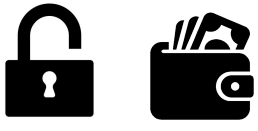
Causal Layered Analysis Ethical OS Risk Zone:

Data **Control** and **Monetization**



Sebastian Buenaventura, Alina Alvarez, Laura Ogle

Context and **Key Trends**

HISTORY AND CONTEXT

DATA **CONTROL** AND **MONETIZATION**

- The first recollections of data were in the form of ticks and count marks to **keep track of inventories** for food and perhaps population.
- **The abacus** is invented to calculate those records, new forms of discoveries arise from collecting and analyzing the collected data. **Having an impact in areas such as astrology and science.**
- Data collection in the form we understand it today, started in the **1800s with the census,** and as the census gathered more data points, more tools to gather and analyze data were needed, Herman Hollerith came up with the **Tabulating Machine** that would allow to collect data and analyze, allowing to make sense of it (he was the founder of IBM).
- Fast-forward to the mid **1900s with the invention of computers** the biggest issue was storing data, and semi-conductor memory chips were invented to replace the vacuums existing in the Tabulating Machine, and as computers started to be commercialized the need to gather more information increased. At the same time, companies collecting data like banks and enterprise institutions started seeing the value of understand the data they were gathering, in **1980s** this term was known as **business intelligence**.
- The big change comes in **1990 with the arrival of the internet**, now more data was available, more interactions with this data were happening, there was more data being generated, more data points, and more data was now being collected as a result of the internet

KEY TRENDS

DECENTRALIZED DATA

Due to the ever increasing number of data breaches, companies are creating and leveraging technology to allow individuals and organizations to own, share, and sell their data in a private and secure manner.

signal: Capital One Hack Makes Department of Defense Reconsider Amazon Web Service Contract

what: After a massive data breach on Capital One's AWS based cloud server, the DoD was forced to reconsider their upcoming $10 billion JEDI contract with Amazon citing security concerns.

so what: AWS owns nearly half of the public-cloud infrastructure market, making them a target for large scale hacking operations. Since the cloud is centralized it leaves it vulnerable to attack, many believe that to protect user data, the cloud should be decentralized using blockchain.

https://www.washingtonpost.com/technology/2019/08/01/capital-one-hack-couldnt-have-come-worse-time-amazons-most-profitable-business/

signal: Ocean Protocol Partners with ConnectedLife

what: ConnectedLife, a personalized symptoms monitoring provider for patients with Parkinson's, has partnered with Ocean Protocol to anonymize sensitive medical data using blockchain technology.

so what: Ocean Protocol's peer-to-peer data sharing platform is one of many that are popping up to explore new ways to operate in the data economy. In sectors like the medical field where patient confidentiality and privacy are of the utmost importance, the anonymity provided by blockchain would allow sensitive data to be securely shared amongst multiple clinical parties for research collaboration.

https://medium.com/datadriveninvestor/connectedlifes-healthcare-ai-journey-with-ocean-protocol-7f93309f7cd1

KEY TRENDS

DATA
EMPOWERMENT

Non-profits, governments, and other organizations are drafting regulations and promoting individual data ownership to leverage as a personal asset for social good.

signal: Proposed California “Data Dividend”

what: In Governor Gavin Newsom’s State of the State address he proposed that big tech companies should pay a “data dividend” to California residents in exchange for access to their data.

so what: Newsom is hoping to combat a widening income disparity gap in the state by adopting a plan similar to the oil dividends paid to Alaskan residents. If brought to fruition, this could lessen the burden on California families living under the poverty line who are the most affected by the skyrocketing cost of living brought on by the Silicon Valley tech boom.

https://www.forbes.com/sites/angelauyeung/2019/02/14/california-wants-to-copy-alaska-and-pay-people-a-data-dividend--is-it-realistic/#4e41b7ec222c

signal: Microsoft Creates New “Data Dignity” Team

what: Within Microsoft, under the guidance of CTO Jaron Lanier, a team is being built to empower individuals to control the use of, and take economic actions around, their data.

so what: The project explores how data creators might unionize and grow the data labor market, to the economic benefit of individuals. With numerous jobs being automated, data as labor could provide income to individuals while providing the necessary high quality data that technology requires.

https://theartofresearch.org/projects/data-dignity/

KEY TRENDS

DATA
THE ULTIMATE CONSUMER CYCLE

Data is known to be the core inside this new technological revolution, a very valuable asset in modern times, but why?
The real value of data depends on 3 key components: data capture, analyzing data and using the results.

signal: Data & IoT

what: We're facing a revolution where 21 billion smart devices and sensors can and will create/collect data by 2025.

so what: Internal sensors collect data from IoT consumer devices, such as security systems, smart appliances, smart TVs, and wearable health meters. Data are collected from commercial devices, as well, including commercial security systems, traffic monitoring devices, and weather tracking systems.

https://www.wired.com/insights/2015/03/internet-things-data-go/
https://it.toolbox.com/blogs/carmashoemaker/iot-data-how-to-collect-process-and-analyze-them-032619

signal: Data & AI/ Deep Learning

what: AI is promoting a revolution in several industries, specially in advertisement, allowing the media-buying process to be completely automated. 2019 will mark the tipping point as intelligent applications -- not people -- become the primary consumers of data.

so what: Machine learning systems are made of algorithms smart enough to understand data and draw conclusions and correlations from it. As a result, they can diagnose, predict and plan things. They can also teach themselves to become better in a certain area (media buying, for example) and improve their intelligence over time as they get more exposure to data.

https://strikesocial.com/blog/what-is-machine-learning/

https://www.forbes.com/sites/forbestechcouncil/2019/02/22/2019-data-predictions-demise-of-big-data-and-rise-of-intelligent-apps/#69463bd5753c

DATA
THE ULTIMATE CONSUMER CYCLE
CONTINUED

signal: Data collection techniques are becoming so invasive that even woman's menstrual cycles and other health related behaviours are being monitored.

what: There's a growing trend of technology designed to serve women's health needs. The emergence of femtech is yet another way that companies learn more about your personal habits, and the more that they know about you, the more that they can profit.

so what: The HIPAA compels healthcare organizations to maintain a high standard for patient information privacy and security, however, many companies aren't required to comply with HIPAA standards. For example, more than 12 million consumers have submitted samples to for-profit companies for DNA testing. Companies such as Ancestry and MyHeritage.

https://dataconomy.com/2019/09/the-rise-of-menstrual-surveillance-and-the-fight-for-data-privacy-in-womens-health/

KEY TRENDS

HYPER-PERSONALIZED DATA

Getting people's data and processing it is becoming more accessible and precise every day that passes. This is leading to a consumer understanding never seen before, where people are targeted in a very accurate and appealing way.

signal: Ads are getting smarter (and the best ones are near invisible).

what: The actual fight is wherever people's attention is, so there will be marketing and advertising people trying their best to capture their attention and sell them on doing something.

so what: It's no longer enough to serve consumer needs in the moment. "Instead, brands need to forecast what their customers might need before they need it. Predictive behaviour is where we need to sharpen our capabilities."

https://medium.com/@iamBrunoCoelho/ads-are-getting-smarter-and-the-best-ones-are-near-invisible-aa250f55acc5

signal: Behavioral targeting knows your next move and will offer you a product you still don't need (but will).

what: Companies can now formulate ads that align with the individual consumer's trackable preferences, needs, tendencies, moods and other traits that can be used to determine (and even influence) what this person wants in the future. A study of 12 ad agencies showed that targeted advertisements based on user behavior converted 6.8% compared with non-targeted ads at 2.8%.

so what: With advanced data studying and mapping of a consumer's behavior will be more accurate as superior AI-based applications can factor in multiple scenarios and patterns to suggest an individual's choice and response to particular circumstances.

https://neilpatel.com/blog/behavioral-advertising/

HYPER-PERSONALIZED DATA CONTINUED

signal: Waze is providing data to cities to help fight traffic

what: Waze users generate massive amounts of data on traffic conditions, and Waze is trying to put that data to good use. The app is offering data and analysis tools to cities via Google Cloud to help reduce traffic congestion.

so what: Genesis Pulse, an emergency services software provider, started using Waze data to give first responders real-time crash alerts from Waze users. In 40% of cases, crashes are reported by Waze users 4.5 minutes before they are called in via 911 or an equivalent method.

https://www.digitaltrends.com/cars/waze-for-cities-data-puts-traffic-data-on-google-cloud/

Causal
Layered
Analysis

LITANY

Individuals don’t know who has access to, and what is being done with their data. Increased data collection, constant data breaches, and widening income disparity due to job loss caused by automation are posing major questions for the future of Data Control and Monetization.

IoT Expansion Means Skyrocketing Data Collection

According to a study by IBM, 2.5 quintillion bytes of data are produced every day, and by 2020 it is estimated that 1.7 MB of data will be created every second for every person on earth. As the IoT expands - and more devices collect and share personal data - public debate around who owns data, and ethical questions regarding how the data is used have been raised.

https://www.forbes.com/sites/bernardmarr/2018/05/21/how-much-data-do-we-create-every-day-the-mind-blowing-stats-everyone-should-read/#523d32ac60ba

Growing the Data Economy and Labor Market

A study by the Brookings Institute found that 25% of American jobs are at “high-risk” of being automated, and with the increased power of AI and robotics, that number could rise to upwards of 70%. In the social sector, governments and NGOs are drafting policy and leveraging existing technologies to create data unions and try to lessen the ever widening income disparity gap.

https://www.brookings.edu/wp-content/uploads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf

Frequent Data Breaches Lead to Calls for Decentralization

In the first six months of 2019 alone, 3,800 data breaches have been publicly announced - exposing over 4.1 billion records. In response, new companies - Ocean Protocol, EcoSteer, StreamR - are popping up, using blockchain technology to anonymize personal information and transform the layperson into their own data broker and participate in the ever expanding data economy and labor market.

https://www.forbes.com/sites/daveywinder/2019/08/20/data-breaches-expose-41-billion-records-in-first-six-months-of-2019/#6be3050cbd54

Hyper-personalized Data Collection Increases Effectiveness of Targeted Ads and Propaganda

An experiment out of Cambridge University showed that there was statistically significant evidence that tailoring digital campaigns to consumers - using hyper-personalized psychological targeting through data collection - was highly effective as an approach to “digital mass persuasion”. They concluded that with the increasing number of devices through which data can be collected, the power of these campaigns will become increasingly effective.

https://www.pnas.org/content/114/48/12714

SOCIAL CAUSES

The public's knowledge of Data Control was thrust onto the global stage in part by the Snowden revelations of the NSA surveilling the personal data of citizens, and further reinforced by the Cambridge Analytica scandal. Individuals began to realize that most activities performed on internet-connected devices were being tracked and stored by service providers. Public sentiment towards data collection took a further hit when it was discovered that many "smart" devices like Amazon's Alexa recorded audio and stored it on Amazon's servers. This breach of privacy, and others like it, lead to a general distrust of large tech companies; but many people have chosen to ignore these affronts to their privacy because the services tech behemoths provide are so convenient, powerful, and fully integrated into everyday life.

In regards to Data Control and Monetization, the worldview level explores the interplay between a person's right to privacy, and participation in a capitalist society.

In the past, this dynamic between protecting personal freedoms, and supporting a capitalist system that values profit above all else was complex, but more manageable on an individual level. The common person could easily control which of their personal information was released and when. However, with the advent of the internet, people - often unknowingly - signed away their right to privacy in exchange for the use of necessary digital tools. As "free" online platforms become ubiquitous, how can individuals balance their desire for privacy, with the need to use said platforms to communicate and compete in the workforce?

MYTH & METAPHOR

Myths and metaphors surrounding Data Control and Monetization speak to the concept of value creation in a capitalist system, deep-seated ideas around individual privacy, as well as Orwellian notions about the dynamic between information control and power.

- Nothing in life comes for free.
- If it’s free - you’re the product.
- You get what you pay for.
- You can’t get something from nothing.

- “Big Brother is watching you.”
- A man’s home is his castle.
- Information is Power.

Future

Scenarios

Sebastian Buenaventura

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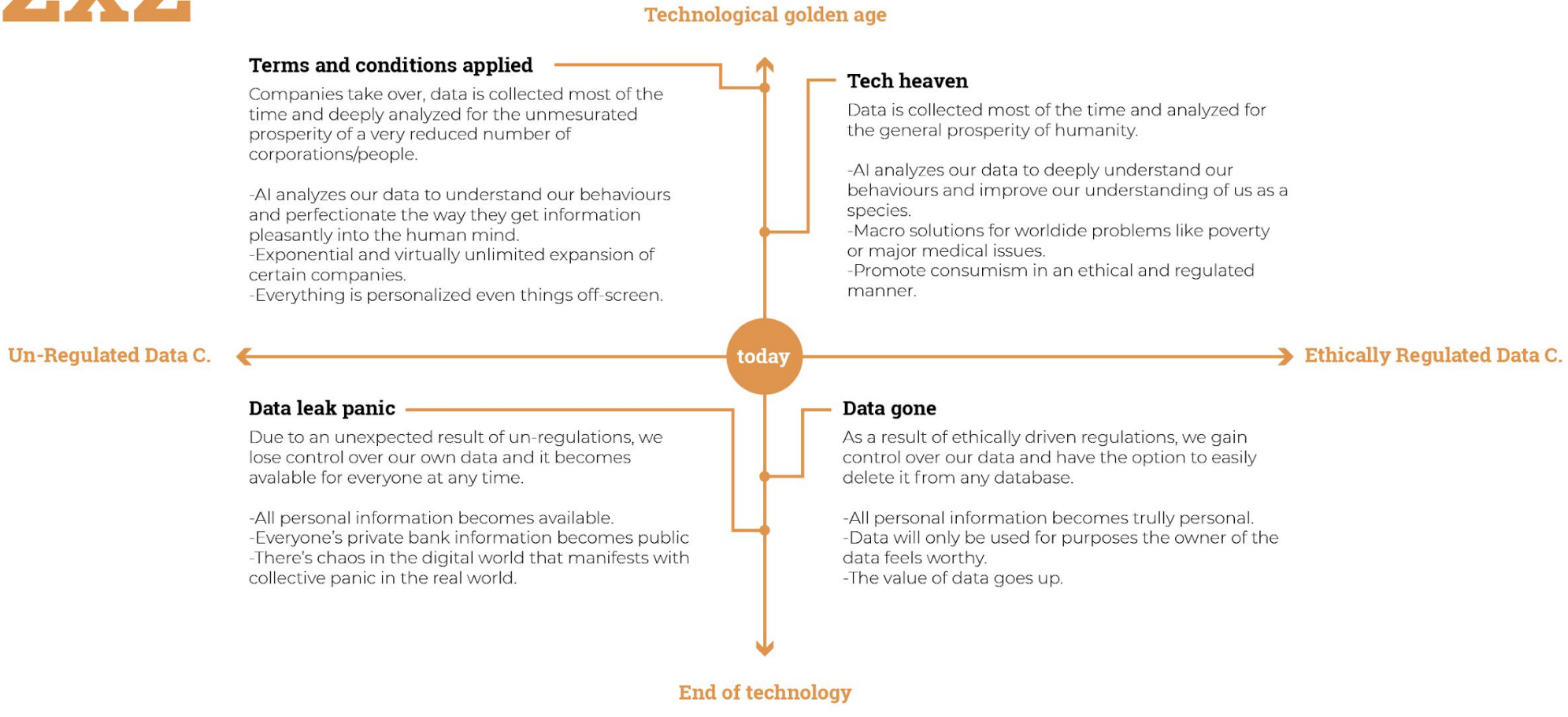


Laura Ogle

Alternative Futures

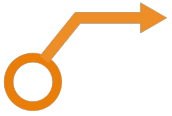
Growth: **Everything is Connected**

The age old adage “everything is connected” has never been truer. Over half a trillion devices are connected to the internet, collecting multiple terabytes of data per person per day. Machine learning has advanced so quickly - due to the never ending stream of data - that digital assistants anticipate and accommodate your needs before you even think to ask.

Sidewalk trash can sensors alert the municipality’s sanitation division that it’s time for a pickup, your coffee maker and shower communicate with your alarm - postponing operation with each tap of the snooze button - to prepare your optimal morning routine, and your autonomous carpool gets you to the office in precisely 13 minutes due to a highly optimized route. Life is good… if you can afford it.

Following the Big Five merger in 2026, 76% of the world’s wealth lies in the hands of 10 people. The income disparity gap is ever widening, and its effects can be seen the further out from the city center you choose to travel. Digital nomads, displaced by skyrocketing cost of living and suffering from technological burnout, have convened on the outskirts of town where they have self organized - tending to community farms, creating makeshift schools and hospitals, and syphoning resources off the city’s grid.

Constraint: **Democratized Data**



Mounting distrust in the security of personal data collected by tech giants, growing public disgust with the extreme wealth of tech CEOs, and unparalleled job loss due to advancement in robotics and AI capabilities - it is estimated that unemployment rates reached 88% - culminated in the data labor riots of early 2027. Protesters staged sit-ins in tech lobbies, and organized a tech blackout - turning off all IoT devices and going fully off the grid for a week - causing a major stock market crash, the effects of which were felt across the globe.

Grassroots organizations that had been trying to promote individual citizen participation in the data economy and labor force gained prominence over night, the United Data Creators union was formed, and many presidential campaigns ran on the platform of distributing data wealth to the masses. Following President O’Neill’s inauguration in January 2029, Congress drafted and unanimously passed a joint resolution that forced data collecting organizations to pay significantly higher taxes - with the stipulation being that funds be used to develop a data fund that benefited all individuals - and a CEO wage cap was implemented.

The US Department of Data was created to oversee and regulate data collection, and a data branch of the US Treasury focused its attention on equal distribution of funds to all residents - stimulating a resurgence of the nearly extinct middle class.

Laura Ogle

Alternative Futures

Collapse: **Going Darq**

After the 2024 election, anarchist hacker group DARQ coordinated an attack on the 400 largest hyperscale data centers - wiping all servers and their backups - causing a global internet collapse. International financial institutions went dark, digital news media outlets - and their entire archives - were wiped, and massive social media sites decimated. Loss of critical patient data crippled the healthcare industry, and governments were plunged into chaos.

People lost everything. As cloud storage capacities increased and costs diminished, very few people kept any physical records or personal backups, and came to depend solely on the highly touted reliability of the cloud. Videos of grandma making silly faces, important business emails, whole digital identities gone in an instant. The loss of these digital memories was painful for many, and led to a resurgence of analog technology.

The recovery was slow and deliberate. Having lost blind faith in the infallibility of the internet, individuals banded together to build a decentralized cloud, less vulnerable to attack. Some people rejected the internet all together, returning to a way of living akin to the late 20th century. The internet has yet to regain as much power and influence as it did in its heyday of the 10's, and many believe that it never will.

Transformation: **Big Data Goes Small**

Thanks to biotech advancements - catalyzed by Helinux Bioindustries picotech breakthrough of 2030 - all living things can be connected to the IoT. Atomic-sized machines attach to DNA, and constantly transmit data to the cloud. These pico-chips track mood and health data, syncing with other IoT devices to create hyper-personalized recommendations. Tired of trying to figure out which restaurant to go to with friends? The group's bio-data is aggregated, synthesized, and cross-referenced with local restaurant reviews to come up with a suggestion that is most likely to please all parties.

Experiments have been run with this burgeoning technology in which upon detection of a new disease in a host's system (be it human, animal, or plant), the CDC/USDA is alerted with a genetic snapshot of the disease, and the cure is created by running globally crowd-sourced bio-data through AI that tests all possible permutations of the disease against combinations of all known medicinal compounds; finally the antidote can be downloaded wirelessly and generated within the host through gene editing.

Though the technology is rather new, its effects are already being felt across the globe. The predicted average lifespan in countries where the technology has been implemented rose drastically between 2032 (when it became commercially available) and today, jumping from 85 to 102 in the span of two years. Critics of the technology warn that, coupled with rapidly growing population sizes, this increase in lifespan would push the globe past its physical limits.

Alina Alvarez

Systems Mythology

Joana, Chicago, 7 am.

Good morning Alexa, please open up the shades, read me my calendar, and let me know what the weather will be like today. Thanks Alexa. While I get ready for work, please review what's going on in the world, I could use some money for this biohacking product I just heard about, I can increase my focus, reduce my hunger and enhance my memory with just one pill, effects are supposed to last 3 years with a 6 month treatment. Can you please go over to Google's Personal Data Market and let me know who's buying what and for how much? Actually, can you just run a test of what data I would make most money from selling, I need about $2000 in about a month. Alexa, just remember I am still hiding from my creepo virtual ex, so please make sure no personal data of where I am and what I'm doing goes public, I'd hate to have to report him to the cyber police again.

Randy, New York City, 8 am.

Alarm sounds from radio signal, “Randy, Randy” are you there? -voice comes out of the radio machine on top of his night table. Randy, we may have a situation. This morning the Street announced a new company going public at the expense of their users, the valuation of the company is actually considering accumulated data points from user’s as part of their valuation, they binded their terms and conditions into unbreakable contracts that users agreed upon with no notice of how their data was going to be used. There’s no personal data attached to individuals, but let’s say people are angry and taking it into the streets. Randy this is going to get bloody, they are anticipating this to be one of the biggest boicots to the technology industry and worldwide economy, they need you Randy! You have to go out there and show up. Dress up on the red cape, will meet you on Floor 83 in 20 mins, fly fast!

Natalie, BioHills City, UT, 10 am Q

Gets off her bike as soon as she reaches the dirt path that leads into the human-made jungle that surrounds her lab. Her bluetooth ear bud named “charlXs” is giving her a summary of her day so far, “Natalie, good job, 10 kms by bike, today you’ve burned 400 calories on this ride and you saved 4.8 pounds of CO2, you’ve done great! This week you’ve saved 15 pounds of CO2 by biking and not eating any animal products, your appliances have been saving you a ton of emissions as well! Remember, you can exchange your CO2 emissions at the end of the month on the Ecological marketplace, you have enough to upgrade your bike Nats! Before I go Nats, I’m ordering you your favorite sub today, your calorie count seems low for your goals, vegan cheese or regular? My recommendation is regular so you can meet your nutritional goals.” “Thanks CharlXs, yes, regular cheese is fine, have it delivered by noon”. She enters her glass dome office, made of half floor to ceiling glass and half plasma screens. She picks her seat, a deep tissue Swedish massage chair in the middle of the room, adjusts her chair to face halfway the screens, and half way the windows. ”CharlXs, please inform the chair to focus on my previous body scan, I have a one hour interview with the NY Times, I would love to get these knots off my body."

“This is Natalie J. from BioHills City. I am one of 100 data analysts at the data center for the city of BioHills. We’re an autonomous-non-government smart city in the middle of the State of Utah. We started as a digital biosphere experiment, after 3 years of launching we currently have more than 100,000 people living here. Our city’s atmosphere is composed by 5 types of ecosystems some natural some artificially recreated. Everything in the city has been planned by the visionary founders, but they hold no decision-making power in our city. Everything is measured ahead of time, once a year we look at our goals and then we feed the system with every citizen’s data. This is a policy that every citizen who moves here has accepted, and every action is tracked from your mobility to your food consumption. This is a free-market society, but the bottomline of the businesses is to meet our society’s co-living principles and our city’s goals, rather than personal profit. People make decisions of what they eat or how they move based on the data available in our city dashboard and app, businesses arise and go out of business on the same principle.” – So, what happens if someone is not contributing to this economy? – “Well, the dashboard doesn’t show names per-se but there’s definitely a way to track who is not contributing enough, we have a once a year contribution evaluation, it’s the equivalent of other market’s tax payment on income, but here you can get kicked out of our city if you’re choosing to not contribute, as easy as that. As I said, our bottomline is the sustainability of our biodynamic city. Thanks, come visit anytime, we’ll send you a link to register to our city and be granted access."

Aaron, Austin, TX 12 pm

Leaves office and goes to therapist's office. Hello Robo, I'm here to see Dr. X. Enters a consultation room and sits on a couch, a camera on each side of the rooms are pointing to the couch getting a full view of Aaron on the screen. He puts on his sensors, covering brain, heart, and strategic body parts. On the other side of the screen, he meets his human therapist currently working out of a Sahala in India. In the room, there's Dr. X, the robotic support that has full access to Aaron's waves from the sensors, as well as all of his social media accounts, text messages, and emails. The therapist initiates the session by playing a live mantra streamed directly from a different room in his Ashram, Aaron is asked to relax and follow the meditation, in the meanwhile Dr. X is monitoring his pulse and waves and will inform the therapist once Aaron is in ideal state of receptivity. If Aaron doesn't come in with a particular topic to work with, Dr. X will suggest a number of topics that it has analyzed as a result of keywords captured from conversations by Siri, Alexa, and Google Home, pairing those with moments in time on social media. Dr. X picks the day Aaron was told by his girlfriend she wasn't feeling the same way, before Aaron gets the chance to speak, facts are brought up to the therapist. At 9 am your heart rate dropped when you received a text from her saying "Aaron, we need to talk, block tonight for us", before knowing what this was about you engaged in a total of 45 minutes mindless scrolling of instagram, you spent 15 minutes stalking her and 20 minutes looking at texts from her from the past. Your productivity at work was low, your brain waves were overthinking for over 5 hours, this led to an inability to remain positive and open to her. You came in with strong muscle contractions, lots of resistance, and you interrupted her 4 times during dinner. That's all Dr. Ez, let me know if you want me to dive deeper

Artifact
from the
Future

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WORLD NEWS

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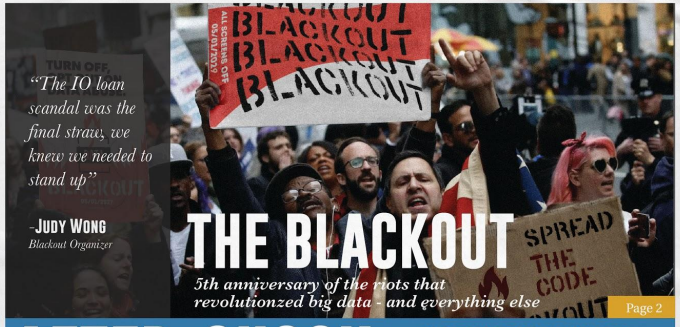

"The IO loan scandal was the final straw, we knew we needed to stand up"

-JUDY WONG
Blackout Organizer

THE BLACKOUT

5th anniversary of the riots that revolutionized big data - and everything else

Page 2

AFTER-SHOCK

FIVE YEARS AFTER THE RIOTS, THE EFFECTS OF THE BLACKOUT CAN STILL BE FELT TODAY - A TIMELINE OF THE POLITICAL RAMIFICATIONS

ECONOMY

HOW THE DATA CRISIS AFFECTED MARKETS ALL OVER THE WORLD

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Catalyzing a Nation

HOW DIGITAL COMMUNITIES SPARKED A MOVEMENT THAT SHOOK THE PHYSICAL WORLD