Assignment M1
Search Function for Coupang e-Commerce App
CS6750 – Human Computer Interaction

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***Abstract*—This study examines opportunities to redesign the existing interface for the search function of the Coupang e-Commerce App by following a user-centered four-stage design life cycle. Coupang is the largest e-Commerce platform in South Korea by market share at the time of writing, in 2022, and the platform exists as a website and as an App. The four-stages in the design life cycle for this study are: the Needfinding stage, where research seeks to establish a comprehensive understanding of both the task and its users; the Design Alternative stage, where multiple preliminary ideas are formulated to tackle the task; the Prototyping stage, where alternatives with the most potential are developed into prototypes for future user testing; and the Evaluation stage, where user testing occurs on prototypes and user feedback is collected. Participants for this study are all English-speaking adults.**

1 PROBLEM SPACE

Coupang is the largest e-Commerce platform in South Korea by market share at the time of writing, in 2022. Coupang is often referred to as the "Amazon of South Korea" (Heebs, G. 2021) because of its significant local market share, large variety and supply of available goods, low and competitive prices, short delivery times, significant logistics infrastructure, and ease-of-use owing to its online website and App. However, it has not held this mantle for a significant time. Coupang's revenue has increased from 4,054 million USD in 2018 to 18,406 million USD in 2021, and its profit has increased from 189 million USD in 2018 to 3,109 million USD in 2021 (Coupang Inc., 2022).

This study seeks to examine opportunities to redesign the existing mobile App interface's search function (depicted in Figure 1) or to discover alternative

solutions to the search function. Due to the size and high usage of this e-Commerce platform within the domestic market, such opportunities yielded by the research could potentially have far reaching benefits. The study is limited to understanding the environment surrounding the use of the mobile App and does not include the website version of the e-Commerce platform.

Figure 1 — Coupang App Interface, Search Bar shown (Byun HJ, 2022)

At a glance, the search function on the Coupang App is similar to search functions on other popular e-Commerce platforms such as eBay or Amazon. After completing a search for a particular product, closest or related matches for products from Coupang or other sellers are displayed.

At a glance, the App landing page is populated with banner advertising directly underneath search bar. Banner advertising usually relates to sponsored brands, special deals or new proprietary offers from Coupang. Beneath the banner advertising are 10 icons including: product categories, current specials, Coupang Eats (a food delivery service similar to Uber Eats), and Coupang Play (similar to Amazon Prime video and gaming). Further beneath these 10 icons are further product spotlights.

Once a product is selected it is added to the user's shopping cart. From there, assuming the user wishes to proceed with a purchase or number of purchases, the user will then be prompted to organize shipping details, delivery methods and payment. Of particular note, Coupang offer 'Rocket Wow' delivery (similar to the Amazon Prime shipping service) which offers expedited shipping and no minimum shipping for a monthly fee.

2 USER TYPES

Coupang primarily serves the domestic market (South Korea) and the website and App are only available in the Korean language. However, international shipping is available for users to various locations such as Canada, the US and Europe. Therefore, a majority of users are based domestically within South Korea and there is a smaller international base of users.

In order to register an account with and use the Coupang App, a user requires an Android or iOS mobile device, a bank card or credit card capable of online purchases, a cell phone number, their name, and a suitable address. This means that users could potentially be anyone in South Korea that fulfills these requirements.

In saying that, users of the Coupang App require a baseline technical proficiency in using mobile technology, the necessary expertise to download, open and operate a mobile app, and necessary understanding to complete account registration.

For the purposes of this study, all participants and user groups will be English-speaking adults.

Of note, those without sufficient Korean language proficiency (such as expats, international students and travelers) often use Google Chrome's in-built translation tool as a workaround on the Coupang website. However, it is not possible to open the App in a translated form. It is possible that these users may open the website version in Google Chrome on their mobile device, with the translation functionality enabled.

The underlying motivations for a user to use the search function of the Coupang App is to search for products they may be interested in buying now or in the future. It is also reasonable that a user may also search for products on the e-Commerce App without a purchase decision in-mind. A user may simply be searching to gain an understanding of product prices and product variety.

3 NEEDFINDING PLAN 1 - SURVEY

3.1 Method

As part of the Needfinding stage in the user-centered four-stage design life cycle, a survey will be used to acquire broad data from a large number of users. This data will assist in formulating models about who are users are, what they need from the Interface (the Coupang App search function) and how they use the Interface. Data collected from this survey will also help other the stages of the design life cycle: Design Alternatives, Prototyping and Evaluation.

3.2 Plan, Questions and Data Inventory

One of the key advantages of surveys is that they can be administered online, asynchronously for a very low-price. Furthermore, they are a good needfinding method to begin the overall Needfinding stage with as they can help formulate interview or focus group questions and observation protocols.

Therefore, a survey using Google Forms or SurveyMonkey will be developed for distribution. People will be invited using a low-cost link to the online survey.

People will be recruited using convenience sampling and snowball recruiting (friends of friends). Respondents and participants are all English-speaking in a predominantly non-English speaking country, and so it is critical to recruit English-speaking participants via convenience sampling and snowball recruiting. It is unlikely that random sampling is likely to find English-speakers effectively.

The survey will feature a progress bar (so users know how close to completion they are), consistent page lengths and questions will be grouped by topics. Questions will be in plain English and questions that are too broad will be avoided.

The survey will open with basic questions used to understand the users. Questions will include questions about: email, age, gender, frequency of Coupang App use, frequency of technology use and frequency of other e-Commerce app use. Furthermore, as the users know who they are, this is an easy way to ease them into taking the survey. Answers for these questions will be either categorical or interval. These questions aim to identify who the user is and their level of technical expertise.

The survey will then move on questions regarding where do they use the App. For example, do they use the App at work, at home, in public places, and so on. The answer to this question will be a free text answer as there should not be any preconceived notions of the locations where people use the App. Another question will be asked about how long do they usually use the App for. The answer choices will be in intervals (minutes). Another question will also be asked regarding what else is competing for the users' attention when using the App. The answer to this question will be a free text answer as there should not be any preconceived notions of the distractions that take place when people use the App These questions aim to establish the location and context of the task.

A question will be asked regarding what the user's goals are. Answer choices will be: to purchase a product, to perform research (example: compare prices or product availability), window-shopping/leisure, or other: user-specified answer. Next, the user will be asked with a free-text response field, what products do they usually search for, listing the five most common items.

Questions will then be asked to understand the users thought process when using the Interface (the search function). A free-text response question will ask what information does the user need before performing a search decision. Further questions will establish how the user performs a search and what other considerations do they need to make. Several 1-7 bi-polar scale satisfaction questions (extremely dissatisfied to extremely satisfied) will be asked about user sentiment towards the Coupang App search function and any other e-Commerce App search function (if any), relating to on average, the speed at which how quickly the search is undertaken and how relevant the search results were. A free text answer question will also request any suggestions for improvements to the App's search function.

A final question requesting feedback on the overall survey will be present.

The survey will be previewed by the creator and other peers, and checked for minor improvements before being distributed.

Ideally, at least 100 survey responses are received, as this will exceed the threshold for sampling at a 95% confidence level, with a 10% margin of error, as outlined in Fig. 4 in Müller et al. (2014, pp. 239).

3.3 Biases

Surveys are subject to observer bias, voluntary response bias, recall bias, satisficing bias, as described by Müller et al. (2014, pp. 244-245), question order bias and sampling bias.

Other issues include duplicate responses, respondents who complete the surveys too quickly, and thereby not reading and answering the questions appropriately. These are referred to as 'speeders' by Müller et al. (2014, pp.

3.4 Bias Mitigation

To improve response rate and reliability of data, and to reduce question order bias, satisficing bias and speeder bias, the surveys will be no longer than they have to be. The survey will be the minimum number of questions necessary to obtain the data required.

Observer bias will be reduced by avoiding leading questions and grouping questions by logical topics (as outlined in Section 3.2)

Voluntary response bias (those with extreme opinions are more likely to respond to surveys) can be minimized by avoiding bi-polar scale questions (1-7 or 1-5 scales) where possible. There are only two of these questions relating to current satisfaction levels of users when using the App's search function and another similar app's search function.

Recall bias may be reduced by requesting the users open the Coupang App and refresh themselves on the usage of the search function.

Sampling bias is occurring as a result of convenience sampling and snowball recruiting as described by Müller et al. (2014, pp. 237). Participants are more likely to belong to similar socio-economic backgrounds and cultures, thereby reducing the breadth of the users being sampled. Due to the study being limited to English-speakers, this is difficult to minimize.

Duplicate responses can be minimized by comparing email identifiers attached to survey responses. Speeder responses and satisficing bias can be minimized by tracking survey completion times and eliminating survey responses that are too quick.

4 NEEDFINDING PLAN 2

4.1 Method

Participant observation will be used to understand how users utilize the App's search function, the overall efficiency of the search function, and other alternative solutions that are available (if any).

4.2 Plan, Questions, Data Inventory

Participants will be recruited voluntarily from public locations for a 5-minute participant observation session. They will open the App on their own mobile device or a provided mobile device to perform a search on the Coupang App.

Before participant observation begins, a few basic questions will be asked about the participant, including: age, gender, frequency of Coupang App use, frequency of technology use and frequency of other e-Commerce app use. This is to establish who the users are and their level of expertise.

They will be asked to search for something they would usually buy. Metrics of efficiency such as number of clicks, time to completion and accuracy of search will be recorded. The participants will be asked if they found what they were looking for on the first attempt, or if it required subsequent attempts or other alternative methods of locating the product. Notes will also be taken on the steps that participants take to perform a search for a product. If the participants use alternative methods, this will be recorded.

Next, participants will be asked to search for 5 different generic products. Survey answer results relating to what are the most popular search products will help decide what these 10 different products are. Notes about steps taken and metric of efficiency will be recorded. If the participants use alternative methods, this will be recorded.

Observing the participants perform searches within the task context will provide insight into their thought process, their goals and the tools and information they need to perform a search. Observations will also identify tasks and subtasks, and how the users accomplish these.

When possible, the session will be rehearsed to design it to close to the 5-minute limit.

4.3 Biases

Although passive in its approach, participant observation is subject to observer bias on the user side, and confirmation bias on the observer side.

4.4 Bias Mitigation

To minimize observer bias, the steps taken during the participant observation will be fairly objective and there will be minimal discussion with participants that lead them to perform a certain way and subconsciously influence them. There is still some residual risk of participants performing searches in ways unnatural to them because they are being timed and observed as they search for 5 different generic products.

Confirmation bias on the researcher/observer side can be minimized by recording all the actions that participants take, regardless of how minor they are to the overall task goal. This will help to reduce the likelihood that the observer only records what they already preconceive as required to achieve the task goals.

5 NEEDFINDING PLAN 3

5.1 Method, Plan, Questions, Data Inventory, Biases

Interviews will be undertaken in attempt to establish a rich understanding of what users think works well with the search function and what doesn't work well with the search function. Another goal of the interview process to facilitate open discussion and for participants to talk about their overall user experience, any problems they have, and any improvements that they think could be made. This is all rich qualitative information and data that has not be obtained in the survey or participation observation.

Interview participants will be recruited at random using the survey respondent email addresses. A goal of 10-15 interview participants is ideal.

Interview scripts will be fine-tuned using research partners and proofreading. All efforts will be made to avoid leading questions and influencing the interview participants.

The researcher/interviewer will take all efforts to spend a majority of the time listening and taking notes.

6 REFERENCES

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