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The Rise of Artificial Intelligence and Big Data in Pandemic Society

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Preface

At the brink of the COVID-19 pandemic, this book was conceptualized by the author. At the time before the outbreak (February 20, 2020), a book on digital and computational social sciences, which was edited by the author, had just been published (Shibuya, 2020). In succession, at the time of confronting with such global pandemic (March 11, 2020), next, the author started writing a new book on social phenomena of such pandemic by standing on own philosophical and sociological foundations.

Namely the main goal of this book serves some of the fundamental questions that the author has been contemplating. "*Can the humanity coexist beyond the social evil inevitably engendered by the pursuit of the highest good (Summum bonum) among individuals?*", "*how to cooperate with each nation beyond the decoupling of the world order?*", and "*how to minimize entire sacrifices at confronting with any tragedy, if possible, how to avoid such situations in advance?*".

In the past, Voltaire said "History is only the register of crimes and misfortunes". Human history could be certainly traced as somehow endlessly survival process from lethal crisis, and it means that human history had been inscribing into the record by survivors in each time. However, every time the humankind overcame each crisis such as infectious disease, disasters, and others, our ancestors had made a lot of the progress since the birth of our civilizations. For example, during the plague epidemic in Europe in the seventeenth century, Newton's discovery of universal gravitation and calculus had been established.

So, what lessons did humanity learn from the COVID-19 pandemic? However, humanity had not even been able to solve such situation. Here, the pandemic of COVID-19 was claimed as an incomparable emerging disease in recent decades. The most important was that the ordinary risk management and quarantine regime was unable to prevent the COVID-19 pandemic, and indeed it posed the challenge of whether it can adequately and effectively save people when another infectious disease (such as Ebola hemorrhagic fever) that is more lethal than COVID-19 spreads in the future. Further, aftermath of the COVID-19 revealed the inside of the humanity facing such extraordinary and emergency situations. We observed many issues such as blames against the others with infected symptoms, repeatable claims about epidemic

policies among the citizens, mindless exclusiveness between multicultural heterogeneity, and further global tensions among the nations after the pandemic due to triggering the balance of powers between China and the USA. Many of the citizens literally missed "*social distance*" to sustain the coexistence among the others.

If there was one fact that COVID-19 exposed, it might have been the reality of the revenge of the poor. Many of the poor and minorities became victims of COVID-19. Normally, it is the same as always, the nameless who are not cared about priceless life by the government that are impoverished, but when countless poor people suffer and die, it is clear that not only do we lose the labor force that supports the bottom of the social economy, but also the social economy stops functioning at its very core. The wealthy had no choice but to splurge in search of investment opportunities. Citizens, whose survival continued to be threatened, feared unemployment, sought stable employment opportunities, and intensified their criticism of the government. Such a situation led to growing unrest in the society as a whole, and mutual distrust led people to riot and engaged in prejudiced fake news. The hard work of medical doctors and specialists was more than gratuitous self-sacrifice. As domestic order and governance diverged from the hopes of citizens, the nation and the world as a whole stood on the brink of collapse. In other words, when the people who have always been responsible for sacrifices are no longer there, no longer able to do so, or cannot be replaced, the entire world turns into chaos. In fact, in the Corona disaster, what was seen in many parts of the world was the fact of who is responsible for the daily sacrifices and the absurdity of the reality by the causality.

Regarding such fundamental matters, this book especially devotes to conducting a study on the human nature confronting with the crisis. And it is mainly edited to synthesize and discuss rich idea from sociology, risk studies, and digital social sciences, because the author convinces that it requires to reconsider the common depth of both the COVID-19 pandemic and international order in the age of After Corona. China has been accused by global countries, where the COVID-19 pandemic originated. And international tension on economics and military aspects between China and the USA has already been invoking before the pandemic. It is historically considered as a derivation of "*The Thucydides Trap*" between them. And then, China and its historical culture seems to hold the keys for understanding how to coordinate with the Western sides. This book intended to explore the possibility of conflict or cooperation with the emerging Asian values (i.e., Eastness) in the current situation where the values of Western society (i.e., Westness) are said to be disappearing (i.e., Westnessless).

During the COVID-19 pandemic, the dichotomy of either health care or economic policy was also prevalent in the world. Whichever one was chosen, not only many of those who were infected but also those who were impoverished were killed, regardless of which one they prioritized. Why is it too difficult for the humanity to cooperate together to confront with the crisis? Can be a selfish act of escaping an infection at the sacrifices of the others justified? Why don't the great powers join hands for global cooperation? Moreover, despite the many sacrifices undertaken by countries and citizens in the wake of the COVID-19 pandemic crisis, which has become a new historical fact, the essence of the problem remains unresolved.

"*Quid pro Quo*". Indeed, the history of humanity was not just a sort of visible "glories", rather a more realistic history built on countless negative facets of the consequences such as "victims", "loss", "costs", "burden", "exploitation", "tolerance", "patience", "failures", and others. And then these concepts can be paraphrased as the "*sacrifices*".

In welfare economics, especially, many of such economic conditions can be stabilized as a *Pareto efficient* situation. However, principally there are often the extreme cases that cannot rely on either Pareto or fairness principle in the crises and risky situations such as pandemic, disaster, other natural hazards, and human-made ones (e.g., conflicts, warfare). Further, whether the government leaders accurately decide what to do (not to do) or not, sacrifices would be inevitably undertaken by someone.

The author calls it "*distribution of sacrifice*", which can be modeled to envision a part of social phenomena (see Chapters "A Worldview Seen from Sacrifices" and "Crises, Risks and Sacrifices"). Sacrifices make especially salient in each crisis, emergency situations, and uncountable events such as warfare, pandemics, environmental disasters, international conflicts, political revolutions, and other social events. Namely such sacrifices almost imply not only the total necessary cost to achieve and solve something but also each *life* of individual. In other words, the author frequently wonders how to equalize the total value of both sacrifices and final consequences whether these are achievements or not. Perhaps, both of them cannot be evaluated as equal values, because those are not always insured an equivalent exchange between total sacrifices and final results. If so, who and what such *difference* (absolute value: results minus sacrifices) would be undertaken? The author considers that such inevitable difference should be called as real sacrifices.

Hence, what did Japan and other countries sacrifice and what did they gain against the corona? It is difficult to compare the future that people were supposed to obtain in the face of a crisis with the future that was lost. But if we compare them with the actuality that remains in people's hands, it clearly sacrifices something valuable. As a result, the actuality we got is often not the future we desired. It would be hard to accept such consequences, nevertheless we have to face the actuality.

With this background in mind, first, the author intends to unveil facts of the COVID-19 pandemic in the context of own social scientific investigation (see Chapters "A Crisis of COVID-19 and Its Sacrifices" and "Formalizing Models on COVID-19 Pandemic"). Especially, the author serves own views, which stands on the "*distribution of sacrifice*". In politics, especially, "*distribution of sacrifice*" is always included to politician's job (rather duty), and "*making decisions that involve sacrifice*" is definitively a reason for a politician's existence. They are to make the necessary decisions in the event that they have to make a decision that involves the sacrifice at the crisis rather than "*making a decision that doesn't involve sacrifice*". However, politicians who often deceive the *crisis* do not tell the truth about latent *sacrifice* that necessarily implicates. When talking about the *sacrifice* is frequently inevitable, there is no acknowledgment of their responsibility. In the first place, they can be criticized for the imposition of sacrifice, but they will not be prosecuted for such reasons on sacrifices. And there is no such thing as adequate compensation for any sacrifice. They often said that "*it should be equally undertaken by everyone*"

and further they claim against another *scapegoat* (sacrificial sheep) that can be the target of its attack. In addition, they exaggerate for the sake of the national security, national integration, and other agitations.

When the COVID-19 pandemic reaches the end, it is good to remember what responsibility politicians have taken and what compensation and sacrifices have been made. There was no one to take responsibility for it. Because their job is to "*make decisions that involve sacrifice*", they just fulfilled their responsibilities in the face of the COVID-19 pandemic regardless of their accurateness to achieve the goal of the policies. However, if the citizens examine it to include the unseen sacrifices, how many sacrifices have been made in the world as a whole? Even if the approval rating did not drop, does this mean that every citizen did not recognize the fact that so many people died as *sacrifice*, or they accepted the government's response?

Secondly, the author discusses the historical significance of the humanity due to differences in cultural values (see Chapters from "AI Driven Scoring System and 'Reward or Punish' Based on a Theory of Han Fei" to "A Living Way in the Digitized World"). For example, it seemed that the recent outbreak of the COVID-19 has highlighted not only the quality of domestic medical services and public health policies, but also the differences and adaptations between Western and Eastern cultural values in the age of artificial intelligence. As of March 2020, the WHO's global infection statistics exhibited that the EU countries, the UK and the USA, made up the top ten with the exception of China. It was severe fact that freedom of mobility, the emphasis on private rights, and the supremacy of personal values, which are the cornerstones of Western values directly related to democracy and individualism, were malfunctioned in a state of emergency. The collapse of medical institutions had led to economic recession, exhaustion, and confusion not only in one country but all over the world. On the other hand, countries that follow East Asian values were getting over the infection situation under control even in China which was the origin of the outbreak, and the situation had not become serious in Asian countries including Taiwan, South Korea, and Japan yet. It was possible that the value system that prioritizes relationship, social values, and cooperation throughout the society, which is called collectivism or totalitarianism, may be working effectively in the spread and recovery of infectious diseases.

And thirdly, the author examines the possibilities for conflict or cooperation in the international politics in the "After Corona" (see Chapters from "A New World in Motion" to "For Strategies in the Age of After Corona"). Once, at the time of the Cold War, an international political scholar Morgenthau articulated China as a country that would emerge in the future, regardless China was only a Communist bloc state. Now, as he expected, China has been further increasing its global presence with the advent of the AI and big data technologies. It has made no secret of its movement, which can be taken as gaining global hegemony, not only in the socioeconomic sphere but also in the exercise of cultural influence and sharp power over the world. There is a persistent view that the "*One Belt One Road (OBOR)*" initiative will also erode European traditional values. As for digital cryptocurrencies, there are other concerns that the Chinese government is leading the way and that the dollar-based international currency market will be losing meaning. The world now appears to be entering an era

of qualitative phase transition from a clearly Western nations led regime. Actually, as of August 2020, Esper who is Secretary of Defense of the USA announced "*The Pentagon Is Prepared for China*"[1] and "*PLA (China's People's Liberation Army) modernization is a trend the world must study and prepare for—much like the U.S. and the West studied and addressed the Soviet armed forces in the 20th century*". As Morgenthau predicted, the time has come for Western society to once again learn deeply about China, their values, cultural and historical background as well as advanced technological and military trends.

With all these points in mind, will the Western nations literally fade away as it is the status quo, and will Western values go on self-destructing? And, what kind of prominence is China about to achieve in the new hegemony? Further, what is the course that Japan should take in the face of such global trends?

Tokyo, Japan
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[1] https://www.wsj.com/articles/the-pentagon-is-prepared-for-china-11598308940.

Acknowledgments

A part of book contents was expanded from an invited presentation of the author ("*A Revaluation for The Morgenthau's Prospects in the Digital Society*") at international workshop ("*Transdisciplinary Approaches to Good Governance*") held by the Center for Southeast Asian Studies (CSEAS), Kyoto University, Japan, on February 7, 2020. And, it also included own lecture notes on risk models, epidemics, disasters, political, and international issues of "*Risk Management*" in Tokyo Metropolitan University, Japan.

Additionally, this book included a part of the research results which were officially supported by JSPS KAKENHI Grant (Number 26590105: Grant-in-Aid for Challenging Exploratory Research: *An Exploring Study on Networked Market Disruption and Resilience*) and ISM Cooperative Researches (Number 19-0008: *A Study on the Research Evaluation of Science & Technology and the Rationality of Decision Making*, and Number 25-0014: *A Study on Social Representation and its Networking Dynamics*, and Number 28-0017: *A Study on Mathematics for International Cooperation*).

About This Book

This book broadly categorized the issues as follows, and it elaborates them in each chapter.

Introduction and Principles of Sacrifices

In the first part, with the Preface to this book in mind, the author defines risk, crisis, and sacrifice and outlines the methodologies pertaining to these matters. And the author's own perspective on the "*distribution of sacrifice*" principle articulates in line with the COVID-19 pandemic and "After Corona" era.

1. Introduction: Chapter "A Worldview Seen from Sacrifices"
2. A principle of "distribution of sacrifices" and relative methodologies: Chapter "Crises, Risks and Sacrifices"

COVID-19 Crisis and Its Sacrifices

The second part of the book scrutinizes the COVID-19 pandemic as a social phenomenon. In addition to examining statistical data and mathematical models, the nature of the crisis and sacrifice will be clarified from the perspective of "distribution of sacrifice" proposed in this book.

1. A comprehensive study on COVID-19 crisis and its sacrifices: Chapter "A Crisis of COVID-19 and Its Sacrifices"
2. Simulations of the spatial model on epidemic processes: Chapter "Formalizing Models on COVID-19 Pandemic"

An AI-Enhanced Society After the COVID-19 Crisis

In the third part, the author discusses the qualitative changes brought about by cutting-edge technologies, focusing on sociocultural and economic aspects, such as AI and big data technologies, which are thought to have been promoted by the Corona pandemic. And it brought to light issues such as people's behavioral principles, social morality, stagnant economic development, socioeconomic disparity, and human resource development. In particular, the author deepens own technological vision and consideration of what China's promotion of AI and big data will bring, contrasting it with Western culture.

1. Sociocultural aspects in COVID-19 pandemic in terms of the digital transformation: Chapters "AI Driven Scoring System and 'Reward or Punish' Based on a Theory of Han Fei"–"Synchronizing Everything to the Digitized World"
2. Economic aspects in COVID-19 pandemic in terms of digital transformation: Chapter "A Living Way in the Digitized World"

International Affairs Against Crisis of the After Corona

The author gave an invited talk on system dynamics and simulation studies on the global politics at Kyoto University on February 7, 2020. At that time, it had not become the COVID-19 pandemic yet. However, international tensions between China and the USA were already high. In light of such a global situation, the author discussed a potential for the worse of the relation between China and the USA, and cyber-warfare, and particularly lectured on the risks and crises of military conflict, balance of power, intervention in democratic politics, and manipulation of public opinion.

Here, this part expanded an above lecture and further explores the international issues of the After Corona world with an eye to the aspects of these crises. Accordingly, given that it views as an international issue, the basis of the decoupling world represented by the two great powers between China and the USA will engender the difference in preferences and values over the system of national governance. And it will fluctuate the structure of the balance of power, in which mutual strategies dictate future in the world of the After Corona.

1. A new world in motion caused by the aftermath of COVID-19: Chapter "A New World in Motion"
2. Political aspects and cyber-warfare: Chapter "Digitized Shifts of Regime and Hegemony"
3. Simulations on the balance of power among the stakeholders: Chapter "On Balance of Power"
4. Global trends and international cooperation in the After Corona: Chapter "For Strategies in the Age of After Corona"

Conclusion

This part summarizes all contents of this book.

1. Conclusion: Chapter “Conclusion”

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