

9/1/2015



UNITED  
STATES  
COAST  
GUARD

EVERGREEN IV SCENARIO:  
THANK YOU SERVER, MAY I HAVE  
ANOTHER?

## Drivers

### Influence of Technology

**High: Radical.** Technology drives change and influences policies, with dramatic impacts on society. New technologies are pervasive and constantly changing. Use and application are innovative and unconstrained. Technological advancement is highly incentivized. Change is erratic and its impact on society unmitigated.

### National Stability and the Role of Government

**Low: A Divided Nation.** Democracy is a facade. It still exists on paper but not in practice. Participation in the governmental process is at historic lows. The regulatory and enforcement role of government continues. The exercise of governmental functions and extension of benefits is inconsistent and based on special interests that clearly select winners and losers. There is no common national vision, and society is increasingly fragmented.

## Overview

The Internet of Things is a reality, and cutting-edge technology pervades most industrial processes. The virtual world is a booming business, and society oscillates between reality and virtual reality in every aspect of living. The unprecedented blending of reality and the virtual world leads the public to believe that it is possible



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*Technological advancement is king, and those driving it reign supreme in the global marketplace.*

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*Patriotism has deteriorated to an all-time low. Individual needs are met by private industry.*

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*Efficiency dominates the cultural psyche and has eroded public sympathy for the less fortunate.*

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*Corporations' automated global supply chains provide ample opportunities for TCO exploitation.*

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*Surveillance is sophisticated and ubiquitous, but humans still control the cameras.*

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to achieve both prosperity and safety by retreating into an alternate virtual reality. There is insatiable thirst for the latest technologies, and advancements are regular and commonplace. Predictive analytics drive lifestyle decisions from recreation to health care.

For most, life is good. An abundance of natural resources, steady industrial output, and life-enhancing technologies instill widespread optimism. Global markets benefit from consumer confidence: Volatility is down and growth is up. Individual disposable income has grown. The central utility supply concept has evolved into microgrids and smart homes as individual dwellings now capture, recycle, and

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This is a plausible future scenario, part of a composite set designed to form planning space for foresight efforts. It is not intended to be predictive, nor does it represent the U.S. Coast Guard's assessment of the future.

treat water. They generate power share energy with other consumers.

Cynical pragmatism pervades national government. Laws are enforced unevenly across socioeconomic strata. Property and individual rights are not respected at the national level. Those living outside strong, corporation-affiliated communities are easy targets for auditors. Government alliances with nation states, companies, or even Transnational Criminal Organizations (TCOs) are dependent on the perception of advantage vice ideology. Elected officials consistently attempt to take credit for technological advancements to enhance their reelection prospects.

Nationalism and traditional values decay, and participation in the electoral process declines. The federal government is reduced in size and scope and focuses on basic services such as national defense, infrastructure, and regulation. The population enjoys a fast-paced, ever-advancing world and is determined to limit government interference. Sectors of the population are opposed to technology and what they perceive as illegal surveillance and government intrusion in their lives. Extremists in the Luddite movement perpetrate domestic terrorism against technology infrastructure.

Private industry and the government share an old foe: Transnational Criminal Organizations. TCOs take advantage of advanced technology and limited government reach to expand a booming black market. They leverage volatile cyber technology against individuals and corporations to steal wealth and intellectual property. Safeguarding information has become increasingly difficult. Black market innovation typically outpaces public and corporate efforts, and the latest protection technologies become obsolete shortly after implementation.

Lines that once distinguished legitimate enterprises from the corrupt have blurred. The same lines can be redrawn by manipulating public opinion. Such power may rest with the government, TCOs, or charismatic corporate figureheads, depending on the prevailing location or economic sector.

Talented workers and those with potential are in high demand by public and private sector entities. Competing interests provide scholarships, ensuring affordable education for those who qualify, but restricting career choices. Scholars are limited to the field of study that their benefactors dictate.

Technology optimizes the entire Maritime Transportation System (MTS). Ubiquitous automation and unmanned systems reduce crew sizes on ships and workforces at commercial ports. Efficient processes lead to increased commerce on the nation's waterways, and ports expand and automate steadily. Most processes are fully automated, allowing ships to pull into port, unload their cargo, and ship it to any location in the country with virtually no human involvement. Manufacturers ally with shippers, commissioning ever-expanding corporate fleets. Global common governance is tenuous at best and outright lawless at worst.

## Vignette

## Global Automated™ Shipping

The banging jolted Clay awake. Heart pounding, it took him a moment to realize it was very loud knocking on his door. He sat up, swung his legs off the bed, and activated his comms portal on the nightstand. The screen came to life and showed his partner, Mira, standing at the door. She noted his unshaven, bleary-eyed appearance and glanced pointedly at her smart watch. She was ready to leave the hotel and get back to Headquarters.

“I still can’t believe you were in the military. I’ll be downstairs.” She secured the channel, and he could hear her purposeful stride moving down the hall.

Mira had anticipated Clay’s tardiness. Her inbox was filled to the brim with messages, reports, and internal memos that needed attention. They had taken a backseat to casework, and she would work on them while Clay got ready. The technology to streamline messaging was out there, but the FBI had not seen fit to make the transition. She was hopeful the incoming director, known to be innovative and tech savvy, would pave the way for a more tech-centric FBI. In the meantime, she would begin ploughing through the mess. With a latte.

Clay had grown accustomed to Mira’s high-strung ways. He never overslept as a Marine, but his current job afforded a few small luxuries that he dared not bypass. Mira would just have to deal with it. Not that she didn’t in style. He knew well that she was using the time to catch up on admin.

As Clay roused himself, the room came to life. The lights gently illuminated and the shades slowly receded. A brilliant sunrise flooded the space with a warm glow. The intoxicating aroma of Molokai coffee pervaded. His favorite sports station was playing softly. He heard the shower turn on, no doubt warming to precisely 95 degrees. The scent of eucalyptus drifted out of the bathroom with the steam. Clay knew he would never be able to go back to non-programmable hotel rooms.

Even after a solid night’s sleep, he was still exhausted. The cyber case they just closed had taken three months of heavy and taxing investigation. It was the first time he had worked such a complex case that crossed so many jurisdictional lines. Fully a dozen federal agencies had been involved.

He walked to the desk, placed his hand on his tablet, and held still for two seconds. A polite beep indicated that he had been logged in and his vitals taken. He begrudgingly obliged the Bureau in their intrusive surveillance. It was a condition of employment. It was not lost on him that if he was deemed a health risk, he would be dismissed. The trick would be to get out just before something derogatory appeared in his official record. Waiting too long would severely compromise his future employment prospects. Assuming he was interested in a third career. All but one of the readings were green. The solitary yellow was beginning to trend toward red. As usual, the program was harping on him and providing its little electronic advice. He knew

what pre-diabetics were supposed to do. He just wasn't interested in doing it. He ignored the machine and headed for the shower.

Coffee consumed, morning ablutions complete, and bag packed, he departed the very pleasant room en route to the very pleasant lobby for breakfast.

Mira had secured a comfortable corner table. She held a mug of coffee and appeared to be scanning other diners through her sleek eyeglasses. He knew she was actually drafting an email. The electronic hocus pocus in those glasses translated her brain waves and transcribed them to an augmented reality overlay projected onto the lenses. He joined her. A server passed him a menu on his way by, promising imminent coffee. Mira glanced at him between lines.

"How was the reading?"

"I got dinged again. It was probably the drinks last night. Great bourbon, but the ol' pancreas can't handle it anymore."

"You should try red wine. It won't spike your blood sugar. Did you schedule an appointment?"

"Why? So some doctor can tell me what I already know? And thank you for your concern. But you can keep the wine."

"I'm just worried about you. I don't want to see you tossed out before you're ready to go. And I'm finally getting used to you."

"Thanks, Mira." He contemplated the yellow-turning-red dot over breakfast, while Mira worked through her inbox.

They checked out of the hotel and found their ride waiting for them. Just outside the front door and clearly marked as reserved.

"New FBI Headquarters." The vehicle responded to Mira's voice command in the affirmative, and it got underway. They settled back to enjoy the smooth ride, made fast and efficient with multiple data inputs on traffic conditions and construction. They had little time to relax and think about nothing in the wake of their toughest case. Their tablets alerted them to a new upload.

"Hmm. Fourth cyber breach this year for GA Shipping." Clay glanced at Mira, also inspecting the brief. "Aren't they out of Norfolk?"

"Yeah. They're a big one. And I thought they cleaned up their act after the last attack. I suppose it would help if Congress could establish some baseline regulations."

"I'm sure they could, if all the lobbyists were kicked out. Less money might mean more progress."

“I just wish they’d realize we’re on borrowed time. Unless we go on the offensive soon, we’re bound to see a fire sale scenario.”

“You’ve been watching too many old cop movies.”

“Hey, the term is still relevant. And accurate. Everything must go!” They read on in silence. The brief disclosed that GA Shipping had continued to refine their docking, loading, and navigation algorithms. They remained top tier in terms of shipping volume, on-time delivery, and, of course, competition for government contracts. However, they had invested little in cyber security. The most recent attack demonstrated that they were woefully behind the power curve on that front.

Attacks on GA had increased proportionately to the firm’s improved earnings and expanding reach. Increased potential for damage meant increased appeal as a target. Pervasive automation meant expanding avenues of attack and growing opportunities for mayhem. Ships could be targeted in port or at sea, anywhere in the world. And GA’s poor cyber security had left the door wide open.

The vehicle informed them of their new ETA: 0930. They would have time to finish the case brief prior to arrival and meet with a few colleagues before their appointment with the Director. The reading was nothing if not interesting. Five GA container ships had gone dark. They were no longer transmitting, all means of location had failed, and GA had no idea where they were. This was a new one. The perpetrator had infiltrated the company’s systems and unrelated, external sensor arrays, many of which were operated by governments. That constituted an attack on an altogether different level. They were dealing with a top-shelf adversary. Another unique feature: All were carrying cutting-edge vaccines and medical equipment. Some of the latter was classified “critical to national security.” Clay spoke up.

“What do you think? Ransom or theft?” Mira mulled it over for a few seconds.

“Making five ships disappear is impressive, I’ll give you that. But I don’t think these guys believe they can keep them hidden indefinitely. I believe our bad actors assumed a limited time window from the outset. They haven’t reached out to make any demands, let alone time-critical ones. I think they’re going to offload what they want and scuttle the ships in the middle of the Pacific. And we’ll be none the wiser as to what they took and what they left.”

“I think your theory is solid. We’ll operate on the assumption that we have very little time to figure this one out before the damage is done. And I was really hoping for some downtime.” They drafted lists of people they needed to consult and questions they needed to ask. Something caught Clay’s eye and he looked up. He wished he hadn’t. It was the construction project moving the Marine Corps memorial. The magnificent shrine was deemed to be occupying valuable real estate that could be sold for other purposes. Like condominiums. He felt Mira’s hand on his and looked at her. There must have been fire in his eyes.

“I’m sorry, Clay. It’s not right. It’s disrespectful.” Clay sighed.

“I suppose it’s a sign of the times. I signed the petition against it. So did every other Marine. Can you believe it? The signatures of the entire United States Marine Corps weren’t enough to keep it where it is.” Mira had been one of a mere handful of civilians to sign. The rest of the country just didn’t care. Beyond their latest gadgets, there was little people were concerned about. They made the rest of the trip in silence.

Clay reflected on other changes he had seen during his lifetime. Some were bad, like the desecration of the Marine Corps memorial that so many called “relocation.” Others were good. The Dulles Toll Road was now an elevated express monorail. Magnetic levitation moved cars in excess of 100 miles per hour, finally shortening the historically interminable commute from cities like Tyson’s Corner and McLean to D.C. Another example of the bad endlessly passed the windows. Building facades had been covered in electronic billboards. Not a square inch of space was wasted when it could be used for advertising.

Not a byte of bandwidth was wasted, either. He finally bought one of those high-speed nano fiber energy shirts, and now his data interface suffered an onslaught of ads for similar products. All of his efforts to turn them off had been in vain.

The gravity of their new case was brought into sharp relief upon their arrival at Headquarters. An agent was waiting and whisked them to a briefing room. There would be no time to call on those specialists after all.

They had barely taken their seats when the brief began. The outlook was grim. Jim Hammond, leader of the highly talented and effective cyber team, indicated that there were no suspects, and the facts of the case matched no known patterns. Even the FBI’s advanced ship monitoring system, Hull Pass, had been defeated. The five ships had simply vanished off the face of the Earth.

Given the caliber of the specialists seated around the table, it was all really bad news. The Bureau had the pick of the litter in a saturated cyber engineering market. They had already thrown the best minds in the country at this case, and were getting nowhere. A hologram of the Chief of Staff appeared and addressed Clay and Mira.

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*The future of shipping has arrived.*



“The Director is ready for you.” They thanked Jim and his team and made their way to the top floor. A screen in one of the halls identified their data ports and congratulated them. *Thank you for your dedication in protecting our national security and providing excellent service to the Navy’s 5<sup>th</sup> Fleet and the Arctic Council!* Mira elbowed Clay in the ribs and pointed to the screen. He had been deep in thought and hadn’t noticed.

“Well, at least that screen thinks we’re doing a good job.” Mira chuckled. Clay always saw technology as a separate entity rather than an extension of human will.

They arrived at the front office as the Director was seeing two guests out. They looked like they had barely graduated from college.

“Thanks, Simon. We really enjoyed your presentation. I think you have a lot to offer our agents in the field. We’ll be in touch.” The young woman spoke up.

“Thank you, Director. You have Mr. Stanislaus’s direct line, as well as my own. I am available twenty-four hours to answer any questions you may have.”

“Thank you, Miss Hattin.”

*Simon. Mr. Stanislaus.* Clay knew why the young man looked so familiar. Simon Stanislaus had graced the cover of every technology and business magazine in publication. He was being heralded as the next Elon Musk. At seventeen, he launched a sophisticated car sharing app. Today, at twenty-three, his accomplishments were too numerous to count, and he was a market force and technology titan.

Simon gave Clay a little smirk as he passed. Clay’s instincts prickled. He didn’t have a good feeling about this young upstart or his motives. The Director greeted them with a warm handshake.

“Clay! Mira! Great work over these past three months! I really wish we could give you some time off. Unfortunately, no good deed goes unpunished. Please, come in.” He ushered them into one of the most secure offices in the United States and invited them to sit. Their eyes landed on the room’s other occupants, and they both started.

“I’m sure you would like to know why Sherry Paulson is here.” Clay didn’t reply. His mind was awash with memories. Chief among them was sending her to prison for life. She had masterminded a cyber attack that funneled billions of dollars out of banks worldwide and into multiple TCOs.

Sherry Paulson’s skills began as adequate and graduated to doctorate in just three years. As a high school freshman, she hacked her school’s wireless printing system to change a grade in Physical Education. Before she graduated, the FBI arrived at her family’s home to inquire after an IP address used to steal a small amount of money from a Fortune 500 company. Through three hours of questioning, Sherry demonstrated impressive poise. She confessed to stealing the money to pay for clothes her allowance didn’t cover. The FBI didn’t press charges, but required her parents to confiscate her computer. Those experiences only fueled her desire to harness the power of cyber space.

As Sherry improved her skills, she was recruited to carry out pranks on corporations, schools, and individuals. In her late teens, she acquired and leaked scandalous photos of a politician who was drafting legislation to heavily regulate the Internet. Within a few years, Sherry graduated to



an elite team of hackers that carried out sophisticated attacks on companies and stole millions of dollars.

She traveled the globe and built networks of contacts that provided information critical to infiltrating many of the world's largest companies. As success compounded, she became overconfident. For the score that proved her downfall, she skipped the deep background check and inadvertently enlisted the help of an undercover FBI agent. She failed to practice sound operational security and allowed her "accomplice" access to her cloud files. He found the Jigger Fly virus: her calling card. During her trial, the agent's testimony detailed operations that produced billions of dollars in losses for investors. A few managers committed suicide after their clients' entire portfolios were lost.

Clay's hard work undercover and on the stand paid off. The jury found her guilty, and sentenced her to life in prison after ten minutes of deliberation.

"Ms. Paulson will be consulting on this case. As you can see, she has a handler who will be with her at all times." Sherry was, in fact, handcuffed to her handler, who looked like a Swedish thunderhead, desperate for an excuse to beat her charge senseless. The Director noted Clay's scowl and Mira's concern.

"Trust me. If this case weren't absolutely desperate, she wouldn't be here. She'll be going back to the federal pen the moment her services are no longer required." Mira was suspicious and concerned for Clay.

"What does she get in return for cooperating?"

"Absolutely nothing, apart from one last field trip outside her cell. But now, we need to focus. We have to recover the cargo. We have to do it now, and it has to be intact."

Clay and Mira spent the rest of the day building their task force. It was a motley, multi-disciplinary crew comprising shipping experts, medicine and drug specialists, and white hat hackers. Members of sister agencies joined to ensure the team would have all requisite jurisdiction. The medical specialist provided a particularly riveting brief.

"The stolen cargo contains predictive medical devices and non-FDA-approved drugs capable of mutating cancer cells and genes. Perhaps the most important of these is a new compound called PX914. Some background is relevant here.

The Congressional Budget Office dramatically underestimated the annual growth of Medicare and Medicaid costs. The public is outraged by the tax hikes for government health care, but they're caught in a double bind. The only way to gain control over the exploding costs of existing obligations is to rescind commitments, retract support for the needy, and stand by as various maladies thin the ranks. PX914 holds promise for addressing some root causes of our budget dilemma." Mira didn't at all like the oblique language, or what she felt the specialist was implying.

“Can you clarify that? What, exactly, does PX914 do?”

“I’m afraid that’s classified.”

“So, I’ll just assume that it’s meant to kill people while masquerading as aggressive cancer.” The specialist looked horrified. Mira continued her assault.

“Tell me, then. Why shouldn’t we be investigating the sickos who commissioned this stuff? Warning the public that government health care can’t be trusted, and now Uncle Sam’s little horror is in the hands of unknown actors? Not that that’s more dangerous than the previous status quo, of course.”

“I can assure you, PX914 is not designed to –

“To what? ‘Address root causes of our budget dilemma?!’” Mira’s tone and air quotes dripped with sarcasm and disgust. She was about ready to come across the table, and no one seemed eager to stop her. In fact, the rest of the team was also looking expectantly at the medical specialist. He continued to splutter.

“Tell you what. Let’s knock off for now. Why don’t you scurry off and get whatever authorization you need to give us the straight story on what this stuff does.” The brutalized man couldn’t leave the room fast enough.

It was past 2000. Mira leaned back in her chair and put her hands over her face. She exhaled loudly. She felt Clay squeeze her shoulder. No one else would dare to do that when she was in “kill” mode. Mira thought everyone else had left the room when she heard links of handcuff chain and two sets of footsteps.

“I know it’s late and everyone is exhausted, but can we talk?” Sherry and her handler had approached. Clay was too tired to tell her what he thought of that idea.

“Why not? Have a seat.” The handcuff-linked women chose two seats on the other side of the table, and the inmate told her tale.

“The theft of the five ships is unique, but it bears some markers of an organization I’m familiar with. I believe this is just the tip of the iceberg.” Clay and Mira were now wide awake. Sherry continued.

“Some Eastern governments retain the services of a certain TCO to infiltrate major port control networks. The constellation of facilities under their control is expanding. I believe that, once they achieve critical mass, they will act at an opportune moment. I also believe that the five ships and their cargoes play into the plan, but I’m not sure how.” Mira was recording details.

“Can you name the organization and the countries involved?”

“Yes. I can also give your technicians some idea of how to find and patch the breaches.” Clay’s mind was on the bigger picture.

“This can be construed as an act of war.” Mira agreed.

“We have to move this up right now. I didn’t think anything could eclipse our disappearing ships.”

“And I didn’t think our own government would be as sloppy about security as GA.” Sherry was becoming increasingly uneasy.

“Can you get me into witness protection?” Mira glared at her as she called the Director’s assistant, but Clay answered.

“We’ll see. We may be able to move you into a different prison.” Sherry’s distress became more acute.

“The governments and organizations involved are powerful. I believe they’ll find me.”

“We’ll worry about that once we do some fact checking.” Mira hung up.

“The Director will be in his office in 15 minutes. He’s expecting a full brief.” Clay felt despair creeping in. Shadowy enemies. America’s security hanging in the balance. No sleep for the foreseeable future. And a criminal he had put away for life was their most valuable asset.

## Dimensions

### Technology

The Internet of Things has arrived, and the rate of technological advancement accelerates annually. Technology permeates every aspect of real and virtual life. People rapidly adopt innovations perceived to make life simpler, and technology is synonymous with the high virtue of efficiency. For example, real estate has dramatically changed in response to the preference of functionality over size. Technology has made homes are smarter and more efficient in their use of space. High-density housing stocks are desirable and selected by citizens of all socioeconomic levels.

Two areas of technology impact people most directly. Health-enhancing innovations extend life, and brain-based technology improves quality of life by adding convenience and fostering perceptions of tailored environments. People become addicted to technology and believe they cannot live without it.

The “workscape” has changed, and advances in technology impact blue collar workers most profoundly. As more processes are automated, skilled tradesmen with single disciplines are replaced with multi-skilled and -credentialed employees.

Lower and middle class people have abandoned privacy concerns and accept government and private sector access to their information. They consider the occasional compromise to be just another cost of living in the current world. Upper class citizens take extreme measures to protect their information, spurring a specialized security industry.

## Cyber

Cyber space was once the Wild West. As it has become more critical to every aspect of life, it has grown more organized. The stakes of dominance in this domain have increased exponentially. The three major players, in order of expertise and relevance, are private industry, TCOs, and government. Shifting alliances and gray markets provide the context for a dynamic playing field.

All three players compete for the brightest operators. Little expense is spared to identify and recruit talented engineers, programmers, and hackers. Loyalty is low, and most in the cyber field will work for whoever pays the most.

There is a constant war between private companies and TCOs, the effects of which are generally subtle. Most Fortune 500 companies maintain the cyber security equivalent of Fort Knox, but a few are lagging. Fully integrated engineering control systems are connected to global networks and form prime targets for cyber attacks.

TCOs are ubiquitous and use sophisticated algorithms to avoid detection by private sector and government forces. Their hackers constantly probe for weaknesses to exploit and damage to inflict, whether kinetic or virtual. They infiltrate networks via the cyber domain or by winning contract work and physically embedding their own systems.

The government plays a unique role in cyber space. While society does not view government as a contributor, private industry lobbies for special-interest legislation to combat cyber threats. Military cyber commands are a critical component of identifying, targeting, and combating TCO activity, but civilian agencies generally have antiquated and vulnerable systems.

Government and businesses monitor cyber space, and social media in particular. It is a core component of the human experience, a de facto sixth sense for the masses. Social media is tolerated when it paints an interested party’s actions in a positive light. It is increasingly difficult to distinguish legitimate activities from coded planning for criminal acts and protests.

## Maritime Environment

Globalization and free trade have primed the world market for technological innovation and revolutionized the shipping industry. Government policy is unable to keep up with rapid developments in maritime commerce, and regulation suffers. However, in the face of a vigorous industry and booming global economy, governments are hesitant to interfere with shipping in any fashion.

Modern navigation systems allow ships to make long transits and carry out complex docking evolutions with little human intervention. Other areas of the maritime industry benefit from innovation, but some industries are slow to adopt new methods or technologies. Industry sectors that have modernized enjoy increased profits, while industries that hesitate to adopt change have experienced moderate to severe losses and struggle to survive.

With major maritime industry modernization, cyber security has become a top concern for many executives. Ships and their cargoes are lucrative targets for piracy and cyber attacks. Government does little to address the threats, even with organic capability to thwart crime at sea. The burden of security is left to industry. Companies use advanced tracking, monitoring, and counterattack capability.

Climate change and over exploitation have caused many fisheries to collapse. Industrial scale aquaculture in the form of coastal and inland fish farms now meets the demand for seafood. In rice growing regions, combination rice paddies/fish farms are common.

## Climate Resiliency

Historically, global warming was a significant threat and source of tension between nations. The United Nations leveraged technological innovations such as big data analysis to develop sophisticated weather forecasting algorithms. The functions won widespread approval and led to development of strong policy and regulations. Computers play a major role in the way humans face natural disasters that once claimed the lives of thousands and impacted millions.

The Global Climate Organization (GCO) is viewed as the international governing body over all climate change issues. It works to address current issues and prevent new ones. Some nations do not believe that climate change is an issue. They view the GCO merely as an entity that levies taxes and interferes with their affairs. They reluctantly comply to maintain their trade agreements.

The GCO required environmental vulnerabilities to be considered and incorporated into technological advancements. New products and services are, consequently, more environmentally friendly and resilient in disaster. Storms and changing weather patterns produce less impact and disruption.

Some industries have benefitted from the changing climate. Increasingly volatile weather has created demand for underground utilities and living spaces, spawning specialized engineering and construction firms. Innovations in agriculture make it more adaptive to climate and less

wasteful. New disciplines in irrigation design, genetic engineering, and conservation science spring up.

Insurers charge realistic premiums. Their risk calculations and statistics support better planning and design in hazard areas. Developers, homeowners, corporations, and municipalities understand local dangers, adapt, and bear the expense. Most individuals incorporate climate considerations into daily decisions on purchasing, travel, and recreation.

## **Governance and Politics**

Cooperation in Congress has improved. The Legislative branch followed industry's lead and adopted data-driven approaches to problem solving and resource allocation. Transparent facts and analyses have invalidated many special interests and pork barrel projects. Partisan tensions have eased.

Crushing debt and crippling entitlement programs reached a breaking point four years ago. The President signed an Executive Order withholding pay from Congress until he received a balanced budget. Overwhelming public support for the bold move finally forced legislators to address long-festered budget problems over three brutal weeks of around-the-clock work. The nation is on track to paying off its debt within 10 years, and agencies have been forced to become lean and efficient.

While the government has had some legislative wins, agencies are ungainly and slow to adapt. Service is wanting, and state governments pick up the slack. Corruption is widespread. Some agencies target people who are seen as weak. They are audited, fined, and made examples to compel compliance from the rest of the population. The IRS has developed a system for targeting the elderly for tax penalties, since many are retired and on fixed income.

Society prefers free market enterprise and looks to private industry to provide individuals and families with economic security. Companies provide pay and benefits, as well as shelter from government abuse. Teams of corporate attorneys aggressively protect employees from government scrutiny and action.

Media reporting is a function of the values of the organization in control. Powerful TCOs occasionally fill the role of controlling organization. Some have their own media outlets. Government agencies struggle to keep up with the real time and active information flow.

Immigration is accepted and visible, and a small fraction of what it once was. Customs and Border Protection has experienced tremendous budget cuts, and protecting the border is not a top priority for the Department of Homeland Security. Strong economies worldwide offer advancement opportunity, and immigration is more evenly distributed across the developed world.

## **Culture and Society**

The population has urbanized, and cities reap the benefits of innovation. Physical terrorism is more pervasive, but people feel more secure in cities, with their protective technologies. Most buildings and residential spaces are models of efficiency. Food, energy, entertainment, and other staples of modern life are abundant. Real life is intertwined with the virtual world, and increasingly difficult to separate. It is sometimes unknown whether notable events are natural occurrences or generated by government or business entities.

In general, people enjoy a high standard of living and have wholeheartedly embraced the technology boom. A small portion of society is left behind, by choice or circumstance. Some distrust technology and are dissatisfied with the current state of affairs. They form off-the-grid communities. Individuals suffering certain types of handicaps are unable to secure employment. Certain professions have become nearly obsolete. While there are a few government programs designed to provide assistance to marginalized people, they lack the funding to achieve their missions in any meaningful way. The most effective advocacy groups are grassroots organizations that use data driven models to put people back to work.

Physical crime is at an all-time low with sophisticated monitoring and tracking of individuals, but there are still cases of theft. The single biggest law enforcement issue is cyber crime, and cyber security is a booming industry. People clamor to secure their online profiles, and fear of being targeted has precipitated the erosion of civil liberties as citizens choose security over personal freedom. Vast amounts of personal information is online, and intricate protective regimes are available. The government is one of the biggest targets for attack: It collects massive quantities of data in antiquated systems.

Education has fundamentally transformed. A pair of innovative cities partnered with the World Economic Forum and countries such as Finland and Germany to design a blended school model that incorporates technological advances in brain-based learning techniques and pedagogy. The model is highly successful, producing benefits that include improving economies, reduced crime, less spending on the legal process, lower levels of incarcerations, and independence for individuals who were once dependent on government assistance. Education has developed stronger ties with private industry as students focus on developing skills necessary to compete for jobs.

## Energy Revolution

The United States is a global leader in alternative energy development, thanks to the nation's innovators and advanced technologies. Society is more self-sufficient and less reliant on fossil fuels. Most cities and suburbs are "smart communities" dominated by "smart homes" with their own renewable energy plants. These dwellings harness solar, wind, and hydroelectric power rather than relying on a utility grid. Eighty-five percent of those living in American suburbs supplement their consumption with renewable energy or are self-sufficient.

Conservation, recycling, and repurposing all feature in resource management plans and business strategies. Improved efficiency in manufacturing supports resource conservation and long-term viability. New companies capitalize on obsolete energy sources by acquiring firms with the best research and development capabilities. Public-private partnerships convert obsolete power generation and distribution infrastructure into materials and facilities that support alternative energy development and deployment. The government provides significant subsidies and tax breaks to companies that dismantle or convert disused oil platforms.

## Economy and Commerce

The economy is recovering from the U.S. bond market implosion of 2017. Unemployment finally achieved an acceptable rate over the past two years. The legacy \$11 trillion Quantitative Easing (QE) program produced a cyclical market. A final, severe correction caused major international trade disruptions and near civil unrest. In response, the government developed long awaited policy to reduce volatility. Money printing is replaced with sophisticated systems to measure economic activity and permit rapid reaction to global events and trends. Regulations are more transparent and feature fewer loopholes.

Commerce and trade remain critical components of economic prosperity. Flow of goods and services is extremely efficient from the global to the neighborhood level. Predictive delivery is standard, and people better manage their time with little need to run errands. Things arrive at the right time and for the right cost. Companies with the best delivery systems gain consumer confidence and greater market share. Smaller and less-efficient firms have difficulty competing.

With developments in the health industry, people are living longer, are happier, and feel more fulfilled. A Harvard University study demonstrated a correlation between a society's emotional state and its economic volatility: Greater happiness produces steady economic growth. The health and well-being of the individual is now viewed as a critical component of economic stability.

The workspace has changed, and offices are now secondary places of work. Many telecommute (some for an entire career), and predictive analytics have revolutionized the way people find the right jobs and jobs find the right people. Extended vacancies are nonexistent. Long-standing employment in one position or with one firm is rare. Frequent job changes for personal and professional development are the norm, and the entire economy has adapted to handle turnover. Most companies now prefer a regular supply of fresh perspectives and skills.

## International Cooperation and Relationships

Cyber attacks spur increased cooperation between states. Nations collaborate in the governance of technology and tech-enabled industry. Relationships improve and stabilize with constant interactions and symbiotic relationships.



Major corporations influence international governing organizations to produce policy that benefits commerce and encourages cooperation. Among these was development of the International Maritime Organization (IMO) enforcement division to replace national regulation and make maritime governance consistent worldwide.

International competition for the very best employees is fierce, reducing immigration to the United States. The nation has relaxed its immigration policies.

## Western Hemisphere

The remaining major threats to Western Hemisphere (WHEM) economies stem mainly from TCOs. They are difficult to isolate and identify; many are entwined with or invested in legitimate enterprise. With the dramatic expansion of the Deep Net, TCOs have developed hidden and symbiotic partnerships with legal businesses. Some private corporations use TCOs to gain market share, while the latter improve their own reach and profits. Some aim to further ideological agendas.

TCOs have been forced to adapt to a changing global economy. New drugs that curb and eradicate addiction have all but destroyed the cartels that once dominated Central and South America. TCOs that once profited by illegal drugs have shifted their business lines to the health industry. Wellness-enhancing and life-extending drugs are in short supply and high demand, producing remarkable profit margins.

Another factor disrupting and weakening traditional TCO activity is the Western Hemisphere Atlantic and Pacific Trade Agreement (WHAPTA). WHAPTA eliminated tariffs and increased trade to many South American countries. The trade agreement influenced the environment, agriculture, and intellectual property sharing and boosted economic activity in many nations that were once isolated from global trade. They are empowered by growing wealth, and no longer dependent on cartels for survival.

Improved economic prospects have reduced the flow of migrants among Western Hemisphere countries. Combined with increasingly educated populations, they have generated a new wave of patriotism among citizens of WHEM countries, who stay in their own nations and help them to prosper.

The color of money is no longer green. It is digital. It is difficult to attain stability in worldwide digital currency due to constant manipulation by multiple entities, including governments, private industry, and TCOs.

## Arctic

The growth of alternative energies has dampened the debate over Arctic resources. There is limited interest or investment in Arctic oil extraction. Climate change, accurate weather forecasting, and rising seas increase the number of vessels that venture through the Arctic and

Antarctic. The northern polar region is a means of expediting shipping and a coveted tourist destination: Transits through the Bering Strait have increased more than 700%, and 15 million people travel to visit the region annually.

Accurate forecasting has reduced Arctic shipping costs and produced a number of outcomes. Voyage planning is more predictable. Northern routes are created and maintained with better ice management technology and practices. Ship construction is more ice capable. There is keen interest in developing Arctic intermodal port infrastructure.

Governments have taken notice of the dramatic increase in far north traffic. Arctic nations deliberate on how to derive revenue from polar transits. They fiercely defend their territorial seas and Exclusive Economic Zones (EEZs) from foreign encroachment.

Natural and man-made processes are changing the Arctic. Currents are shifting, while increased shipping introduces pollution and invasive species. These factors have impacted most of Alaska, where 50% of America's fish production originates.

Native communities are balkanized. Those with government recognition have met the demand for increased infrastructure and invested in subsidized casino and port facilities and amplified services for oil, gas, and bio-prospecting. Traditionally oriented bands function outside of society, adhering to old ways even as the taiga subsides under their feet, the shoreline is washed away with the disappearing icepack, and subsistence marine mammal stocks collapse.

Overt commercial ties between fringe communities, industrialized populations, and the remainder of the nations rest on a network of quiet but rampant trade in poached wildlife, controlled substances, and valuable corporate, personal, and government information.

## Geopolitical Situation

America maintains its historically close ties with the European Union. The allies jointly manage terrestrial, airborne, and space-based sensor arrays around the North Atlantic and Arctic Oceans. Desire for vigorous trade and economic health routinely trumps diplomatic issues of all kinds. Cooperation on criminal investigations and counterterrorism is strong.

Russia has completed a slow, grinding economic recovery and traded Putinism for...trade. While the country harbors a latent desire to restore the former glory of the Soviet Union, Russian leadership learned from the failures of outright aggression against Ukraine. The Union of Soviet Capitalist Republics will be restored with vigorous trade, exchange, and commerce between Russia and its former eastern bloc neighbors, with the goal of becoming their exclusive trade partner.

The United States is keeping a close eye on Russia. Not on diplomatic or military developments, but on its developing technological-industrial base. Russian durable goods manufacturing is well established, but its high-technology sector is developing. At its current

pace, it may be a competitor with China in another decade. American leadership is as eager to wean the country off Chinese electronics as it was to break from Middle East oil. Affordable, mass-produced Russian technology is a promising alternative.

Turmoil is normalcy in the Middle East. Different factions take (or claim) power on a seemingly weekly basis, and most countries in the region are neither socially nor economically stable. Israel is a notable exception. In spite of a brief international outcry, the nation evicted its entire Palestinian population after the Second Battle of Gaza. While it initially struggled to resupply much of its labor force, Israel has fully recovered and is an economic and military powerhouse.

The United States imported its last barrel of OPEC crude ten years ago. As most nations embrace renewable energy, Middle Eastern coffers are drying up. Old ruling elites failed to adapt their economies and are losing control of the last stable bastions, along with their wealth. Contrary to the early-century Arab Spring, the Arab Fall finds Middle East chaos ending in reversion to 19th century living for some, and positively medieval conditions for many. All of the social media capability of the modern age is not creating revolutionary progress, to the dismay of young agitators, who grossly overestimate the world's interest in their lives. As governments fall, social structure collapses, and no authority more powerful than a village elder ascends from the ashes.

The United States has entered a Cool War with China. America ceded the Spratly Islands and South China Sea, leaving "Asian problems to Asian boys," to paraphrase Richard Nixon. Taiwan has been forced to reunify with the mainland, and the Philippines are squarely in the reticle. U.S. dependence on Chinese electronic components and equipment prevents a strong diplomatic stance against Beijing's regional aggression, as the American people will not tolerate disruption to their technology supply. Particularly not for some reef in the South China Sea.

South America is rapidly catching up to North America and Europe in development, and north-south trade will soon match east-west trade in volume. With the exception of a highly advanced South Africa, the African continent has dropped further behind as technology accelerates. Its nations are vulnerable to foreign encroachment and resource exploitation. The Chinese have numerous mining and oil extraction projects in place, and generally stop hiring local labor after the first five years of operation. These practices are sources of diplomatic tension, but U.S. dependence on Asian electronics again prevents strong action.



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