Applying In-depth Interview to Explore the Use of Electronic Coupons and Customer Behavior Change

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Abstract. Thanks to the widespread use of smartphones, many customers especially in Japan rely on using electronic coupons with their smartphone applications. However, in subscription-based electronic coupon services that are widely used, some customers do not take full advantage of their electronic coupons, as they forget they have subscribed to the service. In this paper, we study how to implement persuasive system design (PSD) model to encourage electronic coupon use for various services. To be able to create persuasive techniques, we conducted in-depth interviews to extract clues on how to achieve suitable methods. The interviews indicated that we first need to improve the application's general user interface to fulfill the postulates presented in the PSD model and common usability goals. We also found that PSD model has several system qualities we can take advantage of such as dialogue and social support to create more persuasive features in the system. For example using praise, rewards, reminders, and 'nudge' to encourage term-limited coupon use. We also compare the system features to the PSD model with examples while pointing out that the model lacks development that often uses cycles instead of linear development and is partially vague in describing system credibility and direct and indirect persuasion implementations. Last, we shortly discuss ethical implications of using persuasive technology and behavioural change methods in a commercial application.

Keywords: Qualitative research · Behaviour change · Coupon use

1 Introduction

The widespread use of electronic coupons in Japan enables purchase of items and services with discounted price or getting free products. The coupons in general are ubiquitous and are offered by many companies. Many customers use multiple membership cards (T-point[1], WAN[2], Aeon[3], etc.), or use coupon

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[1] http://tsite.jp/

[2] https://www.oizumifoods.co.jp/premium/

[3] https://www.aeon.co.jp/point/waonpoint/index.html

applications for specific stores, such as McDonald's[4] or Lawson[5] convenience stores. This saves money in a constant and convenient way. The reason they are so widely used in Japan comes from changes of the current society according to a web article[6]. Japan has high population density and compared to other countries, competition is more fierce, as they offer good price-performance from shop to shop to the users. Customers are also more price conscious because of the long-stagnant domestic economy and want to save more money by any means available. Smartphone applications also play a significant role in encouraging customer's coupon use behaviour, since they can search, show and benefit from them. According to a report[7], the number of coupons has increased at the same rate as the amount of smartphones in the market.

However, while coupon numbers increase, not all users utilize them. According [8], nearly 40% do not use their electronic coupons, because there is too large variety available, which makes it difficult to make use of them when wanted. The abundance leads to flood of information. This is a challenge to companies providing a subscription fee-based coupon service model. When the customers cannot use their coupons or forget they have subscribed to a coupon service, they might feel they are paying for nothing and this might degrade their customer service satisfaction. Therefore, we need to develop an approach using persuasive technology to encourage customers to use their coupons, so that they feel satisfied with the service. KDDI(au)[9], a telecommunication company that offers telecommunication services, has a similar challenge with their Smartpass coupon service[10] . A customer can buy their subscription and get discounts for example on foods and drinks at various stores, or to watch movies in a theatre. However, many customers forget they have subscribed to the service. Thus, we aim to develop persuasive techniques to encourage its use. For the above-mentioned objective, we have first conducted in-depth interviews where we inquired reasons why customers do or do not utilize their Smartpass coupons.

Many other studies[2][3][4][6][9] have also conducted questionnaires to extract the reasons why this happened, but we cannot directly utilize their outcomes, since these situations vary from service to service. Instead we focused on extracting the following topics: (i) the frequency of using Smartpass services and the related smartphone application, (ii) barriers for utilizing Smartpass service, (iii) discussion on the improvement possibilities of the application and services.

Our major contribution is that we are first to propose encouraging coupon use by utilizing Persuasive Technology. Specifically, the interviews provided clues towards using suitable persuasion. Second, we looked into how PSD model's system qualities would encourage coupon use in meaningful ways. Lastly, we compare our system features to the PSD model with examples, and argue how the model lacks focus when actual development often uses cycles instead of linear approach. While PSD is good for our system, it is still partially vague in

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[4] http://www.mcdonalds.co.jp/

[5] http://lawson.jp/en/

[6] https://www.nytimes.com/2011/02/14/business/media/14groupon.html

[7] http://www.ilovecouponmonth.com/statistics/

[8] https://whatjapanthinks.com/2010/05/02/mobile-phone-discount-coupons-in-japan/

[9] http://www.kddi.com/english/, KDDI refers to a telecommunication company and au is their mobilephone communication services brand name

[10] https://www.au.com/entertainment/smartpass/

how system credibility is created in practice and how to implement direct and indirect persuasion. To the best of our knowledge, there are very few papers working towards the above mentioned topics.

2   Literature Review

2.1   Persuasive technology design

Persuasion and/or behaviour change are closely related topics, which can be used in various ways and in fields to change a person's state of mind, attitudes or behaviour. For example, they can be used to guide a person to change into healthier life-style by dieting, reinforce existing willingness to quit smoking, or form a totally new behaviour. To enable these changes, persuasive technology (PT), persuasive system design (PSD) and behaviour change support system (BCSS) methods have emerged. In Oinas-Kukkonen's [7] definition of BCSS, he emphasizes that these changes to a person's behaviour should never use coercion or deception. While various behaviour changes are possible to create, a study [8] shows that attitudes are harder to change if its an existing one, instead of being an originating or reinforcing.

While the use of persuasion and behaviour change techniques can offer advantages in changing a customers behaviour towards using applications or services, at the same time ethical questions need to be considered, which might be linked to forcing a user to do or buy something they do not want to. There have been papers discussing how to approach ethical issues gathered in Karppinen et al. [5], but there has been no clear consensus on how exactly one should approach it in persuasive technology cases. Based on their analysis, they suggest that currently the base of knowledge is still very limited and can not address everything related to the use of persuasive technology.

However, in the case of Smartpass coupon service, introduced in more detail in section 3.1, the customer is a willing participant as they have subscribed to the service to get the coupons. What they need is a support system that 1) reinforces the use of the service 2) reminds the existence of the coupons 3) encourages other benefits for the user by utilizing e.g. health improvements via walking or exercises, and 4) is tailored for the users' specific needs. Our initial assumption is that behaviour change in the case of electronic coupon use is not coercive or deceptive in nature and can be utilized.

To create a persuasive system, Oinas-Kukkonen [8] presents the persuasion context for the person as consisting of three parts; intent, event and strategy. Initially the target is to recognize the intent of the proposed persuasion. Secondly to understand the event related to it, and finally to create a strategy how to achieve the goal. In addition, persuasive systems has overlapping commonality with human-computer interaction (HCI) design requirements, such as ease-of-use, responsiveness, good user experience, which should be taken into account when designing persuasive techniques for better user acceotance. Similarly, the persuasive aspects should be introduces in the beginning of system development, so that behaviour change has an effect in all stages of design.

2.2   PSD postulates

PSD presents seven guiding postulates to design, as seen in Table 1, or for evaluating a system design, as is also our case. While on the surface, postulates

Table 1. Persuasive system's design postulates

Postulates	
1.	Information technology is always on and present
2.	Offered information should be organised and consistent
3.	Direct and indirect routes are key to persuasion
4.	Persuasion happens mostly incrementally
5.	Persuasion should always be open and up front
6.	System should be unobtrusive
7.	System should be useful and easy to use.

6 (unobtrusive) and 7 (ease-of-use, useful) are common usability goals for any system, being able to persuade also requires a system that is pleasant. This leads to user acceptance , and for the acceptance of future behaviour or attitude change as it is easier to achieve with usability. Some users found it frustrating or difficult to find information about the coupons or had problems locating coupons they needed, suggests postulates 2 (organised and consistent info), 6 and 7 should be implemented in the next iteration of the application to reach basic usability levels for the software. We can also utilize various direct and indirect routes (postulate 3) to persuade users within the application, while making sure persuasion is done in an open manner (postulate 5).

2.3   PSD system qualities and sub-principles

PSD guidelines, as seen in Table 2, offers four main categories of system qualities: 1. Primary task support, 2. Dialogue support, 3. System credibility and 4. Social support, each including seven sub-principles for reference. These offer design improvements and basics that focus on different parts of a system and the user, so that the end product is assisting in the main tasks of the user, encourages use with different dialogues, is presented in a credible format and also focuses on social aspects for the user. The end goal is to make use of the sub-principles to create more effective persuasive system features.

3   Research method

3.1   Introduction of Smartpass coupon service

Smartpass is a subscription-based coupon service. Fig 1 illustrates the flow of starting and using of this service. First, a user subscribes to the service for a monthly fee and gets the right to use any coupons distributed in the Smartpass application (Smartpass App.) separately installed in a smartphone. With the coupons, they receive discounts and items for free at grocery stores, restaurants, movie theaters, and other locations. Smartpass is offered in two types of subscriptions: Smartpass-premium and Smartpass, where the only difference is that users can get more discounts and items when using the former.

In our survey, most users joined the service when they purchased a new phone or when they upgraded their old smartphones. In Japan, users often do

Table 2. Persuasive system qualities and principles

Qualities	Principles
Primary task support	Reduction. Reduce complex behaviour into simple tasks
	Tunneling. Guiding a user creates changes to do persuasion
	Tailoring. Tailoring to needs, usage context and others to a group
	Personalisation. Personalised content/services is good for persuasion
	Self-monitoring. Keeping track supports user achieving their goals
	Simulation. Simulating provides cause and effect linking behaviour
	Rehearsal. Practicing enables change in behaviour/attitude
Dialogue support	Praise. Using praise can make users open to persuasion
	Rewards. Rewarding target behaviour is great for persuasion
	Reminders. Reminding target behaviour affects achieving goals
	Suggestion. Fitting suggestions is good for persuading
	Similarity. A system that remind users themselves are persuasive
	Liking. Visually attractive system is more likely persuasive
	Social role. A system in a social role is more likely persuasive
System credibility support	Trustworthiness. Creates increase in persuasion
	Expertise. A system viewed as competent affects persuasion
	Surface credibility. Initial impressions affect credibility
	Real-world feel. System highlighting creators has more credibility
	Authority. System's roles of authority enhance persuasion
	Third-party endorsements. Well-known sources boosts credibility
	Verifiability. Content accuracy should be verifiable
Social support	Social learning. Target behaviour motivation by observing others
	Social comparison. Motivation by comparing to others performances
	Normative influence. Peer pressure increases adopting behaviour
	Social facilitation. Performing with others increases change
	Cooperation. Motivation to change from natural cooperation drive
	Competition. Motivation from natural competition drive
	Recognition. Public recognition increases target behaviour change

this exchange in yearly or biyearly intervals, while often forgetting about the subscription service later on even though they pay a monthly fee. This is a challenge for the service. In order to correct this, KDDI has held campaigns like "Santaro-no-hi" three times a month, where customers were able to get special foods or items at stores, while also advertising the campaign on TV and in print. However, the effects were only temporary and limited in encouraging customers to make full use of Smartpass coupons.

3.2   Research flow

Fig 2 illustrates the flow of our research. In "In-depth interview", we conducted a questionnaire survey to extract reasons why customers do or do not utilize their Smartpass coupons. In "Plan persuasive techniques", we will develop techniques to encourage customers to take advantage of the coupons using Persuasive Technology and behaviour change approaches. In "System deployment", we will develop a smartphone application system that takes advantage of the techniques
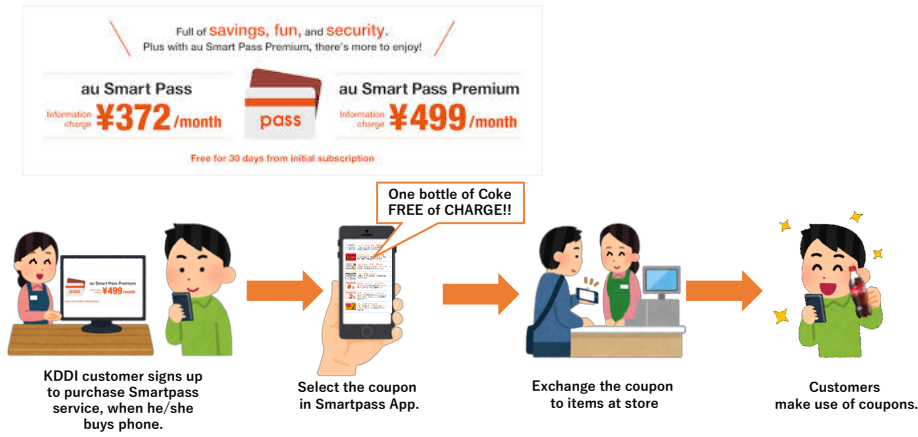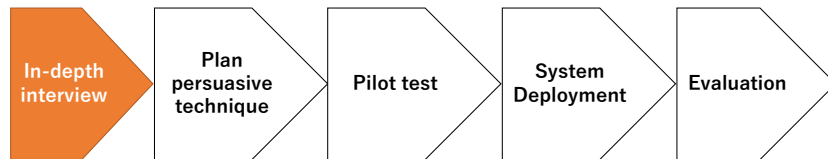
Fig. 1. Research flow

Fig. 2. Research flow

developed in the previous phase. Lastly, we will evaluate the persuasive techniques and the systems in "Evaluation". In this paper, we focus only on the "In-depth interview" parts of the flow where the interviews were done as follows. First, we conducted a screening questionnaire to exclude unsuitable subjects, and second we gathered the subjects for in-depth interviews.

3.3   Screening questionnaire

Method We had a questionnaire to extract individuals whose frequency of using Smartpass service was low. It consisted of the following items:

– Demographic information: gender, age, occupation, marital status, children, income, etc.
– Information on subject's phone model, hours of use, used functions, and their service provider
– The use of au services: term, uses Smartpass (yes/no), frequency of Smartpass application use, and the use of Smartpass services
– Lifestyle: the use of coupons besides Smartpass, frequency of eating out and the names of the restaurants, frequency of using leisure and other services

Data collection We conducted a web-based questionnaire between 02.10.2018 – 05.10.2018 for users registered to Rakuten Insight[11]. The subjects were asked to answer the questionnaire via email or by pushing notifications from the Rakuten App. Users answering the questions, earned Rakuten super points, which they could use as money in Rakuten services and an in an Electric Commerce website. 8,000 subjects answered the questionnaire ranging from 18 to 69 years of age.

Screening results From the 8,000 we screened users suitable for in-depth interviews with the following steps. Empirically, chose subjects who fulfilled:

– Frequently-used phone type: smartphone
– Frequently-used service provider: KDDI(au)
– Smartpass application status in the user's phone: installed
– Median frequency of coupon use other than Smartpass was more than 2.0
– Subjects who have used any point or discount cards.
– The use hours of their smartphone in a day was more than an hour.
– The number of used smartphone functions, such as calling, internet, and email was more than three.

In the end we arrived at 12 subjects by choosing them by their individual scores, using au service, loyalty scores, and frequency of using Smartpass apps, so that they would all be different with each other. Average age was 41.25. Table 3 shows the profiles of the 12 subjects for the in-depth interviews.

3.4   In-depth interview

We conducted semi-structured interviews between 17.10.2018 – 22.10.2018 for the 12 subjects extracted from the screening process. The objective was to find out the difficulties and barriers for the customers to using their Smartpass coupons. The interviews lasted on average for 90 minutes and the questions focused on the following topics:

– How often they used the Smartpass App., how they launch it, in which situation and activities they used it, and if there has been changes in how often they use it, and if they use the Premium service or not
– How often or rarely they used the coupons
– How often they use other coupons besides Smartpass either electronic or paper ones, and what are the differences from Smartpass coupons
– Frequency of using restaurants and other food related services, and if they took advantage of Smartpass coupons in these services, and if not, to explain reasons why.
– Discussion on barriers and limitation when using the Smartpass application, improvement ideas, and discussion on what they thought about privacy issues our suggested new features

4   Result

4.1   Smartpass App. use style

From the answers, we found out that users do not always launch the Smartpass App. from the main icon. Four subjects did it from within "au Service Top". A

Table 3. Subject list

#	Gender	Age	Profession	Phone type	Years	Premium	Frequency	Income(JPY)	Married	Children
1	Male	26	Student	Android	over 4	No	2–3 a week	$600-800$	No	No
2	Male	36	Full-time employee	iPhone	1–2	No	2–3 a month	$800-1,000$	Yes	Yes
3	Male	37	Others	Android	over 4	Yes	4–5 a week	less than 200	No	No
4	Male	41	Contract employee	Android	over 4	No	once a month	$1,000-1,200$	Yes	Yes
5	Male	50	Full-time employee	iPhone	over 4	No	once a month	over 1,400	Yes	Yes
6	Male	58	Full-time employee	iPhone	2–4	No	2–3 a month	$1,000-1,200$	Yes	No
7	Female	28	Part-timer	Android	over 4	Yes	everyday	$600-800$	Yes	No
8	Female	32	Contract employee	iPhone	over 4	No	less than once a month	$600-800$	Yes	No
9	Female	36	Contract employee	iPhone	over 4	No	2–3 a week	$200-400$	No	No
10	Female	46	Part-timer	Android	1–2	Yes	4–5 a week	$600-800$	Yes	No
11	Female	52	Full-time employee	iPhone	over 4	No	once a month	$800-1,000$	Yes	No
12	Female	53	Full-time employee	Android	over 4	No	2–3 a week	$800-1,000$	Yes	Yes

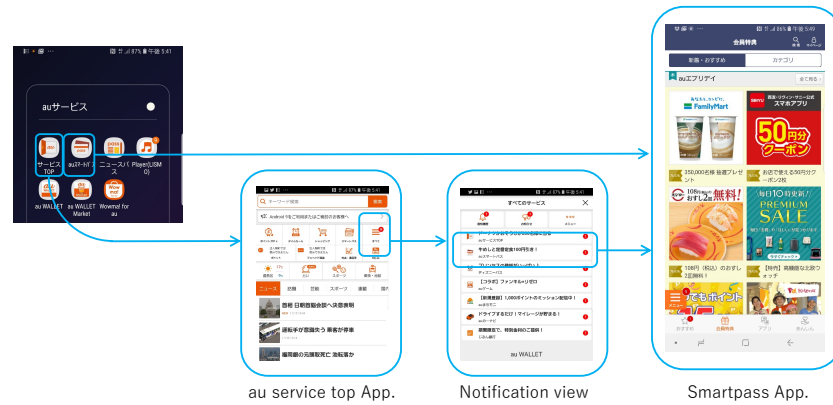au service top App.   Notification view   Smartpass App.

Fig. 3. Smartpass launch flow

separate application, even though they also had the Smartpass App installed. "au Service Top" is a portal application for au customers, where they can check their current telecommunication fee, apply for changing their contract and for example read news online.

The portal application also has in-app notifications, that show the availability of Smartpass coupons, which leads users to launch the application from within, instead of launching the app separately.

4.2   Difficulties in finding suitable target coupons

Ten subjects answered that they had trouble finding information on their target coupons when discussing their coupon frequency. They had trouble looking up suitable coupons from the application, while one commented having trouble getting information on the prices or items from the coupon banners. As a summary from the answers, we found out that the user interface design of the application is poor, as it was hard to find or access preferred target coupons. The design of an easy to use interface for the user is a fundamental postulate of PSD and HCI, so before conducting a new evaluation, we need to improve the application.

4.3   Barriers for using target coupons

From discussions on the differences of coupon use between Smartpass and others, eight subjects answered they had trouble using coupons, because they could only be used during specific times and they had a habit of forgetting to use them on time. These comments imply that persuasion with for example a reminder notification or using others like a 'nudge' style behaviour change features from the PSD model would help inform the user of an impending expiration date or otherwise encourage the use.

5   Discussion

5.1   Implications for Persuasive Technology use

In this section we discuss some examples and improvements which we can create derived from the guidelines of persuasive system design.

Persuasion context We looked into using the PSD model from its persuasion context of "Intent - Event - Strategy" for the current coupon system. The intent, is about recognizing the persuader and the type of change we are looking to achieve (attitude, behaviour change or both). In the case of Smartpass, the persuader is the developer of the software, and the related parties offering services for it. The intended change is to have customer's behaviour towards the use of the application changed. We can also argue that we are trying to change the indifferent attitudes towards an unused application in some cases. The event, is the use-context, where the system has a problem where customers forget to use it, have trouble finding the correct information, or can not effectively use when needed. Mostly these use-context events are the characteristics of a persuasive system, as the coupon application events enable change in behaviour. Most important factor is to understand the user's goals, which would be to increase coupon use to save money, or as an example, to use the application to exercising via visiting coupon locations far away. According to Oinas-Kukkonen[8] a persuasive system should offer ways for user's to reach their goals, and encourage it in a systematic way. Offering these goals is also essential to achieve persuasion. The strategy, is to find ways to reach the previous steps by analysing what needs to doing; emotional and logical persuasion using direct or indirect routes, be it messages or other features. For Smartpass, a direct strategy could be reminding users of coupons that are often used, but are about to expire. However, the PSD does not go into a lot of detail on how these routes can be implemented, so we need to look more into how direct and indirect routes can be done effectively.

System qualities use As presented in the section 2.3, the PSD model offers design support in the form of four system qualities, with seven sub-principles each. For Smartpass application use, we can detect several principles that apply for the current version, or could be used in future designs, based on a Persuasive Technology approach. From the current and distinct problems of Smarpass, we looked into how the principles could fit into our design, while presenting them each with examples and suggestions. Each system quality is analysed below.

1. Primary task support: From the interview results is shows we should reduce clutter on screen and organize information while reducing the effort to find things the users want. Next, when a user is interacting with the au portal app or the Smarpass app, tunneling them towards their intended goal and persuading them along the way is possible. These include possible sub-goals like exercising, offering healthier coupon choices for weight loss, or assisting to meet friends outdoors. It is also essential the application adjusts to group needs, interests, personality, usage context or other factors. For Smartpass this could be done by gathering data about the users, their location, and other agreed and shared information. This would also lead towards sub-principle, personalisation, where

information is offered to specific traits of a single user and should offer an increase in the chances of persuasion. Self-monitoring is often a choice in many sports applications where users can see their overall progress history and is a good way to increase persuasion effectiveness via user own motivation. The principle of simulation, where simulating a behaviour in Smartpass, could be about showing a user what are the calorie benefits of a chosen routes when using coupons at stores and how choosing a store a bit far away is healthier. Users could see the cause and effect link of doing something. Rehearsal principle, is when one can practice a target behaviour, leading to change. The last principle might not be needed in our coupon application as the goal is intended for other kinds of persuasive systems. Using indirect routes of persuasion might make it difficult to have rehearsal function.

2. Dialogue support: Praise, virtual rewards, reminders and tailored suggestions are sub-principles for dialogue support, and each can make user's more open to persuasion. These are all suitable for use in the Smartpass App, as an example, the system could issue awards when lots of coupons are used in a single store, e.g. "You have bought 10 items from this store with discount! Here is a silver stamp! Get three more stamps for an extra discount!" or public recognition "You are crowned the king of this store with most visits!", would likely entice others to do the same, or increase the likelihood. In the interview when asked for improvement ideas, the subject gave similar ideas to the above-mentioned ones. Principle of similarity, creates persuasiveness if a system reminds the user of themselves. This refers to for example using slang or customizing features to more closely remind the end users behaviour or manners. Liking the system or it's visual attractiveness, appeals to users and thus creates persuasion, which can be also considered to be one of the usability features, also for Smartpass. Last, the principle of using the system in a social role, suggest using it as a mediator between the user and the other targets. For example having a virtual coupon mascot for the Smartpass application might achieve more use.

3. System credibility: An application should have features like trustworthiness, where the information is always accurate, fair and unbiased. Expertise, to keep the software always up to date and professional. Surface credibility, is crucial as the initial impressions of a system is often the most critical point for future use, so the application needs to be complete and competent. The real-world feel, is when the people behind the software are highlighted in some ways to make an application more credible. Authority is when a software is quoting authoritative figures e.g. a doctor, will have a bigger chance of persuasion, thus affecting for example people to trust the app more. Third-party endorsements, are also used to create credibility for a software if they are well-known and respected. Verifiability, is when information provided within the application should be verifiable from other sources. For Smartpass, not all of the features are totally fitting for a coupon application. As such they should be considered general suggestions to be implemented if it has good correlation for the user needs. A casual user might not treat the development team behind an application as essential.

4. Social support: The most interesting system quality principles are through social support, as it provides clear connectivity to the features of the Smartpass

application. Social learning, is when a user looks at others and learn from them to change their own behaviour, while Social comparison, is when a user shares their data and compares it to others. Normative influence, is what users feel as commonly know peer pressure, i.e. how others influence you. Social facilitation, on the other hand, is about seeing others doing the same behaviour, which leads to the user doing the exact same behaviour. Cooperation, for example, is about having a common goal with others to lose weight, while Competition principle is about competing for those same goals against each other. Last, recognition principle is about rewarding the user in some ways, that others can also see. These all suggest that social interaction between the users Smartpass could provide more persuasion from competitiveness, peer pressure, shared goals, or from just following what others do. Smartpass could implement shared coupons between friends, comparison of walking distances as a common goal-driven event, or competing to get recognition from virtual rewards for the winner. In the privacy answers, agreeing to share location data was fine by many but not all. If the users would get something back from location sharing then maybe these users, who initially declined, can be persuaded to share. In addition to increasing coupon use, it might be good to connect persuasion to features that offer other clear benefits to customers. These can be personal needs, hopes and goals, or interests such as weight loss, exercising, personal improvement. Targeting these goals for positive effects when using the system, would most likely affect how effectively persuasion for coupon use would work.

5.2 Discussion on ethics towards the use of persuasion

In this section, we present our views on some ethical concerns when using persuasive techniques for our system. Smartpass customers want to use coupon services, so at first glance encouraging its use via Persuasive technology would not be unethical. However, conditioning and surveillance would not be acceptable, while also being open about the persuasion and offering users a change to opt-out if needed, are essential.

In the interviews we also inquired privacy issue concerns with the subjects and from the answers almost all of the subjects did not care about their privacy related to gathering personal data. Some answered that they would agree, because they would be able to utilize their coupons better from the more accurate and tailored information.

In [7] and [8], Oinas-Kukkonen et al. discuss that in a persuasive system "(P7) persuasion through BCSS should always be transparent to the user. " and in Berdichevsky and Neuenschwander's statement[1], they give a baseline for the transparency: "The creators of a persuasive technology should disclose their motivations, methods, and intended outcomes, except when such disclosure would significantly undermine an otherwise ethical goal. ". Considering the above advice, we need to explain our motivations, and other necessary information to the customers and request for their consent before an evaluation is performed.

In addition, Karppinen et al. [5], propose three methods for discussing ethics. First, is the guideline-based approach. The second one is a stakeholder-analysis-based approach. The last one is a user-involvement-based approach. Before evaluation, we need to analyze our system whether it has the required transparency with any of the above-mentioned approaches.

6   Conclusion

In this paper, we presented in-depth interview results to finding out clues for encouraging customers to use their Smartpass coupons. Our in-depth interview focused on the reasons why customers do or do not utilize these coupons and how the system could be improved. From the interviews, we got several implications such as a reminder notification, and usability improvements suggestions which would encourage the customers to use the coupons. Based on the findings, we plan to develop persuasive techniques towards these goals. In addition, we discussed the ethics based on the articles reported in Persuasive Technology. While the PSD model offers a good starting point for persuasive work, the model should add parts that clearly expand on how to implement direct and indirect routes for various types of user goals. Our future work includes planning the persuasive techniques, creating a pilot test and deploying a full system, and lastly analyzing the system within an open and ethical framework.

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