Geneva Challenge 2021

Rashisa Platform

A SOLUTION THAT REALIZES CITIZEN-DRIVEN, INCLUSIVE RECOVERY FROM CRISIS

Masaki Umeda, Taiga Komatsu, Arisa Yasui

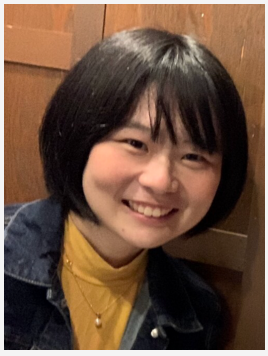
Abstract

In the disaster recovery scene, it is difficult to say that all the people involved are fully utilizing their abilities and personality.
Therefore, we proposed "a platform that accumulates their strengths and weakness so that individuals can demonstrate in the event of a disaster."
By doing so, it is thought that citizens would be able to realize and understand who they are, and at the time of a disaster, they will be able to demonstrate what they can do easily in the field of contribution activities and realize a recovery / reconstruction process. On the other hand, it is thought that the government can promote not only appropriate staffing but also citizen participation in the recovery / reconstruction process by making the best use of individuality and skills based on advance preparation.
It is assumed that the effect of this project will be measured from changes in disaster prevention behavior and satisfaction/awareness of residents. We aim to introduce it from regions that are considered to have a high affinity with this project and develop it throughout Japan and around the world.

Team Description

Masaki Umeda is a Master's student of the department of Civil Engineering at the University of Tokyo, Japan.
He holds a BA in Civil Engineering from the University of Tokyo in 2020. While in school, he has been working at the think tank as well as Africa-based energy startups, triggered by his sufficient academic knowledge of electricity policies in foreign countries, and his strong interests in self-help communities based on decentralized electricity infrastructure.

Taiga Komatsu is pursuing a Master of Civil Engineering at the University of Tokyo, Japan. He holds a BA in Civil Engineering from Toyohashi University of Technology. His research interests are within human resource development and innovation practice for regional revitalization.



Arisa Yasui is currently a Master student of the department of Civil Engineering at the University of Tokyo, Japan.
She holds a BA in Civil Engineering from the University of Tokyo in 2020. Her research and interest revolve around Disaster management, especially focus on human ability and action.

Table of Contents

1: Introduction

1.1 Background

The hometown where one of our members born and raised was hit by a disaster in 2020. Any houses were flooded by the heavy rain, he was involved in disaster recovery as a victim and a volunteer. Many supports and aids were required, and there were a lot of problems to be dealt with. To respond to the situation, many directors such as volunteer leaders addressed others to support disaster recovery. But he sometimes felt troubled by calls. That is "If you are strong men, ..." He assisted in removing debris, because HE WAS A MAN. However, He was proud that he was good at cooking rather than being entrusted with physical labor, so he felt that he could contribute to disaster recovery by distributing boiled rice to victims. Then, he think that several opportunities to fix the role linked to gender were caused and many strengths of individuals were removed in disaster recovery by such calls.

Picture 1: Aerial photo of Ashikita Town, Kumamoto Prefecture, Japan on July 4, 2020
Source: Net news on July 6, 2020, featured by THE NISHINIPPON SHIMBUN CO., LTD.

1.2 Literature review

1.2.1 Overall of disaster preparedness in Japan

Japan is one of the countries with more disaster experiences than other countries in the world. Earthquakes, heavy rains, floods, tsunamis, eruptions, etc. have caused countlessly and made casualties. At present, the risk of flood damage and landslides due to climate change is lurking all over Japan, and there are concerns about earthquakes directly under the Tokyo metropolitan area and Nankai Trough earthquakes. While many lessons have been learned from disasters so far, further

disaster prevention will be required in the future, and both top-down and bottom-up approaches for disaster preparedness are required. It is also becoming necessary to consider disasters as risks that occur in multiples rather than in a single way. In Japan, the need to promote disaster prevention activities through disaster experience has been sought, and various developments have been made. And it can be roughly classified into three phases. The first phase is "disaster prevention to make people aware of disaster prevention", the second phase is "disaster prevention that does not make you feel as disaster prevention itself", and the third phase is "disaster prevention built in town development". The main feature of the first phase is that experts bring knowledge to the local community from the perspective of disaster prevention; thus, it is led by experts. Voluntary disaster prevention organizations were established in many areas of Japan during this phase, and are still at the core of regional disaster prevention activities. However, regarding voluntary disaster prevention organizations, it has been reported that the number of participants in disaster prevention activities is small, the development of human resources such as leaders is not progressing, and the activity costs and equipment shortages are issues. The second phase is characterized in that experts do not bring knowledge about disaster prevention, but use programs and tools that result in enjoying daily activities in the area. One example is the creation of attractive area maps. These efforts provide an opportunity to know about disaster prevention for people who are not necessarily interested in disaster prevention, and it is attractive to acquire knowledge of disaster prevention naturally while enjoying the efforts. However, whether the theme can attract the attention of the participants tends to depend on the characteristics of participants, and the current situation is that participants with different attributes cannot sufficiently interact with each other. In this way, while there are issues that have been resolved through the first and second phases, the reality is that there are many things that can be newly pointed out during the phases.

The first is that there are several unseen barriers to dealing with disaster prevention activities for the local community members. Disasters occur all over the country, and even if it is well known that countermeasures are necessary, it is a burden to engage in disaster prevention activities in a way that is newly incorporated into daily life. The second is the dependence on specialists throughout the region. It is good to see the field of disaster prevention established in the local community. But if the process to establish it depends on experts, it will become the field that is not relevant to the local residents. The third point is that we have not been able to build activities in which all people can participate as the main actors. Programs implemented by citizen groups are based on their own interests, and there is no need to forcibly expand them. However, by dividing the attributes of the target person and continuing to develop the activity, the opportunity for participants with different attributes to interact with each other is not created, and as a result, the people cannot be the main actors. From the perspective of achieving both disaster

prevention as well as sufficient community engagement, there is an urgent need to build inclusive disaster preparedness.

1.2.2 Inclusive disaster preparedness

Inclusion is often discussed as a set with exclusion. It is impossible to include everything, and every time something is included, something is excluded. The power of who identifies the subject of inclusion becomes an issue. And the fundamental debate about inclusion, such as the existence of people who cannot speak for inclusion, the existence of people who do not seek inclusion, and the existence of untouchable people and those who are out of the law, can be exhausted.

The idea of inclusive disaster prevention in Japan has been incorporated into the "Guidelines for Evacuation Support for Persons Requiring Assistance in the Event of a Disaster" formulated in March 2006. People who can be sent are defined as "people requiring assistance during a disaster", and the elderly, people with disabilities, foreigners, infants, pregnant women, etc. are specifically promoted to create a list of people requiring evacuation action. I'm doing it. Internationally, the Sendai Disaster Risk Reduction Framework 2015-2030, adopted at the 2015 World Conference on Disaster Risk Reduction, includes words such as disability, gender equality, non-discrimination, poor people, gender, and age. Inclusion was included in multiple clauses alongside empowerment and accessibility.

The subject of discussions on inclusive disaster prevention is that while the above-mentioned idea of inclusive disaster prevention has become widespread, the current situation is that damage continues to be concentrated on people who needed consideration and support at the disaster site. ..

The third phase, "disaster prevention built into town development," has the potential to lead to inclusive disaster prevention. A major feature of this phase is that disaster prevention is incorporated into activities carried out by local communities, such as conservation of the natural environment, watching over the elderly, and traffic safety. It is essentially different from the first and second phases, where the main focus was on rooting disaster prevention activities. Since the approach is to incorporate the idea of disaster prevention into the activities that the residents are already working on independently, the burden of adding new activities to the residents can be reduced. In addition, since there is a circuit in the existing community where various residents can participate and can approach various people, it is possible to promote mutual exchange between various actors. And building exchanges between various actors before a disaster occurs will be the first step toward disaster prevention activities that include many people.

2: Our Solution - Rashisa Platform

2.1 Description of problem to be solved

In the situation when disaster occurs, one of the biggest barriers for the local community is how to deal with thousands of problems as effectively and efficiently as possible. Such efficiency-oriented experiences have been accumulated so far, by which the concept of "inclusiveness" has been disregarded as a non-prioritized issue. However, it is also true that the strategy has been hindering the active engagement of the citizens while maximizing their abilities, as referred in background section.

We believe that, by applying the power of technology, such an "exclusive" aspect of the recovery and reconstruction process can be solved.

2.2 Idea concept-Interface with the citizens: Smartphone app

We propose the idea of a local-community-based platform which accumulates strengths that each citizen can embrace for the community, as well as their weakness. We name it "Rashisa-platform" after the Japanese term "rashisa" that means the own identities that each person has, regardless of strength and weakness. This platform works as a good reference for all the citizens in the concerned community to understand the demand that can be met by their abilities, and we expect that "understanding what they can do in advance" can become a good trigger to promote the active engagement of the citizens in the situation under disaster. Moreover, we believe that management organizations of concerned communities, such as local government, will also be a beneficiary, because this platform can contribute not only to inclusive development of the community but also to comprehending needs from citizens in more detail, and they can invest in disaster preparedness more effectively.

2.3 Our business overview

2.3.1 Main customers and payers

Our idea is fundamentally a community-based platform; therefore, the expected beneficiaries can be (i) managers of the concerned community, and (ii) citizens of the community. (i) includes not only local municipalities, but also voluntary disaster prevention organizations, which should also be the key players in disaster prevention. However, in terms of payment for our service, we are concerned that each local is not willing to pay for our service in the initial stage, because their benefits from registering the platform (e.g. getting help from the others in the community) are small. Therefore, we suppose that our idea is firstly adopted by the managers of the concerned community.

2.3.2 Flow of value proposition

In order to collect information for “Rashisa-platform”, we firstly prepare the smartphone-based application. In order to promote downloads from citizens, we also prepare some functions that are useful for collecting disaster-related information.

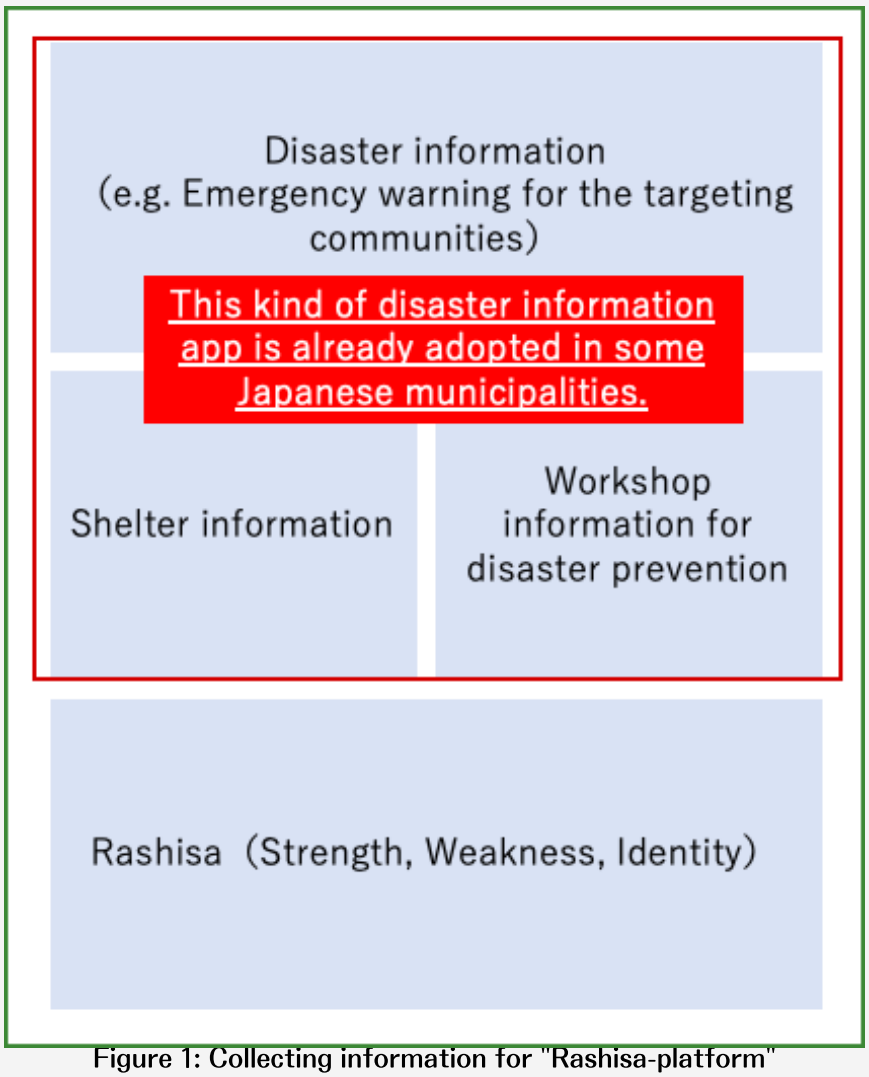


Figure 1: Collecting information for "Rashisa-platform"

Collected information is open to the public as much as possible so that citizens can visibly understand the "rashisa" of community members, and “Rashisa platform” promotes mutual communication and matching among citizens.

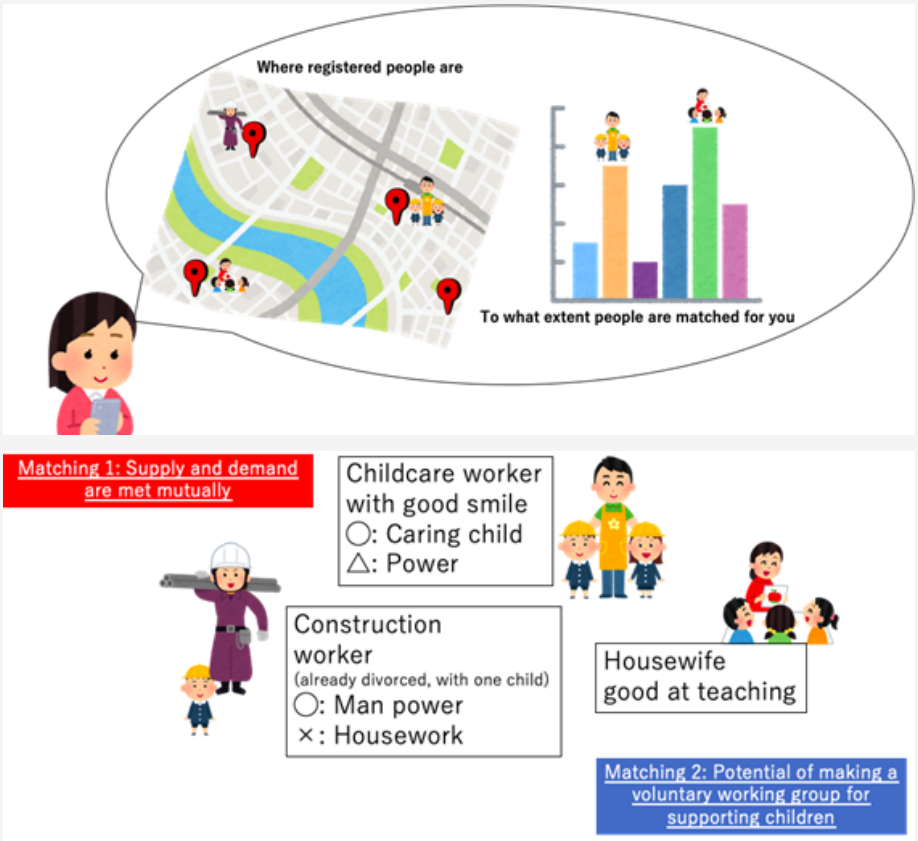


Figure 2: Managing image of customer's "Rashisa"

Moreover, collected information is analyzed for the managers of the concerned community (cf. local municipalities, voluntary disaster prevention organizations) to understand what is necessary to support the community as a whole and invest in them for disaster preparedness more effectively.

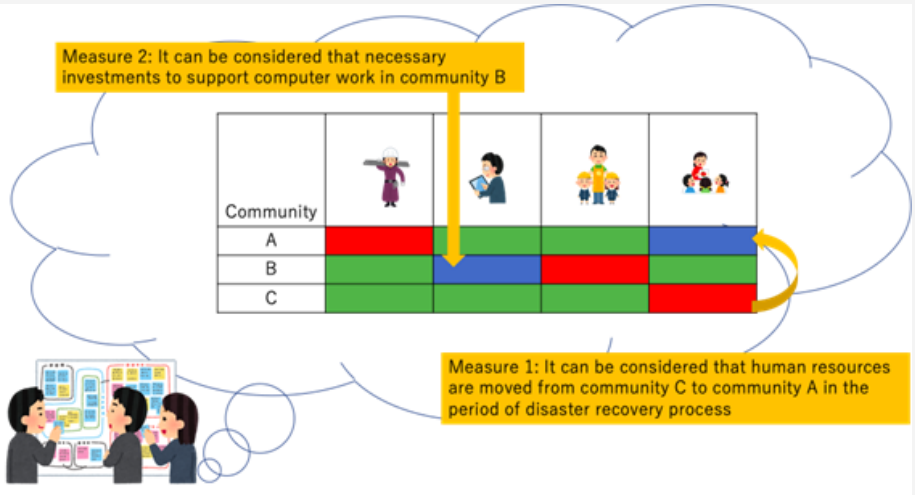


Figure 3: Making use of information from platform for disaster prevention plan

2.4 Result of questionnaire

We conducted small-scale questionnaires (N=20) in order to make it clear whether this "Rashisa-platform" is met with demands so that it can be accepted.
First, in terms of motivation for social contribution activities in the recovery and reconstruction process, 75% of respondents answer that "If there is an opportunity to contribute, I would like to do so."
Second, for the question of "What kind of support do you think would make it easier to conduct social contribution activities in the recovery and reconstruction process?", we collected answers like below;

- "I think it would be easier for me to do activities according to what I can afford if the things I can do are organized by the amount of effort I can spend." (Respondent 1, 20s, Male)
- "Organized information: It should be easy to understand what kind of activities are needed where and how they are organized in a platform." (Respondent 6, 20s, Male)
- "Sending out messages that tell us how low the hurdle is." (Respondent 11, Male, Experienced Great East Japan earthquake in 2011)
- "Providing accurate information (such as where and what kind of support is needed) " (Respondent 14, Female, Experienced Great East Japan earthquake in 2011)
- "Support that allows information to flow to us without having to intentionally search for it" (I wish I could contribute something, but I can't take action, and one of the reasons is that the people I support don't know what to do) (Respondent 15, 20s, Male)

Although the answer to this question was optional with free comments, totally 25% of respondents pointed out the importance of a platform for what they can do, which means there is a clear rationale to implement this idea for the society.

3. Project Implementation Plan

3.1 First phase: Pilot

The primary objective of the first phase is to obtain the necessary permissions from the concerned communities for adopting this platform and following services. After that, we will proceed to evaluate cost-effectiveness.

Although it is difficult to set a good indicator to measure effectiveness, we are considering to measure the satisfaction of citizens, quantitatively and qualitatively. The length of the first phase will be dependent on the progress of coordination with concerned stakeholders.

Table 1 shows a list of areas where we are considering to conduct pilot project. Two reasons for selection are described.

The first point is that they are actively engaged in innovative efforts related to disaster prevention. Since each local government has different awareness of disaster prevention and different status of efforts, it is considered that it's easier to get agreement for our proposal and the business will proceed smoothly if we target those who are actively working on disaster prevention.

In particular, organizations that are making innovative efforts are likely to accept new things and are relatively easy to introduce.

The second point is the extent of risks hat the community faces. All selected areas are with a high risk of various disasters such as earthquakes, floods, storm surges, volcanoes, and nuclear power. There is a high need for disaster prevention efforts in these areas. In addition, they have experienced disasters, and there are many cases where they are working to solve the problems that occurred at that time.

Asaka City, Saitama Prefecture, is an area with a high risk of floods and earthquakes. Due to the high risk of disasters, eight neighborhood associations are working together to carry out voluntary disaster prevention organization activities, and the governor has been commended as a good example of the voluntary disaster prevention organization in 2016.

Kakogawa City, Hyogo Prefecture, has various disaster risks such as earthquakes in addition to flooding of the first-class river Kakogawa. In addition, they were affected by the 1995 Hyogo-ken Nanbu Earthquake, and they are conducting activities that make use of this lesson. Among them, there are activities similar to this project, and it is thought that the introduction of the project can improve their existing activities and contribute to the spread throughout the country.

Kashiwazaki City, Niigata Prefecture, is likely to be hit by various disasters such as earthquakes, tsunamis, and nuclear power plants accidents. Since the Chuetsu earthquake in 2006, they have been actively engaged in activities, and the coverage rate of voluntary disaster prevention organization activities has reached 99.1%. In addition, NPOs that are entrusted with the development of voluntary disaster prevention activities from local governments are involved, and it is presumed that they are willing to introduce external ideas.

Fukushima City, Fukushima Prefecture is at risk of earthquakes, floods, and volcanic disasters. In addition, following the accident at the Fukushima Daiichi Nuclear Power Plant after the Great East Japan Earthquake, it has been actively engaged in disaster prevention activities since then. Fukushima Medical University has a disaster prevention leader training program. This aims to foster "social power (ability to make use of one's own rashisa and collaborate with others to create a better society)" through the acquisition of knowledge and skills related to disaster prevention and collaborative activities in the community. This social power is considered to have a high affinity with our business.

Ashikita Town, Kumamoto Prefecture, is at risk of floods and earthquakes. In response to the heavy rain in July 2020, the Ashikita Town Restoration and Reconstruction Plan has been formulated, and it is in a transitional period to form a disaster prevention infrastructure. In addition, the transmission of information on the lives of residents and the transmission of disaster prevention information through LINE was introduced. It is in the transitional period of disaster prevention infrastructure in terms of hardware and software, and the formation is being promoted under the initiative of the government. In this situation, it is thought that this flow can be used.

Table 1: A list of areas where we are considering the introduction of the project

Prefecture	City, Town	Outlines	Reasons
Saitama Prefecture	Asaka City	- High risk of floods and earthquakes - Eight town councils unite to carry out voluntary disaster prevention organization activities - Governor's commendation as a good example of voluntary disaster prevention organization in 2016	High disaster risk and aggressiveness of voluntary disaster prevention organization activities
Hyogo Prefecture	Kakogawa City	- In addition to flooding of the Kakogawa, a first-class river, various disaster risks such as earthquakes - Disaster prevention activities that make use of the lessons learned from the experience of the Great Hanshin Awaji Earthquake - Activities similar to this project(cf. Chikarako-bu)	High awareness of disaster prevention and high evaluation for it Business affinity (contributing to the update and nationwide dissemination of the Chikarako-bu by introducing this business)
Niigata Prefecture	Kashiwazaki City	- Lessons learned from the 2004 Chuetsu earthquake - Voluntary disaster prevention organization activity coverage rate 99.1% - Existence of NPOs that are entrusted with training such as voluntary disaster prevention activities	Presumed to be active in introducing external ideas, such as including an NPO as a third party in a voluntary disaster prevention organization
Fukushima Prefecture	Fukushima City	- Disaster prevention leader training program - Fostering "social power (ability to make use of one's *rashisa* and collaborate with others to create a better society)" through the acquisition of knowledge and skills related to disaster prevention and collaborative activities in the community	Aggression in disaster prevention activities after the Great East Japan Earthquake and the Fukushima Daiichi Accident
Kumamoto Prefecture	Ashikita Town	- Risk of floods and earthquakes - Ashikita Town National Resilience Regional Plan and Ashikita Town Restoration and Reconstruction Plan in response to heavy rain in July 2020 are being formulated, and they are in a transitional period to form disaster prevention infrastructure - Information dissemination and disaster prevention information related to residents' lives were introduced through LINE media	It is in the transitional period o. disaster prevention infrastructure in terms of hardware and software, and the formation is being promoted under the initiative of the government. Through the disaster experience, the feelings for Ashikita Town are polarized.

3.2 Second phase: Expansion of services to other municipalities

If the evaluation of the first phase was positive enough to apply for other cases, the project would move into the second phase. The main objective of the second phase would be to improve service performance, cost-effectiveness, and system impacts based on accumulated experiences. Moreover, we would start to confirm whether use of this platform can be applicable even for other municipalities.

3.3 Third phase: expansion abroad

If evaluation of second phase was positive enough to apply for other cases, the project would move into third phase. The main objective of third phase would be continuously to improve service performance, cost-effectiveness, and system impacts based on accumulated experiences. Moreover, we would start to confirm whether use of this platform can be applicable even for municipalities in different countries.

Even though Japan is one of the countries with the highest natural disaster risks, this concept of "inclusive disaster preparedness" is crucial in different contexts. We are thinking of applying this service especially to south-east asian developing countries because of the relatively high disaster risks.

3.4 Expected partners

Here, in addition to the target municipalities, we will consider the stakeholders that should be adjusted when introducing this project.

Table 2 shows the stakeholders who should cooperate in conducting business and the reasons for their selection.

The dispatched laborer plays the role of an agent who enters between an individual and a company and concludes a contract that both parties can agree on, and adjusts the work content, work location, working hours, etc. according to the needs of both parties (JASSA). It is thought that such knowledge of matching between people and organizations will be useful for matching the recovery / reconstruction activities required by the government with the individual's rashisa in this project.

Businesses that provide services related to self-analysis are considered to be familiar with how to discover strengths based on their own rashisa. It can be said that the core of this project is to grasp the strengths, while there are few opportunities to think about oneself objectively and grasp one's rashisa, and it is difficult to grasp oneself. Therefore, it is considered effective to adopt the method used in self-analysis in business.

The Council of Social Welfare works on surveys, public relations, and human resources with the participation of local residents and welfare personnel in order to promote the enhancement and development of welfare services and welfare activities that respond to changes in the times and local welfare. One of these activities is the promotion of volunteer and civic activities, providing information to

those who wish to volunteer, and supporting activities by volunteer groups and NPO corporations. It also serves as a reception desk for volunteers in the event of a disaster. The "rashisa recovery" that we propose can be regarded as a social contribution activity that makes the best use of one's strengths and individuality and can be said to be an advanced version of volunteering. Therefore, it is necessary to cooperate with organizations involved in volunteering.

The Meguro-Numata Laboratory, Institute of Industrial Science, University of Tokyo is conducting research on disaster prevention and disaster response from both hard and soft aspects. There are many joint researches and joint projects with local governments, and they have specialized knowledge of disaster prevention and know-how when conducting business with local governments, which are considered to be useful in implementing this project for local governments.

It is thought that technical support can be received from companies that are promoting the introduction of technology into disaster countermeasure planning. Technologies such as platform construction, management and aggregation of registered information, and information visualization are required. It would be a great advantage for us to obtain such support, and it would be a valuable opportunity for companies promoting the introduction of technology into disaster countermeasure planning to implement their own technology. ,

The Chamber of Commerce is an organization in which local businesses become members regardless of the type of business and carry out comprehensive activities for the development of each other's businesses and the region. When a disaster happens, they make efforts for the reconstruction of businesses and the region, such as doing volunteer activities and preparing temporary stores. The experience and way of thinking of reconstruction activities so far are similar to our proposal, and it is hoped that they will work together.

Table 2: The stakeholders who should cooperate in conducting business and the reasons for their selection

Business implementation system (stakeholders to cooperate with)	
Possible stakeholders	Reason for selection
Dispatched laborer	Knowledge of matching between people and organizations
An entity that provides services with a reputation for self-analysis	Know how to discover strengths based on your own rashisa
Council of Social Welfare that serves as a reception desk for volunteers	*Rashisa* recovery is an advanced version of volunteers
Institute of Industrial Science, University of Tokyo Meguro / Numata Laboratory	Disaster prevention specialist
Companies promoting the introduction of technology into disaster countermeasure planning	Get technical support
National Federation of Commerce and Industry Associations	Efforts for recovery and reconstruction

4. Feasibility and Risks to consider

4.1 How to interviewing

4.1.1 Target

Interviewee 1: University professor who are making practical efforts to create innovation in rural areas
Interviewee 2: Town offiers in Ashikita Town, Kumamoto Prefecture

4.1.2 Purpose

In order to clarify the potential problems when introducing our project.

4.1.3 Outlines

The interview for interviewee 1 was conducted on June 25th, 2021, and lasted 2 hours. A semi-structured interview was used as the method. This is to ask the interviewee for an answer based on the question prepared in advance and ask another question from the interviewee's answer to deepen it. The embodiment is online.
For questions to Interviewee 2, we sent a questionnaire by e-mail and had them answer by reply.

4.2 Expected things to consider in the future

4.2.1 Ethical things

Privacy issues can be considered an ethical risk. It is thought that some people are reluctant to be known to others by providing their own inner information about their rashisa. Interviewee 1 commented, "I wonder if it will provide me with my own rashisa on the premise of being known." In general, there is great resistance to disclosing personal information (Wang et al., 2016), and it is considered necessary to devise ways to encourage users to disclose their own rashisa. According to Privacy Calculus (Wang et al., 2016), the intention to disclose personal information is more influenced by the benefits obtained than the risk of privacy infringement. Therefore, it is necessary to firmly convey the advantage that demonstrating one's rashisa contributes to the improvement of resilience of oneself and the region.

4.2.2 Political and economic things

Of the important resources for conducting business, securing funds is considered to be an issue. We are assuming a local government as a fund provider, but Professor Komatsuzaki pointed out that "the nature of the administration and citizen’ s individual rashisa do not match, and it is difficult to obtain continuous funds." It is said that the administration tends to conceptualize as a citizen and think in a cohesive manner rather than paying attention to each person. In creating an organization that is important for the administration, it may be effective to present the background that it is necessary to grasp the individuality of each individual in order to demonstrate the performance of the citizens. Ideally, the background and

4.2.3 Platform strategy

Although it is assumed that the platform service provider and the local government will work together, the town hall is concerned about whether or not smooth cooperation can be achieved. When operating one thing in different institutions, there is a high possibility that problems will occur due to differences in systems.

In addition, when asked about their intention to use the project when it was implemented, they said, "At the time of the initial disaster response, it will be difficult to operate this platform in the midst of rapid changes in the situation. It may be possible to operate it if the situation changes. " Considering the severe situation at the time of the heavy rain in July 2020, it is considered unrealistic to use the platform immediately after the disaster. It is desirable to target the social contribution activities in reconstruction when the situation has settled down to some extent, in the initial period, and it is necessary to convey this recognition correctly.

5. Conclusion

In the disaster recovery scene, it is difficult to say that all the people involved are fully utilizing their abilities and personality.

Therefore, we proposed "a platform that accumulates rashisa based on the strengths that individuals can demonstrate in the event of a disaster."

By doing so, it is thought that citizens will be able to realize and understand their own rashisa, and at the time of a disaster, they will be able to demonstrate their rashisa in the field of contribution activities and realize a recovery / reconstruction process in which their rashisa shines lively. On the other hand, it is thought that the government can promote not only appropriate staffing but also citizen participation in the recovery / reconstruction process by making the best use of individuality and skills based on advance preparation.

It is assumed that the effect of this project will be measured from changes in disaster prevention behavior and awareness of residents. We aim to introduce it from regions that are considered to have a high affinity with this project and develop it throughout Japan and around the world.

List of references

Hiroi U. (2018) Pre-reconstruction Plans for Urban Areas in Japan. In: Müller B., Shimizu H. (eds) Towards the Implementation of the New Urban Agenda. Springer, Cham.

Japan National Council of Social Welfare. Main Business. [accessed July 12, 2021] https://www.shakyo.or.jp/tsuite/jigyo/index.html

Japan Staffing Services Associations(JASSA). The system and role of ours. [accessed July 12, 2021] https://www.jassa.or.jp/keywords/index2.html

National Federation of Commerce and Industry Associations. (2018). Disaster Response and Issues by Commerce and Industry Associations. [accessed July 12, 2021] https://www.chusho.meti.go.jp/koukai/shingikai/syoukibokihon/2018/download/181130syoukiboKihon04.pdf

Pigozzi, M.J. (1999). Education in emergencies and for reconstruction: A developmental approach. New York: United Nations Children's Fund.

Sato, T. (2014). Implementation study of a pilot program of disaster reconstruction education for elementary school children in the damaged area by the Great East Japan earthquake. AIJ Journal of Technology and Design, 20(44), 417-422.

Wang, T., Duong, T. D., & Chen, C. C. (2016). Intention to disclose personal information via mobile applications: A privacy calculus perspective. International journal of information management, 36(4), 531-542.