Assignment M2
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: Needfinding, Design Alternatives, Prototyping, and Evaluation. Participants for this study are all English-speaking adults.**

1 STUDY CONTEXT

For further understanding of the overall study context, please refer to *Appendix 9.1: Extended Abstract*, *Appendix 9.2: Problem Space*, and *Appendix 9.3: User Types*.

A first round of Needfinding was executed using three different methods. Firstly, using a broad online survey with a mix of quantitative and qualitative questions. Most survey questions have a restricted scope of answer choices, but relevant questions provide "Other:" if the respondent wish to specify. Secondly, using interviews to dig deeper on qualitative questions, and to promote free and open discussion. Thirdly, using participant observation to investigate quantitative questions, primarily regarding the efficiency and performance of the search function.

2 NEEDFINDING EXECUTION 1: ONLINE SURVEY

An online survey was conducted using Google Forms on 06/06/2022 12pm to 06/18/2022 11:59pm. The online survey questionnaire consisted of 20 questions that attempt to answer the following questions that are linked to the Data Inventory: Who are the users (age, technical proficiency)? Where are the users and what is the context of the task (OS platform, locations, situations, background

distraction volume)? What is the level of satisfaction with the interface, results and overall performance, relative to their task? The survey also asked respondents to rate the Coupang search function relative to other eCommerce platforms. Further, the survey also invited respondents to provide feedback on things they think work well and comment on any areas of improvement.

The online survey was sent to 43 people via convenience sampling (my workplace colleagues, friends and family). Snowball recruiting was lightly-encouraged, and it was indicated that the survey was forwarded to 6 other people. 30 responses were received.

The full online survey questionnaire and results can be viewed in *Appendix 9.4: Needfinding 1 Online Survey Online Survey Questionnaire*.

2.1 Results, Raw Observations

- 30 people ('the respondents') responded from a pool of 43 convenience-recruited primary invitees and 6 snowballing-recruited secondary invitees.
- 86.7% of respondents were aged 25-34 years old, 10% aged 18-24 years old, and 3.3% (1 respondent) aged 35-44 years old. Therefore, all respondents are young adults (i.e., pre-middle aged).
- 43.3% use Apple iOS, 33.3% use Android and 23.3 use an internet browser to access the Coupang app and its search function.
- 66.7% of respondents had used Coupang for more than 12 months, 10% for 6-12 months, 13.3% for 4-6 months and 10% for 1-3 months. No respondents had used Coupang for less than 1 month.
- Frequency of Coupang search function use was highly variable, with 16.7% using it several times per week, 23.3% once per week, 26.7% once every two weeks, and 20% once per month. Daily usage or usage less than once per month was rare.
- All respondents use the search function at home, 46.7% at work, 50% while commuting, 53.3% while shopping at other locations, 20% at eating establishments, 13.3% while walking, 0% while at a park, and 0% while driving. No respondents reported using the search function in other locations or situations (i.e., there was no reported use of 'Other: ' answer choice).

- 46.7% respondents reported a low amount of background distraction while using the search function. 23.3% reported a moderate level of distraction, 10% reported none, and 16.7% reported very low.
- Sentiment on the performance and usability of the search function was overwhelmingly positive. 93.3% reported the search function is easy to find, 73.3% reported the search function is easy to use, 76.7% reported it was obvious when a search had taken place, 80% reported the search function responds quickly.

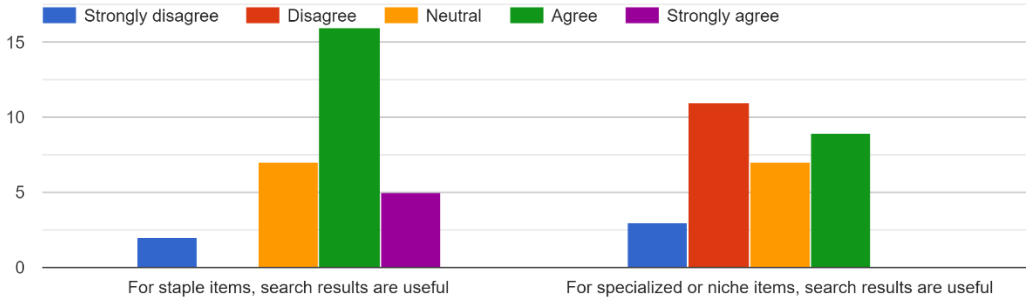

Figure 1 — Opinion on Search Results

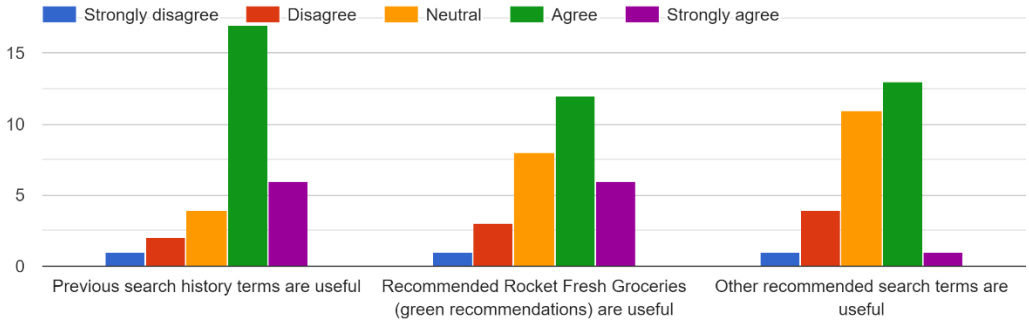

Figure 2 — Opinion of Search Recommendations

- 13.3% and 56.7% of respondents were very satisfied and satisfied with the search function. 23.3% were neutral. 6.7% (2 respondents) were dissatisfied. None reported being very dissatisfied.
- Generally speaking, respondents felt that the Coupang search function worked better than those that other eCommerce platforms. 46.7% positive, 30% neutral, and 23.3% negative. No strong negative answers were received, and 23.3% fairly strong (not maximum) positive responses were received.

- Aspects that were reported as working well include: inbuilt translation function for English search terms into Korean, UI design, good filters for search, good for common products, clear seller ratings and delivery estimates. 10 respondents provided this type of feedback.
- Aspects that were reported as needing improvements or changes include: providing thumbnails or images for search terms for concept-checking, more accurate in-built English translation (sometimes search results are inaccurate), more accurate search results, hide premium membership items for those without the membership, app availability in English, filter options for price range and region of origin, and too many banner and pop-up advertising. 14 respondents provided this type of feedback (non-responses were not counted).
- 80% of those who reported aspects working well also suggested improvements/changes.

2.2 Summary

Overall, the online survey was fairly successful in terms of response rate at 61% (30 respondents from 49 invitees). Acquiring 30 respondents exceeds the 25 responses limit of the course-provided survey platform.

All respondents were under the age of 45, with 86.7% being aged 25-34 years old. As a measure of comparison, Jobst (2021) reported the ages of Coupang Android app users in July 2021 as 7% 10-19 years, 14.3% 20-29 years, 19.5% 30-39 years, 28.7% 40-49 years, and 30.5% 50 years and older. It is clear that the sampling age demographics are skewed towards younger adults, having omitted middle-aged adults, seniors and retirees. In saying that, this may be more closely representative and typical of the English-speaking community in South Korea, which would comprise mostly of expatriates. This will be discussed further as form of sampling bias, however there are a range of social and governmental factors that go beyond the scope of this study that could explain the age demographic skew. For example, there are many visas, such as youth visas or working visas, that use younger ages as being more positive and increase the likelihood of being granted or retaining said visa. This results in the attrition of expatriates back to their home country as they get older. Many youth visas are valid only until someone's early 30's, and age being used as a point system tends to degrade to zero after becoming middle-aged.

In terms of the location and context, there was a fairly even split between iOS, Android and browser usage of the platform. All respondents reported using the search function at home, with approximately 50% also using the function at work (on a break), while community and while shopping at other locations. 20% also used it at eating establishments, and 13.3% while walking. 73.3% of respondents reported none-low amounts of background distraction, but 23.3% reported moderate amounts of background distraction. None to low amounts of background distraction would be typical of the home environment, during a work break in a non-busy location, and non-busy periods while shopping or at an eating establish. Moderate background distraction is likely typical of commuting, walking, eating establishments, shopping during a busy period and on a work break in a busy or populated location. However, it is worth pointing out that a respondent may have other prevailing social interactions preventing them from using the search function during a work break in a busy or populated location.

Overall, the performance and usability of the search function was reported as very positive. Open-response feedback supported this notion and made particular mention that the UI design, search filters and acceptance of English search terms were good features. It was reported as being easy to find and use, and that visual feedback was quick and obvious/clear. As seen in Figure 1, search results for everyday staple items were viewed very positively (being useful). Open-response feedback received supports this notion. On the other hand, search results for niche or specialized items were viewed more negatively with 14 negative responses versus 9 positive responses. Open-response feedback supported this notion. Additionally, as seen in Figure 2, recommended search results were viewed positively, with previous search terms (and by extension learned predictive text) being viewed overwhelmingly favorably. This highlights that the search function, search recommendations and search results generally work well and quickly, especially for everyday staples. This is likely owing to good design taking place, and incorporating the feature to allow English search terms. However, search results for specialized or niche items tended to be viewed more negatively. An explanation for this could be that the in-built English translation is inaccurate for more complex searches, either poorly translating the English to Korean with Natural Language Processing (i.e., it still exists in Korean) or rare/obscure search terms are not well recognized in the search function itself (i.e., it doesn't recognize the search terms at all). The suggestion for using images

to clarify an English search term was a very novel solution to the language barrier. Often search results feature at least some Korean text, and thus English speakers likely rely on pictures to check that search results are consistent with their expectations.

2.3 Bias

Reflecting on the online survey, the primary sources of bias in the online survey are: sampling bias, and making generalizations about the items users search for.

As previously mentioned, convenience and snowball sampling of colleagues, friends and family attracted an overwhelming number of younger adult respondents. My colleagues, friends and partner (my family) all fall into the age groups of 21-38, so this was no surprise. This is likely representative of the English-speaking community in South Korea, representing young people from other countries, young foreign-born Koreans, and the younger generation of South Koreans who are more likely to speak English. However, with a longer survey period and more recruitment avenues, it may be possible to include more of the older age brackets. I can think of circulating the online survey at universities, online forums and Christian churches. Of course, I would not expect a 61% response rate to such a survey without effort, and so it would ideal to use principles from Dillman et. al.'s (2014) Total Design Survey Method to follow-up non-respondents to achieve high response rates.

Assumptions were also made that users only search for items that fall into two categories: 'staples/everyday items' and 'specialized or niche items'. Naturally, it is open to interpretation and this affects survey results. Perhaps my thinking is also flawed in some way to assume only two categories.

Preliminary surveys and interviews were held with two colleagues to assess the quality of preliminary questions. Ensuring the questionnaire was no longer than needed and contained quality questions assisted in reducing question order, satisficing and speeder bias. Observer bias was mitigated by avoiding leading questions and group questions by logical topics (i.e., there was a clear flow to the questions). Duplicate response bias was also prevented by not allowing duplicate email responses in Google forms.

Voluntary response bias was reasonably managed, however the survey questionnaire utilized bi-polar scale questions when assessing sentiment. I believe this is

fair sine I am not sure how else you are meant to ask for someone's opinion. Even just thinking about the normal distribution, some response will naturally be extreme opinions. I used the HCI quarter-course survey and Google Form course survey template as a guide regarding sentiment questions, so I believe I controlled this type of bias by wording the questions in-line with best practice.

3 NEEDFINDING EXECUTION 2: INTERVIEWS

Three interviews were undertaken using convenience sampling (colleagues were asked and invited to participate) during 06/06/2022 Monday to 17/06/2022 Friday. A list of the 22 interview questions and results can be viewed in *Appendix 9.5: Needfinding 2 Interview*. Overall, questions were structured to form strong links with the Data Inventory. There is a reasonable amount of overlap with the online survey questionnaire, but the interview format was intended to allow more free discussion and open expression to answer questions, rather than the constrained format of the online survey.

3.1 Summary

Results were fairly consistent with the online survey results. Which was expected due to the overlap in questions. However, the benefit was that interviewees were free to talk and discuss their answers, not being constrained by the online survey format.

Interviewees were on the younger-side of adult ages, aging from 26-32 and single. Two of the interviewees can read and write novice Korean and can use these language skills to interpret search recommendations and decipher search results that are not in English. Using Korean requires more cognitive effort, and so it is likely more difficult to interpret niche search results in the presence of more background distractions or other tasks competing for cognitive resources. However, owing to their level of experience with their device and usage of the app for more than 3 months, they all believed the search function generally required minimal effort to use.

Interestingly, two situations where the Coupang was used in reaction to other tasks included: when performing household chores and identifying low or lack of cleaning supplies, food or other staples; and comparing the prices of items in-

store to those available online. This demonstrates that the use of the Coupang search function can be a subtask to other tasks and larger goals, rather than a single distinct purchasing decision.

There was some insight into what types of items are considered niche or specialized: such as shoes, furniture, bedding, vitamins, and interestingly fresh food. Fresh food delivery requires a premium delivery service with cooling and an insulated bag that is left at your door.

Goals, tasks and subtasks were explained thoroughly when the thought process was investigated for each interviewee. It can be summarized as: Thought process is generalized as: 1. Need X item, this can be from memory or triggered by another action/observation; 2. Open app or browser and type web address; 3. Click search bar; 4. Search using English, sometimes using predictive text or recommended search terms; 5. Look at results, are they accurate?; 6. Compare prices of first 5-10 items; 7. Assess quality of first 5-10 items; 8. Compare price vs quality trade-off. 9. Decision to purchase a particular item.

3.2 Bias

Much like the online survey, the interviews suffer from sampling bias as result of convenience sampling. The demographics are fairly constrained, but again this could be representative of the English-speaking community in Korea. Of note, there were no foreign-born Koreans or Korean nationals who can speak English interviewed, they were all Western English-speaking foreigners. With a greater timeframe, it would be ideal to have a greater size of interviewees and more variably in the demographics, especially in age.

Interview questions were previewed and reviewed with a colleague prior to commencing surveys. This helped to minimize leading questions within the questionnaire and helped the interviewer (me) to practice not leading the interviewees with probing questions. Probing questions were still required to get valuable qualitative information, but I had to be careful to not lead the interviewees with my own perspective. Reflecting on this, I believe it may be better for non-designers to undertake interviews since they are more likely to be impartial to design or interface usage. Use of probing questions aided the interviewees with any recall bias, jogging their memory of any events.

4 NEEDFINDING EXECUTION 3: PARTICIPANT OBSERVATION

4.1 Summary

Participant observation was undertaken on two participants. Participant Observation consisted of timing: the duration of time from lock screen to the app opening; the searches of 18 everyday staple items; and 10 specialized/niche items. Participants were asked to announce when they believed they had found the item they were told to search for. Notes were taken regarding any work arounds used and any mistakes or difficulties encountered. The list of items, timings results and notes can be viewed in *Appendix 9.6 Needfinding 3: Participant Observation*.

Participant #1 was recorded as taking 10.7 seconds to open the Coupang app from the lock screen on iOS. Participant #2 was recorded as taking 4.5 seconds to open the Coupang app from the lock screen on Android. Participant #1 took a long time to open the app and navigate to the search bar due to advertising and pop-ups preventing entry to the landing page of the app. On average, participant #1 found staple items in 7.59 seconds and niche items in 8.48 seconds, and participant #2 found staple items in 5.71 seconds and niche items in 6.66 seconds. Ignoring statistical sampling significance and natural variability, it appears that participant #1's reaction times and smartphone action times are quicker than participant #2's. It was also observed that participant #1 took longer to clarify whether they had found the item or not. It appeared they spent time checking product pictures thoroughly, clicking and zooming in on product pictures to evaluate the search results.

Edosomwan & Edosomwan (2010, pp. 3) reported off-peak search response times on Google and Bing with a mean of 2 seconds and 3 seconds and a standard deviation of 1 second for both. So, considering that is possible to not only perform a search, but also look at search recommendations and evaluate search results on Coupang within 5.71-7.59 seconds for everyday staples and 6.66 to 8.48 seconds for niche items (a minimum search time was recorded at 1.5 seconds), demonstrates that the search function works quickly and efficiently.

Interestingly, despite differences in overall search times between both participants, the difference in search times between staple and niche items was consistent between both participants at approximately 0.9-1 seconds. Of particular note, it was observed that predictive text was very useful when searching for the

niche items and some food items. For both participants, they often only had to type the first third of half of the name before being recommended the item's full name.

Interestingly, a shortcoming of English search terms was highlighted when both participants searched for 'bottled water' and were suggested 'water bottles', increasing their search time. Another instance was when both searched for 'dry pasta', participant #1's search for 'dry pasta' and got results for hairdryers, and participant #2's erroneous search for 'dry patta' came up with eye cream. Another instance was when both participants searched for 'hoya' the species of indoor plant, and the search result was, in both times, Hoya camera filters.

Reflecting on the observations, it appeared that everyday staple items were evaluated primarily on the pictures shown and not the text. There was also greater variability when searching for generic products.

4.2 Bias

Observer bias was minimized by clearly outlined the steps taken during the participant observation. The tasks to be undertaken within the participant observation were fairly objective and there was minimal discussion with participants to lead them to perform a certain way and subconsciously influence them.

Confirmation bias on the researcher/observer side was minimized by recording all the actions that participants take in the moment, regardless of how minor they are to the overall task goal. This helped reduce the influence of any preconceived notions of the researcher.

Reflecting on participant observation, and although measures were taken to reduce observer bias, I believe that participants behaved somewhat unnaturally and 'raced' to find particular products as quickly as possible. This highlights the difference of performing tasks in lab setting versus in a natural setting. When participants are directed to do something by someone observing them, I believe there may be an inherent desire to 'do well' at that task. If I consider a situation where I search an item I found in a store and attempt to price compare, I don't think this would be a less than 10 second action. I would anticipate this kind of task would take in the realm of 20-90 seconds. Since I already identified that price comparison, and an evaluation of price and quality in the interview needfinding, I believe I framed the task wrong. Perhaps I should have asked the participants

to find each item and then find a version of said item they would be willing to purchase. This would more accurately reflect the full scope of the gulfs of execution and evaluation when searching for an item on an eCommerce platform. However, in saying that, I believe the participant observation was reasonably effective in identifying the overall efficiency of the search function.

5 DATA INVENTORY

Users: Who are the users? What are their ages, genders, levels of expertise?
Refer primarily to Online Survey Summary, and Interview Summary for supporting information. As a result of only performing this survey in English, the users are English-speakers in Korea who primarily rely on their English ability, not being able to take advantage of using Korean in the Coupang app. Ages are primarily 18-44 and excludes older demographics. Levels of expertise are intermediate to advanced based on duration of using the apps, web browsers and particular devices. Gender was not covered. I was very restricted with identifier collection so as to enhance participation. A larger survey could take place with a longer duration which also includes more identifiers such as heritage/race and gender.

Environment: Where are the users? What is the environment?
Refer to both Online Survey Summary and Interview Summary. This is primarily at home, but also takes place at work, while shopping at other locations and while commuting to a lesser, but still significant degree. There were no identifiers to establish if participants had families and thus likely more background distractions. A larger survey could take place with a longer duration to cover this.

Context: What is the context of the task? What else is competing for users' attention?
Refer to both Online Survey Summary and Interview Summary. At home, home chores or family could be a source of divided attention. While shopping at another location, having other items in mind is another source of divided attention. While commuting, paying attention to one's surrounding and not missing their stop or boarding the correct bus/train is a source of divided attention. Within the app itself, some survey respondents highlighted that banner advertising and pop-ups are distracting and this results in divided attention.

Goals: What are their goals? What are they trying to accomplish? Refer to the Interview Summary. To buy an item, or to compare prices of an item.

Needs: Right now, what do they need? What are the physical objects? What information do they need? What collaborators do they need? Refer to the Interview Summary. Users require: the Coupang app or a web browser; internet connection; and smartphone device, tablet or computer with power; a goal item in mind; and money for the purchase of the item in mind. I asked no questions regarding collaborators, and so in the future, I could expand questions to cover who else is involved in making this part of the interface work as intended i.e. get the participants to attempt to identify the collaborators themselves. This would be very dependent on their level of expertise.

Tasks and Subtasks: What are their tasks? What are they doing physically, cognitively, socially? What are the subtasks? How do they accomplish those tasks? As outlined in the Interview Results and Summary.

1. Need [insert item], triggered by memory or another action/observation.
2. Open app or browser and type web address.
3. Click search bar.
4. Search using English. Sometimes using predictive text or recommended search terms.
5. Look at results.
6. Compare prices of first 5-10 items.
7. Assess quality of first 5-10 items.
8. Compare price vs quality trade-off.
9. Decide on particular item.

As mentioned in Participant Observation, users are using their visual senses for input/out and touch input (clicking virtual buttons or typing) in order to utilize the app's search function. Furthermore, they solely use visual feedback to evaluate their actions, using a combination of textual language and pictures.

As identified in the Interview Results and Summary, using Coupang can be a subtask of cleaning the home and undertaking other home chores, or as part of a bigger task of shopping. For example, when performing grocery shopping, the

Coupang search function may be used to check or compare prices or availability of alternative products.

6 DEFINING REQUIREMENTS

Improved English support – better accessibility for those reliant solely on the use of English. Ideally, in the form of a fully English version of the app. Meeting in the middle, search results featuring more English for evaluation. At the bare minimum, improving search term accuracy when using English.

Enhance usability – despite the application and the search function requiring minimal cognitive effort to use (according to the needfinding), there are several sources of distractions within the app itself. There are many promotions, sales and pushing old-stock that are advertised as banner advertising and pop-ups, as evident from the survey results and participant observation. Investigating, less invasive and distracting alternatives of promotion would be ideal.

I believe functionality and learnability are fairly well performing at present. If better English support is offered, the learnability aspects will be taken care of. The core features of the application appear to perform well, it is simply the periphery features that require improvements.

7 CONTINUED NEEDFINDING

As previously discussed, I believe this round of needfinding suffered primarily from oversampling one age demographic: 25-34 years old. Is this representative of the English-speaking community in South Korea? Quite possibly, but I do not have the census data from a Korean government body to confirm this. Without this information, I would recommend undertaking more comprehensively-distributed surveys and interviews to better delineate the user base and understand the full scope of their concerns, needs and wants. In relation to the survey, I would ideally utilize principles from Dillman et. al.'s (2014) Total Design Survey Method to achieve a high survey response rates. Ideas for circulating advertising for such a survey could be universities, Christian churches, and online English forums. I could collect emails or phone numbers and invite any interested respondents to perform interviews.

In terms of additional questions to be covered, I need to pay more attention to demographic information to delineate the user base. Questions would include identifying information relating to: gender, ethnicity/racial heritage/or

equivalent, familial status and number of dependents. This would help to better understand who the user base is, but also to explain the context of their homes and what else is competing for their attention in this setting. If most users are using the Coupang search function at home, I need to obtain more insight on their home situations.

Finally, it would be beneficial to restructure my approach and method to participant observation. I need to instruct participants to announce when they have found product they would be satisfied with purchasing, rather than when they confirm they have identified a product that matches the description. This approach was too detached from the overall goal and tasks associated with using the Coupang search function.

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9 APPENDICES

9.1 Appendix: Extended Abstract

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.

9.2 Appendix: 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, 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 X) 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 3 — Coupang App Interface, Search Bar shown (Byun, 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.

9.3 Appendix 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.

9.4 Appendix: Needfinding 1 Online Survey

9.4.1 *Online Survey Questionnaire*

A copy of the survey is viewable at: https://forms.gle/jkw8aErwKoy2z3pM8. Online Survey was administered through Google Forms.

Coupang search function - User Survey

The survey cutoff date is Saturday night 06/12/2022, 6pm)

This is a survey to gather user feedback on the Coupang search function, which is within the Coupang app/website. The survey is for English speakers, so it is expected that results are more skewed towards to representing the expat community.

Questions relate to: when/where you use the Coupang search function, and your overall satisfaction with the Coupang search function.

This survey is specifically about the search function and the search results, and not other parts, functions or features of Coupang (e.g. sales discounts promotions, advertising or payment).

(!) There is no collection of personal or identifying information other than age. Age is collected only as an indicator of: proficiency with the use of electronics, and that you are an adult with some reason to use an eCommerce platform. The age brackets are for the sake of showing that perhaps the English-speaking community tends to be on the younger side of adulthood, rather than middle-aged or near/of retirement age.
(!) An email is required, but it is not recorded. *Seems to be a limitation of Google Forms*
(!) This is for an individual University assignment and survey results will not be used for any commercial purposes.

Section 1. Understanding When and Where you use the Coupang search function

Picture of app and the Search Function

1. What is your age group? *

- ◯ 17 or less, years old
- ◯ 18 to 24 years old
- ◯ 25 to 34 years old
- ◯ 35 to 44 years old
- ◯ 45 to 54 years old
- ◯ 55 to 64 years old
- ◯ 65 or more, years old
- ◯ Prefer not to say, but an Adult

2. On what platform do you usually use the Coupang search function? *

- ◯ Android App (from Google Play Store)
- ◯ Apple iOS App (from iPhone App Store)
- ◯ Website Browser (e.g. via Google Chrome, Apple Safari, Microsoft Edge)
- ◯ Other: _____

3. How long have you been using Coupang / the Coupang search function? *

- ◯ Less than 1 month
- ◯ 1-3 months
- ◯ 4-6 months
- ◯ 6-12 months
- ◯ More than 1 year (12 months)

4. On average, how often do you use the Coupang search function? Pick the closest choice. *

- ◯ Less than once per month
- ◯ Once per month
- ◯ Once every two weeks
- ◯ Once per week
- ◯ Several times per week
- ◯ Once per day
- ◯ More than once per day

5. In what locations/situations do you use the Coupang search function? Tick all that apply. *

- ☐ At home
- ☐ At work (presumably, on a break)
- ☐ At a café/restaurant/bar
- ☐ At a park
- ☐ While walking
- ☐ While driving
- ☐ While commuting on public transport (bus, train, etc.)
- ☐ While shopping (e.g. to search for/purchase items you cannot find in-person)
- ☐ Other: _____

6. On average, when you use the Coupang search function, how much background distraction, if any, is occurring? *

- ○ None
- ○ Very Low
- ○ Low
- ○ Moderate
- ○ High
- ○ Very High

Section 2. Understanding your overall satisfaction with the Coupang search function

7. Opinion of Performance and Usability of the Coupang search function *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The search function is easy to find	○	○	○	○	○
The search function is easy to use	○	○	○	○	○
It is obvious when a search has been performed	○	○	○	○	○
The search function responds quickly	○	○	○	○	○

8. Opinion of Search Results *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
For staple items, search results are useful	○	○	○	○	○
For specialized or niche items, search results are useful	○	○	○	○	○

9. Opinion of Automated Search Recommendations *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Previous search history terms are useful	○	○	○	○	○
Recommended Rocket Fresh Groceries (green recommendations) are useful	○	○	○	○	○
Other recommended search terms are useful	○	○	○	○	○

10. Overall, how satisfied or dissatisfied are you with the Coupang search function? *

- ◯ Very satisfied
- ◯ Satisfied
- ◯ Neutral
- ◯ Dissatisfied
- ◯ Very dissatisfied

11. Have you used any other eCommerce platforms? Tick all that apply *

- ☐ Amazon
- ☐ eBay
- ☐ G Market
- ☐ Naver
- ☐ Market Kurly
- ☐ eMart
- ☐ Home Plus
- ☐ 11 Street
- ☐ Auction.
- ☐ TMON
- ☐ JD.com
- ☐ Taobao (Alibaba)
- ☐ Meituan
- ☐ Carrot Market
- ☐ Facebook Marketplace
- ☐ Other: _____

12. On a scale of 1-7, how would you rate the quality of the Coupang search function, compared to those on other eCommerce platforms? *

- ◯ 1. Not Nearly as Good as other eCommerce platforms.
- ◯ 2. Not as Good as other eCommerce platforms.
- ◯ 3. Not Quite as Good as other eCommerce platforms.
- ◯ 4. About the Same as other eCommerce platforms.
- ◯ 5. A Little Better than other eCommerce platforms.
- ◯ 6. Significantly Better than other eCommerce platforms.
- ◯ 7. Enormously Better that other eCommerce platforms.

13. What, if any, aspects of the Coupang search function do you like -or- do you think work well? (N/A if nothing) *

Your answer

14. What, if any, changes -or- improvements would you like to see made to the Coupang search function? (N/A if nothing) *

Your answer

End of the survey

Thank you so much! I really appreciate it! ~Bradley Wallace

Submit Page 1 of 1 Clear form

9.4.2 *Online Survey Results*

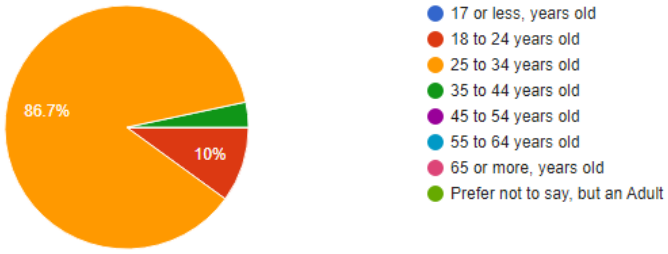
Google Forms 30 Responses were received

Section 1. Understanding When and Where you use the Coupang search function

1. What is your age group?

Copy

30 responses



2. On what platform do you usually use the Coupang search function?

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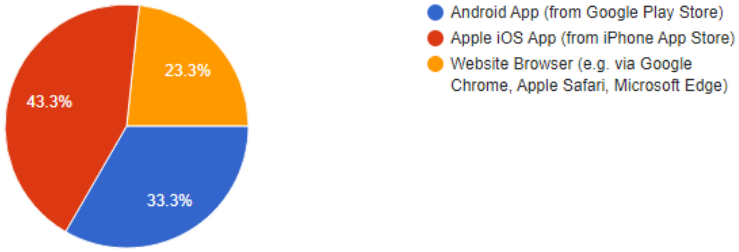
30 responses



3. How long have you been using Coupang / the Coupang search function?

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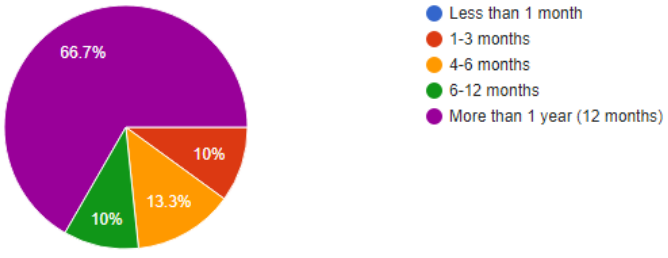
30 responses



4. On average, how often do you use the Coupang search function? Pick the closest choice.

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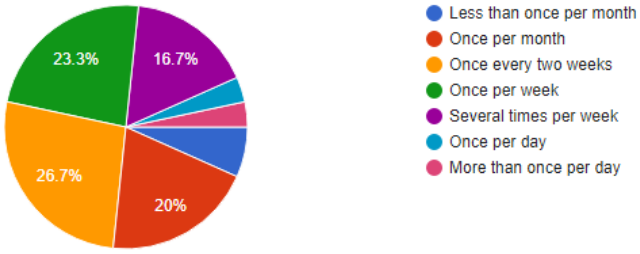
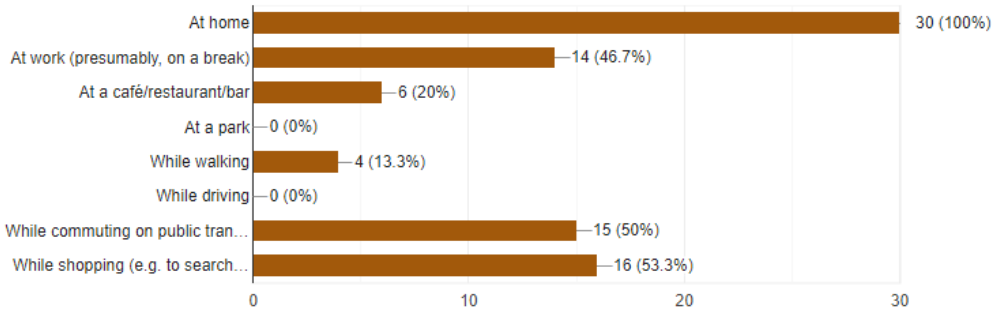
30 responses



5. In what locations/situations do you use the Coupang search function? Tick all that apply.

Copy

30 responses



6. On average, when you use the Coupang search function, how much background distraction, if any, is occurring?

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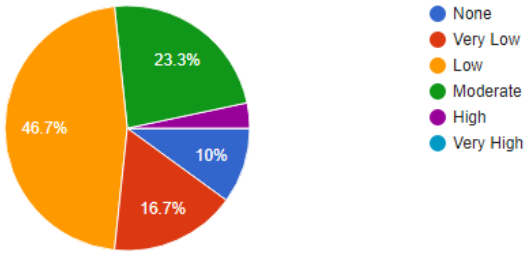
30 responses



Section 2. Understanding your overall satisfaction with the Coupang search function

7. Opinion of Performance and Usability of the Coupang search function

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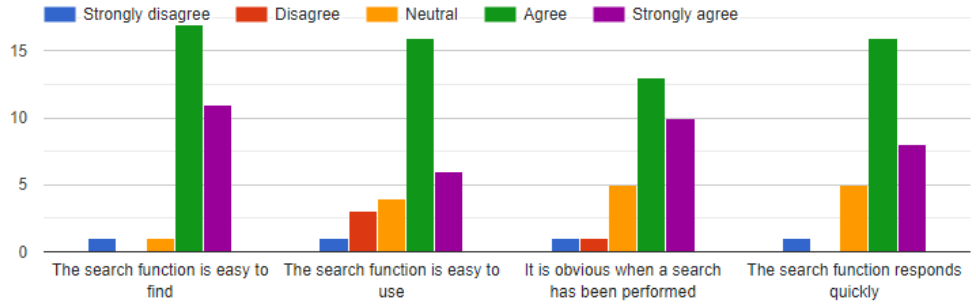

8. Opinion of Search Results

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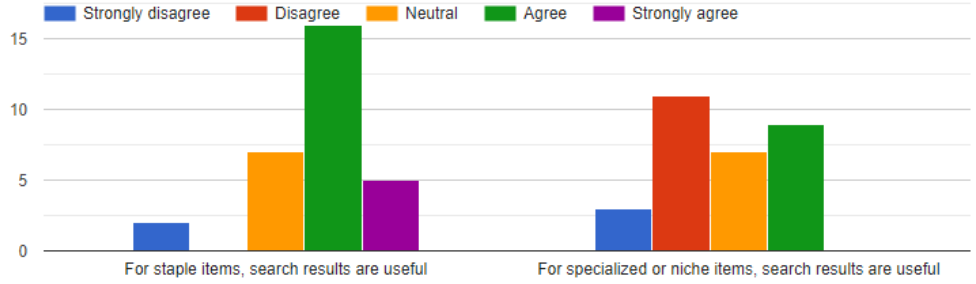

9. Opinion of Automated Search Recommendations

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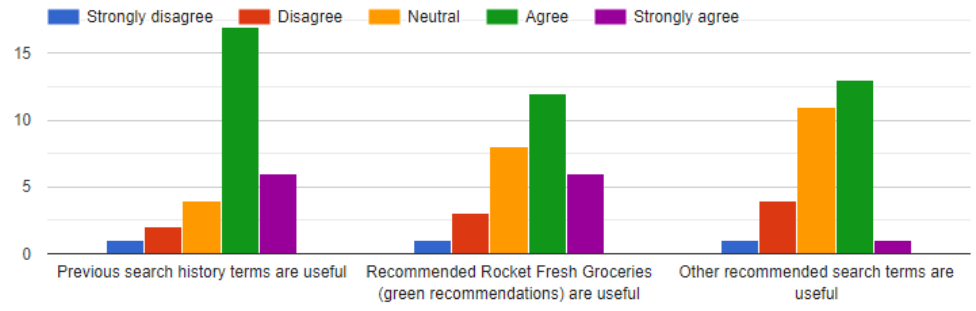

9. Opinion of Automated Search Recommendations

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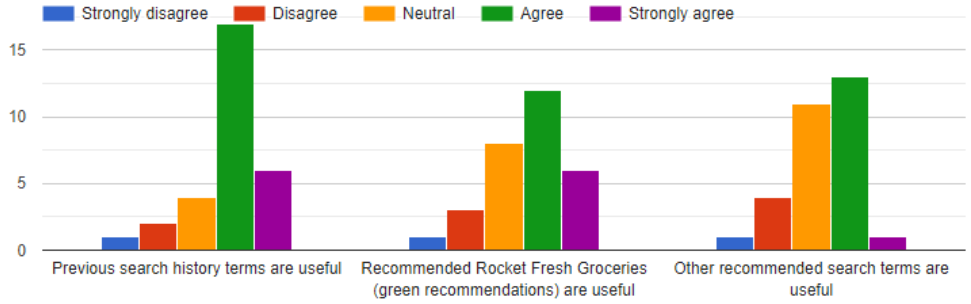

10. Overall, how satisfied or dissatisfied are you with the Coupang search function?

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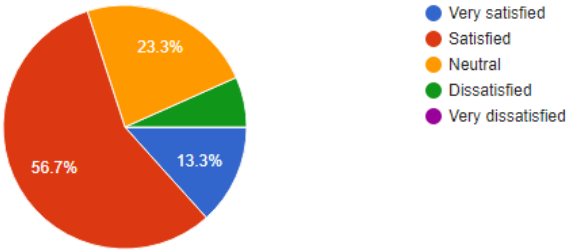
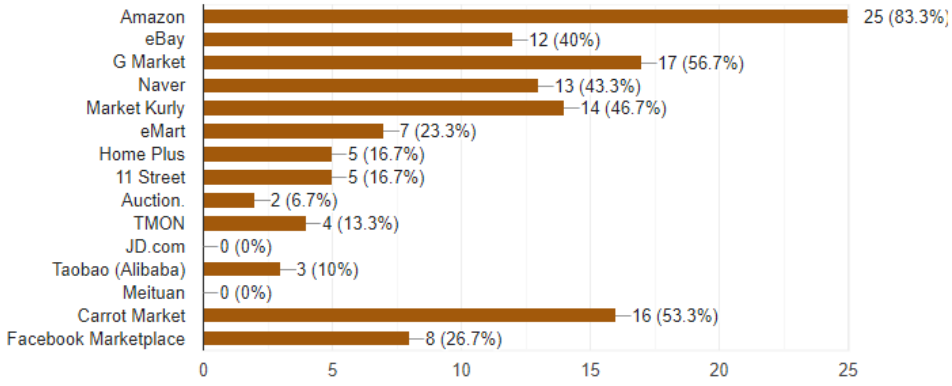
30 responses



11. Have you used any other eCommerce platforms? Tick all that apply

Copy

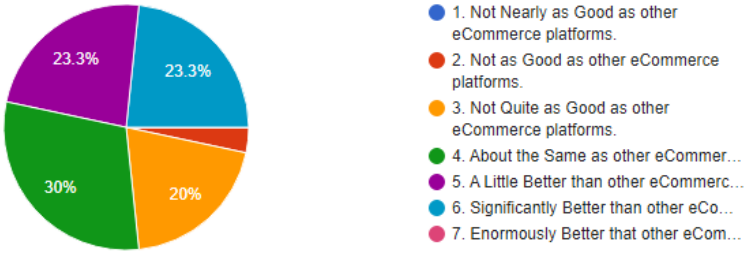
30 responses



12. On a scale of 1-7, how would you rate the quality of the Coupang search function, compared to those on other eCommerce platforms?

Copy

30 responses



13. What, if any, aspects of the Coupang search function do you like -or- do you think work well? (N/A if nothing)	**14. What, if any, changes -or- improvements would you like to see made to the Coupang search function? (N/A if nothing)**
N/A	N/A
N/a	N/a
N/A	If you aren't the rocket member or whatever then hide those results that are only deals for them
Na	Na
General interface of the search and app/website. Also the filter options (though many) are very useful comparative to other platforms.	Not a significant improvement - when searching and gives predictive items, showing that product picture in the predictive search could be useful.
N/A	N/A
-	-
NA	Better foreign language integration
N/A	N/A
N/A	N/A
N/A	N/A
N/A	Search more by key words, for example bed sheets can come up with many unrelated results
N/A	Filtering out products that are no longer in stock, improved English search results or automated translation on site
Translation fucntions	Alt-text added to informational images posted by sellers

Clear ratings from other buyers and clear delivery estimates	all goooood
Na	Be available in English with viable results
Good for common products	Auto translate searches in English into Korean equivalent in order to include better results
N/a	Filter options, for example price range and region of origin
N/A	N/A
I do think the search function works very well for looking English and Korean items.	I think the app is a little too cluttered with vibrant ads and pop-ups. I also think it could be better for searching niche things and items.
N/A	I want search results to be more relevant.
Ui design	N/A
Rocket delivery (arrives the next day)	Better AI recommendations
N	N
Na	Na
N/A	N/A
N/a	Not sure
Even though the app is solely in Korean, it still accepts English search terms with reasonable accuracy.	More English friendly search results. Some results have sufficient English in the name of the product to determine if it is the correct product. However, some results are Koreanized English (Konglish) and this takes time to reconvert these words back into English.
Filters, and the fact that whenever I search for something, it almost always gives me exactly what I'm looking for	Honestly, I'm content with how the search function currently is.
I know the results are skewed for those that they want to sell so I don't like that. Sometimes it's hard to find what I want because it's not rocket anymore	More equality with products even if it's not rocket

9.5 Appendix: Needfinding 2 Interview

9.5.1 *Appendix: Interview Questionnaire*

Who

1. How old are you?
2. What languages can you read/write and listen/speak?
3. How long have you been using the Coupang search function (the 'app')?
4. On what devices (operating systems/platforms) do you use the Coupang search function (iOS, Android, PC and so on)?
5. How long have you been using these devices/operating systems/platforms? How would you describe your technical proficiency?

Where / Context

6. How often do you use the Coupang search function? (For example: daily, several times a week, once a week, once a month, … , once a year)
7. In what situations/contexts are you using the Coupang search function? Is this at night, before/after work, whenever you have time, during breaks… and so on.
8. Relating to the above, in what environments do you use the Coupang search function? Also indicate frequency (For example, mostly at home, usually while commuting, etc.)
9. What is the level of distraction in the background in these environments?
10. Considering the previous questions, how much concentration/cognitive effort is required to use the Coupang search function?

Goals, Needs, Tasks and Subtasks

11. Can you describe the thought process you have when you use the Coupang search function?
12. What goals do you typically have in mind?
13. Thinking back on the task of using the search function. What information and things do you need?
14. You probably identified you required an item, what items do you search for?

Qualitative Thoughts

15. Do you think the Search function (bar) interface and what it displays works well? Does it respond quickly? Does the Search function respond as you would expect a typical search function to behave?
16. How useful are the search results?
17. How useful are the search recommendations?
18. What do you think works well with the Coupang search function?
19. What do you think does not work well with the Coupang search function?
20. Related to the above, what improvements could you make / suggest for the Coupang search function?
21. Thinking about other eCommerce platforms (such as Amazon or eBay or Naver), how do think Coupang's search function compares to its competitors and others in the same space/industry?

9.5.2 *Appendix: Interview Results*

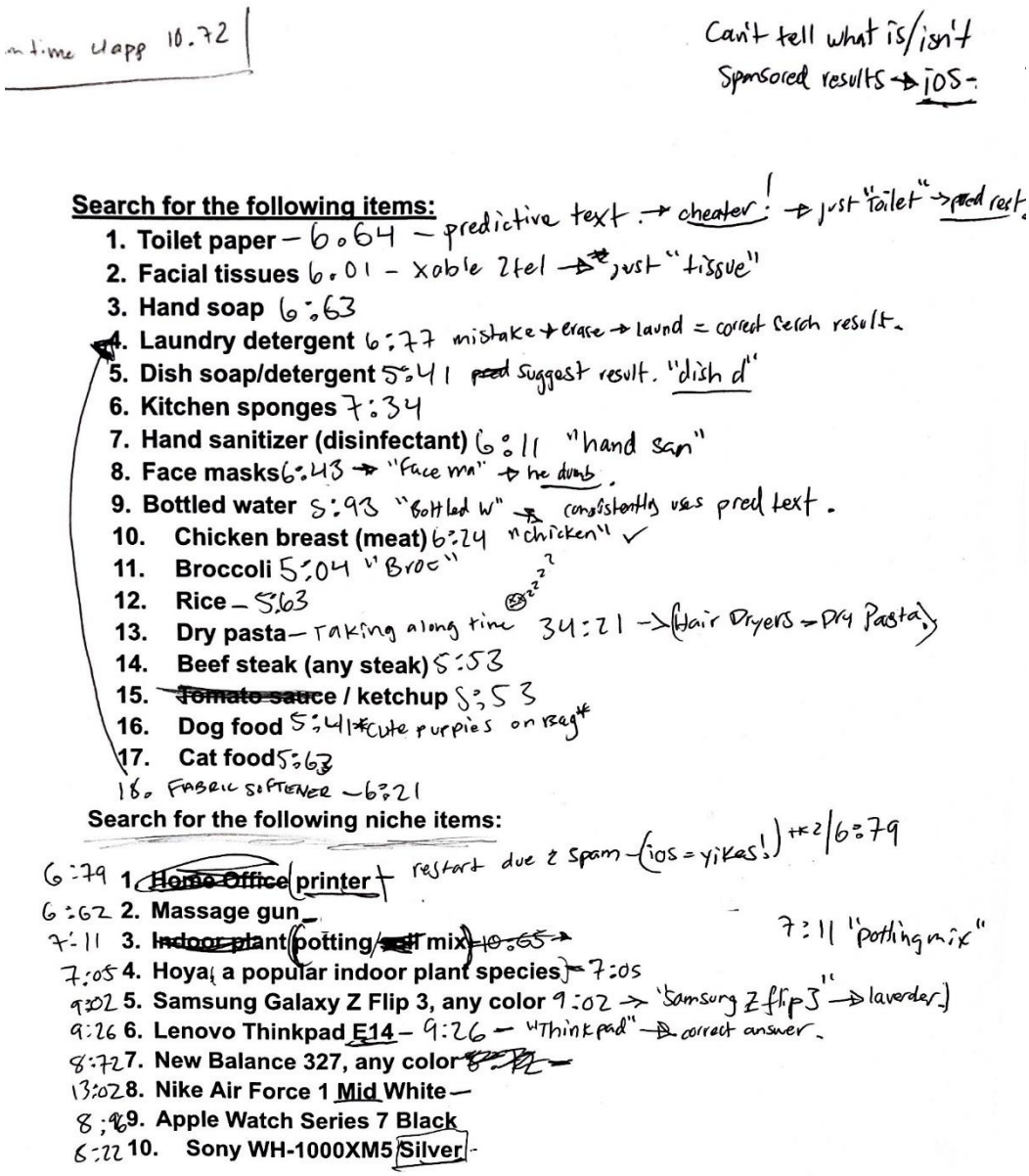
2. Ages of the interviewees were 26, 27 and 32.
3. All interviewees are native English speakers (UK, USA, Australia). Two of the interviewees #2 and #3 can read and write beginner/novice Korean.
4. All users have used the Coupang search function for less than 12 months. 4, 7 and 7 months, respectively.
5. Platforms: Android | Android + browser | Apple iOS
6. Platform usage: Android – 6 years | Android – 8 years, Browsers – 16+ years | Apple iOS – 2 years
7. Frequency: Once a week | Once a week | Several times a week
8. Where: Home, Work breaks | Home, usually reactionary in response to performing chores (e.g. 'I need this') | Home, Work breaks, While Shopping (comparing prices of items)
9. Where * Frequency: Mostly at Home | Mostly at Home | Mostly at Home
10. Background distraction: Single, Music | Single, Music, videos/streams/Youtube in background | Single, Music, videos
11. Cognitive effort: minimal | minimal | typically minimal, some effort if translating Korean
12. Thought process is generalized as:
    1. Need [insert item], triggered by memory or another action/observation.
    2. Open app or browser and type web address.
    3. Click search bar.

4. Search using English. Sometimes using predictive text or recommended search terms.
5. Look at results.
6. Compare prices of first 5-10 items.
7. Assess quality of first 5-10 items.
8. Compare price vs quality trade-off.
9. Decide on particular item.

13. Goals: Buy an item | Buy an item | Buy an item or compare prices to in-store item
14. Needs are generalized as:
    1. The Coupang app or a web browser
    2. Internet connection
    3. Smartphone device, tablet or computer with power
    4. A goal item in mind
    5. Money for the purchase of the item in mind
15. Items searched for: common everyday staples, shoes, bedding | common everyday staples, fresh meat, fresh vegetables, piercings, shoes, furniture, bedding | common everyday staples, fresh meat (sales), computer parts, vitamins, irregular cleaning supplies (broom, etc.)

Question 15-21 are culled. Answers were consistent with Online Survey

9.6 Appendix: Needfinding 3 Participant Observation



Search

find search bar

4.5s to open app + type..

Search for the following items:

typong Eng-

1. **Toilet paper** ~~7.0~~ s
2. **Facial tissues** 4.8 s
3. **Hand soap** 3.7s
4. **Laundry detergent** 1.5 s — previous search history
5. **Dish soap/detergent** 5.2s
6. **Kitchen sponges** 8.8s — error typing.
7. **Hand sanitizer (disinfectant)** 4.8s
8. **Face masks** 6.8s — misclick
9. **Bottled water** 4.5 s — water bottles, 5.7s bottled water
10. **Chicken breast (meat)** 7.8s — ✓
11. **Broccoli** 4.5s —
12. **Rice** 3.4s —
13. **Dry pasta** 15.5s — recommended/ dry pasta ; face cream
14. **Beef steak (any steak)** 4.0s — swipe typing, errors for dairy,
15. **~~Tomato sauce~~ / ketchup** 4.4s —
16. **Dog food** 4.6s —
17. **Cat food** 6.4s —
18. Fabric softener 5.1s

Search for the following niche items:

1. **Home Office printer** — 4.5s (just printer) + found home office printer
2. **Massage gun** — 4.6 s
3. **Indoor plant potting/soil mix** — 6.3s potting soil
4. **Hoya,(a popular indoor plant species)** — ~~10.4~~ s (Hoya -> bonus fillers) Hoya plant - success
5. **Samsung Galaxy "Z Flip 3", any color** — 4.8s
6. **Lenovo Thinkpad E14** — 9.11 s (all in Korean) none text reading.
7. **New Balance 327, any color** — 7.2s (mistype => correct thing (new balance 327)
8. **Nike Air Force 1 Mid White** — 6.1s (airforce 1 mid) knew all white was most popular
9. **Apple Watch Series 7 Black** — 5.9s
10. **Sony WH-1000XM5 Silver** — 7.7s

Apple watch ~~S~~ 7.
→ 2nd result.

predicted.
WH-1000XM~~4~~
WH-1000XM5

2012 - swipe typing
Galaxy
10 years on/off

~ comparing prices.