

Title	ICTを用いたプロボノ活動による社会課題解決プロセスの研究 --Code for Xを事例として
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# Research of Pro Bono Activities for Social Management Process using ICT

--A case study of Code for X

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Nowadays, with the progress of ICT (Information and Communication Technology) in reducing the cost of software development and the increasing number of people who are able to participate in development, it has become possible to develop new services based on basic software. For example, Linux operation system is a kind of DIY version basing on Unix operation system, and everyone can participate in the design of the system. Moreover, due to the development of these new services, the social environment in modern life is rapidly changing. The limitation of governmental responses to social needs and subjects, accompanied by a deterioration in collective action by local communities, has attracted attention. At the same time, due to the persistently low fertility rate and progression of the aging population in Japan, unprecedented social problems are occurring, which are unique to modern Japanese society. In this circumstance, autonomous and sustainable community revitalization that effectively utilizes ICT has begun to be expected. Although there are sufficient ICT experts in the corporate sector, a lack of organizational understanding, such as such as how to achieve cost-effectiveness, and a shortage of ICT experts in the public sector have been an impediment to change. In order to deal with the contradiction that ICT professionals are not able to utilize their skills for the public good, the “part time voluntary contribution” of ICT experts was proposed. Besides, “pro bono” refers to volunteer activities that provide expert skills and knowledge to helping find solutions to social problems. A good example of this new type of software development volunteerism is "Code for Kanazawa," which develops software and hardware for civic society. The name “Code for” comes from the precedent example of the same activity in the United States. This group tries to combine citizens and experts’ knowledge to solve community problems in Kanazawa. Since 2013, Code for X (X standing for a community or agenda) has become popular in Japan. Approximately 80 CFXs were established (or were preparing for establishment) by the end of October 2017. However, the pro bono ICT activities of CFX in Japan have not been fully analyzed.

Until now, research that has studied the process of CFX has not come to systematic conclusions using scientific surveys. Some of the researches have concluded that CFX activities are a combination of ICT experts, citizens, open data, and loyalty to a civic society, while the promotion of open governance and the creation of new businesses accelerated these activities. However, the process of bilateral collaboration in the creation of productive applications of ICT has not been examined, and the factors that drive the process have not been studied based on observed data.

As such, this research tries to clarify the knowledge management and collaborative process between civic society, the corporate sector, and the government sector with the participation of ICT experts using an on-site participatory study and a questionnaire investigating CFX.

This study also tries to identify current trends in pro bono work among diverse experts. Shikida (2010) alone indicated a “half-shift model” that explains part-time volunteer work by experts. However, their motivation and the organizational process of their activities have not been investigated. In addition, CFX is the application of open governance among diverse participants with professional knowledge and skills like programming. This research also uses a “Circuit Model” by Shikida (2005) that describes the participatory knowledge creation process in an open context well. This model can explain the process of CFX, which it can make it easier to understand the steps of the creation of knowledge. The author tries to improve the model to provide a useful evolutionary design for creative learning by introducing, transforming, and creating knowledge autonomously in the process of CFX. The result of this research shows a cyclical process in CFX social management. In addition, the subject of CFX social management is “people,” including the participating citizens and technical experts.

The results of this research are organized into three parts.

The first part of the result is the present situation of CFX in Japan. During the period from 2014 to 2016, CFXs have been densely established. At the same time, the social recognition of CFX has also increased. Also, the most important job that CFX is doing is to create applications, and many of those applications give priority to solving subjects in localized areas instead of subjects that need to be solved immediately. Meanwhile, people with expert knowledge, so-called "pro bono" workers, are required during the process of CFX's social management. However, the maintenance and updates of applications created by CFX have not kept up with needs, which means that the services provided by the applications have not been delivered sustainably.

The second part of the result is the process of CFX social management. From the results of the case study, it was found that CFX solves social problems using four basic patterns: forming a place of establishment, holding an event, issuing an application, and public relations for the new application. The four patterns are also validated by the questionnaire. The result is that, under the influence of a Civic Tech philosophy and the achievements of CFX pioneers, new CFXs are being established, which is the starting point of the social management process. The second pattern is to discover the social subjects of local area through a meeting of core member. Subsequently, at the event organized by CFX, an exchange and

sharing of knowledge will take place with diverse participants and progress will be made in solving the social concern. Finally, CFX uses applications to deliver services to the local community.

The third result of this research is the driving factors of the social management process of CFX. Among the factors related to solving social problems using CFX, the most important aspect is "people." "People" here refers to leaders involved in the establishment of CFX, citizens participating in the event, and engineers with knowledge of programming. Here, it was found that if one of these three kinds of people did not participate, the social management process could not be established.