From the Editors

It is a great pleasure to deliver to you the sixth issue of "Journal of Informatics and Regional Studies." This Journal intends to provide researchers and practitioners with the forum of discussion and sharing findings and ideas about Informatics and Regional Studies. We welcome you to join us to share your idea on this Journal.

This sixth volume is made from articles and reproductions of slides and record of workshop. The topic covers wide range of studies which relate to fundamental theoretical studies as well as case studies in the arena of Informatics and Regional Studies (IRS).

As was the case of previous volumes, this volume also consists of three parts. The first part contains papers, and the second part contains reproductions from presentations of conferences and workshops which are both related to ITeS and IRS research. The final part is taken from the keynote speech of Dr. Daniel Manson of CalPoly presented at the workshop of Internet Security held on August 7, 2010 at Matsuyama University. This is the part of proceedings of the Grant of Matsuyama University's International Academic Research Collaboration (松山大学学術研究国際交流助成).

The first part of this volume starts from the contribution by Dr. Shiro Uesugi and Dr. Hiroshi Okada. Their article entitled "Relationship between Smartphone Diffusion and Personality: A Case of a Japanese University" is adopted from the presentation at the conference of International Telecommunication Society's Regional Meeting, namely, the 6th ITS Asia-Africa-Austrasia 2013 Conference held through 4th to 7th of August in Perth, Australia. The paper provides analysis of the use of smart phones among Japanese university students.

The second part of this Journal consists of the reproductions of presentation slides from the conferences, and made from three parts. The first part contains the slides from the 6th ITS Asia-Africa-Austrasia 2013 Conference. The second part contains the slides from the 1st ITeS Workshop in IEEE/COMPSAC 2013 (The 37th Annual International Computer Software & Applications Conference) held in Kyoto, Japan on July 22nd to 26th. This workshop is the 5th sequel of the workshops held in IEEE/SAINT (Symposium of Application of Internet). Because SAINT was merged to COMPSAC, this workshop became the first of this event. Thirdly, the slides presented in the JPAIS/JASMIN International Meeting 2013 held on December 18, 2013, at Università Bocconi, Milan, Italy are reproduced.

The third part of this Journal is the special contribution from the proceedings of the Grant of Matsuyama University's International Academic Research Collaboration (松山大学学術研究国際交流助成). This part is made up with two parts. One is the transcription of original English, and another is a Japanese translation of adopted from the key note presentation by Dr. Daniel Manson of CalPoly delivered on August 7, 2010 in the "Symposium of Internet Security and E-Business" at Matsuyama University.

This edition of Journal is consisted by the collections of up-to-date researches on wide range of topics. The editor would like to express sincere thank to the contributors of paper and the presenters in the Workshop who make this wonderful omnibus of journal come to existence.

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Relationship between Smartphone Diffusion and Personality: A Case of a Japanese University

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Abstract

Migration from 3G to 4G within the mobile telecommunication ecosystem is inevitable and rapidly proceeding. One of the enabling factors of this phenomenon is the rapid diffusion of smartphones. The sales of smartphones are surpassing those of feature phones because of the comparatively low costs involved in the development and production of smartphones. However, numerous problems emerge in relation to this phenomenon, including the protection of privacy.

This paper deals with the issues related to the diffusion of smartphones among students of Matsuyama University. In Japan, the migration from 3G to 4G mobile phone systems pertains to switching handset hardware from feature phones to smartphones, while working toward compulsory adoption. Fears such as privacy divulgence are prevalent among smartphone users.

This study presents the results of a survey about the use of smartphones among young people. It also uses the variables of the Big Five test of personality traits in investigating the relationship between smartphone usage and personality.

The study aims to provide policy makers, service providers, and academia with relevant insights into properly designing the migration from 3G to 4G mobile phone systems.

Keywords: technology acceptance, smartphones, personality, Big Five personal traits, cyber psychology

1. Introduction

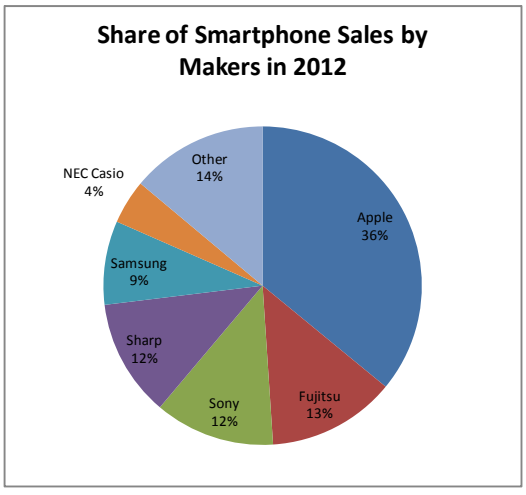
Migration from 3G to 4G within the mobile telecommunication ecosystem is inevitable and rapidly proceeding. One of the enabling factors of this phenomenon is the rapid diffusion of smartphones because of the low cost of development and production. The sales of smartphones are surpassing those of feature phones. However, a number of aspects related to this trend, including privacy protection, need to be discussed.

This paper deals with the aspects related to the diffusion of smartphones among students of Matsuyama University. In Japan, the migration from 3G to 4G mobile phone systems refers to switching handset hardware from feature phones to smartphones, while working toward compulsory user adoption. Although users are lured by sales talk that promises new applications/functions, they express fears related to smartphone usage, such as privacy divulgence.

This study presents the results of a survey about the use of smartphones and their applications/functions among youngsters. It uses the variables of the Big Five test of personality traits in investigating any relationship between smartphone usage and personality.

The paper is organized as follows. First, the background of the study, research questions, and related research are presented. Second, the methodology of the study is explained. Third, the results of the survey are illustrated. Fourth, a discussion of the findings is provided. Finally, a conclusion is presented.

2. Background of the Study and Related Research

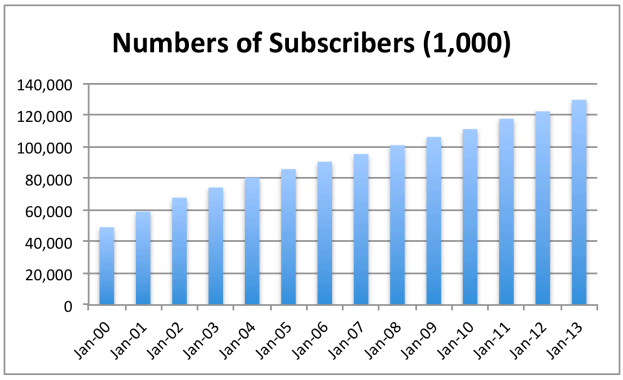


(Source: Nikkei=MM Soken, modified by authors)

Figure 1. Share of Smartphone Sales

2.1 Background

The diffusion of smartphones is remarkable in Japan. On May 10, 2013, *Nikkei* reported the survey results of MM Soken, a telecom think tank, about the previous year's sales of mobile phones in the country. According to the report, the total sales of telephones in 2012 were 41.8 million sets, representing a 2.2% decrease from 2011. However, the sales of smartphones increased by 23.0%, reaching 29.72 million sets. The figure represents 71.1% of the total sales of mobile phones. In 2012, the share of smartphones increased by 14.5% from 56.6%.



Source: Telecommunication Careers Association
http://www.tca.or.jp/database/download.html

Figure 2. Number of Subscribers

As shown in Figure 1, Apple and Samsung reported an increase in their share of smartphone sales, whereas Japanese smartphone makers indicated a decrease in their share of smartphone sales ranging from 0.4% to 5.6%. Nevertheless, sales by Japanese makers reached 39%.

The increase in the total number of mobile phone subscribers indicated a relatively slow growth of roughly 10% per year (see Figure 2); however, the increase in smartphone sales is significant.

Migration from 3G to 4G, together with the promotional efforts of smartphone makers, contributed to this phenomenon. Similarly, the contents provided through smartphones contributed to the phenomenon.

Complex reasons may explain the remarkable migration from traditional devices (i.e., feature phones) to innovative devices (i.e., smartphones). Among these reasons are product promotion and user behavioral patterns.

For instance, the rapid diffusion of i-mode has been explained not only by the aggressive promotion by the NTT DoCoMo in 1999, but also by the design of service contents introduced in the first instance (Matsunaga 2000). In the design of i-mode service, the project team led by Matsunaga poured its efforts into the design of contents, such as online-services and text messaging accessible only through i-mode. In the marketing of digital technology, the design of contents and services apparently matters more than the innovated technology itself.

Therefore, we examine how smartphone users are attracted by the services (i.e., applications/functions) that can only be used via smartphones. Our research question focuses on how users are attracted by the services. Furthermore, we have been investigating the effect of personal traits on the attitudes of technology acceptance since 2010. Hence, this research views personal traits as among the decision-making factors for people's inclination to use smartphones.

2.2 Related research

A number of studies have used the technology acceptance model (TAM) by Venkatesh et al. (2003) in exploring technology acceptance. In particular, research by Junglas et al. (2008), which examined the effects of personal traits on technology

acceptance, is significant. Uesugi et al. (2010, 2011) and Uesugi (2011) investigated how the Big Five model of personality traits[1] could explain the user behaviors of technology acceptance by conducting experimental questioning and surveys. In these previous studies, TAM indicated the existence of certain paths that could be traceable and replicable when user behavioral patterns are clearly defined. The rest of the studies highlighted the explanatory factors derived from the personality traits of users. For instance, in the study by Uesugi et al. (2010), the subject students from different universities with different academic disciplines were reported to share common personality features when adopting new technology.

3. Description of the Study

3.1 Methodology

We conducted surveys on the students at Matsuyama University. Matsuyama University is a private university in Shikoku Island. This location is rather peripheral relative to metropolitan and urban areas in Japan, such as Tokyo and Osaka. The location is considered disadvantageous by marketing professionals. The students are viewed as conservative and less innovative.

Conducting the Big Five test of personality traits enabled us to ascertain the applicability of the aforementioned characteristics and cross-examine the responses to questions[2] about smartphone usage from the same sample. We expect to determine any effects of personality traits on the acceptance of smartphones. Furthermore, we examine whether the impact of personality or services is influential on the migration from a feature phone to a smartphone.

Roughly 300 students who take either “Introduction to MIS” or “Information Society and Ethics” were invited to participate in the survey. They are mainly business majors and are between 18 and 22 years old. The components of the sample are presented in Table 1.

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[1] The Big Five personal traits include “Extraverted,” “Agreeable,” “Conscientious,” “Neurotic,” and “Open.” Scoring methods are used in classifying the traits a person is inclined to demonstrate.

[2] Questionnaire sheets can be retrieved from http://www.cc.matsuyama-u.ac.jp/~uesugi/survey_details/ITSAAA2013_questionnaire.pdf. All items are written in Japanese, and this paper uses part of the results. Questions are constructed while maintaining the consistency with Uesugi (2011) for future comparison.

Table 1. Components of Sample

<< ALL >>

	Num.	%
1st year	95	31.67%
2nd year	165	55.00%
3rd year	26	8.67%
4th year	10	3.33%
5th year	3	1.00%
6th year	1	0.33%
Total	300	100.00%

<< Big Five Valid >>

	Num.	%
1st year	40	37.04%
2nd year	57	52.78%
3rd year	10	9.26%
4th year	1	0.93%
Total	108	100%

	Num.	%
Female	142	47.33%
Male	158	52.67%
Total	300	100.00%

	Num.	%
Female	50	46.30%
Male	58	53.70%
Total	108	100%

Table 2. Proportions of Results of Big Five Test

<< All >>

	(-)	Neutral	(+)	**Average**
Extraverted	84	166	58	**-0.08**
Agreeable	52	224	32	**-0.06**
Conscientious	52	200	56	**0.01**
Neurotic	68	196	44	**-0.08**
Openess	110	175	23	**-0.28**
				n = 308

<< Big Five Valid >>

	(-)	Neutral	(+)	**Average**
Extraverted	32	58	16	**-0.15**
Agreeable	16	76	14	**-0.02**
Conscientious	16	61	29	**0.12**
Neurotic	22	69	15	**-0.07**
Openess	26	65	15	**-0.10**
				n = 106

Note: For each of EACNO, "(-)" indicates strongly negative to this category of personality, "Neutral" indicates neutral and "(+)" indicates strongly positive. to this category of personality.

3.2 Weakness and justification of the study method

The methodology of this study has several weaknesses, including the sample size caused by the methodology of the Big Five test of personal traits, and the survey method or data collection system.

The robustness of the Big Five test of personal traits is examined by Murakami and Murakami (2001). This test is adjusted to fit the Japanese context. However, as demonstrated by Uesugi et al. (2010), the rigidity of the test causes a counter effect, thus excluding a number of samples that do not comprise the formality of the answers. Consequently, we could obtain only a limited number of usable “clean” samples.

Furthermore, the data collection method may be a weakness of the current study. We conducted this study partly through paper-based surveys and partly through online surveys. In either case, students were told that they would be given 10 class participation points by answering the survey. The designs of the survey questions and the answering method (i.e., either using mark-sheets or selecting from multiple questions on the web) were plain. The questions were presented from numbers 1 to 70 in the case of the Big Five test; the other survey questions were presented according to the number of questions. A student may dishonestly respond, for instance by responding “1”

to all questions, just in order to get 10 points. In the case of the Big Five test, we can identify and omit those responses because of the robustness of this test. However, in the case of other questions, the design is not as sophisticated as the Big Five test and it is impossible to exclude such kind of dishonest responses. Providing bonus points may cause moral hazards and yield skewed results.

However, after conducting a statistical comparison, which will be described in a subsequent section, we found that the responses from students who provided invalid responses to the Big Five test and those from all samples were statistically similar. Furthermore, after conducting the test of the difference in the population proportion, the proportion between valid responses in the Big Five test of each category (i.e., EACNO) and invalid responses could be regarded as similar with a 95% of probability.

4. Results of the Survey

Tables 3 to 7 present the details of the responses to the questionnaires about smartphones. The figure includes all responses that have invalid responses to the Big Five test. The responses that have valid Big Five test results are also shown separately. A five-point Likert scale (ranging from 1 = “Strongly Agree” to 5 = “Strongly Disagree”) was used.

Table 8 shows the components of the cross-sectional sums for each personal trait differentiated by smartphone usage.

Tables 9 to 12 depict the results of the test of population proportion, which correspond to the questions listed in Tables 4 to 7. Only the results with statistical significance are shown.

Table 3. Share of Users of Smartphone

Have Smartphone?	no.	%
Yes	272	91%
No	27	9%
n.a.	1	0%
	n=	300

Have Smartphone?	no.	%
Yes	94	88%
No	13	12%
	n=	107
	(Big Five Valid)	

Table. 4 What Contents/Services in Use?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Telephone/e-mail	250	43	3	1	3	**1.21**
Address Book	221	61	8	8	2	**1.36**
Clock/Alarm	216	62	8	7	7	**1.42**
Camera/Movie	203	76	10	9	2	**1.44**
Search	193	67	13	9	17	**1.63**
Calculator	2	114	100	35	33	**2.12**
Location Search	101	87	44	24	43	**2.40**
Other	1	88	80	76	28	**2.42**
Game	95	87	38	43	37	**2.47**
Music Player	109	77	22	37	55	**2.51**
Memo	83	79	50	53	35	**2.59**
Blog	61	58	44	46	91	**3.16**
One-Seg TV	34	32	25	65	139	**3.82**
Payment (OsaifuKeitai)	28	15	13	47	192	**4.22**

n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Telephone/e-mail	95	11	0	1	1	**1.17**
Camera/Movie	78	22	5	3	0	**1.38**
Address Book	79	20	4	5	0	**1.40**
Clock/Alarm	76	24	2	1	5	**1.47**
Search	71	22	4	3	7	**1.63**
Calculator	44	31	12	14	7	**2.16**
Game	38	32	11	12	15	**2.39**
Other	1	34	33	18	8	**2.39**
Location Search	38	32	11	7	19	**2.41**
Memo	36	30	10	18	14	**2.48**
Music Player	39	32	5	10	22	**2.48**
Blog	21	24	11	16	36	**3.20**
One-Seg TV	14	15	4	24	51	**3.77**
Payment (OsaifuKeitai)	13	6	3	14	72	**4.17**

n = 108

Table 5. What Does a Smartphone Mean to You?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Wish to Carry Whenever Possible If not Always	132	123	19	17	9	**1.83**
Necessary/ Uneasy When Without It	88	115	50	40	7	**2.21**
Inconvenient But Do Not Care If Not Have One	13	44	51	92	94	**3.71**
Bothered Being Called Whenever	20	26	64	93	92	**3.72**
I Don't Feel Anything About this Matter	9	29	74	63	119	**3.86**
No Problems Not to Have One	6	18	43	99	127	**4.10**
Do Not Have Chance to Use	2	9	33	85	164	**4.37**
Want One But Not Have One With Some Reason	2	11	48	36	192	**4.40**

n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Wish to Carry Whenever Possible If not Always	46	40	6	9	7	**1.99**
Necessary/ Uneasy When Without It	36	31	15	23	3	**2.31**
Bothered Being Called Whenever	10	10	25	25	38	**3.66**
Inconvenient But Do Not Care If Not Have One	5	21	14	30	38	**3.69**
I Don't Feel Anything About this Matter	2	10	22	23	51	**4.03**
No Problems Not to Have One	0	9	16	32	51	**4.16**
Want One But Not Have One With Some Reason	1	5	21	14	66	**4.30**
Do Not Have Chance to Use	0	3	10	31	64	**4.44**

n = 108

Table 6. What Privacy Sensitive Information Are Acceptable for Divulgence?

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Likes/Hobbies	56	153	45	20	26	**2.36**
Place of Birth	51	150	42	29	28	**2.44**
Education	19	72	71	75	61	**3.29**
Name, DOB, Postal/e-mail Address	25	73	41	84	73	**3.36**
Appearances (Hight, Weight, Body Features)	18	62	73	56	91	**3.47**
ID (Google, Yahoo!, etc.)	2	20	36	69	166	**4.29**
Occupation/Earnings	3	19	27	79	166	**4.31**
Location (GPS Data)	3	12	24	68	185	**4.44**
Bank Account No.	0	4	10	40	236	**4.75**

n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Likes/Hobbies	19	64	14	4	7	**2.22**
Place of Birth	18	58	15	7	10	**2.38**
Name, DOB, Postal/e-mail Address	13	25	15	28	26	**3.27**
Education	7	27	25	26	23	**3.29**
Appearances (Hight, Weight, Body Features)	9	23	26	21	29	**3.35**
Occupation/Earnings	0	9	11	29	57	**4.26**
ID (Google, Yahoo!, etc.)	0	7	12	24	63	**4.35**
Location (GPS Data)	1	5	5	25	70	**4.49**
Bank Account No.	0	3	5	15	83	**4.68**

n = 107

Table 7. How Much Does Private Sensitive Information Worth?

	1.JPY100	2.JPY500	3.JPY1,000	4.JPY1,500	5.JPY3,000	**Average**
Likes/Hobbies	73	56	46	14	104	**3.07**
Place of Birth	61	55	42	23	111	**3.23**
Education	27	45	48	40	132	**3.70**
Appearances (Hight, Weight, Body Feature)	24	35	56	30	146	**3.82**
Name, DOB, Postal/e-mail Address	26	30	20	22	189	**4.11**
Location (GPS)	9	11	25	28	209	**4.48**
ID (Google, Yahoo!, etc.)	7	7	28	24	214	**4.54**
Occupation/Earnings	8	4	20	33	221	**4.59**
Bank Account No.	6	3	5	9	259	**4.82**

n = 300

(Big Five Valid)

	1.JPY100	2.JPY500	3.JPY1,000	4.JPY1,500	5.JPY3,000	**Average**
Likes/Hobbies	24	30	14	2	37	**2.98**
Place of Birth	22	22	16	4	43	**3.22**
Education	11	18	16	11	51	**3.68**
Appearances (Hight, Weight, Body Feature)	8	17	19	14	49	**3.74**
Name, DOB, Postal/e-mail Address	7	12	8	9	70	**4.16**
Location (GPS)	3	5	7	10	82	**4.52**
ID (Google, Yahoo!, etc.)	4	2	8	8	84	**4.57**
Occupation/Earnings	0	3	7	13	84	**4.64**
Bank Account No.	0	1	2	4	100	**4.89**

n = 106

Table 8. Smartphone User and Big Five Categories

Use of Smartphone	E			A			C			N			O		
	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1
Yes	66	144	54	44	195	25	43	174	47	56	171	37	93	152	19
No	14	15	1	7	20	3	5	16	9	9	18	3	10	17	3

(Big Five Valid)

Use of Smartphone	E			A			C			N			O		
	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1
Yes	27	51	16	13	69	12	14	56	24	19	62	13	24	57	13
No	5	7	0	3	7	2	2	5	5	3	7	2	2	8	2

Note: For each of EACNO, "-1" indicates strongly negative to this category of personality, "Ntr." indicates neutral and "1" indicates strongly positive. to this category of personality.

Table 9. Result of test of populaion proportion (with Sig. 1% and 5%)

Telephone/e-mail

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	271	27	82.7%	88.9%	6.2%	0.826	0.409	[ ]
Agree	Yes	No	271	27	15.1%	7.4%	7.7%	1.089	0.276	[ ]
Neutral	Yes	No	271	27	1.1%	0.0%	1.1%	0.549	0.583	[ ]
Disagree	Yes	No	271	27	0.0%	3.7%	3.7%	3.173	0.002	[**]
Strongly Disagree	Yes	No	271	27	1.1%	0.0%	1.1%	0.549	0.583	[ ]

Camera/Movie

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	71.0%	37.0%	33.9%	3.600	0.000	[**]
Agree	Yes	No	272	27	23.5%	40.7%	17.2%	1.968	0.049	[*]
Neutral	Yes	No	272	27	2.6%	11.1%	8.5%	2.353	0.019	[*]
Disagree	Yes	No	272	27	2.6%	7.4%	4.8%	1.402	0.161	[ ]
Strongly Disagree	Yes	No	272	27	0.4%	3.7%	3.3%	2.028	0.043	[*]

Search

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	271	27	68.3%	29.6%	38.6%	4.008	0.000	[**]
Agree	Yes	No	271	27	23.6%	7.4%	16.2%	1.934	0.053	[ ]
Neutral	Yes	No	271	27	3.3%	14.8%	11.5%	2.788	0.005	[**]
Disagree	Yes	No	271	27	2.2%	11.1%	8.9%	2.576	0.010	[**]
Strongly Disagree	Yes	No	271	27	2.6%	37.0%	34.5%	7.361	0.000	[**]

Game

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	34.6%	3.7%	30.9%	3.284	0.001	[**]
Agree	Yes	No	272	27	31.3%	3.7%	27.5%	3.016	0.003	[**]
Neutral	Yes	No	272	27	13.6%	3.7%	9.9%	1.473	0.141	[ ]
Disagree	Yes	No	272	27	12.1%	37.0%	24.9%	3.517	0.000	[**]
Strongly Disagree	Yes	No	272	27	8.5%	51.9%	43.4%	6.531	0.000	[**]

Other

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	271	27	31.4%	11.1%	20.3%	2.200	0.028	[*]
Agree	Yes	No	271	27	28.0%	11.1%	16.9%	1.901	0.057	[ ]
Neutral	Yes	No	271	27	26.2%	18.5%	7.7%	0.873	0.383	[ ]
Disagree	Yes	No	271	27	8.5%	18.5%	10.0%	1.704	0.088	[ ]
Strongly Disagree	Yes	No	271	27	5.9%	40.7%	34.8%	6.014	0.000	[**]

Location Search

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	271	27	35.4%	18.5%	16.9%	1.770	0.077	[ ]
Agree	Yes	No	271	27	30.6%	11.1%	19.5%	2.134	0.033	[*]
Neutral	Yes	No	271	27	15.1%	11.1%	4.0%	0.561	0.575	[ ]
Disagree	Yes	No	271	27	6.6%	22.2%	15.6%	2.837	0.005	[**]
Strongly Disagree	Yes	No	271	27	12.2%	37.0%	24.9%	3.506	0.000	[**]

Music Player

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	39.7%	3.7%	36.0%	3.707	0.000	[**]
Agree	Yes	No	272	27	25.4%	25.9%	0.6%	0.064	0.949	[ ]
Neutral	Yes	No	272	27	6.6%	14.8%	8.2%	1.556	0.120	[ ]
Disagree	Yes	No	272	27	12.1%	14.8%	2.7%	0.404	0.686	[ ]
Strongly Disagree	Yes	No	272	27	16.2%	40.7%	24.6%	3.142	0.002	[**]

Blog

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	22.1%	3.7%	18.4%	2.257	0.024	[*]
Agree	Yes	No	272	27	20.6%	3.7%	16.9%	2.130	0.033	[*]
Neutral	Yes	No	272	27	15.8%	3.7%	12.1%	1.693	0.090	[ ]
Disagree	Yes	No	272	27	15.1%	18.5%	3.4%	0.473	0.636	[ ]
Strongly Disagree	Yes	No	272	27	26.5%	70.4%	43.9%	4.728	0.000	[**]

One-Seg TV

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	267	27	12.0%	7.4%	4.6%	0.709	0.478	[ ]
Agree	Yes	No	267	27	9.0%	25.9%	16.9%	2.731	0.006	[**]
Neutral	Yes	No	267	27	8.2%	11.1%	2.9%	0.510	0.610	[ ]
Disagree	Yes	No	267	27	22.1%	22.2%	0.1%	0.015	0.988	[ ]
Strongly Disagree	Yes	No	267	27	48.7%	33.3%	15.4%	1.523	0.128	[ ]

Note: Sig. *=5%, **=1% level of significance.

Table 10. What Does a Smartphone Mean to You?

Wish to Carry Whenever Possible If not Always

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	47.1%	14.8%	32.2%	3.218	0.001	[**]
Agree	Yes	No	272	27	40.8%	44.4%	3.6%	0.366	0.714	[ ]
Neutral	Yes	No	272	27	5.9%	11.1%	5.2%	1.062	0.288	[ ]
Disagree	Yes	No	272	27	5.1%	11.1%	6.0%	1.276	0.202	[ ]
Strongly Disagree	Yes	No	272	27	1.1%	18.5%	17.4%	5.349	0.000	[**]

Necessary/ Uneasy When Without It

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	30.9%	14.8%	16.1%	1.747	0.081	[ ]
Agree	Yes	No	272	27	39.7%	22.2%	17.5%	1.784	0.074	[ ]
Neutral	Yes	No	272	27	16.2%	22.2%	6.0%	0.803	0.422	[ ]
Disagree	Yes	No	272	27	11.8%	29.6%	17.9%	2.601	0.009	[**]
Strongly Disagree	Yes	No	272	27	1.5%	11.1%	9.6%	3.160	0.002	[**]

Inconvenient But Do Not Care If Not Have One

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	266	27	3.8%	11.1%	7.4%	1.768	0.077	[ ]
Agree	Yes	No	266	27	14.3%	22.2%	7.9%	1.100	0.271	[ ]
Neutral	Yes	No	266	27	15.8%	33.3%	17.5%	2.291	0.022	[*]
Disagree	Yes	No	266	27	32.0%	22.2%	9.7%	1.041	0.298	[ ]
Strongly Disagree	Yes	No	266	27	34.2%	11.1%	23.1%	2.450	0.014	[*]

No Problems Not to Have One

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	265	27	1.9%	3.7%	1.8%	0.634	0.526	[ ]
Agree	Yes	No	265	27	4.9%	18.5%	13.6%	2.802	0.005	[**]
Neutral	Yes	No	265	27	14.0%	22.2%	8.3%	1.154	0.249	[ ]
Disagree	Yes	No	265	27	33.6%	33.3%	0.3%	0.026	0.979	[ ]
Strongly Disagree	Yes	No	265	27	45.7%	22.2%	23.4%	2.340	0.019	[*]

Do Not Have Chance to Use

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	265	27	0.4%	3.7%	3.3%	1.996	0.046	[*]
Agree	Yes	No	265	27	2.6%	7.4%	4.8%	1.365	0.172	[ ]
Neutral	Yes	No	265	27	10.6%	18.5%	8.0%	1.243	0.214	[ ]
Disagree	Yes	No	265	27	28.3%	33.3%	5.0%	0.550	0.582	[ ]
Strongly Disagree	Yes	No	265	27	58.1%	37.0%	21.1%	2.103	0.035	[*]

Want One But Not Have One With Some Reason

	Smartphone?		n		Proportion		Differe	Z-score	P-value	Sig.
Strongly Agree	Yes	No	261	27	0.4%	3.7%	3.3%	1.978	0.048	[*]
Agree	Yes	No	261	27	3.8%	3.7%	0.1%	0.033	0.974	[ ]
Neutral	Yes	No	261	27	16.5%	18.5%	2.0%	0.271	0.786	[ ]
Disagree	Yes	No	261	27	11.1%	22.2%	11.1%	1.682	0.093	[ ]
Strongly Disagree	Yes	No	261	27	68.2%	51.9%	16.3%	1.715	0.086	[ ]

Table 11. What Privacy Sensitive Information Are Acceptable for Divulgence?

Likes/Hobbies

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	19.5%	11.1%	8.4%	1.064	0.287	[ ]
Agree	Yes	No	272	27	51.5%	44.4%	7.0%	0.697	0.486	[ ]
Neutral	Yes	No	272	27	14.7%	18.5%	3.8%	0.528	0.597	[ ]
Disagree	Yes	No	272	27	5.5%	18.5%	13.0%	2.580	0.010	[**]
Strongly Disagree	Yes	No	272	27	8.8%	7.4%	1.4%	0.249	0.803	[ ]

Education

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	270	27	7.0%	0.0%	7.0%	1.425	0.154	[ ]
Agree	Yes	No	270	27	24.8%	18.5%	6.3%	0.728	0.467	[ ]
Neutral	Yes	No	270	27	24.4%	18.5%	5.9%	0.688	0.491	[ ]
Disagree	Yes	No	270	27	24.8%	25.9%	1.1%	0.127	0.899	[ ]
Strongly Disagree	Yes	No	270	27	18.9%	37.0%	18.1%	2.226	0.026	[*]

Appearances (Hight, Weight, Body Feature)

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
Strongly Agree	Yes	No	272	27	6.6%	0.0%	6.6%	1.379	0.168	[ ]
Agree	Yes	No	272	27	21.3%	14.8%	6.5%	0.796	0.426	[ ]
Neutral	Yes	No	272	27	24.6%	22.2%	2.4%	0.278	0.781	[ ]
Disagree	Yes	No	272	27	19.5%	11.1%	8.4%	1.064	0.287	[ ]
Strongly Disagree	Yes	No	272	27	27.9%	51.9%	23.9%	2.583	0.010	[**]

Table 12. How much Does Private Sensitive Information Worth?

Location (GPS)

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
JPY100.-	Yes	No	257	24	3.5%	0.0%	3.5%	0.932	0.351	[ ]
JPY500.-	Yes	No	257	24	2.7%	16.7%	13.9%	3.368	0.001	[**]
JPY1,000.-	Yes	No	257	24	8.2%	16.7%	8.5%	1.398	0.162	[ ]
JPY1,500.-	Yes	No	257	24	10.5%	4.2%	6.3%	0.992	0.321	[ ]
JPY3,000.-	Yes	No	257	24	75.1%	62.5%	12.6%	1.346	0.178	[ ]

Occupation/Earnings

	Smartphone?		n		Proportion		Difference	Z-score	P-value	Sig.
JPY100.-	Yes	No	260	25	3.1%	0.0%	3.1%	0.890	0.374	[ ]
JPY500.-	Yes	No	260	25	0.8%	8.0%	7.2%	2.935	0.003	[**]
JPY1,000.-	Yes	No	260	25	7.3%	4.0%	3.3%	0.618	0.536	[ ]
JPY1,500.-	Yes	No	260	25	11.5%	12.0%	0.5%	0.069	0.945	[ ]
JPY3,000.-	Yes	No	260	25	77.3%	76.0%	1.3%	0.149	0.882	[ ]

5. Discussion

5.1 Influence of personal traits

The results of the survey implied minor differences between all responses and valid responses to the Big Five test. The column “Average” indicates the items that have more

significance to the respondents. In other words, more relevance is suggested when the Average scores are lower.

To double check the results, we took an example and conducted the test about the difference in the population proportion of "Likes/Hobbies" in the question, "What privacy-sensitive information is acceptable for divulgence?" (see Table 6). This item is atop the list, which investigates the responses about privacy-sensitive information. The responses from all students indicated 69.97% of 300 answers, whereas the valid responses to the Big Five test indicated 76.80% of 107 answers. The difference is 6.8%, and the calculated Z-score is 1.347. The P-value of both sides is 0.1778. Therefore, no statistical difference exists between these samples and the valid samples of the Big Five test. Additionally, most of the responses are valid with or without the invalid responses to the Big Five test.

The "Extraverted" criterion demonstrates a difference between smartphone and feature phone users from the results of the Pearson's chi-square test on all responses. The chi-square is 8.9716, and the P-value is 0.0113. No statistically significant differences are observed in other criteria.

5.2 Influence of services

Several types of services demonstrate the statistical differences between smartphone and feature phone users (see Table 9). Among them are the categories of "Telephone/e-mail" and "Camera/Movie," which are the functions or services that mobile phone users are accustomed to. However, for "Telephone/e-mail" functions, more users disagree with their usage. For "Camera/Movie" function, more smartphone users agree with its usage, whereas less feature phone users agree with its usage. However, more feature phone users disagree with this usage compared to smartphone users.

New services/functions such as "Search," "Game," "Location Search," "Music Player," and "Blog," which are easier to use on smartphones, received positive responses from smartphone users compared to feature phone users. In these services/functions, smartphone users indicated agreement, whereas feature phone users indicated disagreement.

The function of "One-Seg TV" (free-to-air TV) gained more agreement from feature phone users compared to smartphone users. The reason is that most Japanese smartphones are not "One-Seg TV"-ready, whereas feature phones are.

Overall, the services and functionality of the telephones are among the determining factors for selecting a smartphone and/or a feature phone.

5.3 Meaning of smartphones

The responses to the question on what a smartphone means to the user indicate the identical reactions of smartphone and feature phone users (see Table 10). The responses to items such as “Wish to carry whenever possible, if not always,” “No problem in not having one,” and “Do not have a chance to use” illustrate the opposite reactions of smartphone and feature phone users.

This tendency is also observed in the responses to the items “Necessary/uneasy without it” and “Inconvenient, but I do not care if I do not have one.” The former indicates that feature phone users do not care as much as smartphone users do. The latter suggests that smartphone users do care more than feature phone users.

5.4 Privacy concerns

Three items in Table 11 show the statistical difference between smartphone and feature phone users. Among the responses to the question, “What privacy-sensitive information is acceptable for divulgence?”, the items of “Likes/Hobbies,” “Education,” and “Appearances” indicated differences. Only feature phone users “strongly disagreed” or “disagreed” with the acceptability of divulgence.

Three responses to the question in Table 12, “How much is privacy-sensitive information worth?”, indicated differences between smartphone and feature phone users. More feature phone users provided responses to “Location (GPS)” and “Occupation/Earnings” worth JPY500.

Overall, feature phone users seem more sensitive to the divulgence of privacy-sensitive information, while they do not provide more importance to the information about “Location” and “Occupation/Earnings.”

6. Conclusion

This paper provided the results from the survey about the comparison of smartphone and feature phone users to identify the enablers of migration from 3G to 4G mobile phone systems. The influence of personal traits is unclear. However, the trait of Extraversion seems to have some influence on user migration to smartphones.

The services/functionalities are more influential on the cause of the differences. Both smartphone and feature phone users indicate certain differences about the services.

Privacy concerns also have some influence on the difference between smartphone and feature phone users.

Acknowledgments

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References

Junglas, I. A, Johnson, N. A and Spitzmuller, C., "Personality traits and concern for privacy: an empirical study in the context of location-based services," Eur. J. Inf. Syst., Vol.17, Issue 4, pp.387-402, Palgrave Macmillan, http://dx.doi.org/10.1057/ejis.2008.29

Matsunaga, Mari, *i-mode Jiken* (in Japanese "Operation i-mode"), Kadokawa Gourp, 2000.

Murakami Y. and Murakami C., *Shuyou 5 Inshi Seikaku Kensa Handobukku* (*BigFive Handbook*, in Japanese), Gakugeitosho, 2001.

Nihon Keizai Shimbun (The Nikkei), May 10, 2013. http://www.nikkei.com/article/DGXNASFK09034_Z00C13A5000000/, Accessed June 23, 2013.

Uesugi, S., Idota, H., Okada, H., Ueda, M., Dell, P., Yamaguchi, K., "A study of diffusion and acceptance of an electronic newspaper: The case of an Ehime newspaper." Proc. International Telecommunications Society 5th Africa-Asia-Austrasia Regional Conference, Perth, November 13-16, 2011, No.09, pp.1-12, 2011.

Uesugi, S., Okada, H., Sasaki, T., "The Impact of Personality on Acceptance of Privacy-sensitive Technologies: A Comparative Study of RFID and Finger Vein Authentication Systems," Proceedings of the 2010 IEEE International Symposium on Technology and Society (ISTAS 2010) - Social Implications of Emerging Technologies -, Wollongong, June 7-9, 2010, pp.111-122, IEEE, 2010.

Uesugi, S., "Effects of Personality Traits on Usage of Social Networking Services." Proc. of 2011 International Conference on Advances in Social Networks Analysis and Mining (ASONAM), July 25-27, 2011, Kaohsiung, Taiwan, pp.629-634, IEEE, 2011.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D., "User acceptance of information technology: Toward a unified view," MISQ, 27(3): 425–478, 2003.

FROM THE CONFERENCE

【ITS-AAA-2013】

MASASHI UEDA

A STUDY ON DIFFUSION OF E-BOOK
– CONTENTS AGGREGATION AND BATTLE OF BARGAINING POWER –

SHIRO UESUGI AND HITOSHI OKADA

RELATIONSHIP BETWEEN SMARTPHONE DIFFUSION AND PERSONALITY

A Study on Diffusion of e-Book – Contents Aggregation and Battle of Bargaining Power

Masashi Ueda

Kyoto Sangyo University

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This work was supported by JSPS KAKENHI Grant Numbers 24530458.

Contents

- Japanese e-book
- Interview survey
- Model analysis
- Discussion

*This study is based on Competition Policy Research Center, Japan Fair Trade Commission (2013), 'Trends in e-book market', *CPRC Report Series*, CR01-13 (in Japanese).

Introduction

- We Focus upon the early stage of the e-book market and make an interview survey on it with theoretical approach in order to pick up some future issues in competition polity.

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1. Definition of e-book

Definition of e-book

- Graphics and/or characters that replace existing books and magazines.
- Charged and provided through the information communication network as an electronic information.
- Read by electronic device like PCs, tablets, smart phones, mobile phones, or e-book terminal.

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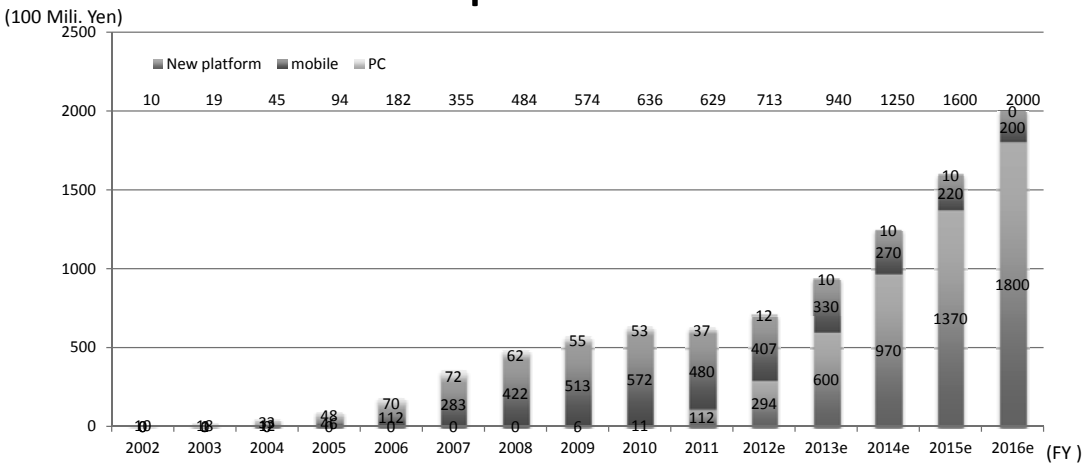
1.1 E-book in Japan



Source: Impress R&D (2012) 'E-book business Research Paper 2012'

- FY 2011: Total: 62.9 Billion Yen, Mobile: 48 Billion Yen (76%), PC: 3.7 Billion Yen (6%).

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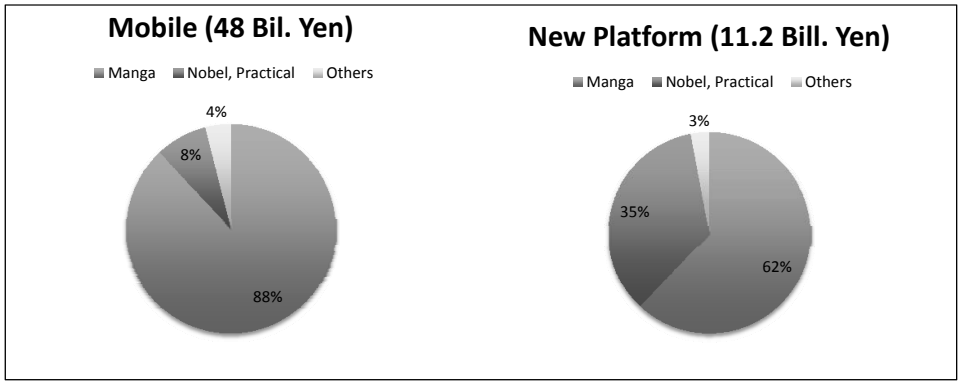
1.2 E-book Market contents



Source: Impress R&D (2012) 'E-book business Research Paper 2012'

- Mobile e-book market is dominated by *Manga* (88%).
- Nobel may grow up in the new platform.

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1.3 Major e-book players in Japan

E-book wholesalers	Owners
bitway	Digital Publishing Initiatives Japan (DPIJ)
Mobile book.jp	DNP, DoCoMo
Media do	

E-book stores	Owners	E-book readers	
BookLive	Toppan Publishing	Lideo	Android, iOS, PC
honto	DNP		Android, iOS, PC
Reader	Sony	Reader	Android, iOS, PC
Kinokuniya		Reader	Android, iOS, PC
kobo	Rakuten	kobo	Android, iOS, PC
Kindle	amazon	Kindle	Android, iOS, PC
iBook	apple		iOS

* DPIJ was established by major publishers, two publishing companies (toppan and DNP) in 2011/9.
* bitway was merged by its subsidiary company Booklive in 2013/3 and was sold to DPIJ in 2013/7.

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2. Interview Survey

- **Research body**: Competition Policy Research Center, Japan Fair Trade Commission.
- **Respondents**: 30 publishers, 5 e-book wholesalers, and 4 e-book stores.
- We send questionnaire sheets to them and visit each companies and make interviews.
- **Research period**: Nov. 2012-Feb. 2013

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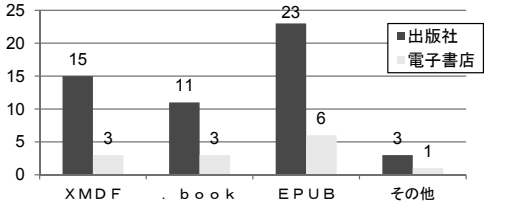
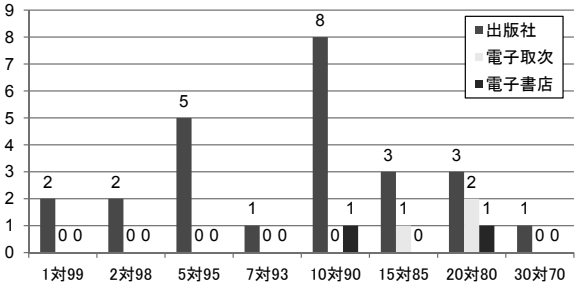
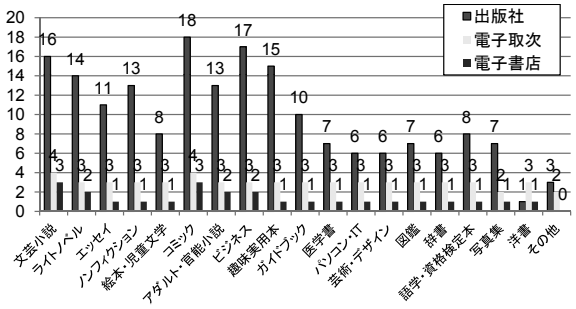
2.1 Japanese Publishers

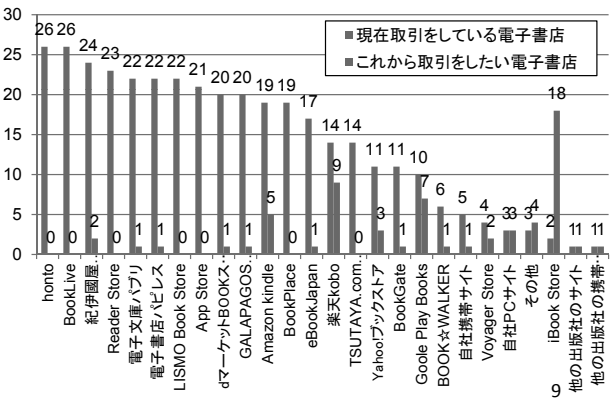
- Top SIX (Top four has strong weekly comics for their primary incomes) and over two thousand SMEs.
- E-book sales is less than 1% of total sales of publishes but they hope this figure to 10% in this five years.
- E-book suggested retail price (SRP) is about 80% of listed price of its paper version.
- For publishers there are two types of e-book; 1) Simultaneous publication (book and e-book) and 2) digitarise backlist book.
- Most of them promote digitalisation first.
- Some of them promote simultaneous publication tend to invest certain amount of money for e-book management system.
- Disincentive for publishers
  - Licensing for e-book is difficult from authors.
  - Initial cost for digitalisation process.
  - Some file format standards for e-book in Japan (epub 3, XMDF, .book, pdf, etc.).
  - Need for accounting system for e-book.

2.2 Some data from questionnaire









2.3 E-book distribution structure in Japan

- Agency model and wholesales model.
- **Agency model**: consignment sales by e-book store. Publishers set the sales price of each item and commission rate for them.
- **Wholesales model**: Publishers sell their book to e-book wholesalers or e-book stores. Retail price will be set by e-book store.
- Function of e-book wholesalers
  - Brokerage (to many e-book stores)
  - Consignment of digitalisation (w/ commission)
  - Clearinghouse

Model	Price decision maker
Agency	Publishers
Wholesales	E-book stores

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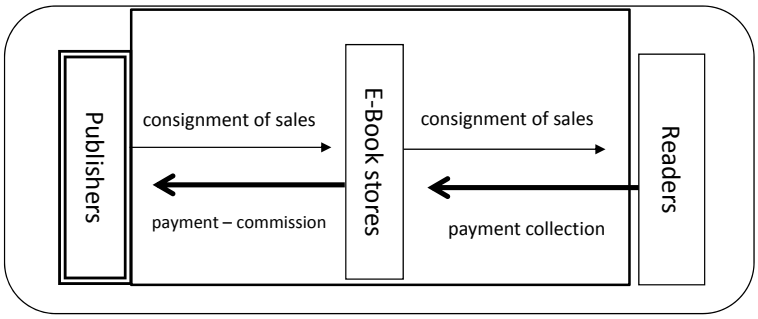
2.4 Agency model contract



- E-book store sells books of publishers in the price set by them and pay back to them in the sales amount minus its commission for them.
- Very few major publishers adopt this model in Japan.

Example: Price: 1,000 yen, commission: 300 yen
Sales amount: 1,000 yen, commission: 300 yen, pay back: 700 yen

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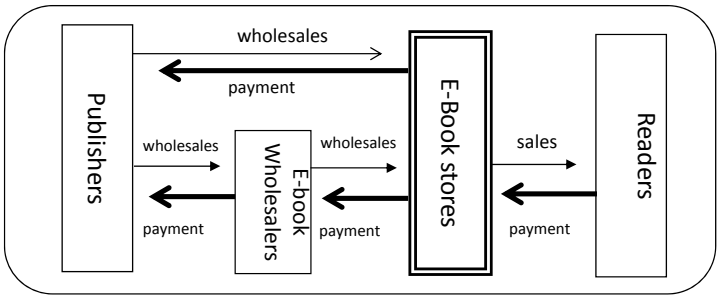
2.5 Wholesales model contract



- Each entities decide wholesales price/sales price.
- According to interview, most publishers adopt this wholesales model but provide suggested retail price (SRP) to e-book stores. They often sell e-books in this SRP.
- After e-book stores sale an e-book to reader, they pay its wholesales price to e-book wholesalers or publishers.

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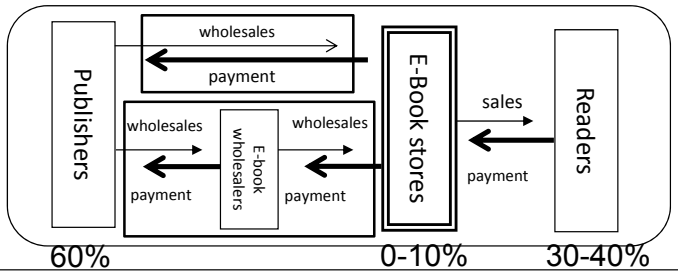
2.5 Wholesales model contract (cont.)



Examples 1: price: 1,000 yen (SRP: 1,000 yen), wholesales price: 600 yen

E-book store keeps 400 yen for its profit among sales amount, 1,000 yen and pay 600 yen to publisher.

Examples 2: price: 1,000 yen (SRP: 1,000 yen), wholesales price (publisher): 600 yen, wholesales price (wholesaler): 700 yen

E-book store keeps 300 yen for its profit among sales amount 1,000 yen and pay 700 yen to e-book wholesaler.
E-book wholesaler keeps 100 yen for its profit among sales amount 700 yen and pay 600 yen to publisher.

Wholesales price of publisher is 60% of SRP, Wholesales price of e-book wholesalers is 70%, sales price of e-book store is SRP in general.

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2.6 Summery: Interview

- Distribution of e-book is composed by that of paper book. Margin rate in each stage is fixed.
  - Publishers to wholesalers: 70% of list price, wholesalers to book stores: 80% of list price.
  - Publishers to e-book wholesaler: 70% of SRP, e-book wholesalers to e-book stores: 60% of SRP.
  - SRP of E-book is 80-100% of list price of paper book.
- E-book stores respect SRP of each books.

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3. Music distribution market outlook

- Two types of music distribution: distribution for mobile (Feature phones) and distribution for PC (PCs, portable music players, tablets, smart phones) in Japan.
- In distribution for mobile market Reco-Choku (means 'direct sales of labels') has a dominant share and it adopts agency model.
- This situation is looks like that of paper book market.
- In distribution for PC market vertical integrated platform operators (Apple and Sony) occupies most of the share of it. Both are adopting wholesales model.
- This situation is looks like that of paper e-book market.
- Like mobile handset market, music distribution market also move from mobile-centered to PC-centered from 2008.
- Average price of distribution for PC (149.0 yen) is about half of that of mobile (333.8 yen). In addition the growth # of Download (DL) for PC don't cover the decline # of DL for mobile.
- Music distribution market in Japan is shrinking now.

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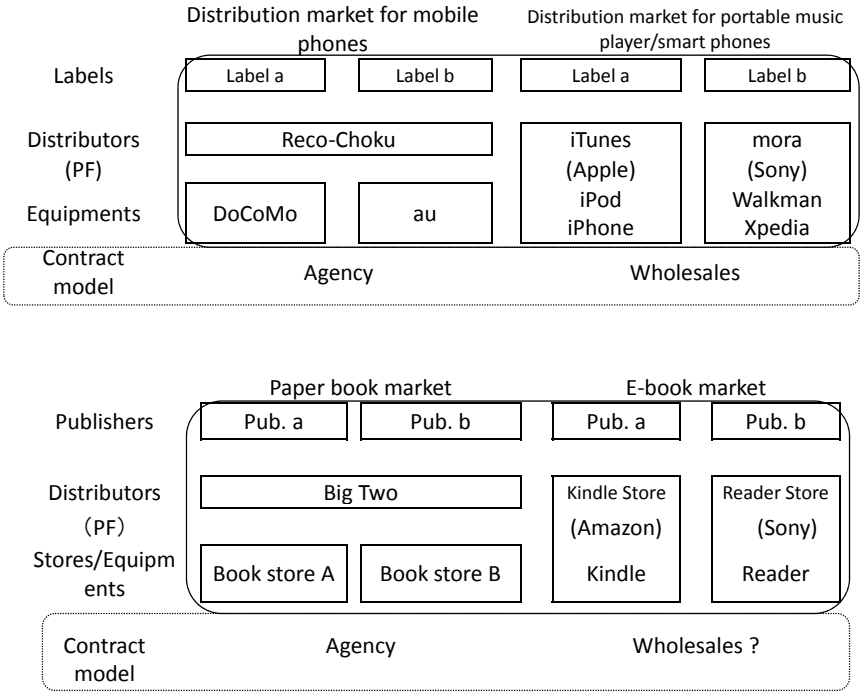
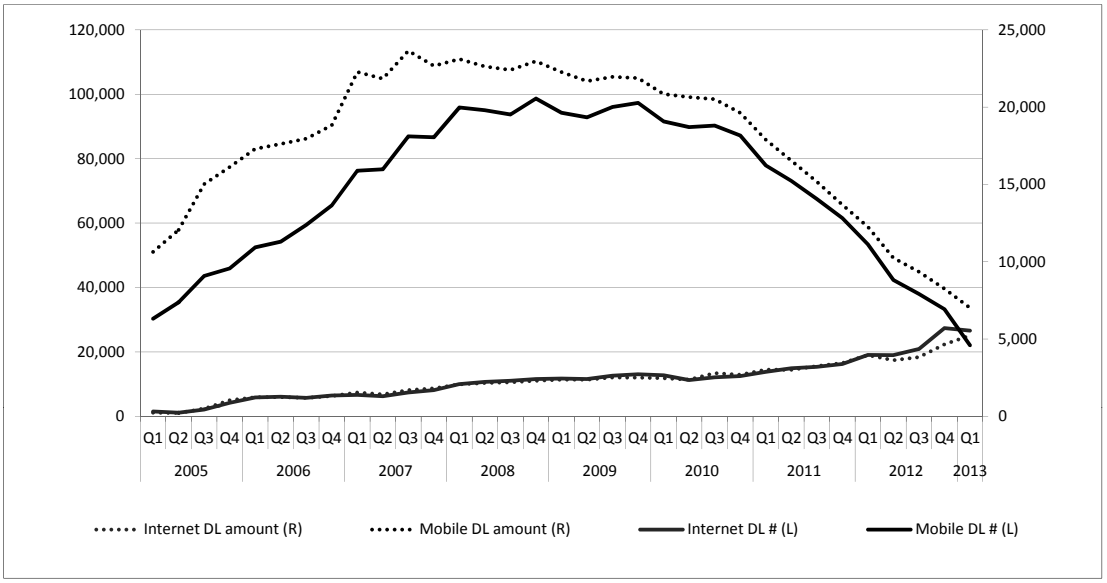
3.1 Music distribution and e-book



16

3.2 Music download market



Average payment for Mobile DL (333.8 yen) is bigger than that of PC (inc. portable music players and smart phones) DL (149.0 yen). So music DL market is shrinking in Japan though # of DL of PC is increasing.

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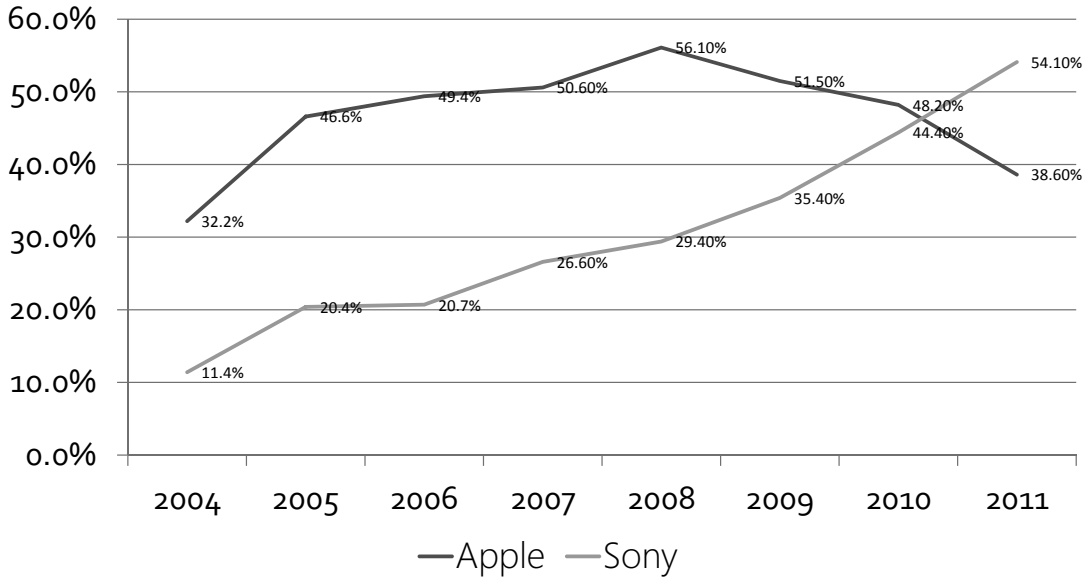
3.3 Share of portable music player



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3.4 Analysis for music distribution

- Setting
  - To find impact of competition for the music download market under distributors enclose their users.
  - We suppose 'market growth may affected by competitive condition'. So we put share of second top company, Sony, as competitive condition index.

Distribution market growth = a SONY + control factors + fix

- Estimation
  - When Sony's share is growing up total # of DL for PC also growing up.
  - When # of subscriber of feature phone is declining # of DL for mobile also declining.
  - When # of subscriber of smart phone is growing up total # of DL for PC also growing up.
  - Year dummy 2008 is significant in any models and structural change may occurred in 2008.

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3.5 imprecations from music distribution

- Replacing this analysis and qualitative results reflexively to the e-book market,
- Competition among e-book readers are active, e-book market may be grow.
- # of book store is declining, sales of book may also declining.
- Sales of e-book readers is grow, e-book market may also grow.
- Of cause the growth # of e-book sales *may not* cover the decline paper book sales.
- If the competition among integrated two platform companies are serious, it's enough but ***if not***, we need to discuss ***open access for dominant e-book*** reader from third party companies.

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(statistics 1)

	DLS.Q (1)		PCS.Q (1)		PCS.Q (2)		MPS.Q (1)	
SONY	10489607	(0.34)	27273527***	(5.08)			38829501***	(5.87)
POP	-6217.32**	(-2.30)	-1032.06	(-1.33)	166.62	(5.08)	-6463.11	(-2.63)
NGDP	207.23	(0.68)	48.19	(0.55)	-1032.06	(-1.33)	142.39	(0.68)
GL	2.33***	(5.01)			48.19	(0.55)	1.48***	(7.19)
Smart	0.98*	(1.99)	0.02	(0.23)				
BB	0.04	(0.23)	0.10*	(1.78)	0.02	(0.23)		
Yd2	4051105**	(2.25)	194371	(0.49)	0.10*	(1.78)	5698478***	(3.96)
Yd3	7354530***	(3.26)	1572585***	(3.93)	194371	(0.49)	8097487***	(4.36)
Yd4	5543806*	(1.92)	1255067	(1.76)	1572585***	(3.93)	5717050**	(2.43)
Yd5	1448070	(0.57)	-820679	(-1.15)	1255067	(1.76)	1581957	(0.69)
Yd6	-684576	(-0.32)	-759037	(-1.21)	-820679	(-1.15)	-565300	(-0.30)
Qd2	-906442	(-1.00)	-754636**	(-2.89)	-759037	(-1.21)	-257377	(-0.36)
Qd3	5659212	(0.72)	-370669	(-1.66)	-754636**	(-2.89)	710667	(0.99)
Qd4	559995	(0.20)	-830857	(-1.04)	-370669	(-1.66)	1350825	(0.76)
Constant C	596007484	(1.68)	123799474	(1.24)	-18749380	(-0.11)	693473774**	(2.23)
# of observations	25		25		25		25	
Correction R2	0.983016		0.985867239		0.956702952		0.976977473	
Significant F	7.91E-09		4.29E-10		4.33E-08		1.02E-09	
Regression	14		13		12		12	
Residual error	10		11		12		12	

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(statistics 2)

Parameters		Source
SONY	Sony’ s share in portable music player market**	Nikkei Industry Press
POP	Total population	MIC
NGDP	Nominal	Cabinet Office
GL	# of mobile phone subscribers	TCA, Impress
Smart	# of smart phone subscribers	Impress
BB	# of broadband subscribers	MIC
DLS.Q	Distribution (=PCS.Q+MPS.Q)	
PCS.Q	Distribution for PC	Recording Industry Association of Japan
MPS.Q	Distribution for mobile phone	

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4.1 discussion: early stage

- If various high qualified goods would provided though a platform, many consumers may use that platform. And # of transactions though it would be expand, other resources like qualified personnel, companies, and goods rush to it.
- This structure have a network externalities (relationship between ‘expand of consuming though a platform’ and ‘high qualified services are provided’).
- In early stage of an industry vertical integrated services often comes, like telephone, video game, mobile phone, etc.

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4.2 discussion: future of e-book

- Two special characteristics of e-book market
  1. Licensing for e-book is difficult from authors.
  2. Publishers also make paper book (Competing goods).

- In early stage, publishers are the only providers who arrange licensing negotiations with authors, editing books. So bargaining power of them is relatively higher than e-book store (because of shortage of contents/scarcity of resources).
- Apple case in the U.S. and E.U. can be understand as a defense action from publishers in the power shift from resource owners to distributors in e-book market.

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Relationship between Smartphone Diffusion and Personality:

A Case of a Japanese University

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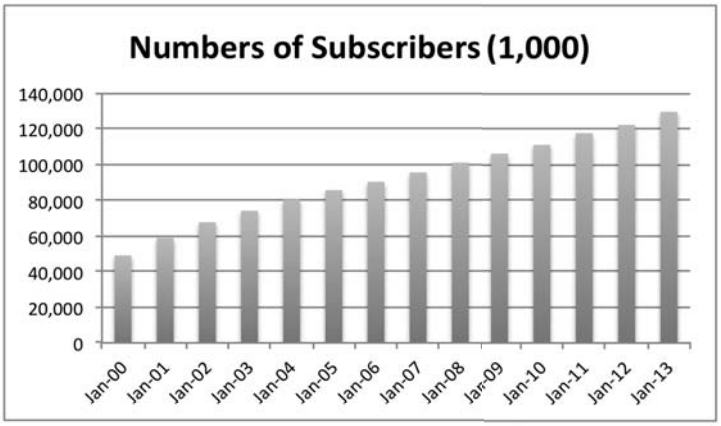
Plan

- Back ground
- Previous studies
- Descriptions of the survey
- Survey results
- Discussions
- Acknowledgement

Back ground#1

Nikkei reports:

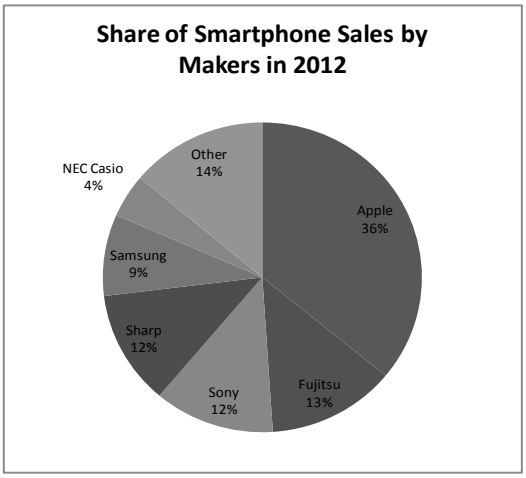
- Total sales of telephones in 2012 ➔ 41.8 million sets
  2.2%↓ from 2011
- However,
  The sales of smartphones
  23.0%↑,
  ➔29.72 million sets
- Representing 71.1% of the total sales of mobile phones
  14.5%↑



Source: Telecommunication Careers Association
http://www.tca.or.jp/database/download.html

Back ground#2

- What are the factors which influence Technology Adoption behavior for new technology such as Smartphones with 4G connection.
- "Contents" or "Service"?
- Or, "Personality"?



(Source: Nikkei=MM Soken, modified by authors)

Previous studies

Famous TAM

- Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D., "User acceptance of information technology: Toward a unified view," MISQ, 27(3): 425–478, 2003.

Use of Personality Traits

- Junglas, I. A, Johnson, N. A and Spitzmuller, C., "Personality traits and concern for privacy: an empirical study in the context of location-based services," Eur. J. Inf. Syst., Vol.17, Issue 4, pp. 387-402, Palgrave Macmillan,
- http://dx.doi.org/10.1057/ejis.2008.29

- Uesugi, S., Okada, H., Sasaki, T., "The Impact of Personality on Acceptance of Privacy-sensitive Technologies: A Comparative Study of RFID and Finger Vein Authentication Systems," Proceedings of the 2010 IEEE International Symposium on Technology and Society (ISTAS 2010) - Social Implications of Emerging Technologies -, Wollongong, June 7-9, 2010, pp.111-122, IEEE, 2010.

- Uesugi, S., "Effects of Personality Traits on Usage of Social Networking Services." Proc. of 2011 International Conference on Advances in Social Networks Analysis and Mining (ASONAM), July 25-27, 2011, Kaohsiung, Taiwan, pp.629-634, IEEE, 2011.

Big Five Factors of Personal Traits

- personality factor E is translated as *Gaikousei*, which means "outgoing"
- personality factor A is translated as *Kyouchousei*, which means "collaborative"
- personality factor C is translated as *Kinbensei*, which means "diligent"
- personality factor N is translated as *Jouchoanteisei*, which means "emotionally stable"
- personality factor O is translated as *Chisei*, which means "intelligent"

Descriptions of the survey

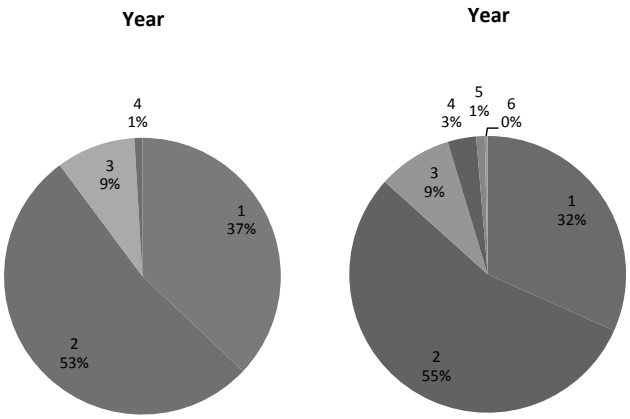
<< ALL >>	Num.	%
1st year	95	31.67%
2nd year	165	55.00%
3rd year	26	8.67%
4th year	10	3.33%
5th year	3	1.00%
6th year	1	0.33%
Total	300	100.00%

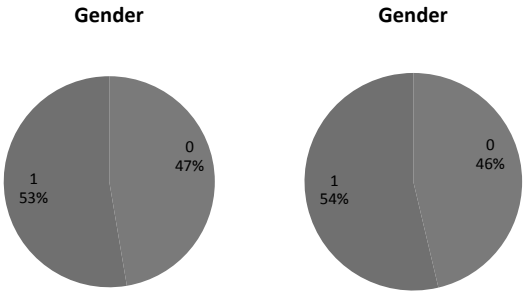
	Num.	%
Female	142	47.33%
Male	158	52.67%
Total	300	100.00%

<< Big Five Valid >>	Num.	%
1st year	40	37.04%
2nd year	57	52.78%
3rd year	10	9.26%
4th year	1	0.93%
Total	108	100%

	Num.	%
Female	50	46.30%
Male	58	53.70%
Total	108	100%

Table 1. Components of Sample





Descriptions of the survey

<< All >>	(-)	Neutral	(+)	Average
Extraverted	84	166	58	**-0.08**
Agreeable	52	224	32	**-0.06**
Conscientious	52	200	56	**0.01**
Neurotic	68	196	44	**-0.08**
Openess	110	175	23	**-0.28**

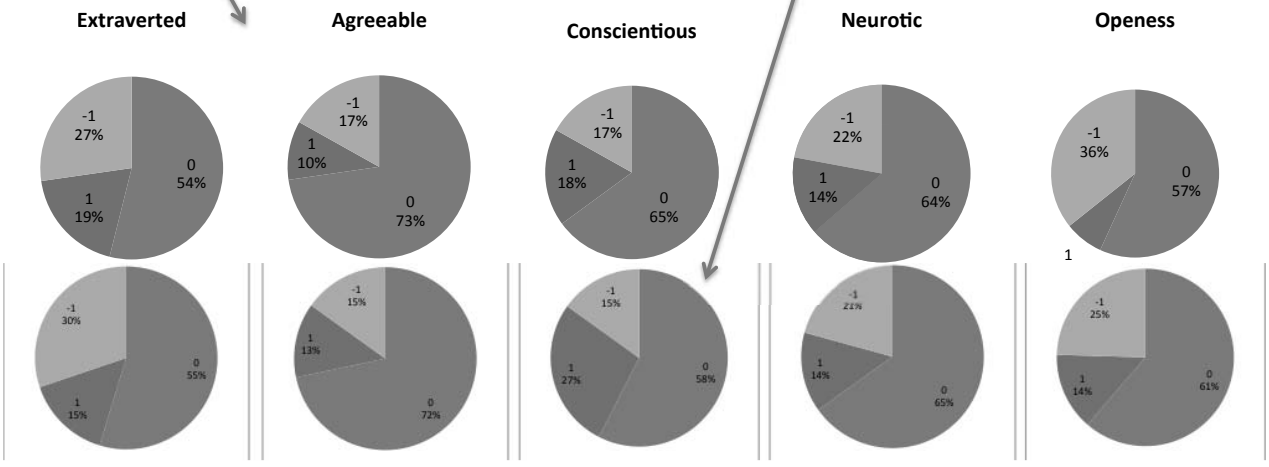
n = 308

<< Big Five Valid >>	(-)	Neutral	(+)	Average
Extraverted	32	58	16	**-0.15**
Agreeable	16	76	14	**-0.02**
Conscientious	16	61	29	**0.12**
Neurotic	22	69	15	**-0.07**
Openess	26	65	15	**-0.10**

n = 106

Note: For each of EACNO, "(-)" indicates strongly negative to this category of personality, "Neutral" indicates neutral and "(+)" indicates strongly positive. to this category of personality.

Table 2. Proportions of Results of Big Five Test

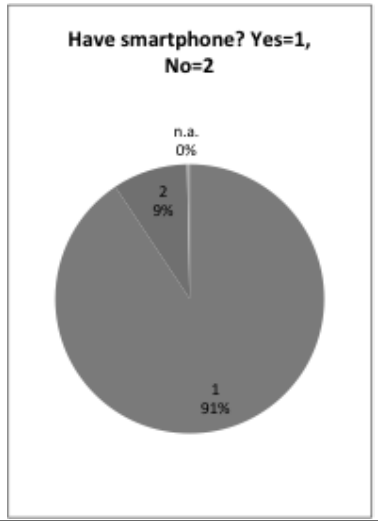


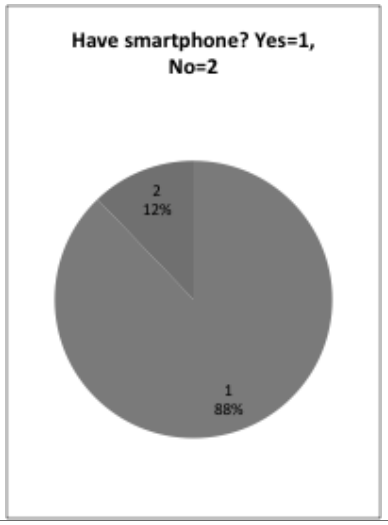
Descriptions of the survey

Have Smartphone?	no.	%
Yes	272	91%
No	27	9%
n.a.	1	0%
	n=	300

Have Smartphone?	no.	%
Yes	94	88%
No	13	12%
	n=	107
	(Big Five Valid)	

Table 3. Share of Users of Smartphone





Descriptions of the survey: Services

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Telephone/e-mail	250	43	3	1	3	**1.21**
Address Book	221	61	8	8	2	**1.36**
Clock/Alarm	216	62	8	7	7	**1.42**
Camera/Movie	203	76	10	9	2	**1.44**
Search	193	67	13	9	17	**1.63**
Calculator	2	114	100	35	33	**2.12**
Location Search	101	87	44	24	43	**2.40**
Other	1	88	80	76	28	**2.42**
Game	95	87	38	43	37	**2.47**
Music Player	109	77	22	37	55	**2.51**
Memo	83	79	50	53	35	**2.59**
Blog	61	58	44	46	91	**3.16**
One-Seg TV	34	32	25	65	139	**3.82**
Payment (OsaifuKeitai)	28	15	13	47	192	**4.22**
						n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	**Average**
Telephone/e-mail	95	11	0	1	1	**1.17**
Camera/Movie	78	22	5	3	0	**1.38**
Address Book	79	20	4	5	0	**1.40**
Clock/Alarm	76	24	2	1	5	**1.47**
Search	71	22	4	3	7	**1.63**
Calculator	44	31	12	14	7	**2.16**
Game	38	32	11	12	15	**2.39**
Other	1	34	33	18	8	**2.39**
Location Search	38	32	11	7	19	**2.41**
Memo	36	30	10	18	14	**2.48**
Music Player	39	32	5	10	22	**2.48**
Blog	21	24	11	16	36	**3.20**
One-Seg TV	14	15	4	24	51	**3.77**
Payment (OsaifuKeitai)	13	6	3	14	72	**4.17**
						n = 108

Table. 4 What Contents/Services in Use?

Descriptions of the survey: Meaning of Smartphone

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Average
Wish to Carry Whenever Possible If not Always	132	123	19	17	9	**1.83**
Necessary/ Uneasy When Without It	88	115	50	40	7	**2.21**
Inconvenient But Do Not Care If Not Have One	13	44	51	92	94	**3.71**
Bothered Being Called Whenever	20	26	64	93	92	**3.72**
I Don't Feel Anything About this Matter	9	29	74	63	119	**3.86**
No Problems Not to Have One	6	18	43	99	127	**4.10**
Do Not Have Chance to Use	2	9	33	85	164	**4.37**
Want One But Not Have One With Some Reason	2	11	48	36	192	**4.40**

n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Average
Wish to Carry Whenever Possible If not Always	46	40	6	9	7	**1.99**
Necessary/ Uneasy When Without It	36	31	15	23	3	**2.31**
Bothered Being Called Whenever	10	10	25	25	38	**3.66**
Inconvenient But Do Not Care If Not Have One	5	21	14	30	38	**3.69**
I Don't Feel Anything About this Matter	2	10	22	23	51	**4.03**
No Problems Not to Have One	0	9	16	32	51	**4.16**
Want One But Not Have One With Some Reason	1	5	21	14	66	**4.30**
Do Not Have Chance to Use	0	3	10	31	64	**4.44**

n = 108

Table 5. What Does a Smartphone Mean to You?

Descriptions of the survey:
What Information are acceptable for divulgence

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Average
Likes/Hobbies	56	153	45	20	26	**2.36**
Place of Birth	51	150	42	29	28	**2.44**
Education	19	72	71	75	61	**3.29**
Name, DOB, Postal/e-mail Address	25	73	41	84	73	**3.36**
Appearances (Hight, Weight, Body Features)	18	62	73	56	91	**3.47**
ID (Google, Yahoo!, etc.)	2	20	36	69	166	**4.29**
Occupation/Earnings	3	19	27	79	166	**4.31**
Location (GPS Data)	3	12	24	68	185	**4.44**
Bank Account No.	0	4	10	40	236	**4.75**

n = 300

(Big Five Valid)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Average
Likes/Hobbies	19	64	14	4	7	**2.22**
Place of Birth	18	58	15	7	10	**2.38**
Name, DOB, Postal/e-mail Address	13	25	15	28	26	**3.27**
Education	7	27	25	26	23	**3.29**
Appearances (Hight, Weight, Body Features)	9	23	26	21	29	**3.35**
Occupation/Earnings	0	9	11	29	57	**4.26**
ID (Google, Yahoo!, etc.)	0	7	12	24	63	**4.35**
Location (GPS Data)	1	5	5	25	70	**4.49**
Bank Account No.	0	3	5	15	83	**4.68**

n = 107

Table 6. What Privacy Sensitive Information Are Acceptable for Divulgence?

Descriptions of the survey: How much for privacy?

	1.JPY100	2.JPY500	3.JPY1,000	4.JPY1,500	5.JPY3,000	**Average**
Likes/Hobbies	73	56	46	14	104	**3.07**
Place of Birth	61	55	42	23	111	**3.23**
Education	27	45	48	40	132	**3.70**
Appearances (Hight, Weight, Body Feature)	24	35	56	30	146	**3.82**
Name, DOB, Postal/e-mail Address	26	30	20	22	189	**4.11**
Location (GPS)	9	11	25	28	209	**4.48**
ID (Google, Yahoo!, etc.)	7	7	28	24	214	**4.54**
Occupation/Earnings	8	4	20	33	221	**4.59**
Bank Account No.	6	3	5	9	259	**4.82**

n = 300

A$1.00=JPY97.0

(Big Five Valid)

	1.JPY100	2.JPY500	3.JPY1,000	4.JPY1,500	5.JPY3,000	**Average**
Likes/Hobbies	24	30	14	2	37	**2.98**
Place of Birth	22	22	16	4	43	**3.22**
Education	11	18	16	11	51	**3.68**
Appearances (Hight, Weight, Body Feature)	8	17	19	14	49	**3.74**
Name, DOB, Postal/e-mail Address	7	12	8	9	70	**4.16**
Location (GPS)	3	5	7	10	82	**4.52**
ID (Google, Yahoo!, etc.)	4	2	8	8	84	**4.57**
Occupation/Earnings	0	3	7	13	84	**4.64**
Bank Account No.	0	1	2	4	100	**4.89**

n = 106

Table 7. How Much Does Private Sensitive Information Worth?

Descriptions of the survey: Smartphone users and Big 5

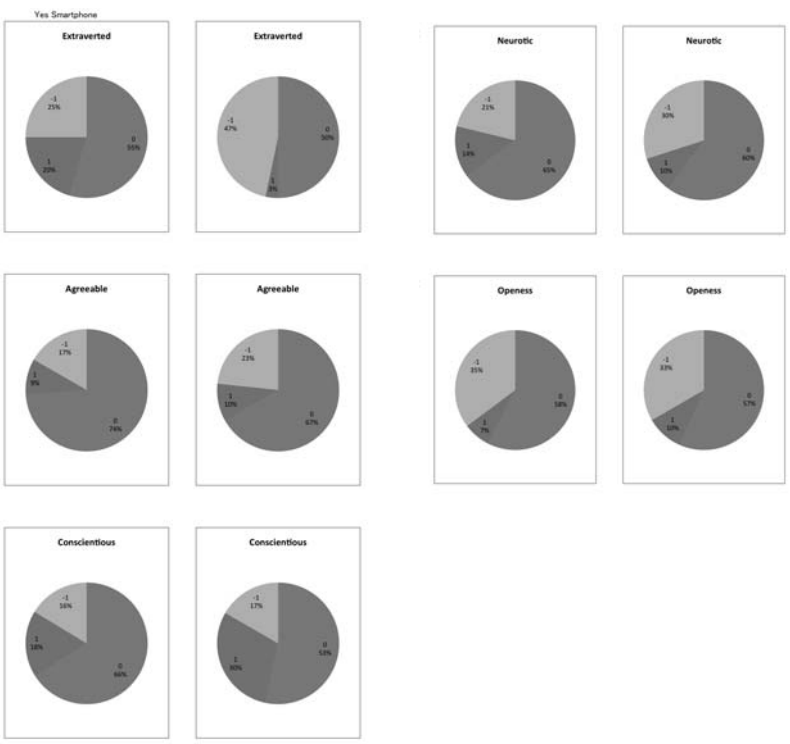
Use of Smartphone	E			A			C			N			O		
	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1
Yes	66	144	54	44	195	25	43	174	47	56	171	37	93	152	19
No	14	15	1	7	20	3	5	16	9	9	18	3	10	17	3

(Big Five Valid)

Use of Smartphone	E			A			C			N			O		
	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1	-1	Ntr.	1
Yes	27	51	16	13	69	12	14	56	24	19	62	13	24	57	13
No	5	7	0	3	7	2	2	5	5	3	7	2	2	8	2

Note: For each of EACNO, "-1" indicates strongly negative to this category of personality, "Ntr." indicates neutral and "1" indicates strongly positive. to this category of personality.

Table 8. Smartphone User and Big Five Categories



Survey results: Personal Traits

- Influence of Personal Traits

"What privacy-sensitive information is acceptable for divulgence?" (Table 6)

Stats

Parameters	B5 Valid	B5 In-valid
n	107	300
Proportions	76.80%	69.97%

Z-score	1.347499407
P-value	0.177819444

No difference

Survey Results: Big Five Personality Traits

Extraverted

Cross Table

		Weakly	Neutral	Strongly	Total
Have smartphone?	Yes	66	144	54	264
		82.5%	90.6%	98.2%	89.8%
	No	14	15	1	30
		17.5%	9.4%	1.8%	10.2%
	Total	80	159	55	294
		100.0%	100.0%	100.0%	100.0%

Expected Proportions

		Weakly	Neutral	Strongly
		-1	0	1
Have smartphone?	Yes	71.837	142.776	49.388
	No	8.163	16.224	5.612

Chi-Square Test

Method		Chi-Sq. Value	D.O.F.	P-value	Sig.
Pearson		8.9716	2	0.0113	*

Survey results: Service

- Influence of Differences of Services (Table9)

  "Yes" there are some differences.

- "Telephone/e-mail" and "Camera/Movie" "Search," "Game," "Location Search," "Music Player," and "Blog"

  Smartphone Users >> Feature phone Users

- "One-Seg TV" (free-to-air TV)

  Feature phone Users>>Smartphone Users

Survey results : Meaning of Smartphone

- Influence of the "meaning of smartphone"

"Wish to carry whenever possible, if not always," "No problem in not having one," and "Do not have a chance to use" illustrate the opposite reactions of smartphone and feature phone users.

This tendency is also observed in the responses to the items "Necessary/uneasy without it" and "Inconvenient, but I do not care if I do not have one."

Survey results : Privacy Concerns

"What privacy-sensitive information is acceptable for divulgence?" in Table 11

"Yes" differences between Smartphone Users and Feature phone Users:

- ✓ "Likes/Hobbies,"
- ✓"Education,"
- ✓"Appearances"

"~~Only~~ Because feature phone users indicated "strongly disagreed" or "disagreed" with the acceptability of divulgence. "

Survey results : Price of Privacy

"How much is privacy-sensitive information worth?" (Table12)

- ✓For Feature phone users, Location (GPS) is cheap (only JPY500)
- ✓For Feature phone users, Occupation/Earning is cheap (only JPY500)

Discussions and conclusions

From the survey results, we may conclude that…

- ✓ Regardless of the validity of responses in Big Five tests, the overall structures of the sample seems indifferent to each other.
- ✓ Migration from feature phones to smartphones (i.e. from 3G to 4G) seems to be mainly led by the services.
- ✓ Extroverted personal character may affect the migration pattern.

Acknowledgements

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- Many thanks to ITS and ITS-AAA staffs and reviewers.

  …. and you, audience!!

FROM THE CONFERENCE

【WS-ITES IN COMPSAC2013】

SUMIKO MIYATA, KINOSHITA HIROTSUGU,
MORIZUMI TETSUYA, LI CHAO

GAME THEORETIC ANALYSIS OF THE VALUE EXCHANGE SYSTEM

YU-LUNG WU, CHI-JUI CHANG, YU-HUI TAO

CLOSED-CIRCUIT TELEVISION-ENABLED SERVICE:
A REVIEW OF SECURITY AND PRIVACY ISSUES

RUNGSIMAN NARARATWONG, NAGUL COOHAROJANANONE,
NATTARAT PONGSUPANKIJ, RAJALIDA LIPIKORN,
KANOKWAN ATCHARIYACHANVANICH

THE STUDY OF BRAND PERCEPTION THROUGH SOCIAL NETWORK
SITES AND CORPORATE SOCIAL RESPONSIBILITY PROGRAMS

KEYNOTE:

SHIRO UESUGI

IT-ENABLED SERVICES: SCOPE FOR THE FUTURE

Game theoretic analysis of the value exchange system

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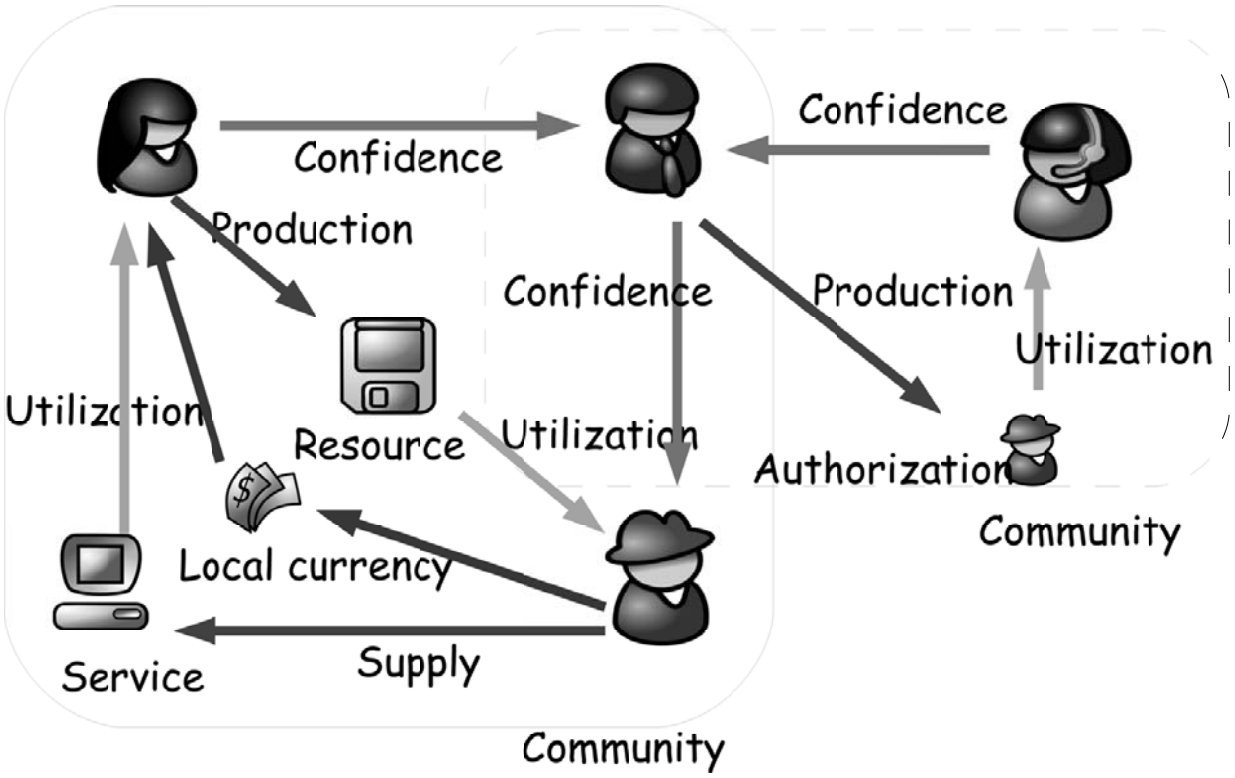
Various relationships in communities



•In various different societies, the information resources need to be circulated among communities
• There are different values and public entities that do not belong to any particular community.

In contemporary society, we circulate information resources, e.g. knowledge, writings, and personal information, through networks with various information technology tools.

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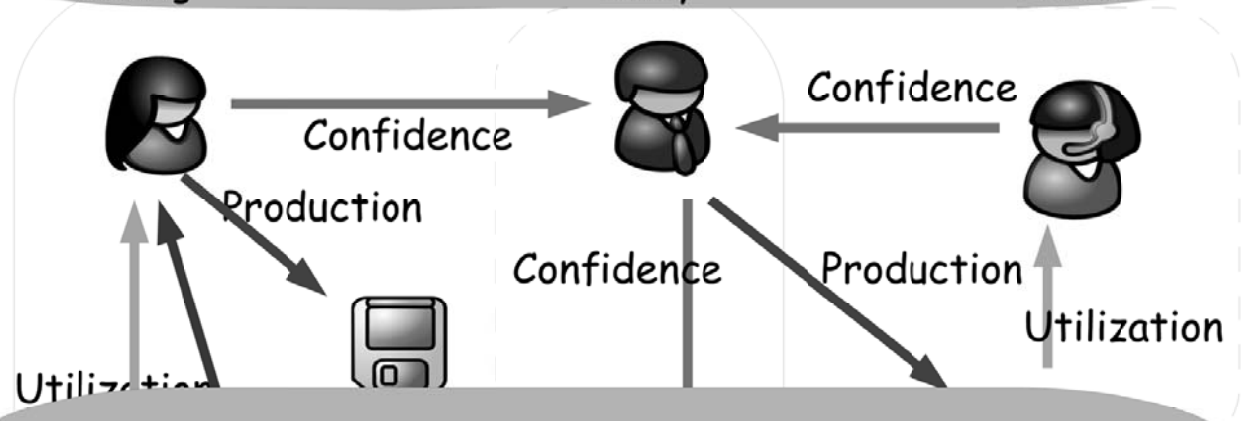
Members are bound by agreements based on confidence and exchanges of resources and money such as local currencies.



In order to circulate the information resources more **smoothly**, **Appropriate values** for them should be evaluated **before** these values and information resources are exchanged

Furthermore, information resources should be prevented from leaking.

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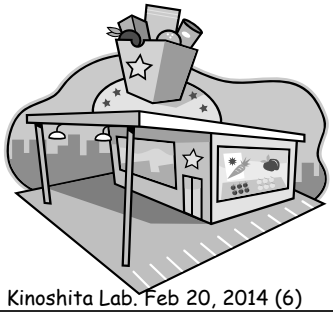
The lawful currency

- Several settlement systems are used to circulate goods, services and information resources.
- The lawful currency is used for most transactions.
- However, it is difficult for the lawful currency to reflect the sense of values in various communities, and as result, goods and currency do not always circulate smoothly.

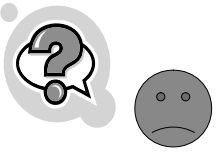
The lawful currency

- For example, money tends to concentrate in large-scale shopping malls rather than in small shopping centers, and this means information and services may not circulate sufficiently.
- Recently, some small shopping centers have introduced local currencies reflecting the sense of values of their communities as a way of circulating goods and services smoothly.



Local currencies

- Another example is a community that has respect for the elderly.
- In this system, members of the community get points when they talk to elderly persons.
- However, in a typical community, there would be individuals would want to talk to elderly persons **without** an incentive
- Other individuals would NOT prefer to talk with the elderly even **with** an incentive.



- It is important to find appropriate matching partner.

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Proposed Currencies in practice?

Two office workers' case

	Volunteerism	Acknowledgment
Office worker A	O	X
Office worker B	X	O

Firstly, office worker A helps B because A has volunteerism, then B maybe help A in return since B has acknowledgment feelings
Good mutual help is realized! Total utility is increased

How can we find such an appropriate partner?

→ Proposing a new management system of goods value exchanging makes finding these good partners easier.

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A value exchange system(SAINT2011)

- A value exchange system between two entities who have different senses of value
- A value vector that describes the variety of values
- The credit of the securities evaluated by using a human relationship diagram
- The settlement based on an information capsule with agents

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A value exchange system(SAINT2011)

•A value exchange system between two entities who have different senses of value
•A value vector that describes the variety of values
•The credit of securities evaluated by using a human relationship d
•The settler n an information capsule with agents

•This system enables smoother exchanges of information resources and services.
•The balance between convenience, safety, and circulation is considered in the transactions.

A value exchange system(SAINT2011)

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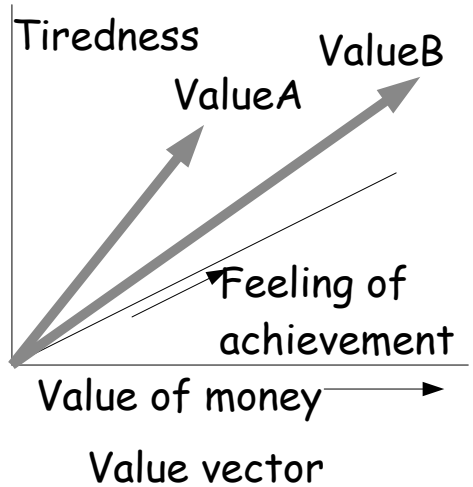
•We define a value vector that describes the variety of values in our system, what constitutes a settlement between two entities, and the circulation of the values with securities.



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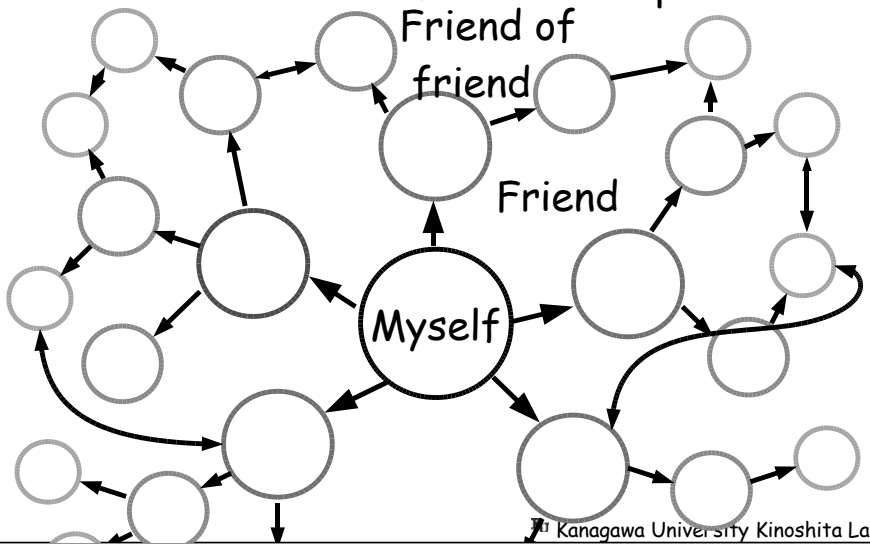

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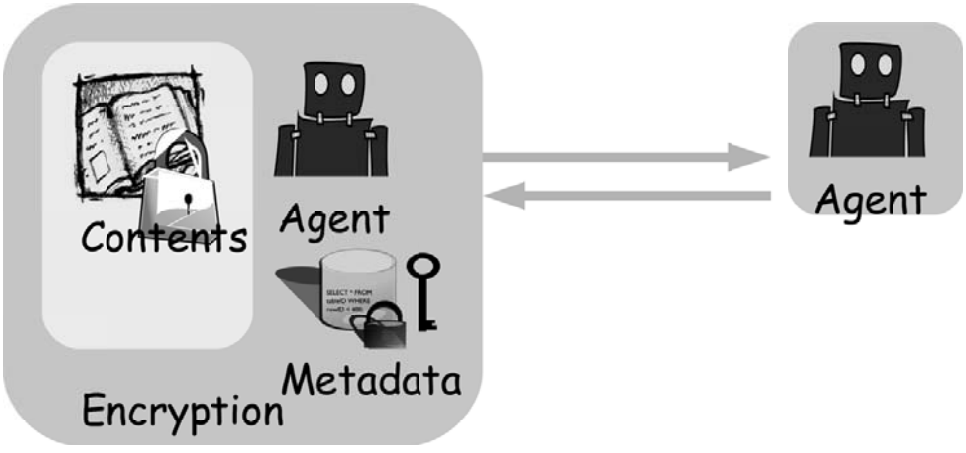
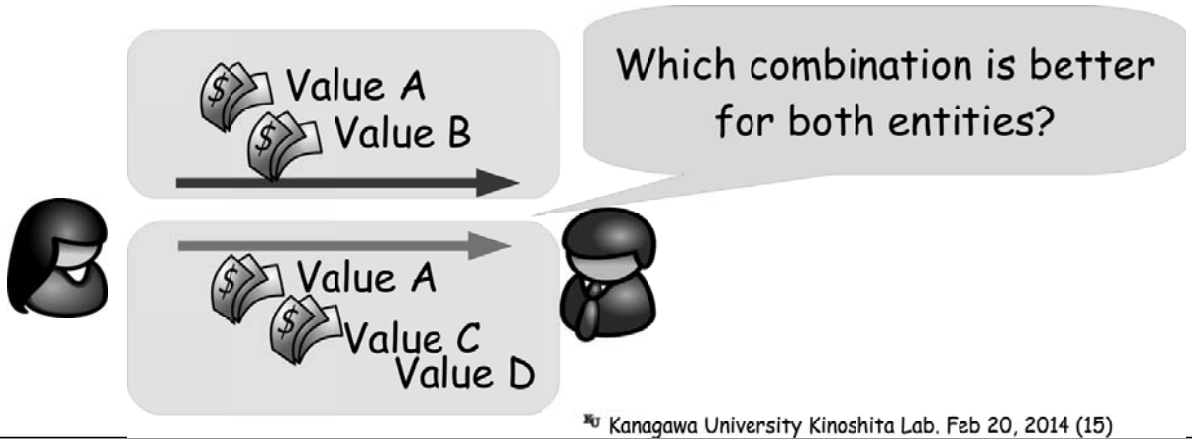


Combinations of values (SAINT2012)

•It is generally difficult to decide the optimum combinations that maximize the properties of entities.
•Particle swarm optimization (PSO) is applied to decide the optimum combinations of values as a reward for services.



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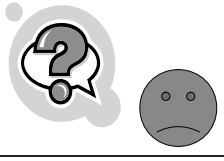
Problems of conventional methods

•The circulation may be hindered by differences in the sense of values in the same community.

- We study the circulation of goods and local currencies of a value exchange system that accounts for different values in a community.

•Here," value "means not only monetary values but also goods that reflect various senses of value.

•However, these methods have not yet been shown to be able to exchange goods without any disapproval from users.



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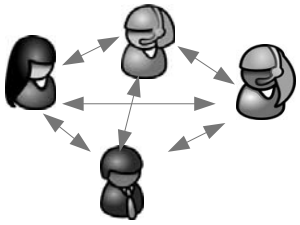
Purpose

•We propose a game theoretic model where in *n* users can be satisfied by the utilities under certain conditions.

- This model accounts for not only exchanges between two users but also exchanges among *n* users.

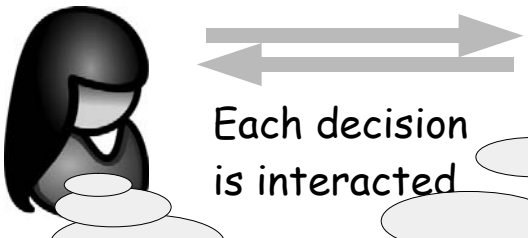


•We demonstrate with market game theory that goods can be exchanged without any disapproval from users.

Game theory(Basis of the game)

•Game theory is the study of how players interact and make decisions.
•Each player selects own behavior to achieve own objective in a game (noncooperative game and cooperative game).

Player
→ get a payoff



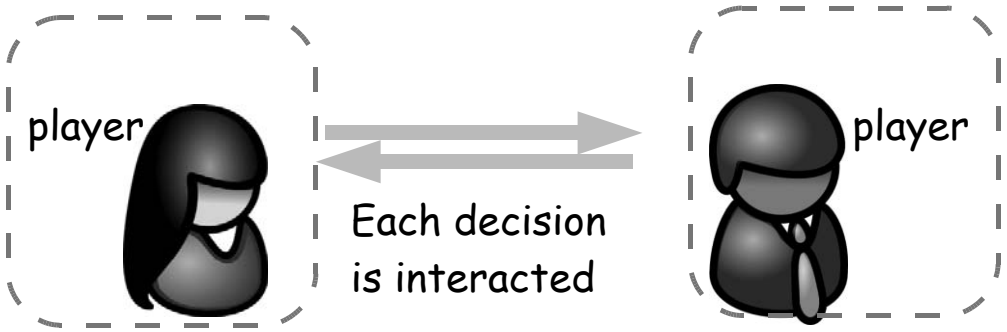
Each decision is interacted

Player
→ get a payoff

It is assumed that individual players have a clear purpose and select the actions that will achieve their goals.

Game theory(Basis of the game)

•Noncooperative games: players make decisions independently.
•Cooperative games(=coalitional game): players form groups (coalitions) and enforce cooperative behavior.
→ Market game, big boss game, airport game etc.



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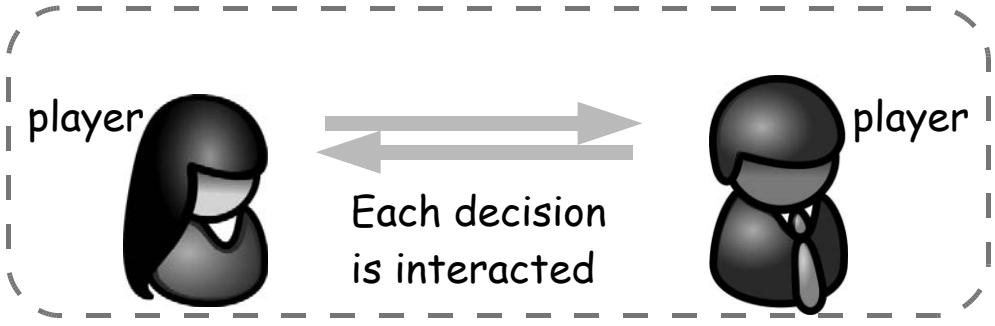
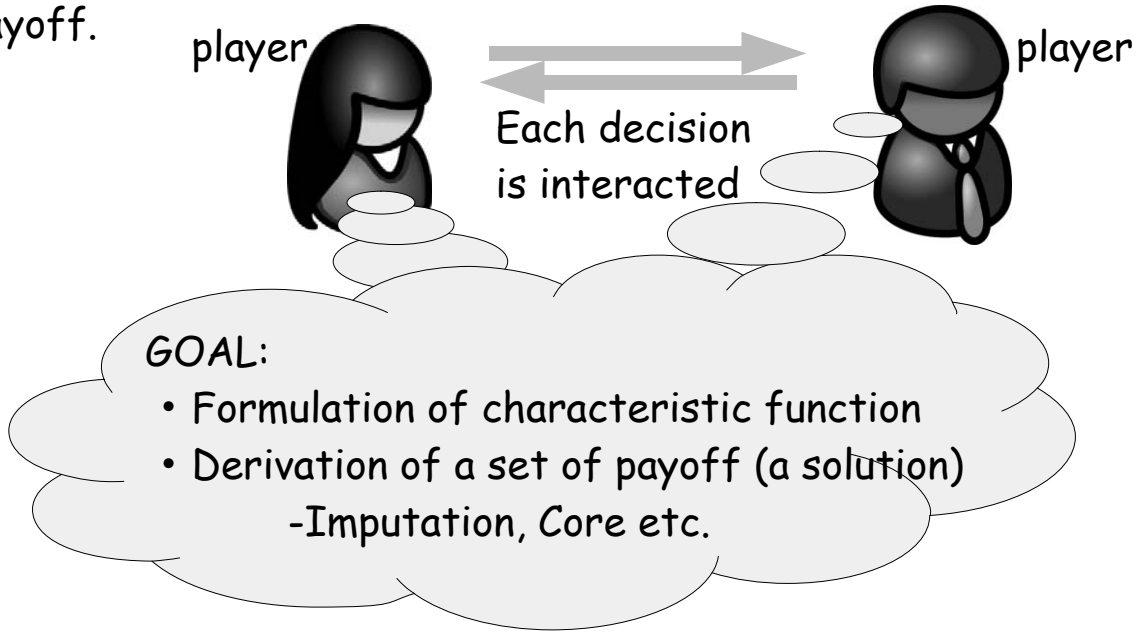


Game theory(Cooperative game)

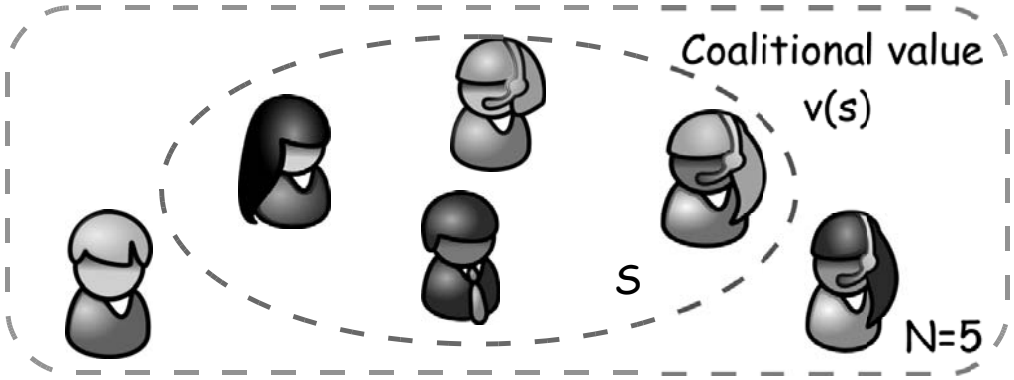
•Cooperative games (=coalitional game): players form groups (coalitions) and enforce cooperative behavior.
•All players cooperate in order to select strategies and get the payoff.



Game theory(Cooperative game)

•Definition of parameter of the cooperative game (*N, v*)
- *n*: players
- S: a subset of *N* is defined as a coalition
- *v*(*S*) :characteristic function -> the maximum value of a member of the coalition.
- *N* : a coalition called the *grand coalition* (=*all* players coalition) .

•By using coalitional game, we can find a set of payoff (solution) !



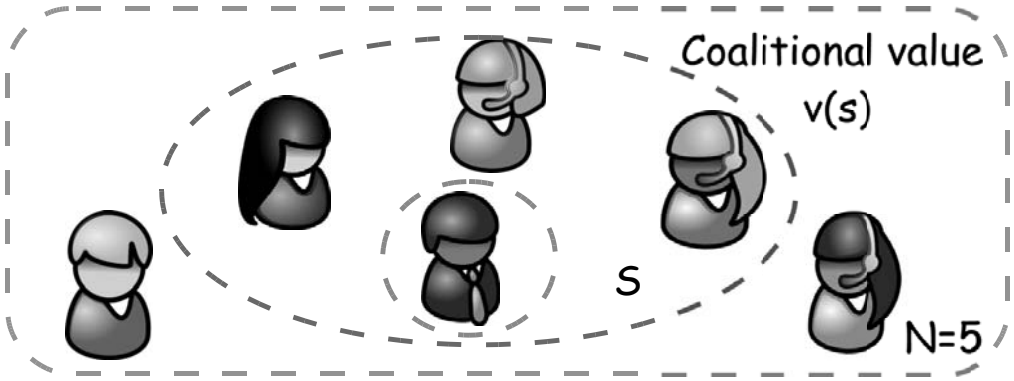
Game theory(Cooperative game)

•A solution concept is a payoff vector $x = (x1; x2; \cdots ; xn) \in Rn$ that represents the allocations to each player.

•When **x** satisfies the following two conditions, this vector is called an *imputation I*.

Group rationality individual rationality.

$$I = \{x \in \mathbb{R}^n | \sum_{i \in S} x_i = v(N), x_i \geq v(\{i\}), i = 1, 2, \cdots, n\}$$



Game theory(Cooperative game)

•Imputation has been proposed for different solution concepts based on different notions of fairness.

- i.e, core, Shapley value and Nucleolus.

•The most popular solution concept is the core.

•A core *C* is defined by

Coalitional rationality

$$C = \{\in I | \sum_{i \in S} x_i \geq v(S) \ \forall S \subseteq N, \sum_{i \in N} x_i \leq v(N)\}.$$

•In the core, all players can satisfy a set of imputations.

- A typical cooperative game model is the market game.
- The market game has core.

Game theory(Cooperative game)

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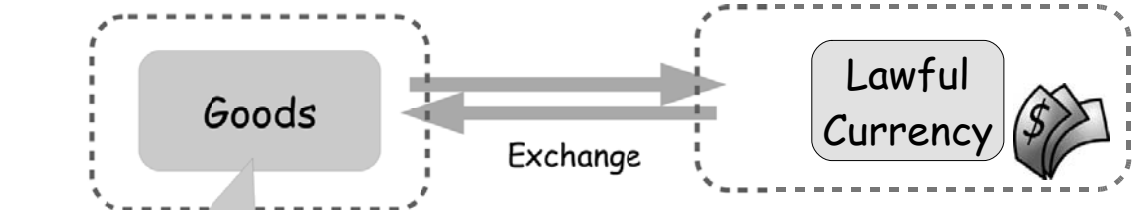
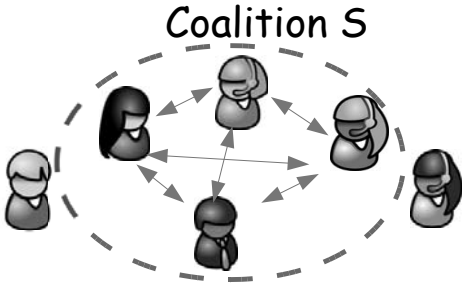
- To show the exchanged system without any disapproval from users.
  - → We extend the market game !
  - → We show the existence of the core !

Game theory(Market game)

- The market game is a typical cooperative game model.
  - The market game explains the exchange economy.
  - Here, players form coalitions with each other.



Materials that satisfies human and provides utility



Game theory(Market game)

•Definition of parameter of the market game (*N, v*):

- $i \in N$: *Players*
- $N = (1; \cdots ; n)$: *Set of players n* players
- $\boldsymbol{w}_i = (w_1^i ; \cdots ; w_i^{m+1})$: Initial good vector of the player i
- $\boldsymbol{x} = (x_1^i ; \ldots ; x_i^{m+1})$: A transferable good vector

•We need to derive the characteristic function v(S).

- The characteristic function means the sum of the player's utilities is maximized.

Game theory(Market game)

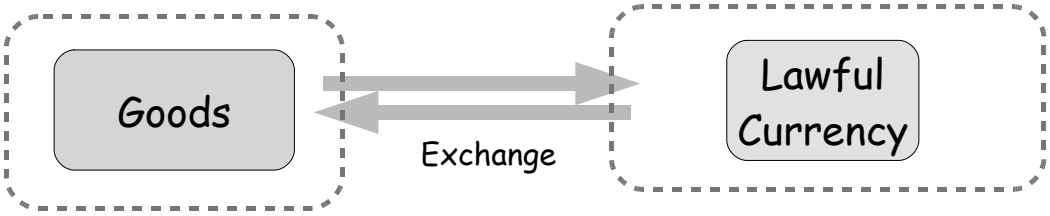
- The characteristics function of the market game:

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, \ldots, x_i^m) + \sum_{i \in S} x_i^{m+1} \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ \ldots \ , m+1.$$

Utility function of player i (**concave and monotonic**)

The lawful currency of player i



Game theory(Market game)

- The market game is a typical cooperative game model.
  - The market game explains the exchange economy.

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} \right\}$$

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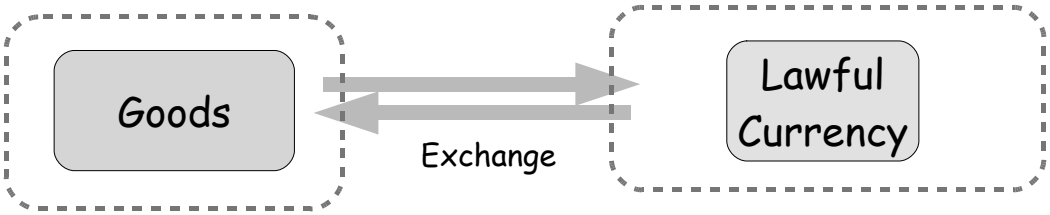
The type of goods



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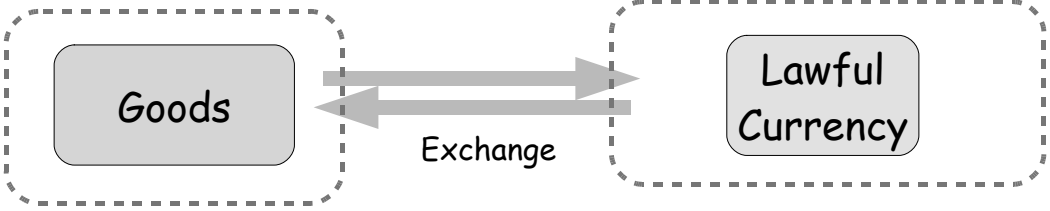
A transferable goods and lawful currency of player i

A initial goods and lawful currency of player i



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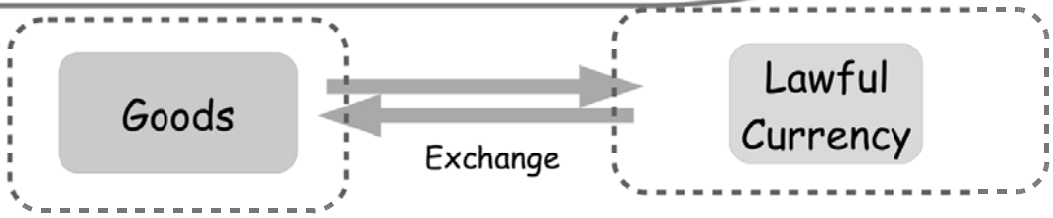
$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ \ldots, m+1.$$

For all players i,
the transferable goods vector xi must satisfy.



Game theory(Market game)

- By using Strategic equivalence, we can change the characteristic function !

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, \ldots, x_i^m) + \sum_{i \in S} x_i^{m+1} \right\}$$

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•Strategic equivalence :Two games (N,v) and (N,v') are equivalent if the following condition regarding the characteristic function v and v' is satisfied .

•Let δ be a positive real number and let ($\beta 1$, $\beta 2$, ...,βn) be a vector of real numbers.

$$v'(S) = \delta v(S) + \sum_{i \in S} \beta i \quad S \subseteq N$$

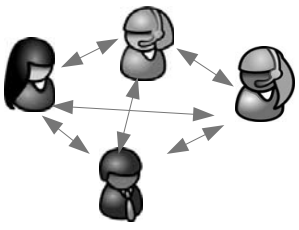
Market game (Existence condition of a core)

•It's not always true that a core exists in a game.

•However, when the game is a *balanced game*, the core exists.

•As the market game is a balanced game, cores exist.

The market game = the balanced game → Core !!!



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- However, when the game is a *balanced game*, the core exists.
- As the market game is a balanced [illegible]res exist.

- The balanced game:
  - β means a family of non-empty coalitions in the player set N.

$$\sum_{S\in\beta} \delta_s v(S) \le v(N) \quad \text{where} \sum_{S\in\beta, i\ni S} \delta_s = 1 \quad \forall i \in N.$$

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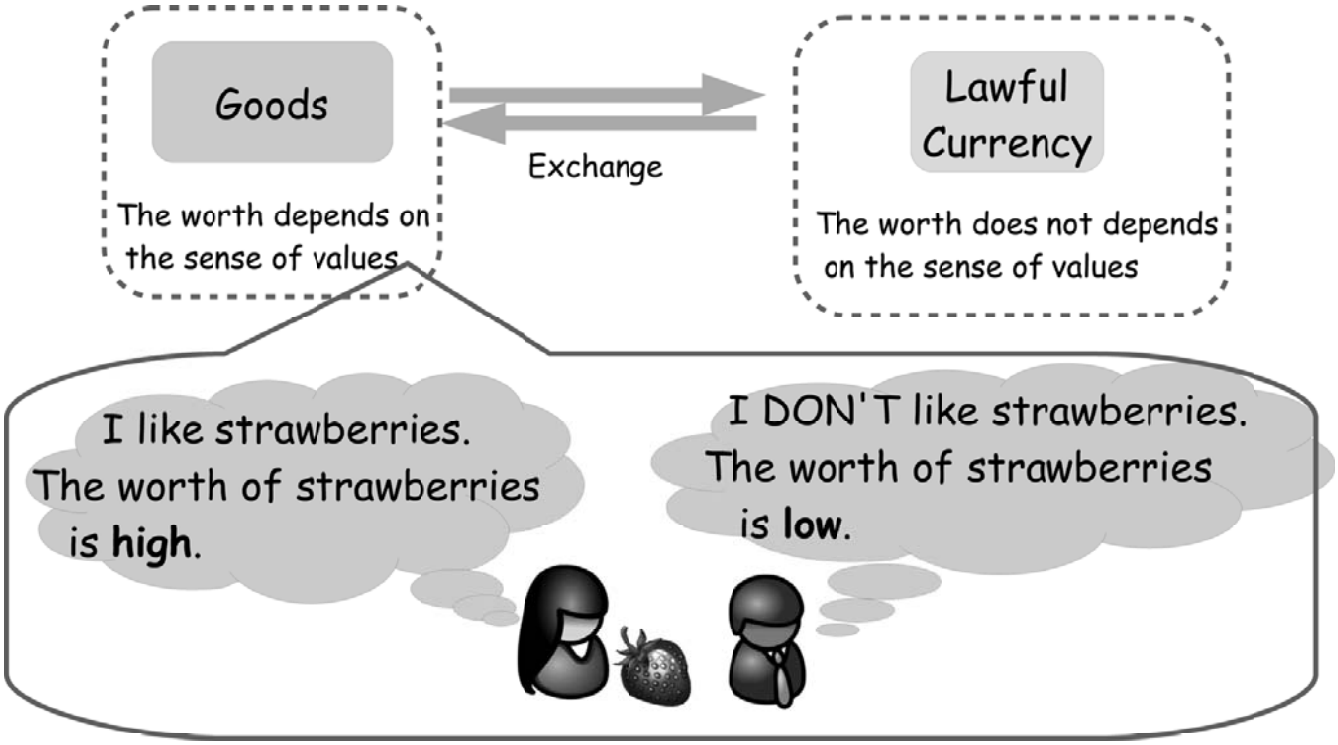
Problems of market game

- The conventional market game: lawful currency and goods are exchanged.



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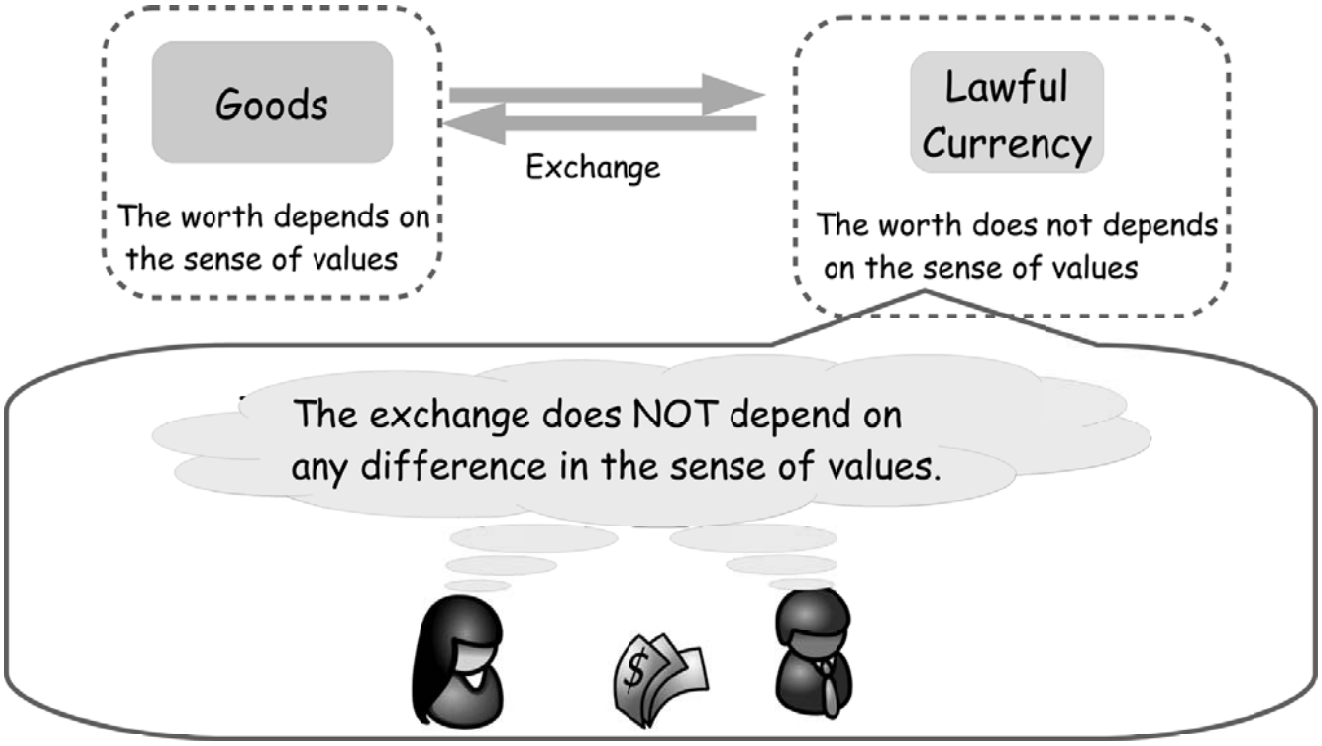

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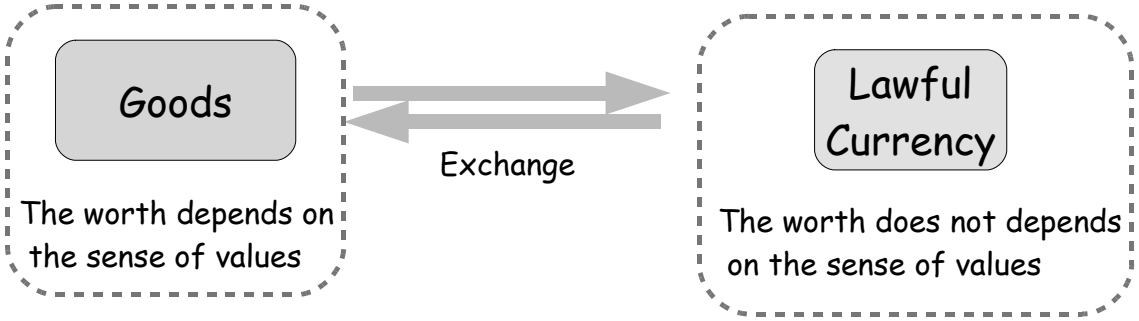

•This conventional market game model cannot be exchanged by the sense of values.

- We will extend the market game !

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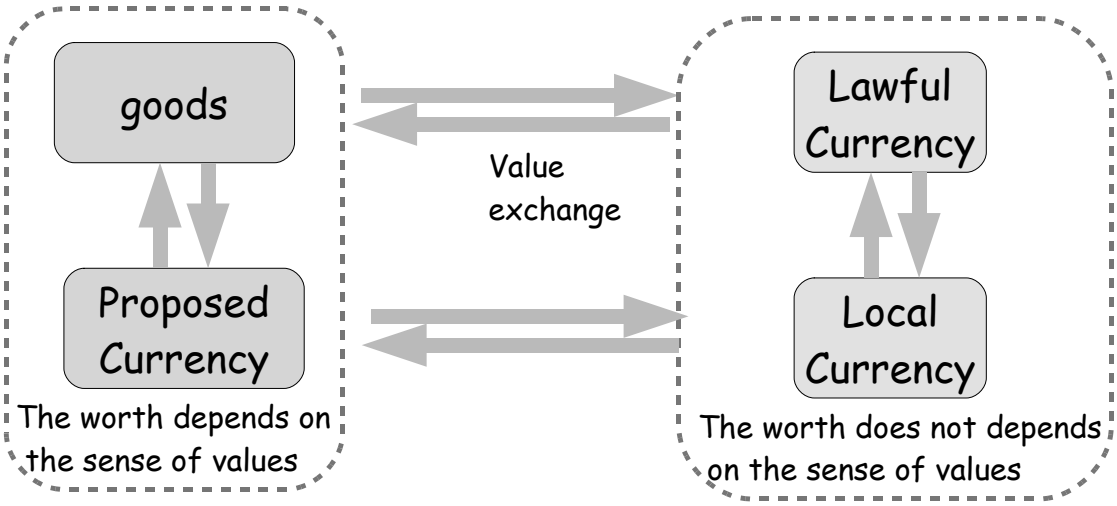
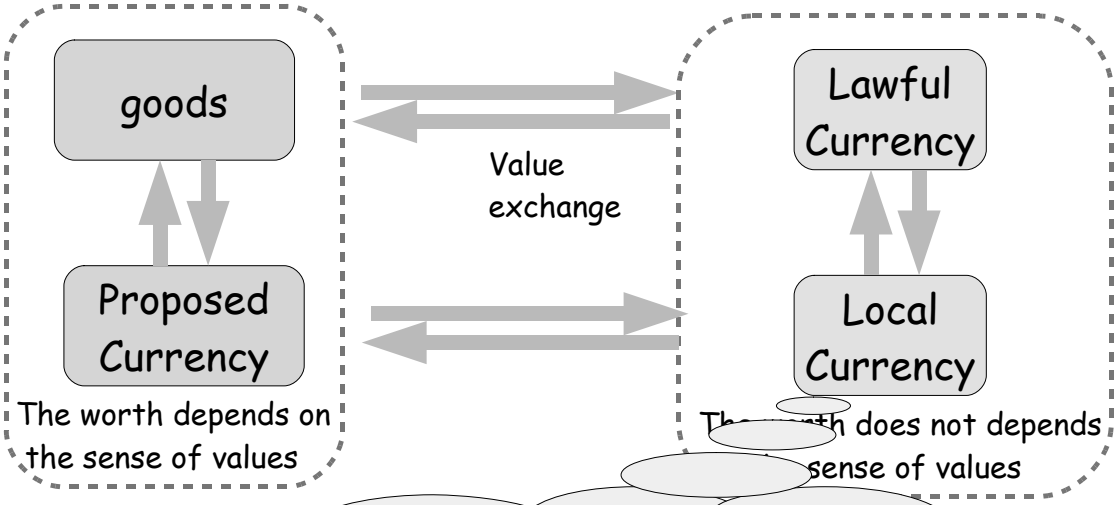
Value exchange model based on the market game

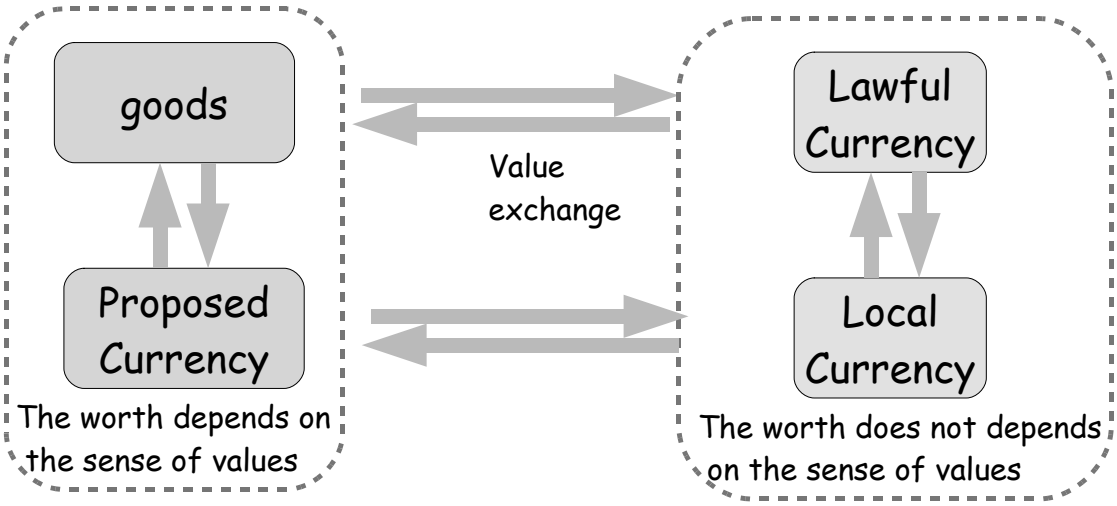


- Lawful currency and goods are exchanged in the market game.
- We add a local currency that reflects the various senses of value in a community.
- This extension increases the amount of circulation.

Value exchange model based on the market game



Value exchange model based on the market game



•We add a proposed currency that reflects the various senses of value of player.

- Such as feelings of happiness, sad or the spirit of volunteerism to help others etc.

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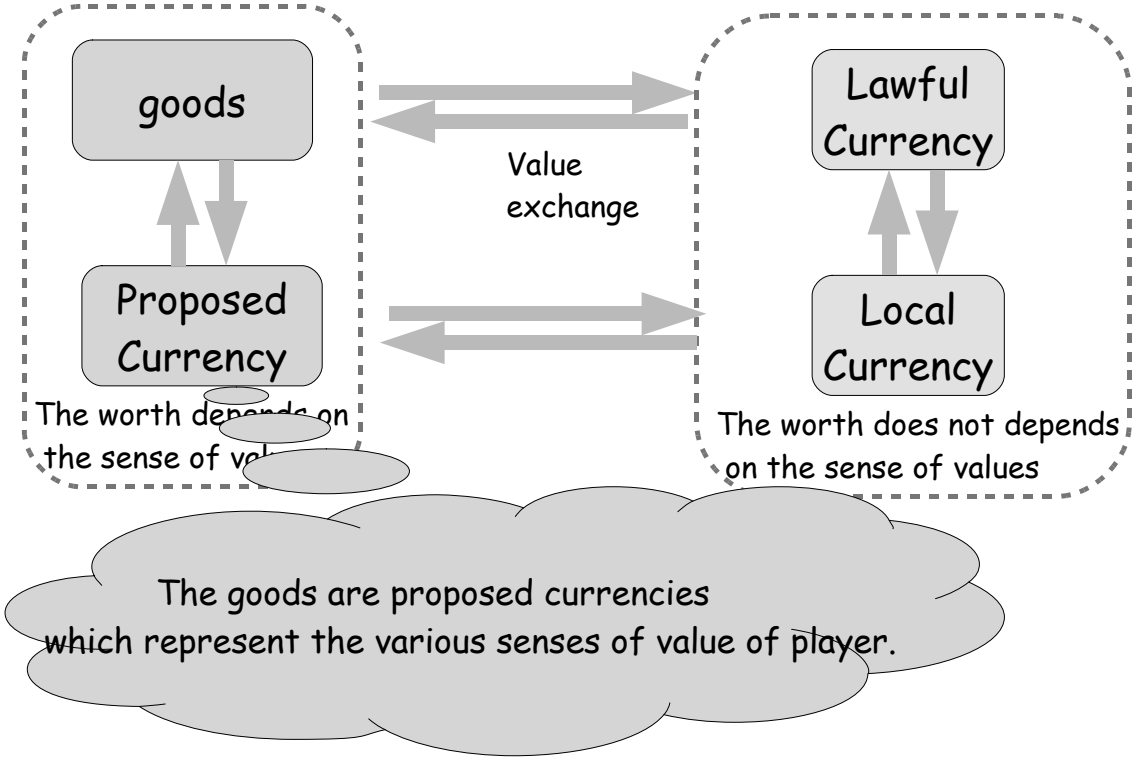
Value exchange model based on the market game



Kanagawa University Kinoshita Lab. Feb 20, 2014 (42)

Value exchange model based on the market game

- Definition of parameter of the extended market game (*N, v*)
  - $i \in N$: *Players*
  - $N = (1; \cdots ; n)$: *Set of players n* players
  - $\boldsymbol{w}_i = (w_1^i; \cdots ; w_i^{m+n})$: Initial good vector of the player i
  - $\boldsymbol{x} = (x_1^i; \ldots ; x_i^{m+n})$: *A* transferable good vector
  - $\boldsymbol{x}' = (x_i^{m+3}; \ldots x_i^{m+n})$: *A* various value vector

- We need to formulate the characteristic function v(S).

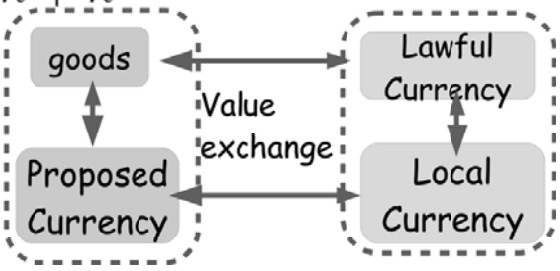
Value exchange model based on the market game

- The characteristic function of the proposed market game

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} \right.$$

$$\left. + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ \ldots \ , m+n$$



Value exchange model based on the market game

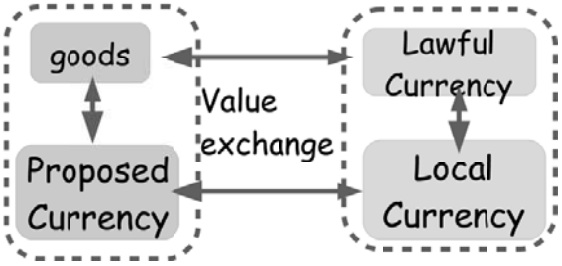
- The characteristic function of the proposed market game

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ldots, m+n$$

Local Currency of player i

Lawful Currency of player i



Value exchange model based on the market game

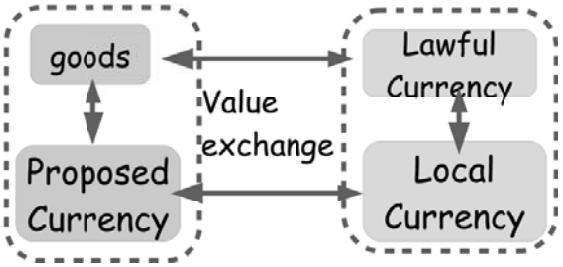
- The characteristic function of the proposed market game

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ldots, m+n$$

Utility function of player i

Proposed Currency of player i



Value exchange model based on the market game

- The characteristic function of the proposed market game

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} \right.$$

$$\left. + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ ... \ , m+n$$

The type of goods

Value exchange model based on the market game

- The characteristic function of the proposed market game

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} \right.$$

$$\left. + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ ... \ , m+n$$

A transferable goods and currencies of player i

A initial goods and currencies of player i

Value exchange model based on the market game

•Here, in regard to the lawful currency and local currency, the characteristic function with strategic equality is

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} x_i^{m+1} \right.$$

$$\left. + \sum_{i \in S} p(x_i^{m+2}) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ \dots, m+n$$

Value exchange model based on the market game

•The characteristic function :

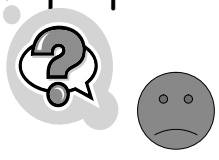
$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, ..., x_i^m) + \sum_{i \in S} q_i(x_i^{m+3}, ..., x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \ \dots, m+n$$

•The core exists in the conventional market game.

•However, its existence is unclear in the proposed model.

- Because it is not clear yet that proposed game is a balanced game.



Value exchange model based on the market game

•We assume that the worth of the currency reflecting the various values is included the utility function of player i.

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, \cdots, x_i^m, x_i^{m+3}, \cdots, x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \leq \sum_{i \in S} w_i^j, \quad j = 1, \cdots, m+n.$$

Utility function of player i
(concave and monotonic)

Value exchange model based on the market game

•We assume that the worth of the currency reflecting the various values is included the utility function of player i.

$$v(S) = \max_{(x_i)_i \in S} \left\{ \sum_{i \in S} u_i(x_i^1, \cdots, x_i^m, x_i^{m+3}, \cdots, x_i^{m+n}) \right\}$$

$$s.t. \sum_{i \in S} x_i^j \quad w_i^j, \quad j = 1, \cdots, m+n.$$

•There exists an imputation without any disapproval from the players.

•We demonstrate with market game theory that goods can be exchanged without any disapproval from users.

Conclusions

- We proposed the extended market game considering value exchange.
- We showed the existence of a core in the extended market game for the value exchange system.
  - This means that goods, lawful currency, local currency, proposed currency reflecting various senses of value can be exchanged without any members in the community becoming dissatisfied.

Conclusions

- Our model assumes that the utilities of the local currency in a community are equivalent.
  - However, even if players belong to the same community, their utilities may be different in some situations.
- Furthermore, we will expand the model in order for it to show exchanges among different communities.

CCTV Shots

路口17支監視器 違規全都錄
http://blog.xuite.net/dagon.chen/myblog/6746227

Closed-Circuit Television (CCTV)-Enabled Service
A Review of Security and Privacy Issues
Review of CCTV *Installations and Applications* –
A Comparison between UK and Taiwan

Yu-Lung Wu
Chi-Jui Chang
I-Shou Univerity

Yu-Hui Tao
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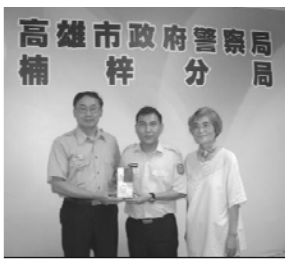
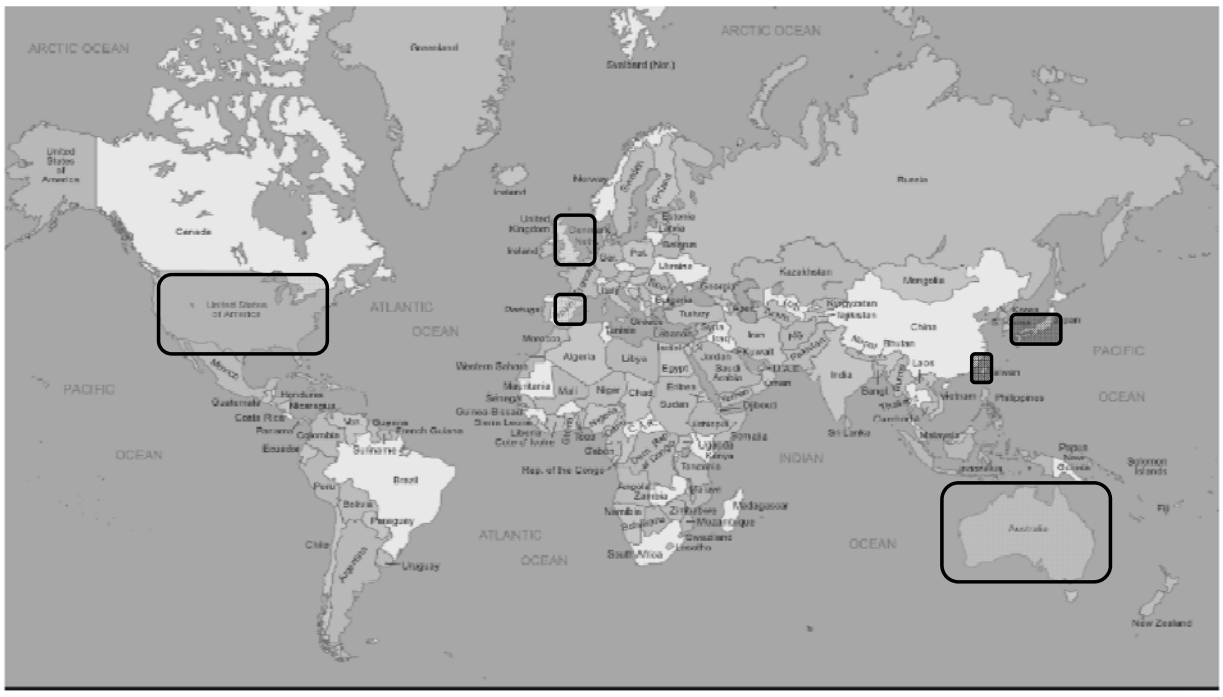
yao@nuk.edu.tw



Motivation #1

- Related CCTV research studies of available countries/regions are unevenly distributed in the literature
- Overall speaking, UK has the most research outcomes, followed by Spain and USA
  - Traffic (Conche and Tight, 2006)
  - drugs (Gill, 2006)
  - school (Hope, 2009), student privacy (Taylor, 2010)
  - legislation (Coudert, 2009)
  - criminal fear (Williams and Ahmed, 2009)
  - crime prevention (Grant and Williams, 2011)

Observations #1



Motivation #2

- One main CCTV issue is related to general public's concerns of privacy and security
  - CCTV violates privacy and freedom of speech (Giddens, 1985)
  - Specific norms and regulations by the government for installing CCTV (Wu et al., 2012)
- Most countries over emphasize the value of public security by sacrificing the privacy right under the huge trend of society interest or crime prevention
  - Spain - the law requires all CCTV installations to be reviewed by the committee to ensure compliance with the Organic Law
  - Japan - The Criminal Procedure clearly specifies the policies for CCTV usage and the purposes by which policy institutions can use CCTV

Motivation #3

- Compare with the Western countries, except Japan, most countries in Asia lack of CCTV research studies
  - Most CCTV research studies are written in Japanese (Huang, 2008)
- The research outcome written in English is difficulty to be accessed by international academic societies – 4 in Asia
  - Prashyanusorn et al. (2010) studied the E-JIKEI CCTV system in Kiryu city
  - Oram (2011) from Japan concluded that CCTV is effective, but may not meet the crime prevention purpose
  - Park et al. (2012) research the crime migration and expansion situation by installing open CCTV in Gwang Myeong City in Gyeonggi Province in Korea
  - Wu et al. (2012) studied the legislation, citizen voting right, privacy and security issues in one district in Taiwan

Research Method

- Secondary Data Analysis
- Simple framework (via 3 Tables)
- Comparative Research across Countries
  - UK – benchmark
  - Taiwan – the authors' country
  - Japan - ?
  - Thiland - ?
  - Others?

I sincerely invite some of you to be part of this join-effort cross-country comparative research

TABLE 1 - CCTV Law and Installation Procedures

Item	Regulation and Norm Level	Installation Decision	Installation Eval. & Review
UK	1. The Tort Breach of Confidence 2. Human Rights Act 3. Data Protection Act 4. Regulation of Investigatory Powers Act 2000 (House of Lords Constitution Committee, 2009)	Funding from the Home Office (Hope, 2009; Taylor, 2010).	Not available
Taiwan	1. Personal Information Protection Act 2. Police authority performing act (Law and Regulation Database of the Republic Database, 2013a & b)	Mainly decided by neighborhood magistrates or councilors (Deng, 2009).	Not available

TABLE 2 CCTV Installation Ratio and Perceptions of General Public

	Installation Ratio	Perceived Privacy Protection	Perceived Level of Demand
UK	1. One camera per 14 citizens (Morgan, 2013) 2. Londoners can expect to be filmed by around 300 cameras a day (Norris and Armstrong, 1999; Fussey, 2002)	1. The stereotype of male 'skinhead' and 'studious' female (Williams and Ahmed, 2009). 2. The efficiency of data protection legislation put into question (Coudert, 2009). 3. CCTV infringes Privacy (Taylor, 2010)	Not available
TW	1. Kaohsiung: 0.64% (population - 2,778,793) . 2. Nan-Tzu District: 0.93% (population 76, 328) (Kaohsiung City Civil Affairs Bureau Website, 2013; Kaohsiung City Government Policy Monitoring Lens Statistics Database, 2013)	Low (Source: Statistics for Kaohsiung City Government Police Nanzih Branch Document System)	Strong (Source: Statistics for Kaohsiung City Government Police Nanzih Branch Document System)

TABLE 3 CCTV Research Outcomes and Suggestions (1/2)

	CCTV Research Outcomes on Public Security	Suggestion
UK	1. Especially suited to disrupting open street drug markets (Gill et al., 2006) 2. Human factor issues that affected (CCTV) operator task performance (Keval and Sasse, 2008) 3. Crime of possessions (Williams and Ahmed, 2009) 4. Technological advances bring threats of a new kind and data protection legislation (Coudert, 2009) 5. Reassessment of privacy law and data protection legislation is undertaken with a view to updating it to provide greater coverage (Taylor, 2010) 6. CCTV records of accidents could provide an independent perspective on an accident (Conche and Tight, 2006) 7. CCTV in UK schools such devices have become part of material culture (Hope, 2009).	1. Management of privacy risks through, independent authorities and a priori control of systems (Coudert, 2009) 2. It is recommended that a reassessment of privacy law and data protection legislation is undertaken with a view to updating it to provide greater coverage for the growing myriad of ways that privacy can be encroached by surveillance practices (Taylor, 2010) 3. Instigate legal devices for controlling systems and practices and techniques that have a regulatory effect and institute compulsory risk assessments (Morgan, 2013)

TABLE 3 CCTV Research Outcomes and Suggestions (2/2)

	CCTV Research Outcomes on Public Security	Suggestion
TW	1. The most important factor that drives citizens to install CCTV is their sense of security in daily life (Wu et al., 2012) 2. CCTV has certain effectiveness in preventing crime, especially street crime, property crime and stopping crime in public spaces (Wu, 2012) 3. CCTV has the mechanism of lifting the mentality of security insurance and thus being treated as a new weapon. for proactive crime prevention (Huang, 2008) 4. CCTV is a means under the situation of no choice but have to take, and thus we should have taken other less encroaching alternative if available. Even if CCTV is needed, there should be a more comprehensive procedure and a mechanism of monitoring and management (Deng, 2009)	1. Set CCTV installation evaluation standard 2. Set specialized law and regulation on CCTV installation, management, utilization and data preservation 3. Establish an independent CCTV management organization (Wu et al. 2012)

Conclusions－UK Profile

UK is a common-law country, but according Table 1, UK has a pretty comprehensive CCTV-related law and regulation.
The decision control for installing CCTV lies in the institutional level of Home Office.
There is no pre-evaluation and review procedure before installing CCTV.

Observed from Table 2, UK has the highest installation ratio in metropolitan areas and also currently the largest CCTV market. Regarding privacy impact, scholars have wide discussions on effective control by law, privacy value and society/campus monitoring (Morgan, 2013; Taylor, 2010; Hope, 2009), and though that CCTV invade people's privacy such that the legislation needs to be re-evaluated and updated for providing higher public privacy protection. Although some general public against CCTV for its violation of people's privacy, the majority seem to agree the installation of CCTV(Norris and Armstrong, 1999).

From the research outcomes in Table 3, it is clear to see that the CCTV regulation and academic research in UK has become a benchmark for other countries.

Conclusions – Taiwan Profile

Taiwan has no specific law for CCTV, although according Table1, there are Personal Information Protection Act and Article 10 of the Policy Authority Performing Act in place. Local governments have setup additional local CCTV management regulations, but the content involves the right of general public and lacks the authorization of parent laws. The right for deciding CCTV installation is the neighborhood magistrates or councilors. The general public in Taiwan has positive attitude toward CCTV, and will proactively install CCTV to pre-warn and stop crime in important streets and locations with crime tendency by governments or community citizens.

From Table 2 we learn that the CCTV installation ration is increasingly each year, but no intensive discussion regarding whether CCTV violates the privacy right of general public.

In Taiwan, the CCTV research outcomes, as seen in Table 3, are not rich, and thus is expecting CCTV installation procedure and standard, establishing independent CCTV management institute, such that people's privacy right can be really protected by law and become more comprehensive.

Conclusions

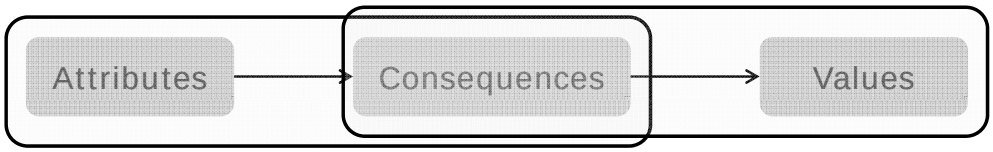
Sample Suggestions

1. Taiwan can learn from UK to pass specialized CCTV law and regulations, and install CCTV predominant controlling institute.
2. Both UK and Taiwan can learn from Spain to implement a CCTV-installation preview procedure.
3. Both UK and Taiwan can learn from Spain to establish an independent CCTV management institute to make sure the recorded images will be overused or leaking.
4. Clearly mark CCTV monitoring areas for the general public's awareness.
5. Specifically regulate the right for using and recording under necessary conditions.
6. Form an cross-country Asian CCTV forum to raise the awareness of the Asian countries' CCTV current status

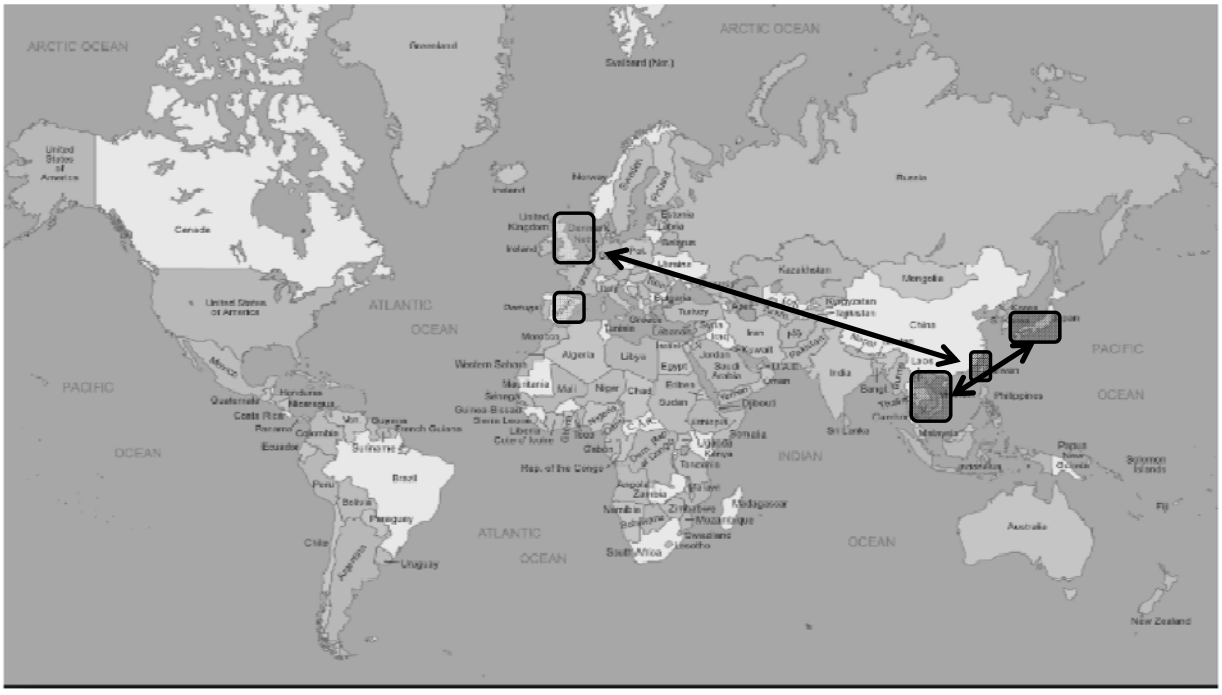
Future Reseaech (Example)

1. It is interesting to know the value of CCTV in the general public's mind under the assumption of balancing the security concern and privacy right.

2. Therefore, Means-End Chain (MEC) framework can be use to probe into the current relationship between CCTV attributes and consequences, and further link to the perceived value of the general publics.



Scope of the Near-Future Research Collaboration



The Study of Brand Perception through Social Network Sites and Corporate Social Responsibility Programs

Rungsiman Nararatwong, Nagul Cooharojananone, Nattarat Pongsupankij, Rajalida Lipikorn

Machine Intelligence and Multimedia Information Technology Lab
Department of Mathematics and Computer Science, Faculty of Science
Chulalongkorn University, Thailand

Kanokwan Atchariyachanvanich

Faculty of Information Technology
King Mongkut's Institute of Technology Ladkrabang, Thailand

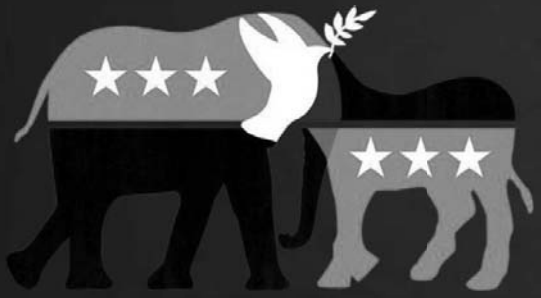
KONY 2012

1987

Joseph Kony and the Lord's Resistance Army have been abducting, killing, and displacing civilians in East and central Africa since 1987.

2003

"We first encountered these atrocities in northern Uganda in 2003 when we met a boy named Jacob who feared for his life and a woman named Jolly who had a vision for a better future."



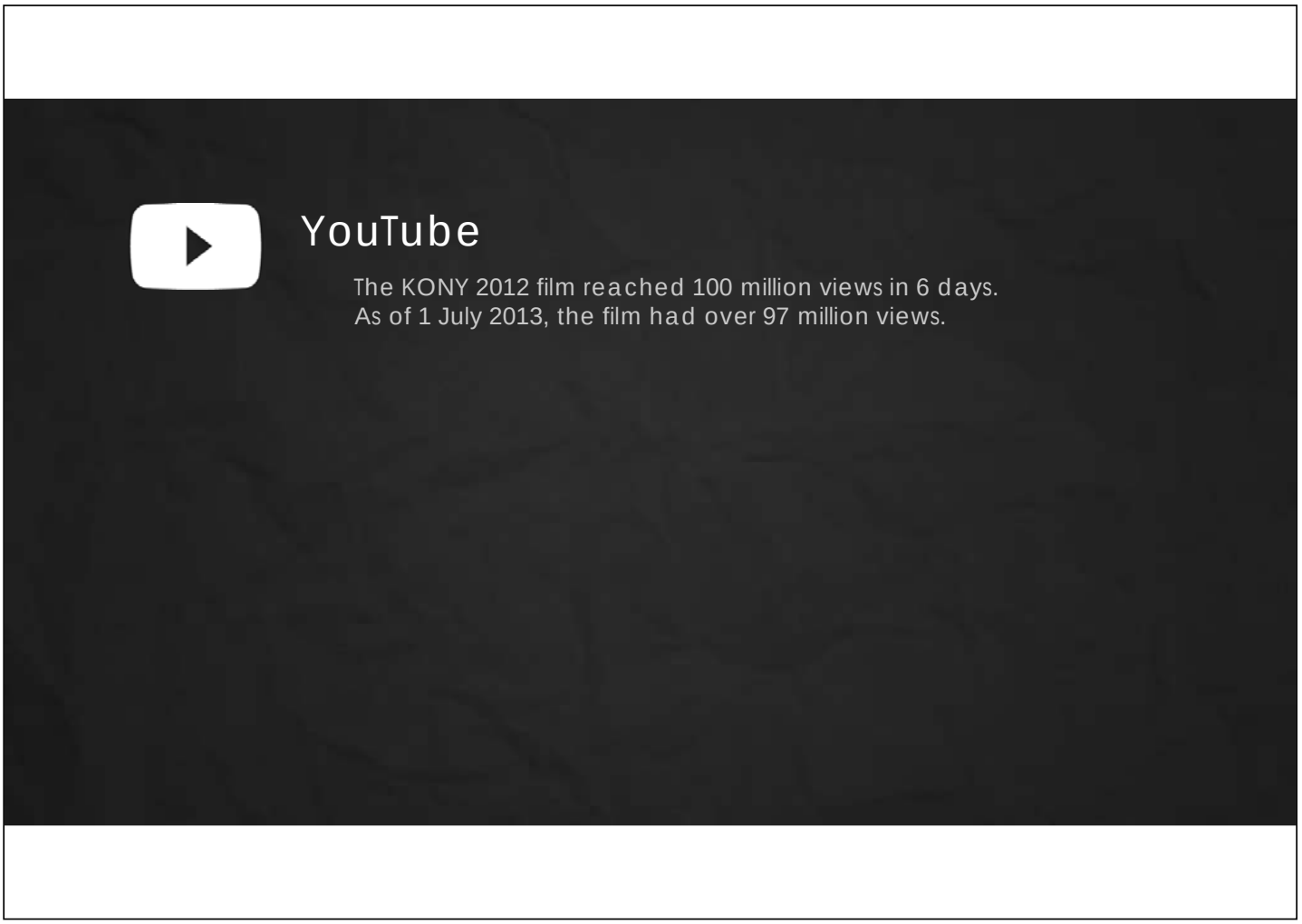
2004

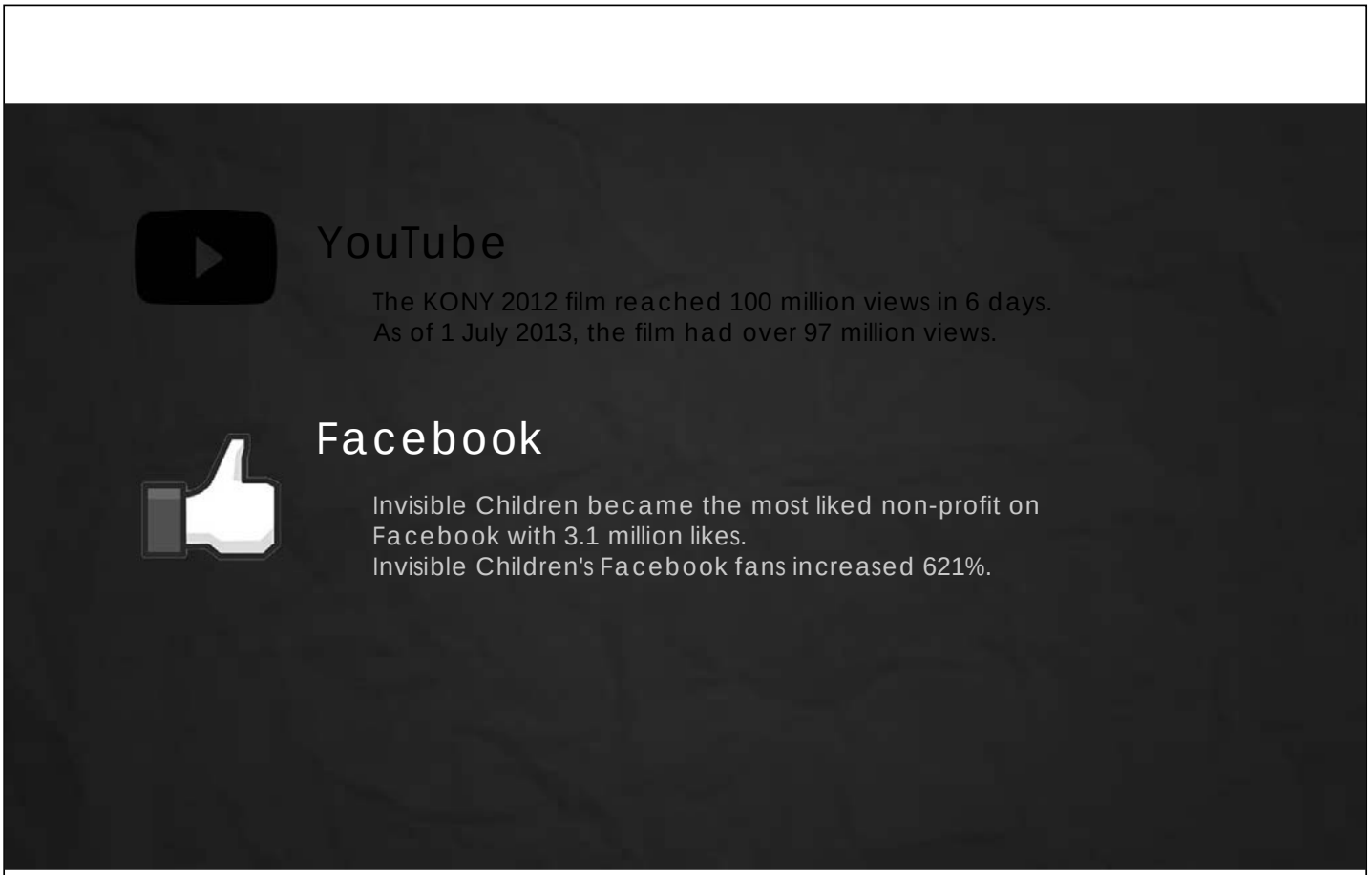
"Together, we promised Jacob that we would do whatever we could to stop Joseph Kony and the LRA."

Invisible Children was founded in 2004 to fulfill that promise.


2011
U.S. President Barack Obama announced the deployment of 100 Special Forces military advisers to provide "information, advice, and assistance to partner nation forces" of Central African countries to "remove Joseph Kony from the battlefield."


YouTube™
KONY 2012


YouTube
The KONY 2012 film reached 100 million views in 6 days.
As of 1 July 2013, the film had over 97 million views.


YouTube
The KONY 2012 film reached 100 million views in 6 days.
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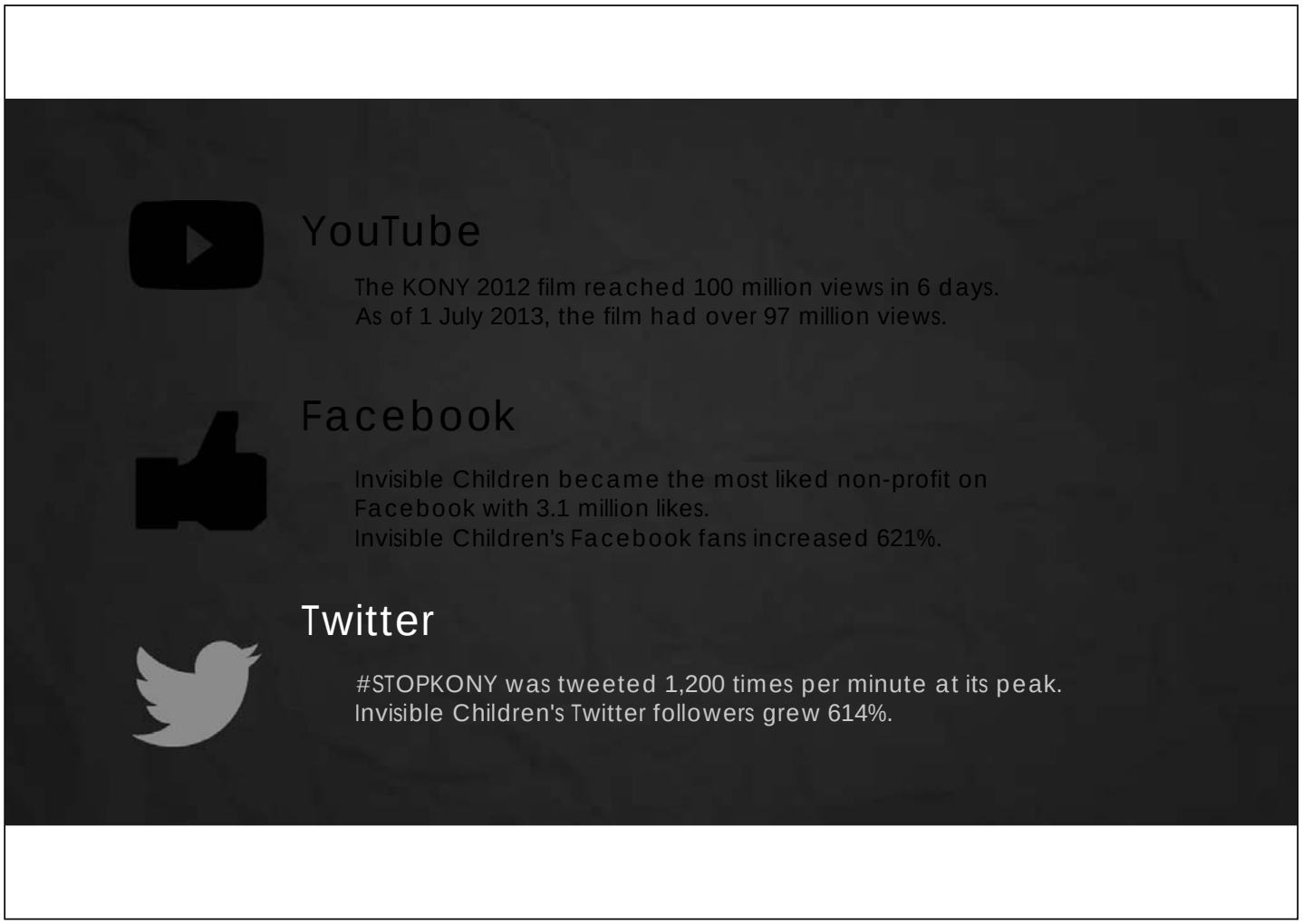
Facebook
Invisible Children became the most liked non-profit on Facebook with 3.1 million likes.
Invisible Children's Facebook fans increased 621%.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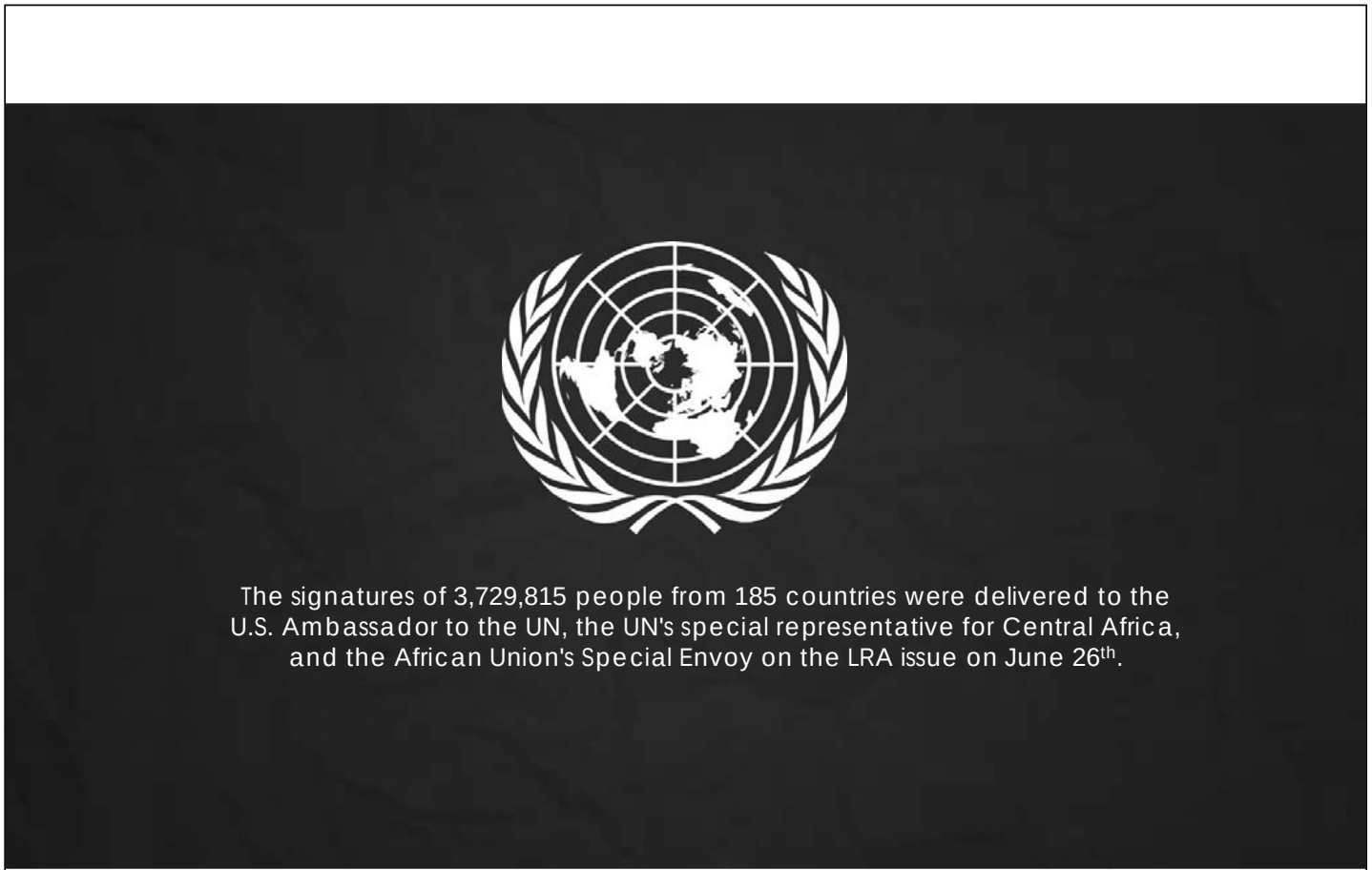
Facebook
Invisible Children became the most liked non-profit on Facebook with 3.1 million likes.
Invisible Children's Facebook fans increased 621%.
Twitter
#STOPKONY was tweeted 1,200 times per minute at its peak.
Invisible Children's Twitter followers grew 614%.


The signatures of 3,729,815 people from 185 countries were delivered to the U.S. Ambassador to the UN, the UN's special representative for Central Africa, and the African Union's Special Envoy on the LRA issue on June 26th.


Social Responsibility


Corporate Social Responsibility
CSR

A company's status and activities with respect to its perceived societal or, at least, stakeholder obligations.

Brown, T. J., and Dacin, P. A.

84% of Americans say they would be likely to switch brands to one associated with a good cause, if price and quality are similar.

Cone Communications, 2002

69% of consumers say they are more likely to buy from a company that talks publicly about its CSR results, versus one that only talks about its CSR mission or purpose.

Cone Communications, 2012

Corporate Social Marketing

CSM

Encompass marketing initiatives that have at least one non-economic objective related to social welfare and use the resources of the company and/or one of its partners.

Drumwright, M. E., and Murphy, P. E.

Six ways CSM programs can build brand equity: building brand awareness, enhancing brand image, establishing brand credibility, evoking brand feelings, creating a sense of brand community and eliciting brand engagement.

Hoeffler, S., and Keller, K.L.

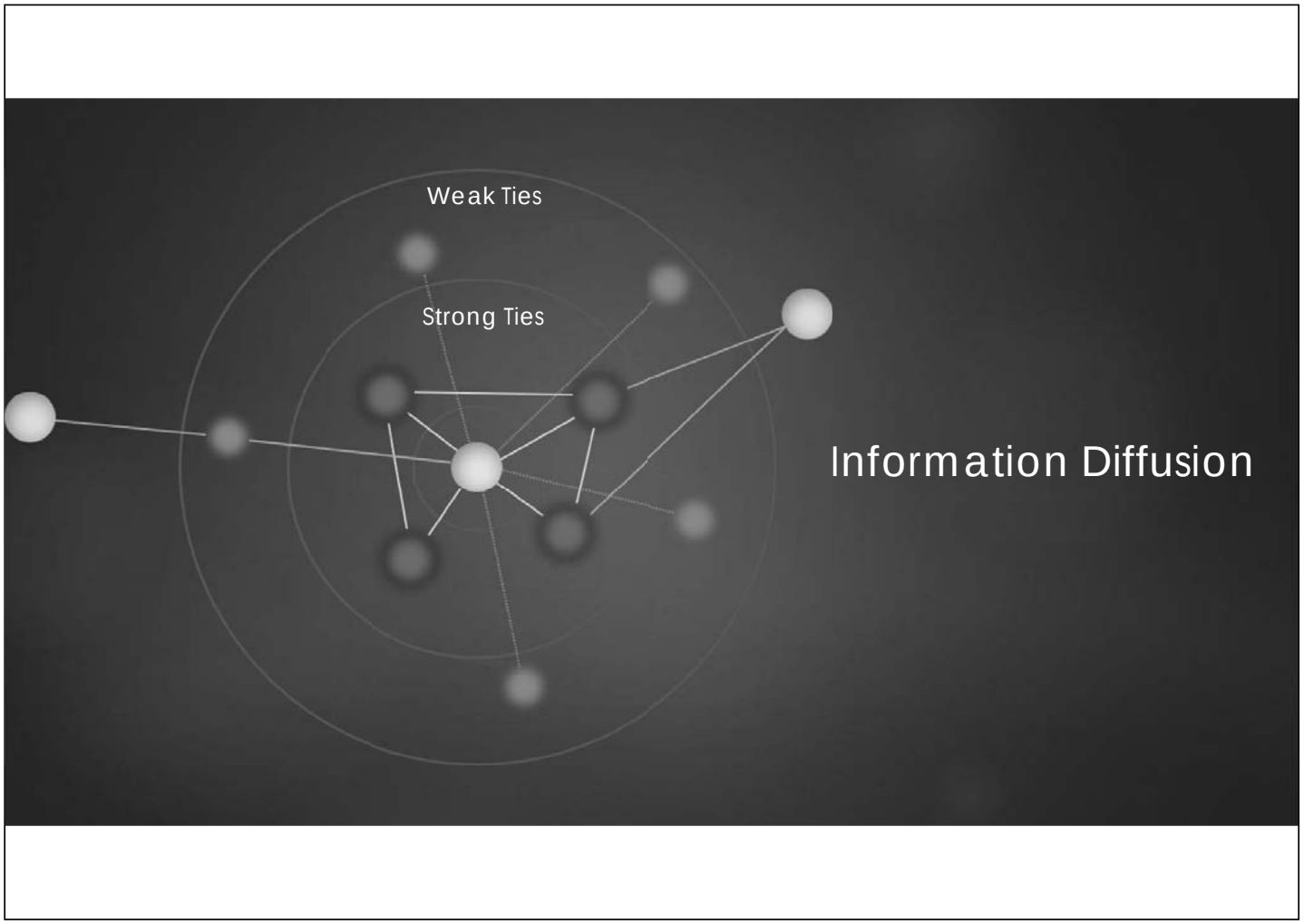

Social Network Sites
SNSs


Information Diffusion


Weak Ties
Strong Ties
Information Diffusion


Weak Ties
Strong Ties
Information Diffusion


Weak Ties
Strong Ties
Information Diffusion


Weak Ties
Strong Ties
Information Diffusion

Although strong ties are more influential, propagations of novel information are more likely to occur through weak ties.

Bakshy, E., Rosenn, I., Marlow, C., and Adamic, L.

facebook


Walmart
Home
Rungsiman
Create Page
Yummy! Yummy!
Walmart
Walmart
31,080,387 likes · 820,667 talking about this · 3,326,895 were here
Like
Retail and Consumer Merchandise
"If we work together, we'll lower the cost of living for everyone...we'll give the world an opportunity to see what it's like to save and have a better life." - Sam Walton
About – Suggest an Edit
Photos
My Local Walmart
31m
Likes
What's On Your Mind?
Feedback
Highlights
Post
Photo / Video
Write something...
Walmart
Friday
18 Friends
Like Walmart
+9
Invite Your Friends to Like this Page
See All
Invite friends.
Invite
Now
2013
2012
2011
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1980s
1970s
1964
Founded


Walmart
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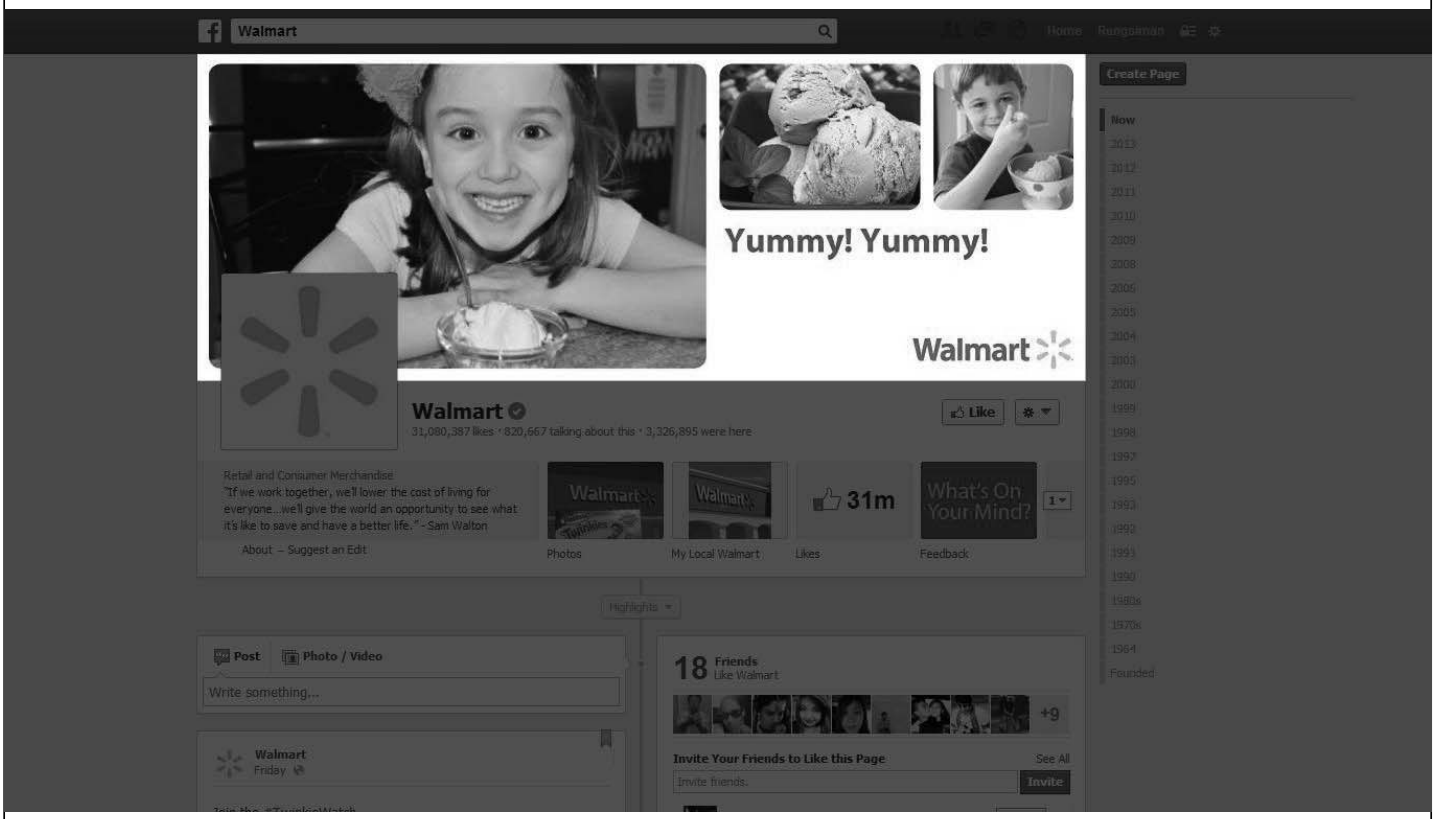
Walmart
Friday
18 Friends
Like Walmart
+9
Invite Your Friends to Like this Page
See All
Invite friends.
Invite
Now
Founded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About – Suggest an Edit
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31m
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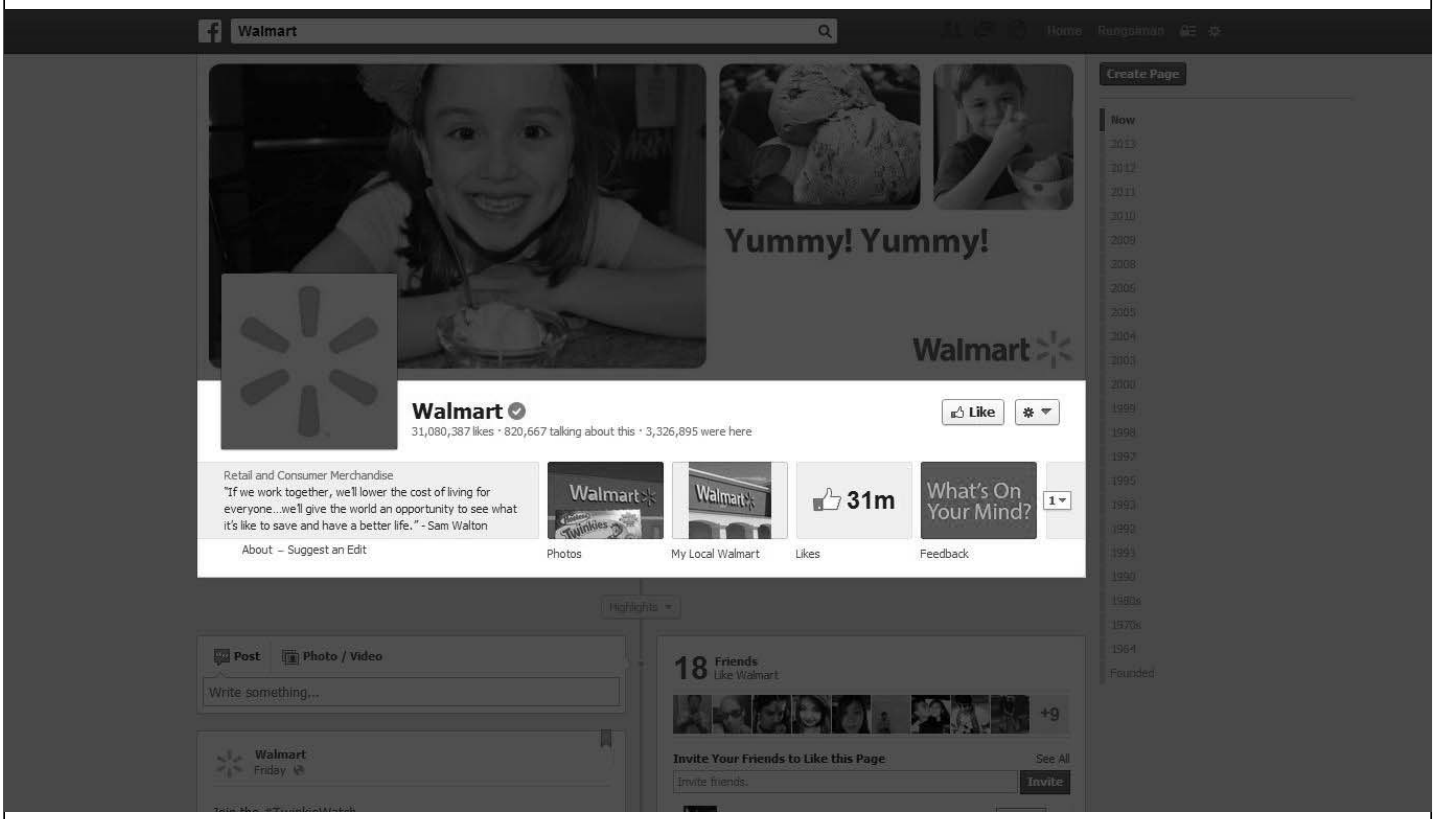
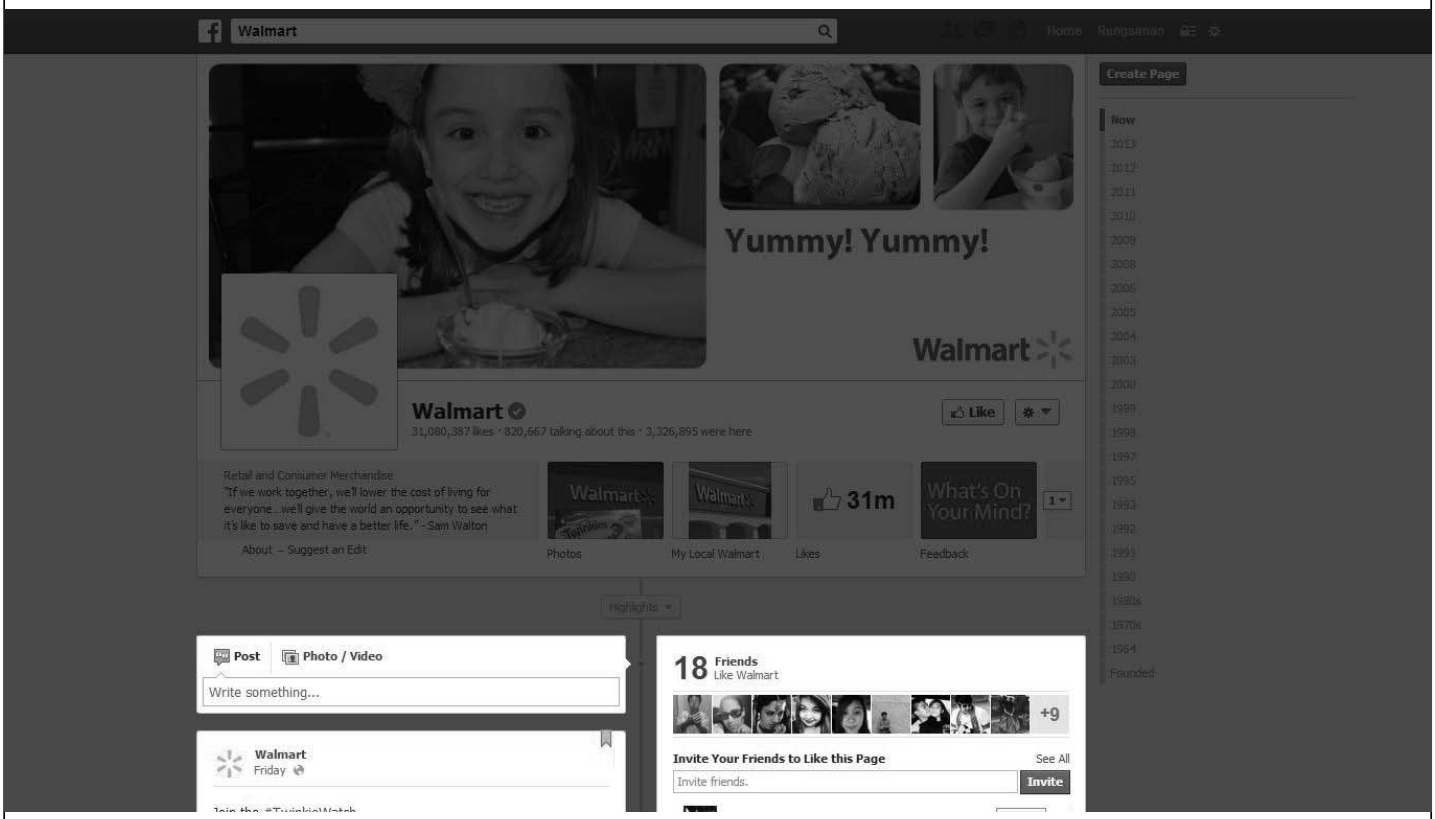
What's On Your Mind?
Feedback
Post
Photo / Video
Write something...
18 Friends Like Walmart
+9
Invite Your Friends to Like this Page
See All
Invite friends.
Invite
Walmart
Friday


Walmart
Yummy! Yummy!
Walmart
Like
31,080,387 likes · 820,667 talking about this · 3,326,895 were here
Retail and Consumer Merchandise
"If we work together, we'll lower the cost of living for everyone...we'll give the world an opportunity to see what it's like to save and have a better life." - Sam Walton
About – Suggest an Edit
Photos
My Local Walmart
31m
Likes
What's On Your Mind?
Feedback
Post
Photo / Video
Write something...
18 Friends Like Walmart
+9
Invite Your Friends to Like this Page
See All
Invite friends.
Invite
Walmart
Friday


Walmart
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Walmart
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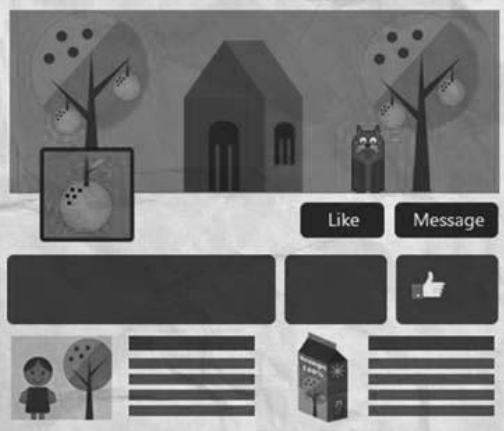
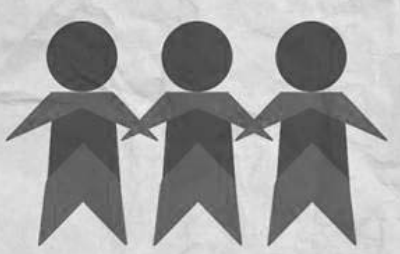
Feedback
Post
Photo / Video
Write something...
Walmart
Friday
18 Friends
Like Walmart
+9
Invite Your Friends to Like this Page
See All
Invite friends.
Invite
Create Page

Hypotheses

H1: Social influence leads users to brand's page which its contents will raise brand awareness among users.



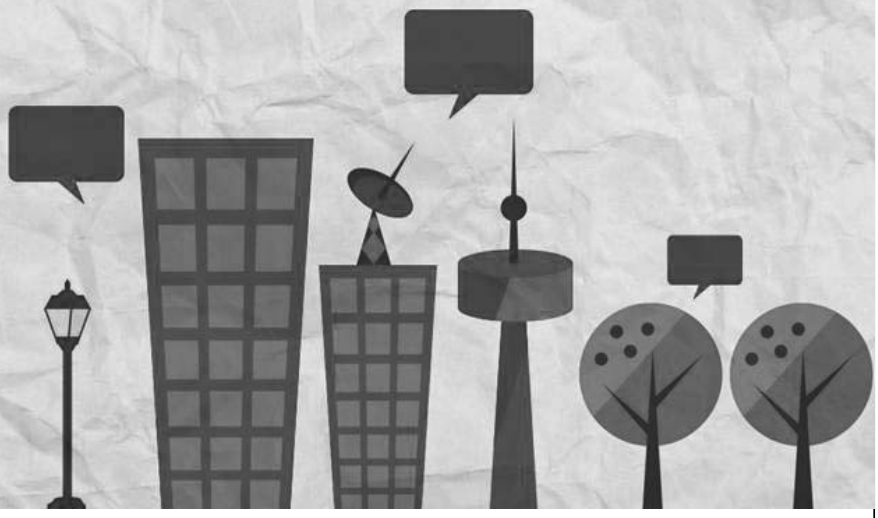
H2: Social influence has an effect on users' intention to engage the CSR programs.

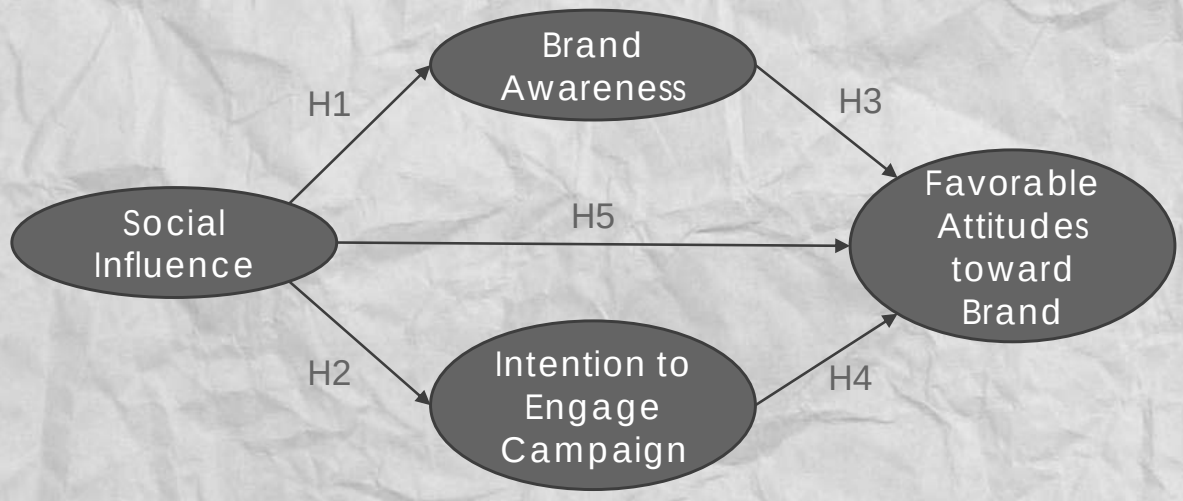


H3: Users who aware of the brand are tend to have favorable attitude towards brand.

H4: Users who engaged the CSR programs are tend to have favorable attitude towards brand.

H5: Social influence has an effect on users' favorable attitude towards brand.





Data Collection

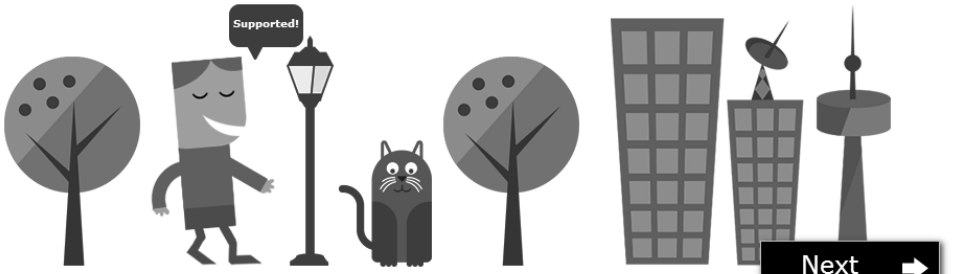
URGE SOCIAL NETWORKS
Everyone can help solve the world's problems

Share with your friends

129 people participated

IT'S TIME TO RISE AWARENESS AND WE NEED YOUR VOICE

Businesses have high potential for donating and their brand's images are very important.
We need to show them that people on social networks are willing to support their campaign



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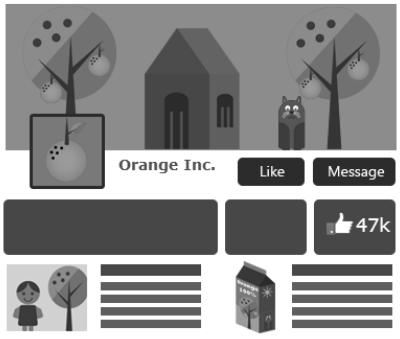
Share with your friends

129 people participated

MISSION 3 OF 6: BRAND AWARENESS

Will you find out more information about the page?



QUESTION 1 OF 5

When you are interested in the campaign,
will you go to the page?

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Department of Mathematics and Computer Science, Faculty of Science
Chulalongkorn University, Thailand.

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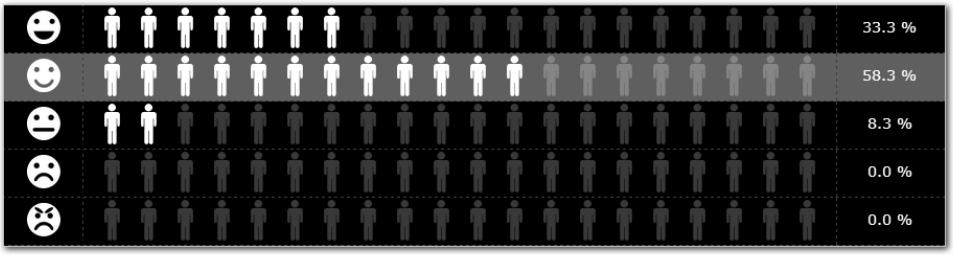
Share with your friends

129 people participated

STATISTIC: SOCIAL INFLUENCE

How do people think: Will friend's activities related to the campaign on Social Network Sites raise public interest?



Mission 1 of 6: Social Influence

Your average score is 4 which is Yes

Next

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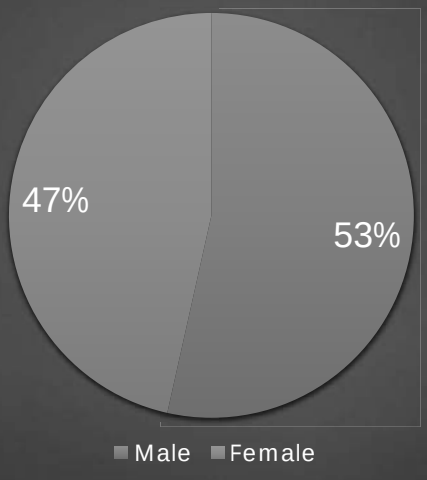
Gender



Age

Location

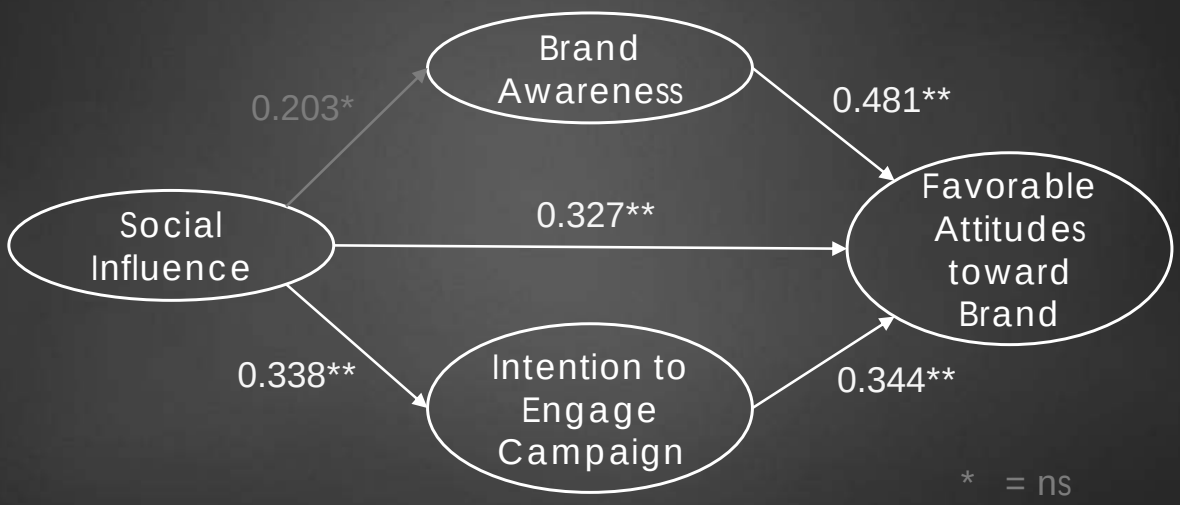
Data Analysis

Cronbach' reliability test was performed on the data and the results indicated a high level of internal consistency.

Factor analysis was performed using principal components extractions method and varimax rotation.

Four factors were extracted and rotated (Social Influence, Engage Campaign, Brand Awareness and Favorable Attitudes toward Brand).

Regression Analysis



Discussion

Social influence has no significant effect on brand awareness.

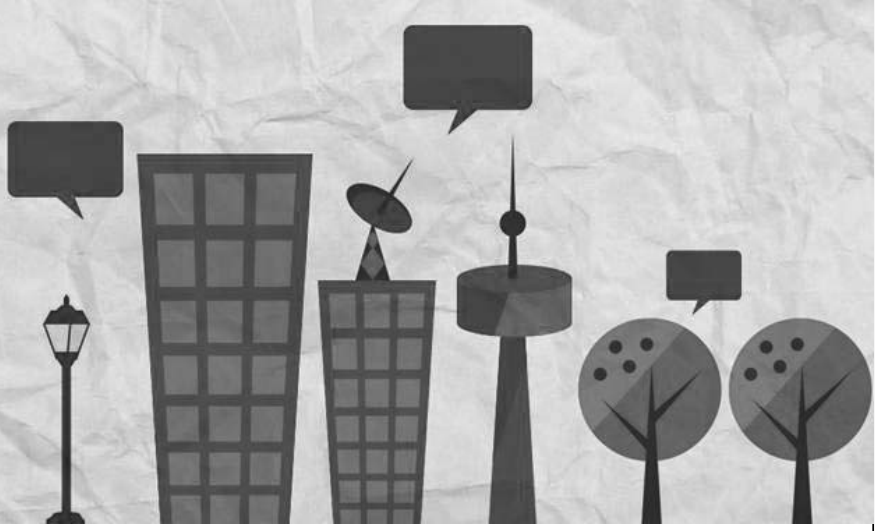
HYPOTHESIS 1

Social influence has a significant effect on users' intention to engage campaign.

HYPOTHESIS 2

A successful story will reach more audiences and increase opportunity to gain more engagement and finally result in users' favorable attitudes toward brand.

HYPOTHESIS 5



Engagement to the campaign help improve users' favorable attitudes toward brand.

HYPOTHESIS 4

Users who aware of the brand are tend to have favorable attitude towards brand.

HYPOTHESIS 3

We found that SNSs are the effective way to help promote CSR program

Rungsiman et al.

Credits

Pictures in KONY 2012 story were designed and published by Invisible Children, Inc.
http://www.invisiblechildren.com/

Barack Obama picture in slide 7 was edited from the original image designed by Frank Shepard Fairey.
Available online:
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http://www.istockphoto.com/stock-photo-11456652-full-shopping-trolley.php

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The Study of Brand Perception through Social Network Sites and Corporate Social Responsibility Programs

RUNGSIMAN ET AL.


ありがとうございます。

國立高雄第一科技大學
National Kaohsiung First University of Science and Technology

The service design of intelligent robot (iRobot) for entertainment

Presenter: Dr. SAM Tung-Hsiang Chou

sam@nkfust.edu.tw

2013/07/22

Agenda

1. Introduction
2. Literature Review
3. iRobot Multi-Agent System (MAS) Model
4. Developing Approach
5. Conclusions

1. **Introduction**
2. **Literature Review**
3. **iRobot Multi-Agent System (MAS) Model**
4. **Developing Approach**
5. **Conclusions**

1. Introduction

- Demonstration
  - ➢Service Design
  - ➢Multi-agent systems(MAS)
  - ➢Intelligent Robot(iRobot)
- This research uses game to experience service design, MAS, and iRobot

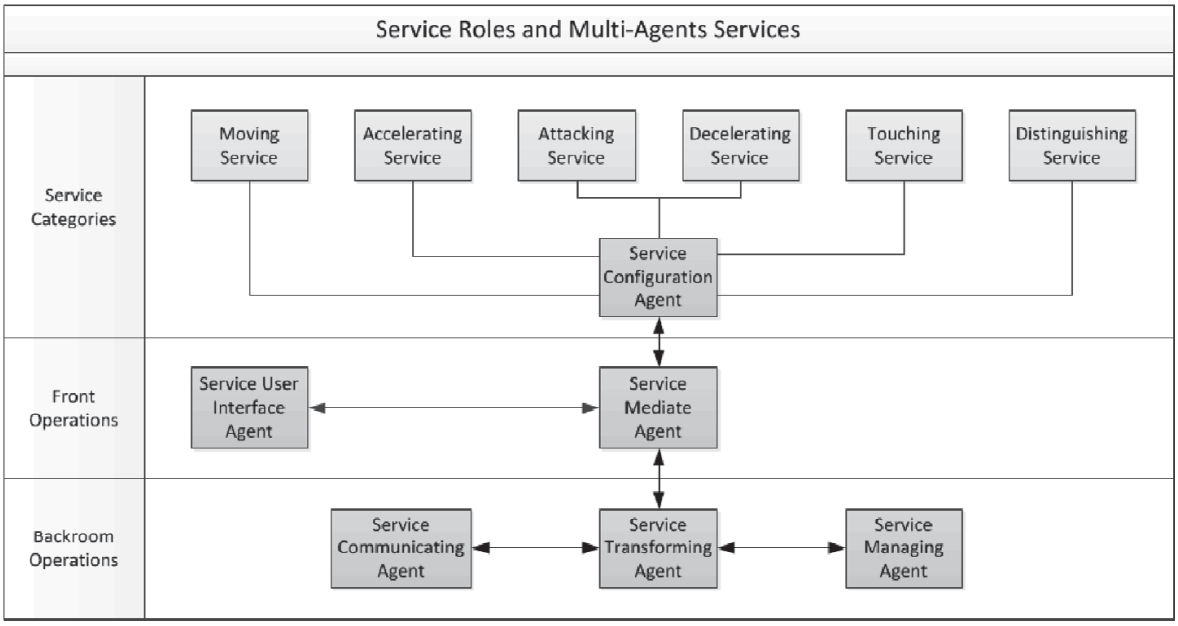
1. **Introduction**
2. **Literature Review**
3. **iRobot Multi-Agent System (MAS) Model**
4. **Developing Approach**
5. **Conclusions**

2. Literature Review

- Service Science
  - Service Science is an interdisciplinary method that integrates management and engineering theories.
- Multi-Agent Systems (MAS)
  - Artificial intelligence techniques provide an agent with autonomous, intelligent, and mobile abilities.
- Networked Robotics Technologies

1. Introduction
2. Literature Review
3. iRobot Multi-Agent System (MAS) Model
4. Developing Approach
5. Conclusions

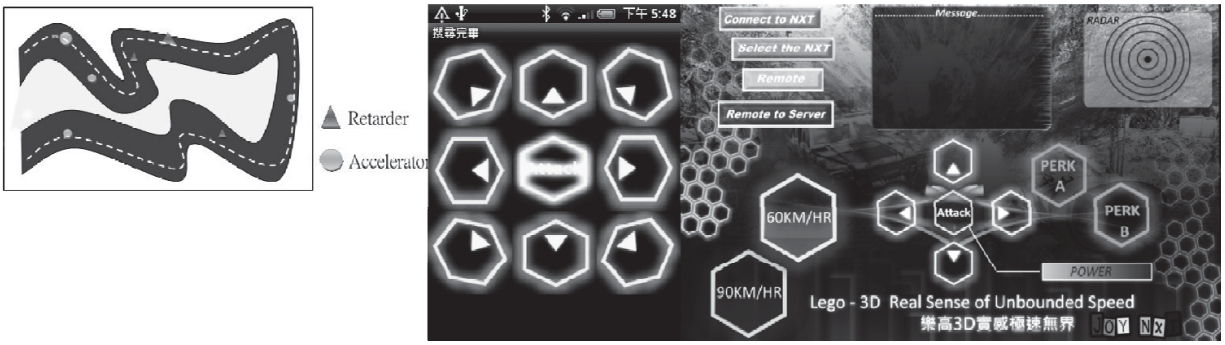
3. MAS Model



1. Introduction
2. Literature Review
3. iRobot Multi-Agent System (MAS) Model
4. Developing Approach
5. Conclusions

4. Developing Approach

- iRobot environment
- iRobot specifications
- The controlling application



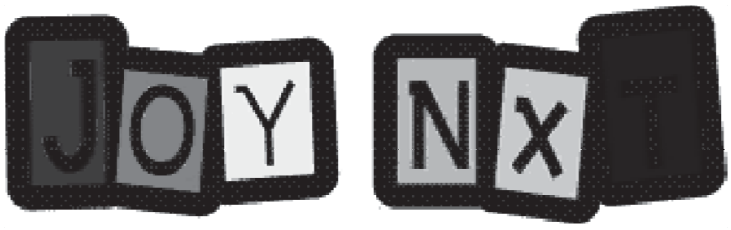
1. Introduction
2. Literature Review
3. iRobot Multi-Agent System (MAS) Model
4. Developing Approach
5. Conclusions

5. Conclusions

- This research uses several wireless and network techniques to communicate with iRobot
- This research applies these techniques to control iRobot through the smart phone or remote computer.
- In the future, this research will apply these techniques on medical care aspect.

Q&A

Thank you all for your time and participation!



IT-Enabled Services
- Scope for the future -

Professor Shiro Uesugi, PhD, MPA
Matsuyama University
Matsuyama City, Ehime, Japan

Presented at 5th WS-ITeS, COMPSAC2013 2013, July 22, 2013@ Kyoto Tersa

Agenda

- Little about WS-ITeS
- Something about 土用の丑(*Doyo No Ushi*)
- A Scope for the future of ITeS

Paths of WS-ITeS

- WS-ITeS has been a part of SAINT since 2009.
- First time as a part of COMPSAC => Very much honored.
- WS-ITeS has been trying to bridge Computer Science and Humanity/Social Science.
- Published a book of *IT Enabled Services* from Springer this year as a “Merkmal”

The Book of IT Enabled Services

Table of Contents

Approaches of the past studies

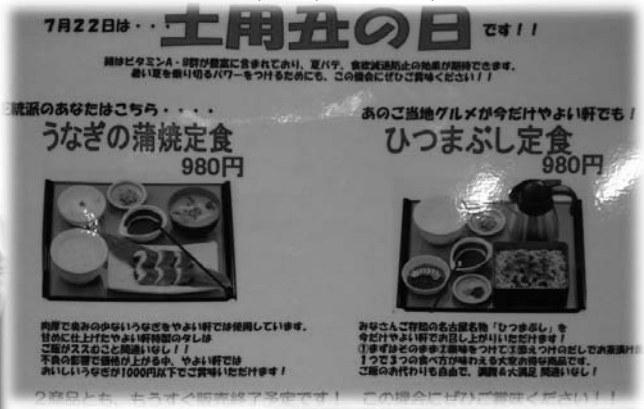
- Applications of IT
- Services which are Enabled by IT
  - Directions (= Topics)
    - Business, Government, Community, Research

Topics covered to days

- Business (CASES)
  - e-Banking, e-Commerce, e-Medication, e-Money, e-Education, e-Office, e-Productions
- Government(CASES)
  - e-Medication, e-Government, e-Education
- Community(CASES)
  - e-Money, SNS
- Research(ANALYSIS)
  - Privacy Protection, Diffusion Theory, Simulation, Legal framework

Before going to the Future of ITeS, let's have a look at Today

- Today is "土用の丑"(Doyou No Ushi)
- "土用" = the period of about 18 days before the first day of autumn on the Luna calendar
- "丑" = a day of "cattle" during "土用"
- You are supposed to eat "鰻のかばやき"(= Unagi No Kabayaki), a traditional cuisine of grilled eel today!



Why? Origin of this “Obligation”

A Myth of 平賀源内(Hiraga Gennai) :

- Late 18th Century, Hiraga Gennai advised an owner of the eel restaurant to post a flag that read “本日丑の日”(Today is the day of Cattle).
- Then, the sales of grilled eel boosted.

There is even a Musical of Hiraga Gennnai

(Now tickets are available)

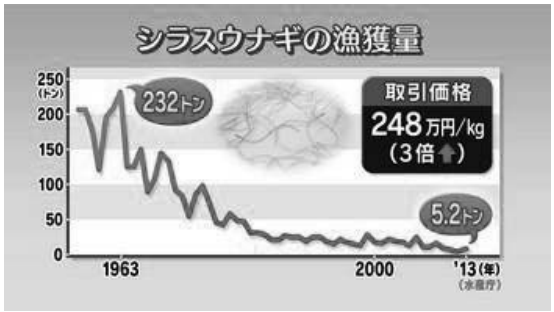
Consequences

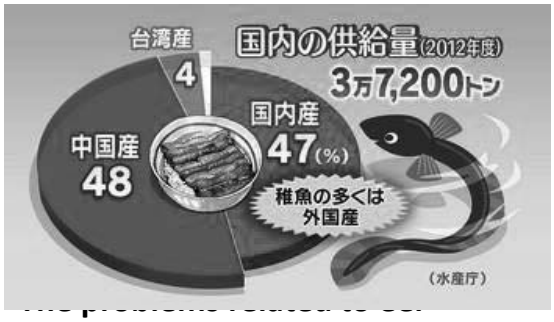
- Eating grilled eel became a Tradition.

- People are Obliged to eat.

- Too much consumptions because of profit.

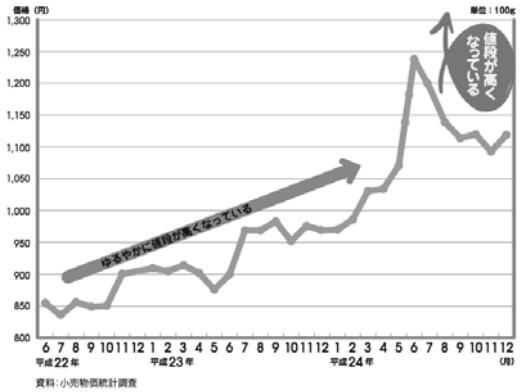
Consequences





- Warning of extinction = Too much juvenile are caught!!

- Price soars.



(Source: http://www.nhk.or.jp/kaisetsu-blog/700/161055.html)

http://www.stat.go.jp/info/guide/asu/2013/pdf/26.pdf

Consequences

- Technological Solution
  - Develop a perfectly man-controlled production cycle = No rely on the numbers of juvenile.
- Regulatory Solution
  - IUCN (the International Union for Conservation of Nature) Red-listed.
- Philosophical Solution
  - “Let’s stop eating eel !!”

Lessons learned

- The economic/market mechanism of Demand-Supply works well.
- Always there are technological solutions.
- Philosophical solutions do not (or, may not) work.

Scope for the future
IT Enabled Services #1

Application to:

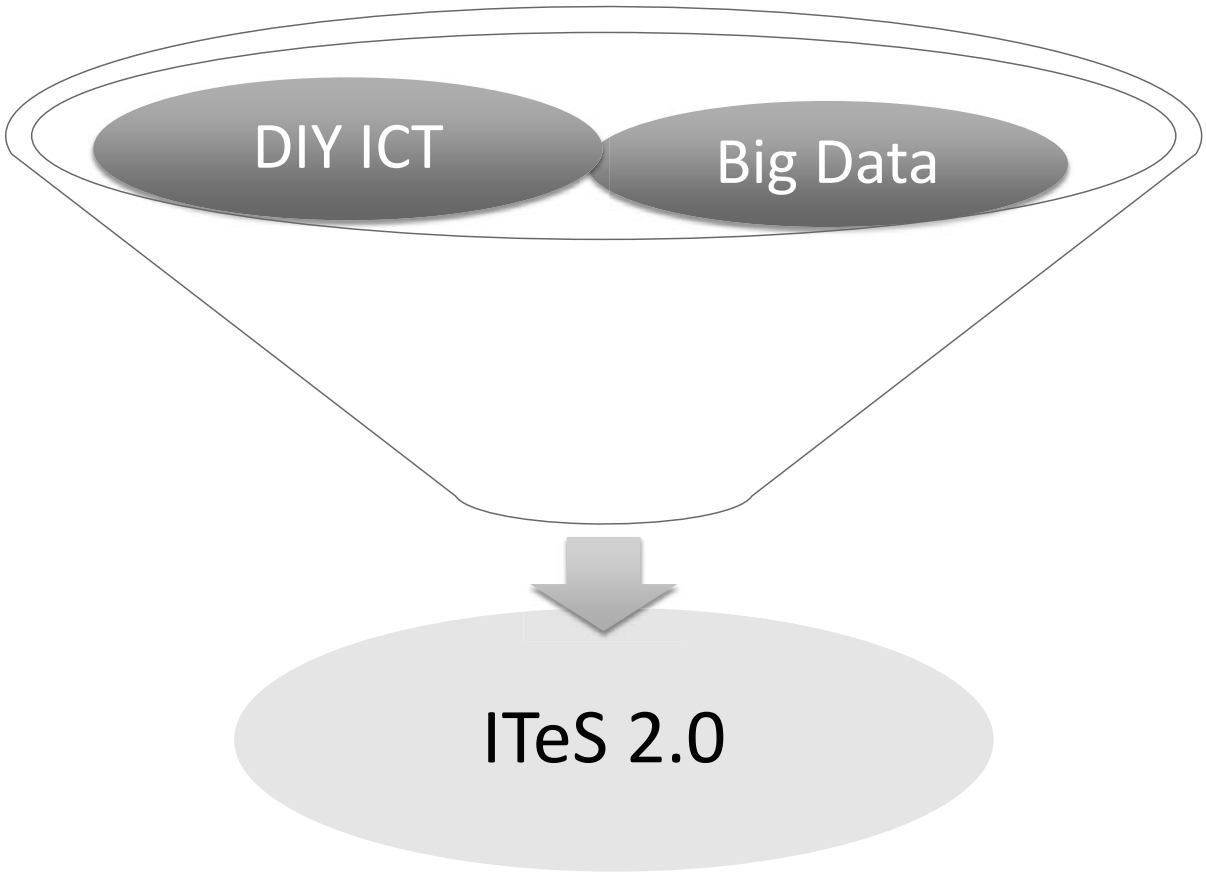
- Agriculture, Bio, Medical, Big Data

Creative:

- Any kinds of Services can become object

Approach:

- Problem solving vs Creative

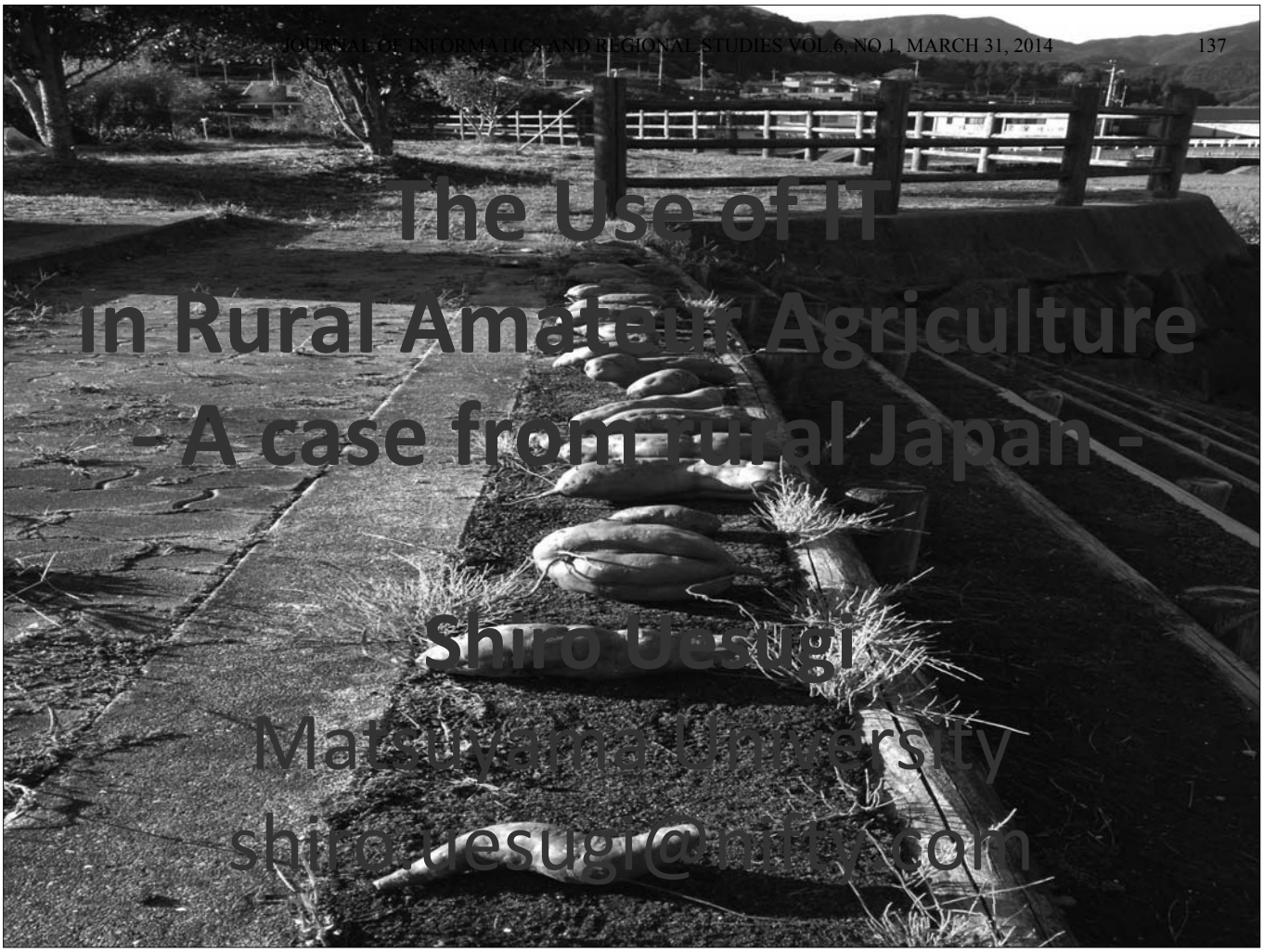


FROM THE CONFERENCE

【JPAIS/JASMIN2013】

SHIRO UESUGI

THE USE OF IT IN RURAL AMATEUR AGRICULTURE



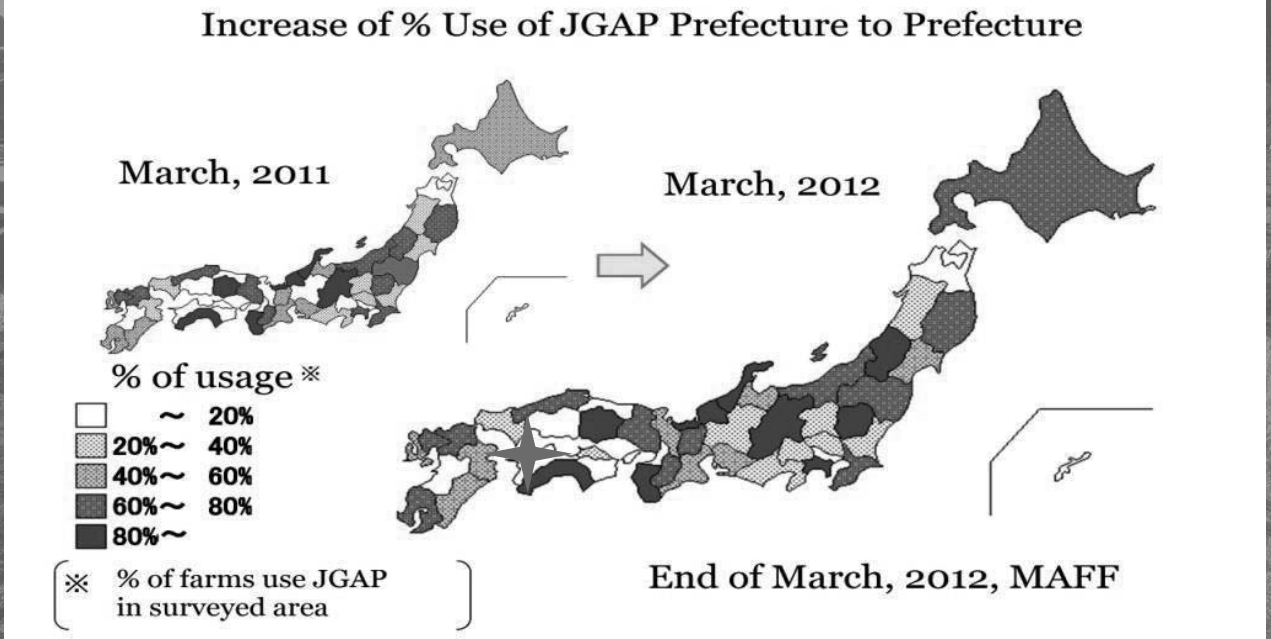
The Use of IT in Rural Amateur Agriculture - A case from Rural Japan -

Shiro Uesugi
Matsuyama University
shiro.uesugi@nifty.com

Agenda

- Background
- Research Questions
- Cases
- Models
- Discussions
- Conclusions

Background



Background

- Our Research of ITeS
  - "E": "Enabled"
    - E-Business, E-Education, E-Government, E-Medical Apps, E-Privacy, E-Community Building, E-Financing
  - Lacks "Agriculture," "Online Game"

Background

- Why Agriculture?
  - –Global Trades & Open Up Japanese Market c.f. TPP
  - –Aging Community in Rural Area c.f. Major Industry is Agriculture
  - –Potential to GROW

Scope of Study

- Provide some ideas about Japan's rural SMEs = Agriculture
- Look into ITeS aspects related to Amateur Agriculture
- NOT finished testing the model,

Research Questions

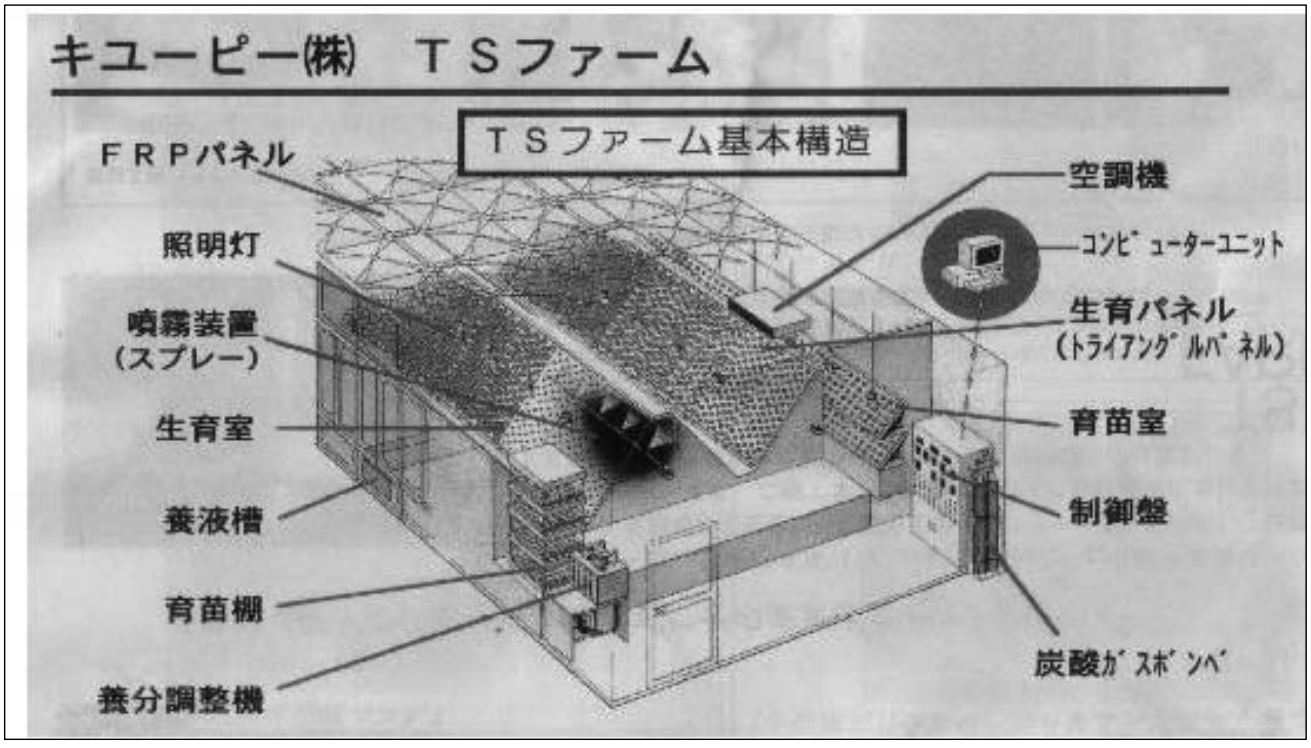
- What role IT can play in rural agriculture?
  Subject to:
  - Small to medium size, i.e. earn JPY 3 mil. p.a. (=20,000 euro)
  - Run by elderlies, women, weekend farmers
- Can ITeS in rural agriculture contribute to the betterment of rural lives in Japan? = Increase Income

Cases

- Case 1
  TS Farm by Kewpie Inc.
- Case 2
  Telefarm
- Case 3
  Kleingarten

Case 1 TS Farm by Kewpie Inc.

Case 1 TS Farm by Kewpie Inc.



Case 2 Telefarm

Organic Vegetable Production by Telefarm

Case 2 Telefarm

Connects Real with Virtual

Play Game and Grow Vegetables

Case 2 Telefarm

7 Specs of Telefarm

1. Organic
2. JPY500 min.
3. Traceability
4. Learn agriculture through simulation
5. Sell vegetable you grow
6. Fit for restaurants
7. Contribute to region through Community Supported Agriculture

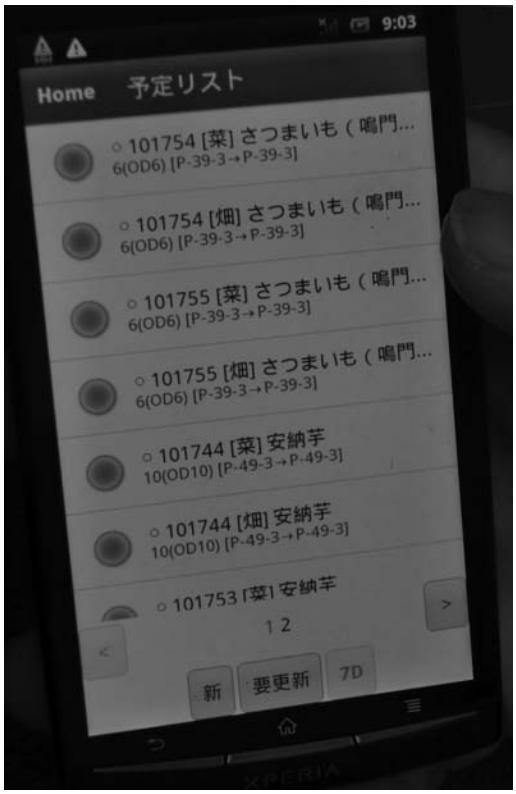
Telefarm in YouTube

Case 2 Telefarm

Mr. Endo (President) operates the game

- PC Game (Simulator) gives instructions to farmers

Case 2 Telefarm



- Smartphone receives directions in the farm

Case 2 Telefarm

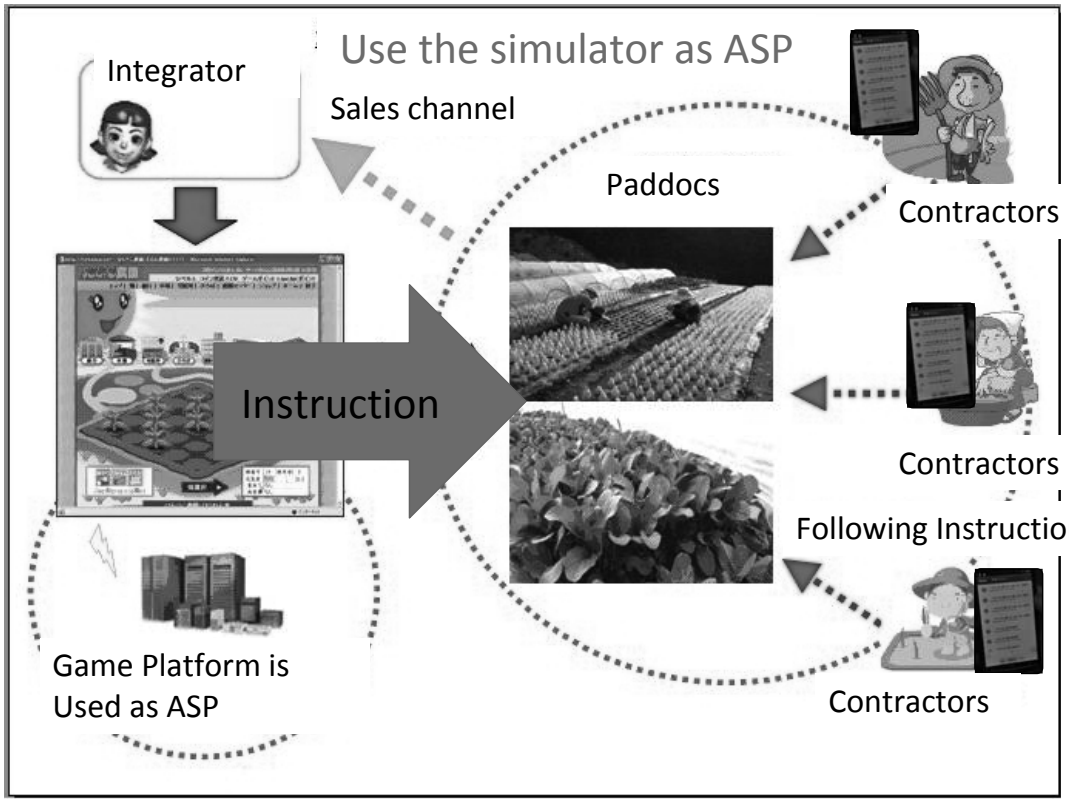
- Problems
  - Aging farmers in rural area, abandoned lands
  - Low & unstable income not-attracting young successors
  - Organic products through regular channel sold very cheap

- Intended Solutions by IT
  - Step in agricultural business by themselves
  - Generate income monthly by Game subscription
  - Direct B to C sales incorporated in the Game

Case 2 Telefarm

- Results (after launching in 2010)
  - Numbers of Game subscriber: Not increasing (250?)
  - Recognized as pioneering activities
- Intended Solutions by IT
  - Not really intended
- Use the system as ASP for production control

Case 2 Telefarm ASP



Case 3 Kleigngarten

- The importance of the Kleingarten has been recognized widely as what is stated in the report of BMVBS/BBR "Allotment gardens fulfil important social functions for the allotment garden holders, but also for visitors" (BMVBS/BBR Hrsg. 2008, p.10).
  - Ecological role / Preservation of Nature
  - Human recreation / Community building

Case 3 Kleigngarten

Case 3 Kleigngarten




Case 3 Kleigngarten




Types of Business Cases

- Type 1

Professional Agriculture Business in Large Scale => Vegetable Plants/Factories

- Type 2

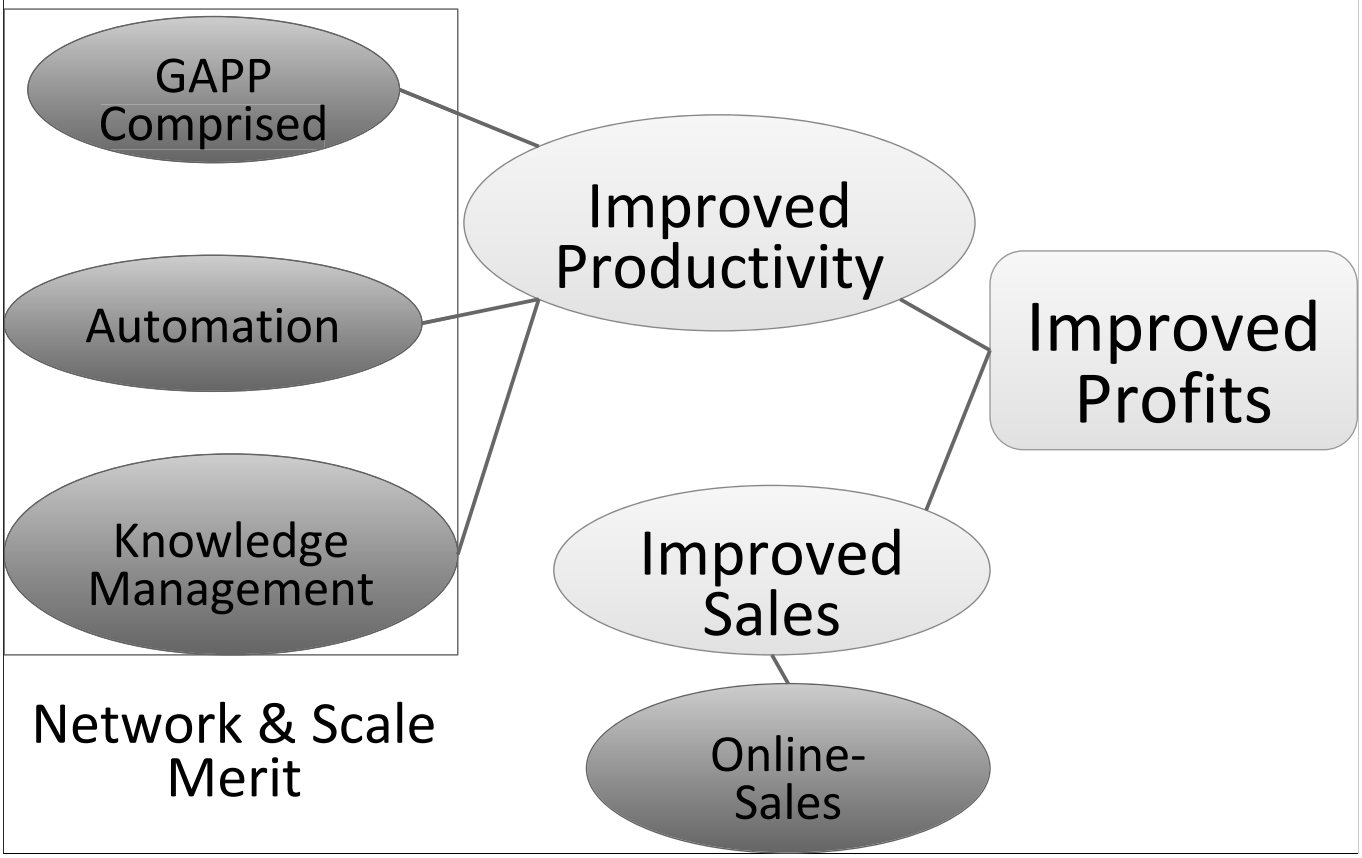
Professional Agriculture Business in Small Scale => IT-enabled Networks

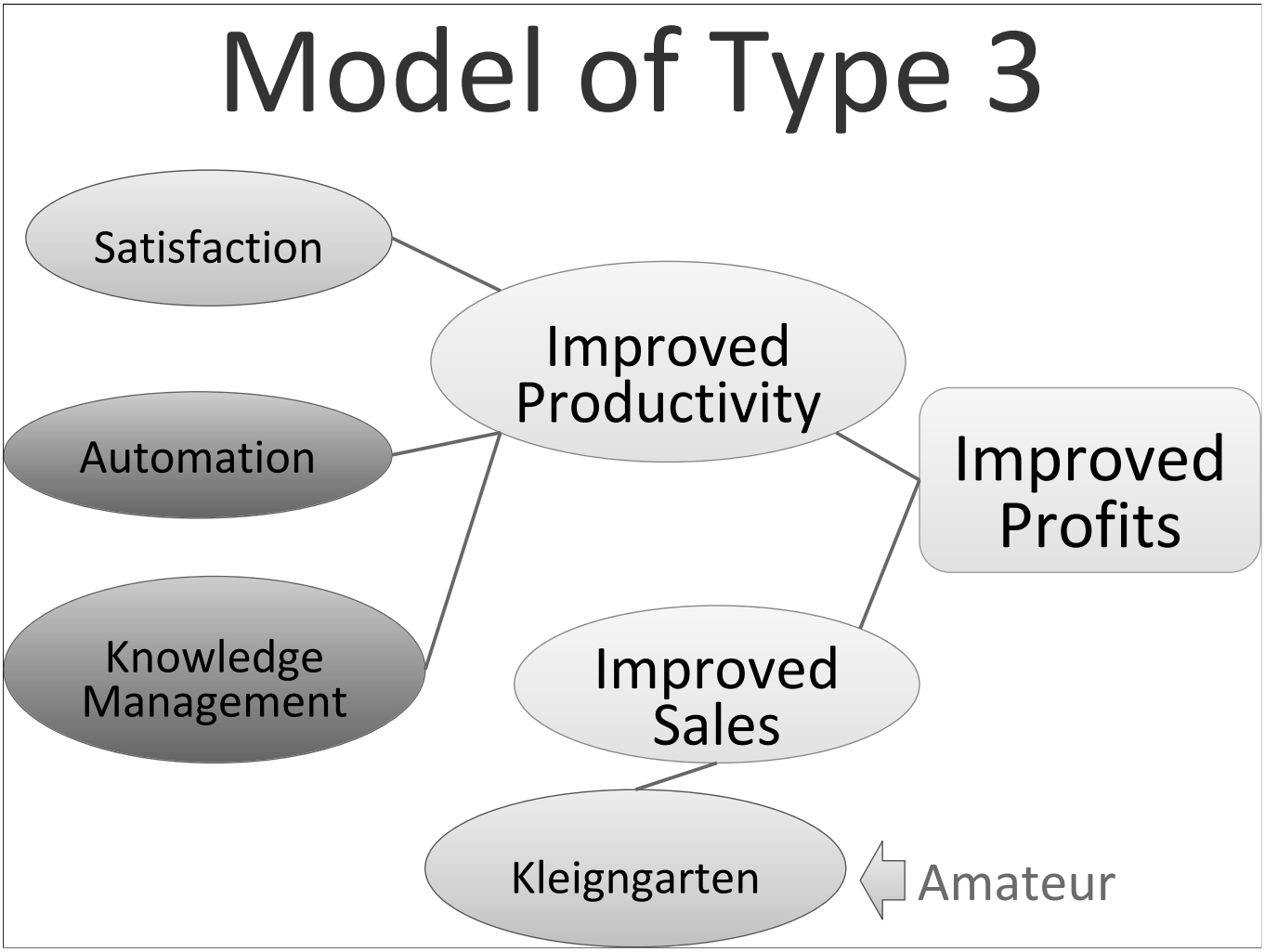
- Type 3

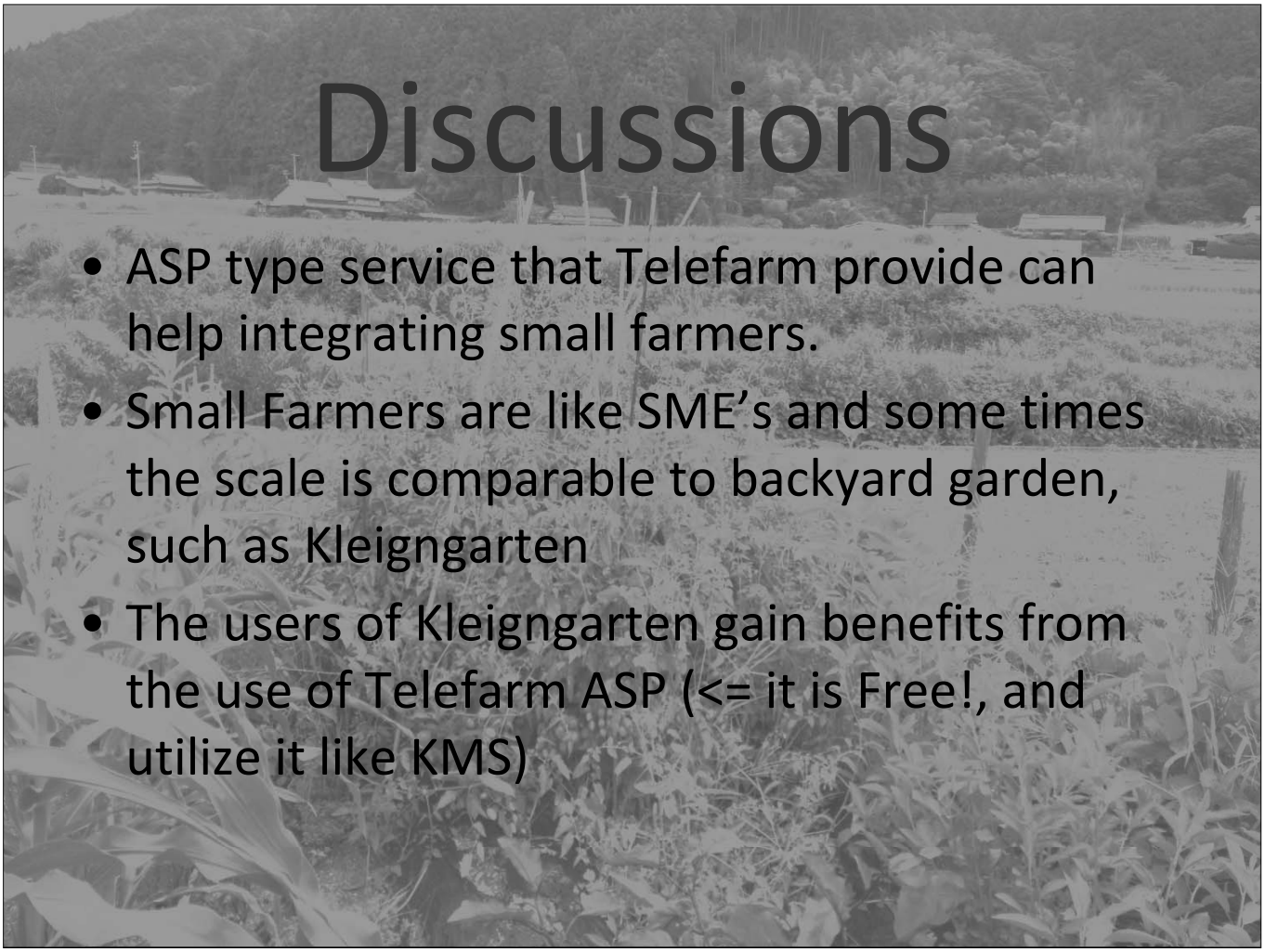
IT-enabled Business involving Non-Professional into Agriculture

Target of Research

Model of Type 2




Model of Type 3
Satisfaction
Improved Productivity
Automation
Improved Profits
Knowledge Management
Improved Sales
Kleigngarten
Amateur


Discussions
• ASP type service that Telefarm provide can help integrating small farmers.
• Small Farmers are like SME's and some times the scale is comparable to backyard garden, such as Kleigngarten
• The users of Kleigngarten gain benefits from the use of Telefarm ASP (<= it is Free!, and utilize it like KMS)

Conclusion

Hitting two birds with one stone,
It's Fun and Good for the community.

Acknowledgements

•This work was supported by JSPS Grant-in-Aid for Scientific Research (B) Project Number: 24330127.

SPECIAL TOPIC

KEYNOTE LECTURE
FROM
SYMPOSIUM ON INTERNET SECURITY AND E-BUSINESS
(AUGUST 7, 2010)
BY

DR. DANIEL MANSON

“INFORMATION SECURITY AND E-BUSINESS”

THIS IS THE PRODUCE OF THE GRANT OF MATSUYAMA UNIVERSITY’S INTERNATIONAL ACADEMIC RESEARCH COLLABORATION (松山大学学術研究国際交流助成) IN FY2010

Symposium on Internet Security and E-Business

August 7, 2010 at Matsuyama University

Key note of
Dr. Daniel Manson (CalPoly)

Thank you very much. I would like to start my thanking for you to come today. I have been to Japan three times with Prof. Isshiki for his seminar in Kamakura. This is my first time to come to Matsuyama. Matsuyama University is a very impressive university and I am honored to be teaching here this week. And, Matsuyama City is a very beautiful city and I have been enjoying being here and visited many places and enjoying the sights very much. This is much more relaxing than being in Tokyo.

I would like to start by giving some background of myself and what currently involved in security, and walk you through the journey of security. And then I will walk you through the comprehensive national cyber security initiative which is what US government looks as security today. Please feel free to ask questions at any time.

I have been involved with security for almost 30 years. I was a student at CalPoly Pomona in the early 1980's. CalPoly Pomona developed a master's degree in information systems auditing in 1980 - the first program of the country. Our university has taught auditing information technology and information security for almost 30 years. I joined a professional association when I was a student -- the information systems and systems auditing association. There are many top quality alumni in the association. To be in an association I made contact in I was able to be working as an information auditor. I started in 1982.

I have working as an information auditor for several companies including McDonnell Douglas. I began teaching information systems auditing at CalPoly Pomona I the late 1980's. I should mention that one of my teachers when I was a student is here tonight, I admire Dr. Koichiro Isshiki. Our program at Faculty was always to be a leader. So when I look myself today, I found myself following the footsteps. I began teaching at CalPoly in late 1980's and began studying for PhD in Information Science in 1989. I was able to become a Fulltime instructor at CalPoly in 1992.

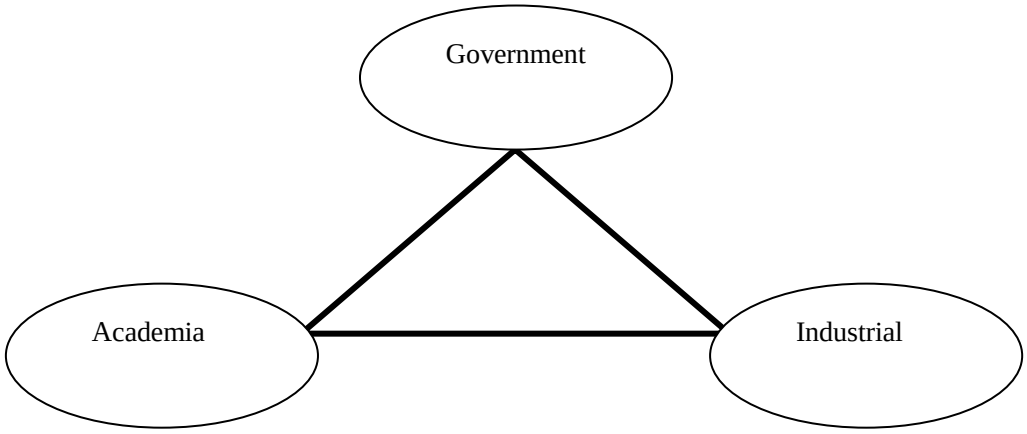
At CalPoly we have been leaders in teaching information system. In the 1980's we were

leaders in teaching structure systems analysis and infrastructures program. In the 90's we were leaders in object programming and object systems analysis. In the last ten years I have been fortunate to help to lead CalPoly in internet security. It became clear to us in the late 1990's that the internet was something very important. But we always seem to use technology before understanding how to secure technology. The internet was not created security in mind. The internet was created to always be available. In the early part of this decade (last ten years), we began to see attacks on the internet. We began to see denial of service attack, began to see many viruses worms, many malicious operands on the internet.

I wanted CalPoly to continue to be the leader, so I became very involved with internet security. In 2003, we mapped our curriculum to government standards for information security. In 2003, I became the university information security officer. I felt it was important to have practice, to have critical ability with my teaching, so I wanted to perform security job in addition to teaching work.

CalPoly Pomona is a Poly-Technique university. The goal of a Poly-Technique university is "Learn by Doing." We encourage faculty to continue to that experiences. And we want our students to have practical experiences. In addition to be university's campus security officer, in 2003, I developed two new security courses. One course is a broad basic course called "Internet Security." The second course is more focused. It was Computer Forensics. I was fortunate in 2003 to be a part of National Science Foundation Grant. In the grant I received funding that was used to create a Computer Forensics Lab. We wanted our students to have practical hands on experience in Computer Forensics. We knew at the time that Computer Forensics (CSI Forensics) was becoming an important field.

We were concerned that our students being able to get jobs in the Computer Forensics, because most of the works in Computer Forensics were done by law enforcement and government organizations. But we have learned at CalPoly Pomona how to build bridges, how to create relationships with government and with the industry. Let me draw the picture of this.



We really believed in a power of relationships. So, in 2003, I joined in a new professional association. This was the High Technology Crime Investigation Association (HTCIA). This organization was mainly for law enforcement and government who performed computer forensics. I did not feel that they welcome someone from academia.

To my surprise, they did welcome me. I believe the reason they support academia being involved is the same reason that the Information Systems Auditing and Control Association supported academia. Professional associations see our students as their future. The more we in an academia build the bridge with professional associations, the more we learn and the more opportunities our students have.

In 2004, I hosted a meeting with High Technology Crime Investigation Association at CalPoly Pomona. I was on the panel with the information security office for UC school – UCLA and other California State Schools. We have many people from industry and from government at the meeting. I learned, when I was the university information security officer, that academia has very interesting place on the internet. We have lots of bandwidth. We tend not to have strong policies on use of internet. So, we became a target for those that want to misuse the internet. What I wanted to help CalPoly, in its use of the internet become, was the part of the solution and not a part of problem.

When I was campus information security officer, I helped create our first information security policy. There is a law passed in 1999 in the US called Gramm-Leach-Bliley Act (GLB, GLBA). The law contains two major components regarding internet security. One was the privacy part of the GLB, and one was the safeguards.

Universities in the US do have to protect privacy of student information. We have a law that

has passed ten years ago for universities called FERPA. This is the law for universities to protect privacy of students. For example, once students become over 18 years old, they control their academic information. Parents may not look at student's academic information unless students give permission.

So, we were complied with the privacy aspects of GLB. When GLB was first passed, we thought the law did not apply to universities. GLB was passed for the financial industry. However, universities do perform financial transactions through student's loans and grants. In the US, the Federal Trade Commission ruled in 2003 that the universities must have information security policies to comply with GLB.

We also found out that the new privacy law in California has passed on July 1st of 2003. This law required all organizations in California that have personally identifiable information must follow. For example, Social Security Number to notify individuals if they believe that that personally identifiable information had been accessed by an unauthorized persons. At that time, the student ID at our university was Social Security Number.

The law was passed on July 1st and I was teaching my first internet security class that summer. So, I asked my students do a student's project. The student project was to audit how well CalPoly was complying with this new law.

Within two weeks, they found spread sheets – Excel's spread sheets – on the public internet that has Social Security Numbers. They were faculty list of grades and Social Security Numbers. I believe CalPoly was the first university in California to have to send letters notifying individuals that their personal information may have been accessed by another unauthorized persons. In fact some students in my class received these letters.

This is a good example of "Learn by Doing."

It was very interesting because one of the faculties who had posted Social Security Numbers and names was in my department. So, we were able to immediately look at how we needed to comply with this law.

In 2005, we became national COE in Information Security and Information Assurance Education. This designation was given by the Information Security Agency and Department of Homeland Security. We were the first university in Southern California with this designation.

That summer, I hosted a two week boot camp for faculty from other schools in California to teach information security. It was very exciting to have faculty from other schools at CalPoly to teach about the internet security. Two of the schools that have attended the boot camp later became national COE in information assurance education.

I believe that CalPoly Pomona has an obligation to help other schools learn about information security. Few of our faculty believed that I should not be helping other school so much. But I believe that the more I help others, the better we become.

In 2007, I was at a meeting of the schools of COE in information assurance education. I found about national competition in cyber defense.

The competition involves different regions of the US, this was a three days competition where student teams had to defend a working commercial network. Security professionals during those three days were attacking the student teams. At the same time, the students team receives business request to update the network.

They seemed like great opportunity for CalPoly become involved and "Learn by Doing." I found out that there was no regional competition in our area. I volunteered for Calploy to become the host for the Western Regional Cyber Defense Competition.

In 2008, we hosted the first Western Regional Cyber Defense Competition. We have four collages competing in the first year. In 2009, we have six collages to compete. And this year (2010) we have eight collages to compete.

We learned last year a new competition. This was called "US Cyber Challenge." We heard that there were going to be three states involved in the first year. These were California, New York and Delaware.

We wanted be a part of "US Cyber Challenge." So, we promoted ourselves, heavily. We had members from the members from "US Cyber Challenge" to attend our 2010 Western Regional Cyber Defense Competition. After attending our competition they felt we got already host the "US Cyber Challenge."

Last month, we hosted a one week SANS intensive cyber security camp. We had twenty-two

best and brightest individuals from the State of California at the camp. They have four days of very intensive security training from the SANS Institute. Their training was all day, 9:00 am to 5:00 pm, 9:00 am to 6:00 pm.

After dinner, we had more opportunities. We had a law and ethics panel discussion. We had meeting with government and industry representatives. We found that even after the panel, the students wanted to keep talking.

We had the instructors from the SAN institute staying with the students. I was also staying with them. The students and the instructors was stay at past 1:00 am talking about security. I went bed earlier.

I learned something very important that week. There are a number of people that really want to learn internet security. They want to be a part of solutions. But, they are not be given the best opportunities through our current educational system. What the "US Cyber Challenge" can do is to identify these individuals and provide them with training. So, we believe it is important to work on many levels. We want to do well with our own teaching -- our own courses. We want to help other schools to better in their courses.

We want partner with government and the industry. And we want identify individuals that have talent wherever they are and help them develop.

Do you have any questions at this point?

Q) Size of the budget from National Science Foundation.

A) There are several grants. First one is to share with neighboring community college. That is ninety hundred thousand dollars for three years. Two school with 900,000, not bad. We had second grant 900,000 but it was divided with 5 schools. So more schools but less money for us. I am applying with other schools for a larger grants. The grant will be submitted in October. It will be 3 million dollars for four years. So we have more money but we have more schools with longer terms.

So, my part of this grant will be 500,000 for four years.

I also learned about grants in university. We have something called as “indirect cost” and this means that university takes some part of the grant. Our university takes about 40%. That means actual part of my grant that I can use is 300,000.

Then, I have another choice I have. I can choose how much release time from the grant I have. I can take one course release time. So, less release time I have, more money I can spend on what I want from the grant to accomplish. So, I am willing to take my full teaching load. What I am performing with grant activities I have more to spend on the grant. Fortunately, I look for synergy, I look to combine what I do as a professor with what I want to accomplish in a grant.

One of the positions I have on campus is Director of our Center for Information Assurance. It is unpaid. But, the way I look at it is that everything I do to support the center supports our program and supports our students. So, I try not separate outside activities from inside activities in CalPoly.

シンポジウム

「インターネット・セキュリティとＥービジネス」

２０１０年8月７日

基　調　講　演

講演者：カリフォルニア州立理工大学　ダニエル・マンソン博士

【主催者挨拶】

松山大学　上杉志朗教授

本日は土曜日のお休みのところ、わざわざご足労下さいましてありがとうございます。

これからカリフォルニア州立理工大学（CalPoly＝カルポリ）のダニエル・マンソン先生をお迎えして、基調講演、それから、パネルディスカッションという形で、「インターネットのセキュリティと、e-ビジネス」という題でお話を進めさせていただきたいと思います。

まず、講演者のダニエル・マンソン先生ですが、御存知の方はいらっしゃると思いますけれども、カリフォルニア州には、大きな州立の大学が二つの機構として存在しております。一つは、バスケットボールやフットボールなどが強い UCLA などが有名な、ユニバーシティ・オブ・カリフォルニア機構、それからもう一つが CalState すなわちカリフォルニア州立大学機構（カルステート）、なんですけれども、カリフォルニア州立理工大学は後者のカルステートの一部となっています。

このカリフォルニア州立理工大学すなわちカルポリ（CalPoly）というのは、カリフォルニア州立の大学の中でも最も古い部類に入っておりまして、中でも理工系の部分を担っています。いち学年４千人ぐらいの学生さんが常時を勉強しているところであります。

ダニエル・マンソン先生は、若いころに最初、カルポリの学部に入学したときは、カリフォルニアを代表する産業である映画産業に興味をもって、映画の勉強をされたそうです。その後、民間の放送局に入られて、ニュースカメラマンをなさっていたそうです。その後は、お仕事を変わられまして、今日もあちらにご出席でいらっしゃいますけれども、カルポリの一色浩一郎教授の下で勉強されて、最終的にはクレアモント大学で博士号を取得されました。カルポリのポモナキャンパスはクレアモント大学のとても近くにありまして、

愛媛県でいいますと、松山市と東温市くらいの距離になります。クレアモント大学は、経営学分野で申しますと、非常に有名なピーター・ドラッカー先生がおられた大学で、マンソン先生も、博士課程の学生の時には、ドラッカー先生の講義を受講したとのことです。

現在、ダニエル・マンソン先生は、カリフォルニア州立理工大学のポモナキャンパスにある情報セキュリティの研究センターのチェア（責任者）を務めておられています。このセンターは、日本語に訳すと「情報の品質をきちんと保つためのセンター」というふうに訳せると思います。いわゆる大学全体の情報セキュリティの要になるセンターのセンター長をされておられます。それ以外にも、FBI（アメリカ連邦捜査局）、それから、NSA（国家安全保障局）の顧問として、情報セキュリティに関連するアドバイスをされたり、カリフォルニア州全体の、検察庁、判事、裁判所にたいして、インターネット・セキュリティのアドバイスをされたりしておられます。

本日は、全て英語での講演となります。マンソン先生が英語でお話をされます。お手元の配布物をご覧いただければと思うのですが、その配布物を元に、御講演を進めていかれます。マンソン先生が話された英語を、逐次、私が日本語に訳していく流れになりますので、よろしくお願いします。それでは、マンソン先生、よろしくお願いします。

【基調講演】

皆さんお忙しい時にお集まりいただきましてありがとうございます。

いままでに私は日本には３回来たことがあります。あちらにいらっしゃる一色浩一郎先生が、鎌倉セミナーを主催しておられて、その講演に参りました。今回、初めて松山に来たわけですが、松山は非常に美しい街でありますし、松山大学で一週間、夏季集中講義を担当いたしましたが、松山大学は非常に印象深い大学であると思います。この街は東京にいるよりも随分リラックスをすることができる街だと思います。

さて、最初に私自身について少しお話をしてから、何故セキュリティを勉強するようになったのか、そして現在、セキュリティの仕事としては何をしているのかについて触れていきたいと思います。そして、その中で、今アメリカ合衆国政府が全国をあげて実施中のセキュリティ強化のポリシーについてお話したいと思います。いつでも発言していただいて、なんでも質問していただいて結構です。

私は、３０年にわたってインターネットのセキュリティについて常に関わっています。８０年代初頭、私はカリフォルニア理工大のポモナ校の学生でした。１９８０年代初頭、全米では初めてのことだったのですけれども、情報システムの監査を学習するプログラムで、大学院の修士課程レベルのものとしては全米で初めて作られたのが、カリフォルニア理工大のプログラムでした。カリフォルニア理工大は、以来ほぼ３０年に渡って、情報通信及び情報セキュリティの監査について教えているということになります。私は学生時代から既に情報監査の協会のメンバーに入っていましたが、現在、この協会にはたくさんのカリフォルニア理工大ポモナ校の卒業生がメンバーに入っています。

１９８２年に、私は情報システム監査人として仕事を始めました。私は情報監査人としてコンピューターメーカーやマクドネル・ダグラスなどの会社で働いてきました。１９８０年代後半に、私は、カリフォルニア理工大のポモナ校で情報監査について教え始めました。こちらにおられる一色先生は私が学生の頃にお世話になった先生でいらっしゃいます。

私たちのプログラムというのは学生が皆、何らかの分野でリーダーになってほしい、そんな風につくられたプログラムであります。そういう意味では、私は、当時一色先生から教えてもらったことを忠実に実行して今日に至っているのだなという風に思います。

１９８９年に私は情報科学の分野で大学院の博士課程の勉強を始めた訳ですが、それまでの間にカリフォルニア理工大ポモナ校では非常勤講師として、継続して仕事をしていま

した。１９９２年には、カリフォルニア理工大ポモナ校で専任講師となりました。

カリフォルニア理工大学は、全米単位でみても、情報処理分野における教育のリーダーとしての働きを担ってきています。８０年代においては、私達は、大学において、構造分析や構造プログラムを教える主導的役割を果たすようになっていました。９０年代に入ると私達は、オブジェクト指向のシステム構築について教育するリーダーでありました。ここ最近の１０年では、私達カリフォルニア理工大ポモナ校は、セキュリティ教育のリーダーとしての役割を果たすようになってきております。

１９９０年代後半になると、インターネットはとても重要なものであることが明らかになりました。しかしながら、人類というものは皆、新しいものを使う時には、その技術が安全なものであるかどうかをきちんと確認する前に使いたがる、そういう傾向にあるように思います。インターネットは重要なもので、しかも簡単に使えるものでしたが、そもそもセキュリティを考えて作られたものではなかったのです。この技術は、安全を優先に作られたものではなく、インターネットは「いつでも使えるもの」として作られたものだったです。

２１世紀になってから私たちが経験していることは、インターネットの世界が、セキュリティ上の問題から脅かされていることばかりです。例えば、実体のないサービスとか、お金を払ったにもかかわらずアクセスを拒否する製品などがあげられます。

私はカルポリが常にリーダーに立っていることを意識しています。そのためにインターネット・セキュリティの分野をひろく教育していく使命があると考えています。２００３年には、全米のカリキュラムに合わせて、私達のプログラムをきちっとマッチさせることができました。

２００３年に私は全学部の情報セキュリティの責任者でありました。私はインターネットのセキュリティについて実際に現場で働くということが、自分の教えている分野にとっても役に立つし、自分の資格を向上させるためにも役に立つと考えて、全学の情報セキュリティの責任者になりました。

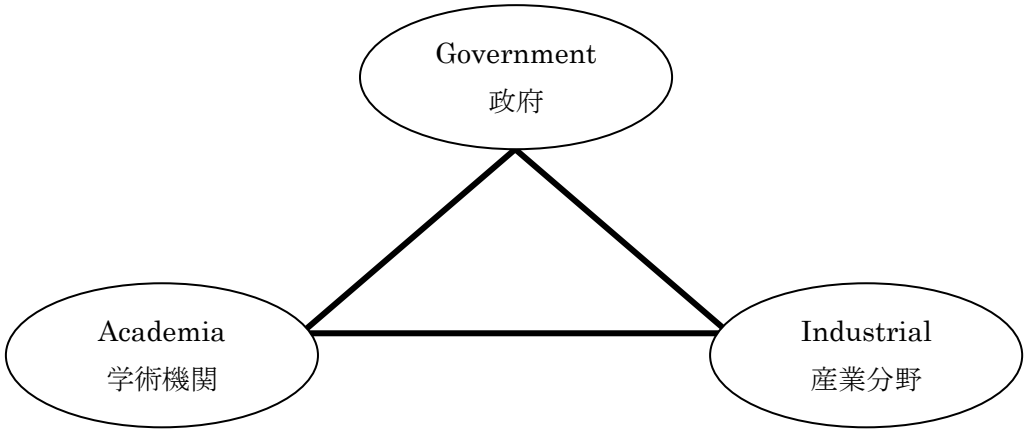
さて、カルポリ・ポモナ校はポリテクニック・ユニバーシティというカテゴリの教育機関です。ポリテクニック・ユニバーシティというのは、教育の最終的なゴールを「実践力を持ってもらう」というところに置いております。従いまして、私達教授陣は、実践経験を積む、ということが求められることになります。

そして、私達教授陣は、学生たちにも同じように経験を積んでほしいと考えています。情報セキュリティの責任者になると同時に、私は、２つの情報セキュリティ関連の事業を始めました。１つ目は概括的なもので、インターネット・セキュリティという名前です。もう１つのものは、より専門的になりますが、コンピュータ・フォレンジクス、すなわちコンピュータ鑑識、というものになります。

２００３年には全米科学財団などのファンド（研究資金）を得ることができました。このファンドを使うことによって、私は学内にコンピュータ鑑識の研究機関を作ることができました。そうすることで学生たちがコンピュータ鑑識の分野の実務経験を積むことができると考えたからです。

私は当時、コンピュータ鑑識の分野が大変重要な分野になるだろうという風に考えていました。このコースをつくるときに、学生たちのコンピュータ鑑識の分野で仕事を得ることができるかどうか心配でした。何故ならば、この分野は、政府や犯罪捜査の分野に需要があったからです。

しかしカルポリでは、政府や産業分野とどうやって橋渡しをつけていくか、ネットワークをつくっていくかということを、学習しました。このことについて図解で説明していきます。学術機関があり、政府があり、そして産業がある、いわゆる、産官学の取り組みの中心として研究機関を位置付けたのですね。



私達は、関係、すなわち、ネットワークの力というものに非常に信頼をおいています。そこで２００３年に私は新しく別の協会にも参加いたしました。これは、「ハイテク犯罪捜査協会（High Technology Crime Investigation Association=HTCIA）」と呼ばれるものです。

この協会のメンバーというのは主に捜査員、捜査活動をされている方、それから、政府の方で、コンピュータの鑑識にかかわっておられる方です。従いまして、私のような学術分野、大学人が参加するということについて、果たして受け入れられるかどうか心配でした。

ところが、実際は、私のことを快く迎えてくれました。これは、彼ら、ハイテク犯罪捜査協会の人たちが支えてくれた理由というものは、結局のところ情報監査をしている人たちがアカデミア、学術分野を支えているというのと同じ理由だと思います。

専門家の協会というものは、学生は、自分達が担うべき将来を支えてくれる存在なのだという風に認識しています。プロフェッショナルの職業集団の方々と大学が関係を深めることは学生にとってのチャンスを広めることになるのだと実感しております。

２００４年になりますとハイテク犯罪捜査協会との合同ワークショップをカルポリで開催しました。私と一緒にUC、州立大学機構、それから、その他カリフォルニア州の大学機構の情報セキュリティの責任者の方もパネルディスカッションに参加していただきました。

この時には、多くの政府の関係者の方ですとか、犯罪捜査に関わっている方々が参加してくださいました。私はインターネット・セキュリティの責任者になったことで、大学という所がインターネットのセキュリティを考える上で非常に重要な地位を占めていることに気付かされました。

私達大学には、たくさんのインターネット帯域が割り当てられています。利用者が大変多い、ということです。ところが私達はあまりインターネットの利用に関して、ポリシーというものを定めない傾向があります。従いまして、インターネットを使って悪事を働こうとする者にとって良いターゲットになってしまうのです。

私はそういう状態を憂えておりまして、カルポリを助けることによって、カルポリが問題の根源になるのではなくて、何かインターネット・セキュリティを増進するための助けになる、そういった組織になってほしいという風に考えていました。

私がインターネット・セキュリティの責任者になって最初にしたことは、インターネット・セキュリティに関するポリシーを作ったことです。１９９９年には、全米で「グラム・リーチ・ブライムリー法」（銀行と証券会社の垣根の撤廃の法律）が制定されていました。

この法律のおかげで、大学に限らず、インターネット利用にかかわるプライバシー・ポ

リシーが全米で制定されていったわけですが、この中には２つの大きな事柄がインターネット・セキュリティに関わる事柄として定められておりました。

最初の目的は個人のプライバシーに関わることです。もう１つはセーフガードに関わることです。アメリカの大学はこれによって、学生のプライバシーを守らなければいけないということになりました。家庭教育権・個人情報保護法（The Family Educational Rights and Privacy Act of 1974 ＝FERPA or the Buckley Amendment）によってインターネットに関わらず、学生のプライバシーを守らなければならないと１９９０年代後半に定められました。例えば、１８歳以上の学生は、自分の成績情報に対するコントロール権を持ちます。たとえ両親であっても、その学生が許可を与えない限り、成績情報を見ることはできません。

最初の個人のプライバシー保護の話について「グラム・リーチ・ブライムリー法」の定めるところについて考えてみましょう。最初に「グラム・リーチ・ブライムリー法」が制定された時には、この法律は当初金融機関を対象としていると考えられていましたので、大学は対象になっていないと考えられておりました。

しかしながら、奨学金や貸出という事で大学自体が金融機関の働きをしている事がわかってきました。その結果、２００３年にはアメリカの連邦公正取引局により「グラム・リーチ・ブライムリー法」の法の効力が大学にもおよぶので、大学も情報セキュリティポリシーをもたなければならないという事が決まったわけです。

２００３年には、カリフォルニア州では、州法によって、プライバシー法が新しく定められました。カリフォルニアの州法は２００３年の７月１日に施行されたわけですが、個人を特定できる情報について取り扱う機関すべてに適用される決まりを定めております。例えばソーシャルセキュリティナンバー（社会保障番号）がそれにあたります。

この法律ではこれらの個人を特定できる情報に対して、権限を持っていない人がアクセスした場合には、アクセスがあったという事実を特定の個人にきちんと報告しなければいけないという義務を課しております。大学は社会保障番号を取り扱っていますので、この法律の対象となるわけです。

ちょうど私はその２００３年の夏に、最初のインターネット・セキュリティの講義をしておりました。そこで私は自分の学生さん達にお願いしてプロジェクトをやってみたらどうかと話をしてみたわけです。このプロジェクトは何かというと、いろんな人に聞いてみて、カルポリが、どれだけこの新しい法律をきちんと守っているかという事を確かめてみ

ようというものでした。

２～３週間もたつうちに、学生の社会保障番号がエクセルのファイルの表に入って、そのまま誰でもアクセスできるインターネットのサーバーにあるという事を見つけてきました。そこには教授陣の社会保障番号も入っていたのです。

したがいまして、カルポリは、全米でも最も早く、全学に向けて「あなた方の個人情報に権限のないアクセスがありました」という手紙を出す羽目になったのです。実際私の教えていた学生もそういう手紙を受け取りました。

これこそがまさに実践を通して学ぶ（Learn by Doing）といったいい例ではないでしょうか。

更に面白い事には、社会保障番号をＷｅｂ上に上げていたのは、私の同僚で情報担当の教授だったのが判明しました。こういう事例があったものですから、私達は確実に速やかに法律を順守する状態を作ることを要求される事になったのです。

そんな背景もあり、２００５年になりますと、カルポリは全米の情報教育の中核研究拠点（ＣＯＥ）となる事が出来ました。それは分野としては情報セキュリティ（information securrity）と情報保証（information assurance）の分野です。これは国家安全保障局と国土安全保安省から指定されたものです。この指定を受けた南カルフォルニアの大学は、私達が初めてでした。

この夏に、私は２週間にわたってブートキャンプを主催しまして、学生や他の大学機構の教授陣などを対象として、情報セキュリティを学べる機会をつくりました。カルポリの他の学部の教授陣もお迎えしながら、インターネット・セキュリティについて学ぶ、大変エキサイティングな経験でした。このブートキャンプに参加された先生方の所属大学の中から、さらに２つの大学が、私達が得たような形で情報保証にかんするプログラムの指定を受ける事が出来るようになりました。

私はある意味でカルポリに課せられているのは、他の大学の人達を含め、情報セキュリティについて学ぶ場を提供するという義務であると考えています。少なからぬ同僚の先生方は、私が他の大学を手助けしすぎているのではないかとおっしゃいます。しかしながら私は、他の大学を助ければ助けるほど自分達の地位が高まるのだと信じております。

私は２００７年に、情報保証教育プログラムでＣＯＥとなっている大学が集まった会議

に参加しました。この中で、全米のサイバー防衛についてのコンテストがある事を知りました。全米のいろんな地域からの参加者を募っておりました。

このコンテストはどういう物かというと、参加者の学生達が、３日間にわたって実際に稼働しているＷｅｂを防衛するという物です。この３日間の間には、セキュリティのプロが、学生チームに攻撃をかけてきます。また、企業の人達からは、そのＷｅｂサイトをアップデートするよう要求がされます。

これこそ実践を通じて学習するという良いチャンスだと思いました。彼らの活動に参加することがカルポリにとって役に立つ機会であると確信しました。私達の地域では、地区予選が開催されておりませんでした。そこで私は自ら手を上げて、カルポリがカリフォルニアのこの地域で予選を開催する学校になるように手配しました。

２００８年に、カルポリは、第１回西海岸サイバー防衛コンテストの主催校となりました。この年には、４つの大学が競争に参加しました。２００９年には、その数は６大学になりました。２０１０年は８大学が競争しています。

２００９年には、新しい競技があることを知りました。これは「全米サイバーチャレンジ」というコンテストです。これは初年度、カリフォルニア州とニューヨーク州とデラウェア州の３つの州が参加するコンテストであったと聞いております。

カルポリは、このコンテストに参加していきたいと考えて、一生懸命頑張って売り込みをかけました。そこでサイバー防衛の競技の中に、サイバーチャレンジからの参加者が参加できるように取り計らいました。このことで、事実上カルポリがサイバーチャレンジのプログラムのカリフォルニアでの受け皿となっているのだという認識を得られたと思います。

先月１週間にわたって、SANS Institute と共同して、サイバーチャレンジキャンプを実施致しました。このキャンプにはカリフォルニア州全体から、２２名の最も優秀な人達が集まりました。参加者達は４日間のセキュリティ集中訓練、９時～５時、９時～６時といった１日中続く訓練を受けました。

そして夕食後は、法と倫理に関するパネルディスカッションをしました。政府や産業からの代表の方を招待して講演に来て頂きました。このパネルディスカッションでは、時間が過ぎてもなお、学生達はずっと話を続けたいというふうな具合でした。

そこでSANS Instituteからの講師陣は、学生達と一緒に話をつづけ、私も一緒になって夜遅くまで話つづけました。ずっとインターネット・セキュリティについて話をして気が付いたら深夜の１時をまわっておりました。私はその時さっさとベッドに入ってしまいましたけれど。

その週、私は個人的に大変重要な事を学びました。世の中に、インターネット・セキュリティについて「本当に学びたい」と強く思っている人がいるのだ、という事です。このような方々は、「問題を解決する側に立ちたい」と考えている人達です。

しかしながら、現在の私達の教育システムの流れのなかでは、このような人々に要求され水準の教育を施す事はできません。全米のサイバーチャレンジのようなコンテストを実施する事によって、このような人達を発掘する事が出来て、必要なトレーニングを施す事が出来るようになると思います。

従いまして、私は、いろんなレベルで活動の実績を積んでいく事が重要であると考えます。私達大学は、教育機関として、講義やカリキュラムなどを通じて教育を提供すること、これが大事です。それに加えて、カルポリは、他の学校で教えられているコースについても、私達の情報を提供してより良い物にしていきたいと思います。

私達は、政府や産業などからパートナーを求めています。私達は、その人がどこにいるかは関係なく、才能があって意欲がある個人を探しています。

これまでのところで何かご質問があれば何でもどうぞ。

Q）予算規模について聞いてみたいと思います。インターネット・セキュリティが国防に関わるという事であれば予算額が大きいのではないかと思いますが。

A）ＮＳＦから受けている補助金（Ｇｒａｎｔ）はいくつかあって、ひとつは、３年間で９０万ドルのものです。これはカルポリの隣にあるコミュニティカレッジと共有です。２つ目の補助金は、９０万ドルですが、５つの大学でシェアをしました。多くの学校を中に招き入れる事が出来たわけですが、その分自分達の取り分が少なくなってしまいました。

今申請中の予算は３００万ドルで４年間です。これは期間としても長くなりますし、それから、参加する大学も増えますので１大学あたりの金額は少なくなるのではないかなと思います。

自分が使っていい配分は年間５０万ドルを４年間に渡ってサイバーセキュリティ教育、サイバー品質保証に使っていきたいと考えています。

大学の補助金について非常に色々研究してきました。間接経費という言葉が存在します。これは大学が組織として何%かを天引きするみたいなものです。私の大学の場合、それは４０％です。従いまして私が手にするのは３０万ドルになります。

補助金の使い方では、補助金をとると講義を担当する責任時間が短くなるという原則（release time）がありますが、責任時間を維持すると補助金から天引きされる金額が減るという方法があります。

授業時間を減らさない事で、補助金で使える金額を増やしながら、授業自体も維持する事が出来ます。教える仕事をたっぷりして、使用できる補助金額も増えることができるという事です。幸いにも、私は、教えるという事と、補助金や基金を使ってする仕事の間には相乗効果があると考えておりますので、両立させています。

私は、カルポリの「情報品質保証センター」の所長であります。それは無給の職責です。このセンターをサポートするという事、私の活動自体は自分のセンターをサポートするだけではなく学生諸君をサポートする事です。従いまして私は大学内の仕事と大学外の仕事を出来るだけ分けないように考えております。

（以上：翻訳／文責　上杉志朗）

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「２０１０年度、２０１１年度　松山大学学術研究国際交流助成

研究課題:　米国の電子商取引（e-Commerce, e-Business, digital Commerce, digital Business を含む）に関する研究」

２０１１年度は東北大震災の為、中止になりましたが、２０１０年度の研究交流にご支援をいただいたことをここに記し感謝します。また、２０１０年８月８日愛媛新聞４ページに写真とともに本シンポジウムの要旨が掲載されています。