論文審査の要旨及び担当者

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The thesis argues that the problems that challenge humanity today, climate change, health and societal inequity are complex problems that cannot be solved with the industrial methods of productivity that we have applied to our most recent challenges and can only be solved by a paradigm shift. The dissertation describes an array of new theories and methods which use the Internet and advances in science and technology to tackle these problems by causing a paradigm shift through communities and social movements.

Over the last century civilization has systematically supported a market-based approach to developing technical, financial, social and legal tools that focus on efficiency, growth and productivity. In this manner we have achieved considerable progress on some of the most pressing humanitarian challenges, such as eradicating infectious diseases and making life easier and more convenient. However, we have often put our tools and methods o use with little regard to their systemic or long-term effects, and have thereby created a set of new, interconnected, and more complex problems. Our new problems require new approaches: new understanding, solution design and intervention. Yet we continue to try to solve these new problems with the same tools that caused them.

Ito's thesis is titled "The Practice of Change" and consists of six chapters.

The thesis addresses to the research question "How can we understand and effectively intervene in interconnected complex adaptive systems?" by examining his own success and failures in the form of learnings and insights. The thesis discusses what questions are

outstanding and conclude with a call to action with a theory of change; bringing about a fundamental normative shift in society through communities, away from the pursuit of growth for growth's sake and towards a sustainable sensibility of flourishing that can draw on both the historical examples and the sensibilities of some modern indigenous cultures, as well as new values emerging from theoretical and practical progress in science.

The dissertation begins by describing five primary problem: the peril of silos; the problem of monolithic and centralized systems; the opportunity and need to rethink democracy in the post-Internet era; the need to rethink health and medicine; and how to address climate and environmental issues in Chapter 2.

In Chapter 3 the dissertation presents a framework for understanding the systems we will be discussing. The dissertation draws on systems dynamics, evolutionary biology, cybernetics, design, history and philosophy of science, the history of the Internet, and lessons from Lawrence Lessig. The dissertation addresses the nature of the Internet and the perils of reductionist thinking. Ito argues that the only way to change the system is through a paradigm shift in theories and methods of change. He argues that the intervention is best delivered through an artistic and cultural intervention, using the hippie movement as an example.

In Chapter 4 the dissertation describes how the Media Lab works, using several of the initiatives at the Media Lab as examples of an "antidisciplinary" approach to address the peril of silos. The dissertation then describes Ito's work as the CEO of Creative Commons, a board member of The Open Source Initiative, his work in the cryptocurrency communities since the 1990s, and his work in the venture and venture capital community to describe the learnings from, and contributions to, decentralized architectures. The dissertation describes Ito's work on various layers of the Internet infrastructure, including his role in the development of social media and the new public sphere, and his teaching and research in the ethics and governance of artificial intelligence. These are contributions to reinventing the new post-Internet democracy. The dissertation describes Ito's course, "Principles in Awareness" at the Media Lab that he teachs with the Venerable Tenzin Priyadarshi that explores self-awareness. The dissertation describes the Health 0.0 initiative—a new intervention to think about the future of health and medicine, and whether Ito and his group can apply learnings from the Internet and the antidisciplinary approach. The dissertation also describes Ito's work as the board chair of PureTech Health — a new kind of biomedical

company. Lastly, the dissertation discusses Ito's work on the environment, describing the citizen radiation measurement organization Safecast as an example not only of environmental activism but as a new way of using post-Internet organizational principles to create grassroots activity. The dissertation describes the efforts of the Nia Tero organization to protect the environment through collaboration with indigenous people and local Communities.

In Chapter 5 the dissertation describes Ito's journey and addresses some of the questions that were raised during the dissertation defense and in feedback from the committee. The chapter covers happiness, conviviality, interest-driven learning, and how individuals and organizations apply the lessons developed through the course of this dissertation.

Chapter 6 is a conclusion in which Ito reflects on his experience and examines his successes and failures in the form of learnings and insights. The dissertation explores questions that remain and concludes with a direction for future work based on a theory of change: a fundamental, normative shift in society away from the pursuit of growth for growth's sake. Ito argues that this new sensibility should draw on historical trends, indigenous sensibilities, and new values emerging from the environment created by new technologies and understanding of science.

Through this thesis, the following three major contributions are proven;

First, a post-Internet framework for understanding and intervening in complex adaptive systems. Drawing on systems dynamics, evolutionary dynamics and theory of change based on causal networks, the thesis describes a way to understand and suggest ways to intervene in complex systems. It also argues that an anti-disciplinary approach and paradigm shifts are required to achieve the outcomes we desire.

Secondly, learnings from the creation and management of post-Internet organizations that can be applied to designing and deploying interventions. The thesis proposes an architecture of layers of interoperability to unbundle complex, inflexible, and monolithic systems and increase competition, cooperation, generativity, and flexibility. It also argues that the Internet is the best example of this architecture and that the Internet has provided an

opportunity to deploy this architecture in other domains. In this thesis how the Internet has made the world more complex but through lowering the cost of communication and collaboration has enabled new forms of organization and production is clearly demonstrated. This has changed the nature of our interventions.

Lastly, how and why we must change the values of society from one based on the measurement of financial value to flourishing and robustness. The paradigm determines what we measure and generates the values and the goals of a system. Measuring value financially has created a competitive market-based system that has provided many societal benefits but has produced complex problems not solvable through competitive market-based solutions. In order to address these challenges, we must shift the paradigm across our systems to focus on a more complex measure of flourishing and robustness. In order to transcend our current economic paradigm, the transformation will require a movement that includes arts and culture to transform strongly held beliefs. The thesis proposes a framework of values based on the pursuit of flourishing and a method for transforming ourselves.

The thesis committee thoroughly examined this thesis arguments and highly valued this thesis as a proposal of changing in the social system for the human beings in the post-Internet society. Therefore, the committee agreed to issue the Doctoral degree of Media and Governance to Joi Ito for this thesis.