

Assignment M2

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Abstract—The objective of the project is to redesign the task of **navigating the search results on the Amazon website**. The product search is one of the most widely performed activities on the Amazon website, however, the efficient navigation of search results is as important as the accuracy of search results for a user. Despite using advanced NLP and AI algorithms for search, Amazon returns hundreds or thousands of results for each search due to the sheer volume of the products. The desired product does not always come on top of search results and needs separate tasks of navigation through the returned results. This project would attempt to redesign the search result interface to improve the search result navigation efficiency. The project would limit its scope only to the search result navigation on the Amazon website and not in the Amazon Mobile Application.

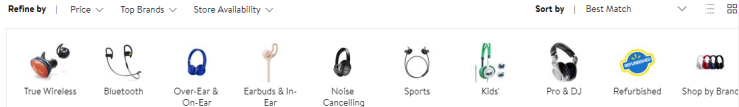
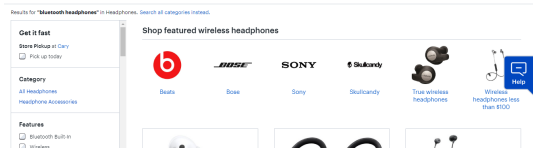
1 NEEDFINDING EXECUTION 1 - EVALUATION OF EXISTING INTERFACES

I executed the first needfinding exercise of the Evaluation of existing interfaces on different E-commerce websites(Walmart and Bestbuy), on their post search navigation interfaces.

I took an example task of finding a quality Bluetooth headphone in the price range of \$100 to \$200 and from a reputed brand and an over-ear type. However, the Search Phrase is limited to "Bluetooth Headphones", since the idea is to focus on the post-search filters and navigation.

The task is carried out by searching with a search phrase and trying to navigate the search results and recording the observations. The Information observed from the experiment is recorded in the below table as raw notes. The data are grouped for each of the e-commerce websites observed.

1.1 Raw Notes

Interface	Notes
Walmart	 <ul style="list-style-type: none"> Walmart lists important filters like Price, Brand, and Store availability at the top. The sort option is also available on the top left. Apart from these filters, the type of headphones filter is given with the pictorial representation as shown in the image. After applying the price filter, brand filter, and selecting the headphone type the search results narrow down to 20 to 25 results which is reasonable to browse and analyze. However the additional filters are listed in the left pane which is very cluttered. Also, the price and band filter is available on both top and left which is repetitive and confusing.
Bestbuy	 <ul style="list-style-type: none"> Best buy interface displays selected filters with pictures on top of the page and all other filters are listed in the left pane. The filters on the top page are almost useless for the task of filtering reputed brands as there is no multi-select option. Both Price and Brand filters had to be applied from the left pane. The filters in the left pane are too long and difficult to search. The sort option is available in the top left of the page and some of the options like 'Brand A -Z' and 'Brand Z - A' are not practically helpful.

1.2 Summary

From evaluating the existing interfaces with the sample use case, the main take away is that the long list of filters in the left pane of the search page is very difficult to navigate and very much cluttered. The basic and important filter and sort options on top of the page are quite intuitive and useful.

1.3 Bias

One of the important Bias anticipated in the Evaluation of existing interfaces is Confirmation Bias. The existing interfaces would be evaluated with my preconceived opinions about the interface that is going to be redesigned, which is the amazon post-search interface. So I tried to take the ideas and opinions while evaluating these interfaces, assuming myself to be the novice user.

2 NEEDFINDING EXECUTION 2 - SURVEYS

The second needfinding approach executed was the survey. A survey is created in a peer survey to get the user opinion about the post-search user interface.

<http://peersurvey.cc.gatech.edu/gt/899c93604d8b4483bdb4caae4b168309>

<http://peersurvey.cc.gatech.edu/s/899c93604d8b4483bdb4caae4b168309>

The survey was designed to get the response on the frequency of e-commerce search functionalities used, typical filters used, the typical sort used, the purpose of the search, search phrase, and missing functionalities.

The survey got 27 responses and below are the raw results from the survey.

2.1 Survey Results

The detailed survey results are given in the Appendix. Some significant results are given in this section.

- 21 out of 27 users use e-commerce search functionality one to 5 times a day
- Only 2 out of 27 users always get the product they are looking for at the top of the search.
- Brand and Price are the most used filters followed by Rating, Free Shipping, and Size.
- Ratings are the most widely used sorting criteria.
- 10 out of 27 users don't find the filter criteria they look for.
- Mostly the search phrase contains 3 to 5 words. Brand and Size are mostly used in the search phrase.
- 17 out of 27 users use less than or equal to 2 filters on top of the search results to navigate to the desired product
- One of the important suggestion is to include many results in the single page instead of pagination.

2.2 Summary

Most users use very few filters and Price and Brand are the most used filters. All other filters are rarely used but are difficult to find in the interface. Users prefer narrowed down results rather than navigating through multiple pages. Most of the users are ready to use long search phrases to narrow down the search.

2.3 Bias

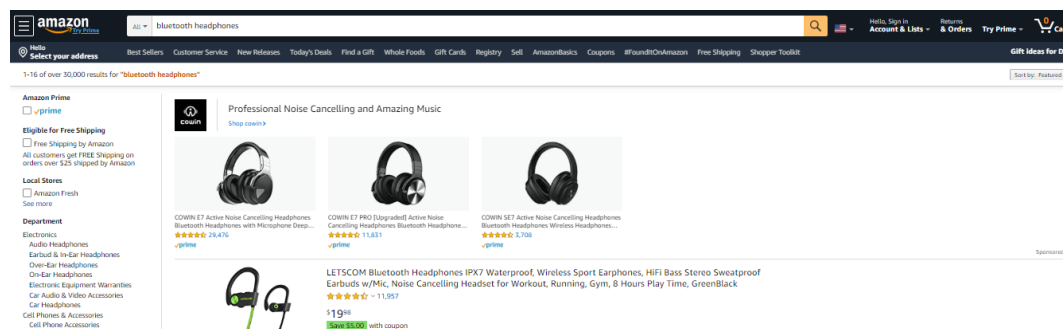
The anticipated risk of Observer bias is avoided by self-validating my opinions and making sure the survey questions were not biased. Also, I got my survey questions reviewed by a family member to make sure there is no observer bias. The exercise might also have participation bias due to the same age group of people who responded to the survey. Hence the result needs to be analyzed in combination with other needfinding exercises.

3 NEEDFINDING EXERCISE 3 - PARTICIPANT OBSERVATION

The third needfinding exercise of Participant Observation is carried out by observing the interface for different search phrases in the interface and observing the behavior of the observation. I used the same phrase of "Bluetooth Headphones" and observed the behavior in the Amazon Product Search interface.

3.1 Raw Observations

The task of the exercise is again to find the over-the-ear headphones in the price range of \$100 to \$200 and from the reputed brands. The phrase "Bluetooth headphones" is searched and below is the image of the search result interface.



All the filters are available in the left pane of the page. The price and brand filter is not at the top of the Pane. The brand filter could be found after scrolling down a bit however the price or price range filter could not be found, which is very surprising. The only option is then to sort the results by price range. However sorting by neither from 'Low to High' nor 'High to Low' brings \$100 to \$200 headphones to the top, making us navigate multiple pages. The long list of departments and categories is mostly irrelevant for the search term.

3.2 Summary

The main observation is that there is no priority in the filter type and all the by department and category filter which is mostly irrelevant. One of the important filters of price/price range is missing in the filter list. It is quite difficult to search for the desired filter type in the filter pane. The price sort is not much use without the price range filter.

3.3 Bias

The most anticipated bias from the participant observation is confirmation bias. The search phrase used is something I have not used personally which kept my previous opinions about the shortcomings of the interface out of the exercise. Also choosing the random product helped in avoiding the observer bias as well.

4 DATA INVENTORY

4.1 Who are the users?

The data about who the users would be is not well collected in the survey which would be corrected in the next iteration. The challenge was that the participants in the survey were all from almost the same age range since most of the people are from class. In the next iteration, the focus would be to collect the responses from outside as well. However, on a high level, all the E-commerce users would be the potential users. From the survey, most of the users use e-commerce websites 1 to 5 times a week.

4.2 Where are the users?

The project focuses only on the desktop version of the Amazon post search navigation and hence it would be used mostly from the desktop device. However, users can use it from both the home settings as well as the office setting. I tried

both these options as part of the participatory observation exercise.

4.3 What is the context of the task?

Since the task is executed from the desktop the cognitive load of the user is mostly available for the task as there are fewer distractions. However, when the user searches for the product in between other tasks in either work or home settings, the time that can be spent on the activity can be limited. This affects the ability of the user to go through all the options like different filter categories in detail.

4.4 What are their goals?

The goal of the user is either to find the exact product they are looking for or get a narrow list of products to pick products of their choice. From the survey, almost 45% of the users(12 out of 27) use it for both these purposes, and the remaining 55% of the people are equally divided between these two purposes(8 and 7 out of remaining 15) and hence both the tasks are equally important.

4.5 What do they need?

To carry out the goal, the user needs the desktop computer for searching and the search phrase related to their desired product. Based on the relevance of the search term used the user would be applying the filter and sorting trying to navigate to the desired product.

4.6 What are their tasks?

The user's task involves searching and finding the product they desire to purchase. The user has to come up with the relevant search term and perform multiple sub-tasks on top of the search results to find out the product. To navigate to the product faster, the user should be aware of the properties or features of the product to apply the right filters.

4.7 What are their subtasks?

The subtasks in the activity include opening an E-commerce website, search for the product in the search bar, find out and apply multiple filters on the search results until they find out the product of their choice, apply to sort of results if needed. Most of these subtasks might need to be done iteratively if the user is not completely aware of the features of the product they are looking for.

5 REQUIREMENTS

The important requirements for redesigning the interface based on the needfinding exercises are as follows.

- The user should be able to apply the filters and/or sort the search results to navigate to the desired product.
- The most widely used filters like Brand, Price, and Size must be easily available for the user. Also, basic sorting criteria should be available for the user and should be prominent.
- The prominent filters and sort options should focus on the novice user as they look for basic filters and sort options. The detailed filters and drill-downs should be given for the expert users who need not be prominent but should be clutter less.
- The filters need to be intuitive and with less number of options. For example, Category filter with hundreds of categories and subcategories should be avoided and redesigned to improve the usability

The quantitative metrics like the number of actions/clicks required to find the product and qualitative metrics like the ease of use would be used as performance metrics to evaluate the interface.

6 CONTINUING NEEDFINDING

Based on the learning from the three needfinding exercises carried out, the next iteration of needfinding would be planned to have a much detailed survey focusing on the user type, environment, context, and preferences of the user.

These results would help carry out the multidimensional analysis of results such as user preferences as per the environment or user preferences as per the demographics of the user. These data would be helpful to fill in the shortcomings of the first iteration of the need-finding which was more generic.

Two out of three initial needfinding exercises (Participant observation and Evaluation of existing Interfaces) were based on the observer's input and hence the next iteration would only be a survey with a focus to include many diverse users. This would help in bringing in the preference of different user groups into the requirement.

7 APPENDIX

7.1 Raw Survey Results

- Question: How often do you use search functionality in E-commerce websites in a day ? 1 to 5,6 to 10,More than 10 21,4,2
- Question: How often the product you search come as a top product in search ? Always,Never,Sometimes 2,1,24
- Question: What would be your purpose of search ? Both,Finding the exact Product,Finding the list of Product to choose from 12,8,7
- Question: What are the typical filter criteria you apply on top of the search results ? Brand;Price; Free Shipping,Category,Category; Brand,Category; Brand;Price; Rating,Category;Brand; Price;Rating;Free Shipping,Category; Price,Category; Price;Rating,Category; Size; Brand,Category;Size;Brand;Price;Rating,Category; Size;Brand; Price;Rating;Free Shipping,Category;Size;Rating,Category; Size;Rating;Others,Price; Free Shipping,Price; Rating,Price; Rating; Free Shipping,Rating,Size; Brand,Size; Price;Free Shipping 1,1,1,1,1,1,3,1,1,1,3,4,3,1,1,1
- Question: What are the typical sort criteria use use on top of the search results? Average Ratings,No. of Ratings,No. of Ratings;Average Ratings,Price,Price;Average Ratings,Price;No. of Ratings,Price;No. of Ratings;Average Ratings,Relevance,Relevance;Average Ratings,Relevance;No. of Ratings;Average Ratings,Relevance;Price,Relevance;Price;Average Ratings,Relevance;Price;No. of Ratings;Average Ratings 1,1,1,2,2,4,2,4,3,1,1,2,3
- Question: Do you always find the filter criteria you are looking for ? ,No,Yes 1,10,16
- Question: What are some of the filter criteria you usually look for but missing in most of the sites ? ,Ability to filter on sub-categories,Availability,Available in local store for pickup,Brand,Category,Color, shipping time,Delivery date,Ethically sourced,I typically on use rating. This is kind of a "you don't know what you don't know" question ,N/a,NA,NA almost there,Price doesn't always work. Sometimes unrelated items show up at the lowest price so it's not even worth sorting from low to high,Relevance,Similar items,Sub-categories of products,Survey results,They are all there,Would be nice to filter by price on Amazon. Either they don't support that or I'm missing it,country of origin,default search criteria for all searches ,none,nothing that I can think of,ratings 1,1,1,1,1,1,1,1,1,1,2,1,1,1,1,1,1,1,1,1,1,2,1,1
- Question: How long your product search phrase will be ? ,1 to 2 Word,3 to 5 Word,More than 5 Words 2,7,17,1

- Question: What are the typical properties you use in search phrase ? ,Brand,Brand; Category,Brand; Size,Brand; Size;Category,Brand; Size; Others,Category,Others,Size,Size; Category 2,6,5,1,3,1,3,2,2,2
- Question: What is the functionality that you think would help in navigating the product search results faster? ,?,Auto complete on what is available,Auto finish typing based on common searches,Filter by trusted seller,I can't think of any new functionality.,Maybe a main window showing a product with a top window showing all that can be chosen ,N/a,Price/quality sorting,Short writing on search,Showing more items in a page,Suggestions based on past purchases; suggestions from a "like list",auto complete,auto suggestion,complex queries with user based responses,default search criteria for all searches ,don't know,eliminating cheap items tagged with random stuff to try and get it to appear,if they learned my typical filter habits and applied them automatically ,larger library in key words,none,not sure,relevance by different factors,search hints, type ahead 3,2,1
- Question: How many Filter criteria do you typically apply for navigating through search results ? ,0 to 2,3 to 5,More than 5 2,17,7,1
- Question: Please provide any suggestions/Feedbacks on the existing e-commerce search navigation you use? , N/A,?,As mentioned above, it'd be nice to have price filtering on Amazon.,Autopopulate as you type ,Best price for the best quality based on ratings,I do wish I could see similar past orders within my search results,ML for user based responses,N/A,N/a,NA,Showing more items in a page would definitely help. Rather than clicking pages and pages of products and waiting for each page to load, showing more items in a single page would definitely help go the extra mile,Well-trusted sellers and businesses should be shown before non-business sellers,auto suggestion for the search,better organization of the search database hive to make results more relevant ,better relevance,bigger product pictures ,eliminating cheap items tagged with random stuff to try and get it to appear,i hope i can set default criteria for all the searches, so that i dont need to change every time ,keeping a list of previous purchases,n/a,none,nothing 3,1,1,1,1,1,1,1,1,3,1,1,1,1,1,1,1,1,1,1,1,1