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Human extinction scenario frameworks

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ABSTRACT

It is a natural human instinct to wonder about the future. Some have long speculated about the various events that could potentially lead to the extinction of the human race. While a dark subject, the point of exploring factors that could drastically impact the ability to sustain life on our planet has utility in preparing for events of this nature. It is in the spirit of learning how to change before catastrophe strikes that such wondering occurs.

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1. Purpose

The purpose of this exercise was to explore multiple scenarios leading to an outcome of human extinction. Our interest in the future of human existence formed the basis of our work, “In times of change, learners inherit the Earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists” [1, p. 13]. This exercise was predicated upon a given outcome – human extinction – and at first glance seemed in harmony with the obvious purposes of scenario planning [2,3]. Thus, this effort differed somewhat from traditional scenario planning projects, and this difference is elaborated upon after the scenarios are presented. These scenarios are thought to be useful in global foresight activities and in attempts to estimate the likelihoods of certain cataclysmic events.

2. General approaches to scenario planning

Huss and Honton [4] described four general approaches to scenario planning; (1) intuitive logics, introduced by Pierre Wack (2) procedural scenarios (3) industry scenarios, and (4) soft creative methods approach. Each of these is described in detail, but it is important to note that scenario planning as has been popularized through its use at Royal Dutch/Shell is only one approach to the process. Alternate approaches to scenario planning have been adopted at a national level in some cases, and such methods have been successful in bringing diverse groups of people together around a common purpose and vision [2,5,6]. Some of these methods have been updated over the last decade, but for purposes of clarity, we have decided to present the original sources. By presenting these approaches we hope to present clear reasoning for the methods we chose to cause the extinction of humanity.

2.1. Intuitive logics

Popularized by Ted Newland and Wack [7] this approach to scenario planning has been developed and forms the basis of the scenario consulting services offered by the Global Business Network [8,9]. GBN is arguably the foremost authority in

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scenario consulting for business and industry although recent applications of the technique by certain members of the network are delving into non-profit and philanthropic work [10]. The general approach begins with a business issue or problem and interviews with the key stakeholders. The scenario agenda is developed and intense research around the trends and forces relating to that issue are undertaken. Through several workshops with a stakeholder team key forces are identified and prioritized. Once a prioritized list of key concerns regarding the initial business issue is developed, these concerns are ranked first by impact and then by uncertainty. Forces high in impact and uncertainty are positioned into two axis matrices to develop general scenario logics.

2.2. Procedural scenarios

Amara and Lipinski [11] and Chandler and Cokle [12] use very similar methods for constructing scenarios, but prepare separate forecasts for each principal factor or variable. Chandler and Cokle “also define scenarios as the coherent pictures of different possible events in the environment whose effect on a set of businesses should be tested through linked models” [p. 132]. The manipulation of macroeconomic models is a mechanism by which vague assumptions are translated into projected values of wholesale prices, GDP, or consumer expenditures for an entire industry. The models used in these approaches are computer-driven [13] and provide a good example of procedural scenarios incorporating intuitive and quantitative techniques.

2.3. Industry scenarios

Porter [14] asserts that scenarios traditionally used in strategic planning have stressed macroeconomic and macropolitical issues. He further claims that in competitive strategy the proper unit of analysis is the industry and defines industry scenarios as the primary, internally consistent views of how the world will look in the future [14]. The essence of this view holds that there are two loops in building these industry scenarios. In this approach, industry analysis is within the larger unit of building industry scenarios. Industry focus scenarios can help an organization in analyzing particular aspects of a business [14], but it has been argued that beginning with a narrow focus will miss key dimensions [7].

2.4. Soft creative methods approach

Brauers and Weber [15] have formulated an approach with three basic phases: analysis, descriptions of the future states, and synthesis. The analysis phase brings organization members to a common understanding of the problem. Based on this consensus, the problem can be further bounded and structured. Brauers and Weber recommend the use of soft creative methods for the analysis phase, including morphological analysis, brainstorming, brain-writing, and the Delphi technique. The second phase examines the possible development paths of the variables chosen in the analysis. The synthesis phase considers interdependencies among the variable factors to build different situations for the future states. These eventual scenarios are then fed through a complex computer program for linear programming and cluster analysis [15].

3. Methodology

We intended to conduct our scenario project with the approach to scenario planning generally known as the intuitive logics approach described above [4,16]. This model is the foundation of the famous scenario exercises at Royal Dutch/Shell [7], and has evolved into many variations on this theme [17,18]. We quickly realized that this method was not going to work in the context of scenario planning in reverse. A key learning to be expanded upon in a later section was that it is quite a different task to be “given” the future and to have to work backwards in a variety of ways, to the present. Our experience with scenarios prior to this project has always involved an inherently unknown and frankly, unknowable future.

Our approach to this task therefore utilized a series of brainstorming workshops and division into small groups to tackle a multi-faceted approach to accomplish our purpose. In short, we refined our process as we went along. Early in this process, we realized that it was going to be a very complicated project in its entirety. It was going to be much more difficult to provide a plausible explanation of human extinction that it initially appeared. In some ways, this was reassuring and in fact, a relief.

A more detailed examination of our process can be described as a multi-group approach with scheduled meetings to present our progress on extinction scenarios and also to discuss plausibility with other groups. What seemed obvious to some was very subtle to others. Over the course of about six weeks, we labored, met and labored again until we produced a set of scenario frameworks we felt carved a few paths to extinction that were somewhat relevant and plausible. We use the term “frameworks” to indicate that these are the basic scenarios—the plots. If these frameworks are to be useful beyond a conversation about what could happen in the future, considerable research would be needed to explore trends based on current data within each of these frameworks.

4. Human extinction scenarios

We have developed three scenario frameworks that capture different paths to human extinction. While we have intended for each of these scenarios to be challenging, relevant and plausible, certainly, efforts moving forward would establish more

facts and trends, and place a much more rigorous research agenda underneath the ideas presented here. Our scenario frameworks are as follows:

- Scenario framework 1: A journey of a thousand miles begins with a single step.
- Scenario framework 2: A road paved with good intentions.
- Scenario framework 3: Pouring salt in the wound.

Each of these scenario frameworks features a combination of different events that have dramatic impacts on the human race and ultimately lead to extinction.

5. Scenario framework 1: A journey of a thousand miles begins with a single step

In 2010, the pandemic began; it was generated from a highly virulent airborne virus that originated somewhere in the Pacific Rim. It quickly expanded to Asia through travel routes.

After only three years, the Asian population had suffered greatly. Fifteen percent of the population perished. Including non-Asians, the pandemic took 6% of the world's population. The continuing deaths led to a global economic crisis due to heavy restrictions on product distribution and travel. Businesses closed due to loss of merchandise. Schools began to close at alarming rates from fear of spreading the disease. Major public events virtually disappeared off the calendar. Professional sports leagues went on hiatus one after another. Theatres and museums closed.

Food shortages grew due to halted commerce; malnutrition and starvation increased. This led to greater illness and chaos as if a cloak of desperation had enveloped the human race. Taking advantage of the turmoil and heartache, terrorist groups began to escalate their actions.

In 2018, the United States entered into an armed conflict with Syria and Iran due to their increasing support of terrorist activities and pursued a build up of weapons. The elevated conflicts led to major disruptions in Middle East oil supplies. South American countries also stopped exporting oil to the U.S. leaving China as the world's largest consumer of oil. As the Chinese industrialists prospered, unhampered by environmental regulations, air pollution worsened. Worldwide the pandemic seemed to be under control; however, mortality rates remained high due to starvation, disease, and violence.

After four years of engagement in the Middle East, a crippled economy and lack of support forced the U.S. military to withdraw. Although weakened from the engagement, Iran did not halt its mission of destroying Israel. Within a few months, nuclear weapons were used by both sides. Iran emerged victorious however much of the Middle East was now wasteland.

Three more decades of increasing pollution and radiation resulted in global warming that caused severe disruptions in the ecosystem including drastic climate change. Melting icecaps led to coastal flooding. In 2050, the California coast became the Sierra-Nevada Mountains. As temperatures remained high, the insect populations grew at an accelerated rate. As cities and towns attempted to relocate further inland, insects followed. Mosquitoes, locusts, and other parasites drastically affected agriculture and spread more disease. Sickness, hunger and death touched every corner of the world. Mass chaos and violence became the norm. Governments were no longer able to provide basic services or maintain order. Either completely unscrupulous or religiously fanatical leaders emerged; neither felt restraint about using nuclear weapons.

With civilization in its last days, the final blow was struck. A meteor, approximately the size of the island of Oahu, struck the Atlantic Ocean. The resulting tidal waves, earthquakes, and changes in weather served to extinguish the remaining humans from the earth.

5.1. View from the end of the journey

My family is gone. I will join them soon. I am not sure why I decided to write this; it just did not seem right to not leave some sort of explanation. Although, I am certain no one is left to find it. I am not sure how long ago it was (time does not make sense anymore) when we convinced the children and their families to come with us to North Dakota. In the more populated areas disease, violence and warfare were quickly taking their toll. Major cities were bombed, and anyone in those areas died almost instantly. The real horror was the slow agonizing death of those who did not die from the initial blast but from radiation sickness.

Complete panic and lawlessness were becoming ubiquitous; even police and military personnel were joining the gangs. I suppose the 'if you can't beat them, join them' approach made sense at that point. They looted and robbed mainly for food and shelter, but somehow these acts of survival turned into senseless killing. As food and energy became increasingly difficult to obtain, disease and sickness spread. Compassion gave way to fear and those afflicted were shunned, tormented and killed.

We decided that the only way to survive was to leave and try to escape to a sparsely populated area. We were not the only ones leaving the cities; practically anyone that had the means tried to go somewhere. We were pleased that relatively few seemed to select the same destination that we had.

When we left, some communication services were still working. News reports confirmed that relocating was a good idea. At first, we did OK. Fortunately, we left in the spring, had an opportunity to plant a garden, and even canned some fruits and vegetables. As time went on however, the ability to secure food and energy declined. The world was slipping back in time. To a world where one's survival depended entirely on hunting and farming. We were not ready for it, but we tried our best to

learn. We would joke about being the new pilgrims. We even felt somewhat optimistic at first. We thought that working together we would be able to overcome the hardships of survival just like our ancestors. The last news we heard was that the war was still raging. We were certain that it would continue until there was no one left to launch another bomb or there were no bombs left. The world leaders that had come to power amid the mass chaos seemed determined to destroy the world, unable to conceive of any action other than violence.

Of all the hardships we endured, and the things that we did without, it seems odd that the most difficult adjustment was the lack of communication. When we lost communication with others, the feelings of isolation and abandonment were overwhelming.

Initially the local communities were cooperative and bartering was common; but the more scarce resources became, the more everyone focused only on themselves and their families. Desperation was setting in and along with it came the fear and violence it breeds. One by one various family members died throughout our community. It did not take long to realize the symptoms of radiation poisoning. The horror we were most afraid of and tried to escape had caught up with us. We were all completely physically and mentally exhausted and overcome with grief and fear. The suffering reached an intolerable level, doing what I believed to be the most humane thing I could; I killed any wretched soul that remained alive. Now finally, my suffering also ends.

6. Scenario framework 2: A road paved with good intentions

Early in the 22nd century a large pharmaceutical company, LoPhares, announced that after over six decades of work, a relatively inexpensive inoculation for cancer had been found. While it did not work for people who had already had cancer, it had been shown to be significantly effective for prevention of any type of cancer for those people who had not had cancer. LoPhares thought it was effective enough, in fact, to call it a vaccine. The only side effect was the slight blue skin discoloration (slightly larger than a U.S. quarter) where people received the shot. This discoloration typically appeared on the side of the neck just above the collar line.

The more prosperous countries and regions of the world were the first to use the vaccine that LoPhares called the Cancerous Hybrid Inoculation Prescription, or CHIP. By refining vaccination strategies almost two centuries old, it only took eight years for CHIP to reach the populations of the first and second world countries. Unstable regions in the Middle East and Central Africa that had volatile or suspicious leaderships made complete vaccinations almost impossible. With subsidization from the United Nations and other non-governmental agencies, vaccination in these areas continued at a much slower pace.

With only a small percentage of humanity vaccinated the cancer rate dropped almost to zero. 15 years after the first vaccinations, all but an estimated 400,000 people (besides children who were inoculated once they reached the age of two) in the unstable Central African regions had been vaccinated and cancer was relegated to historical texts. The United Nations had declared this point in history as The Last Year. Ten years later the last non-inoculated person in the world passed away. He was an 89-year-old retired computer programmer from Scranton, PA who lived most of his life in Arizona where he had had multiple instances of skin cancer. He died, tragically, when he was hit by a small child riding a bike. The impact dislodged a blockage in his heart that proceeded to his brain and killed him in a most alarmingly quick manner.

While the world was celebrating the success of CHIP, a sinister plot was unfolding. Answering the triumph of the inoculation, an ultra-patriotic environmental extremist (UPEE) began work to combat the byproduct of overpopulation. The UPEE utilized nanotechnology as his weapon of choice, and women's ovaries as the target. By designing a nano-attack intended to destroy the ovaries, the infection, subsequent to debilitating the host, became airborne, passing through the atmosphere to infect others. The method of dispersal was under the guise of an air purifier, slated for mass distribution to African, Asian, and Middle Eastern markets. A steady, if not alarming, decline in birth rates in the targeted markets exhilarated the UPEE, and he began to distribute the air purifiers to the Southern California and Atlanta, GA markets under the guise of a smog deterrent. Because the air purifier was such a success, demand rose across the U.S., resulting in declining birth rates. Low birth rates across the world soon became a very real concern for humanity.

Sixty-six years after the death of the computer programmer, something unexpected happened. A Texas oil baron, son to two of the first vaccine recipients, passed away from a seizure-like event. An autopsy determined that his body was riddled with cancerous tumors. They had manifested themselves in record time, as he was the picture of health eight months earlier during a complete exam.

Seemingly, men were being affected by what was found to be a Hypercancer. Worldwide men started dying at alarming speeds. This new strand of cancer affected men at 100 times the rate that it affected women—it only took three years for Hypercancer to kill off 99.9% of the inoculated men in the world. The cause had yet to be discovered.

6.1. Journal entry: Year 69

In the beginning, it seemed as though everything was going well. I was so excited to be working with the lab that discovered The Cure. The company was doing extremely well. Hell, Pam, the kids, and I were doing extremely well too. We had a great house, great cars, great neighbors. The kids grew up with everything they wanted and needed, and even stuff they did not want nor need.

I was honored to be a part of the team to complete inoculation of the entire population. That was a great day. Boy did we party as if it was 2099. For decades, life on earth was great. The next big project I was a part of was investigating the decline in

birth rates. We noticed a steep decline in several parts of the world, including the Southern United States. Our group, thinking that we were super agents because of The Cure, began to study the birth rate debacle. We worked on it for five or six years, and by this time, the birth rate had become the #1 issue in the entire world. We never understood what was going on. We were never able to identify anything besides the fact that women just were not giving birth; they just were not able to become pregnant. Only later did we realize that some extremist genius was responsible. I wonder if he is still alive, that son of a bitch.

I remember my retirement party. Pam, the kids, the grandkids, they were all there. It was great! A lot of my coworkers were there. Almost everybody I cared about was in the room. Little did I know it would be the last time I would see a great deal of the guys, including Steve, my youngest. Why did not we see this coming? Why did not we realize what we had done? We had done the lab work, followed research and methodology protocols. Yet it only took three years to undo all the good that we had accomplished. There were no men left. Only boys remained, and because of the decline in birth rates, there were very few. How could we know that The Cure was responsible for the Hypercancer? I guess, in our perch above humanity, we lost sight of the fact that there might be someone judging us. Ironic then that I, as one of the team leaders of The Cure, became a final witness of the human race. May God have mercy on my soul. May God forgive us.

7. Scenario framework 3: Pouring salt in the wound

It was 1:35 AM aboard the Pacific Queen, a trans-oceanic cargo carrier. The deck was as busy as a beehive on this cold December night as the crew worked the ships cranes and lifts. Big black containers were carried and dumped into the ocean under the cover of darkness. The containers slammed into the ocean surface and then disappeared into the black depths. Everyone was working as fast as humanly possible, for it was not the best of situations to be caught dumping nuclear waste into the cold Atlantic Ocean in the middle of the thick night. Everyone aboard the ship was thinking the same thing: the sooner this task was finished, the sooner everyone could go home.

Six years later, people were being rushed to hospitals by the dozens. Old men, infants, women, everyone seemed to be victims of a strange phenomenon; all had died from internal hemorrhaging. Hospitals were overflowing with patients, and many were turned away and returned to their homes to face certain deaths. The doctors were helpless. They did not know what was causing these horrible mass deaths. Medical facilities were operating more as morgues rather than medical aid providers. Within hours of death, members of victim's families started dropping dead one after the other, a scene of insanity, of utter human tragedy.

No one seemed to understand what was going on. The disease seemed to target everyone at random without differentiating between age group, gender, or ethnicity. What made matters worse was that disease did not show any symptoms to speak of, it was more or less a sudden death situation for the victims. The government mobilized the National Guard and declared martial law in order to try to gain some control over the civil unrest that had begun. A curfew was imposed in an attempt to isolate the believed disease carriers and prevent further spread. Medical teams were called on the scene to examine the dead victims and central operation centers were established in state capitals and other large metropolitan areas.

Within three years, half the earth's population was taken out by this killer disease. The people under curfew died in their own houses one after the other not able to bury the dead, until the family home became the family graveyard. Soldiers, children, politicians, who wore biomedical suits were not spared.

After four years, scientists had their first breakthrough: the sudden death was being caused by bacteria that nested in the human blood stream and deteriorated the walls of the blood vessels, causing ruptures in the major arteries and rapid death due to extreme internal blood loss. As important a discovery as this was, it only brought more bad news. Apparently, the carrier of this strand of bacteria was regular table salt. The bacteria lie in the body for two to three years before multiplying and reaching a critical mass that resulted in a complete breakdown of arterial walls. Victims typically died within 13 h. The strand of bacteria was found to be a mutant form of a similar form of bacteria found in the common sea salt particles floating in the ocean and on dinner tables.

The scientists disclosed the discovery of the source of this epidemic, but could provide no cure. They claimed that the salt purifying procedure was ineffective against these bacteria due to their endurance to extreme conditions. The official report was that anyone who had consumed salt within the last six months, from canned foods, restaurants or just plain sprinkles, had acquired the bacteria. If nothing could be done, they would perish. Unfortunately, it also appeared as if the bacteria were as highly adaptive as the Bird Flu. Once it entered the human body, it eventually found its way to the lungs where it mutated and became airborne. It started spreading through the air, not only through the consumption of salt. As a result, people could do nothing but await the inevitable; even the scientists working on the cure died one after the other. Six years after the initial infections, all the human population was dead leaving the Earth silent with nothing but the remnants of a civilization—just like an empty anthill.

7.1. A final goodnight

The human race thought it was special. We thought there was a reason why we were on this Earth, for some kind of higher purpose, something beyond life and death. How foolish we were. As the history of this blue planet would have it, we were nothing more than another species; we were only meant to exist on this Earth for a short time. Just like dinosaurs and all the

other species before us, we were only meant to have a brief visit. I do not know why I am writing this; I guess I am getting tired. Maybe my voice would give me company, maybe not.

It all started as a seemingly innocent disease that then grew into an epidemic that finally consumed the whole world. My husband, my two kids, and I spent many evenings watching in horror as the events unfolded. Death was everywhere. All we could see on the news were images of pandemonium. . .of chaos. . .of people dying. . .Nobody knew why. They called it The Disease; it was the end that we did not see coming. My husband was the first to succumb. He fell down on the floor convulsing in pain. Just like the other families, we tried taking him to the hospital. We were turned back by the National Guard.

My kids and I watched as the patriarch of the family withered away and died. We buried him in the backyard and promised him we would get over this terrifying situation. Two weeks later, my son Jeff fell ill and within two days of his death, my daughter Becky was gone. We were told that those who did not eat salt caught the virus through the air and it was going to be a while until we would catch up to our loved ones. With no electricity, no running water, no news, and the knowledge that everyone I knew was gone, I have grown very tired. I think it is time for me to go to sleep too. For that, I say one final goodnight.

8. Signposts

In exploring the implications of these scenario frameworks, we must first consider the signposts. Signposts are events that may be signaling the unfolding of a defined scenario [9]. We see four key signposts that should draw serious consideration throughout the globe if they present themselves. Namely, (1) the launch of any nuclear weapon, (2) the outbreak of Avian flu or other disease with potential global impact, (3) questionable side effects of our techno/medical advancements, and (4) environmental responses. All but one have received prominent attention in the U.S. media [19].

8.1. *Launch of nuclear weapons*

This is an obvious concern for any individual, in any country on our planet. What is perhaps most compelling about this is not so much the event of any single strike, but rather, it is a combination of strikes in an “I’ll get you before you get me” kind of mentality. With a number of states (e.g. Iran) advancing their development of nuclear technology the chance that an aggressive government or non-governmental organization gains access to such weaponry is very real.

8.2. *Outbreak of disease*

Current concerns about Avian flu outbreaks are real. Experts have suggested that it is not a matter of “if” this will happen, but “when” such an outbreak will occur. This thinking extends to other, as yet undiscovered, illnesses [19]. Resources to deal with such an event certainly vary from country to country. To be sure, preparations for a global pandemic are underway, although the degree to which these threats are being taken seriously are debatable. Steps are also being taken to prepare for pandemics that are engineered for harm [19].

8.3. *Side effects of technical/medical advancements*

Much more subtle than the preceding two signposts, the side effects of our technological and medical breakthroughs should be seriously considered. Our scenarios have outlined the possibility that these side effects may only reveal themselves in time, which speaks to the delicate nature of advancements that we think will help, but in the long run, we are not quite sure. The signpost here will be abnormal and seemingly unexplainable medical problems, and a general increase in illness in post-industrial societies. Recent findings from cancer research indicate that some types of cancer could be caused by unknown environmental conditions [20]. Perhaps such conditions include the additives in the food we eat, changes brought on by long-term exposure to magnetic or electronic fields, artificial cleansers, etc.

8.4. *Environmental responses*

Less within our control than the other key signposts we have outlined, environmental responses demand that we keep our planet in mind. Global warming, ozone depletion, and other natural responses to things like pollution and our technological advances applied to resolve pollution is just one example and something that has seen prolonged media attention. The key lesson here is simply trying to take the long view. Tools like systems theory can help us to understand more clearly the long-term implications of our actions.

9. Conclusions and learnings

These signposts also lead us to a few key conclusions that can be gleaned from our scenarios. First, the human race is unlikely to become extinct without a combination of difficult, severe and catastrophic events. We were very surprised about

how difficult it was to come up with plausible scenarios in which the entire human race would become extinct. As we have stated, there was something reassuring about this fact.

We also speculated that in order for the human race to become extinct, it would have to be the result of some kind of intent, malicious or not, by some group of people, in some place of power on this planet. Naturally occurring phenomena can be devastating, but we found that we could not conceive of a naturally occurring phenomenon, or even a combination of them that would actually lead to our extinction. Thus, we learned that we, as a human race, have some influence over our ability to survive—we DO have a choice about how we solve our differences and explore solutions to highly complex, global problems.

We found the method we began with to be inadequate. Thus, in our experience, the intuitive logics approach seems to thrive when the future is truly ambiguous, but is considerably less useful in any context in which the future is known and the task is to explore the various paths to that future, although we did find this an exercise is constructivist thinking [21]. We found ourselves creating a dialogue and this was the most helpful of the various things we tried.

We are hopeful only that these frameworks might be used to provoke further dialogue on the topic of human extinction. While we found a tremendous amount of difficulty in creating plausible paths to extinction, the conversation itself was useful, engaging, and important. In our complex world with deeply volatile issues that could lead to an intent to create situations in which our race could become extinct, it is increasingly important to consider our responsibilities. We believe that exercises like this, as well as publications like this issue of Futures are extremely influential and important in promoting the tools that we can use to better understand our world and how we can as individuals and groups, contribute more to it.

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