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Analysis of People's Willingness to Use Personalization Services in Times of Disaster

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Analysis of People's Willingness to Use Personalization Services in Times of Disaster

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Background

Japan has experienced major earthquake disasters in the past. The Great East Japan Earthquake of March 11, 2011 caused enormous damage. Subsequently, in April 2016, a major tremor centered in Kumamoto Prefecture in Kyushu also occurred.

In the event of such a disaster, it is important to ensure that medical services are available and that a lifeline is secured. The use of information and communication technology, or ICT, is essential in implementing such efforts in an efficient manner. For example, ICT is very helpful in searching for evacuation routes, locating evacuation sites, tracking supply shortages, and understanding the situation at medical facilities.

The use of ICT for such purposes requires personal information. Users can find their evacuation routes precisely because their locations are confirmed with GPS. People will also be able to locate medical facilities to receive special treatment if they register beforehand their pre-existing conditions. Thus, personal information utilization services are extremely effective in times of disaster.

On the other hand, the use of personal information could raise concerns about privacy violations. While the use of personal information may allow for valuable services, privacy could be violated if data are leaked or handled in an inappropriate manner.

Research question

As stated above, ICT services that use personal information are helpful in times of disaster. However, there are concerns with respect to privacy violations. Thus, such privacy concerns must be alleviated for ICT services to expand.

For this reason, this present research will identify the factors that may influence people's privacy concerns regarding the use of personal information utilization services in times of disaster. This research may pave the way for the creation of ICT services that do not raise serious privacy concerns, thereby contributing to increased use of such services in times of disaster.

Prior research

Regarding privacy concerns and the use of ICT services, Acquisti and Wagman (2016) released a study on the economics of privacy. The issue was also reviewed by Hui and Png (2006).

As for empirical research, there are the publications Koguchi et al. (2015) and Koguchi et al.

(2016), which are works of the present writer. Even so, there are very few empirical studies regarding ICT services in disaster situations.

These rare works include Sakurai et al. (2107), a pioneering study involving empirical analysis of ICT services in times of disaster in Japan. Sakurai et al. (2017) seeks to find out, using a method called CVM, how much money people are willing to pay for disaster-related services that use personal information, such as GPS and medical records. The research indicates that the amount would be between 2,000 yen and a little less than 4,000 yen.

Sakurai et al. (2017) shows how much people are willing to pay for different services that use various kinds of information and identifies the factors that may influence their willingness to pay. However, the study has not conducted any analysis regarding the influence of the service operator and the scope of the use of collected personal information. Thus, this present research, based on Sakurai et al. (2017), will seek to elucidate the impact of these two factors.

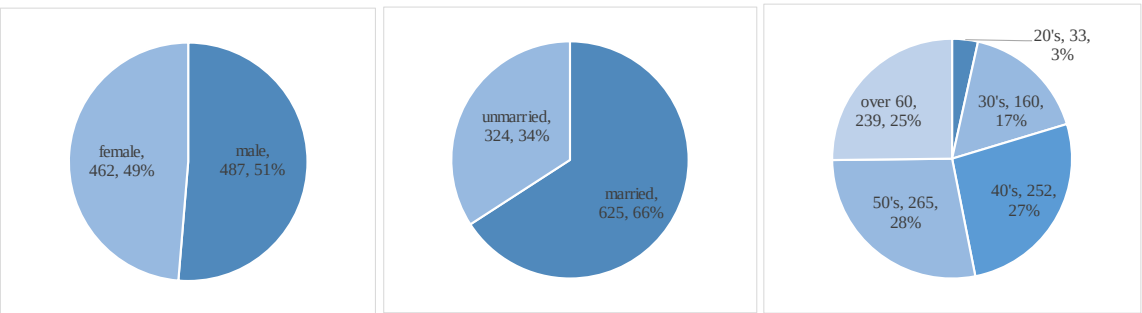
Analysis method

This present study will conduct empirical research with the use of conjoint analysis to examine multiple factors that may influence the use of ICT services. Specifically, several scenarios will be created regarding services that use personal information that can be helpful in disaster situations. Then, evaluations will be made using these various scenarios.

An online survey was conducted for this analysis. The survey, carried out on March 2, 2018, collected responses from 1,699 people aged 20 or above. The respondents were 850 men and 849 women. Conjoint analysis was conducted using the results of this survey.

Outline of survey data and model

After eliminating protest responses from those collected in the survey, 949 samples were ultimately obtained for analysis. The basic attributes of the samples are as follows:



Basic attributes

For conjoint analysis, the following models were created.

- Scenarios
  1. Service using location information
  2. Services using personal medical information
- Attributes and levels

1. Operating entity of the service
   - ✓ Government (=1, for dummy variable)
   - ✓ Private enterprises (=0)
2. How to use personal information
   - ✓ Used only for principals (=1, for dummy variable)
   - ✓ Used to improve overall service (=0)
3. Registration fee / usage fee
   - ✓ 500 yen (3.8 euro)
   - ✓ 1,500 yen (11.5 euro)
   - ✓ 3,500 yen (26.8 euro)
   - ✓ 6,000 yen (45.9 euro)

- Other factor variables
  - ➢ Experience fearing through the earthquake (yes=1, no=0, for dummy variable)
  - ➢ Experience of physical or physical damage due to earthquake (yes=1, no=0, for dummy variable)
  - ➢ Special medicine and medical necessities in daily life (yes=1, no=0, for dummy variable)
  - ➢ Income (ten levels of ordinal variable)
  - ➢ Sex (male=1, female=0, for dummy variable)
  - ➢ Age (20’s=2, 30’s=3, 40’s=4, 50’s=5, over 60=6)
  - ➢ Marital status (married=1, unmarried=0, for dummy variables)

Analysis results

The estimation results are as follows:

Service using location information

	Estimate	P-value	
(Intercept)	4.525	0.000	***
Operating entity of the service	0.716	0.000	***
How to use personal information	0.461	0.000	***
Registration fee / usage fee	0.000	0.000	***
Experience fearing through the earthquake	-0.019	0.761	
Experience of physical or physical damage due to earthquake	-0.116	0.115	
Special medicine and medical necessities in daily life	-0.070	0.307	
Income	0.044	0.001	***
Sex	0.034	0.605	
Age	-0.067	0.014	**
Marital status	0.174	0.006	**

Services using personal medical information

	Estimate	P-value	
(Intercept)	4.493	0.000	***
Operating entity of the service	0.639	0.000	***
How to use personal information	0.385	0.000	***
Registration fee / usage fee	0.000	0.000	***
Experience fearing through the earthquake	-0.015	0.804	
Experience of physical or physical damage due to earthquake	-0.104	0.151	
Special medicine and medical necessities in daily life	-0.059	0.377	
Income	0.034	0.010	**
Sex	-0.083	0.201	
Age	-0.039	0.152	
Marital status	0.139	0.025	**

This research will seek to analyse the impact that the following two factors may have on people's willingness to use personal information utilization services in times of disaster: (1) The service operator (whether the service operator is a private-sector business or a local-government entity) and (2) The scope of the use of personal information that has been collected (whether information is used only for the sake of individual subscribers who have provided the information or also used to enhance

overall services).

This research will determine changes in people's willingness to use personal information utilization services, depending on whether the service operator is a private-sector company or a local-government entity, and whether people's willingness will also change, if the use of personal information is not restricted to services for individual subscribers who have provided the information. Further investigation into these points is ongoing.

Reference

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(JEL Classifications: L86, L96)