

Title	社会調査の手法を用いたシビックテックにおける技術者と非技術者の協働に関する研究
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Citation	
Issue Date	2019-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/15999
Rights	
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Study on collaboration between engineers and non-engineers in civic technology by social research

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March 2019

Keywords: Code for X, Grassroots community, Civic engagement

In recent years, citizen-driven problem solving which is called a “Civic tech” has been a big movement in some countries like America or Europe. Civic tech is a coined word which is made by “Civic” and “Technology”, and in many cases, this is used as a tool to improve the relationship between government and citizens or to change government service more efficiently or effectivity. However, civic tech in Japan has another meaning, we tend to use this word as a civic activity to solve our personal issues, not a government issue. Cause Japanese civic tech has those meaning, civic tech in Japan has some unique features. For example, the number of communities which work to do civic tech is so much bigger than other countries, and they are doing various activities not only problem-solving in their area. Also, civic tech in Japan makes a solution in the field which is not covered by the government service, like an issue in rural area and earthquake disaster reconstruction.

That's why, civic tech is becoming an essential tool for us, who cannot be helped by others, but in Japan, civic tech is facing one big problem. There often presents an imbalance between skills and problems, such as difficulties in utilizing technology due to a shortage of engineers with adequate skills, and in finding actual social problems caused by a lack of citizens who are familiar with regional matters. And what is worse, many civic tech communities are trying to improve their situation, but most of them have not been able to do that. And curious to say, this issue is not regarded as a serious issue in civic tech in foreign countries. Take a Japanese civic tech situation in the count, this problem can be caused by the difficulties of collaboration between engineers and non-engineers in the civic tech community. In America, civic tech communities are

supported by Code for America, which is a non-profit organization to help civic tech in America, and most of them have organization structure to collaborate Code for America and local government because their role is an improvement of government service or relationship between citizens to the government. But in Japan, the role of civic tech is different from that of America and making a support system like Code for America is difficult in Japan because we don't have foundation or donation system for civic tech. Consider this situation, the collaboration between engineers and non-engineers in the civic tech community in Japan looks impossible, but in Japan, some case which looks succeed the collaboration exists. If the collaboration between engineers and non-engineers are truly being a problem in the civic tech community in Japan and we can clear up the mechanism of development of collaboration of them, it may lead to find new theory about collaboration and improve the situation of Japanese civic tech as well. Then, we confirmed the recognition of organizer of civic tech about collaboration between engineers and non-engineers by the questionnaire survey, and the result of this survey supported our assumption.

Based on that, we aim to qualify the elements which improve collaboration between engineers and non-engineers and value which is made from collaboration in Japanese civic tech communities and make a model which explain the process of development of collaboration in the civic tech community.

To achieve this purpose, we had conducted a literature survey about collaboration and interview survey to the developed civic tech communities and made these four hypothesizes about the collaboration between engineers and non-engineers in the civic tech community.

1. Communities which has high independence of tasks, communication, and coordination, relationship sustainability, social capital has a stronger dependency between engineers and non-engineers compared with the other communities.
2. The autonomy of participants in the communities which is doing effort to enhance autonomy is higher than that of other communities.
3. The rate of regular participants in the communities which have a strong relationship to outsiders and place where members can come any time
4. The number of application which is maintenance long time in the community which has strong dependencies between engineers and non-engineers, the autonomy of the participants is high, the rate of regular participants is high is more than other communities

We make measurable indicators from those hypothesizes and verify them by the questionnaire survey to all of the organizers of civic tech communities in Japan. We

sent questionnaires to 90 civic tech communities, which we confirmed as a civic tech community, and corrected 50 answers. In those answers, we analyzed 36 communities data which passed out validation check.

As a result of this research, we found two things.

- Collaboration in the civic tech community is separated by 3 phases, the first phase is started from efforts to make collaboration place and continually relationship between the members of the community.
- The autonomy of non-engineers is affected by some efforts by the civic tech community, like making collaboration place, making the relationship to outsiders, and autonomy of engineers are affected by the autonomy of non-engineers.

Based on the result, we verified our hypothesis and made a model which explain the process of collaboration development. The model indicated the process of collaboration development in grassroots community and method to enhance the autonomy of participants in collaboration between engineers and non-engineers. We also found that organizers think that the values of collaboration between engineers and non-engineers are improvement of the diversity and improvement of the approach to regional issues. This result suggested us to focus on process, not an output of the activity.