracy theories and books. Therefore, if big tech gets broken down, it would be easier to monitor them and prevent such future outbreaks of fake news.

6.9. Manual Override Options to Disconnect

Any device, especially implantable electronics, needs to have the opportunity to disconnect from the Internet manually. This can be achieved by several means, explained in the next section.

7. Free Will and Anonymity in the Transhuman Age

Let us face it; we are all psychological cyborgs, a fact that is undeniable because most of us are using cellular devices and other computing devices. When BCI, muCI, and transdermal implants go from medical devices to the mainstream, we will have reached the transhuman age. When the machines are inside us, and they begin to monitor and augment every aspect of our life, the possibility of machines taking over our free will be alarming for any individual. In this paper, we attempt to propose three different technologies that will solve this problem. We urge the community of the internet and all the proponents of the preservation of free will, including Anonymous, to go through this and make all the necessary additions to this framework.

7.1. Technologies That Ensure Preservation of Free Will, Privacy and Anonymity

7.1.1. Faraday Clothing

Today, we have Faraday bags that act like mini Faraday Boxes that prevent remote data transfer or wiping. Cyber lawyers and investigative journalists primarily use these to ensure that data remains protected [222]. If we can have Faraday bags, why not have some sort of Faraday clothing in the future? We are already seeing several commercial examples of electronic fashion accessories and conductive fabric being used by Levi's and Google to control smartphones via gestures.

7.1.2. Nanotechnology

Nanotechnology has been shown to make non-conductive substances like silver conductive by the formation of certain nanoclusters. This was used in tagging biological cells; a potential example of this is a means to locate and isolate cancer cells using a magnetic field [223]. We hope for nanorobot surgeries to treat and cure several diseases, and we hope to have cells or a membrane around our implants to ensure that our bionic brains do not get hacked.

7.1.3. Quantum Dots and DNA Storage

The privacy of data storage in bionic devices is a major concern. One way of making this discreet is by using protein-based quantum dots; applications of this technology have also been suggested in the early detection of cancer [224]. Maybe in the future, we may have some form of protein quantum dot data storage. We have also seen bacteriophages being used to create quantum dots with zinc sulfide crystals [225]. In the future, we may see viruses replace or repair the quantum dot data storages in our transdermal implants, or assemble a quantum dot to detect cancer.

7.1.4. Human, Machine and AI Ethics

There have to be standards and guidelines for designing software and hardware for bionic devices, similar to the US Army guidelines [226], that would ensure the safety of such technologies. We should also ensure free will and privacy are the foundational guidelines for such technologies.

7.1.5. Animal Ethics

Currently, there are limits to animal experimentation, and companies will have to apply for permission to test their technologies on animals. This would be applicable in the future as well; companies preparing such software and hardware will be required to go through stringent guidelines and pass certain tests before being given permission for animal testing.

7.1.6. Education

Cyber laws and cybercrime cases should be taught as part of the school curriculum. Children should be educated about the concepts of privacy and free will at a young age. They should also be educated about how such technologies can impinge on their privacy and how these technologies can be used to alter their perception of reality.

7.1.7. Governments, Law and Order

There have to be strict laws involving cyber-crimes of such nature, and strict actions would be taken if any entities were found to be engaging in such acts; they would be subjected to strict punishments. However, there should also be laws and frameworks that would ensure technologies being built are safe and reliable; like the FDA and other regulatory bodies, there should be a regulatory body for such bionic devices, which currently falls under the purview of the FDA. It should be noted that if, as a species, we are serious about privacy and free will, the nature of governmental bodies is also very crucial. Evidence points toward anarcho-capitalistic/anarcho-socialistic states combined with a worldwide monarchist night watchmen state would ensure more importance is given to human rights, freedom of speech, and freedom of the press for such issues.

8. Conclusions & Future Work

8.1. Implications of Current Findings

Hive minds are an inevitable part of our future. We are slowly being turned into nodes in an electronic hive unless we start applying our minds together; only then can we preserve the true values that make us humans. From our analysis of QAnon, it is clear that it should be classified as a bioterrorist entity and the people behind the movement, from alt-right politicians to dark enlightenment Silicon Valley tech gurus, need to be held accountable. Since this crime involved an angle of bioterrorism plus was enabled and amplified in cyberspace, we can call this a first-of-a-kind cyberbioterrorism.

QAnon did not just appear out of nowhere. There were several aspects of American culture that was primarily to blame. The US mass media had encouraged anti-science movements like fear of GMOs, vaccines, and conspiracy laden fandom like Ancient aliens and UFOs for a very long time. QAnon managed to combine all of these theories into one, which during the COVID-19 pandemic contributed to the increase in the number of infections and deaths. The purposeful spread of such anti-public health propaganda should be classified as a new-age form of bioterrorism. This, coupled with the fact that the Republican Party was profiting heavily from the same, indicates a genocide for profit scheme. Thus, it needs to be charged for bioterrorism and medical malpractice. QAnon is what you get when you combine the Rajneeshi cults bioterrorism and Heavens Gates mass suicide, but the damage QAnon caused was several thousand times the damage caused by these two entities. The leader of Heavens Gate joined his followers, but Trump and his ilk have stolen millions of dollars from his followers and killed them.

8.2. Future Research

In the future, we would like to further research the aspect of cyber bioterrorism and dissect every aspect of the ARG, including the intentions behind increasing the spread of the SARS-CoV2 virus. The researchers would also like to work on bringing forth laws and regulations that would prevent such crimes from happening in the future.

We would also like to look at the implications of a hive mind in augmented reality and see if it can improve the productivity of human beings in general. We would like to work on a hive mind-based augmented reality application that workers can use in performing coordinated tasks.

Julian Assange famously said this could be the last free generation because of the mass surveillance and the fact that parents splash their kids' photos all over social media. We need to heed his words as a warning and start putting the necessary foundations in place to preserve our freedom. The QAnon ARG-based conspiracy theory has destroyed the very idea of free will, and this was done using mobile technology, social media, and print-based medium. One can only imagine that if IoT systems and other technologies are used by such bad faith actors, they could cause many problems in the future. The authors would also like to aid law enforcement, private intelligence, and information activists to fight such sort of cyberterrorist groups in the future.

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