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Supporting Gift Selection to Encourage Consideration of Gift-Receivers from Various Perspectives

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Abstract: The purpose of this research is to encourage consideration of gift-receivers in the gift selection process from various perspectives. People often purchase gifts for their loved ones, such as partners and friends. There are various e-commerce websites that recommend gifts for loved ones; however, selecting an appropriate gift is difficult because these recommendations do not consider gift-receivers' hobbies and preferences. Entering all their hobbies and preferences into the system in advance will solve this problem, but it takes time and effort. To solve this problem, we proposed a system that encourages consideration of gift-receivers by themselves. To achieve this, the proposed system provides questions about the gift-receiver and facilitates deeper consideration in gift selection. Using this proposed system, we conducted an experiment to observe the participants' gift selection process. As a result, we confirmed that the system increases people's consideration of gift-receivers.
Keywords: *Gift selection process, Various perspective, Consideration of gift-receiver, Questions about the gift-receiver*

1. INTRODUCTION

With the spread of the Internet in recent years, many shopping websites, such as Amazon and Rakuten Market, have arisen online. Users can select and buy various products on such websites, and the number of users is increasing every year. The range of product selection has also expanded. However, it is not easy for the website to choose the desired product from the wide variety of available products. The technique of recommending products that match a user's preferences is one way of solving this problem. For example, a collaborative filtering method has been proposed [1] that guesses each user's preferences from past purchase data and recommends products that match the user's preferences. As another example, when a user chooses a desired item on Amazon, he/she receives product recommendations such as "people who bought this product also bought the following products" [2]. Such recommendations support an individual's purchasing behavior.

Such purchase behavior happens not only when users buy products for themselves, but also when they select gifts for others. Various websites offer products suitable as gifts, including COCOMO (https://cocomo.to/) and GIFT DINOS (https://www.dinos.co.jp/gift/). On these websites, when searching for gifts, users can select the age and event (e.g., birthday) of the person they are buying a gift for, and products that correspond to each selection are recommended. Many websites also provide information on selecting gifts based on questionnaires. For example, "Recommended gifts for 20 to 30-year-old people" and "Birthday gifts list." Since the Internet is easy to use, many users use such websites for selecting gifts. Many websites provide such gift recommendations. However, the recommendations made by these gift websites do not consider gift-receivers' hobbies and preferences. For this reason, the recommended products are not necessarily suitable. It is not always possible for a person giving a gift (hereinafter referred to as "gift-sender") to find a satisfying gift item on such websites. Therefore, in this research, we focus on a system that can help increase consideration of gift-receivers during the gift selection process. Unlike the conventional gift recommendation system, in the proposed system in this study, users think about gift-receivers from various perspectives when choosing gifts. Through this system, we will help gift-senders find a satisfying gift.

2. RELATED STUDIES

The factors related to a user's purchasing decision when buying products as gifts for other people are different than those when buying products for himself/herself [3,4]. Clarke et al. have shown that people who buy gifts

consider more products and visit more stores compared to those who buy products for themselves [3].

Kudo et al. proposed a simple product recommendation system [5]. This system uses a rough set theory. In this system, rules for a recommendation method are first created from users' queries. Next, based on that, the system estimates the implicit condition of the products that users want to search and then recommends the products.

Sarwar et al. explored item-based collaborative filtering techniques [6]. In particular, they analyzed an item-based recommendation generation algorithm. They examined various ways to measure the similarity between different items, for example, correlation between items and cosine similarity between the vectors of items. Further, they examined ways to recommend products from item similarity, for example, a weighted sum or regression model.

In this research, we do not purchase products themselves but support the purchase of products as gifts for others. We focus on the gift selection process.

By urging gift-senders to consider gift-receivers (e.g., preferences, favorites, belongings), we aim to help gift-senders select a convincing gift item. Our purpose is to develop a system that encourages gift-senders to increase their consideration of gift-receivers, not a system that recommends traditional products.

3. PROPOSED METHOD

3.1 Methods to increase consideration of gift-receivers

It is difficult for a gift-sender to consider gift-receivers from various perspectives without the opportunity to consider the opponent. In this paper, to encourage gift-senders to increase their consideration of gift-receivers, the proposed system uses a method of asking questions about gift-receivers. We aim to make gift-senders select gifts considering the gift-receiver based on responses triggered by the questions. We conducted a preliminary experiment aimed at setting questions to make the user think about the gift-receiver. Two university students were selected as experiment participants. They decided to whom to send gifts and selected gifts. The selection process was observed using a think-aloud protocol. This is a way for participants to utter what they think or think during the experiment as much as possible. For example, they said the following when choosing: "What kind of wallet did she use?" and "If the wallet was not damaged, she used the same thing all the time." In addition, their thoughts concerned what the gift-receiver wears frequently or which of the gift-receivers belongings were damaged. In this, it seems that they thought about the gift-receiver.

Based on such utterances, we selected 18 questions about gift-receivers. For example, "gift-receiver's environment," "gift-receiver's hobby," "gift-receiver's favorite color," and "consideration of gift-receiver (metal allergy, dislike of smells, etc.)."

3.2 Overview of the proposed system

In the proposed system, the gift-sender generates keywords associated with the gift-receiver by answering questions presented by the system, which then conducts a product search based on keywords. An example of the assumed interaction is shown below, which shows how college students conducted a product search to find gifts for friends.

One participant thought about gifting her friend cosmetics, considering the friend's likes. She searched for cosmetics and set it as an option. Looking at the question column, she considered the question "what has the gift-receiver bought recently?" As a result, she recalled that the friend recently purchased new cosmetics, and hence removed cosmetics from the options. She considered which product might be ideal. Her gaze stopped at the question "what item is damaged among the gift-receiver's belongings, and what item should be replaced?" She reconsidered the gift. She remembered that the gift-receiver's pass holder was damaged. When searching for a pass holder, she found one illustrated with the friend's favorite character. Through the above actions, she decided to choose the pass holder.

As mentioned above, asking such questions promotes the consideration of gift-receivers, thereby widening the range of gift items. Based on this, we proposed a system using the questions shown in section 3.1.

The proposed system can be used on a webpage, and is implemented with HTML and JavaScript. In this paper, we used the Rakuten product search API (version: 2017-07-06) of the Rakuten web service developed by Rakuten Co., Ltd. The interface of the proposed system is shown in Figure 1. Answers are entered using a filling formula, and the questions are always presented from the time of system startup (see Fig. 1-A). Questions are fixed, not changing for each user. This is to allow gift-sender to consider gift-receiver from various perspectives. A question can be answered arbitrarily while a user is selecting a gift. By inputting a search keyword with a question as a trigger (see Fig. 1-B), a product corresponding to that keyword is displayed (see Fig. 1-C).

Figure 1: Proposed system

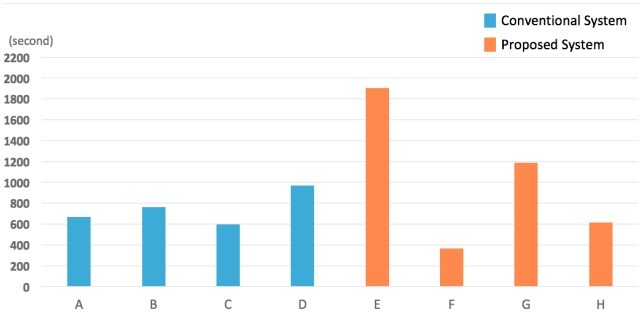

Figure 2: Search time

The questions are presented in the question column.

4. EXPERIMENT

4.1 Outline of experiment

In this experiment, we focused on the gift selection process. This experiment aimed to verify whether the gift-sender will be encouraged to consider the gift-receiver using the proposed system. A system with only a product search function, excluding the question column from the proposed system, was used to represent a conventional system and compared with the proposed system. Four experiment participants were selected for each the conventional system and the proposed system. For the conventional system, four college students (one male, three females) from the information systems department were selected. For the proposed system, four college students (two males, two females) from the same department, but who did not participate in the experiment using the conventional system, were selected. Experiment participants made their gift choices using the system assigned to each group. The following three experimental conditions were explained to the experiment participants: (1) The experiment participant decides a gift-receiver, but as an exception, he/she must avoid choosing a person who he/she has already decided what to give or for whom he/she has already decided on a category; (2) When choosing a gift, the experiment participant must utter what he/she thinks as much as possible; and (3) When a gift is determined, the experiment is terminated. We first communicated the experiment contents to the participants and explained how to use the system. Next, to help them get used to the system, experiment participants were directed to enter specified search keywords and conduct a product search. When explaining the proposed system, we only told them that they can fill in the question column of the system. We did not encourage use of the question column. After that, the first participant decided on a gift-receiver and started the experiment. The experimenter waited next to the participants in order to respond immediately to any remarks. During the experiment, we asked the question “Why did you search by that word?” This was to clarify their reason for searching when participants selected a gift. After obtaining the participants’ consent, we recorded the search screen and their utterances during the experiment.

4.2 Search time and questionnaire result

The average time for gift selection using the conventional system was 12 minutes 29 seconds. On the other hand, the average time for gift selection using the proposed system was 17 minutes 00 seconds. Figure 2 shows the time taken by experimental participants A to D using the conventional system, and by participants E to H

Table 1: Table caption

Conventional system		Proposed system	
Participant	Number	Participant	Number
A	6	E	36
B	8	F	1
C	6	G	39
D	5	H	18
Average	6.3	Average	23.5

using the proposed system. The questionnaire results of participants A, B, C, and D, who used the conventional system, are as follows. Participant A made the final decision by considering the gift-receiver's looks and price of the gift. Participant B selected items based on price, functionality, novelty, and looks. Participant C made a decision based on price, the gift-receiver's preferences, and looks. Participant D selected products based on whether the gift will be easy to use for the gift-receiver. The questionnaire results for participants E, F, G, and H, who used the proposed system, are as follows: Participant E made product decisions based on whether the product is a consumable item, the thoughts of the gift-receiver (filial piety), and the gift-receiver's preferences. Participant F selected the product considering the season, the their own preferences, and price. Participant G made the final decision based on the feelings of the gift-receiver and what he/she wears. Participant H made product decisions considering practicality and the gift-receiver's feelings.

5. DISCUSSION

5.1 Search time

The average time taken by the experiment participants' using the proposed system was longer than that taken by those using the conventional system. However, there was no significant difference between the two groups, as there were differences in the time to choose for each gift-sender. After the experiment, we formed a question "Do you usually take time when you choose a gift?" Regarding the participants who replied that the time spent choosing a gift is short, it was observed that they promptly determined the gift item in the experiment.

Moreover, looking at time taken to choose a gift by participants E and F, who used the proposed system, it can be seen that there is difference of 25 minutes between the two. From their utterances, we observed that participant E looked at all the questions in the proposed system and answered all of them. On the other hand, participant F did not use the question column to make the product decision. This shows that using the question column affects the time taken to choose a gift.

5.2 Analysis of search process

First, in order to analyze the search process, we generated text from speech data obtained from the experiment process. Next, we divided the recorded utterances by sentence, giving them a label and briefly describing the contents, and then grouping them into categories based on similar labels. In the conventional system and the proposed system, we categorized utterances into "categories including consideration of gift-receivers," such as gift-receiver's hobby and gift-receiver's favorite celebrities, etc. We also categorized utterances into "categories not including consideration of gift-receivers," such as product discovery and evaluation of products. This was to make it easier to examine whether the search process promoted consideration of gift-receivers. In the conventional system, 12 categories including consideration of the gift-receiver were generated.

On the other hand, 17 categories were generated in the proposed system. Both systems had nine common categories. They are "Gift-receiver's situation," "Gift-receiver's event (e.g., birthday, marriage)," "Gift-receiver's hobby," "Gift-receiver's clothes," "Gift-receiver's episode (e.g., filial piety)," "Gift-receiver's favorite color," "Gift-receiver's favorite entertainer," "Gift-receiver's taste," and "Recollection of what you bought before." This shows that both systems encouraged consideration of the gift-receiver. However, the remaining categories were obtained only when those obtained using the proposed system were the same as those obtained from the questions. Based on their utterances, three out of four people who used the proposed system confirmed only that they read all the questions aloud and confirmed that the product was searched for using that question as a trigger. Therefore, these categories are considered to have been obtained by presenting questions. In addition, by presenting questions based on the number of categories, it can be suggested that the proposed system, using questions, increases consideration of gift-receivers from various perspectives compared to the conventional system.

5.3 Number of considering points for gift-receivers

We measured the number of participants' utterances in which the gift-receiver was considered for each divided sentence at the time of category generation. This was done to measure the number of utterances that considered gift-receivers by each participant for both systems. The

results are shown in Table 1. The average number of such utterances by the participants using the conventional system was 6.3, and the average number of such utterances by participants using the proposed system was 23.5. Two of the experiment participants using the proposed system made more than 30 utterances that considered the gift-receiver.

5.4 Questionnaire results

Three out of four experiment participants in the conventional system and all four in the proposed system made utterances (e.g., preference of the gift-receiver and ease of use) that considered the gift-receiver. However, utterances (e.g., prices and appearances of products) that did not consider the gift-receiver were obtained from three out of four participants in the conventional system and two out of four in the proposed system. This indicates that in both systems, gifts were selected by considering gift-receivers. Furthermore, participants did not select other possible items because they considered gift-receivers using both systems. This is the same as the decisive factor for the final gift. When selecting a gift, it is necessary for the gift-sender to consider the gift-receiver (e.g., preferences, favorites, belongings).

5.5 Overall discussing

In this paper, we conducted experiments aimed at promoting consideration of gift-receivers when selecting gifts by presenting questions about gift-receivers. The questionnaire results showed that experiment participants considered the gift-receiver using both systems. By observing the amount of consideration given to the gift-receiver in the search process, many categories, including consideration of the gift-receiver, were obtained using the proposed system. In addition, more utterances were observed in the proposed system than in the conventional system. From these results, it seems that presenting questions about gift-receivers could encourage consideration of gift-receivers from various perspectives. Further research should examine the question items.

6. CONCLUSION

In this paper, we aimed to have gift-senders select a satisfying gift by encouraging their consideration of gift-receivers in the gift selection process. We conducted an experiment aimed at promoting consideration of gift-receivers using the proposed system that presented questions about gift-receivers. After that, we analyzed the utterances of participants. It was found that the proposed system helped them consider the gift-receiver (e.g., preferences, favorites, belongings) from various perspectives. The study results also confirmed that the proposed system led to more utterances that considered gift-receivers. In future studies, we will consider adding more questions and improving the present question items to encourage gift-senders to consider the preferences of gift-receivers from various perspectives.

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