

Incentive Effects on the Decision to Utilize e-Tax and Motor OSS in Japan

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Abstract: - The author conducted a survey of 100 administrative scriveners who file tax returns in regards to whether or not they utilize e-filing and tax payment systems for national taxes (e-Tax) at the time of filing income tax returns as well as in regards to factors that resulted or did not result in such utilization. According to the survey results, a 5,000 yen tax credit is considered to serve as an incentive to promote e-Tax utilization. Those who continue to utilize e-Tax also tend to be interested in other incentives. On the other hand, a demographic exists who choose not to utilize e-Tax regardless of the monetary incentive, indicating the limitation of the monetary incentive. Meanwhile, the same survey was also conducted in regards to one stop service for procedures relating to automobile ownership (Motor OSS) governed by the Ministry of Land, Infrastructure, Transport and Tourism, but the number of cases of utilization was zero. As a nationwide trend, the rate of utilization was 0.7% (11,175 vehicles), indicating a stagnant rate of utilization. The author assumed that a policy to design effective incentives can be established by comparing incentive factors for e-Tax with those for Motor OSS and analyzing the differences, and for that purpose prepared a buyer persona (virtual character) in consideration of the background on the side of an automobile buyer. Incentives that are effective in the case that this buyer persona utilizes Motor OSS were investigated and analyzed. As a result, it was found that monetary incentives for automobile buyers to utilize Motor OSS were not effective, including the incentive that does not require attachments as well as one stop service itself.

Key-Words: - e-Tax, Motor OSS, Decision Making, Monetary Incentive, e-Government, Online Application, Questionnaire Survey, Persona Model

1 Introduction

According to the National Tax Agency [1], there were 6,136,866 cases that utilized e-filing and tax payment systems for national taxes (e-Tax) at the time of the 2008 income tax returns. This number represents a 68.9% increase over the previous year, indicating that certain results have been achieved in order to accomplish the goal "Action Plan to Expand Online Utilization" upheld by the IT Strategy Office of the government [2].

In regards to one stop service for procedures relating to automobile ownership (Motor OSS) governed by the Ministry of Land, Infrastructure, Transport and Tourism, the rate of actual online utilization is 0.7% (11,175 vehicles) in 2007, indicating a stagnant rate of utilization.

Both e-Tax and Motor OSS target the general public, and use personal authentication (electronic certificate) in order to identify an individual. Despite the fact that they both use personal authentication system that has been pointed out in the past as the

cause of the stagnant utilization rate of online application in Japan, there is a difference in the rate of utilization.

In response to this plan, the National Tax Agency listed the following eight items as measures to promote e-Tax utilization [3].

1. To eliminate the need for mail attachments prepared by a third party.
2. To allow omission of electronic signature by a taxpayer himself, in the case of transmission by a representative such as certified tax accountants, etc.
3. To install PCs at tax offices to utilize e-Tax and experience its convenience and to introduce measures to encourage e-Tax utilization with a PC at home after the subsequent years.
4. To shorten the processing time in regards to returns with refunds utilizing e-Tax.
5. To establish special deduction for the electronic certificate, etc.

6. To implement a 24-hour e-Tax desk during the period of income tax returns.
7. To strengthen the structure of taxpayer support including help desk.
8. To simplify the pre-configuration work (system response without relying on Java) for the electronic certificate relating to the public personal authentication service (basic resident register card), in regards to direct transmission from a tax return preparation corner to e-Tax.

It is assumed that online utilization is expanding by implementing some of the above measures. However, the measures among them that are effective have not been verified, and it will be necessary to examine the relationship among measures as well as the priority in order to maximize the return on investment from these measures.

To summarize the above eight measures, they can be categorized as follows. First of all, No.3 is the measure to improve the recognition of e-Tax itself. No.7 and No.8 can be categorized as the measure to improve the system and operation for improvement of e-Tax's convenience.

The rest of them can be categorized as incentive measures to promote utilization. No.5 falls under the monetary incentive among incentive measures, and No. 1, No.2, No.4 and No.6 are non-monetary incentives. No.6 is treated as one of the incentives since the 24-hour desk can become a factor for users to utilize e-Tax without a visit to a tax office, while it is generally recognized that "tax return implies a visit to a tax office."¹

The author is particularly interested in incentive measures among these measures, and conducted a survey of 100 administrative scriveners who file tax returns in order to analyze their structure and effect.

In this paper, the incentives effective for e-Tax utilization and appropriate levels of incentives are indicated based on the survey results, and factors of the stagnant rate of Motor OSS utilization are also analyzed by comparing them with incentive measures in Motor OSS.

This paper consists of the following: Section 2 explains about previous studies on incentives for online application. The overview of the survey conducted is indicated in Section 3, and the results and

¹ Income tax returns have been accepted by mail in the past; therefore there is no novelty as a measure from the viewpoint that it is unnecessary to visit the office.

discussion in Section 4. Section 5 includes comparison with incentive measures in Motor OSS. Cases based on four scenarios using a persona are indicated as a new analysis method in Section 6. The results of Section 6 are discussed in Section 7. Finally, the summary and future tasks are included in Section 8.

2 Previous studies in regards to incentives for online application

Previous studies on incentives for online application are indicated below.

The New Media Development Association [4] is researching motivation to select an electromagnetic method rather than paper in application procedures from the viewpoint of incentives.

In accordance with this research, (1) whether a user is an individual or a corporation, (2) whether users are the general public or only specified users, (3) frequency to utilize procedures by a user, (4) the number of cases of procedures in general, (5) the number of visits to the administrative agencies, (6) whether or not strict personal authentication is necessary, and (7) the number of attachments in application are listed as attributes that greatly influence promotion of computerization, among some online application systems in operation as of 2001 ("electronic application system" in the research). Based on this, the following conclusion was drawn:

- ✓ Online application and submission businesses will increase since they are inevitable for day-to-day corporate businesses where time is greatly valued. On the contrary, it is expected that extraordinary application and submission businesses by corporations as well as those by the general public won't increase even though they can be done online.
- ✓ However, computerization will be promoted by economic incentives (fee reduction or no fee) at the early stage of implementation.

Ministry of Internal Affairs and Communications Round Table Conference for Promotion of e-Government - Working Group to Promote Online Utilization [5] is also attempting to quantitatively compare the effects of promoting online utilization by incentives using a model. According to this study, the utilization rate of online procedures resulted in 1.7 times more by giving non-monetary incentives, while

in the case of the monetary incentive that reduces costs, the same level of effects as non-monetary incentives were not obtained unless costs were reduced by 40% to 50%, and it was computed that promotion of online utilization is not very effective if the reduction is around 10% to 20%.

When the above conclusion is summarized by setting the index at costs, motivation for application by an electromagnetic method (electronic application and online application) is not created unless the following relationship among each incentive factor is maintained:

$$uP_r - P_c + vP_t + P_i > 0 \quad (1)$$

where P_r represents the relevance between applicants' objectives of activities and application details (higher relevance contributes to the increase of incentives), P_c represents the increase of personnel and equipment costs in application (including depreciation of initial investment; lower increase contributes to the increase of incentives), P_t represents reduction of time required for application procedures (higher reduction contributes to the increase of incentives) and P_i represents the increase of economic incentives given as an institution (higher increase contributes to the increase of incentives). u is the coefficient in the case that the relevance is converted into costs, and v is the unit price of labor costs for a person engaging in the procedure.

3 Survey in regards to incentives in the selection of e-Tax utilization

3.1 Overview

The "establishment of special deduction for the electronic certificate, etc." as a monetary incentive indicated in Section 1 is a system to give 5,000 yen tax credit when e-Tax is utilized for income tax returns. Since the purpose of this system is to subsidize the cost to implement a basic resident register card, personal authentication and IC card reader required when utilizing e-Tax for the first time, this system can be utilized one time only.

In this study, a survey of practicing administrative scriveners was conducted in regards to how the special deduction for the electronic certificate, etc. influences the behavior of e-Tax users.

Method: Online survey form

Respondents: E-mail newsletter readers targeting administrative scriveners (practicing administrative scriveners who are also obliged to file income tax returns)

Notification method: Recruiting notification by email (to 2,123 readers)

Number of collected surveys: 101 (excluding duplicate responses)

Period: March 2009

3.2 Question items

Question items in this survey are as follows:

- ✓ Whether or not e-Tax was utilized in the 2008 tax return (utilized for the first time / continuously utilized since last year / did not utilize)
- ✓ Question to those who utilized: Motivation to decide utilization (multiple responses and free words)
- ✓ Question to those who utilized: Equipment installed for utilization (multiple responses and free words)
- ✓ Question to those who utilized: Impression after utilization (free words)
- ✓ Question to those who utilized: How much savings would be the deciding factor to select or continue e-Tax utilization (multiple responses)
- ✓ Question to those who did not utilize: Reasons of not utilizing (multiple responses and free words)
- ✓ Question to those who did not utilize: How much saving would be the deciding factor to begin e-Tax utilization (multiple responses)

4 Results and discussion

4.1 Motivation for e-Tax utilization

Since respondents who utilized e-Tax include those who utilized it for the first time this year (first-time users) as well as those who continued to utilize it since last year (continuing users), the motivation was collected for each group. For continuing users, the difference from first-time users was also described.

First-time users (multiple responses)

No need to go out:	0%
Easy-to-operate system:	9%
Quick refund procedure:	27%
Easy electronic return procedure:	36%
5,000 yen less tax:	63%
No need of attachments:	36%

Good impression to the tax office: 0%

Continuing users (multiple responses)

No need to go out: 15% (+15%)
 Easy-to-operate system: 26% (+17%)
 Quick refund procedure: 31% (- 4%)
 Easy electronic return procedure: 42% (- 6%)
 5,000 yen less tax: 42% (-21%)
 No need of attachments: 52% (+16%)
 Good impression to the tax office: 10% (+10%)

Looking at these results, it can be interpreted that first-time users are interested in the monetary incentive: 5,000 yen tax credit. When it comes to continuing users, it is indicated that their interests shift to non-monetary incentives including operability of e-Tax system, no need of office visit and no need of attachments. Since there are some cases where the monetary incentive is not applicable to continuing users, however, the results are not directly explaining the lower interests in the monetary incentive.

4.2 Equipment installed for e-Tax utilization

This question is asking what was prepared upon e-Tax utilization, regardless of how many times it was utilized.

Both first-time users and continuing users (multiple responses)

IC card reader: 56%
 Basic resident register card: 70%
 Personal authentication: 73%
 Personal computer: 0%
 Accounting software: 0%
 Printer: 0%

It seems that an IC card reader, basic resident register card, and personal authentication essential for e-Tax are newly implemented, and that a personal computer, accounting software and printer are not newly purchased for e-Tax. New implementation of IC card reader, resident register card and personal authentication does not reach 100% because some administrative scriveners in the survey had already installed the equipment for other businesses (electronic application and preparation of electronic articles of incorporation by deputy.)

The rates of new implementation for basic resident card and personal authentication are approximately consistent, indicating that the basic resident card is used only for the purpose of storing the personal

authentication and there are only a few cases where the card was previously obtained for other purposes.

4.3 Relationship between motivation leading to e-Tax utilization and the monetary incentive

The relationship between the motivation leading to e-Tax utilization and the monetary incentive to choose (or continue) e-Tax utilization is indicated in Figures 1 and 2 separately for first-time users and continuing users.

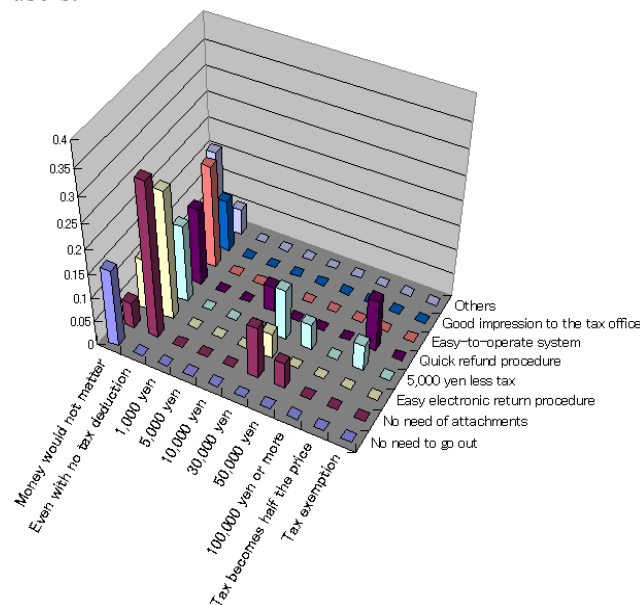


Figure 1: Relationship between motivation and monetary incentive (first-time utilization)

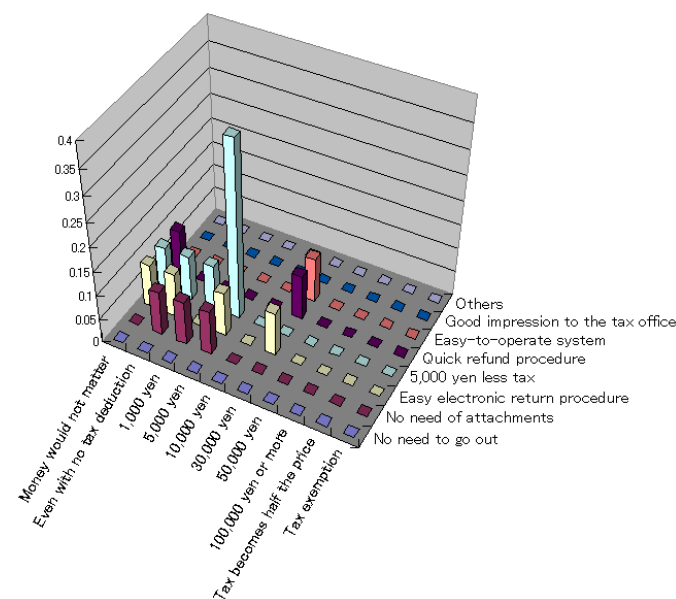


Figure 2: Relationship between motivation and monetary incentive (continuing utilization)

According to Figure 1, first-time users determined that the monetary incentive of 5,000 yen tax deduction is a reasonable incentive and chose e-Tax implementation. Otherwise, there is a tendency to ratify the 5,000 yen tax deduction as the monetary incentive after e-Tax utilization. In regards to continuing users, many responded that "they would continue utilization even with no tax deduction" or "money would not matter" regardless of the details of incentives. As a result, reduction of interests in non-monetary incentives by continuing users was indirectly proved.

4.4 Reasons of not utilizing e-Tax

In regards to respondents who ended up not utilizing e-Tax (non-users), the reasons were summarized as follows:

Non-users (multiple responses)

Don't want capital expenditure:	8%
Anxiety in system operation:	20%
Preparation is troublesome:	32%
Electronic return procedures are difficult:	10%
Do not like strict returns:	6%
No special reason:	8%

32% answered that "preparation is troublesome," but it is not very prominent as a reason. Therefore, details of multiple responses are indicated in Figure 3.

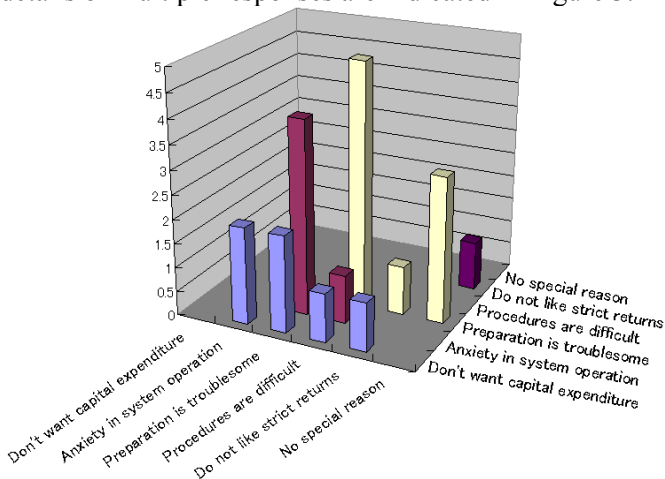


Figure 3: Reasons of not utilizing e-Tax (details of multiple responses)

In accordance with the above, combinations of "preparation is troublesome" and "electric return procedures are difficult" and of "preparation is troublesome" and "anxiety in system operation" are prominent.

Respondents are administrative scriveners who conduct application business on behalf of their clients. Since income tax returns are their annual business, we can assume that they don't hesitate for the work of tax returns itself. Thus, it is presumed that "electric return procedures are difficult" and "anxiety in system operation" imply their feeling of rejection to utilizing the e-Tax system. The number for "don't want capital expenditure" is not distinct in particular in the summary results; however it is indicated in Figure 3 that this is the reason combined with another reason. Based on these results, it is not possible to specify the reason of not utilizing e-Tax, and it is assumed that utilization is prevented due to preliminary actions for e-Tax utilization as well as to feeling of rejection to e-Tax itself.

4.5 Relationship between the reasons of not utilizing e-Tax and the monetary incentive

The relationship between reasons in Section 4.4 and the monetary incentive to choose e-Tax utilization is indicated in Figure 4.

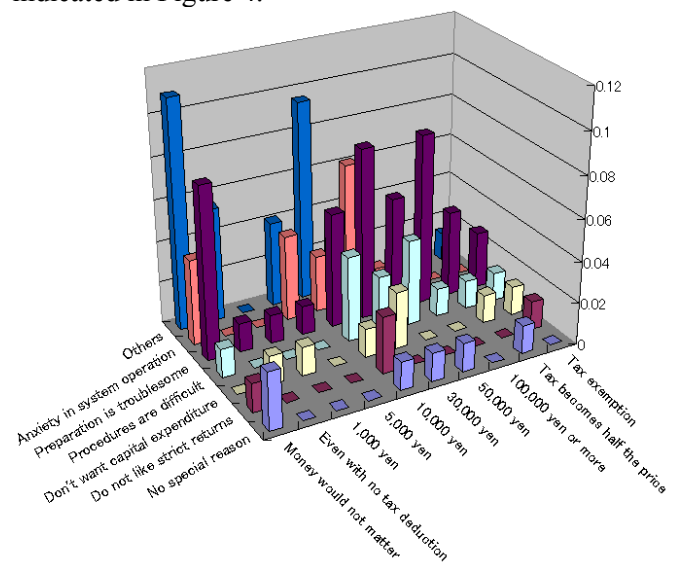


Figure 4: Relationship between reasons of not utilizing e-Tax and the monetary incentive

The response that "money would not matter" is considered to mean that "I would not utilize e-Tax regardless of how much I can save," unlike Section 4.3.

According to Figure 4, there is a slight difference in amounts with which the monetary incentive becomes effective. In regards to those from whom responses on reasons of non-utilization could not be obtained, it is indicated that they might decide to utilize e-Tax with a monetary incentive of 10,000 yen or more and that

those who answered "preparation is troublesome" and "anxiety in system operation" are seeking for a monetary incentive of 30,000 yen or more.

On the other hand, we recognized that many responded that "money would not matter." Those who don't utilize e-Tax tend to reject utilization with no particular reason, indicating the limitation of the monetary incentive.

4.6 Impression after utilization, reasons of non-utilization (free words)

In addition to the above results, the following include some interesting responses indicated with free comments.

Impression after utilization

- ✓ Easier than expected. (first time)
- ✓ Initial setting was complicated, and preparation was a lot of work. (first time)
- ✓ Hard to understand the explanation on preparation. (first time)
- ✓ Coordination with the IC card reader was troublesome. (continuing)
- ✓ Able to attribute previous data and easy. (continuing)
- ✓ Hard to recollect operation since this is only once a year event. (continuing)

Reasons of non-utilization

- ✓ Costs to purchase the equipment are more expensive than 5,000 yen deduction.
- ✓ More comfortable to deliver documents to the counter by hand.
- ✓ 5,000 yen deduction is one time only and not very beneficial.
- ✓ Reduction of burdens on staff at tax offices seems to be the objective, and the fear is that the reduced manpower could be attributed to unfair tax inspection.

4.7 Summary of this section

Effects of incentive measures in e-Tax were investigated in this paper. As a result, it is considered that a 5,000 yen tax credit is an effective incentive to promote e-Tax utilization. In addition, interests of continuing users of e-Tax tend to subsequently shift to other incentives. On the other hand, those who do not utilize e-Tax exist regardless of the amount of monetary incentive, indicating the limitation of the monetary incentive.

5 Comparison of incentive factors between e-Tax and Motor OSS

A survey in regards to utilization of Motor OSS was conducted to the same respondents as e-Tax in Section 3, and the following results were obtained:

Have utilized:	0%
Had an opportunity to utilize but did not:	11%
Did not have an opportunity to utilize:	89%

Furthermore, 33% of e-Tax users responded with "want to utilize" to the question asked to the respondents who did not have the opportunity of utilization: "Do you want to utilize if there is an opportunity?"

As indicated in Section 1, this tendency was also clarified in the nationwide survey results.

This Motor OSS provides a service to enable the procedure to administrative agencies upon automobile purchase to be completed at once on the system. The target users are mainly the general public, similar to e-Tax, and procedures are taken by using personal authentication.

Although it is not a monetary incentive designed institutionally, the Ministry of Land, Infrastructure, Transport and Tourism is estimating that approximately 7,000 yen cost reduction will be realized by utilizing Motor OSS [6].

The largest difference between Motor OSS and e-Tax is the package application (one stop service) to multiple administrative agencies. While e-Tax is a procedure to the National Tax Agency only, it is possible with Motor OSS to complete three procedures to three different administrative agencies at once, i.e., the Land Transport Office for automobile registration, the police station for the mark of automobile storage, and the prefectural tax office for the vehicle tax and vehicle excise tax.

Thus, two visits to the Land Transport Office (to apply and to receive the vehicle inspection certificate and number plate), two visits to the police station (to apply and to receive the mark of automobile storage) and one visit to the prefectural office (to pay taxes) to be done successively will be reduced to one-time online application, one visit to the Land Transport Office (to receive the vehicle inspection certificate and number plate), and one visit to the police station (to receive the mark of automobile storage).

Since responses with actual utilization of Motor OSS were not obtained in the survey, the same analysis as e-Tax is not possible. Therefore, in order to compare incentive factors for Motor OSS with those for e-Tax with different rates of utilization, “not willing to invest into equipment” listed as a motivation of not utilizing e-Tax was added to motivations that resulted in e-Tax utilization, and respective factors to generate incentives are classified and indicated in the table. Furthermore, from the results of Section 4, factors that are effective in the case that e-Tax was utilized are noted in the Table 1.

+ in the table represents contribution to the increase of incentives and – represents the cause of the decrease of incentives in comparison with traditional applications (hereafter the same).

Table 1: Change incentives for utilization of e-Tax

Factors of incentives to occur	Incentive			
	P_r	P_c	P_t	P_i
Equipment investment is necessary		–		
No need to go out			+	
Operation of the system is easy / worrying			+	
Quick refund procedure			+	
Easy electronic return procedure or not	+			
5,000 yen less tax				+
No need of attachments		+		
Good impression to the tax office	+			

Furthermore, factors that generate incentives to utilize Motor OSS equivalent to the factors to generate incentives to utilize e-Tax are listed. Table 2 is a summary of the comparison.

Thus, the Motor OSS has a structure where incentives similar to e-Tax are effective, except “no need to go out” and “good impression to each administrative agency.” A new incentive is also added which realizes one stop service to multiple administrative agencies. Regardless of this fact, the choice of utilization is not actually made, probably because incentives relating to “no need to go out” or “good impression” are seen as particularly important compared with other incentives, or because there might be other potential defects in the design of incentives. These matters cannot be determined only by looking down upon automobiles OSS in general,

and a new analysis from the viewpoint of users is necessary.

Therefore, the concept of persona [7] is introduced as a new analysis method. A buyer persona is established in consideration of the background of an automobile buyer, and incentives that are effective in the case that this buyer persona utilizes Motor OSS are investigated and analyzed based on behavior scenarios.

Table 2: Comparison between factors to generate incentives for Motor OSS and e-Tax

Motor OSS	Comparison	e-Tax
Equipment investment is necessary. Equipment investment is necessary for online application itself in both cases.	=	Equipment investment is necessary.
No need to go out Need to go to receive the certificate of automobile storage and the number plate in the case of Motor OSS.	≠	No need to go out
Operation of the system is easy / worrying Operation itself is easy with navigation on the Web in both cases.	=	Operation of the system is easy / worrying
Quick processing for the procedure of automobile ownership Possible to shorten the processing time by going online.	=	Quick refund procedure
Easy procedure of automobile ownership The complicated procedure is lightened by systematization.	=	Easy electronic return procedure
Approximately 7,000 yen cost reduction There is a monetary benefit by utilization.	=	5,000 yen less tax
No need of attachments Motor OSS can be utilized with only personal authentication.	=	No need of attachments
Good impression to each administrative agency Unlike e-Tax, there is less relevance between impression to administrative agencies and procedures.	≠	Good impression to the tax office
One stop service There is no target of one stop service in the case of e-Tax.	≠	Not applicable

6 Investigation and analysis in regards to incentives in the selection of Motor OSS utilization using a persona

6.1 Overview of the analysis

A persona is a virtual target established for the purpose of obtaining information for decision-making by a designer, and is a concept widely used in the interface design of software [8].

Although the persona data is established by a designer, he does not determine everything arbitrarily but groups the target population derived from quantitative and qualitative data given from demographic statistics and many other marketing techniques to create a representative character of the group; therefore certain objectivity is ensured.

Upon designing a persona this time, a persona model was extracted based on wage structure statistics by the Ministry of Health, Labor and Welfare as well as on the family budget survey by the Bureau of Statistics of the Ministry of Internal Affairs and Communications in regards to quantitative data, and in regards to qualitative data, an individual interview was conducted on 40 trainees (ages from 18 to 38) of Tokyo Chuo and Johoku Human Resources Development Centers for which the author was in charge of lectures in the area of information engineering at the time of investigation. Possible backgrounds for persona models extracted from quantitative data were extracted then clustered.

Multiple buyer personas were established in accordance with the backgrounds of automobile buyers. In this paper, the representative case is indicated, which seems to be the closest to the situation to utilize Motor OSS.

It should be noted that the parent population targeted for the interview includes trainees of the Department of Information Engineering when the qualitative data was extracted; therefore IT literacy is higher than the average persona character.

Background of Persona 1

Hiroshi Takahashi is replacing his Toyota Corolla with a new model. Since he finally paid back the loan for his current vehicle, he decided to trade it in to use as the down payment on the new loan, together with a small amount of savings. Since this is a replacement, the location for automobile storage (garage) remains the same.

He had already consulted with the dealership from which he purchased his current vehicle. At that time, he heard that "the cost required for procedures

might be about 7,000 yen cheaper by using Motor OSS." He has not decided to utilize Motor OSS at this point.

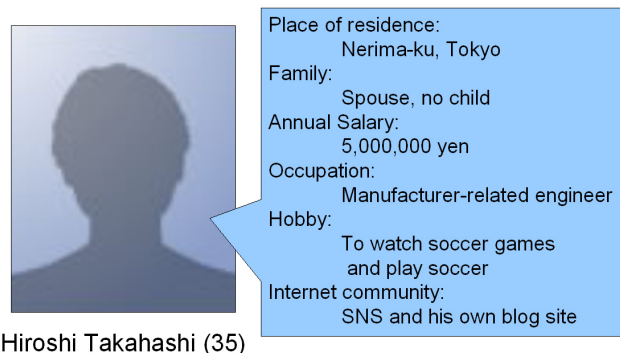


Figure 5: Persona 1 Overview

Supposing the Persona 1 utilized Motor OSS, possible tasks are listed chronologically. Specifically, consensus was built by conference among four people: the author and three people close to the Persona 1 in age among trainees interviewed at the time of extracting qualitative data, in order to consider possible behaviors by the Persona 1.

6.2 Analysis results

Behavior scenarios and results are indicated based on the four analyzed cases in the following:

Case 1: Mr. Takahashi utilizes the Motor OSS by himself.

In this case, an environmental setting² is necessary in order to operate Motor OSS on the PC owned by Mr. Takahashi, and it is necessary to take the procedure to have personal authentication (on the premise of issuing the basic resident card) issued, and to purchase IC card reader. Since the personal authentication and IC card reader are the same as those used for e-Tax, there is no extra expense for e-Tax users.

In addition, it is necessary to correspond with the insurance company to switch the automobile liability insurance for the current vehicle to the new vehicle; therefore it is necessary to go to an administrative agency to obtain a copy of resident register, a seal certificate, etc.³ required to attach for

² JRE (Java Runtime Environment) used for online application requires different versions depending on the system at each administrative agency and is not standardized.

³ Sales contract for a used car as well as

the trade-in of the current vehicle as well as for refinancing.

Table 3: Change incentives for utilization of Motor OSS by a persona (Case 1)

Factors of incentives to occur	Incentive			
	P_r	P_c	P_t	P_i
Equipment investment is necessary	—			
No need to go out				—
Operation of the system is easy / worrying				+
Quick processing for the procedure of automobile ownership				+
Easy procedure of automobile ownership	—			
Approximately 7,000 yen cost reduction				+
No need of attachments				
Good impression to each administrative agency				
One stop service				

It is assumed that Mr. Takahashi further thought as follows:

“I did not feel burdens because the map, layout, parking, contract, etc. for the current vehicle were used for inspection to obtain the certificate of automobile storage, but it is troublesome to pay the tax and fee separately at a bank during the course of the procedure. I also need to go to the Land Transport Office and the police station to receive the vehicle inspection certificate, the number plate and the mark of automobile storage respectively, and don’t feel like it is a very convenient service.”

Case 2-1: Mr. Takahashi instructs the dealership to utilize Motor OSS (with personal authentication).

In the case that Mr. Takahashi possesses the personal authentication, the dealership prepares a data file called a mandatory file by using Motor OSS and deliver it to Mr. Takahashi. Then Mr. Takahashi prepares an electromagnetic power of attorney on the Motor OSS in accordance with the mandatory file. This electromagnetic power of attorney is stored on Motor OSS and referred by each administrative

loan contract that accompany automobile purchase are private-private contracts; therefore occur regardless of Motor OSS.

agency to confirm the relationship of delegation of procedures.

However, if Mr. Takahashi is able to use Motor OSS, it is not necessary to delegate procedures to the dealership; therefore Case 1 will be selected. If the dealership is still instructed to utilize Motor OSS by all means, it is assumed that Mr. Takahashi will visit the dealership to operate Motor OSS there, rather than using his own PC. In this case, the subsequent procedures will be handled by the dealership and burdens on Mr. Takahashi won’t happen until the delivery of a vehicle.

Table 4: Change incentives for utilization of Motor OSS by a persona (Case 2-1)

Factors of incentives to occur	Incentive			
	P_r	P_c	P_t	P_i
Equipment investment is necessary				
No need to go out				—
Operation of the system is easy / worrying				+
Quick processing for the procedure of automobile ownership				+
Easy procedure of automobile ownership	—			
Approximately 7,000 yen cost reduction				+
No need of attachments				
Good impression to each administrative agency				
One stop service				

The procedure of automobile liability insurance went out of the hands of Mr. Takahashi by going through the dealership; however the problem of obtaining a copy of resident register, a seal certificate, etc. accompanying trade-in of the current vehicle and refinancing still remains.

Case 2-2: Mr. Takahashi instructs the dealership to utilize Motor OSS (without personal authentication).

Mr. Takahashi hands the sealed power of attorney in paper and the seal certificate to the dealership, and the subsequent procedures are handled by the dealership using Motor OSS [9].

A copy of resident register and a seal certificate accompanying the trade-in of the current vehicle and refinancing can be obtained at an administrative agency at the same time as issuance of a seal certificate to be attached to the power of attorney;

therefore a new specific procedure does not occur. Mr. Takahashi successfully reduced the cost of procedures by approximately 7,000 yen by utilizing Motor OSS.

Table 5: Change incentives for utilization of Motor OSS by a persona (Case 2-2)

Factors of incentives to occur	Incentive			
	P_r	P_c	P_t	P_i
Equipment investment is necessary				
No need to go out			—	
Operation of the system is easy / worrying				
Quick processing for the procedure of automobile ownership				
Easy procedure of automobile ownership			+	
Approximately 7,000 yen cost reduction				+
No need of attachments				
Good impression to each administrative agency				
One stop service		+		

Case 3: Mr. Takahashi chooses not to utilize the Motor OSS.

Mr. Takahashi hands the sealed power of attorney in paper and the seal certificate to the dealership, which takes the subsequent procedures to individual administrative agencies on behalf of Mr. Takahashi.

Table 6: Change incentives for utilization of Motor OSS by a persona (Case 3)

Factors of incentives to occur	Incentive			
	P_r	P_c	P_t	P_i
Equipment investment is necessary				
No need to go out			—	
Operation of the system is easy / worrying				
Quick processing for the procedure of automobile ownership				
Easy procedure of automobile ownership			+	
Approximately yen 7,000 cost reduction				
No need of attachments				
Good impression to each administrative agency				
One stop service		+		

A copy of resident register and a seal certificate accompanying the trade-in of the current vehicle and refinancing can be obtained at an administrative agency at the same time as issuance of a seal certificate to be attached to the power of attorney; therefore a new specific procedure does not occur. Since Mr. Takahashi did not utilize Motor OSS, costs for procedures were not reduced.

By following the flow of utilization of Motor OSS from the viewpoint of persona called Hiroshi Takahashi, the incentive factors were successfully summarized in these four cases.

7 Discussion from analysis results

7.1 Discussion on one stop service and no need of attachments

Following is indicated from the results in Section 6:

- ✓ One stop service as an incentive factor for Motor OSS does not serve as intended by the system operator.
- ✓ The Motor OSS targets administrative procedures only and does not consider private contracts accompanying the procedure to purchase an automobile (e.g. loan contract and used car sales contract).

Not limited to one stop service, a user is able to evaluate the system by declaration of intent and actions of “not utilizing” the online application system, even though the system operator takes measures to accomplish objectives and goals raised as important. Furthermore, since the evaluation results are polarized to “yes” or “no,” the axis of system evaluation is difficult to control on the side of operator compared with other measures.

Thus, however the operator defines one stop service and stipulates the axis of system evaluation, the rate of utilization won't increase and the measure itself won't receive good evaluation, unless citizens benefit as users of the system.

It is necessary to confirm the objective: “what is the benefit gained from one stop service” from the standpoint of users in advance, when one stop service is defined.

The author focuses on the benefit of one stop service gained by applicants in accordance with the past investigation results, and defines it as the “service for an applicant (the subject to benefit from

application) to benefit from multiple parties selected by the applicant to which the applicant sends application, as a result of one-time behavior.”

From the viewpoint of an applicant, benefits gained are certainly the “automobile ownership and certificate of automobile storage” whether the electromagnetic method or the traditional method with paper is used for application in regards to automobile ownership.

According to the definition by the author, the procedure to purchase an automobile without utilizing Motor OSS comes into effect when the automobile buyer delegates various procedures in regards to purchase to the dealership, which takes care of duties for the certificate of automobile storage, automobile inspection and registration, and filing of automobile tax, where one stop service is already realized by the dealership and reasonable benefits are gained.

On the other hand, when the flow of procedures in the case that an automobile buyer himself utilizes Motor OSS is reviewed, two tax payment procedures occur at a timing different from application, and the mark of automobile storage and number plate have to be separately received at the police station and the Land Transport Office, as indicated in Figure 6. Thus, it is not really one stop service and fewer benefits are gained.

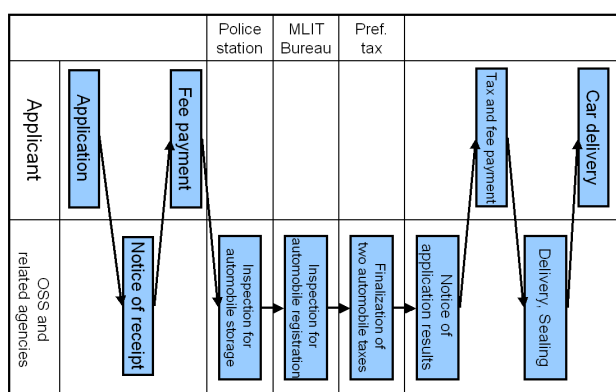


Figure 6: Flow of procedures in Motor OSS (Prepared by the author based on the Ministry of Land, Infrastructure, Transport and Tourism, Road Transportation Bureau, Engineering and Safety Department [6])

Although attachments are supposed to be unnecessary at the time of procedures for Motor OSS, the procedures do not actually come into effect without private contracts such as loan contract; therefore a copy of resident register and a seal certificate need to be obtained regardless of personal

authentication. Thus, it was clarified that no need of attachments does not serve as an incentive factor.

7.2 Discussion on cost reduction

When focusing on Case 2-2 and Case 3 in the results of Section 6, the only difference in these cases is whether or not utilization of Motor OSS is declared from the viewpoint of Persona 1. Since the 7,000 yen monetary incentive occurs as a result, it is a reasonable decision to choose Case 2-2 and utilize Motor OSS.

Therefore, transition of the rate to utilize Motor OSS published by the Ministry of Land, Infrastructure, Transport and Tourism is investigated in order to verify the change in selection from Case 3 to Case 2-2.

Utilization of Motor OSS was made possible with the power of attorney in paper and seal certificate instead of personal authentication as of November 26, 2007 [9].

Thus, Case 2-2 can only occur after November 26, 2007, and it is possible to indirectly verify whether or not the behavior change from Case 3 to Case 2-2 occurs by comparing the rate of utilization before and after the date.

First of all, the rate of utilization of Motor OSS in October 2006 (six prefectures; single month), the time when personal authentication is required, is approximately 1.1% [6].

On the other hand, the rate of utilization of Motor OSS in May 2008 (10 prefectures; single month), the time when personal authentication is not required, is 1.4% [10] (See Figure 7). Simple comparison is not possible since prefectures where the Motor OSS can be utilized are expanded, but significant improvement in the rate of utilization of Motor OSS because of the need or no need of personal authentication is not recognized. Therefore, the monetary incentive to Persona 1 seems to be not effective.

If Persona 1 is the owner of reasonable thinking, it is hard to imagine that he would utilize Motor OSS. The price of new Toyota Corolla is 1,500,000 yen to 2,000,000 yen, and it is doubtful that the amount of 7,000 yen can become an incentive to utilize Motor OSS for Persona 1 who pays for the car⁴.

⁴ However, completely different next-generation incentives (e.g. to publicize articles on SNS or blog site as own “stories”) exist and might become factors that cannot be ignored in the future.

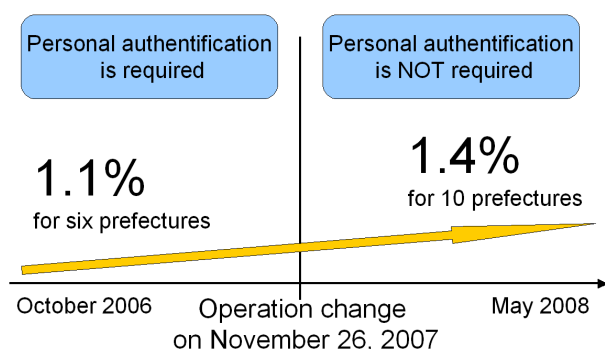


Figure 7: Transition in the rate of utilization of Motor OSS before and after the change in operation

7.3 Summary for this section

Based on the above discussion, incentive factors for Motor OSS are compared again and summarized in Table 7.

It was found that incentive factors for Motor OSS, originally considered as the same as e-Tax, are not effective in reality, and that the decrease of incentives tends to be rather emphasized by utilizing Motor OSS.

On the other hand, in the case that Motor OSS is not utilized, the decrease of incentives is hardly observed, and one stop service by a dealership is practically effective instead. This is considered to be promoting passive selection by users.

8 Conclusion and future tasks

8.1 Conclusion

In this paper, incentive factors for e-Tax and Motor OSS were investigated and analyzed. As a result, it was indicated that the 5,000 yen tax credit serves as an incentive to promote utilization of the system. Subsequently, interests of users who continue to utilize e-Tax tend to shift to other incentives. However, there are non-users of e-Tax regardless of monetary incentives, indicating the limitation of monetary incentives.

On the other hand, it was not possible to understand the tendency of users from a survey in the case of Motor OSS; therefore a persona was developed in order to analyze the incentive structure, and incentives effective in the case that this persona utilizes Motor OSS are investigated and analyzed based on behavior scenarios. In the case of online application system for which there are not many cases of utilization or the overall tendency of utilization is hard to understand, the method to develop the kind of

persona indicated in this paper and review expected scenarios one by one is effective.

As a result of analysis, the monetary incentive for utilization of Motor OSS by automobile buyers is not effective, and the incentive that does not require attachments as well as one stop service itself are not functioning either. Therefore, it was found that only the decrease of incentives by utilizing Motor OSS tends to be emphasized.

Table 7: Comparison of incentive factors between Motor OSS and e-Tax (reevaluation)

Motor OSS	Comparison	e-Tax
Equipment investment is necessary. Equipment investment is necessary for online application itself for both cases.	=	Equipment investment is necessary.
No need to go out Need to go to receive the certificate of automobile storage and the number plate in the case of Motor OSS.	≠	No need to go out
Operation of the system is easy / worrying Operation itself is easy with navigation on the Web in both cases.	=	Operation of the system is easy / worrying
Quick processing for the procedure of automobile ownership Possible to shorten the processing time by going online.	=	Quick refund procedure
Easy procedure of automobile ownership <u>The procedure itself can be avoided by delegating it to a dealership.</u>	≠	Easy electronic return procedure
Approximately 7,000 yen cost reduction <u>Does not serve as an incentive in reality.</u>	≠	5,000 yen less tax
No need of attachments <u>Preparation of attachments is inevitable when private contracts are considered.</u>	≠	No need of attachments
Good impression to each administrative agency Unlike e-Tax, there is less relevance between impression to administrative agencies and procedures.	≠	Good impression to the tax office
One stop service <u>One stop is effectively realized by delegation to a dealership.</u>	≠	Not applicable

8.2 Measures for effective incentives in Motor OSS

In order to promote utilization of Motor OSS, the following measures are considered to be effective to make incentive factors function, while they are not functioning at this time:

- ✓ To improve the flow of procedures in order to reduce the number of visits by an automobile buyer as much as possible.

Since the procedure accompanies a tangible car, it is difficult to completely eliminate the need for visits, but it is considered to be possible at this time to take a measure to send the mark of automobile storage from the police station to the Land Transport Office, and have it picked up together with a number plate, etc. Although significant institutional revision will be necessary, it will be possible to have everything delivered by eliminating installation of a number plate that accompanies sealing, to realize the procedure that does not require visits.

- ✓ Changes in occasions to utilize Motor OSS
The current Motor OSS targets only procedures relating to new purchase of automobiles. In many cases, new purchase of an automobile accompanies financing; therefore the incentive that does not require attachments is not effective from the first place. Since one stop service is actually provided by a dealership at present, there are less occasions for automobile buyers to utilize Motor OSS. On the other hand, there are many procedures that do not go through a dealership including trade of a used car between individuals, name change and vehicle disposal procedure, and there are also many procedures that do not involve loan contracts, etc. Since a large amount of money does not move in these procedures unlike the time to purchase a new vehicle, the proportion of monetary incentive increases relatively, and the possibility of a monetary incentive to work effectively is expanded. In this case, however, a measure for institutional monetary incentives will be necessary instead of factual monetary incentives.

8.3 Future tasks

In this paper, the tendency where monetary incentives are effective was analyzed from the results of a survey in the cases of e-Tax, but quantitative relationship with non-monetary incentives was not successfully clarified. Investigation needs to continue in order to quantify incentives, and hopefully to analyze

transition of incentive effects chronologically at the same time.

In the cases of Motor OSS, the phenomenon where incentives are not effective was successfully clarified by breaking them down into incentive factors; however there are many unclear areas including quantification in regards to the relationship among incentive factors. The progress of quantification will enrich other incentive factors in order to complement those that are not effective in view of return on investment and will probably ensure certain incentives. Investigation needs to continue in addition to other cases of online application.

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