From the Editors

It is a great pleasure to deliver to you the fifth 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 fifth volume covers the main topic of "New Horizon of IT-enabled Services." As was the same as the previous volumes, this issue intends to explore wider range of topics which cover not only those topics focusing on ITeS but also fundamental theoretical studies relating to Informatics and Regional Studies.

This volume consists of the reproductions of presentation slides from three conferences, namely, The 5th ITeS Workshop, APCIM 2012 and SAINT-WS2003. The 5th ITeS Workshop, what was held as part of a session in IEEE/IPSJ SAINT 2012 (The 12th Annual International Symposium on Applications and the Internet) held in Izmir, Turkey on July 16-20.

The 2012 APCIM was held in Seattle on August 16-18. APCIM is a bi-annual international conference organized by JSIM. Two presentations are included in this volume. Both of them are closely related to the topic of ITeS in the context of the Regional Studies.

A reproduction from SAINT2003 is included to commemorate the history of SAINT-WS. In 2012, the SAINT conference closed its long history and will be merged to IEEE/COMPSAC in 2013. It is my hope that this reproduction will remind all of us how the Workshop of ITeS emerged.

This edition of Journal is made of collections of up-to-date researches. The editors would like to express sincere thank to the contributors of the presentations in the Workshop who make this wonderful omnibus of journal come to existence.

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Table of Contents

FROM THE CONFERENCE

In this volume, presentation slides from three conferences are presented.

The presentations from *The Fifth Workshop on IT Enabled Services (ITeS 2012, Izmir, Turkey, July, 16-20)* are taken from SAINT2012 (IEEE/IPSJ Symposium on Application and the Internet). The symposium was the final one because from 2013, SAINT is merged to COMPSAC. The entire program of the Workshop is shown as follows.

The 5th Workshop on IT-enalbed Services (ITeS 2012)

Welcome note by Workshop Organizers: Hitoshi Okada

Session 1: Keynote & Real-time Application of ITeS
Chair: Hirotsugu Kinoshita
Workshop Keynote: New horizon of IT-enabled Services
Shiro Uesugi

Evaluation Study of Usability Factors on Mobile Payment Application on Two Different Service Providers in Thailand
Nagul Cooharojananone, Pongjit Kongnim, Aratchaporn Mongkolnut and Hitoshi Okada

A Resilient Survivors identification Service for Large-Scale Disasters
Shigeichiro Yamasaki

Session 2: Community Application of ITeS
Chair: Hitoshi Okada
The study on the effect of Facebook's social network features towards intention to buy on F-commerce in Thailand
Wannapon Suraworachet, Sarawadee Premsiri and Nagul Cooharojananone

A local currency system reflecting variety of values with a swarm intelligence
Hirotsugu Kinoshita, Yoshiaki Tajima, Tetsuya Morizumi, Masato Noto and Hideyuki Kannabe

Panel Discussion: New Horizon of ITeS
Chair: Hitoshi Okada
Panelists: Shiro Uesugi and Hirotsugu Kinshita

Closing Remarks: Shiro Uesugi

Two presentations from *Asia Pacific Conference on Information Management (APCIM2013, Seattle, USA, August, 16-18)* are included.

The study on Young people's Behavior and Attitudes to Online Shops
Takashi Okamoto

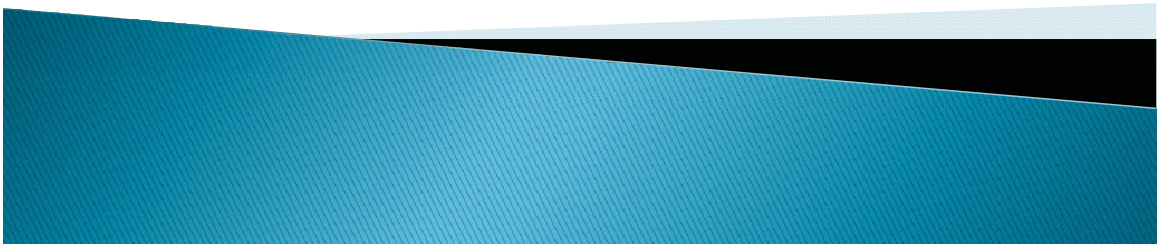
Analysis of web portal business for restaurant information from information perspective
Hidenobu Sai

One presentation from *SAINT2003-WS, Orland, USA, January)* is included. This will let us remind the long history of our research of ITeS has its root in the investigation about the application of the internet for more than a decade. The presentation included is as follows.

The survey of the mobile Internet, usage and awareness, study for m-commerce
Kazuaki Naruse

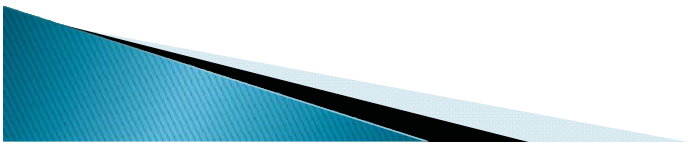
New Horizon of IT-enabled Services (ITeS)

Professor Shiro Uesugi
Matsuyama University

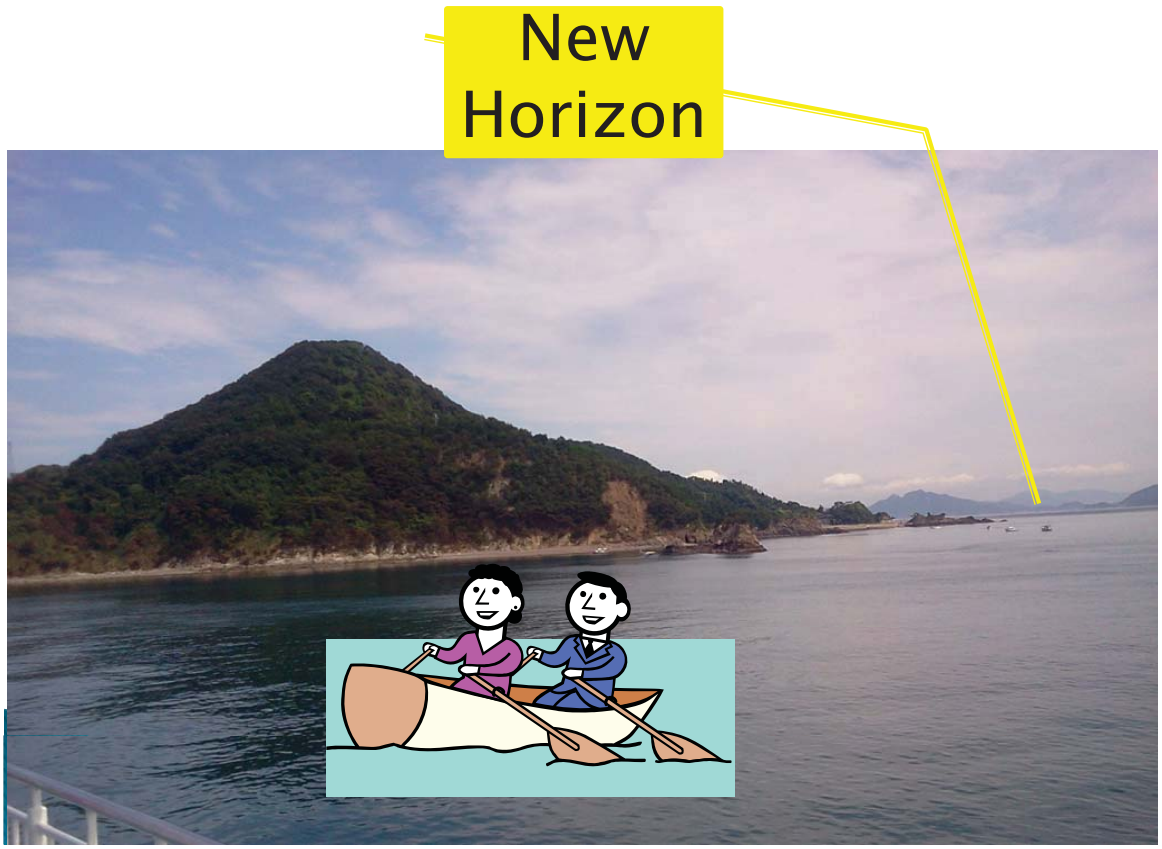


Topics

- New Horizon of ITeS
- What is ITeS
- Geography
- Technology
- Applications




A
Horizon


New
Horizon

What is ITeS ?

- IT-enabled Services
- Services provided "by/through" IT
- "Out-Sourcing" through IT

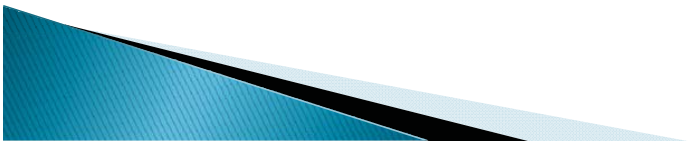
Traditional

However

Services – everywhere…

Old ITeS researches…

- Out-Sourcing
  - Electronic Commerce
  - E-Government
  - E-Financing
- Reaching to more "services"
  - Digital Cash
  - Tele-Medicine
  - Tele-Education
  - Remote Survelance



New Horizon for ITeS…

- Geographical aspects
- Technological aspects
- Applications

Geography

Human, historical, economic, physical

More Inclusion

Technology

IPv6 More Use

Applications

- Medical Services
- Services via Control
  - Energy Control
    - Large Scale – Power Grid
    - Small Scale – Community Grid
  - Environmental Control
- Legal Issues, Protection of Privacy, Security Issues

Conclusion

Evaluation study of Usability factors
on Mobile payment application
on two different service providers in Thailand

K-Mobile Banking PLUS and mPay application

1

Asst. Prof. Dr. Nagul Cooharojananone

Pongjit Kongnim
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Department of Mathematics
Faculty of Science Chulalongkorn University

Assoc. Prof. Dr. Okada Hitoshi
National Institute of Informatics

2

Agenda

- Introduction
- Methodology
- Results of Regression analysis
- Results of Compare means
- Conclusions
- Future work

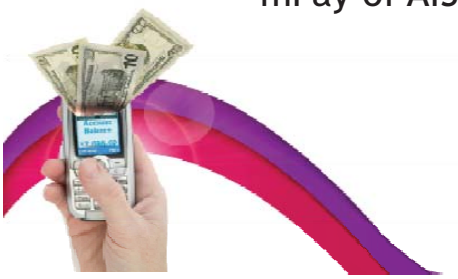
3

Introduction

4

Introduction

- The mobile phone have become a business tool because companies use them to increase the opportunity to connect with their consumers.
- Mobile payment (M-payment) is a payment service via mobile phone.
- M-payment applications in Thailand
  - K-Mobile Banking PLUS of Kasikorn bank
  - mPay of AIS



Introduction (2)

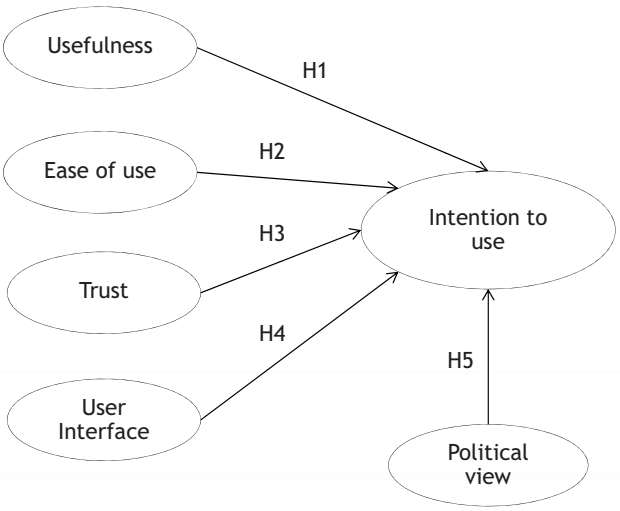
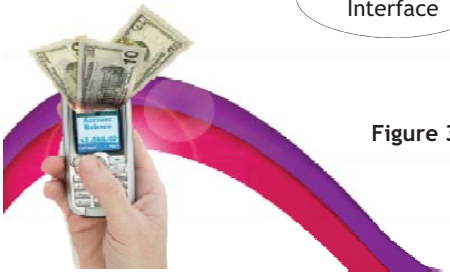


Figure 3. The proposed hypotheses model.



Methodology

Methodology

- Data collection
- Measurement
- Reliability analysis
- Factor analysis
- Regression analysis

Data Collection

- We divided 200 participants into two groups.
- Participants are asked to fill out questionnaires after finishing their task.

Data Collection (2)

- Tasks that users performed.

K-Mobile Banking PLUS	mPay
Transfer Money	Transfer Money to bank account
Pay donation bills	Transfer Money to mCASH
	Top up One 2 call

Data Collection (3)

Category	K-Mobile Banking PLUS N = 100 Percentage (%)	mPay N = 100 Percentage(%)
Gender:		
Male	39.0	39.0
Female	61.0	61.0
Age:		
18 - 22	84.0	96.0
21 - 35	7.0	34.0
>= 35	9.0	0.0
Mobile phones with Touch screen system:		
Used	87.0	83.0
Never	13.0	17.0
Mobile Payment:		
Used	20.0	18.0
Never	80.0	82.0

11

Measurement

- Questionnaire is divided into two sections :
  (1) Demographic characteristics of participants and their technology background.
  (2) Participants' attitude toward M-payment application.

12

Measurement (2)

- There are seven parts in the second section :
  (1) To measure the usefulness of application.
  (2) To measure the ease of use of application.
  (3) The suitable interface of application.
  (4) The trust of application.
  (5) The intention of using the application.

13

Reliability analysis

- To measure how decisive of each question by limiting the questions that when that item is removed, Cronbach's Alpha will be increased.
- Questions from the second section in a questionnaire are separately performed with reliability analysis until the total Cronbach's Alpha is higher than 0.7 leaving out only the benefit items.

14

Factor analysis

- Be applied to the benefit by using the principle components extractions method and varimax rotation.

Regression analysis

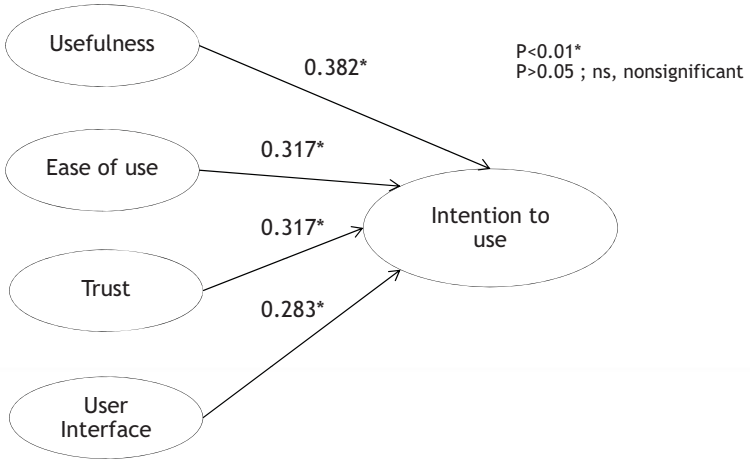
- To measure which factors have an effect on the intention of using the mobile payment application.
- In this experiment, the collected data of K-Mobile Banking PLUS and mPay are separately analysed.

Results of Multiple Regression Analysis

17

Results of Multiple Regression Analysis

K-Mobile Banking PLUS



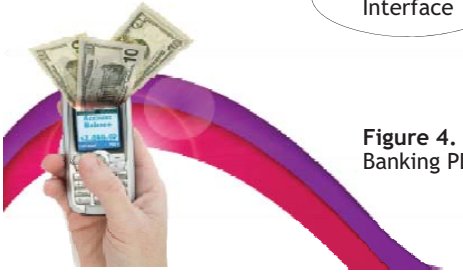


Figure 4. Results of the hypotheses testing model for K-Mobile Banking PLUS application.

18

Results of Multiple Regression Analysis (2)

K-Mobile Banking PLUS

- The location of some menu options are different from the location on the ATM.

User Interface of K-Mobile Banking PLUS for Donation task on the ATM.

Results of Multiple Regression Analysis

K-Mobile Banking PLUS

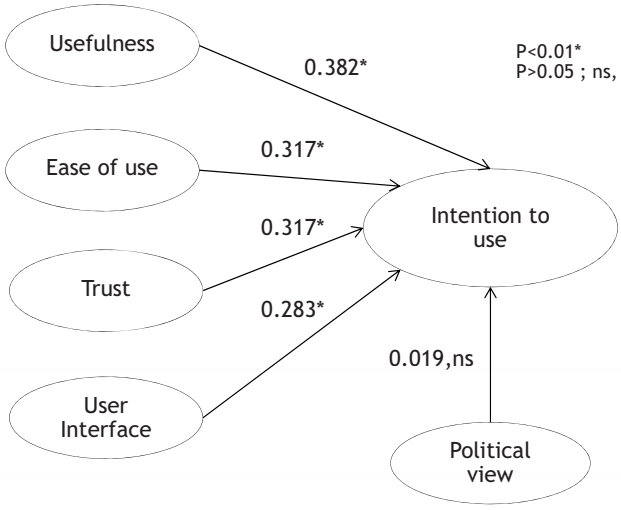
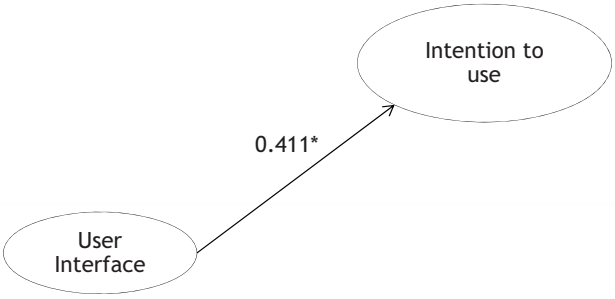


Figure 4. Results of the hypotheses testing model for K-Mobile Banking PLUS application.

Results of Multiple Regression Analysis

mPay

P<0.01*
P<0.05**
P>0.05 ; ns, nonsignificant



21

Results of Multiple Regression Analysis (3)

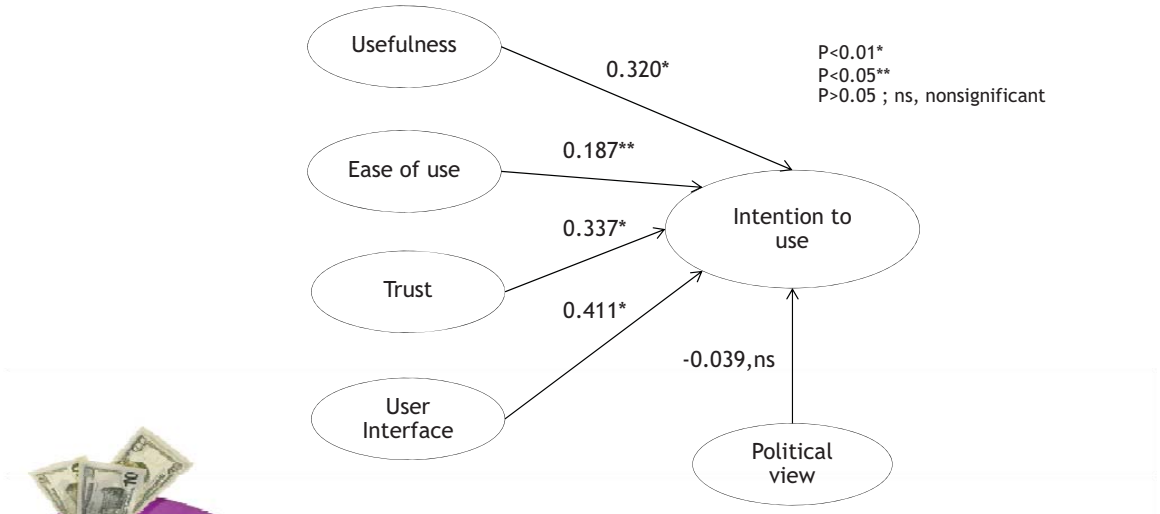
mPay

User Interface of mPay application for Money Transfer task.

22

Results of Multiple Regression Analysis

mPay



Results of Compare means

Is there significant experience on using touch screen system on mobile phone difference in intention to use ?

25

Results of compare means (2)

Hypothesis:

- μ_S = The average of intention to use for people who have experience on touch screen system on mobile phone.
- μ_M = The average of intention to use for people who **never** who have experience on touch screen system on mobile phone.

26

Results of compare means (3)

Hypothesis:

- Null hypothesis (H0): $\mu_S = \mu_M$: There is no significant experience difference in intention to use.
- Alternative Hypothesis (HA): $\mu_S \neq \mu_M$:There is significant experience difference in intention to use.
- **Independent Samples t-test** was used.

27

Results of compare means

K-Mobile Banking PLUS

Aspect	t	Sig. (2-tailed)
Intention to use	0.480	0.632

28

Results of compare means (2)

mPay

Aspect	t	Sig. (2-tailed)
Intention to use	-0.301	0.764

29

Results of compare means (3)

Conclusions

- The experience has any effect on the intention of use that both agree on the benefits of the application

30

Conclusions

Conclusions

- User interface design, perceived ease of use, perceived usefulness and perceived trust have significant positive on the intention to use both of applications.
- Political view have not significant on the intention to use both of applications.

Future work

33

Future work

- There should have multi-language, simple and clear user interface.
- The design and user interface on applications with the similar look as the ATM.

34

Future work (2)

- There are still many interesting factors :
  - Service quality
  - Security

35

Thanks for your attention

36

Q & A

A Resilient Service for Survivor Identification in Large-Scale Disasters

Shigeichiro Yamasaki
Kindai University

1

Introduction

It is almost impossible to prepare for the risks of a disaster which comes only once in 1000 years.

2

Introduction

However the March 11, 2011, earthquake, tsunami and nuclear accident in Japan taught us serious lesson.

3

Introduction

During the time of the large-scale disaster

we were unable to accomplish tasks we were not prepared for.

4

The purpose of this research

- To propose a resilient IT enable service (It is not an IT system) for the time of the large-scale disaster

5

The purpose of this research

- A resilient service
  - A service which tries to accomplish its task to withstand unexpected serious situations.
- The purpose of our service
  - survivor identification

6

Survivor identification

- **The most sought after information**

  by the family and friends of the survivors and the rescue teams.

7

Survivor identification

- **The requirements**
  - **The information should be accurate and integrated**

8

The actual occurred in Japan

■ Survivor identification

- **Even in one local government, each department tends to collect the survivor identification data independently.**
- **Some survivor identification data collected by volunteer organizations was lost when the organization evacuated.**

9

Hi-Tech devices and IT systems

■ did not work in the most seriously damaged areas

- **the loss of power sources**
- **the destruction of communication infrastructure**

Tsunami destroyed a lot of bridges along the rivers.
It also cut off the electric power cables and the communication cables.

10

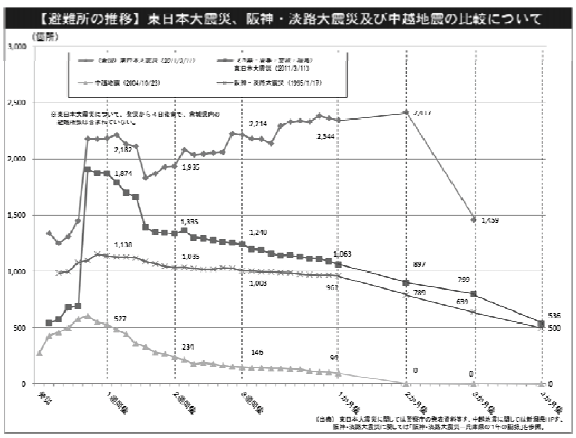
Hi-Tech devices and IT systems

- **were effective around the affected regions**
  - **Voluntary activities on the Internet to accumulate and integrate information were effective in supporting the survivors and rescue services**
- **The scale is too large to manage with Low-Tech methods**

11

Shelters of the Great East Japan Earthquake

- **2400 Shelters (2 months after)**
- **480,000 people had taken refuge**



12

The problems associated with long-term continual preparation for a disaster

- IT systems tend to become obsolete rapidly.
  - In 100 years, almost all current IT systems will be outdated.
  - We have to finance the costs of upgrading the systems and reeducating the users in order to maintain a continual state of preparedness.

13

Resilient activities

- Some of the disaster manuals were not adequate
  - for a disaster of this magnitude.
  - The case of an elementary school of Ishinomaki city
- Education, drills and activities by regional rescue organizations worked comparatively well
  - under the circumstances, in assisting people to escape from the unexpected scale of tsunami.

14

Resilient activities

- **The most effective activities**
  - were those carried out through the cooperation of the people using their own practical knowledge combined with knowledge obtained through disaster education and readiness drills.

15

Resilient activities

- **The most effective activities**
  - example of kindergarten

722 kindergarten had been destroyed by Tsunami but only 3 victims

Kindergarten in Japan must carry on compulsory drill for escape 2 times a year.

they knows the most suitable route for escaping

and required time to escape all children

16

Required features of the resilient service for survivor identification

- Such a service should provide a variety of methods
  - Some methods would not depend on any Hi-Tech devices
  - while other methods will utilize the latest and most efficient technologies.

17

Required features of the resilient service for survivor identification

- Such a service should provide a variety of methods
  - The people on the scene of the disaster can select the most suitable method based on their own judgment.
  - Those methods should be able to collaborate mutually

18

Example of the methods of survivors identification

- Paper (Most popular way)
- Mobile email
- Mobile phone
- Satellite cellular phone
- Twitter / SNS
- FM regional radio
- Neighbors
- Regional publicity vehicle
- Ham radio
- TV / Radio

19

Survivors information by paper in Natori City

20

Free satellite cellular phone for survivors

21

FM regional radio in Natori City

22

Our reference implementation

- **OruneOruyo2**
  - **We have built a IT enable service for survivor identification called 'OruneOruyo2' as a reference implementation of our proposal.**
  - **OruneOruyo2 provides variety of methods**

23

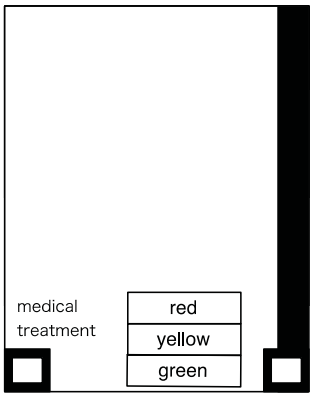
Our reference implementation

- **OruneOruyo2 provides following methods**
  - **Paper**
  - **Standalone databases**
  - **distributed database cloud service**
  - **Twitter BOT type survivor searching**

24

Paper OruneOruyo2

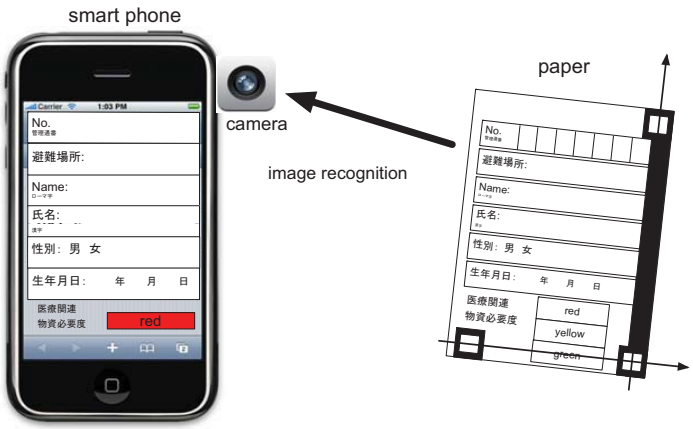
- **Paper-based version of a survivor identification service.**
  - **This service works without the need for power supply or Internet connection.**
  - **The size of the form is almost same as the display size of popular smart phones**



25

Paper OruneOruyo2

- **Data capture from paper Oruneoruyo2**
  - **The data contained on the paper OruneOruyo2 is easily captured as digital data with the camera of a smart phone.**

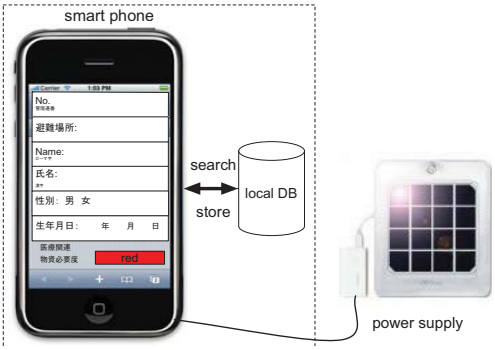


26

Standalone Oruneoruyo2

■ Smart phone based service

- The user of standalone OruneOruyo2 is the administrators of a shelter.
- It has a local database of survivors
- It requires power supply but do not requires Internet connection.

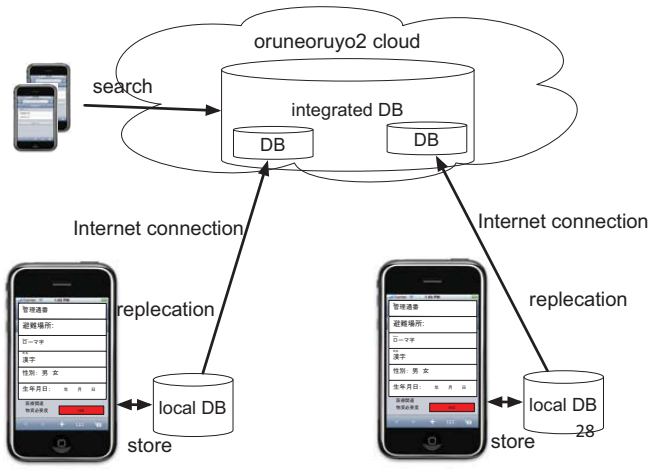


27

OruneOruyo2 cloud

■ is a distributed database system

- This system is an Internet cloud service and its terminals are standalone OruneOruyo2's
- Power supply and Internet connection are required



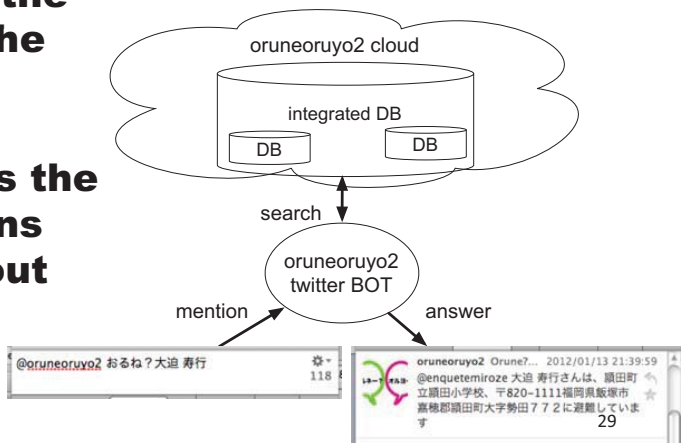
28

OruneOruyo2 Twitter BOT

■Twitter BOT software on the OruneOruyo2 cloud

●Users can Tweet the search request to the Twitter BOT.

●The BOT searches the database and returns the information about the person



29

Social preparation for information management in the time of disaster

■Accurate and rapid information distribution is very important

- many victims of the Great East Japan Earthquake did not get information about the huge Tsunami approaching their area.
- Some people might go to or remain in dangerous areas when they can't get information about their family's safety.

30

Social preparation for information management in the time of disaster

- **Most Japanese local governments and schools**
  - **have introduced compulsory education for disasters to carry out life saving measures**
  - **There are some local governments who perform training for information management in case of disaster, but not many.**

31

Social preparation for information management in the time of disaster

- **When a disaster strikes,**
  - **one of the most important tasks for the local government, and community of residents is to collect and to distribute information about the risks around their residential area**

32

Facilities and equipment in shelters

- Local governments have to prepare the appropriate facilities and equipment to cope with disasters in their area.

33

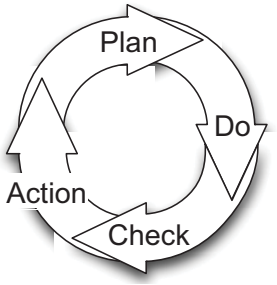
Facilities and equipment in shelters

- The candidate sites for shelter should be equipped with facilities and equipment to be able to be an information management site for disasters.

34

Social preparation for our proposals

- **is indispensable to ensure our service is resilient**
  - **The problem of long-term maintenance of our system**
  - **can be approached by applying the PDCA cycle method (Plan Do Check Action)**
  - **PDCA cycle based on the periodical education and drill for disasters is it.**

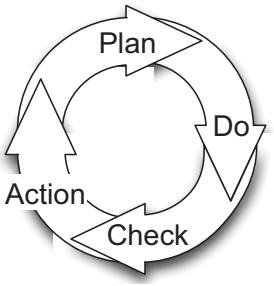


PDCA of education and drill

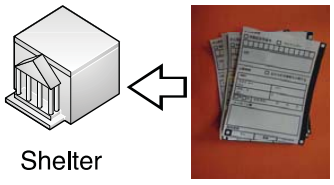
35

Social preparation for our proposals

- **Printed forms for the paper OruneOruyo2**
  - **The candidate sites for shelter should be stocked with forms for the paper OruneOruyo2**



PDCA of education and drill



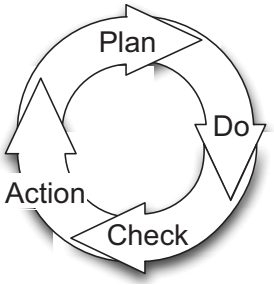
Shelter

printing
paper OruneOruyo2

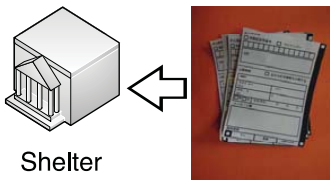
36

Social preparation for our proposals

- **Printed forms for the paper OruneOruyo2**
  - **Otherwise, printing is required in the shelter.**
  - **It would be a fault to require printing as it is a system designed for the situations of loss of power.**



PDCA of education and drill

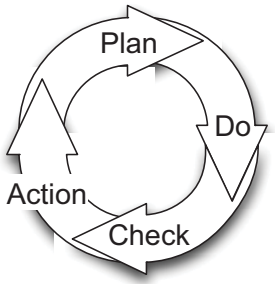


printing
paper OruneOruyo2

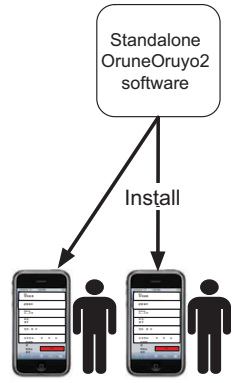
37

Social preparation for our proposals

- **Installation of stand-alone OruneOruyo2 application**
  - **Our proposal also requires the installation of stand-alone OruneOruyo2 application software on smartphones before the time of disaster**
  - **Otherwise, installation of the application is required at the time of disaster.**



PDCA of education and drill

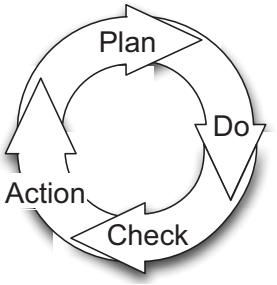


member of residents

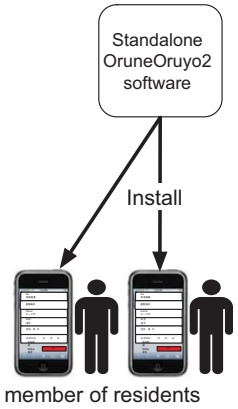
38

Social preparation for our proposals

- **Installation of stand-alone OruneOruyo2 application**
  - **As a part of the PDCA cycle of the education and drills for disasters.**
  - **Every member who are responsible for information management at the time of a disaster should install this application software on their smartphones**



PDCA of education and drill



39

Implementation and self-rebuilding system

- **Using the application framework**
  - **Ruby on the Rails 3.2 and jQuery mobile**
  - **program generation, testing program generation, database migration and deployment are semi-automated**
  - **with declarative definitions of the target system.**

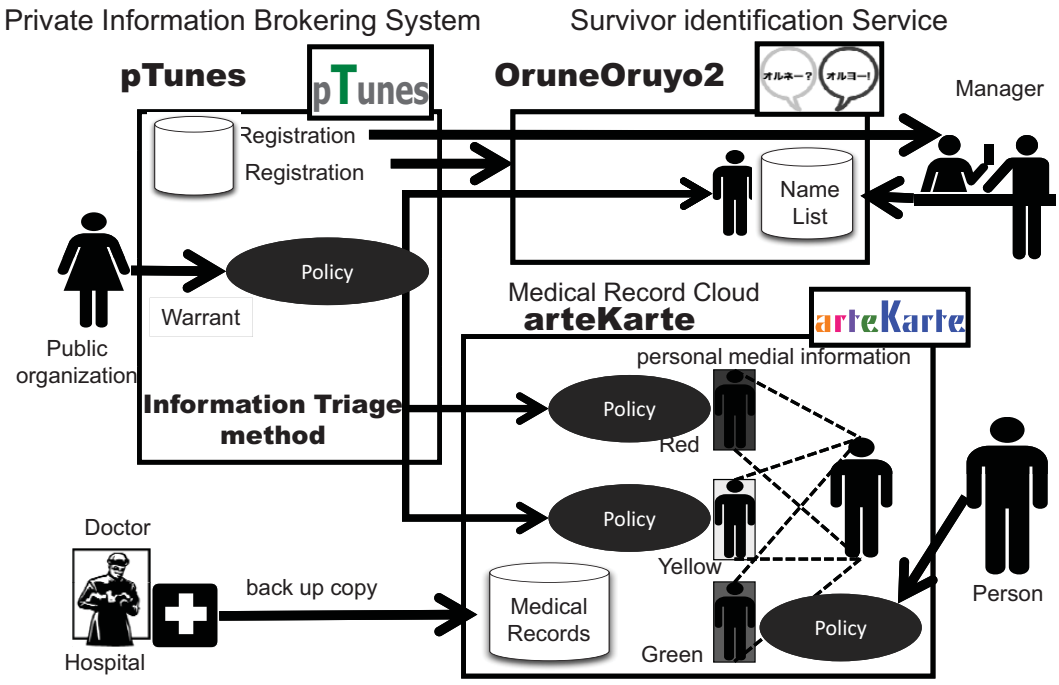
40

Implementation and self-rebuilding system

- **Using the application framework**
  - The current technology is limited in it's ability to automate these system building processes
  - however the re-building cost is reduced dramatically

41

Whole Services of our Reference Implementations



Conclusion

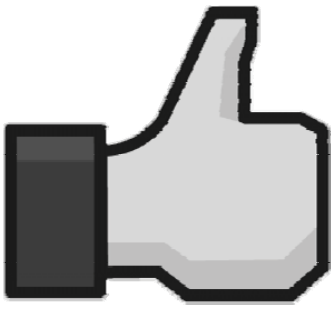
- We propose a resilient IT enable service for survivor identification.
- We pointed out that such an IT enable service
  - should provide a variety of methods
  - could not be worked and maintained without social preparation with PDCA cycles

43

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

The Study on the effect of Facebook's social network features toward intention to buy factors on F-commerce in Thailand

Wannapon Suraworachet
Sarawadee Premsiri
Nagul Cooharojananone



1

Agenda

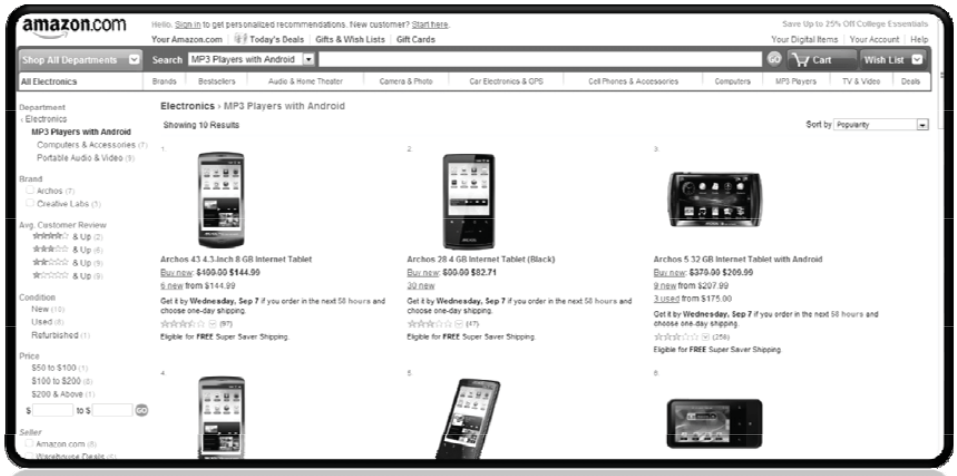
- Introduction
- Methodology
- Analysis
- Suggestion
- Future work

2

Introduction

3

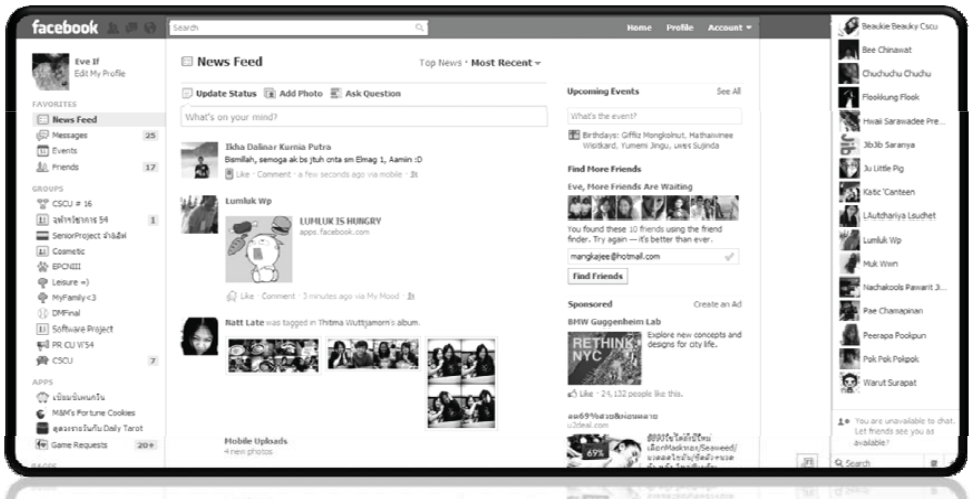
E - commerce



Amazon.com

4

Social Media



Facebook.com

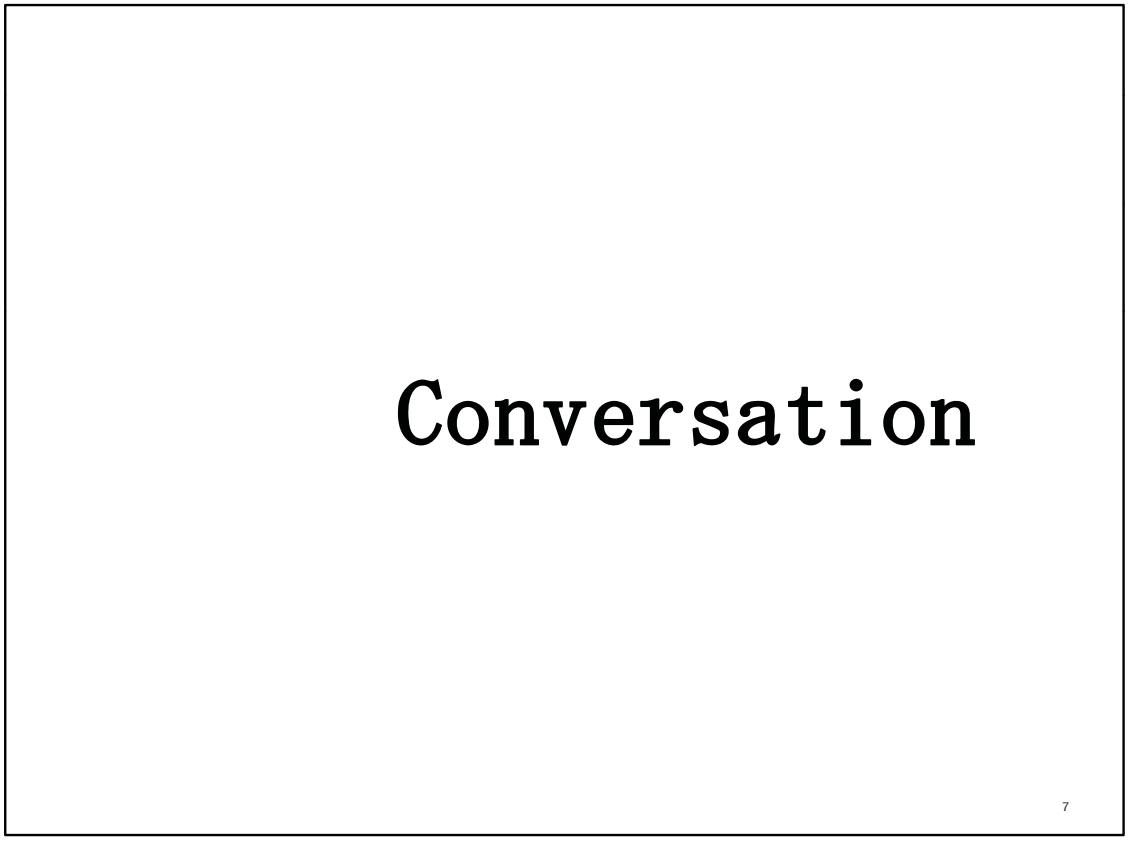
5

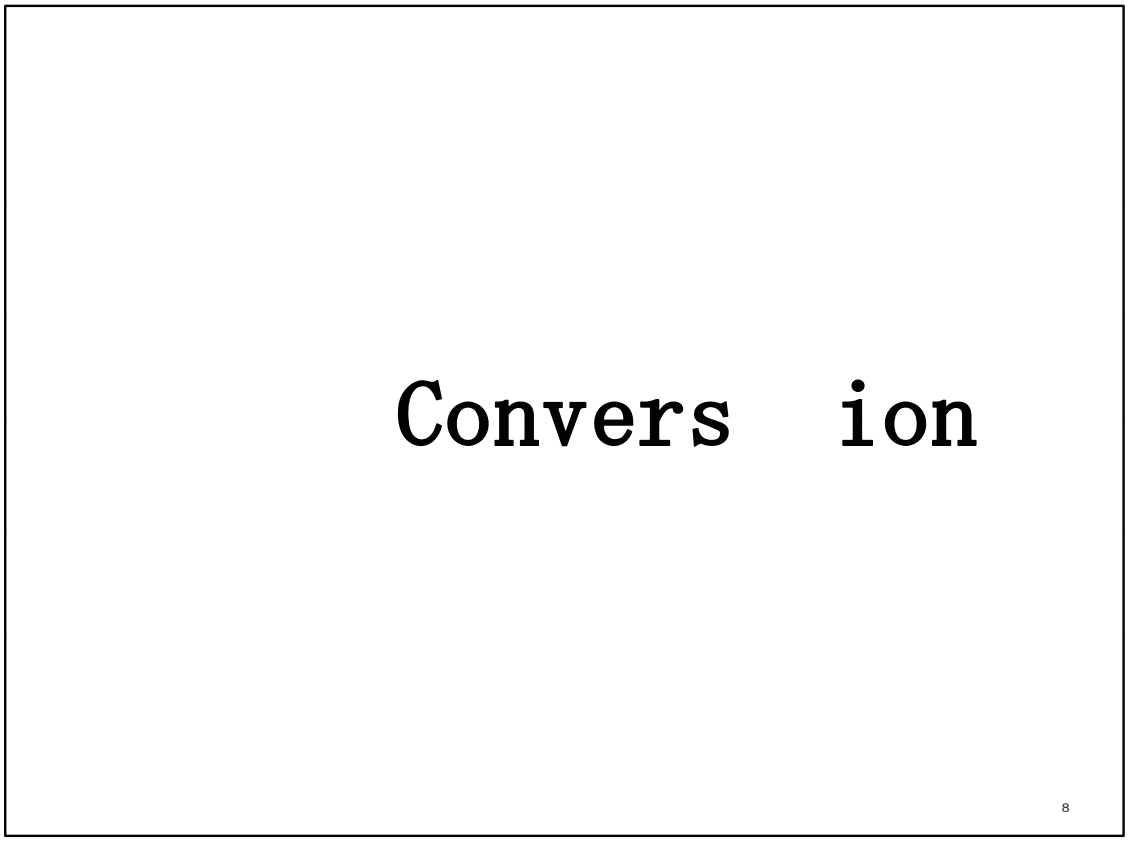
Social Media

+

= Social Commerce

6


Conversation
7


Convers ion
8

Conversion

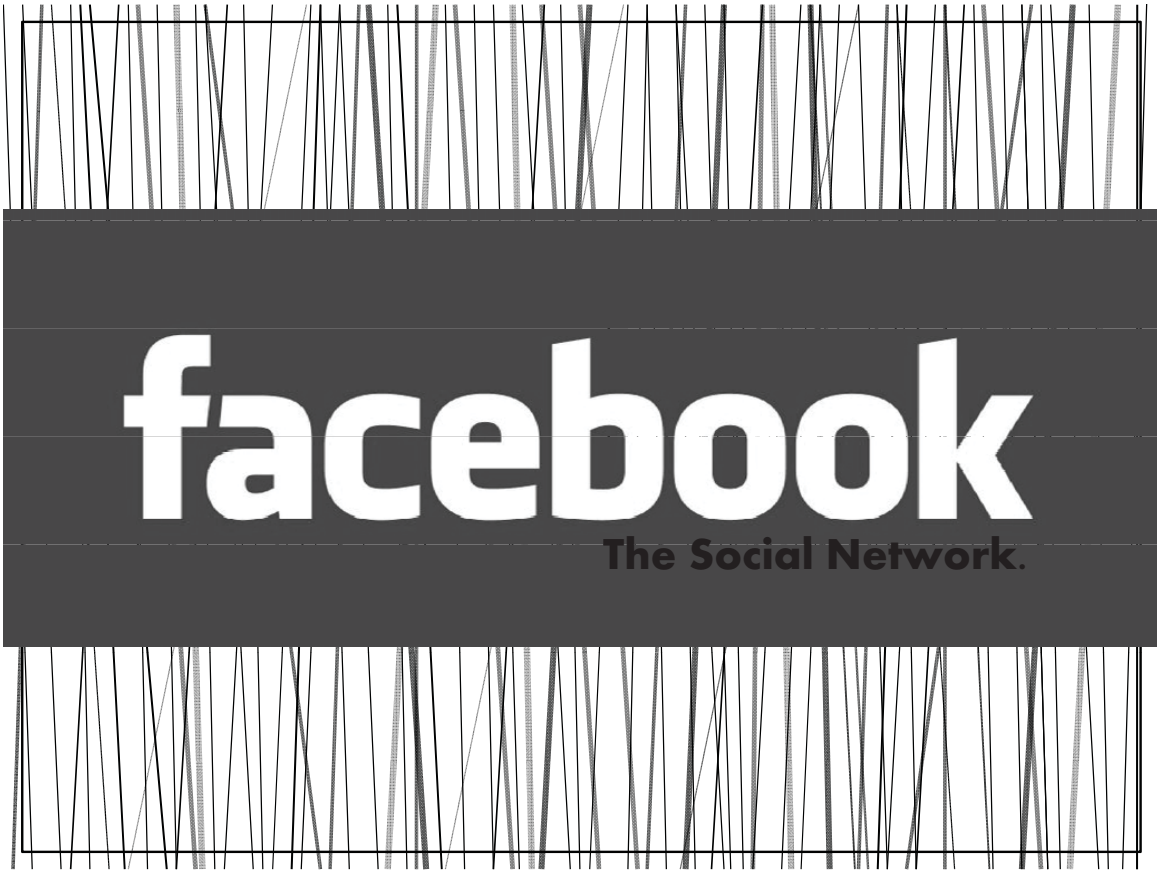
9

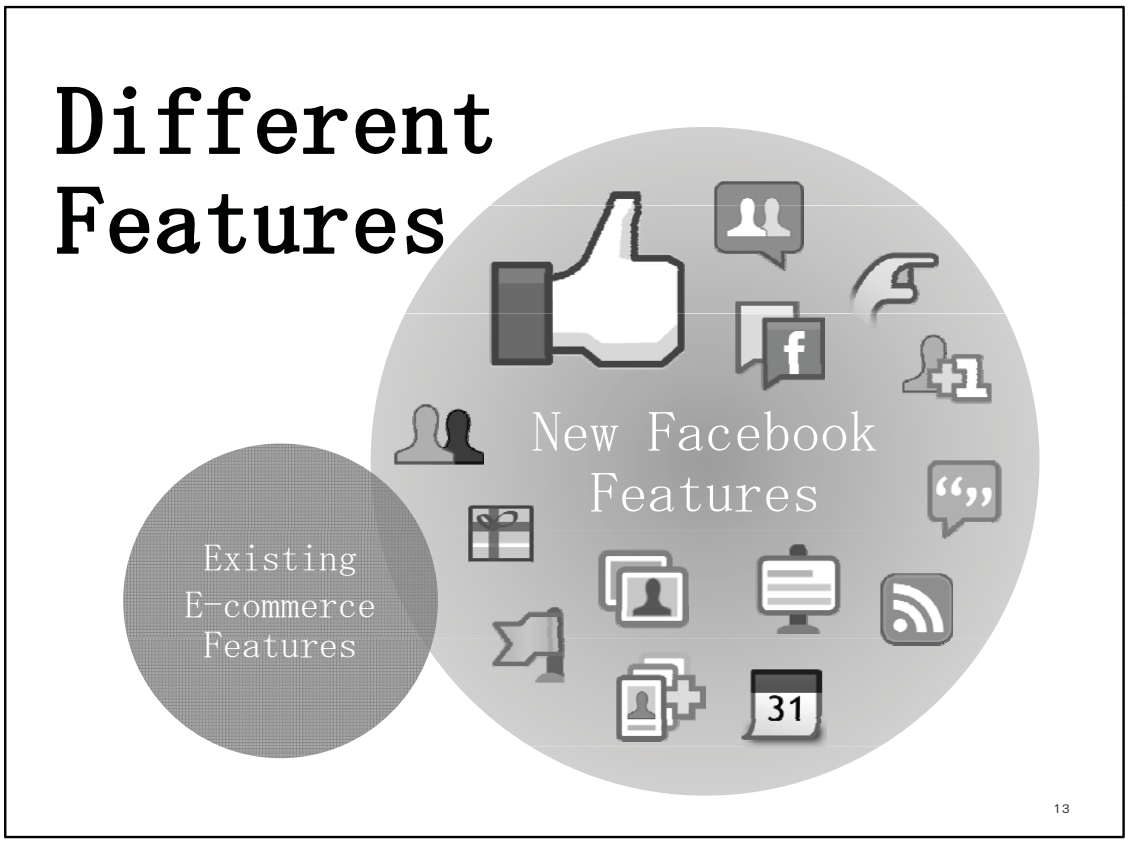
E - commerce

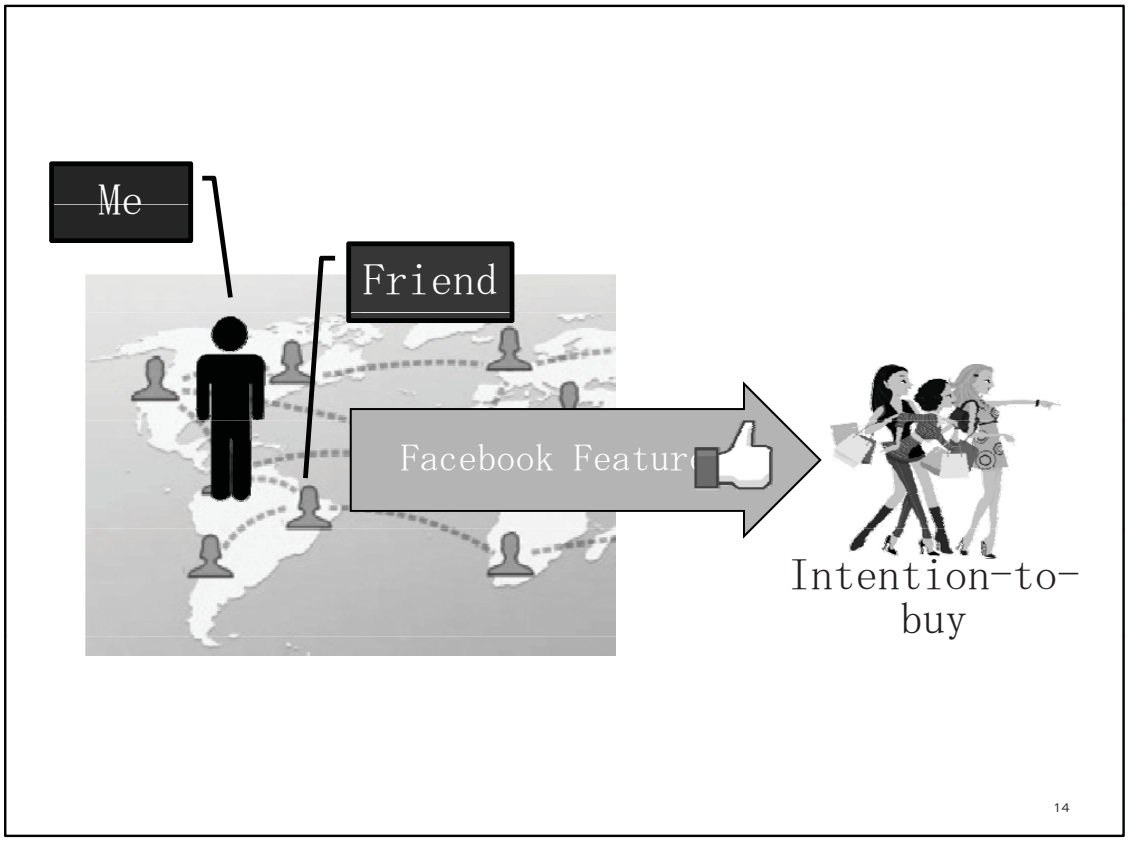
10

F - commerce

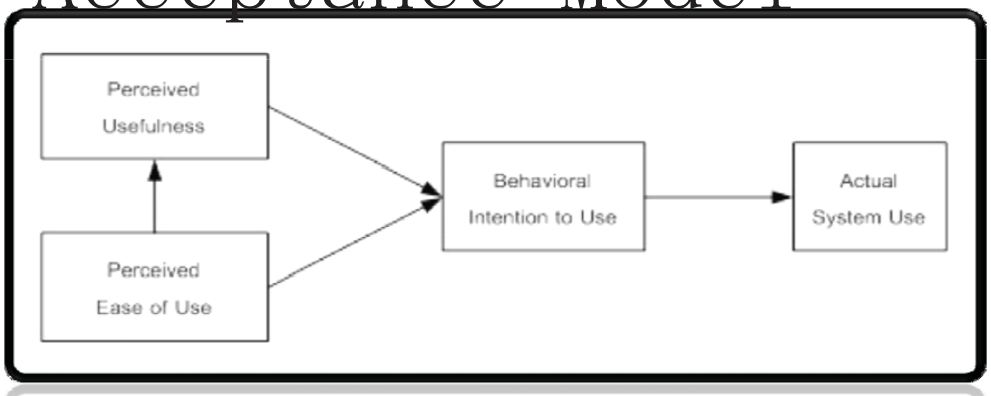
11




Different Features
New Facebook Features
Existing E-commerce Features
31
13


Me
Friend
Facebook Featur
Intention-to-buy
14

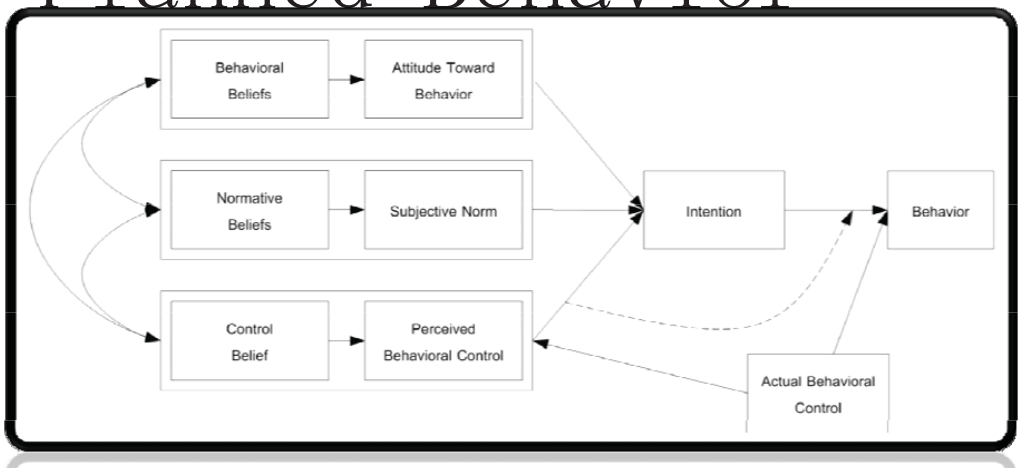
Technology Acceptance Model



Devis et. al. (1989), Venkatesh et. al. (2003)

15

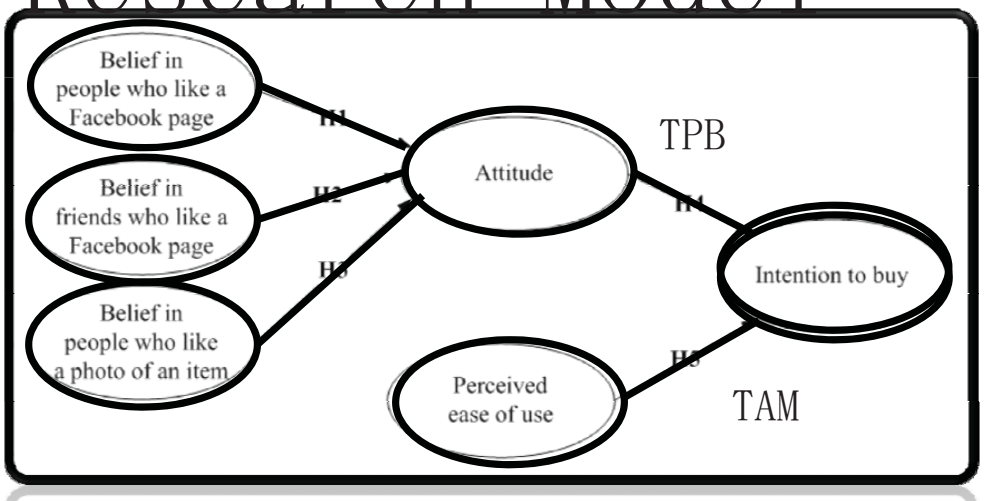
Theory of Planned Behavior



Icek Ajzen (2006)

16

Research Model



17

Beliefs in the number of 3 Facebook Features

People "like" page

Friends "like" page

People "like" item

$2^{Features} = 2^3 = 8$ different mock-ups

18

A Survey

1 sample : same scenario + 1 random mock up + same questionnaire

19

Methodology

20

Product

Poll

To buy product under condition :

1. Reusable
2. Affordable
3. Unisex

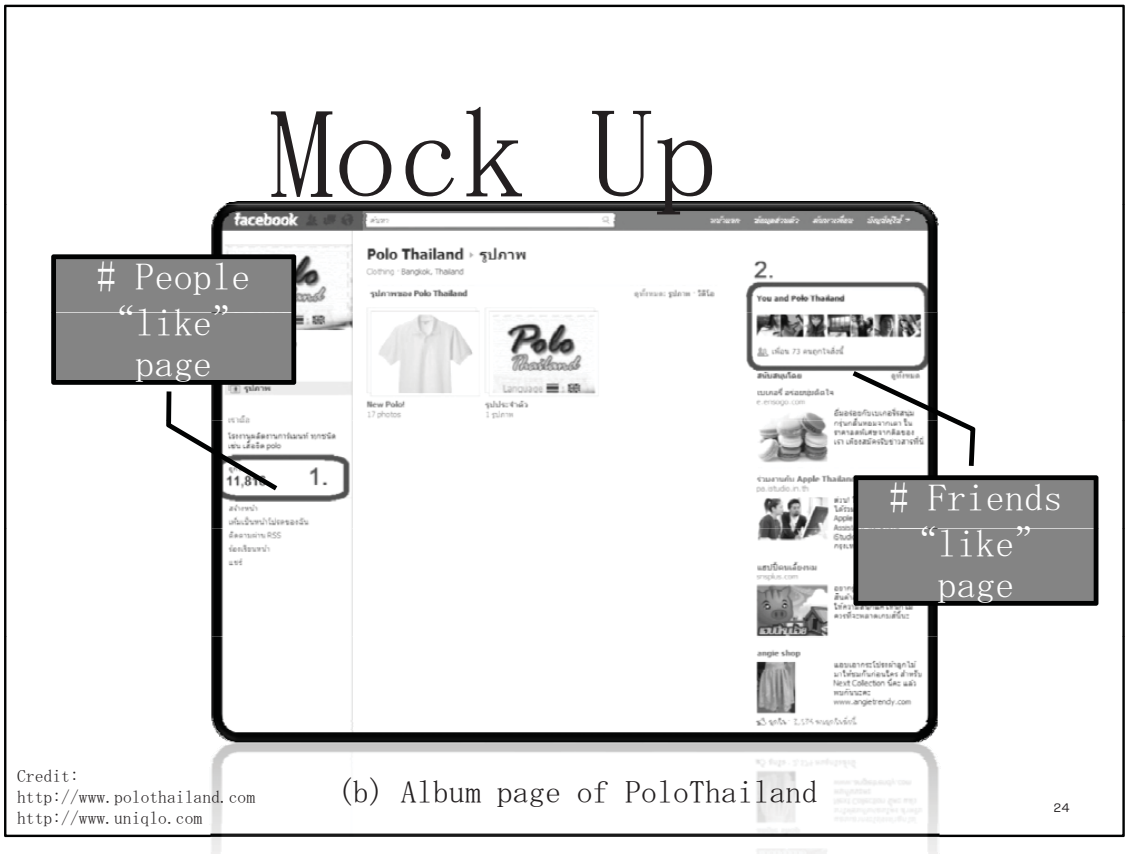
21

Scenario

"Your friend is going to hold his birthday party and you are invited to join this event. Thus, you have to buy a new plain blue polo shirt to match his party's theme but you don't know where to buy it directly. Therefore, you decide to buy it online via Facebook."

22


Mock Up
People "like" page
Friends "like" page
Polo Thailand
POLOThailand.com
รับพลิตเสื้อโปโล
คอกลม
T-Shirt
Jacket
POLOTHAILAND
11,816
1.
2.
Credit:
http://www.polothailand.com
http://www.uniqlo.com
(a) Welcome Page of PoloThailand
23


Mock Up
People "like" page
Friends "like" page
Polo Thailand › รูปภาพ
2.
Credit:
http://www.polothailand.com
http://www.uniqlo.com
(b) Album page of PoloThailand
24

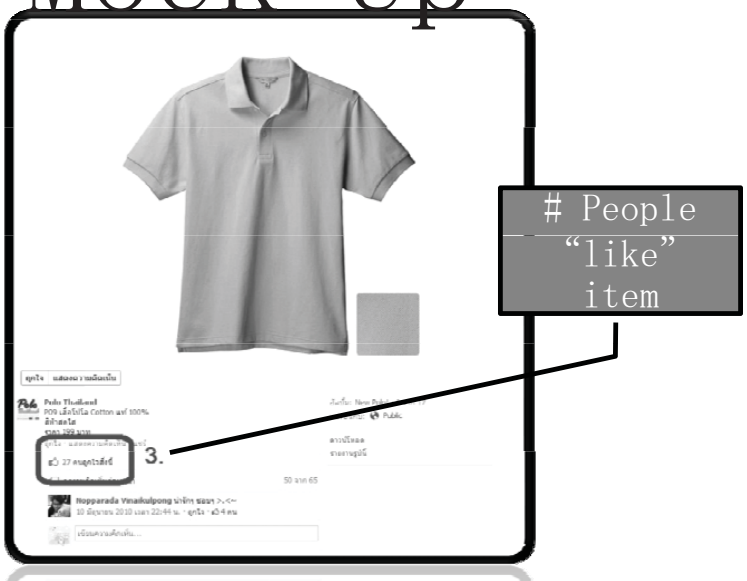
Mock Up

Credit:
http://www.polothailand.com
http://www.uniqlo.com

(c) All Photos of "New Polo!" Album

25

Mock Up



Credit:
http://www.polothailand.com
http://www.uniqlo.com

(d) Detail Page of Blue Polo Shirt

26

Questionnaire

Section	Sub section	Description
1	A	The Simulating Situation and Mock-Up
	B	Rating Scale of Consumers' Opinions
2		Questions and Suggestions (Optional)
3		Social Network Experience
4		Online Shopping Experience
5		General Information

27

Factors

Measured Factors	Number of Questions
Attitude towards F-commerce	7
Belief in the number of people who like a Facebook fan page	7
Belief in the number of friends who like a Facebook fan page	6
Belief in the number of people who like a photo of an item	6
Perceived ease of use	6
Intention to buy	6
TOTAL	38

28

Point Likert scal

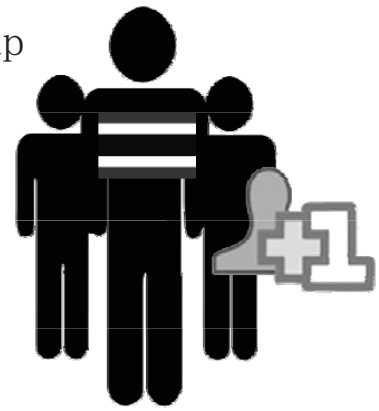
Strongly agree → Somewhat agree → Somewhat disagree → Strongly disagree

29

Samples

340 Samples

Average 42 samples/Mock up



Convenient Sampling Methods

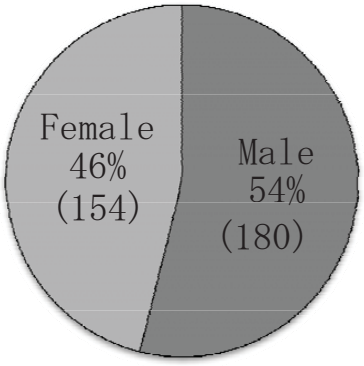
30

Analysis

31

articipants' Characteristi

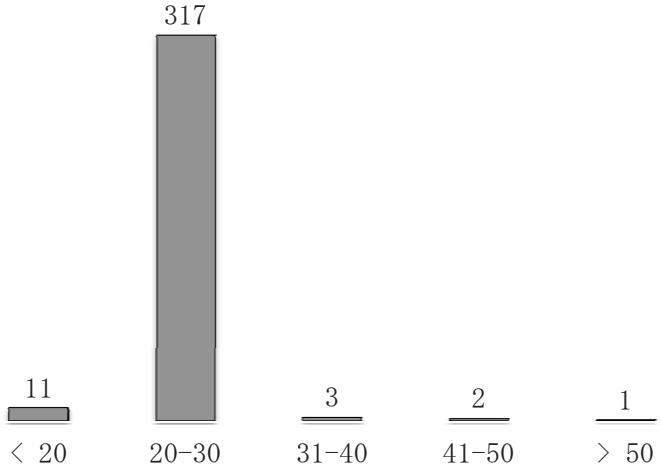
Gender



32

articipants' Characteristi

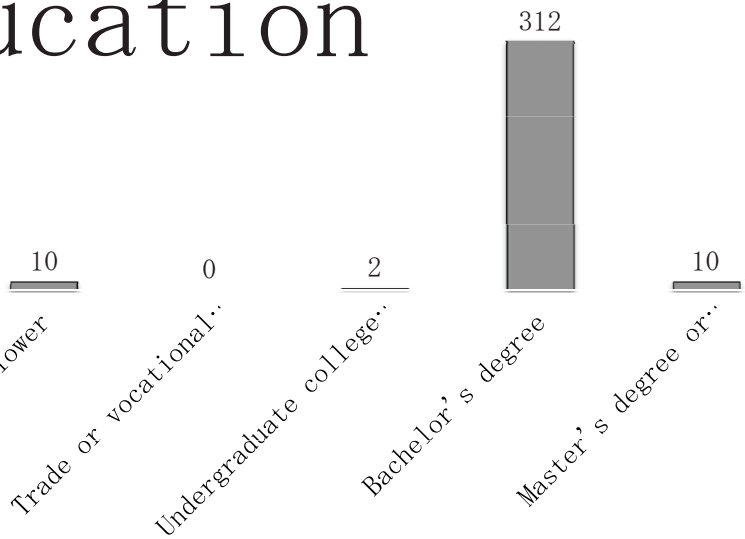
Age(Years)



33

articipants' Characteristi

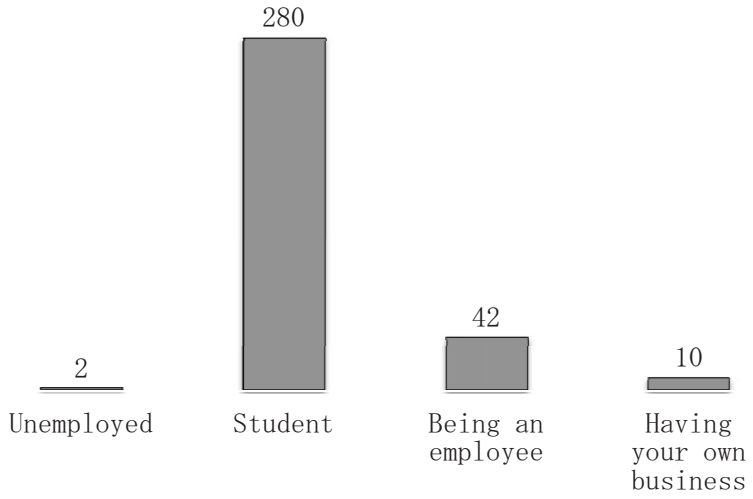
Education



34

articipants' Characteristi

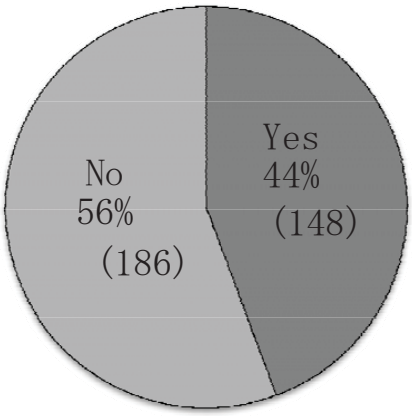
Employment



35

articipants' Characteristi

OnlineShoppingExp



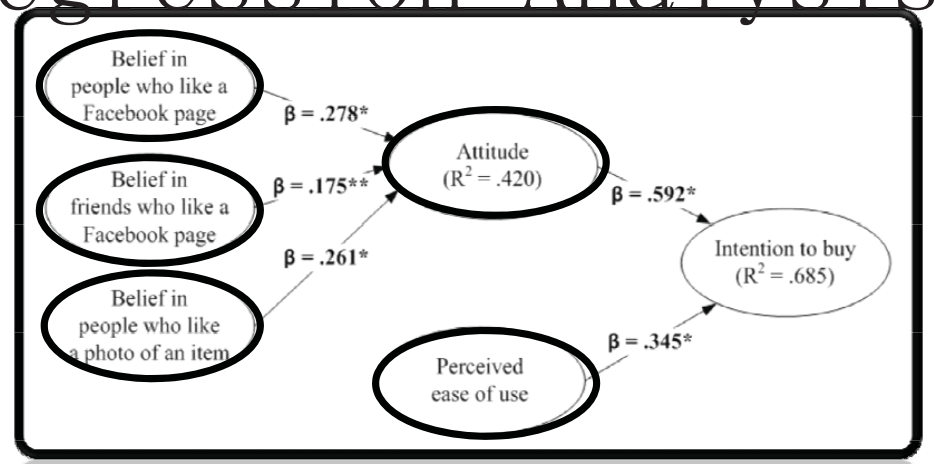
36

eliability & Factor Analysi

Constructs	Number of Questions	Cronbach's alpha
Attitude (AT)	7	0.848
Belief in People who like a Facebook page (BP)	3	0.802
Belief in Friends who like a Facebook page (BF)	2	0.568
Belief in People who like a Photo of an Item (BI)	2	0.739
Perceived Ease of Use (PE)	6	0.816
Intention to buy (IN)	6	0.931

37

Regression Analysis



Note. p < .001*,
p < .01**

38

Compare Means

Is there significant relationship closeness in beliefs of friends who like a Facebook f

Hypothesis:

μ_S = The average of Beliefs in friends who like a FB fan page for close relationships group

μ_M = The average of Beliefs in friends who like a FB fan page for further relationships group

Null hypothesis (H_0): $\mu_S = \mu_M$:

There is no significant relationship closeness difference in Beliefs in friends who like a FB fan page

Alternative Hypothesis (H_A): $\mu_S \neq \mu_M$:

There is significant relationship closeness difference in Beliefs in friends who like a FB fan page

39

Compare Means

Is there significant relationship closeness in beliefs of friends who like a Facebook f

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Closeness of relationships factor score	Equal variances assumed	.133	.715	-2.734	332	.007	-.41533249	.15189599	-.71413242	-.11653256
	Equal variances not assumed			-2.724	67.206	.008	-.41533249	.15246045	-.71962765	-.11103733

40

Suggestion

41

Facebook

- Payment system
- Delivering system
- Categorize system
- Stocking system
- product Search
- Try-On Cloth
- more specific Rating Scale
- more Privacy - less Public

42

Retailors

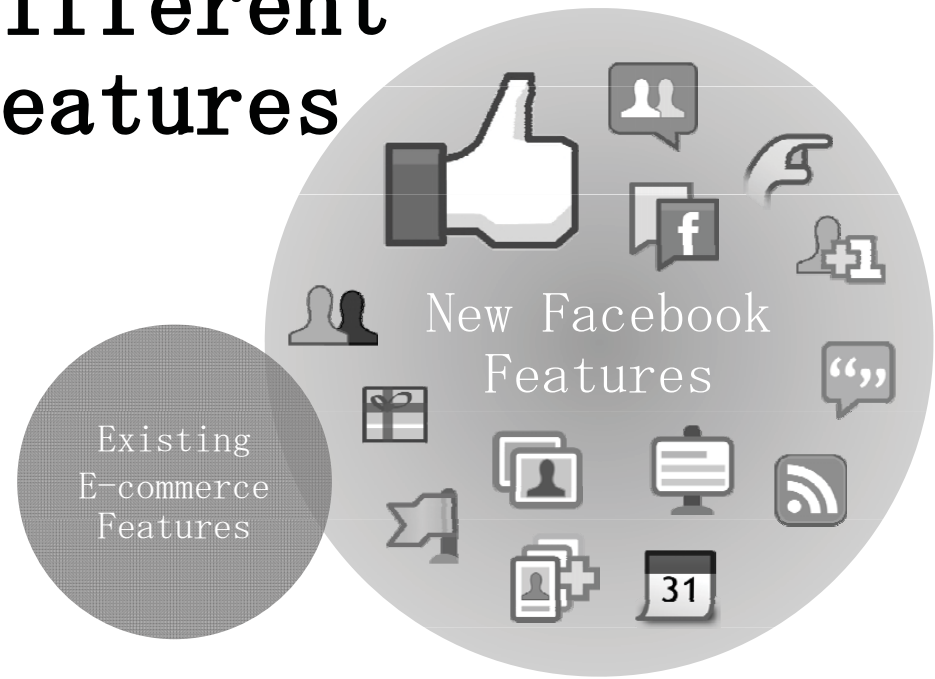
- Variety of Product (Unique/Cheaper)
- Attractive Models
- more Product Details
- more Product Images
- less Negative Comments
- high Positive Comments
- more Brand Information
- good Welcome Page

43

Future works

44

Different Features



45

Thank you for attention

46

BACK UP

47

8 UI Mock Ups

Mock Up Number	The Number of People who Like a Facebook Fan Page	The Number of Friends who Like a Facebook Fan Page	The Number of People who Like a Photo of an Item
1	11816	73	27
2	11816	73	2
3	11816	2	27
4	11816	2	2
5	315	29	27
6	315	29	2
7	315	2	27
8	315	2	2

$$2^{\text{Features}} = 2^3 = 8$$

48

List of 100 Thai brand pages

	The number of people who like a page	The number of friends who like a page	The number of people who like a photo of an item
AVERAGE	5294.38	2.32	2.537

49

Reliable Questions of Attitude(AT)

Code	Attitude towards F-commerce
AT_1	The idea of using PoloThailand page to buy a product is appealing.
AT_2	I like the idea of buying a product on PoloThailand page.
AT_3	Using PoloThailand page to buy a product is good idea.
AT_4*	Using PoloThailand page to buy a product is foolish idea.
AT_5	Using PoloThailand page to buy a product is willingness idea.
AT_6	Using PoloThailand page to buy a product is pleasant idea.
AT_7*	I dislike the idea of buying a product or on this page.

*Note. * Item codes AT_4 and AT_7 were negatively worded items; the participants' responses were reversed.*

50

Reliable Questions of Belief in People who Like a Facebook page (BP)

Code	Belief in the number of people who like a Facebook fan page
BP_2	I think that the number of people "like" PoloThailand page attracts me to buy that blue polo shirt.
BP_5	If there is higher number of people "like" PoloThailand page, I would buy that blue polo shirt from this shop.
BP_6	The number of people "like" PoloThailand page makes me feel easier to decide to buy that blue polo shirt.

51

Reliable Questions of Belief in Friends who Like a Facebook page (BF)

Code	Belief in the number of friends who like a Facebook fan page
BF_2	I think that my friends who "like" PoloThailand page want to buy some products.
BF_3	I think that my friends who "like" PoloThailand page would recommend me to buy PoloThailand's products.

52

Reliable Questions of Belief in People who Like a Photo of an Item (BI)

Code	Belief in the number of people who like a photo of an item
BI_4	I think that people "like" blue polo shirt pictures because they found that this product is interesting to purchase.
BI_5	I think that people "like" blue polo shirt pictures because this product is suitable to their wants.

53

Reliable Questions of Perceived Ease of Use (PE)

Code	Perceived ease of use
PE_1	PoloThailand page makes me feel more effective.
PE_2	It is easy to use PoloThailand page as I want.
PE_3	The interactions with PoloThailand page are clear and understandable.
PE_4	PoloThailand page is easy to use.
PE_5	The profile picture of PoloThailand page is clear and understandable.
PE_6	The welcome page of PoloThailand page is clear and easily understandable.

54

Reliable Questions of Intention to Buy (IN)

Code	Intention to buy
IN_1	Buying product from PoloThailand page is something I would do.
IN_2	I Intend to continue buying products from PoloThailand page.
IN_3	I will repurchase products from this page.
IN_4	I will recommend other people buying products from PoloThailand page.
IN_5	I plan to buy products from PoloThailand page in the short term.
IN_6	I plan to buy products from PoloThailand page in the long term.

55

Problems

56

Convenient sampling method
Use probabilistic sampling methods

Unnoticed the vary numbers in Mock-up
Tell them to be more concentrated

Similar patterns of questions
Use more obvious questions

Clothing product is too common
Try different extraordinary products

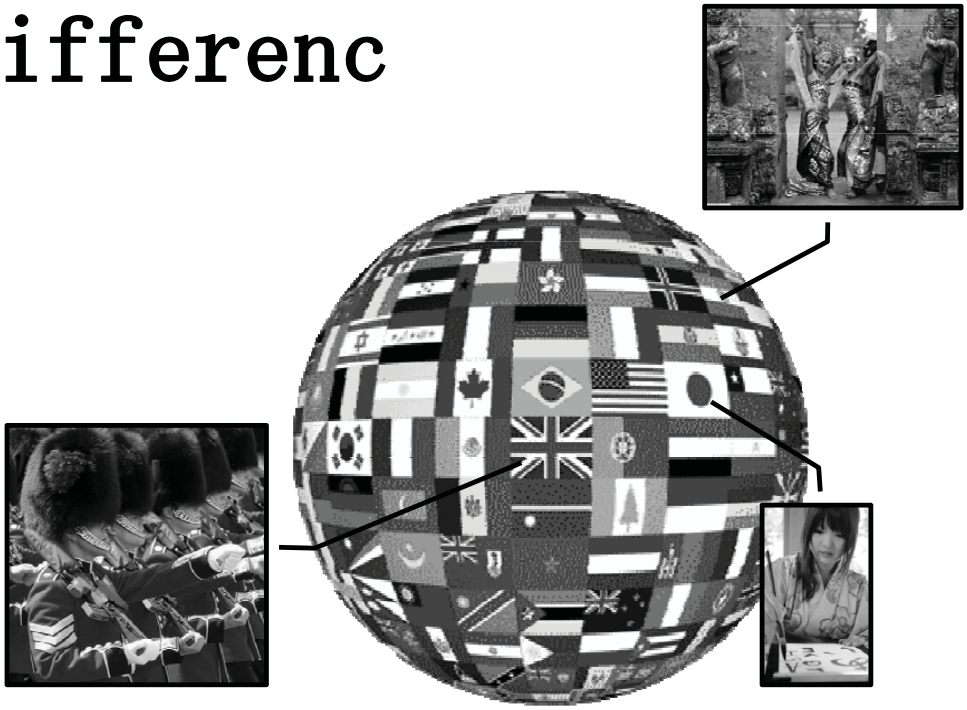
Fast change in Facebook Fan Page
Use an actual page

57

Future works

58

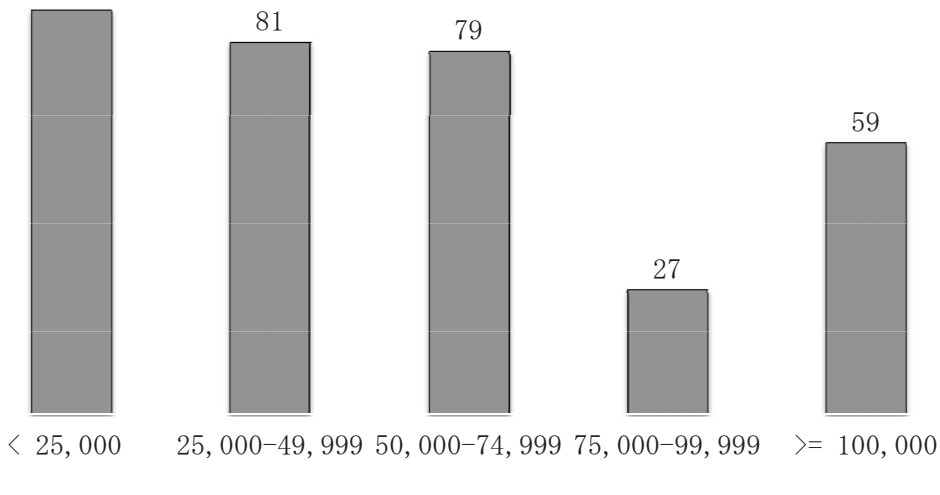
Culture Difference



59

articipants' Characteristi

MonthlyHouseholdIncome(Bahts)



60

A local currency system reflecting variety of values with a swarm intelligence

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KANNABE Hideyuki MIYATA Sumiko
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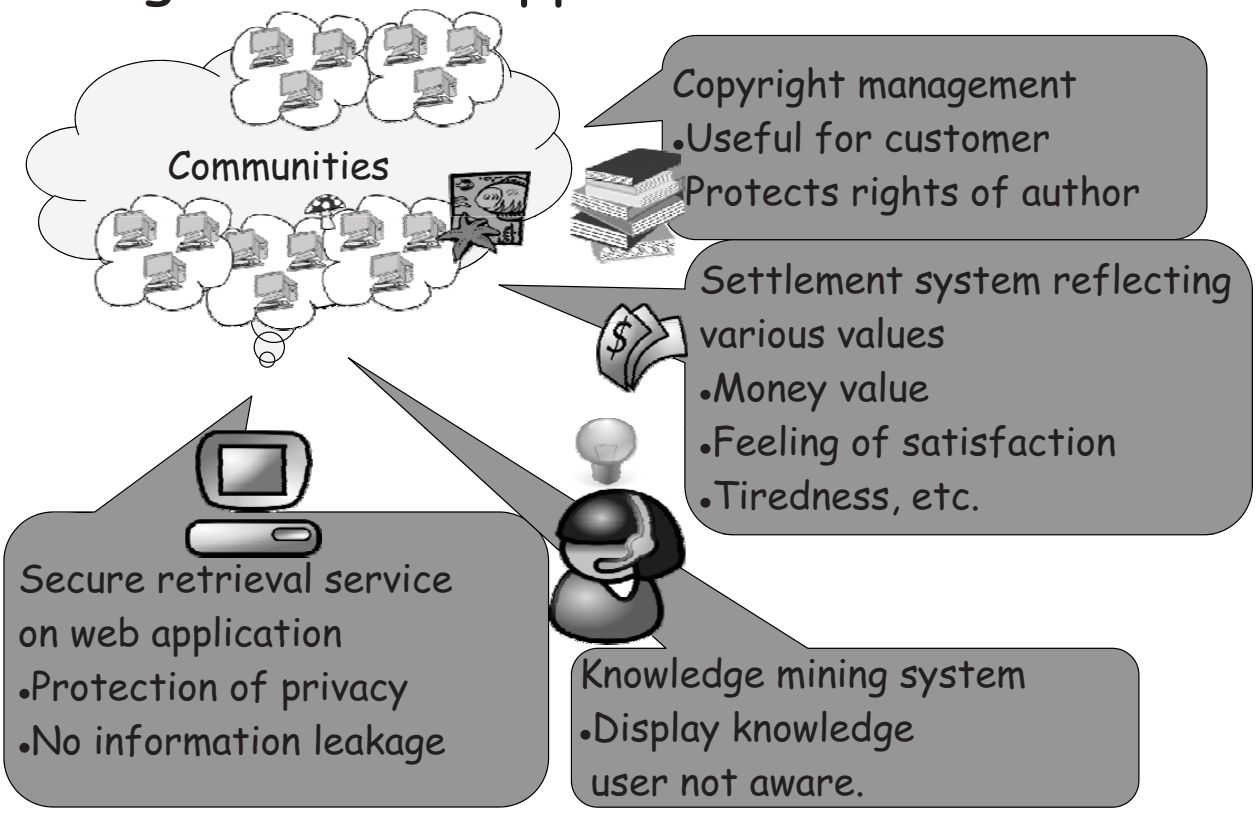
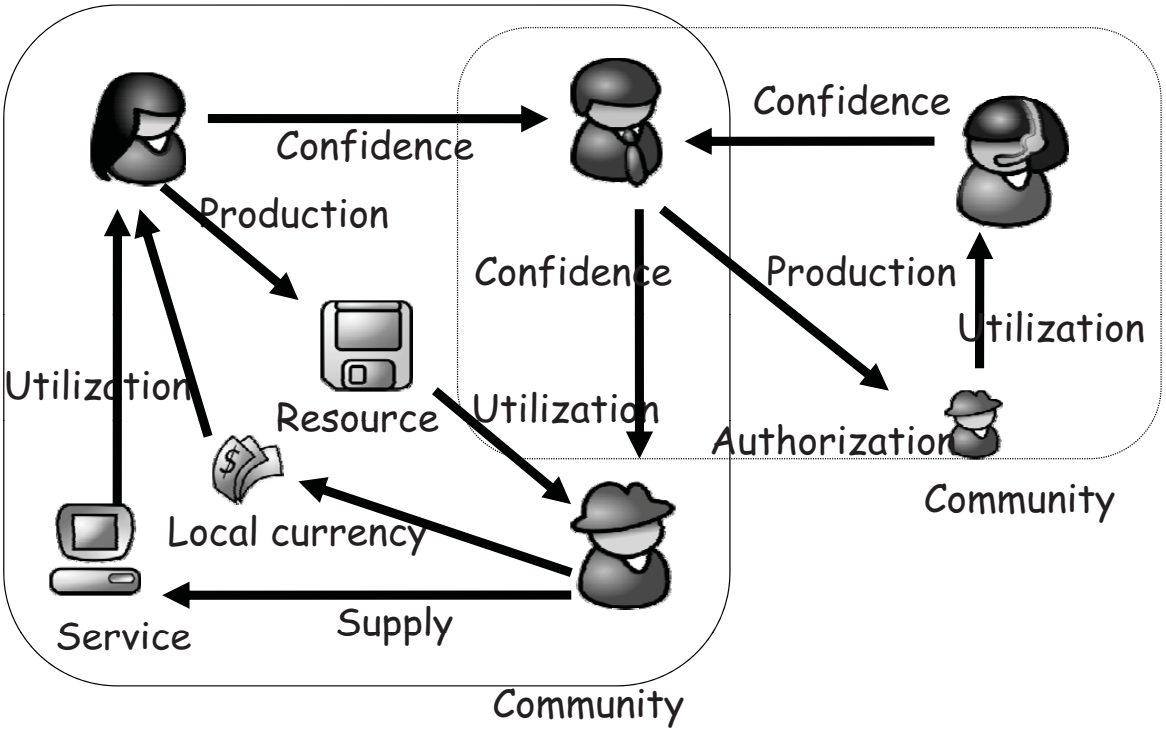
MORIZUMI Tetsuya
Toyo Networks & System Integration Co.,Ltd.
Engineering Management Division
Samukawa-machi, Koza-gun,Kanagawa 253-0198,Japan

The goal of our approach

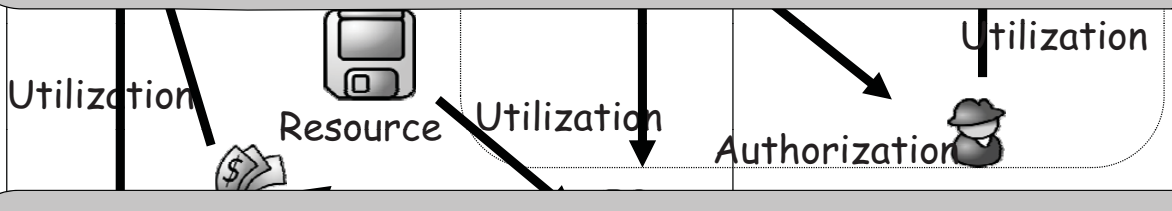


Various relationships in communities



Kanagawa University Kinoshita Lab. Feb 21, 2013 (3)

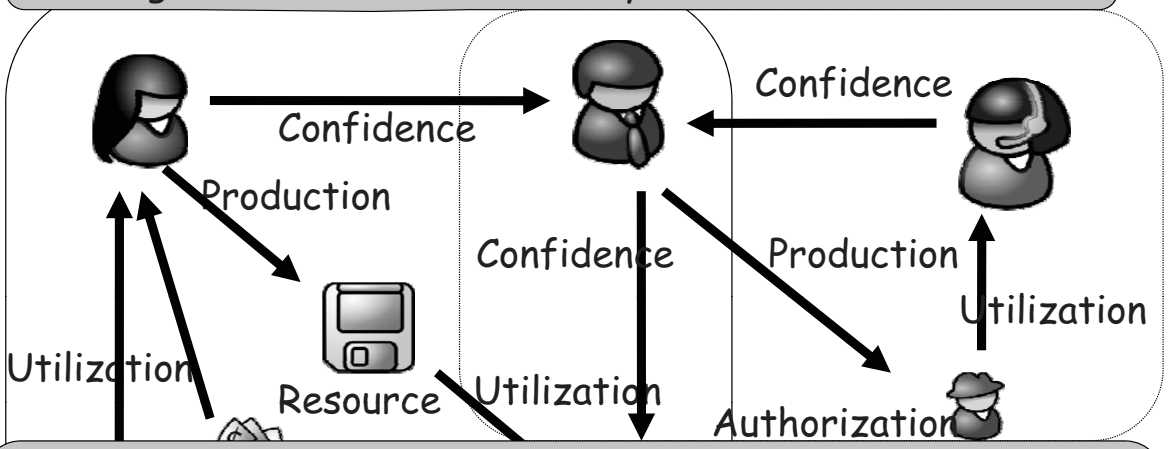
In various different societies, the information resources need to be circulated among communities that have different values and public entities that do not belong to any particular community.



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

Kanagawa University Kinoshita Lab. Feb 21, 2013 (4)

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



Appropriate values for the information resources and services should be evaluated before these values and information resources are exchanged in order to circulate the information resources more smoothly.

Community

Furthermore, information resources should be prevented from leaking.

Kanagawa University Kinoshita Lab. Feb 21, 2013 (5)

Background

- We circulate information resources, e.g. knowledge, writing, and personal information, through networks with various tools of information technology in contemporary society.
- However, the information resources in different societies need to be circulated among communities that have different values and public entities that do not belong to any particular community.
- Members are bound by agreements based on confidence and exchanges of resources and money such as local currencies.
- Appropriate values for the information resources and services should be evaluated before these values and information resources are exchanged so that the information resources can be circulated more smoothly.

Kanagawa University Kinoshita Lab. Feb 21, 2013 (6)

Background

- The local currency is suitable for financial settlements between members of a community.
- We studied a value exchange system with agents to enable smoother exchanges of information resources and services.
- We defined the value vector that describes the variety of values in our system.

Kanagawa University Kinoshita Lab. Feb 21, 2013 (7)

Background

- Next, we defined the settlement between two entities.
- Then, we defined the circulation of the values with securities.
- The credit of the securities was evaluated by using a human

relationship diagram.

- Furthermore, we evaluated the settlement based on an information capsule with agents.

Kanagawa University Kinoshita Lab. Feb 21, 2013 (8)

Purpose

- Multiple values in our scheme should be combined to pay them as a reward for services.
- It is generally difficult to decide optimum combinations that maximize the properties of entities.
- We apply Particle Swarm Optimization (PSO) which is an optimization method that emulates the behavior of creatures such as a flock of birds or a school of fish.
- And we propose a scheme to decide the optimum combinations of values as a reward of services.

The exchange of values

A. Values and services

- When information resources and services are supplied through a network, their values are unified and expressed in prices in conventional settlements.
- Furthermore, finding appropriate parties with which to exchange and the services for currency can be difficult.

The exchange of values

A. Values and services

- It is also difficult to exchange one local currency for services in different communities.
- Thus, various types of value should be considered to describe a user's conditions for the transactions, and the information capsule with the agent is required to exchange services between communities.
- Certain values, e.g. laws, ethics, or feelings of satisfaction, are difficult to replace with the conventional value of money.

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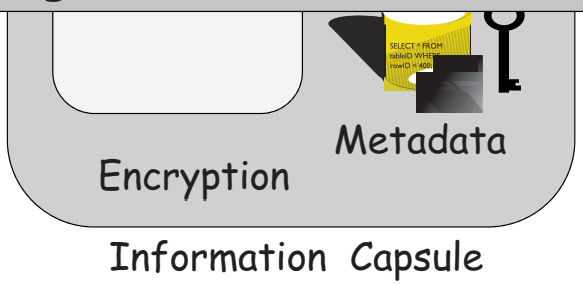
The exchange of values

B. The implementation of the scheme

The information capsule is a framework that circulates digital contents such as music, movies, and books

It can be used to control the access to the Contained information and negotiate the content usage conditions with other agents.



of contents.
- Conditions are considered on basis of the meta-data stored in capsule.
- Decryption is controled by agent with key stored in meta-data.

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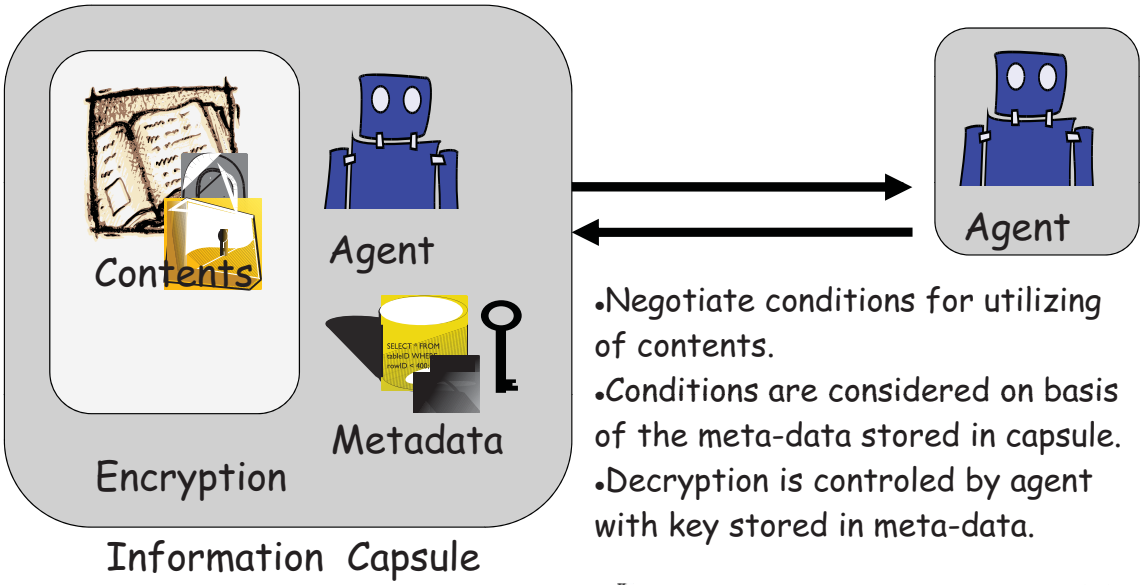
The exchange of values

B. The implementation of the scheme



- Negotiate conditions for utilizing of contents.
- Conditions are considered on basis of the meta-data stored in capsule.
- Decryption is controled by agent with key stored in meta-data.

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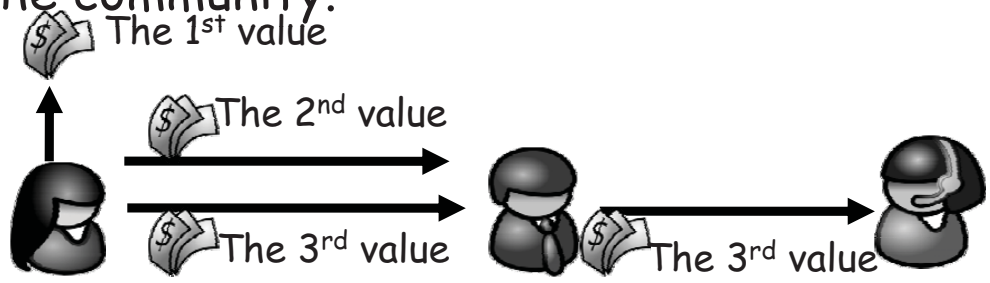
The exchange of values

C. Classification of values

We classify the values into three categories.

- The first value: value is effective for oneself.
- The second value: value is effective for entities who transact with each other.
- The third value: value is recognized commonly in the community.



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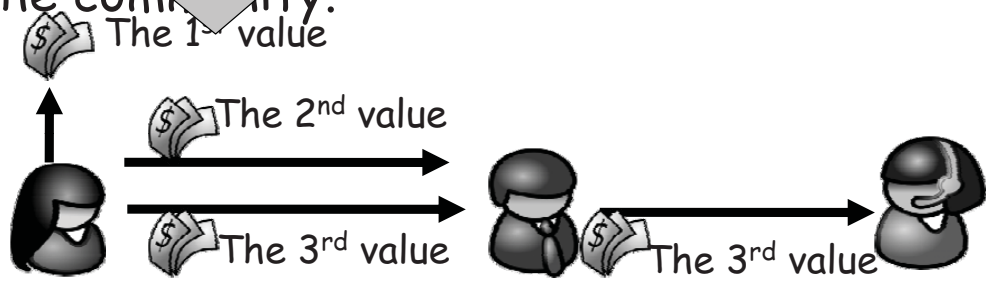
The exchange of values
C. Classification of values

To circulate the first and second values, we have to convert them into the third value.

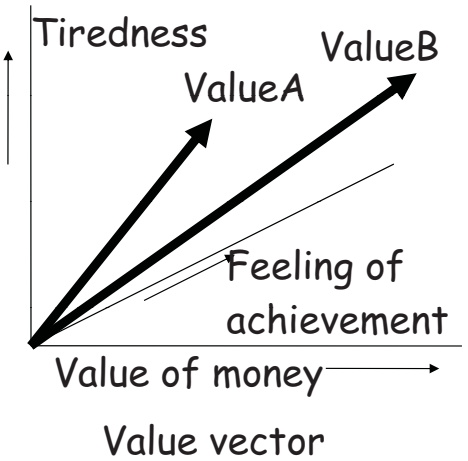
- The second value: value is effective for entities w
- It is difficult to circulate the first and second values one after another.
- nmonly in the com ity.



The exchange of values
D. *Value vector*

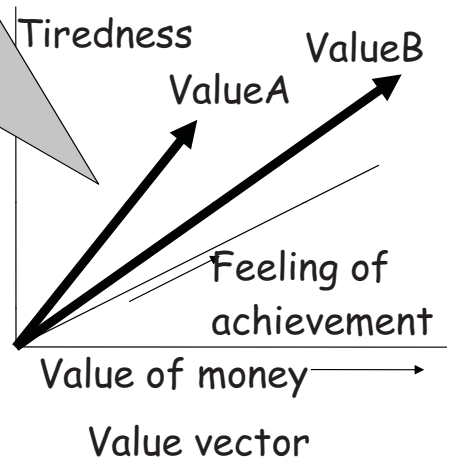
- We describe the value as the vector.
- Each axis shows a value. Let $(x_1, x_2, \ldots, x_n)$ be the values.
- The value of object x denoted as

$$\mathbf{V}_x = (x_1, x_2, \ldots, x_n)$$



...lues

Independent axes will be determined by multivaliate statistics



Value vector

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- The value of object x denoted as

$\mathbf{V}_x = (x_1,x_2,\ldots,x_n)$

The exchange of values

D. *Value vector*

- Services, products, and local currencies have a value vector.
- We introduce two types of value vector functions.
- One is the transaction evaluation function $F_{transe}(V_x,V_y)$, which shows the gain of the transaction from the viewpoint of the entity e.
- V_x *and* V_y *are* a value vector of a service

and a reward for the service, respectively.

The exchange of values

D. *Value vector*

- F_{transe} becomes positive if the transaction yields a profit for *e*.
- The other is the property function F_{prope}, which shows amount of the property of the entity *e*.

The exchange of values

E. Transactions

- The transaction comes off successfully if

$$F_{transA}(V1, V2) > 0 \wedge F_{transB}(V2, V1) > 0$$

- Let $V_A(t)$ and $V_B(t)$ be the value vectors at the time *t* of entities A and B respectively.
- Then, the amounts of property the entities have after a transaction are described as

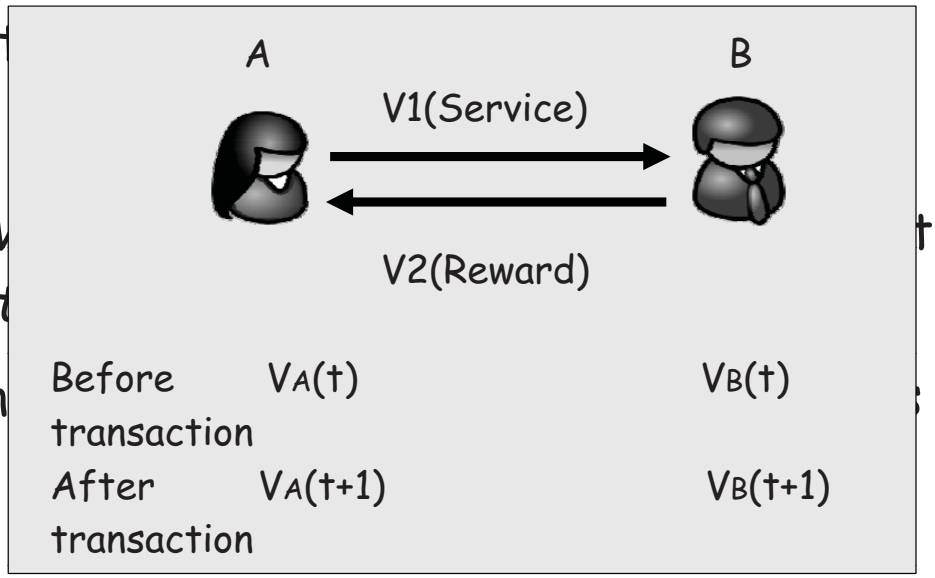
$$V_A(t+1) = F_{propA}(V_A(t), -V1, +V2)$$

$$V_B(t+1) = F_{propB}(V_B(t), +V1, -V2)$$

The exchange of values

E. Transactions

- The t



- Let V the time t
- Then have after

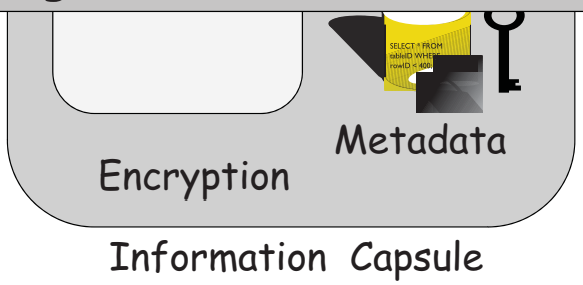
$$V_B(t+1) = F_{propB}(V_B(t), +V1, -V2)$$

Currency with information capsle

A. Information capsule

The information capsule is a framework that circulates digital contents such as music, movies, and books

It can be used to control the access to the Contained information and negotiate the content usage conditions with other agents.



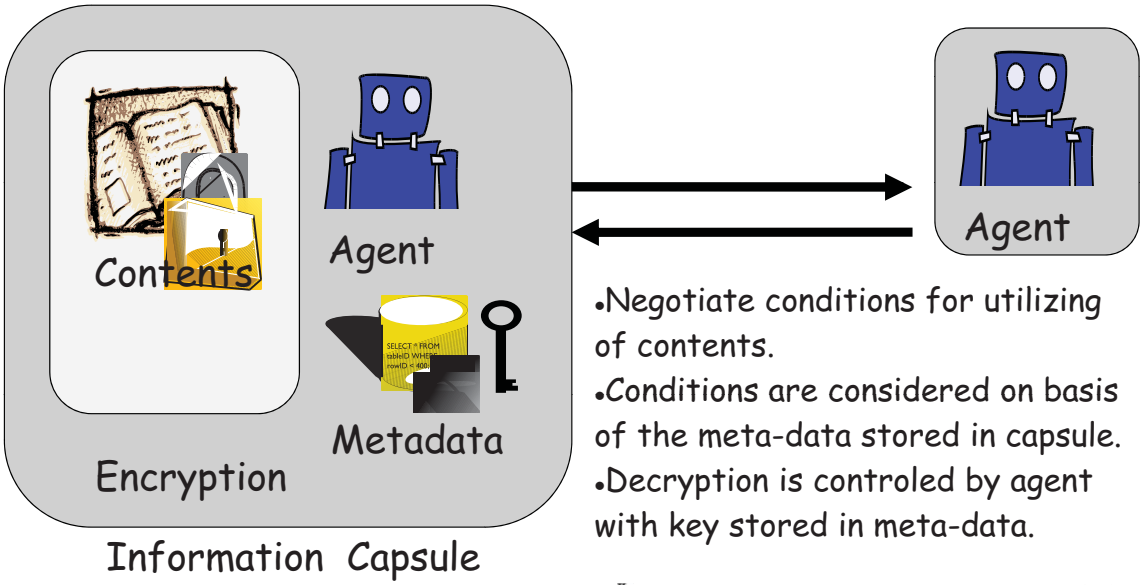
Information Capsule

of contents.

- Conditions are considered on basis of the meta-data stored in capsule.
- Decryption is controled by agent with key stored in meta-data.

Currency with information capsle

A. Information capsule



- Negotiate conditions for utilizing of contents.
- Conditions are considered on basis of the meta-data stored in capsule.
- Decryption is controled by agent with key stored in meta-data.

Summarizing value vector

A. Principal value

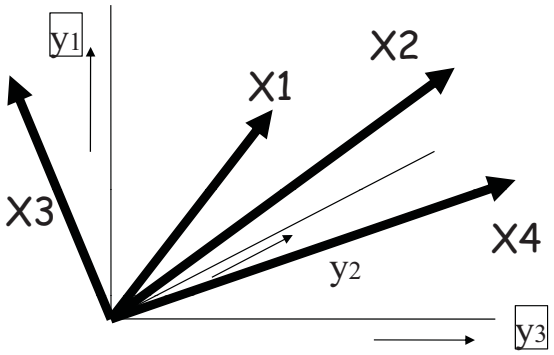
- Entities have diverse values and it has become difficult to compare these values directly.
- We should try to summarize values that resemble one another and each value should be as dependent on others as possible.
- These requirements achieve a smooth currency of values among users.

Summarizing value vector

B. Principal components analysis

- We apply principal components analysis that creates a new set of orthogonal variables that contain the same information as the original set.
- It rotates the axes of variations to give a new set of orthogonal axes, ordered so that they summarize decreasing proportions of variations.

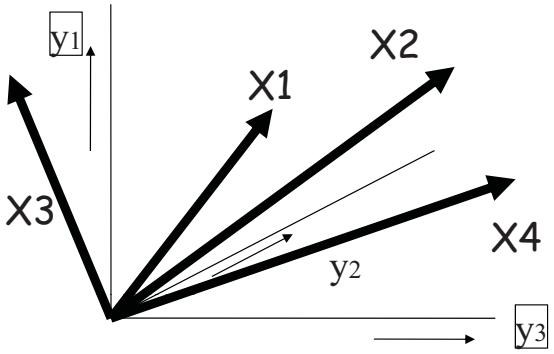
Summarizing value vector



- An *n*-dimension value vecto
  $V_x = (x_1, x_2, \cdots, x_n)$.
  is summarized into an *m*-dimension value vector
  $V_y = (y_1, y_2, \cdots, y_m)$.

- $x_1, x_2, \cdots, x_n$ denotes values that interest an entity and $y_1, y_2, \cdots, y_m$ denotes values that summarize values deduced by principal components analysis from v_x.

Summarizing value vector



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$V_x = (x_1, x_2, \cdots, x_n)$.
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analysis from

- These axes are calculated from the evaluations for services for entities in communities in advance.

Combinations of values

A. Swarm optimization and local currency

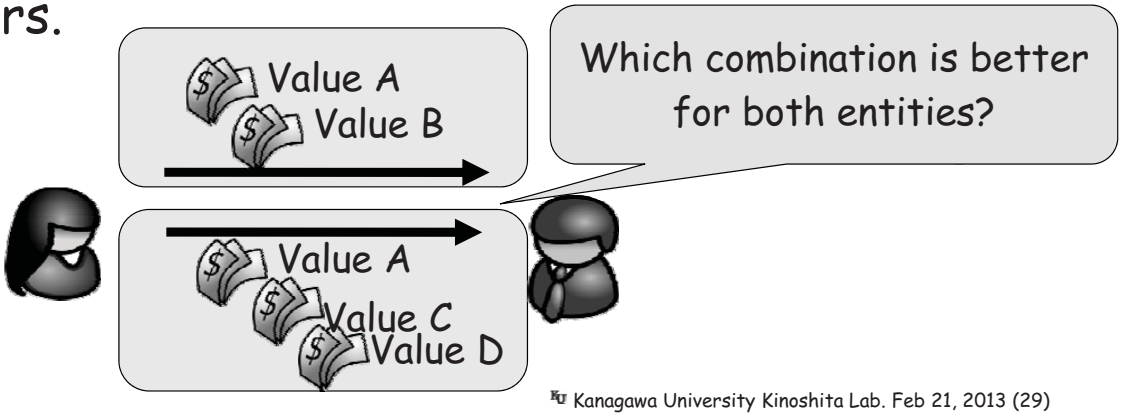
- The frame work for swarm optimization is efficient in many situations of our local currency and access control systems.

- Swarm intelligence is applied to create a consensus of values for services in the community, i.e., a decision that the transaction will be successfully conducted and a combination of values that will be used as a reward for some services.

Combinations of values

A. Swarm optimization and local currency

- The sum of properties of entities is the same before and after conventional transactions.
- However, we consider that the sum of these may be plus in some cases in our scheme and minus in others.



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Combinations of values

B. Values and evaluation

- Value vectors are categorized into two types.
- Fixed values
  - We assume that the values of services can not be separated and circulate a set of values.
- Free values
  - The values of property can be separated and subsets of values can be circulated.

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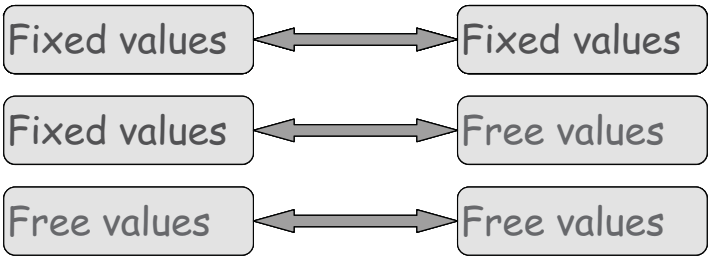
Combinations of values

B. Values and evaluation

The three types of transactions are categorized as follows.



- Each entity should select the combination of values to be transferred as the number of properties of entities that are changed under the restrictions of the property equation.

Combinations of values

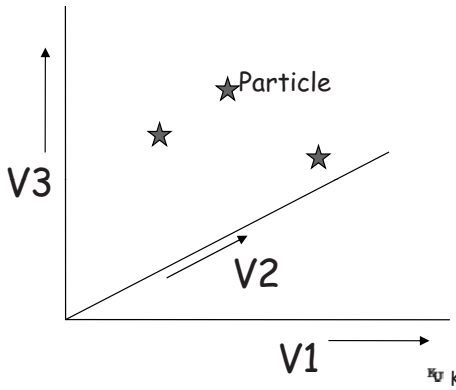
B. Values and evaluation

- The combination of values should be decided to maximize the property of entities.
- Property functions are generally too complex to solve the optimum combination of values.
- Property functions as evaluation functions reflect a variety of values.
- The payer accumulates his reward for the transaction using PSO.

Combinations of values

B. Values and evaluation

- Each axis indicates the scale of values.
- Particles are candidates for the result.
- Evaluation functions are constructed so that each scale on an axis are normalized.



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Combinations of values

B. Values and evaluation

$$V_{free} \in V_{propA}, V_{propB}$$

Properties of entities before a transaction

Advantageous for entity A.

A fixed value vector of services that entity A provides to entity B

$$V_{free} = \arg\max_{V_{free}} F_{propA}((V_A(t), -V_{free}, +V_{fixed}))$$

Advantageous for entity B.

Free values as a reward from entity B to entity A

$$V_{free} = \arg\max_{V_{free}} F_{propB}((V_B(t), +V_{fixed}, -V_{free}))$$

Combinations of values

B. Values and evaluation

- We apply PSO to satisfy both requirements as these requirements conflict with each other.
- Here, we assume that value vectors are the summation of each vector.
- There are some restrictions in the process of optimization.

$$F_{propX}(V_X(t), -V_1, +V_2) = F_{propX}(V_X(t) - V_1 + V_2)$$

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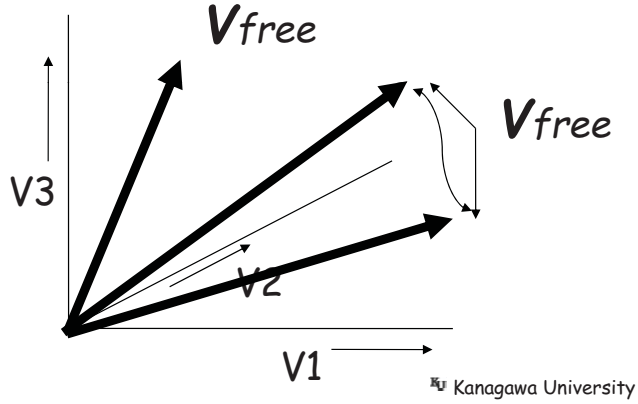
Combinations of values

B. Values and evaluation

The axis that belongs to V_{fixed} is fixed in optimization and axis that belongs to V_{free} is variable in optimization.



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Combinations of values

B. Values and evaluation

As the value of an evaluation function generally become minimum at an optimum point in PSO, we treat evaluation functions as follows.

$$f_A(x^t) = -F_{propA}((V_A(t), -V_{free}, +V_{fixed}))$$

$$f_B(x^t) = -F_{propA}((V_A(t), +V_{free}, -V_{fixed}))$$

Where $x^t = V_{free}$

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Combinations of values

C. Particle Swarm Optimization (PSO)

- One method of solving optimization problems
- Meta-heuristics
- Observing the behavior of "swarms"

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Combinations of values

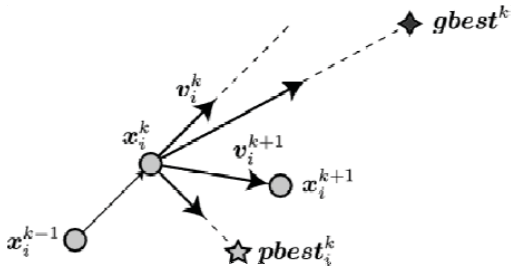
C. Particle Swarm Optimization (PSO)

- The basic principle underlying PSO is founded on the assumption that "information is shared by the entire swarm", which was derived from research into the behavior of flocks of birds or schools of fish while foraging for food.

Combinations of values

C. Particle Swarm Optimization (PSO)

- Each of a number of candidate points (particles) in PSO has information about its own position and velocity, which is shared within the swarm, and the search proceeds while information on the best solution is shared.



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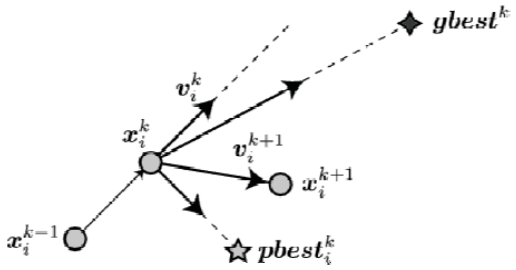
Combinations of values

C. Particle Swarm Optimization (PSO)

- The most representative PSO model is the Gbest model.
- Each particle (candidate point) in an *n*-dimensional optimization problem that forms part of the swarm.



Combinations of values

C. Particle Swarm Optimization (PSO)

- Travel of particle in Gbest model its current position

i is the number of particles

$$x_i = (x_{i1}, x_{i2}, \ldots, x_{ij}, \ldots, x_{in})^T$$

and velocity

$$\mathrm{v}_i = (v_{i1}, v_{i2}, \ldots, v_{ij}, \ldots, v_{in})^T$$

in the state space.

x_{ij} and v_{ij} are the *j*-dimensional components of the position and velocity of the I th particle

Combinations of values

C. Particle Swarm Optimization (PSO)

- Each particle also stores information on solutions to its own best position

$$\text{pbest}_i = (pbest_{i1}, pbest_{i2}, \ldots, pbest_{ij}, \ldots, pbest_{in})^T$$

that it has searched up until the present, together with a related evaluation value $f(\boldsymbol{pbest}_i)$.

- It also stores information on the best position

$$\text{gbest}=(\text{gbest}_1, gbest_2, \ldots, gbest_j, \ldots, gbest_n)^T$$

that is shared by the entire swarm, and a related evaluation value $f(\boldsymbol{gbest})$

Combinations of values

C. Particle Swarm Optimization (PSO)

- Each particle in the Gbest model searches the state space with the aim of finding the optimal solution to the objective function that is to be optimized, by using **pbest**i and **gbest** to amend its velocity and update its position.

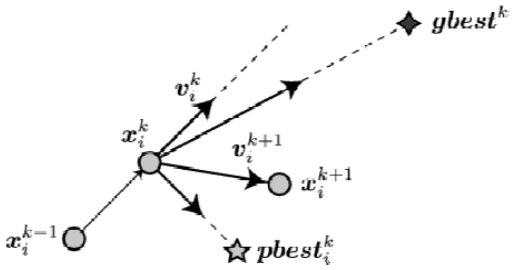
Combinations of values

C. Particle Swarm Optimization (PSO)

- The equations for updating the velocity and position of each particle are

$$\mathrm{v}_i^{k+1} = w v_i^k + c_1 \mathrm{rand}_1(pbest_i^k - x_i^k) + c_2 \mathrm{rand}_2(gbest^k - x_i^k)$$

$$\mathrm{x}_i^{k+1} = x_i^k + v_i^{k+1}$$



w, c1, and c2 are weighting parameters for corresponding terms

rand1 and rand2 are uniform random numbers between 0 and 1

Number of iterations

C. Particle Sw

- The equat for upd velocity and position of each par le are

$$\mathrm{v}_i^{k+1} = w v_i^k + c_1 \mathrm{rand}_1(pbest_i^k - x_i^k) + c_2 \mathrm{rand}_2(gbest^k - x_i^k)$$

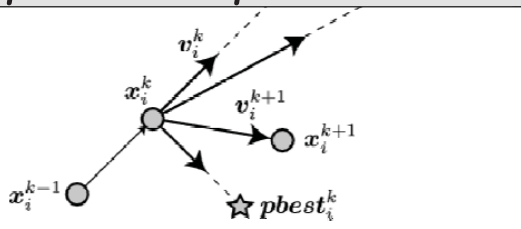
$$\mathrm{x}_i^{k+1} = x_i^k + v_i^{k+1}$$

Current velocity

Current position

each particle updates its current velocity

Next velocity
Next position



Combinations of values

towards the best snolution that is shared by the etire swarm

towards the best solution that it has stored

C. Particle Swarm O the velocit
position of each cle are

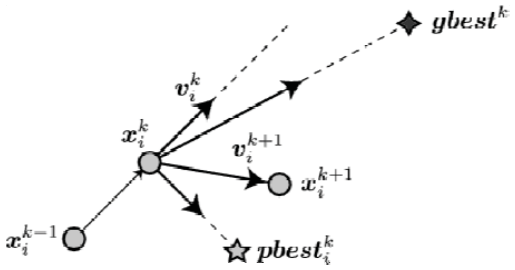
$$v_i^{k+1} = w v_i^k + c_1 \mathrm{rand}_1 (pbest_i^k - x_i^k) + c_2 \mathrm{rand}_2 (gbest^k - x_i^k)$$

$$x_i^{k+1} = x_i^k + v_i^{k+1}$$

Current velocity

Current position

Next velocity
Next position



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Combinations of values

D. Satisfying two evaluation functions

- Position ***pbest*** is updated considering both evaluation functions of each entity.
- If there are conflicts in the interest of the updates between entities, priority is given to the entity that has the large difference in the evaluation function.

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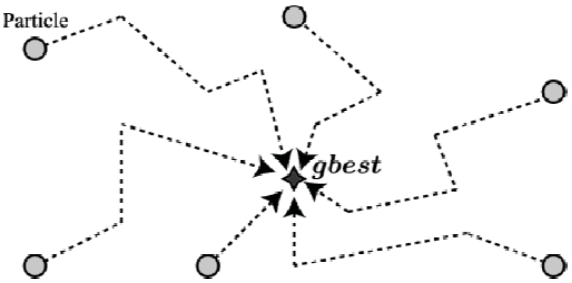
Combinations of values

D. Satisfying two evaluation functions

The position of ***gbest*** is calculated as an optimum combination.

- Gbest model of values in Steps 1 and 3. First, the optimum point of each entity is calculated. Next, the optimum particle that minimizes the difference between a candidate point and an optimum point is selected.



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Combinations of values

v_i^0 x_i^0

Step 0. Assign the parameters.

Step 1. Assign initial position x_i^0 and initial velocity v_i^0 of each particle.

i th particle

Initialize personal best and global best.

$$\mathrm{pbest}_i^0 = x_i^0 \qquad \mathrm{gbest}^0 = pbest_{i_g}^0$$

$$i_g = \arg\min_i (c_A(f_A(pbest_i^0) - f_A(pbest_{i_{gA}}^0)) + c_B(f_B(pbest_i^0) - f_B(pbest_{i_{gB}}^0)))$$

$$i_{gA} = \arg\min_i f_A(pbest_i^0).$$

$$i_{gB} = \arg\min_i f_B(pbest_i^0).$$

weights that indicate the significance of an entity

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Combinations of values

Step 2. Update velocity v_i^k and position x_i^k

$$\mathrm{v}_i^{k+1} = wv_i^k + c_1\mathrm{rand}_1(pbest_i^k - x_i^k) + c_2\mathrm{rand}_2(gbest^k - x_i^k)$$

$$\mathrm{x}_i^{k+1} = x_i^k + v_i^{k+1}$$

Combinations of values

Step 3. Compare current evaluation values $\mathrm{f}_A(x_i^{k+1})$ and $\mathrm{f}_B(x_i^{k+1})$and past best values $\mathrm{f}_A(pbest_i^k)$ and of$_B(pbest_i^k)$·ticle.

- If the candidate position makes benefit for both entites, the candidate becomes new pbest.
- If the candidate position makes loss for both entities, the candidate is discarded.
- If the benefits are conflict between entities, the candidate is decided by the weighted difference of the evaluation function.

Combinations of values

Step 3.Compare current evaluation values $\mathrm{f}_A(x_i^{k+1})$ an$\mathrm{f}_B(x_i^{k+1})$ and past best values$\mathrm{f}_A(pbest_i^k)$ and $\mathrm{f}_B(pbest_i^k)$article.

If $(\mathrm{f}_A(x_i^{k+1}) < f_A(pbest_i^k)) \wedge (f_B(x_i^{k+1}) < f_B(pbest_i^k))$
$\vee (f_A(x_i^{k+1}) < f_A(pbest_i^k)) \wedge (f_B(x_i^{k+1}) > f_B(pbest_i^k)) \wedge$
$(c_A|f_A(x_i^{k+1}) - f_A(pbest_i^k)| > c_B|f_B(x_i^{k+1}) - f_B(pbest_i^k)|)$
$\vee (f_A(x_i^{k+1}) > f_A(pbest_i^k)) \wedge (f_B(x_i^{k+1}) < f_B(pbest_i^k)) \wedge$
$(c_A|f_A(x_i^{k+1}) - f_A(pbest_i^k)| < c_B|f_B(x_i^{k+1}) - f_B(pbest_i^k)|),$

Let $\mathrm{pbest}_i^{k+1} = x_i^{k+1},$

otherwise, let $\mathrm{pbest}_i^{k+1} = pbest_i^k.$

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Combinations of values

Step 3. In addition, $\mathrm{gbest}^{k+1} = pbest_{i_g}^{k+1}.$

However,

$$\mathrm{i}_g = \arg\min_i (c_A(f_A(pbest_i^{k+1}) - f_A(pbest_{i_{gA}}^{k+1})) + \mathrm{c}_B(f_B(pbest_i^{k+1}) - f_B(pbest_{i_{gB}}^{k+1}))).$$

$$\mathrm{i}_{gA} = \arg\min_i f_A(pbest_i^{k+1}).$$

$$\mathrm{i}_{gB} = \arg\min_i f_B(pbest_i^{k+1}).$$

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Combinations of values

Step 4. If $k == T_{max}$ end with the optimal solution being $gbest^{k+1}$ and the optimal value being $f(gbest^{k+1})$. If not, return to **Step 2** with $k = k + 1$.

Update velocity v_i^k and position x_i^k

$gbest^{k+1}$ indicates the optimal combination of free value ***V****free* for payment as a reward.

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Conclusion

- We introduced the value vector to reflect a variety of values.
- Multiple values in our scheme, should be combined to pay a reward for services.
- It is generally difficult to decide optimum combinations that maximize the properties of entities.
- We applied PSO to decide the combination of values as a reward for service.

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Conclusion

- We have to define the details of the value evaluation functions in future work.
- Furthermore, transactions among *N* entities should be considered. Because there is a possibility that the properties of entities with this concept will become larger than the transactions between two entities.

The study on Young people's Behavior and Attitudes to Online Shops

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Table of Contents

1. Background of this work
2. Research results derived with Conjoint Analysis
   - Respondents
   - Research methods
   - Whole results
   - Differences among area, experience, gender
3. Summary and Future Plans

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Background of this work (1)

- In the ICT environment, we can see that B2C has been commonly used as an important element of the consumer market not only in Japan but world-wide
  - 53.6% Japanese internet users utilized B2C in 2010
  - 40% of people in EU have purchased through Internet in 2010
- A lot of people and companies have been opening their online shops
- Many local governments in Japan expect online shops will become means to revitalize local economy
  - For example, Matsuyama city offer a grant to online shops

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Background of this work (2)

- To develop online shops' market and create effective sales strategies, we need to know users' behaviors and perceptions.
- Almost all young age people use the Internet now
  - They will become major customers of online shops
- We should research consumer behavior and perceptions of young people.

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Background of this work (3)

- Some features of consumer may affect their behavior and perceptions for online shops
  - Their living environments, gender, experience of purchasing from online shops may affect their behavior
    - Urban or non-urban
    - Transportation system, ICT environment, etc.
- We should know consumer behavior and perceptions of online shops specifically.

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Research methods and respondents

To examine young people's behavior and perception for online shops, we use a questionnaire as the research method.

Composition of respondents

Respondents	Ehime Univ. (373 students*)	Kanagawa Univ. (194 students*)
Date	2012/1/16, 27	2012/1/10, 13
Grade	1st:206, 2nd:104, 3rd:58, Over 4th:5	1st:96, 2nd:39, 3rd:35, Over 4th:24
Gender	Female:212 Male:160 No answer:1	Female:76 Male:118

* Both are students of faculty of social science

Students' Perceived Advantages of Online Shopping

Priorities of advantages of online shopping	Ehime	Kanagawa	χ(1)	P-value	
Price / cheapness	194(52%)	98(51%)	0.114	0.735	
Purchasing goods not sold at nearby physical shops	243(65%)	87(45%)	21.623	0.000	**
Large variety of items	174(47%)	70(36%)	5.812	0.016	*
Rich information about goods	65(17%)	35(18%)	0.033	0.855	
Shopping at home	237(64%)	108(56%)	3.317	0.069	
Open 24 h	176(47%)	92(47%)	0.003	0.957	
Purchasing at one's own pace	93(25%)	51(26%)	0.124	0.725	
Easy purchasing procedures	41(11%)	31(16%)	2.864	0.091	
Speedy purchasing	34(9%)	20(10%)	0.211	0.646	
Easy searching of goods	82(22%)	52(27%)	1.643	0.200	
Easy comparison of goods	82(22%)	38(20%)	0.439	0.507	
Referring reviews and reputations	150(40%)	88(45%)	1.388	0.239	
Rich information about other goods	52(14%)	29(15%)	0.106	0.745	
Acceptable waiting time for delivery	29(8%)	12(6%)	0.481	0.488	
Delivery by other people	86(23%)	69(36%)	10.056	0.002	**
Availability of rare goods	32(9%)	23(12%)	1.564	0.211	
Others	1(0%)	3(2%)	2.977	0.084	

This question allowed multiple answers

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Students' Perceived Advantages of Online Shops

- For about availabilities of goods, Ehime university students give higher priority than Kanagawa university students.
  - In many cases, shops in local area like Ehime have less variety of goods than shops in urban area.
  - They feel this online shops' advantage strongly

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Conjoint Analysis part of questionnaire

- Model
  - Mixed Logit Model
- In questionnaire, we set a situation
  - You have a desirable goods.
  - The goods' established price is 5,000 yen.
  - You are considering to purchase the goods at online shops.
  - Two online shops have some different conditions.
  - If you have complains for both online shops, you can choose not to purchase at neither online shops.

Example of Conjoint Card

Attribute	Online shop A	Online shop B	
価格 (Price)	5,000 yen	5,000 yen	どちらも 利用しない (using neither)
身近な店舗にある (Goods Availability at nearby physical shops)	No	Yes	
サイトの認知度 (Site's Perception)	High	Low	
購入手続き (Purchase Procedure)	Difficult	Easy	
送料 (Postage)	Free	500 yen	
回答欄(answer)→			

Comparing online shop A and B, each respondent must select the most desirable option by ranking their preferences.
Each respondent evaluate each shop comprehensively based these five attributes.

Varity and level of Attributes

Attribute	Level1	Level2	Level3
Availability	Yes	No	−
Percetpion	High	Low	−
Procedure	Easy	Difficult	−
Postage	Free	500yen	−
Price	3,000yen	4,000yen	5,000yen

- Sixteen profiles were created using the orthogonal array design from the level of each attribute.
- Two profiles were combined at random, and eight choice set was created.

ASC indicates affirmativeness

- ASC (Alternative specific constant) is added to the analysis
  - ASC < 0 : it can be interpreted affirmative for the purchase of goods from online shops
  - ASC > 0 : it can be interpreted negative for the purchase of goods from online shops

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Whole Result of conjoint analysis

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	0.14657	0.0678	0.2522	79.8
Perception (High)	1.63194	0	0	888.6
Procedure (Easy)	1.21123	0	0	659.5
Postage	−0.00408	0	0	−2.2
Price	−0.00184	0	0	−1.0
ASC	−7.98740	0	0	
Standard deviations parameters				
Availability (No)	0.89706654	0	0	
Perception (High)	1.66290764	0	0	
Procedure (Easy)	0.8880615	0	0	
Postage	0.00270745	0	0	
ASC	2.59857883	0	0	
No. of Obs.	4453		: P-Value < 0.05	
Log-Likelihood	−3399.88		: P-Value < 0.01	

WTP:
Willingness to pay
WTP evaluates preference by monetary value

Underline:
nonrandom parameter

e.g. WTP of Availability

$$WTP = -\frac{0.14657\cdots}{-0.00184\cdots} = 79.8\cdots(yen)$$

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No. of Obs.	4453		: P−Value < 0.05	
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- Students consider to be affirmative about the use of online shops.
- Online shops may be common channel of shopping.

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ASC	2.59857883	0	0	
No. of Obs.	4453		: P−Value < 0.05	
Log−Likelihood	−3399.88		: P−Value < 0.01	

- It is not important for students whether online shop's goods can be obtained in nearby physical shops.

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No. of Obs.	4453		: P−Value < 0.05	
Log−Likelihood	−3399.88		: P−Value < 0.01	

- Both perception and procedure make students' utility increase.
- Site perception is more important than purchase procedure.
- Students want to avoid some risks of online shop strongly, compared to technical convenience.

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Whole Result of conjoint analysis

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ASC	2.59857883	0	0	
No. of Obs.	4453		: P−Value < 0.05	
Log−Likelihood	−3399.88		: P−Value < 0.01	

- Students do not like price and postage.
- The WTP of price is bigger than postage.
- Students dislike postage stronger than price.
- One yen of postage is equivalent 2.2 yen of price.

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Whole Result of conjoint analysis

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	0.14657	0.0678	0.2522	79.8
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ASC	2.59857883	0	0	
No. of Obs.	4453		: P-Value < 0.05	
Log-Likelihood	−3399.88		: P-Value < 0.01	

- Postage is random parameter
- Most students consider postage as cost, but there are various estimation for postage.

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Difference between Ehime Univ. and Kanagawa Univ.

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	0.09783	1.145	0.2522	53.0
Availability × KU dummy	−0.41907	−2.857	0.0043	−226.8
Perception (High)	1.35750	9.314	0	734.7
Perception × KU dummy	0.84383	3.651	0.0003	456.7
Procedure (Easy)	1.02649	10.818	0	555.6
Procedure × KU dummy	0.46551	2.776	0.0055	251.9
Postage	−0.00416	−13.952	0	−2.3
Postage × KU dummy	−0.00014	−0.295	0.7677	−0.1
Price	−0.00185	−23.135	0	−1.0
Price × KU dummy	−0.00019	−2.54	0.0111	−0.101
ASC	−8.37723	−26.196	0	

Standard deviations parameters			
Availability (No)	0.9759948	10.285	0
Perception (High)	1.5939466	15.453	0
Procedure (Easy)	0.907509	8.841	0
Postage	0.0028606	8.434	0
Price	.830418D-04	1.867	0.0619
Availability × KU dummy	0.2294132	0.699	0.4846
Perception × KU dummy	0.0908973	0.333	0.7392
Procedure × KU dummy	0.0707238	0.158	0.8745
Price × KU dummy	0.0001637	2.459	0.0139
ASC	2.6834707	16.138	0
No. of Obs.	4453		: P-Value < 0.05
Log-Likelihood	−3368.771		: P-Value < 0.01

e.g. WTP of Availability

$$WTP = -\frac{0.09783\cdots}{-0.00185\cdots} = 53.0\cdots(yen)$$

Underline: nonrandom parameter

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ASC	−8.37723	−26.196	0	

- "Perception" KU dummy and "Procedure" KU dummy are estimated as positive and significant
  - KU students think them more important
  - They require higher quality to online shops

EHIME U

Difference between Ehime Univ. and Kanagawa Univ.

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	0.09783	1.145	0.2522	53.0
Availability × KU dummy	−0.41907	−2.857	0.0043	−226.8
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Price × KU dummy	−0.00019	−2.54	0.0111	−0.101
ASC	−8.37723	−26.196	0	

- "Postage" KU dummy is not estimated as significant
  - Both students dislike postage as well
- "Price" KU dummy is estimated as negative and significant
  - KU estimate price more seriously

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Difference between Ehime Univ. and Kanagawa Univ.

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	0.09783	1.145	0.2522	53.0
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Price × KU dummy	−0.00019	−2.54	0.0111	−0.101
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- "Availability" KU dummy is estimated as negative and significant
  - For Ehime Univ. students, "availability" is more important than KU students.

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Difference in use experience of online shops

Variable	Coefficient	t-Value	P-Value	WTP
Availability (No)	−0.00393	−0.028	0.9775	−2.0
Availability × Exp. dummy	−0.09065	−0.57	0.5689	−46.5
Perception (High)	2.09491	8.564	0	1075.5
Perception × Exp. dummy	−0.65574	−2.503	0.0123	−336.6
Procedure (Easy)	1.22474	8.478	0	628.8
Procedure × Exp. dummy	−0.04216	−0.254	0.7997	−21.6
Postage	−0.00356	−7.676	0	−1.8
Postage × Exp. dummy	−0.00093	−1.803	0.0714	−0.5
Price	−0.00195	−19.08	0	−1.0
Price × Exp. dummy	0.00010	1.112	0.266	0.0523
ASC	−8.22033	−25.59	0	

Standard deviations parameters			
Availability (No)	0.9539377	10.37	0
Perception (High)	1.6036903	14.722	0
Procedure (Easy)	0.4613401	2.239	0.0252
Postage	0.0028235	8.734	0
Price	0.0001239	1.867	0.0619
Procedure × Exp. dummy	0.8466017	5.082	0
Price × Exp. dummy	.784498D−05	0.156	0.8758
ASC	2.7821878	15.808	0
No. of Obs.	4453		: P-Value < 0.05
Log-Likelihood	−3371.612		: P-Value < 0.01

Underline: nonrandom parameter

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Difference in use experience of online shops

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Price × Exp. dummy	0.00010	1.112	0.266	0.0523
ASC	−8.22033	−25.59	0	

- "Procedure", "postage", "price" experience dummy are not estimated as significant
- There is no difference derived from use experience

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Difference in use experience of online shops

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Price	−0.00195	−19.08	0	−1.0
Price × Exp. dummy	0.00010	1.112	0.266	0.0523
ASC	−8.22033	−25.59	0	

- "Perception" experience dummy is estimated as negative and significant
- Those who have experiences of using online shops feel less importance for site perception

- For those who have never used online shops, site perception is important information.
- Once using online shops, or for repeaters, the worry about online shops will ease.

Difference between Female and Male

Variable	Coefficient	t-Value	P-Value	WTP
Perception (High)	1.52752	8.855	0	806.6
Perception × M dummy	0.13552	0.605	0.545	71.6
Procedure (Easy)	1.10341	10.382	0	582.7
Procedure × M dummy	0.07663	0.517	0.6051	40.5
Postage	−0.00462	−13.334	0	−2.4
Postage × M dummy	0.00116	2.448	0.0144	0.6
Price	−0.00189	−21.726	0	−1.0
Price × M dummy	0.00009	1.211	0.2258	0.0
ASC	−8.07385	−25.256	0	

Standard deviations parameters			
Availability (No)	0.8116394	7.859	0
Perception (High)	1.5958	14.49	0
Procedure (Easy)	0.8259983	8.093	0
Postage	0.0018925	3.122	0.0018
Availability × M dummy	0.7015009	5.249	0
Postage × M dummy	0.0024102	3.174	0.0015
ASC	2.7400574	16.97	0
No. of Obs.	4453		: P-Value < 0.05
Log-Likelihood	−3882.986		: P-Value < 0.01

Underline: nonrandom parameter

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Difference between Female and Male

Variable	Coefficient	t-Value	P-Value	WTP
Perception (High)	1.52752	8.855	0	806.6
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Price × M dummy	0.00009	1.211	0.2258	0.0
ASC	−8.07385	−25.256	0	

- Women think “availability” is important, although men do not think
- Women dislike postage compared to men

If some online shops sell goods for women, free postage is good strategy for sales.

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Summary and Future Plan

- Online shops are common channel of purchasing for most students
- Goods “Availability” at nearby physical shops is not important for students
- Site “perception” is most important
- Students evaluate “postage” more negative than goods’ “price”
  - Postage is a big charge for them

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Summary and Future Plan

- KU students think “Perception” and “Procedure” more important than EU students
- KU students estimate “price” more seriously
- Those who have experiences of using online shops place less importance “site perception”
- Women think “availability” is important although men do not think
- Women dislike “postage” compared to men

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Summary and Future Plan

- From the view of local economy,
  - Online shops may become one of the means of revitalizing local economy
  - Local government may support small shops' site perception
  - Local online shops may cooperate to lower their postage cost
- Differences derived from consumer features
  - Online shops can make sales strategies for each customers

Summary and Future Plan

- Our research needs to expand respondents
  - Other age
  - Other region
  - Other countries

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Thank you very much for your attentions

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Asia Pacific Conference on Information Management 2012
August 16-18, 2012 Seattle University

Analysis of web portal business for restaurant information from information perspective

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1

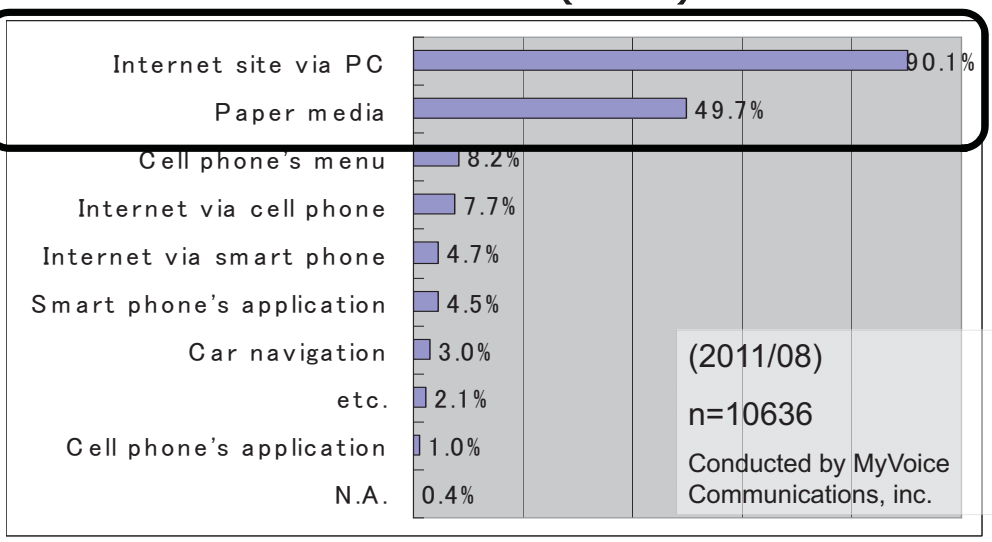
Table of contents

- Background and Purpose
- Structure of restaurant information service
- Comparative analysis of 3 major restaurant information services in Japan
  - Quantity of information
  - Types of information
- Summary

2

Background and purpose #1

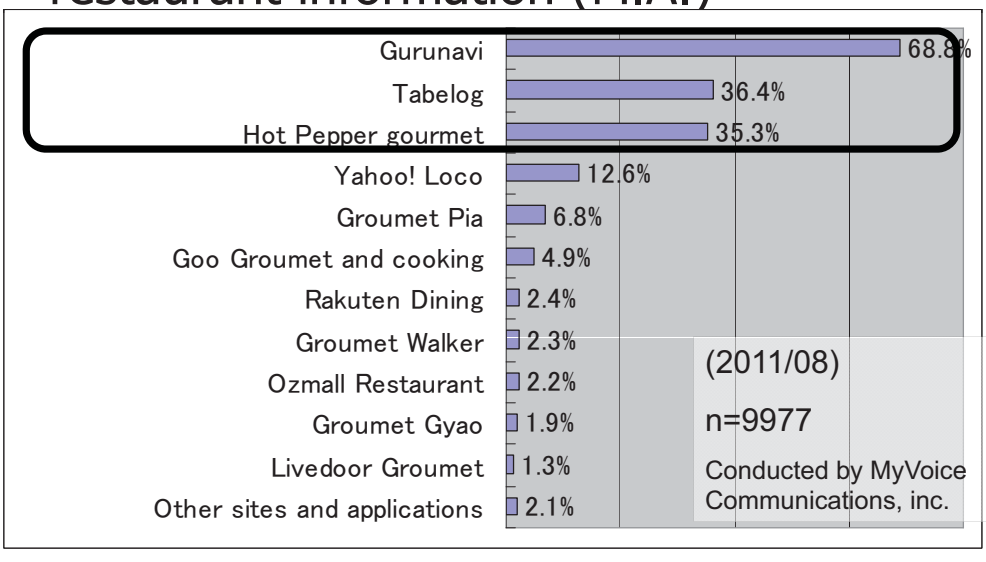
- Information sources for searching restaurant information (M.A.)



3

Background and purpose #2

- Sites and applications used for searching restaurant information (M.A.)



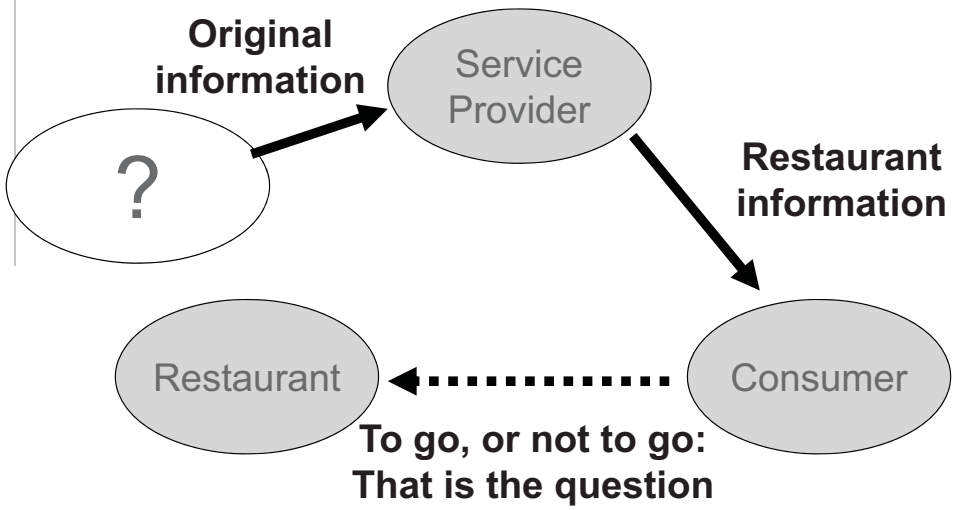
4

Background and purpose #3

- Purpose of this study
  - Clarify key factors for success
- Method of this study
  - Comparative analysis of 3 major restaurant service in Japan
    - Each company has different business model
    - Focusing on
      - Who inputs information (=informer)
      - Quantity and Types of offered information

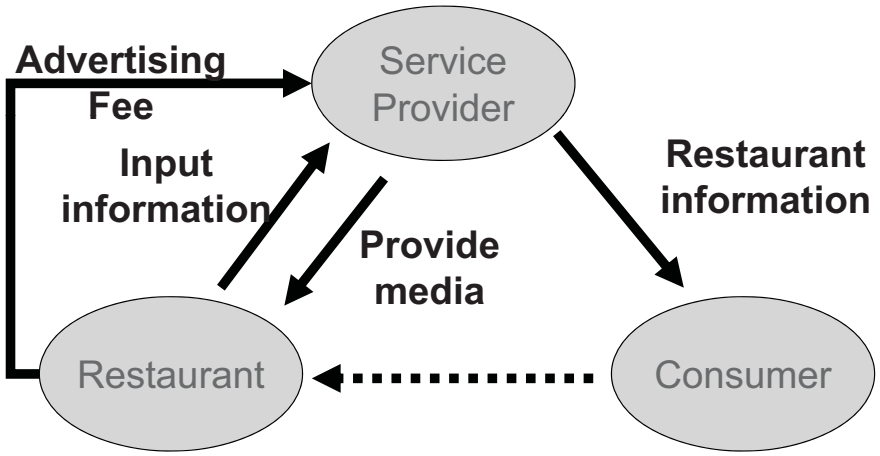
5

Structure of restaurant information service



6

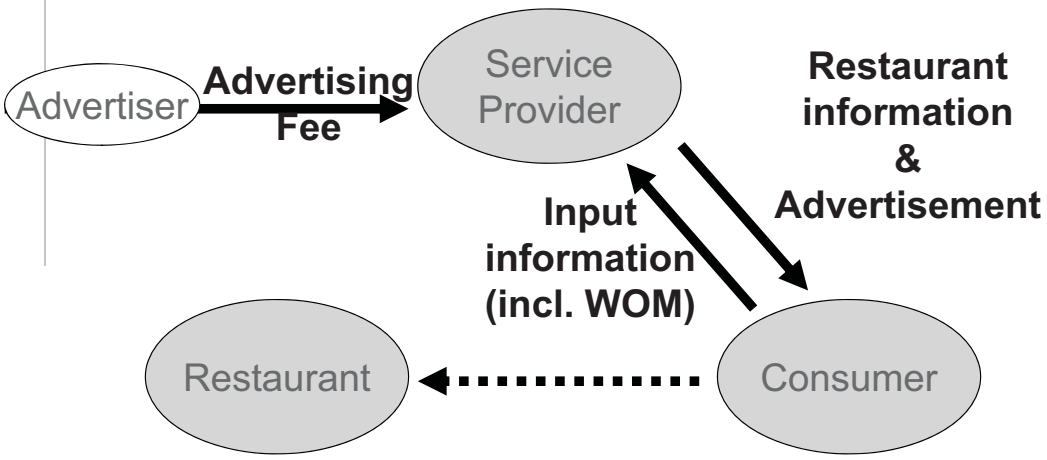
Structure of Type CA; Classified Ad



- Information from **restaurant's standpoint**
- Negative information **is not** included

7

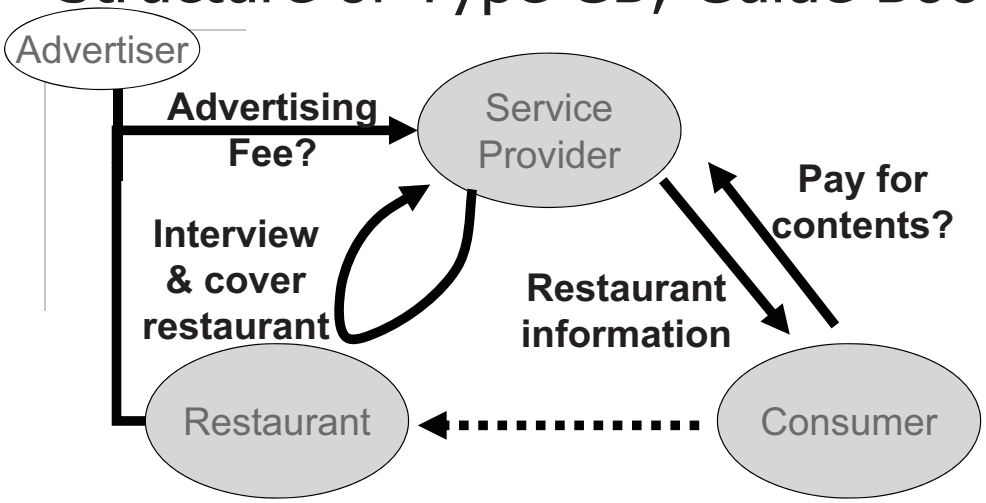
Structure of Type CGM; Consumer Generated Media



- Information from **consumers' standpoint**
- Negative information **is also** included

8

Structure of Type GB; Guide Book



- Information from **service provider's standpoint**
- Negative information **may not be** included

9

Gurunavi（ぐるなび）

- **Pioneer of restaurant information service in Japan since 1996**
  - Started as one division of company advertising in station and train
  - **Type CA**
    - **Using information system for inputting restaurant information by restaurants themselves since 2001**
    - Providing function for inputting WOM from 2006, but not frequently used

10

Tabelog（食べログ）

- **Operated by Kakaku.com since 2005**
  - Kakaku.com : gathering and providing price and WOM of products (Computer, Electrical appliance, etc.)
  - Tabelog is the second largest business in the company
- **Type CGM**
  - **Inputting WOM and pictures by consumers**
  - **Evaluating five-star scale by consumers**
  - Starting paid service for restaurants since 2009

11

Hot Pepper Gourmet （ホットペッパーグルメ）

- **Started in 2005 as internet version of free coupon magazine published by Recruit**
  - Now: publishing original information
    - Cheaper than magazine
- **Type GB** gaining fee from restaurants
  - **Interviewing and covering restaurant and inputting information by affiliate company of Recruit**
  - Providing function for updating information by restaurants and inputting WOM by consumers

12

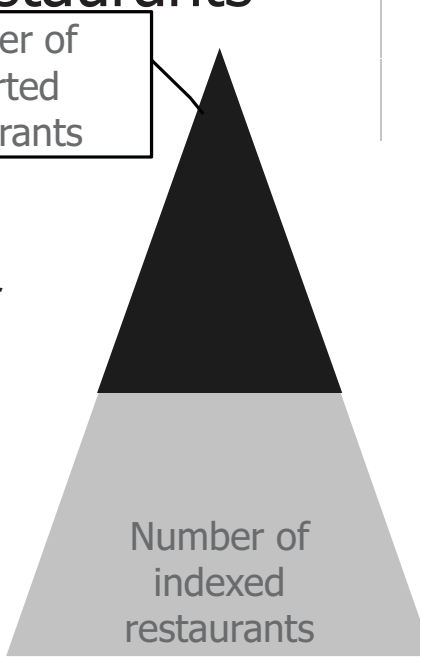
Quantity of information offered by restaurant information services

- Number of restaurants by Japanese statistics survey
  - About 670,000 restaurant in 2009
- Number of indexed restaurants in Gurunavi
  - About 500,000 in 2012
- Number of indexed restaurants in Tabelog & Hot Pepper Gourmet
  - About 700,000 in 2012
    - Both services can offer information about almost all restaurants in Japan?

13

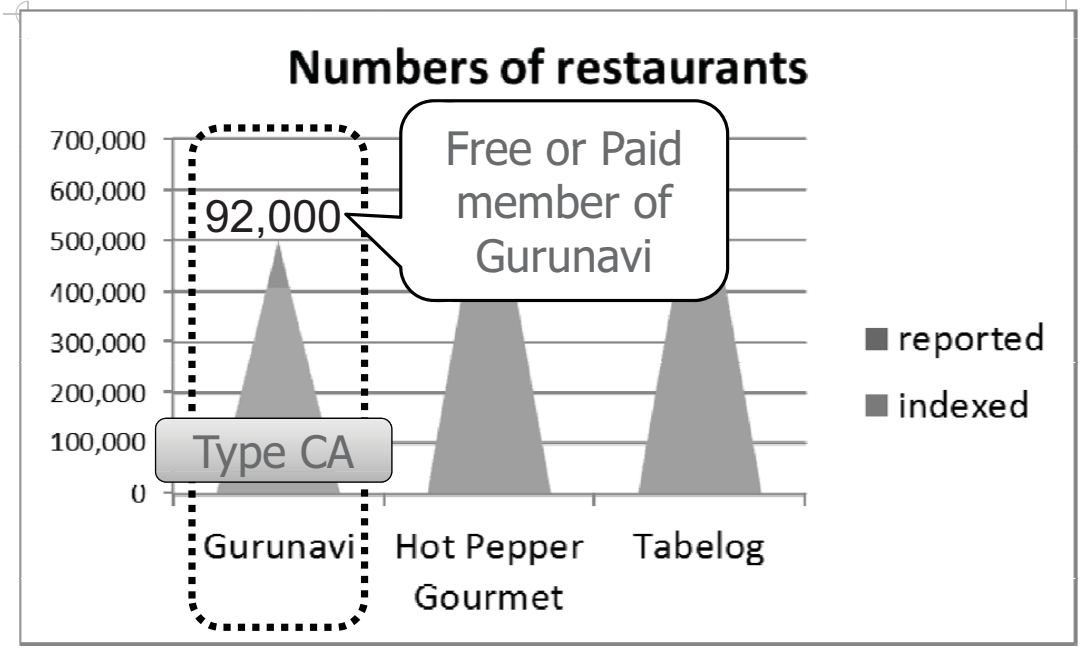
Number of reported restaurants

- Number of indexed restaurants
  - Including limited informed restaurants
    - *ex. name and address of restaurant only*
- Number of reported restaurants
  - Number of restaurants with additional information
    - *ex. Menu, business hours, WOM, etc.*



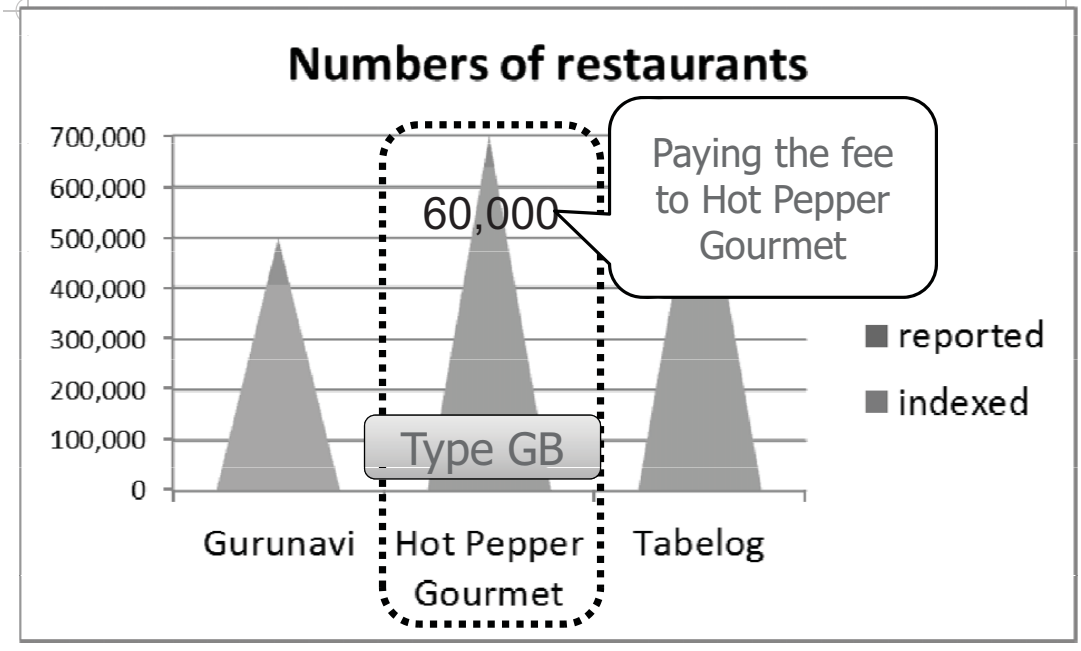
14

Numbers of 3 services #1



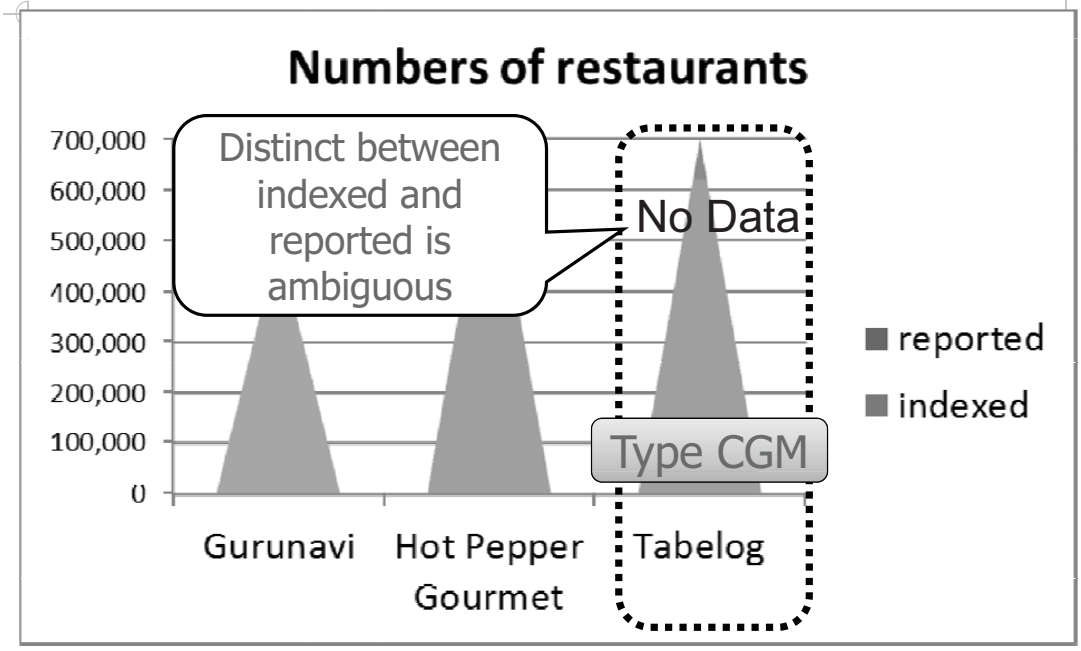
15

Numbers of 3 services #2



16

Numbers of 3 services #3



17

Rapid increasing of indexed restaurants

- Rapid increasing of indexed restaurants
  - Gurunavi
    - 53,000 (Mar. **2006**) ⇒ 500,000 (Mar. 2007)
  - Hot Pepper Gourmet
    - 21,000 (Jun. **2006**) ⇒ 577,000 (Dec. 2006)
  - Tabelog
    - 200,000 (Feb. **2009**) ⇒ 357,000 (Mar. 2009) ⇒ 520,000 (Oct. 2009)
- How did these services acquire a lot of basic information?
  ⇒ Town Page as information source

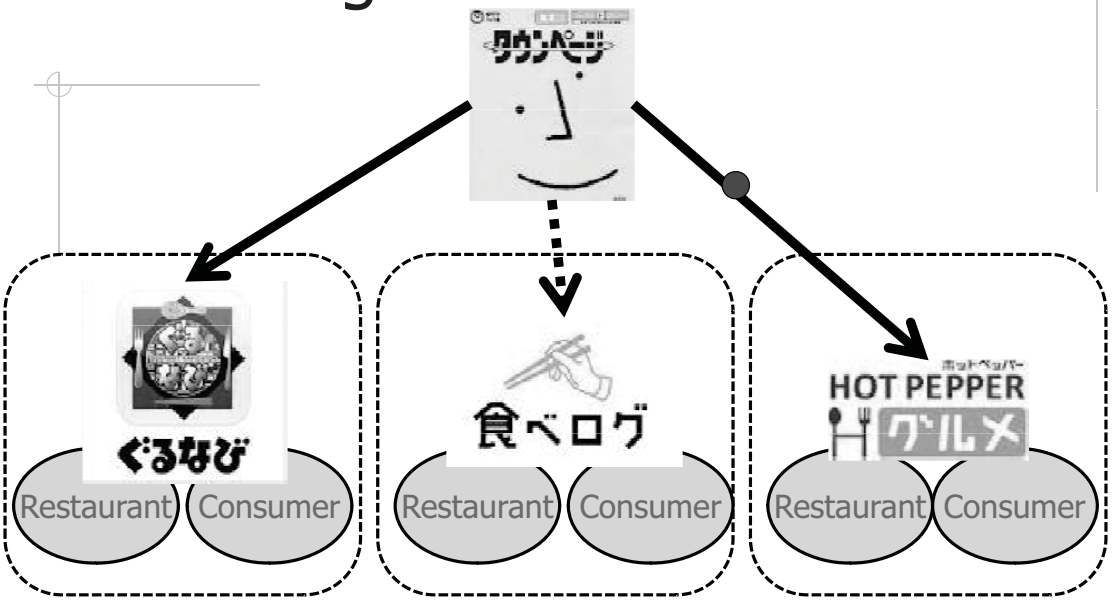
18

What's "Town Page"?

- What's "Town Page"?
  - Japanese "Yellow Pages"
  - Affiliate company of NTT selling information listed in Town Page
    - Gurunavi uses this as information source
    - Hot Pepper Gourmet indirectly uses this
      - Recruit's other service uses Town Page's information
    - Tabelog may use this
      - Tabelog uses this for registration of restaurant membership and it links to main system

19

Town Page as Commons

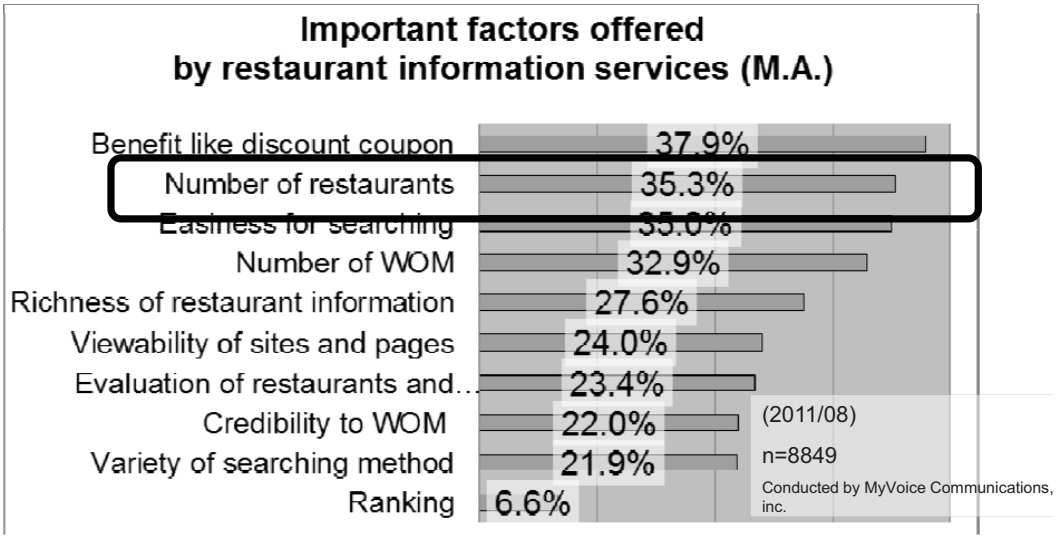


- Each individual service (Platform) uses Town Page as commons

20

Functions of Town Page as Commons #1

- Using Town Page as commons brings
  - Increasing number of indexed restaurants



21

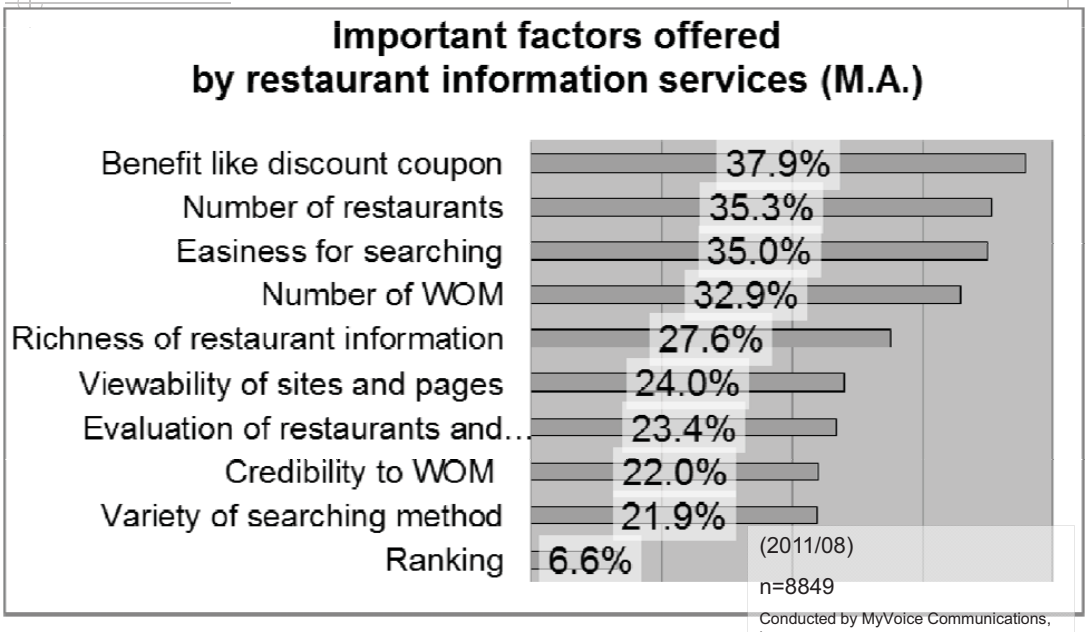
Functions of Town Page as Commons #2

- Using Town Page as commons brings
  - Decreasing input burden for Type CGM
    - Input burden
      - degree of trouble in inputting information
        - Poor interface, demand of inputting a lot of information
    - Basic information of restaurant has been registered in

      ⇒ Consumers need not to input restaurant information from scratch

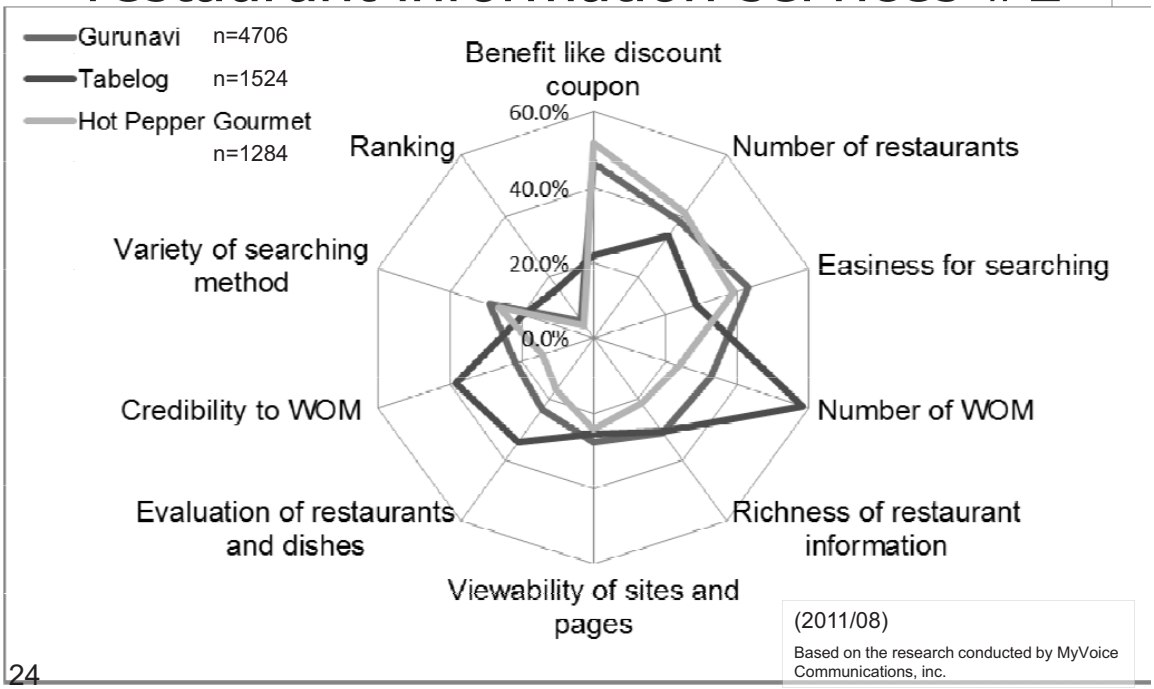
22

Top 10 important factors offered by restaurant information services #1



23

Top 10 important factors offered by restaurant information services #2



24

4 types of information offered by restaurant information services #1

- Basic information
  - *Name, address, phone number*
- Sales information
  - *Business hours, Menu, Acceptance of credit card, picture of interior and dishes, etc.*
- Evaluation information
  - *WOM, five-star scale, etc.*
- Benefit information
  - *Discount or gratis coupon, etc.*

25

4 types of information offered by restaurant information services #2

- Basic information
  - *Name, address, phone number, category of restaurant*
  - is not changed as long as the restaurant continues its business
  - can be available from Town Page

26

4 types of information offered by restaurant information services #3

- Sales information
  - *Business hours, Menu, Acceptance of credit card, picture of interior and dishes, etc.*
  - is often changed rather than basic information
  - cannot be available from Town Page
    - Restaurant naturally grasp it
    - it is necessary for consumer and service provider to interview and cover restaurant to grasp it

27

4 types of information offered by restaurant information services #4

- Evaluation information
  - *WOM, five-star scale, etc.*
  - Problem about objectivity
    - Information by restaurants is not welcomed and causes a trouble
    - Information by service provider may raise problem of objectivity
    - Information by consumer
      - is not free from problem of objectivity
      - Gathering many information increases objectivity

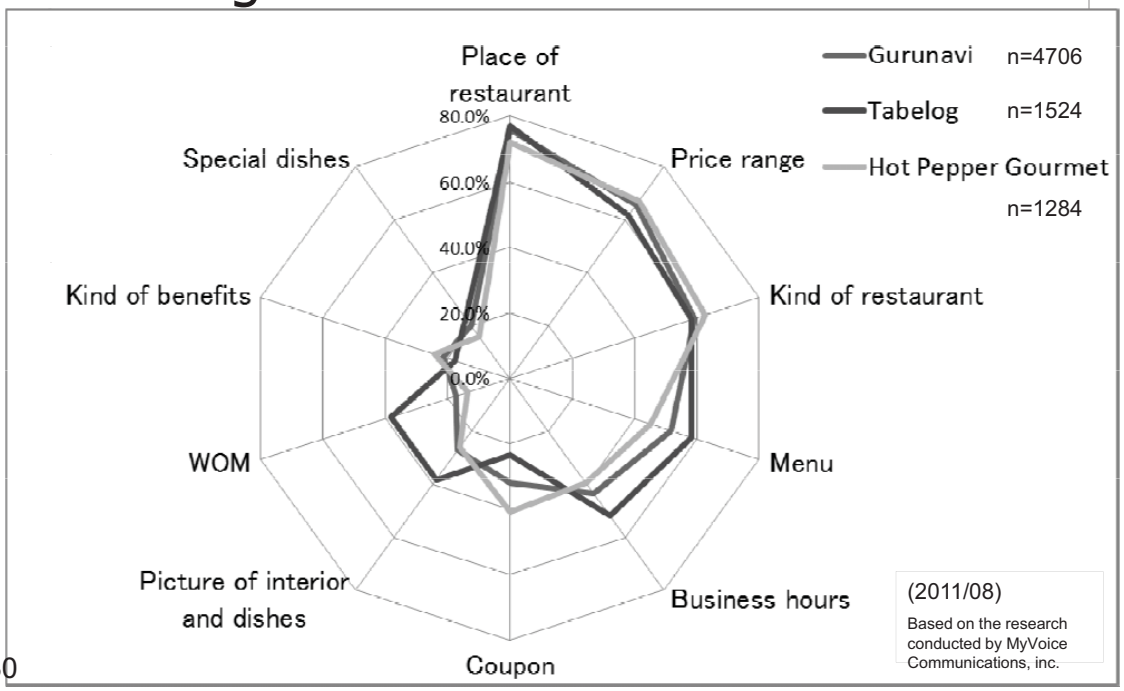
28

4 types of information offered by restaurant information services #5

- Benefit information
  - *Discount or gratis coupon, etc.*
  - Tabelog does not provide benefit information so much
  - In Hot Pepper Gourmet , restaurants with detailed information also offer benefit information
  - Gurunavi's rate of offering benefit information is midway between Tabelog and Hot Pepper Gourmet

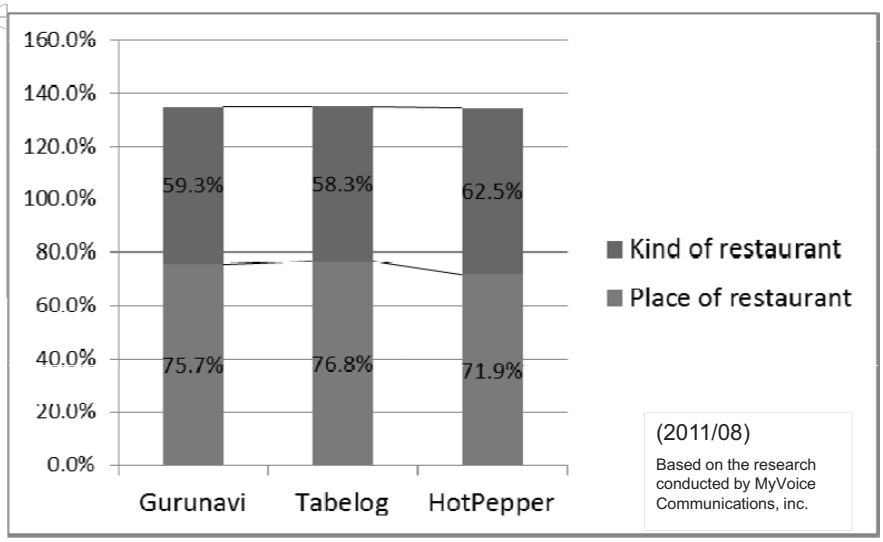
29

Top 10 frequently used information thorough restaurant information services



30

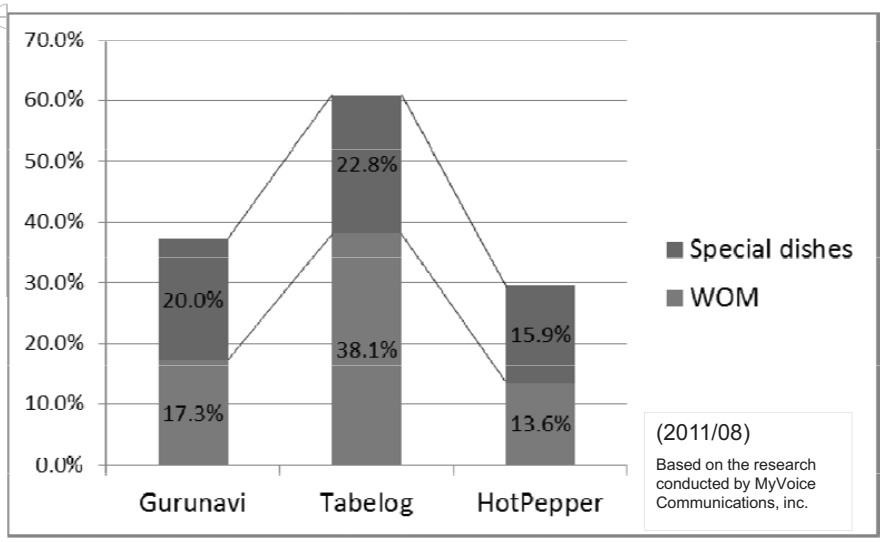
Utilization ratio of basic information



- There are no significant differences among 3 services

31

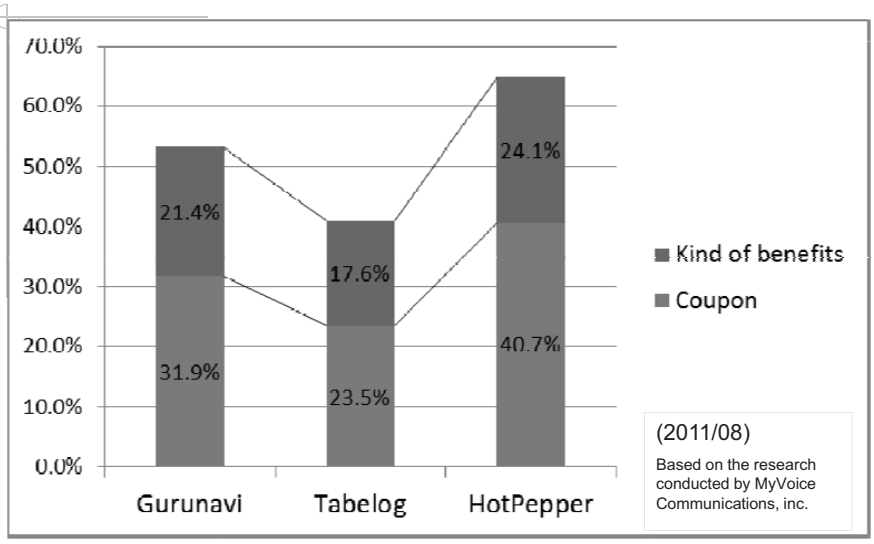
Utilization ratio of evaluation information



- Tabelog (Type CGM) is the highest among 3 services

32

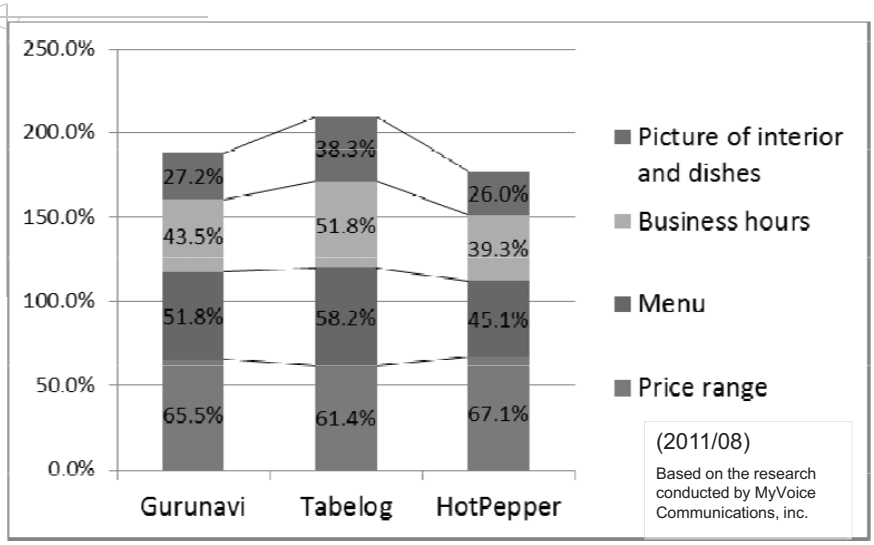
Utilization ratio of benefit information



- Hot Pepper Gourmet is the highest and Tabelog is the lowest among 3 services

33

Utilization ratio of sales information



- Why Tabelog as Type CGM is the highest in Sales information?

34

Inputting sales information in Tabelog

- Informers in Tabelog
  - Do not input complete sales information
  - Do input partial sales information

35 There are so many users who input information

Summary

- Findings by Comparing 3 services
  - Quantity of information
    - Existence of Commons (Town Page)
      - Increasing number of indexed restaurants
      - Decreasing input burden
        - Especially important for Type CGM
  - Types of information
    - About sales information in Type CGM
      - Many of partial information does matter

36

Thanks for your attention

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37

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Taki, Hisao. *Gurunavi: Way to No.1 Site.* Tokyo: Nihonkeizaishinbunsha, 2006. Print, in Japanese.

MyVoice Communications, Inc.,. *3rd Questionnaire Survey about Searching Restaurant Information*. N.p., 2011. Web, in Japanese. <https://myel.myvoice.jp/products/detail.php?product_id=15716>.

38

Gurunavi
http://www.gnavi.co.jp/

Tabelog
http://tabelog.com/

Hot Pepper Gourmet
http://www.hotpepper.jp/

Town Page
http://tpf.itp.ne.jp/

SAINT 2003

Workshop 3: E-Business

The survey of the mobile Internet, usage and awareness, study for m-commerce

30 January 2003

Orlando, Florida

Electronic Commerce Promotion Council of Japan

(The Graduate University for Advanced Studies)

Kazuaki Naruse

naruse@ecom.jp

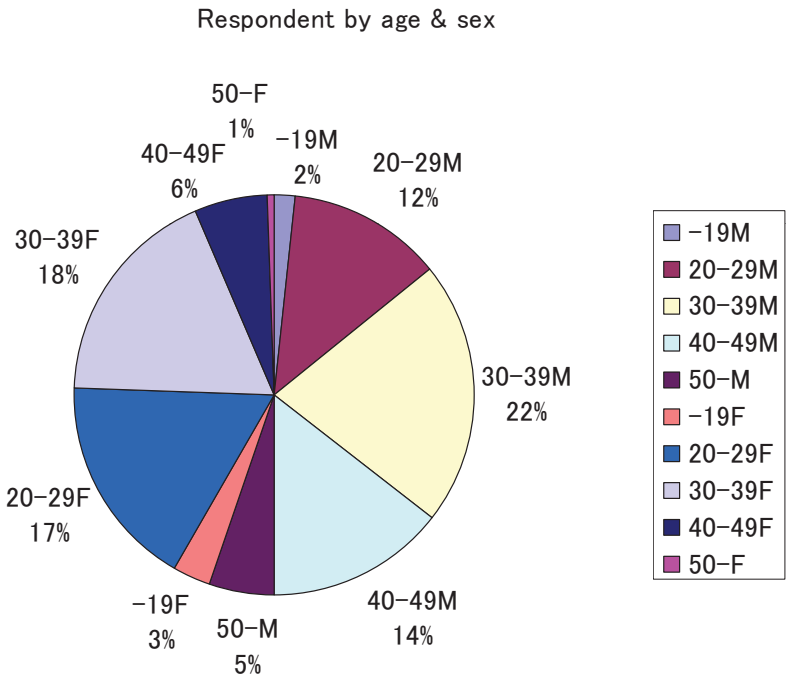
BACKGROUND & OBJECTIVES

- Mobile internet services are commonly used in Japan
- May change our life style over generation, profession and over area
- To find what they want, where they use over mobile phone
- To explore new needs for application, interface and rule etc.

CONDITION

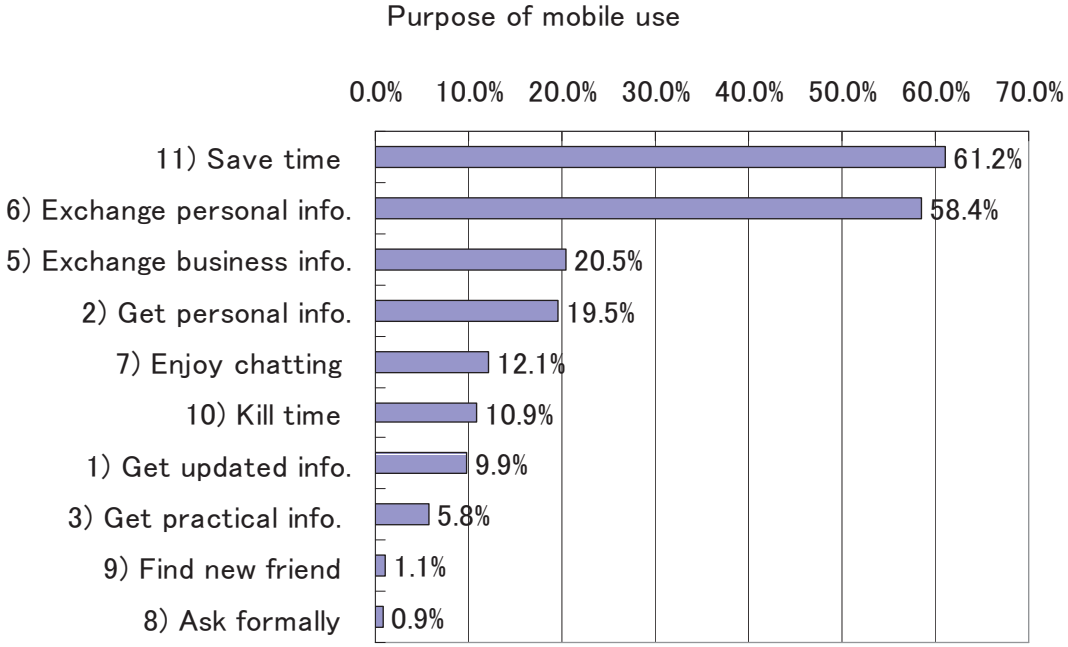
- Online questionnaire survey was conducted via WWW on Oct. 2001
- **Respondents: 5,724**

Purpose of mobile phone use in Japan



Purpose of mobile phone use in Japan

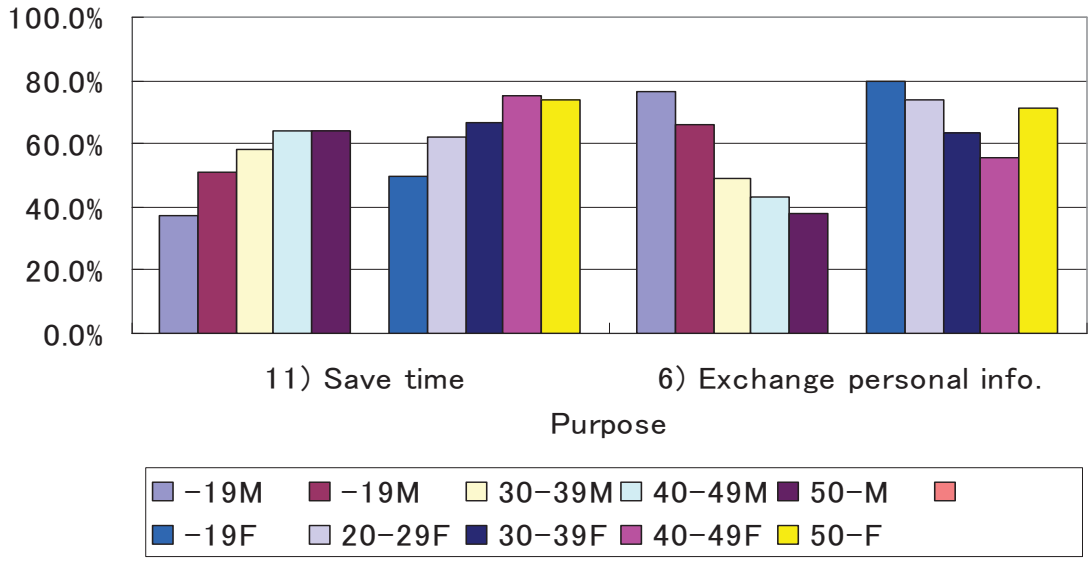
Mainly used for Saving time, Exchange of personal information



Purpose of mobile phone use in Japan

The more user aged, the more they aim for saving time

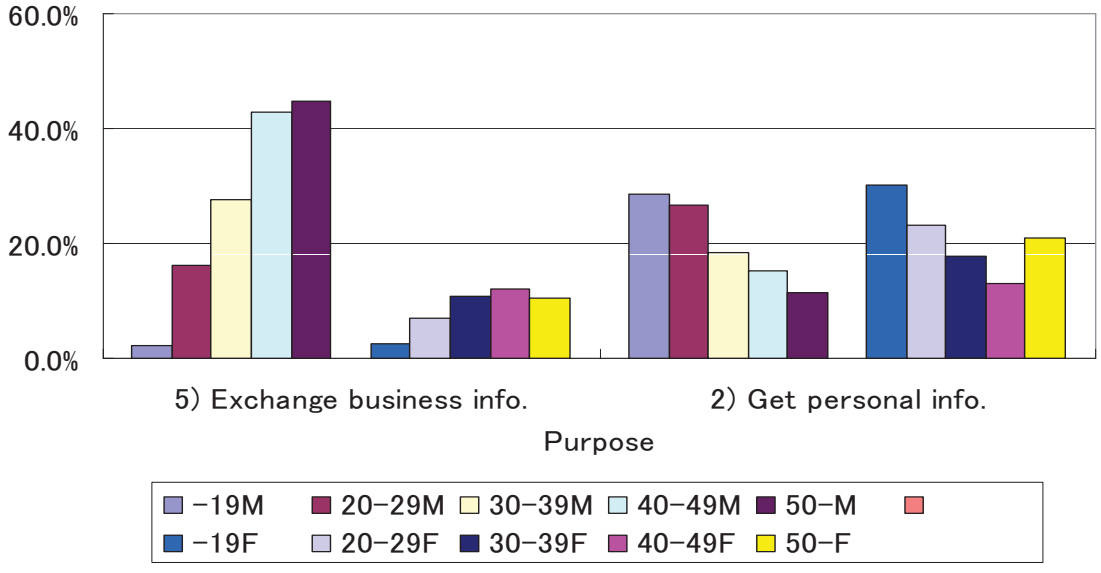
The more user aged, the less they aim for exchanging personal info.



Purpose of mobile phone use in Japan

The more user aged, the more they aim for exchanging business info.

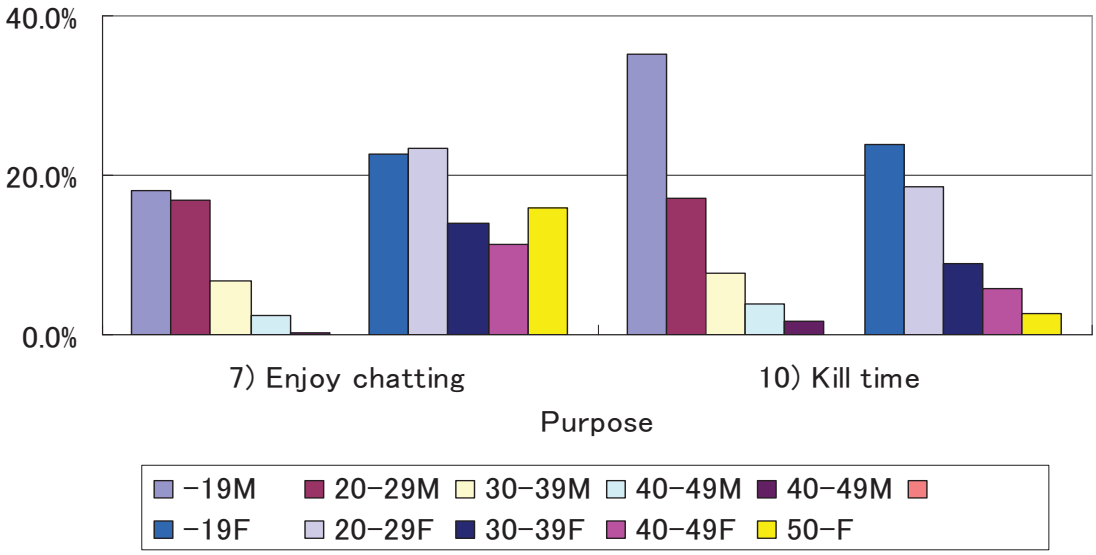
The more user aged, the less they aim for getting personal info.



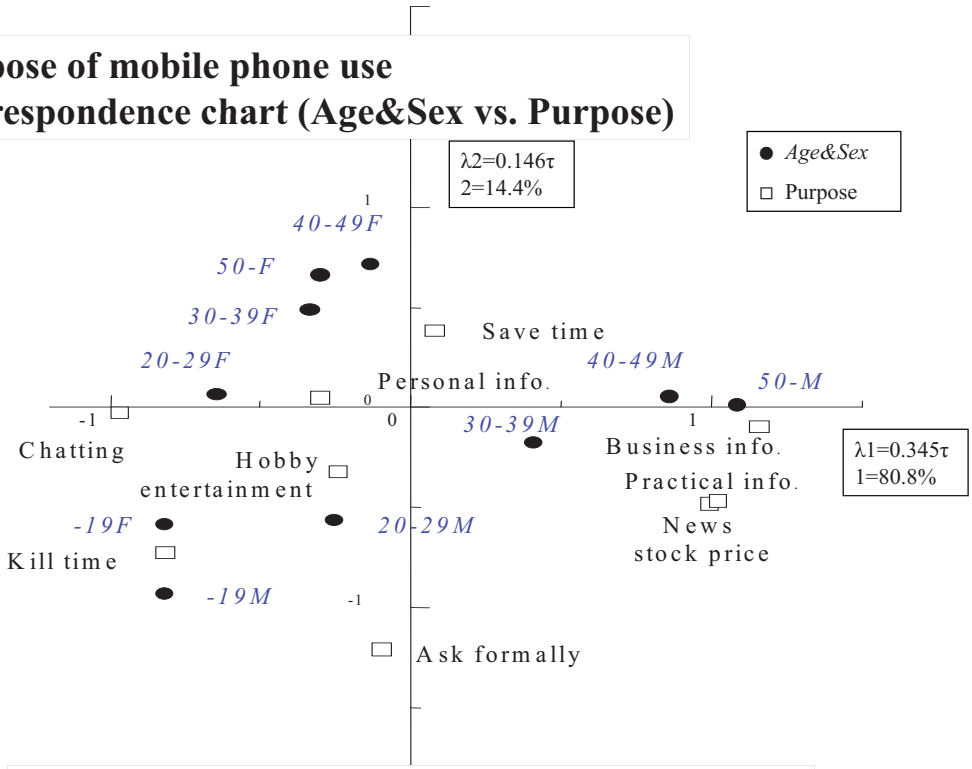
Purpose of mobile phone use in Japan

The more user aged, the less they aim for chatting.

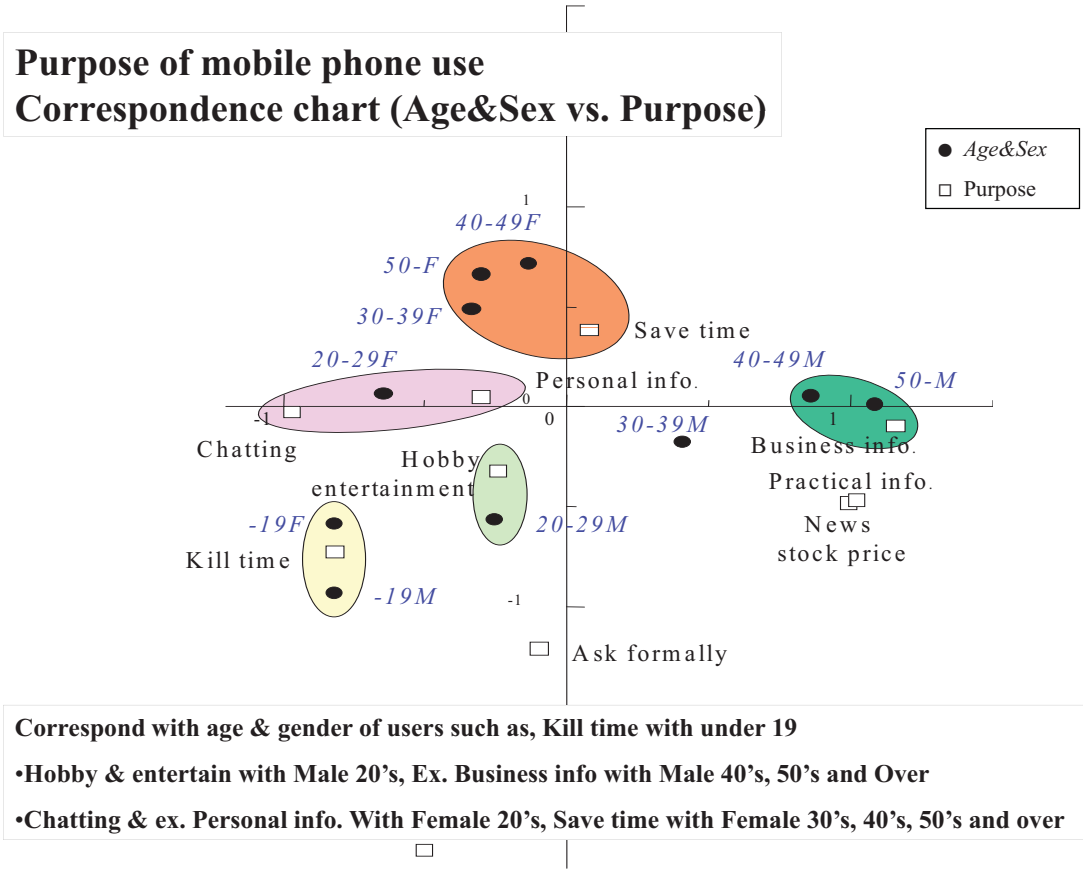
The more user aged, the less they aim for killing time.



Purpose of mobile phone use Correspondence chart (Age&Sex vs. Purpose)



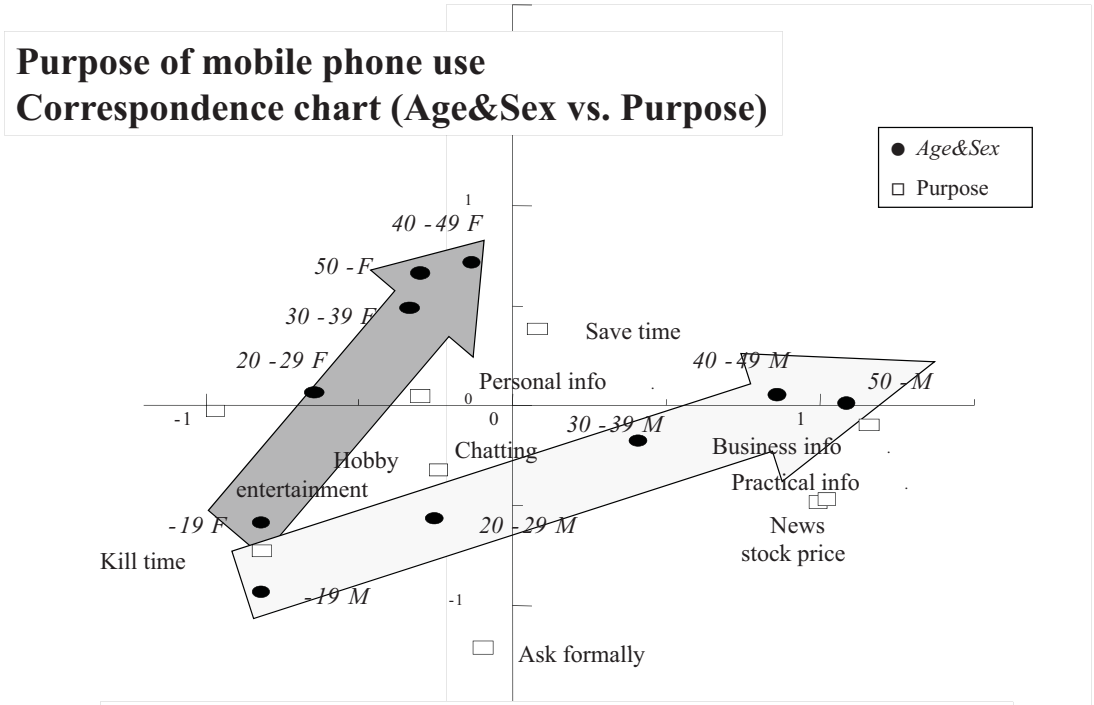
The 1st axis of the chart is defined as clearness of purposes, the 2nd axis as freedom of time use by factor analysis



Correspond with age & gender of users such as, Kill time with under 19

•Hobby & entertain with Male 20's, Ex. Business info with Male 40's, 50's and Over

•Chatting & ex. Personal info. With Female 20's, Save time with Female 30's, 40's, 50's and over

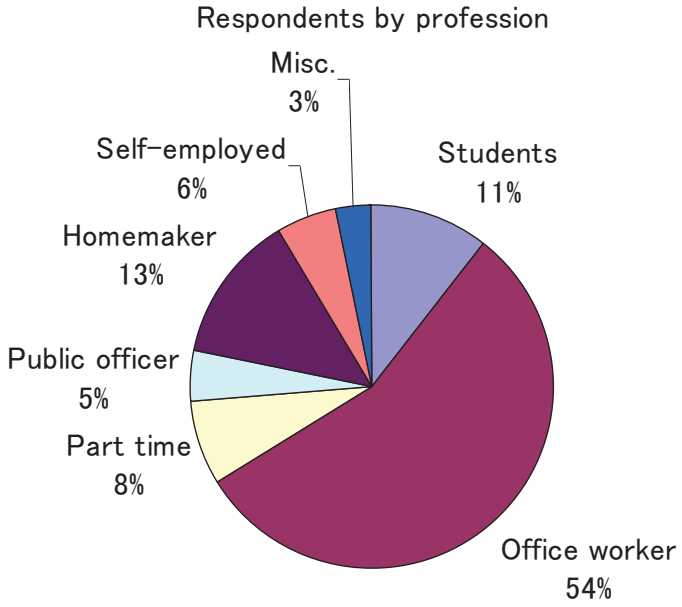


•The more user aged, the more plots of each gender apart

•The more user aged, the less they seek entertainment

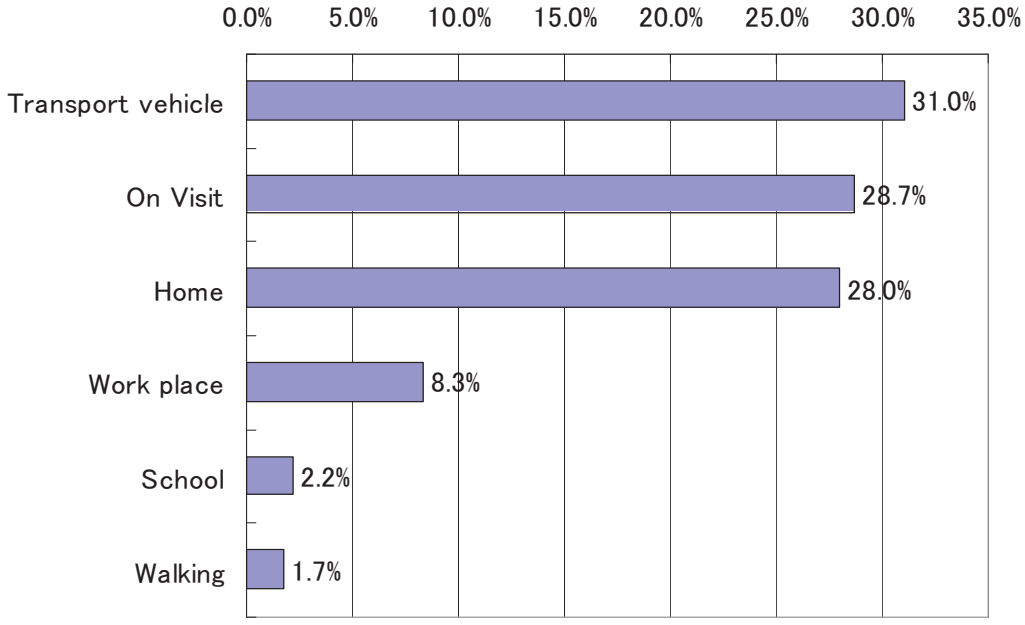
•Purposes can be categorized by gender common and gender specific

Main place to access web services in Japan



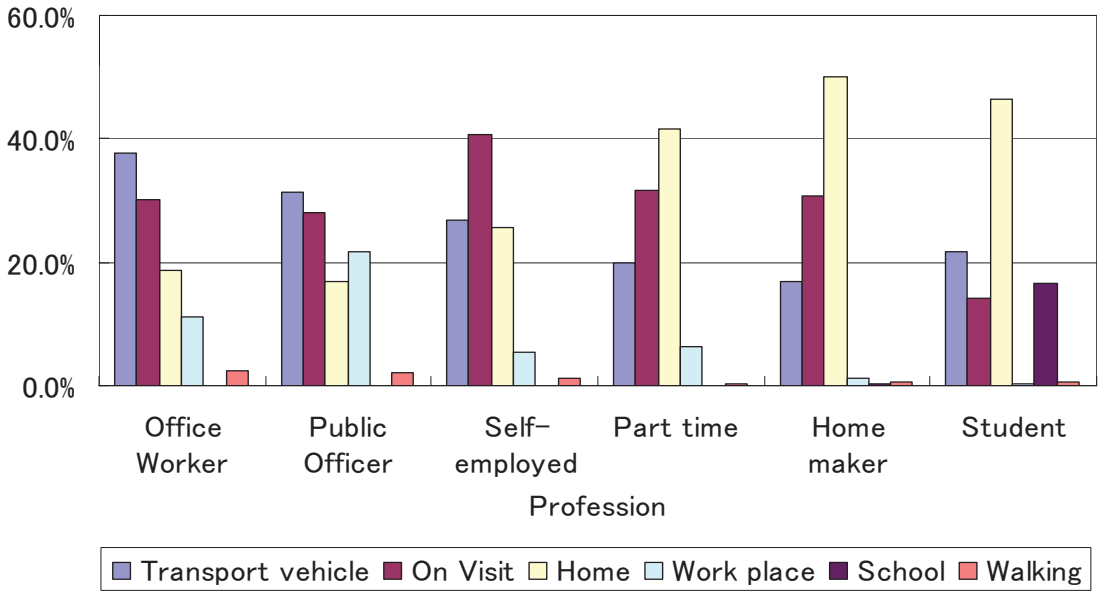
Main place to access web services in Japan

Mainly used on transportation, at home and on visit

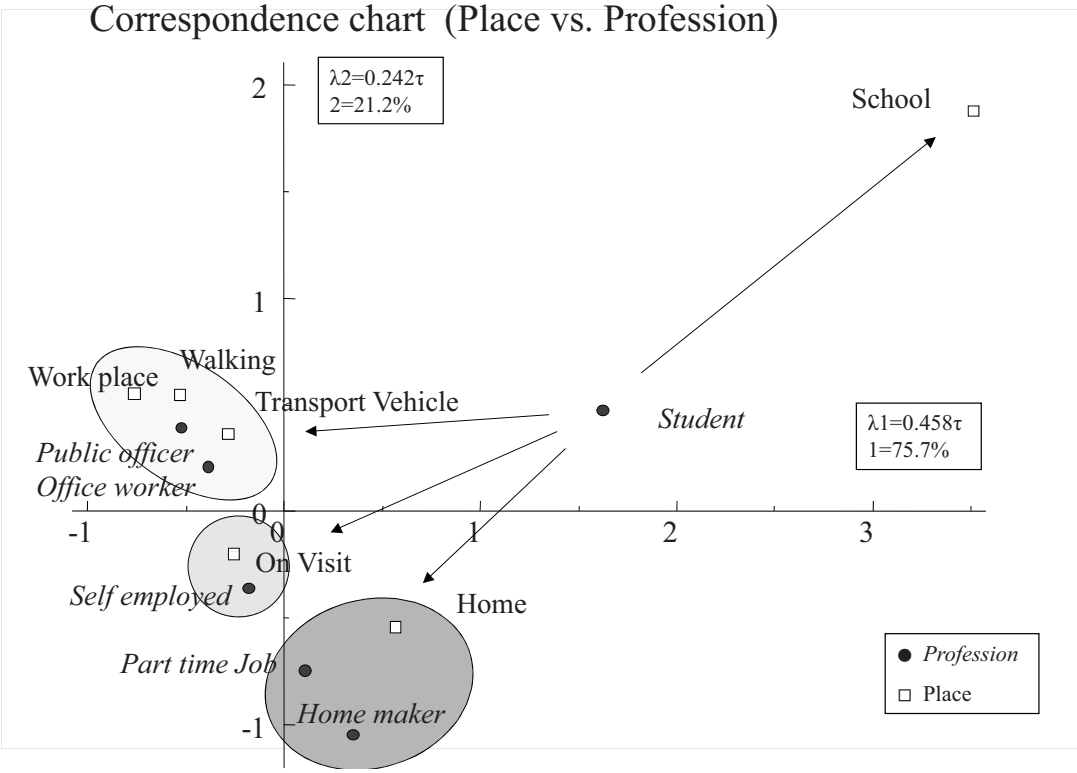


Main place to access web services in Japan

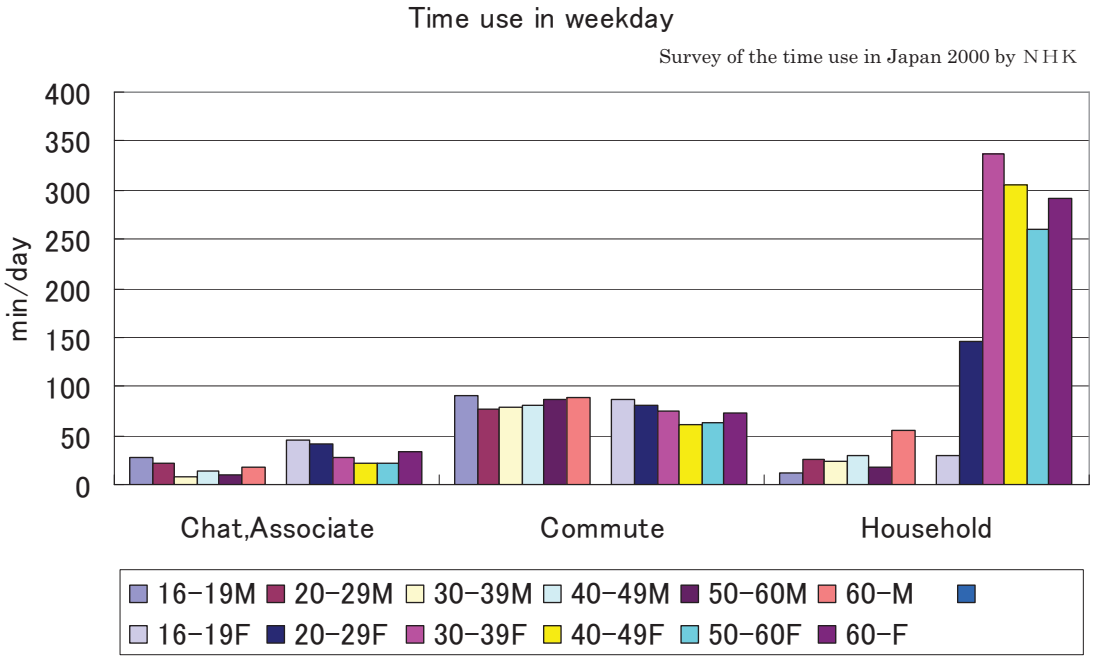
Mainly used on transportation by office worker(37.8%), at home by house worker(50.0%) and on visit by self employed(40.7%)



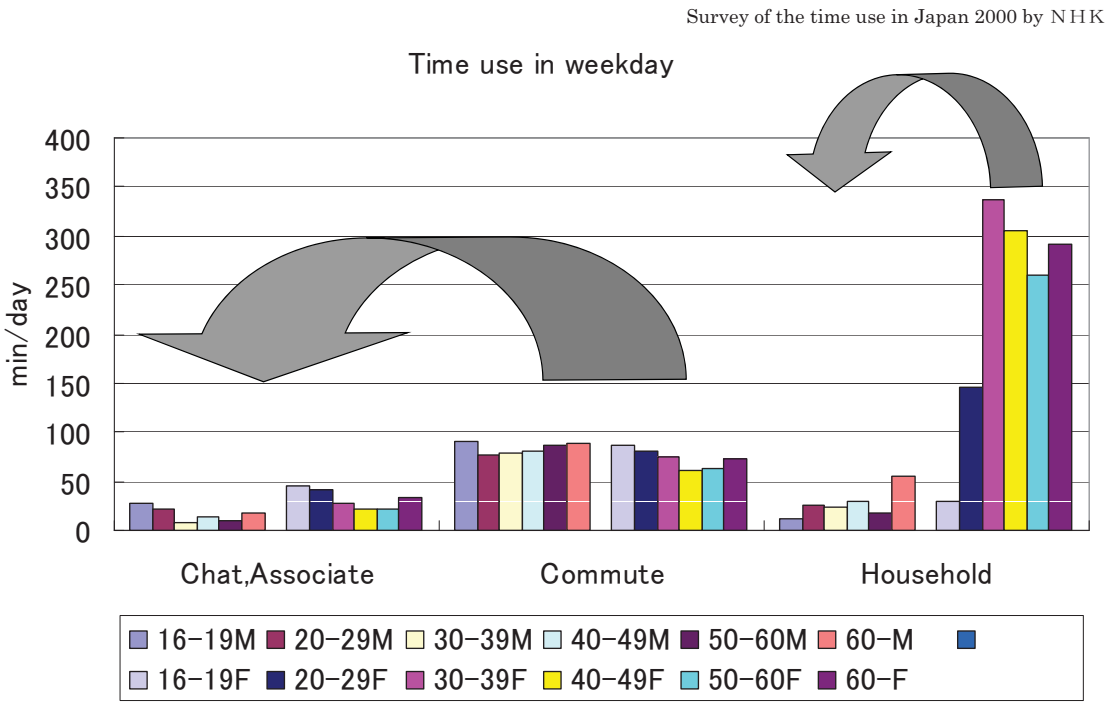
Where to Use Web Services
Correspondence chart (Place vs. Profession)



Time use in Japanese daily life



Time use in Japanese daily life



Conclusion

■Analyzed who wants what over mobile internet in Japan

- **Mainly used for Saving time, Exchange of personal information**
- **The more user aged, the less likely they seek entertainment**
- **The factor analysis shows "clearness of purposes" as the 1st axis of the correspondence chart, "freedom of time use" as the 2nd axis**
- **Purposes correspond with age & gender of users**
- **The more user aged, the more plots of each gender apart**

Conclusion

■**Main place to access mobile web services**

- **Mainly used on transportation by office worker, at home by house worker and on visit by self employed**
- **Places correspond with profession of users**
- **Over professions, On transportation and On visit are commonly used places**

■ Explore new needs for application

■ MI may improve our quality of life over generation and gender