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Factors of Continued Individual-Led Participation with Digital Platforms and Open data

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Abstract. This research explores the factors influencing participation and sustained engagement in individual-led social actions, particularly in online open-data communities. Drawing from economic and sociological perspectives, it examines the mechanisms of online social relationships and their impact on civic engagement. Inspired by the gift economy (Rheingold, 1993) and commons-based peer production (Ostrom, 1990), this study investigates how decentralized cooperation, and digital tools facilitate participation in collaborative projects. A review of prior studies reveals a gap in understanding how cooperative behaviors persist in fluid, short-term participation models. Traditional research assumes fixed participant roles and strong organizational belonging, but recent trends indicate increasing diversity in online participation structures. This study seeks to clarify participation and continuation motivations in such dynamic environments through case studies of cloud work, civic tech, and individual-driven OSINT(Open Source Intelligence). A mixed-methods approach, including quantitative analysis of participation factors and qualitative interviews, will be applied. The findings will contribute to social informatics and behavioral economics, offering insights into digital collaboration and online governance. By reassessing social relationships and motivation structures, this research aims to refine theoretical models of online participation and inform platform designs for sustainable digital communities.

Overview of Doctoral Research

My doctoral research focuses on identifying the initial and sustained participation factors in individual-led social actions, particularly in online open-data communities. From an economic perspective, it seeks to elucidate the mechanisms of online social relationships and their influence on civic engagement. Inspired by the gift economy concept (Rheingold, 1993) and commons-based peer production (Ostrom, 1990), this research investigates how decentralized cooperation and digital tools facilitate individual-led participation in collaborative projects. The study aims to analyze multiple cases of individual-led cooperative actions in online spaces to provide a research perspective on diverse and fluid collaboration models. To achieve this, the doctoral research focuses on identifying the factors influencing participation and sustained engagement in cooperative actions within online environments.

Literature Review and Research Question

In determining the approach for this doctoral research, a review of the following prior studies will be conducted. Based on these discussions, the research questions will be derived.

1. Foundational Research on Collaboration in Digital Spaces

1.1 Gift Economy

Understanding social relationships in online and digital spaces requires examining the concept of the gift economy. Rheingold (1993), inspired by Mauss (1925), proposed that gifting is not a one-way transaction but a reciprocal action that strengthens social bonds. This notion applies to digital environments, where gift economies play a vital role.

1.2 Relationships through Shared Resources

The notion of commons and public goods has been revisited to reflect evolving societal structures. Ostrom (1990) warned against the depletion of commons and highlighted the potential for sustainable resource management. Ostrom's work also challenged the binary division of governance into market and state, demonstrating the feasibility of governance through voluntary cooperation.

Unlike physical resources, digital collaboration primarily involves the exchange of information rather than tangible assets. Unlike finite physical resources, information retains its value and even enhances the community's overall value when shared (Rheingold, 1993). Thus, understanding online collaboration requires focusing on information as a key resource and analyzing why and how such exchanges occur.

A shift has occurred from traditional commons (static and universal assets) to fluid, continuously updated information flows. Digital collaboration relies on dynamic knowledge-sharing, where collective intelligence gains value through broader participation rather than long-term involvement by a single entity. Furthermore, for instance commons management can be structured as crowed working, freelance workers, voluntary commitment works in civic projects and decentralized autonomous corporations.

2. Analyzing Participation Motivations in Online Communities

Research on cooperative behaviors in online communities (Kollock, 1999) highlights the gap between incentive structures and actual motivations. Based on the argument of Kollock, future research must identify the motivations that drive individuals to collaborate online.

Additionally, the study references existing research on online participation motivations to establish a comprehensive understanding of the factors influencing engagement in digital communities. The role of social relationships in online collaboration has been a recurring theme across research. Rheingold (1993) focused on social relationships in online spaces, emphasizing sustaining the community through cooperation as a crucial factor in community longevity. He argued that online communities rely on long-term relationship building and mutual assistance. Similarly, Brian et al. (2002) examined the role differences between formal leaders (administrators, owners) and general members in online communities, highlighting the incentives that drive contribution. Their findings revealed that members with strong real-world social connections tend to contribute more actively to their online communities. Furthermore, they emphasized that stronger social ties lead to higher engagement, indicating that designing roles based on participant motivations is essential for community sustainability. Similarly, Kittur et al. (2007) analyzed Wikipedia, focusing on the different roles of contributors in collaborative editing and highlighting the distinct behavioral patterns of various user groups. Another study, Organizational Commitment Theory (Lampe et al., 2010), demonstrated that a sense of belonging to a digital community predicts long-term participation. This research confirmed that when users feel a sense of belonging, their frequency of use and level of contribution increase.

However, these previous studies assume fixed roles for participants and emphasize organizational belonging as a prerequisite for engagement. Recently, participation models have become more diverse and fluid, with short-term participation patterns involving rapid assembly and dispersion. This suggests that the time available for building social relationships is shorter, and participant roles are not necessarily fixed. Additionally, emerging communities lack strong shared goals or a common sense of purpose as commons (Ostrom, 1990). Therefore, a reassessment of the assumptions regarding social relationships in prior research is

necessary. This study aims to address these considerations by examining multiple use cases with different participation structures, breaking down the dynamics of social relationships, and clarifying their realities. Drawing on Rheingold's (1993) theory of gift economy in online spaces, this research seeks to elucidate the mechanisms of information exchange and cooperation in digital environments.

Therefore, building upon these prior studies, the research questions in this study are the followings.

Research Questions

(1) While social relationship building is considered essential for sustained participation in online spaces, why does participation and continuity in cooperative actions persist despite the fluidity of participation and the short-term variability of participants? (Mechanism Analysis)

(2) Despite the expanded opportunities for individual-led social participation enabled by technology, why do some people choose to participate while others do not? (Motivation Analysis)

Methodology

As previously discussed, this study acknowledges the increasing diversity of cooperative actions in online spaces. By revisiting the assumptions of prior research and focusing on new forms of cooperation, it aims to clarify participation and continuation motivations, ultimately seeking to understand "what is considered valuable" in these interactions. To achieve this objective, the following methodology will be adopted:

Selection of Use Cases

In an era of increasing individualization, the purposes and motivations behind cooperative actions have also diversified. Firstly, group boundaries have become more ambiguous, fluid, and variable. As a second, anonymity has increased, with participation often being event-based. Thirdly, instead of focusing on shared purposes and commons-based resource management, this study emphasizes cooperative actions that form and dissolve around tasks or events. By analyzing the diverse nature of cooperative actions in online spaces, this study aims to reveal participation and continuation motivations, contributing to a deeper understanding of what individuals perceive as valuable in these interactions.

Methods

The estimated use cases for this study and each data collection methods are described in a table (Table I). Firstly, cloud work involves cooperative actions that generate economic value, primarily as a form of economic compensation on

Table I. Selected Use Cases and the Methods

Use Case	Data Collection Methods
Cloud Work	(1) Quantitative Analysis: Online Questionnaire Survey
Civic Tech	(1) Quantitative Analysis: Analysis of open data (2) Qualitative Analysis: Interviews
Individual-driven Open Source Intelligence (OSINT)	Qualitative Analysis: Interviews

digital platforms. While participants may have common goals, these goals are not the primary purpose of their engagement. This category is analyzed through quantitative methods, which is regression analysis using econometric methods using an online questionnaire survey to participation trends and motivations. Secondly, civic tech cooperation is conducted with an awareness of the commons, focusing on information sharing rather than financial incentives. Participants engage in collaborative efforts to manage and utilize shared digital resources. The study employs both quantitative and qualitative approaches. Quantitative analysis involves examining open data to understand participation patterns, while qualitative analysis consists of interviews to gain deeper insights into participant motivations and behaviors.

Lastly, OSINT (Open Source Intelligence) is a methodology for collecting and analyzing publicly available information to extract valuable insights, and its importance has been increasing in recent years. Individual-led OSINT refers to an individual-driven cooperative action that involves verifying facts using publicly available satellite images, geospatial information, and other open data, then sharing and discussing findings in online spaces. It differs from OSINT as used in policy-making and national defense strategy, where analyzed and processed knowledge products are created for decision-makers, or the process of producing such intelligence products. This category includes cooperative actions where there is little awareness of the commons, and participants do not necessarily share common goals. Instead, collaboration occurs in a more decentralized and fluid manner. The study primarily uses qualitative analysis**,** relying on interviews to explore how cooperation emerges despite the lack of a centralized organizational structure. To synthesize the results of interviews about individual-led OSINT and Civic Tech, I have applied Grounded Theory Approach (GTA) for qualitative analytics.

Achievements and Progress

Papers Under In Press

Asaki Fujino, Soichiro Takagi. (2025). Factors Influencing the Cognitive Attitudes of Crowd Workers: A Focus on the Social Relationship between Workers and Seekers. Social and economic systems studies, The Japan Association for Social and Economic Systems studies. (In Press).

Presentations and Conferences

Fujino, Asaki; Shirasawa, Miyuki; Hamm, Andrea; Shibuya, Yuya; Takagi, Soichiro; Sekimoto, Yoshihide , Exploring Community-led Participation with Civic Tech to Create New Community Ties: Potential and Challenges of an Eco-Activity Promotion Platform in Nagareyama, Japan, IIAS-DARPG , New Delhi, India, February 2025.

Asaki Fujino, Hidenori Watanave, Analysis of the Motivation and Continuation Factors in OSINT Activities: Focusing on Attributing Meaning to Data and Communication of Information Sharing, Japan Society for Digital Archive, Tokyo, Japan, November 2024. https://doi.org/10.24506/jsda.8.s2_s43

Asaki Fujino, Shoichiro Takagi, Examining Work Styles in the With-COVID Era: An Analysis of Cloud Work Implementation and Its Sustainability from the Perspective of Occupational Characteristics, Japan Society of Social and Economic Systems, Tokyo, Japan, October 29 2022.

Awards and Honors

The SSI Thesis Encouragement Award (Master's Thesis), The Society of Socio-Informatics, September 2023.

The Head of Department Award -Socio-information and communication studies course, The University of Tokyo Graduate School of Interdisciplinary Information Studies, March 2023

Future Research Plans

Currently, I am refining my research direction by presenting at domestic and international academic conferences and incorporating feedback. The first round of analysis for all selected use cases is complete, with results aligning with the expected research direction. Based on this, I am preparing for a second round of analysis to conduct a more in-depth examination.

Regarding cloud work, data collection was completed in both 2022 and 2023. Cloud work involves labor generating economic value, where common goals exist but are not the primary purpose. Interestingly, findings from the 2022 dataset indicated monetary rewards were not a significant factor in participants' intention to continue engagement (Fujino, 2023). Instead, Fujino (2023) revealed variables related to social relationships were significant in predicting continued participation. The next step is to examine whether the 2023 data yield similar results. Additionally, I plan to reassess social relationship variables, considering the COVID-19 pandemic's impact from its peak to its decline. By integrating conclusions from the 2022 data, I aim to derive further insights into factors influencing sustained participation in cloud work.

For OSINT studies, my research will focus on its potential applications in civil society, exploring citizen-participatory possibilities. I will examine how citizens engage in OSINT activities in journalism, disaster response, and policy evaluation. In particular, I will investigate how integrating open data enables citizen-driven information analysis to contribute to society by conducting interviews with individual-led OSINT activists.

From a Civic Tech perspective, my focus is analyzing factors for community participation, investigating characteristics of long-term and short-term sustainable Civic Tech communities, and deriving insights on maintaining participant motivation. As a Project Researcher at the Center for Spatial Information Science (CSIS), University of Tokyo, I am conducting case studies on Civic Tech initiatives in Japan and abroad. In collaboration with Professor Clara Crivellaro from Newcastle University and scholars in ECSCW and HCI, I plan to advance joint research efforts in this domain.

Expected Contributions

Building on my expertise in social informatics and behavioral economics, my research focuses on understanding human behavior in online spaces. By integrating sociological perspectives with econometric methodologies, I aim to model and theorize digital interactions, contributing to the practical development of Information Sociology. While my research theme itself is inherently interdisciplinary, I also seek to combine sociological analysis with quantitative economic approaches as a methodological framework, fostering a more comprehensive understanding of digital society.

(1,964 words)

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Rheingold, H. (1993). The virtual community: Homesteading on the electronic frontier. MIT Press.