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Intelligent information deriving using network panel data management system in marketing research

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Abstract

A variety of research surveys have been conducted to make the right decisions, to offer insights into necessary changes, and to find new opportunities. The most of them, however, perform just one-time analysis (i.e. cross-sectional analysis) and the intelligent use of accumulated survey researches have hardly been investigated so far. In this study, we propose a very effective marketing research system called the network panel data management system (NPDMS). To compare the different questionnaires, NPDMS transforms all different survey form into the standard form consisting of common mandatory questions. NPDMS finds the most similar marketing research survey and panel among different marketing researches and performs the longitudinal study of loyal/disloyal customer groups. In this study, we developed a web-based NPDMS and demonstrated its effectiveness through its application to research survey data of a Korean research company.

Keywords: Network panel data management system; Marketing research; Longitudinal analysis

1. Introduction

Today, products are more complex and more customized. A short time-to-market for a new product and short product life cycle become critical factors in fierce competition. The ability to obtain market feedback has been more important than ever, as corporate decision makers must make quick and agile, yet well-informed and accurate business decisions. Furthermore, today has competitive and complex market environment with the various products/services, the caprice of customers and the cost of making a mistake. Therefore, marketing research has been more often requested to research service provider by a variety of firms which have to focus on these changes of customers and market environments to survive in global market.

Recent marketing researches have been performed to identify problems of products/services, segment the customers according to their attitudes, feeling, tendencies or other information, and build efficient strategies. However, recent marketing research has still had some problems for the good use as follows:

1. *Very few integrated studies which combines longitudinal studies as well as cross-sectional studies:* Most marketing researches have focused on only cross-sectional studies or only longitudinal studies. The former is the research study to identify the details of a specific product/service (Leeflang & Wittink, 2002; Santhanam & Guimaraes, 1995). The latter is a correlational research study that involves observations of the same items over long periods of time and accordingly tracks the change of research result.

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2. *Using the only simple socio-demographic (SD) information for designing quota and questionnaires, etc., in the marketing research:* Marketing research providers have used sampling frame consisting of simple SD information from previous marketing research results when they conduct new marketing research survey or build new marketing strategies. The accumulated respondent group from various and repetitive market researches have the relation between them: however, the accumulated data of many market researches has not been sufficiently used.
3. *Nonstandardized questionnaires:* Survey questionnaires have been performed on nonstandard type because a number of various services/products have different focuses on marketing strategies irrespectively. Standardization is needed for the actively use between various and repetitive market researches. ISO20252 has the purpose of this international standard for market, opinion and social research to unify the criteria of the work procedures, establish level of requirements of the service provision (ISO 20252, 2006).

In this study, we propose a network panel data management system (NPDMS) for intelligent information deriving in marketing research. Unlike general meaning of panel, we define the panel as the respondents answering an online/off-line questionnaire for a service/product in this study. In general, panel means the group of selected research participants who have agreed to provide information at specified intervals over an extended period of time.

Network panel in our study means networked panel information that is used for mutual assistance or support in all marketing researches.

To compare different questionnaires in different marketing researches, NPDMS standardizes survey results based on common mandatory questions (refer to Fig. 1 and Table 1) and finds the most similar panel among different marketing researches. It gives the research providers recommendation about more qualified respondents in quota sampling of a new marketing research. NPDMS also tracks the pattern changes of loyal/disloyal customer groups through the longitudinal study of them.

We have organized this paper as follows. The literature review in the area of marketing information management system is discussed in Section 2. In Section 3, we present a network panel data management system (NPDMS) and its basic modules. In Section 4, we apply NPDMS to the marketing research in South Korea. Finally, we make conclusions in Section 5.

2. Literature review

A marketing information system (MKIS) was defined as a structure consisting of people, equipment, and procedures to gather, sort, analyze, evaluate, and distribute needed, timely, and accurate information to marketing decision makers (Kotler, 1997). Kotler's definition provided a specific decision support system (DSS) and an ad hoc DSS. The former was a semi-continuous system that managed data of a specific product/service to constant customers (i.e. traditional panel) and that provided recurring decision making support to its users, while ad hoc DSS was developed for limited use on a specific problem sometimes one-time. However, its unchangeable panel might give bias to users.

Bush presented nearly identical models of marketing information systems which showed relationships between managerial tasks, uses of the MKIS, MKIS information development and decisions in the marketing environment (Burns & Bush, 2000). It illustrated only the functions of distinct components but did not identify the relation of a variety of product/services.

Even though marketing management support systems (Wierenga & van Bruggen, 1997) developed a classification of marketing problem-solving models through intelligent data mining methods (Marketing Expert Systems, Marketing Neural Nets, etc.), it did not analyze at more than two time periods.

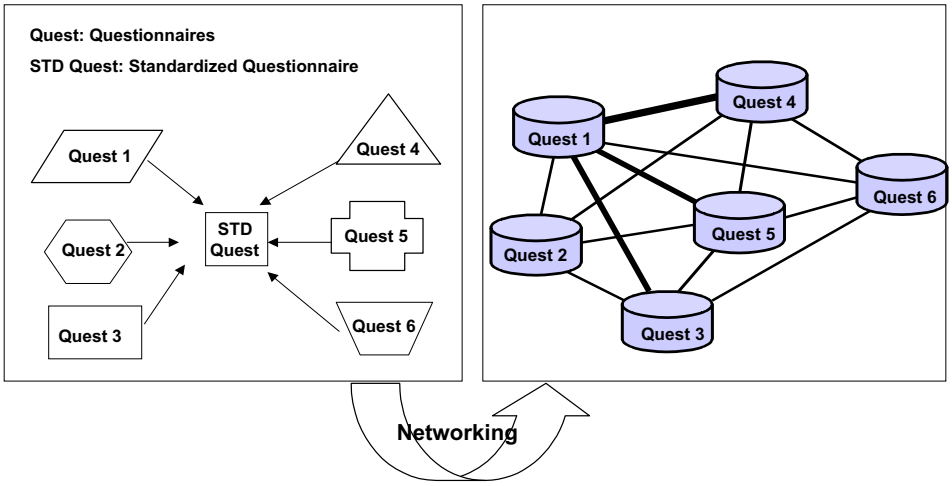


Fig. 1. Standardization and Networking of multiple questionnaires.

In this study, we present a NPDMS that can integrate and analyze plenty of marketing researches irrespective of products/services and time periods.

3. NPDMS for intelligent information deriving in marketing research

In this section, we present a framework of network panel data management system (NPDMS). NPDMS has two parts. One is the analysis part consisting of three analysis modules, the other is the database part consisting of two modules which manage panel information and survey results shown as Fig. 2.

Three analysis modules of NPDMS are the similarity analysis module between different marketing researches, the sharable service/products analysis module for a new marketing research survey design and the longitudinal analysis module for a specific customer segmentation (e.g. loyal or disloyal customer segmentation).

3.1. Standardization of survey data

Fig. 3 shows the overall processes in NPDMS for intelligent information deriving in marketing research survey.

After conducting a new marketing research, panel information such as their mobile numbers, addresses and names is inserted into panel information database if they do not exist. In case of existing, panel information is updated (refer to Fig. 3).

NPDMS transforms all variables of a new marketing research result into a standardized form to share panel information between marketing research surveys. In our

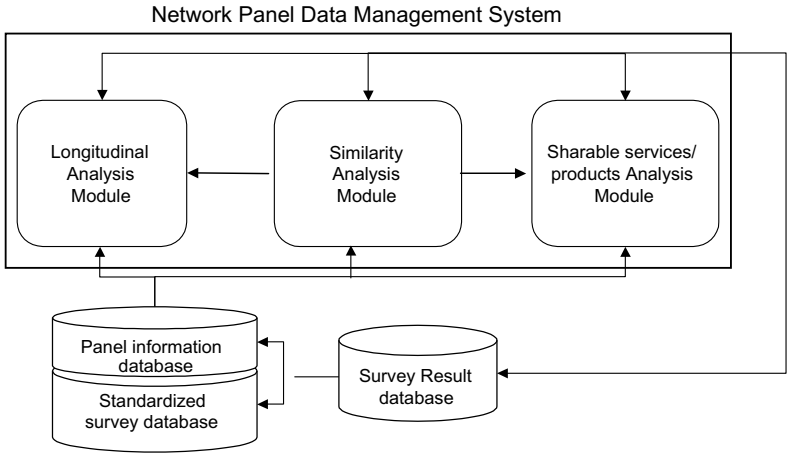


Fig. 2. Architecture of NPDMS.

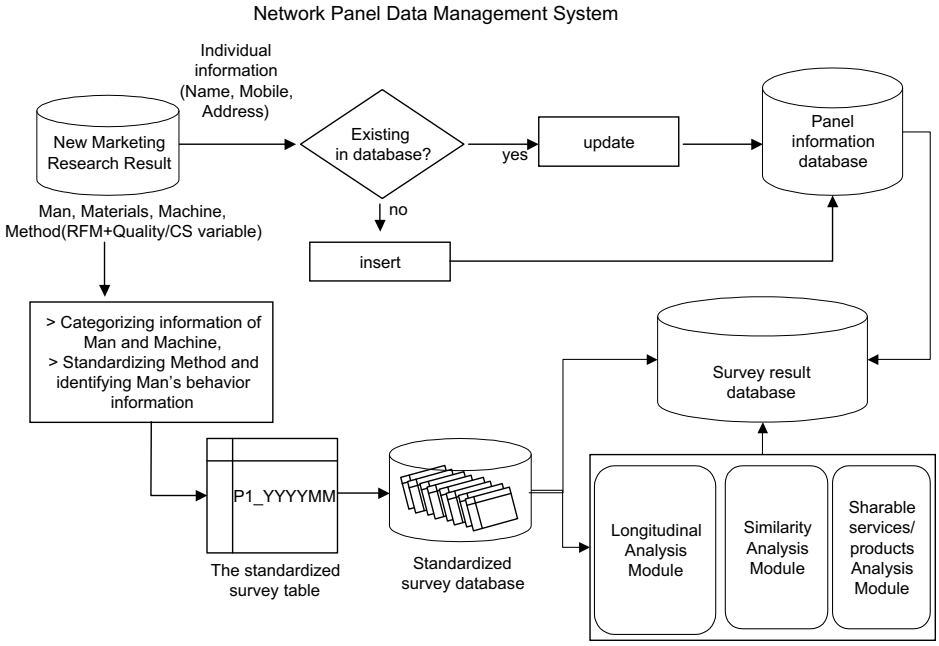


Fig. 3. Overall process in NPDMS for intelligent information deriving in marketing research survey.

study, a new marketing research result is categorized in terms of 4M (man, method, machine and material) elements of Ishikawa diagram (Mach & Guáqueta, 2001) and RFM (recency, frequency and monetary) metric. We divide the survey variables (i.e., questions) of each survey into 4M elements, man, method, machine and material element, of Ishikawa diagram (Mach & Guáqueta, 2001), which generally analyzes potential causes of a defect, error or problem. The 4M elements in our study are followed as

1. Man (the human element): the respondents' social-demographic features.
2. Material (components): the main material which the respondents use.
3. Machine (equipment): the place where the respondents live, use or buy.
4. Method (how work is done): how the services/products are served for respondents.

Table 1 shows the 4M elements and RFM information in common mandatory questions of a survey, which is saved as the form of a table in survey result database.

RFM (recency, frequency and monetary) information from the survey data are obtained for identifying purchase behavior of a customer (Keay, McNeil, Sung, & Sang, 1998). In our study, RFM are defined as follows:

1. Recency: The last period of time to purchase or use product/service.
2. Frequency: The number of purchases made to purchase or use product/service.
3. Monetary: Amount of money spent to purchase or use product/service.

3.2. Preprocessing of survey data

NPDMS preprocesses survey data to integrate numerous survey data from various survey results. Prerequisite questions (shown in Table 1) may be common entities and means criteria to slice research data. These prerequisites mean the one of starting points in standardization of marketing research industry and can be compared between various kinds of marketing surveys corresponding marketing researches' aims for a variety of services/products.

However, various kinds of questionnaires from different products/services need the ETCL (extract, transformation, cleansing and loading) process which is a basic step to construct data warehouse. The slices of data can be categorized as socio-demographic (SD) features (e.g., age, city, sex, marriage, income, education, job, family), behavior information and variables about quality, loyalty and customer satisfaction. In case of variables (i.e., survey questions) about quality, loyalty and customer satisfaction, 5-point-scale (1 means "strongly disagree/dissatisfied", 3 means "neither agree/satisfied nor disagree/dissatisfied", 5 means "strongly agree/satisfied) is used.

3.3. Similarity analysis module of NPDMS

Similarity analysis module (SAM) calculates the extent to how correlated a survey is with other surveys, identifies the most similar/dissimilar one. Fig. 4 shows the similarity analysis process of SAM.

At first, SAM extracts all method-variable values in the same condition of combinations of SD features. Method-

Table 1
Common mandatory questions classified in terms of the 4M view

Column name	Column description	Type of scales	4M	Type
Age_id	Age	Nominal	Man	SDFeatures
Sex_id	Sex	Nominal		
Marriage_id	Marriage	Nominal		
Family_id	The number of family	Nominal		
Edu_id	Education Level	Nominal		
Income_id	Total income	Nominal		
Job_id	Job	Nominal		
Area_id	Residential district	Nominal	Machine	
User_period	Purchasing data	Ratio		RFM (Recency, Frequency, Monetary) value of quality and customer satisfaction primarily used
F	Purchasing frequency	Ratio		
M	Average purchasing price	Ratio		
Change_period	The date to change	Ratio		
CS1	Overall satisfaction point	Interval	Method	
CS2	Recommendation point	Interval		
CS3	Repurchasing point	Interval		
Material_id	Service id	–	Material	
Man_id	Social security number	–		
Email	E-mail	–		
Phone	Phone number	–	Man	Panel individual information
Address	Address	–		
Agreement	Agreement	–		

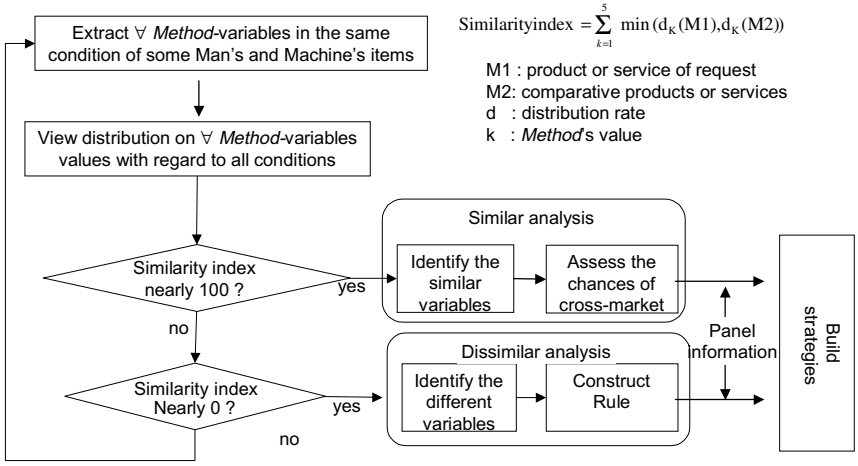


Fig. 4. Similarity analysis process.

variable values are categorized, and the distributions of each categorized item are calculated as similarity index (SI).

To measure SI, we use the index of dissimilarity calculated the extent to which percentage distribution in categorical items (i.e. the scales from 1 to 5) of a specific service are same as and different from others with respect to all the combinations of categories and method types. This extent represented by dissimilarity index indicates the percentage level of dissimilarity between SD feature vectors from two exclusive panels. In case of dissimilarity index, the summation is over the percentage difference of component real units from scale-1 to scale-5.

Let T_i and T_j denote product/service requested and comparative products or services, respectively. d represents distribution percentages in all 5 scales, k represents method-element. The dissimilarity index equals:

$$\text{Dissimilarity index} = \frac{\left(\sum_{k=1}^{5}|d_k(T_i) - d_k(T_j)|\right)}{2} = 100 - \text{Similarity Index} \quad (1)$$

where we divide by 2 to avoid double counting (Jahn, Schmidt, & Schrag, 1947). This index measures the evenness with which two mutually exclusive groups are distributed across the SD Features. Its minimum value is 0 and maximum value is 100.

In the case of high SI (i.e. low dissimilarity index), every ratio distribution of a method-variable between the two surveys corresponding to combinations on SD features is very similar, even though they are totally different surveys about different services/products. Through the detailed investigation of survey questions in surveys performed by SAM, we find the similar survey questions and then build cross-marketing strategies using it.

In the case of low SI (i.e. high dissimilarity index), through comparing the details of survey questions between the two surveys, we also find the difference of survey questions and construct the rules which are able to guide when a next similarity analysis is requested.

3.4. Sharable services/products analysis module of NPDMS

The sharable services/products analysis module (SSAM) can help to design sampling frame or quota sampling from previous marketing research results when a new marketing research survey is planned. Fig. 5 shows the overall deriving processes of sharable information for designing a new survey from existing marketing research results.

When a new survey is requested by a client company that obtains the survey result from affiliated company or itself previous research, SSAM selects its attainable panel data directly and constructs quota sampling from it during the sampling frame analysis (refer to Fig. 6.).

Research survey provider (RSP) identifies an optimal sampling frame which is fit for the purpose of a marketing research survey. RSP conducts a new survey based on the optimal sampling frame. All the survey data collected are saved as tables through their standardizations, compared with the existing other panel data and analyzed through the use of similarity analysis module.

3.5. Longitudinal analysis module of NPDMS for loyal/disloyal customer caring

Longitudinal analysis module (LAM) of NPDMS provides the integrated analysis through a combination of cross-sectional and longitudinal method for analyzing loyal/disloyal customer trend. In general, there are some changes in the distributions of loyal/disloyal group's age-brackets at different two time points. The changes can be explained by other combination on SD features.

At first, LAM extracts the common variables from the surveys conducted at different time points. Next step, LAM identifies the similar variables from the raw survey data between different services/products. Longitudinal analysis module firstly uses factor analysis for survey data

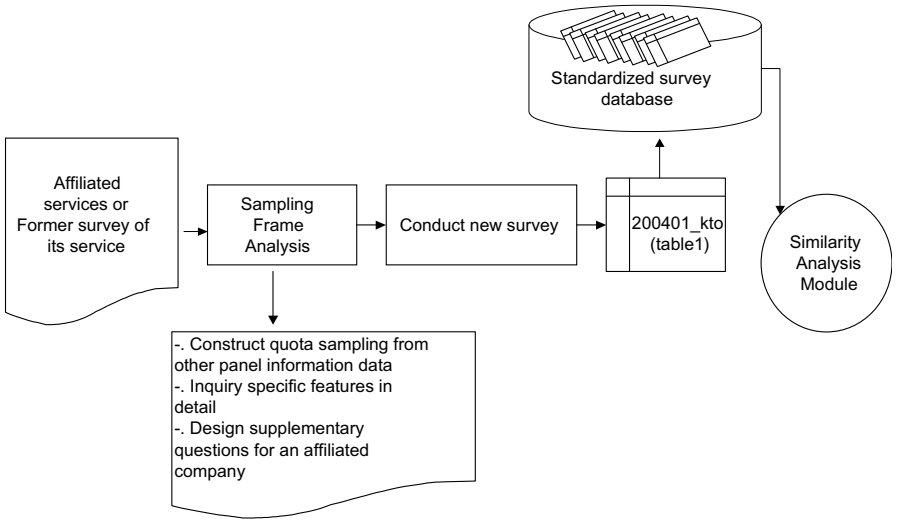


Fig. 5. Deriving process of sharable information in sharable services/products analysis module.

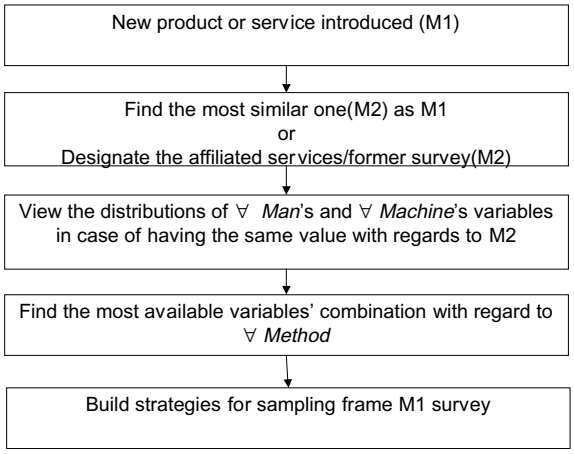


Fig. 6. Sampling frame analysis.

reduction and then uses contribution rate and correlation rate of variables corresponding to Method element (overall satisfaction, etc.) for extracting key variables (i.e., questions in the questionnaire) from every identified factor (Woo & Park, 2005). After checking the matrix analysis of correlation and contribution rate, we extract key variable from every factor as they mentioned.

Fig. 7 shows the overall process in LAM for loyal/disloyal customer caring.

After reducing large number of variables, key driver analysis is performed to derive key information, which will be an input for discriminating loyal/disloyal customer group. The loyal group has high value (i.e. more than 4 in case of 5-scale) of these key driver variables and method-variables or has high average score on them among cluster groups through *K*-means clustering method. The

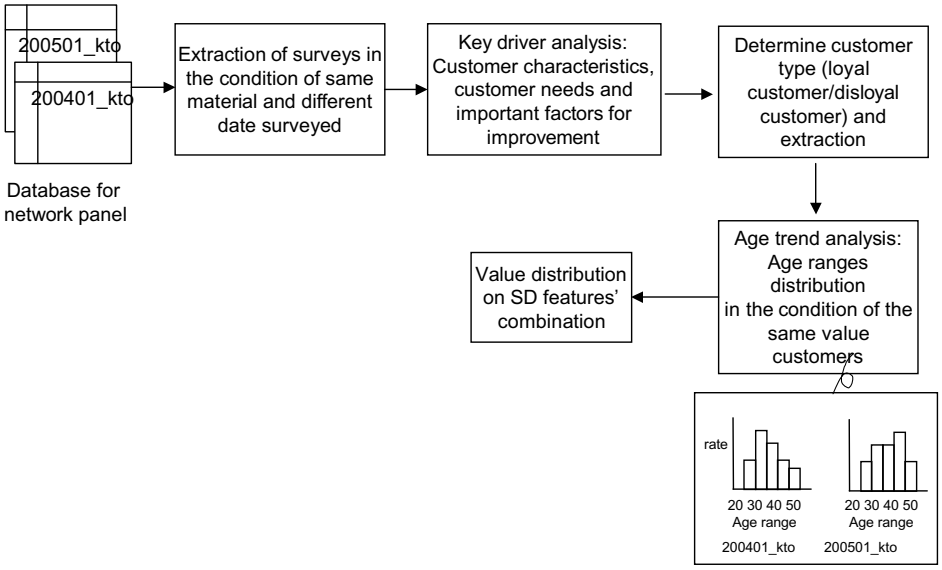


Fig. 7. Overall process for loyal/disloyal customer caring in longitudinal analysis module.

age distribution of the loyal customers/disloyal customers is shown in Fig. 7. We identify the combination of characteristic features which are very different or very same between two marketing research results.

4. Application of web-based NPDMS to market research survey

In this section, we illustrate application examples using web-based NPDMS for surveys of a research survey provider in Korea, which is developed using html, java script, jsp, and java beans as development language. Fig. 8 shows the survey lists.

The surveys were conducted by the request of different companies during from 2004 to 2006. Questionnaires in the survey were designed to ask more than one question about overall satisfaction (SAT), repurchase intentions (REPUR), and recommendation intentions (RECOM). A 5-point scale was used in that question.

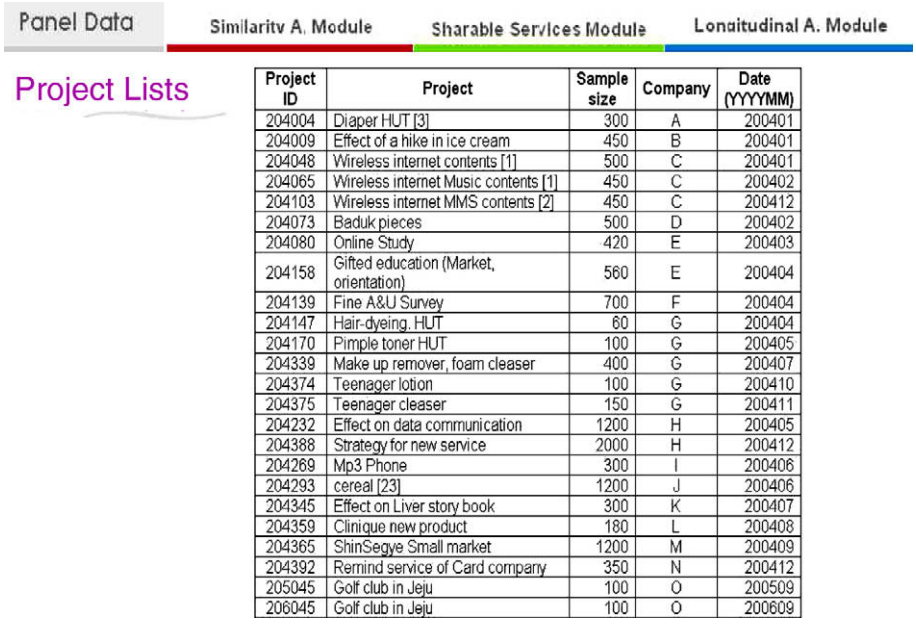
4.1. Application of similarity analysis module of NPDMS to 'Online study' survey

After the preprocessing of the 'online study' survey data, the similarity analysis module of NPDMS identifies more similar one as the respondents' SD features of the 'online study' survey. Table 2 shows the similar survey lists after performing a similar analysis by SAM.

Among the respondents of 'Strategy for new high speed internet' survey, those respondents with the EDU6 (educational background: high school graduate) and JOB7 (job: technician) have the highest similarity index.

Fig. 9 shows the main focuses (i.e., key variables) of those respondents of two surveys, 'online study' and 'strategy for new high speed internet' survey.

In the case of high SI, those respondents focus on four similar points/variables (survey questions) such as price, speed, stability and supplement (or free prize). Therefore, the company of 'online study' can advertise the high speed internet service to the customers who want more stable and



Project ID	Project	Sample size	Company	Date (YYYYMM)
204004	Diaper HUT [3]	300	A	200401
204009	Effect of a hike in ice cream	450	B	200401
204048	Wireless internet contents [1]	500	C	200401
204065	Wireless internet Music contents [1]	450	C	200402
204103	Wireless internet MMS contents [2]	450	C	200412
204073	Baduk pieces	500	D	200402
204080	Online Study	420	E	200403
204158	Gifted education (Market, orientation)	560	E	200404
204139	Fine A&U Survey	700	F	200404
204147	Hair-dyeing. HUT	60	G	200404
204170	Pimple toner HUT	100	G	200405
204339	Make up remover, foam cleaser	400	G	200407
204374	Teenager lotion	100	G	200410
204375	Teenager cleaser	150	G	200411
204232	Effect on data communication	1200	H	200405
204388	Strategy for new service	2000	H	200412
204269	Mp3 Phone	300	I	200406
204293	cereal [23]	1200	J	200406
204345	Effect on Liver story book	300	K	200407
204359	Clinique new product	180	L	200408
204365	ShinSegye Small market	1200	M	200409
204392	Remind service of Card company	350	N	200412
205045	Golf club in Jeju	100	O	200509
206045	Golf club in Jeju	100	O	200609

Fig. 8. Survey lists in web-based NPDMS.

Table 2
Calculating similarity index based on 'Online study' survey

Project_name	Method	Category 1	Category 2	Category 3	DI	SI	No. of respondents
Strategy for new high speed internet	SAT	EDU6	JOB7		2	98	111
Strategy for new high speed internet	SAT	JOB7			5	95	147
Strategy for new high speed internet	SAT	AGE2	EDU7		6	94	221
Strategy for new high speed internet	SAT	AGE2	EDU7	JOB8	6	94	124
Pimple toner HUT	SAT	SEX2			6	94	100
Effect on data communication	SAT	AGE2	JOB8		6	94	52
Online game of baduk	REPUR	AGE3	JOB6		76	23	59
Online game of baduk	REPUR	EDU6	JOB6		79	21	81

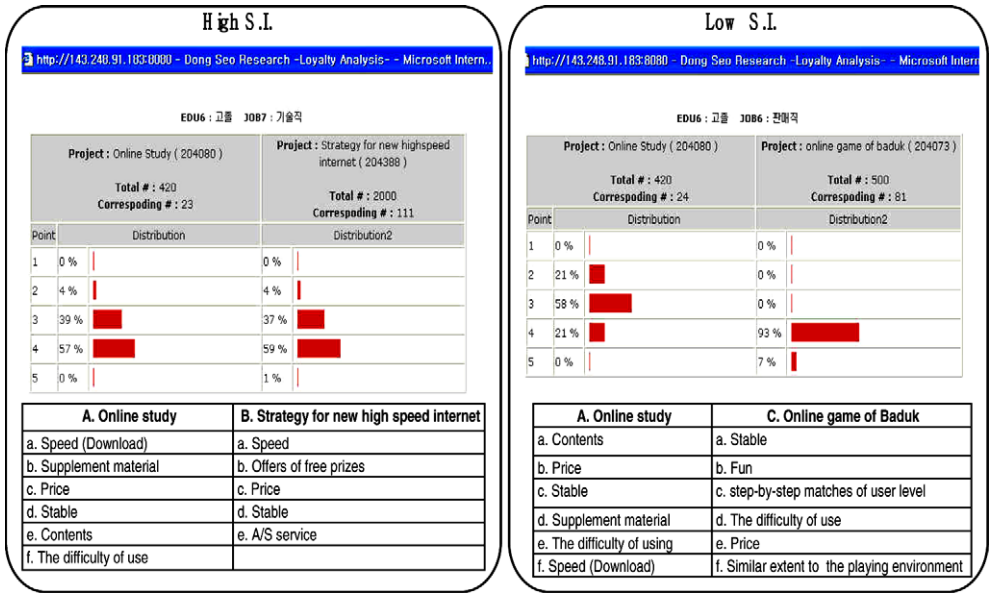
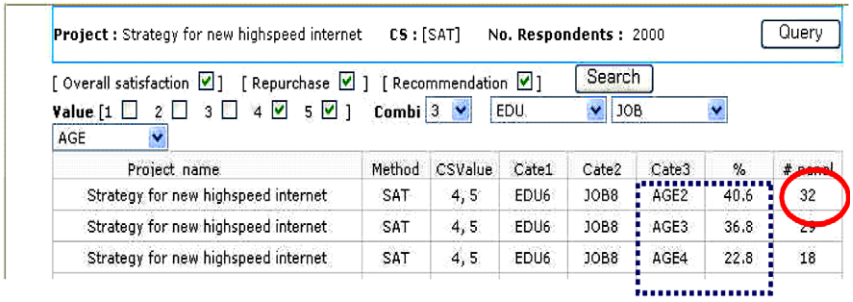


Fig. 9. The distribution of similar and dissimilar surveys and its key variables.



(a) age distribution of panel with high (i.e., 4/5 value) overall satisfaction

(b) the respondents' information with EDU6, AGE2 and JOB8

Fig. 10. The quota sampling window of the age range-distribution in the case of positive customer on 'high speed internet' service.

speedy internet service. The company of 'high speed internet' can purchase tickets of the online study to recompense and attract new customers with it as a free prize.

The opposite case with low SI also can be interpreted analogously. Among the respondents of 'Online game of Baduk' survey, those respondents with the EDU6 (educational background: high school graduate) and JOB6 (job: sales man) have the lowest similarity index. Fig. 9 shows the value distribution on method-variable of two services.

4.2. 'Online study' company's data extraction by sharable services/products analysis module of NPDMS

When 'Online study' company set up affiliation with 'Strategy for new high speed internet' company and develop a new lecture and want to do some preliminary research to its affirmative customer before launching it, it may share the exiting information of not only survey result but also their survey respondents of its affiliated company.

Those in the EDU6 (high school graduate) and JOB7 (technician) of two companies had very similar distribution patterns with regard to overall satisfaction (refer to table 2). We selected respondent group who gave 4 or 5-point of overall satisfaction values. To find more detailed sample frame, we used 3-combination.

Fig. 10a shows the age distribution of panel.

Percentages in the 20–29, 30–39 and 40–49 age group are 40.6%, 36.8% and 22.8%, respectively. By clicking the number, 32, of '# panel', we obtain the respondents' information such as their names, phone numbers, addresses and mails of as shown in Fig. 10b and can use the information in conducting a new survey of 'Online study' company.

4.3. Loyal/disloyal customer analysis using longitudinal analysis module (LAM) of NPDMS

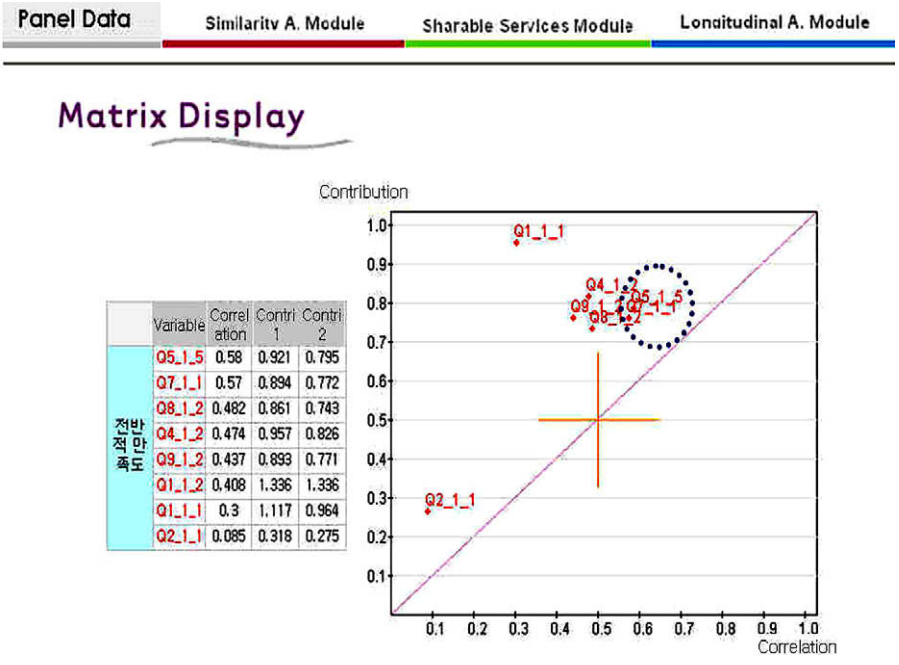
A golf club 'K' in Korea conducts marketing research survey every year to improve its service. It naturally conducted survey in Sep. 2005 and Sep. 2006 and LAM performs a loyal/disloyal customer analysis for those data. Fig. 11 shows the result of correlation and contribution rate analysis for the extraction of key variable (i.e., survey question).

LAM uses *K*-means clustering to group 2005 and 2006 survey data. In applying *K*-means clustering to 2006 survey data, input variables are satisfaction degrees on subsidiary facilities, parking helper, smoothness game, iron help and overall items. In applying *K*-means clustering to 2005 survey data, input variables are satisfaction degrees on clean locker room, traffic convenience, field quality and overall items. After *K*-means clustering, we obtain three customer groups consisting of the loyal group with highest mean value in input variables among them, respectively.

Fig. 12 shows the loyal customers' distribution of age ranges in 2005 and 2006.

We find that the 2006 loyal customers are increased in 40s-ages and decreased in 50s-ages and 30s-ages. Before setting out marketing retention strategies for loyal customers and resolving dissatisfaction of past customers, we should identify the behaviors and demographic information of the increased loyal customers in the 40s and the decreased ones in the 50s and 30s.

Fig. 13 shows the process of identifying the difference points between two groups. LAM investigates the distributions of other SD features and RFM in the 40s and 50s (refer to Fig. 13).



	Variable	Correlation	Contri 1	Contri 2
전체문항	Q5_1_5	0.58	0.921	0.795
	Q7_1_1	0.57	0.894	0.772
	Q8_1_2	0.482	0.861	0.743
	Q4_1_2	0.474	0.957	0.826
	Q9_1_2	0.437	0.893	0.771
	Q1_1_2	0.408	1.336	1.336
	Q1_1_1	0.3	1.117	0.964
	Q2_1_1	0.085	0.318	0.275

Fig. 11. 1. Matrix analysis of correlation and contribution rate for 2005 survey data.

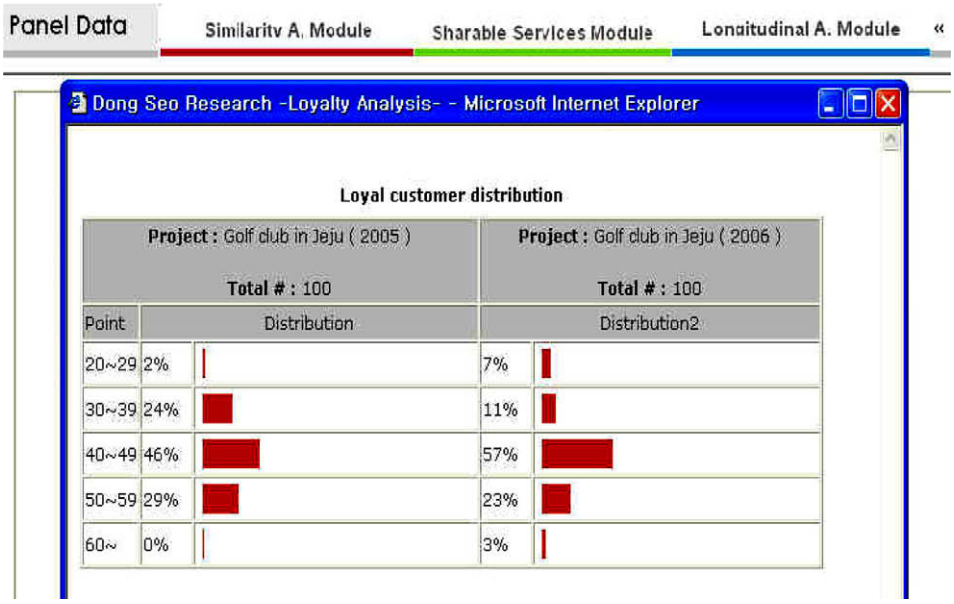


Fig. 12. Comparing the 2006 loyal customer's distribution of age ranges with the 2005 one.

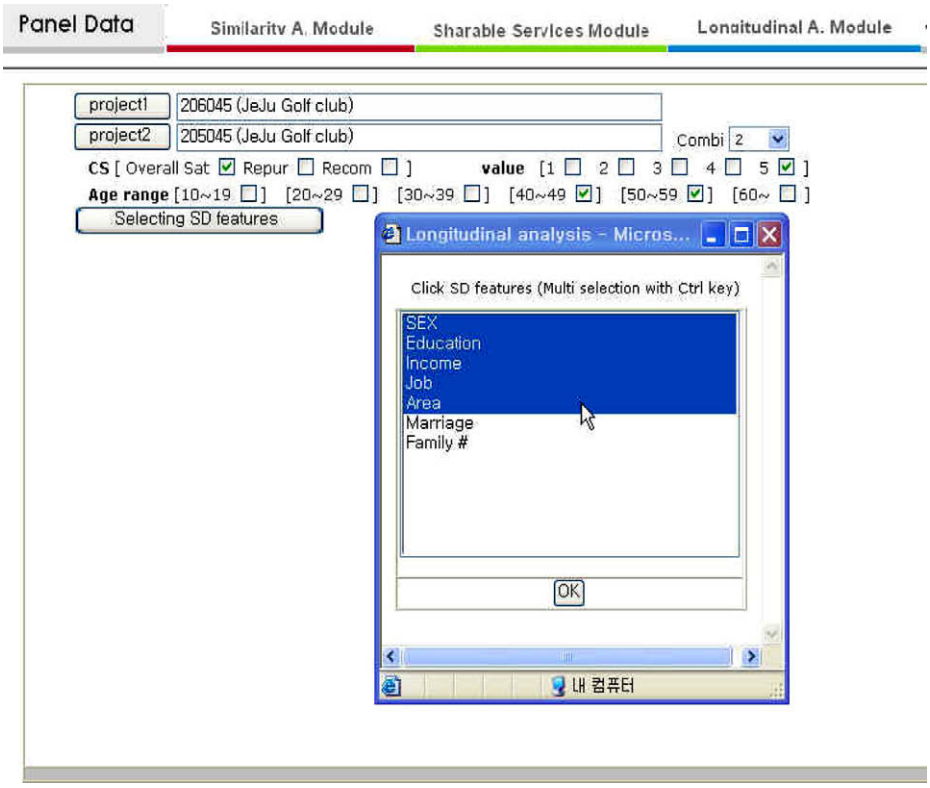


Fig. 13. Specifying the longitudinal analysis of 2005 and 2006 Jeju golf club survey data.

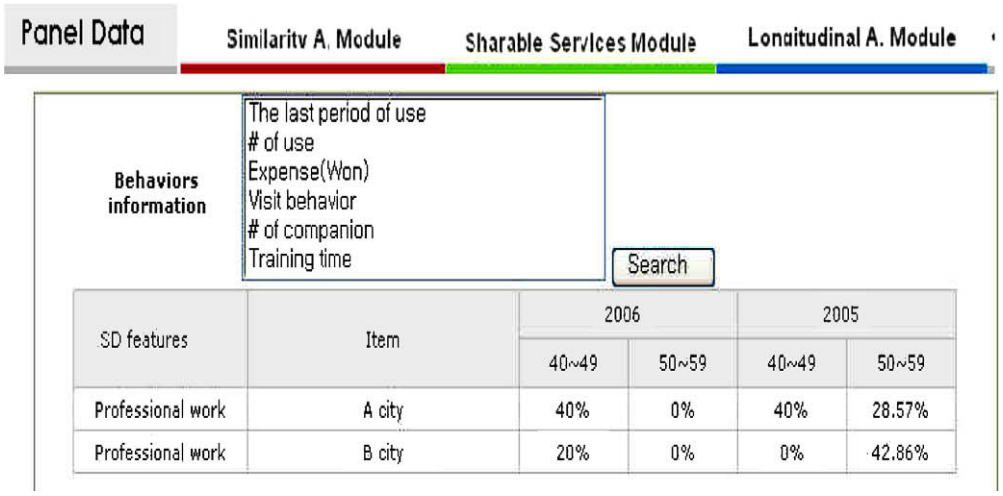
Fig. 14 illustrates the distribution of other SD features.

The bold-faced values in it mean the increase of more than 10% with regard to the corresponding age-ranges in 2005. The underlined values in it mean the decrease of more than 10% in the same case. One of the most noticeable variables' distributions is the sharp decrease of the professional job from 43.8% to 0% in the 50s.

Among combination of job and other SD features, the percent of 'A' and 'B' city in the 50s decreased drastically as shown in Fig 15.

SD features	Item	2006		2005	
		40~49	50~59	40~49	50~59
SEX	Man	85.7%	**78.6%**	96%	100%
SEX	Female	**14.3%**	**21.4%**	4%	0%
EDU	high school graduates	**22.9%**	**28.6%**	8%	12.5%
EDU	university graduates	62.9%	57.1%	68%	43.8%
EDU	More than ~	**14.3%**	**14.3%**	24%	43.8%
INC	200-300,000	2.9%	0%	4%	12.5%
INC	300-400,000	11.4%	7.1%	12%	6.3%
INC	400-500,000	37.1%	10.7%	28%	6.3%
INC	500-600,000	14.3%	10.7%	20%	18.8%
INC	600-700,000	11.4%	21.4%	4%	0%
INC	700,000~	**22.9%**	50%	32%	56.3%
JOB	Own business	**57.1%**	**71.4%**	40%	**37.5%**
JOB	administrative	11.4%	7.1%	12%	6.3%
JOB	office	14.3%	14.3%	20%	12.5%
JOB	professional work	**8.6%**	**0%**	20%	43.8%
JOB	Sales	8.6%	7.1%	4%	0%
JOB	House keeper	0%	0%	4%	0%
AREA	Seoul	28.6%	42.9%	28%	37.5%
AREA	Jeju	**45.7%**	**28.6%**	20%	18.8%
AREA	Others	25.7%	28.6%	52%	43.8%

Fig. 14. The distribution of SD feature in 2006 and 2005 with regard to the 40s and 50s age.



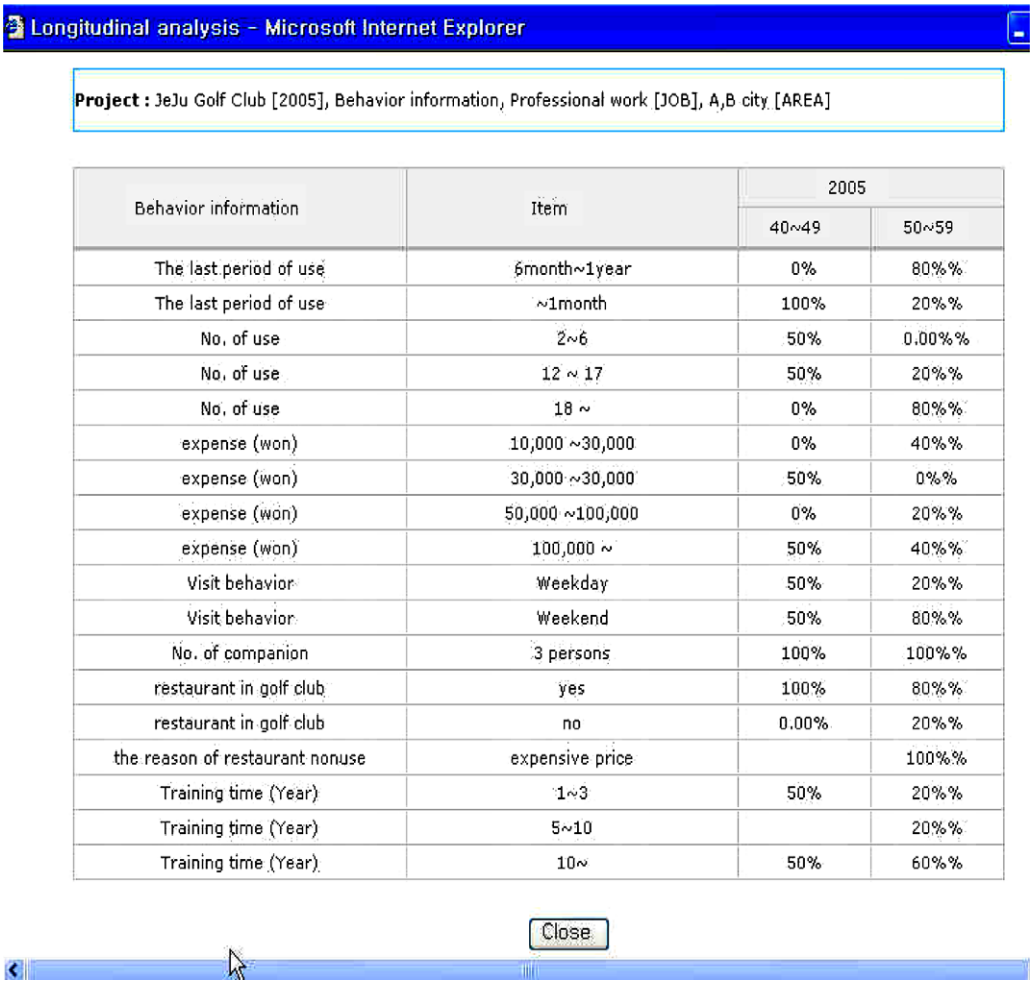
SD features	Item	2006		2005	
		40~49	50~59	40~49	50~59
Professional work	A city	40%	0%	40%	28.57%
Professional work	B city	20%	0%	0%	42.86%

Fig. 15. Analysis of age distribution according to the combination of JOB and AREA.

Furthermore, behavior characteristics in this group are illustrated in Fig. 16.

We find that the customers used the golf club over 18 times in 2005, visited weekend and seemed reluctant to use restaurant in golf club because of expensive price.

On the contrary, if the percent of a variable increases largely, we also obtain more detailed information through the combination of other SD features. We then combined the behaviors information with it in 2006 and can set out new retention strategies for the emergence of loyal customers in 2006.



Behavior information	Item	2005	
		40~49	50~59
The last period of use	6month~1year	0%	80%%
The last period of use	~1month	100%	20%%
No. of use	2~6	50%	0.00%%
No. of use	12 ~ 17	50%	20%%
No. of use	18 ~	0%	80%%
expense (won)	10,000 ~30,000	0%	40%%
expense (won)	30,000 ~30,000	50%	0%%
expense (won)	50,000 ~100,000	0%	20%%
expense (won)	100,000 ~	50%	40%%
Visit behavior	Weekday	50%	20%%
Visit behavior	Weekend	50%	80%%
No. of companion	3 persons	100%	100%%
restaurant in golf club	yes	100%	80%%
restaurant in golf club	no	0.00%	20%%
the reason of restaurant nonuse	expensive price		100%%
Training time (Year)	1~3	50%	20%%
Training time (Year)	5~10		20%%
Training time (Year)	10~	50%	60%%

Fig. 16. The distribution of customer behavior variables and SD features with regard to 40s and 50s age (in case of profession job, A and B city in 2005).

5. Conclusion

Analysis of marketing researches makes it possible for companies to identify customers' tastes and needs and then prepare for developing new strategies for the change in the market. Many market researches achieve their aims; however, marketing managers may occasionally overlook the relations among the survey results. Our study focuses on the use of previous surveys' results and proposes the use of network panel data management system (NPDMS). In this study, we built a web-based NPDMS prototype, which has three analysis modules, the similarity analysis module, the longitudinal analysis module and the sharable service/products analysis module.

Through the application study of web-based NPDMS prototype, NPDMS makes a research company understand the relations between the different marketing research results better. When the proposed NPDMS is used in practice, NPDMS gives us new opportunities of cross-selling or up-selling between different services/products and hints to design a sampling framework for the upcoming survey. It also can derive the marketing strategies to improve services, maintain the loyal customer and accordingly enhance the competitive power of both survey research providers and product/service companies.

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