Online Job Search
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November 22, 2020

We are submitting our report entitled "Online Job Searching: Multiple City Locations." In this report, we describe our methods, findings and implications for the design of a technology aimed to improve the job search process for people who have flexibility with location. We are tentatively calling this technology "Location Job Search Efficiency."

Major implications for the design of our technology are as follows:

·   **Need for a more efficient search method to alleviate multiple location search repetition** - Users search multiple job titles for one location and repeat the process with secondary locations. Also, users are more inclined to search by specific cities rather than larger regions. During the interview study, seven out of eight participants noted they were repeating the same job search over multiple cities, and 29 out of 38 survey participants (76.3%) had a positive sentiment of ≥ 4 (out of 5) on our Likert scale with regard to usefulness of searching by specific city names.

·   **Need for a streamlined job title search** - Users search multiple job titles for one location and repeat the process with secondary locations, and users also felt job title was in the top 3 of job search filters. Five out of eight participants during the observational study adjusted their job title after their initial search, seven out of eight interview participants stressed needing to search with multiple job titles to encompass all possible openings, and 12 out of 38 participants provided details in our survey discussing its importance.

·   **Need for job search websites to utilize saved information** - Users felt autofill was convenient and sped up the search process when searching in multiple locations. Four out of eight noted a positive sentiment for autofill during our observational study, five out of eight expressed use of autofill to ease the job search process during our interviews, and 31 out of 38 survey participants (81.5%) responded with a positive sentiment of ≥ 4 (out of 5) on a Likert scale with regard to how useful autosave would be.

In our next step, we will review presentation feedback to determine next steps.
Thank you. If you have questions about this report, please contact us at:

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Multiple City Locations

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HCI 445 User Research Methods
DePaul University
November 22, 2020

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I. Executive summary

Online job searching has become the primary mechanism for many people to find employment. As economies change, job seekers often expand job searches to find work. Current job search engines, however, do not support efficient multi-location job searchers. Our team asked: "How can technology improve the job search process for users who have flexibility with location?" Observations were collected from eight participants who searched for their interested position across three cities of their choosing.

Based on our participant observations, we identified the following themes among the participants' job searches:

- Cyclical location search
- Prioritizing position title
- Saved information features

These findings have several implications for future product designs: 1) designs should prioritize location for users, in both visibility and job search inquiry, and should support searching multiple locations at once, 2) designs should also supporting for multiple position titles simultaneously in combination with the location, and 3) job titles should save users search criteria for later use and provide options for pre-populating information in job applications.

After observing the process, we hosted more in-depth interviews with eight participants who were specifically interested in job relocation. We applied structural coding to the interview transcripts, affinitized interview details, and crafted key persona spectrums.

To further validate our study findings, we also conducted a survey with thirty-eight participants who were open to relocation. The participants were from a varying range of demographics (e.g., age, education, and gender). We asked participants about the importance of search filters, openness to relocation, and managing information while job searching. The survey exposed the following themes:

- Participants' openness to relocation
- Job title and location were the most important search filters for users
- Users felt autofill was convenient and sped up the search process
- Users were more inclined to search by city and not by region

The survey results confirmed our findings with some exceptions when considering design implications. Users needed the flexibility to make search tools align with personal circumstances. The combination of providing filter choice and having the ability to save appeared that it may have a higher likelihood to improve the job searching experience in these cases.

For future explorations within the study, we would increase the number of participants, consider asking participants more about the top three filters (job title, benefits, and job location) identified as most important to get a holistic viewpoint on how they can be improved for multiple location search, and also gather more information regarding how to best handle the multiple-city search within a single, more efficient manner.

II. Competitor Review

Our team will include popular online job search engines such as Indeed, LinkedIn, etc. Prior to study observations, when comparing these popular tools, we discovered that many have similar features.

Competitors	Job Search primary function	Open-ended job searching (e.g., not titles only, etc.)	Requires sign-in /account to use?	Advanced Search - extending 100 miles beyond city	Searching multiple locations specified by user	Searching remote jobs
Indeed	Yes	Yes	No	Yes	No	Yes
LinkedIn	No	Yes	Yes	Yes	Limited after selection	Yes
Glassdoor	Yes	Yes	Yes	Yes	No	Yes

III. Introduction

Reliance on the internet has, over time, transformed user behaviors. When someone has a question, their first instinct is no longer to ask a person. Instead, they might use a search engine such as Google to find a multitude of answers quickly. Similarly, whereas employers may have previously used printed advertisements or posted on physical job boards to advertise a position, now employers frequently post job listings electronically. According to Chancellor et al. (2019), "Nearly 80% of people use the internet to help get a new job." Job search engines have been found to be about 25% faster for those seeking jobs online compared to other methods and have demonstrated lower exit rates for employers (Mansouri et al., 2018).

Job seekers tend to use more complex searches (with more filters applied) than people making general searches (Mao et al., 2019). In studies comparing job searching to general searching, users spent an average of 12 minutes longer on job searching to review the details (Mansouri et al., 2018). According to Jansen et al. (2005), when searching for jobs online, at least 45% of query expressions contain a specific location. Although other studies proposed lower values, location remains a critical input when searching for jobs online.

Although job seekers may typically search for positions in one or two specific locations, economic downturns can prompt more job seekers to search beyond their preferred locations. Employees become more willing to migrate to locations with better economic conditions or opportunities (Basker, 2002). For example, with the current pandemic, abrupt layoffs have increased job seekers' interest in jobs that are remote, temporarily remote, or available in adjacent cities and states. However, job search

engines often do not support location-flexible applicants like these, as they require users to enter locations inefficiently one at a time.

- **Indeed** - The popular website has the primary goal of job searching. It provides users the ability to list any open-ended phrase for searching and then the selection of a city or state to search within.

- **LinkedIn** - This website is often depicted as the professional's social media outlet. It not only includes job searching but also sharing of industry based information and facilities networking for its users.

- **Glassdoor** - The website is made for job searching with extra perks such as salary insights. It was including salary insights prior to both indeed.com and LinkedIn. However, it does host distracting ads and the interface filtering is not as desirable.

Some search engines have attempted to address this frustration by providing searches that span up to 100 miles from the requested location. However, not enough search engines provide searching beyond that range to cover the users' needs. To meet user needs and increase satisfaction, a focus on job search engine quality becomes more important (Wickasono, 2019).
The focus of this study will be to evaluate the following research questions:

How can technology better support the job search process for users who are flexible with their job location?

- What are user needs when searching for jobs across multiple states?
- How do people use search filters to find relevant job listings?

In our research, we are focusing primarily on job seekers who are willing to work beyond their home locations as well as job seekers who are interested in either multiple cities or general geographic areas (e.g., the East Coast).

IV. Methods

A. Observation

1. Participants

As a team, we recruited our participants through friends and family. Our participants included eight adults (4 male, 4 female) between the ages of 22 and 50. All participants were actively seeking employment (or had recently sought employment) and were willing to work beyond their home location.

Table 1: Observation Participant Summary

No.	Pseudonym	M/F	Age	Occupation	Location	Cities open to relocate
1	Luis	M	26	Graduate Student	Chicago, IL	Pittsburgh, Milwaukee, Pennsylvania
2	Kam	M	24	Credit Analyst	Skokie, IL	Houston, Atlanta, New York City
3	Tonya	F	50	Customer Success Manager	Jacksonville, IL	Atlanta, Chicago, Jacksonville
4	Leah	F	40	Financial Analyst	Tampa, FL	Atlanta, Chicago, Seattle
5	Victoria	F	27	Graduate Student	Chicago, IL	Chicago, Seattle, Portland (pacific northwest region)
6	Alex	F	27	Technical Sales Engineer	Atlanta, GA	Atlanta, Nashville, Austin
7	Luke	M	22	Undergraduate Student	Chicago, IL	Chicago, Seattle, Austin
8	Mason	M	23	Junior Software Engineer (Remote)	Chicago, IL	Indianapolis, Austin, Santa Monica

2. Data Collection Methods

Our 30 to 40 minute observations were conducted remotely. In order to capture the steps users took to search for a job online, we recorded the screen share of their actions using the Zoom and Validately platforms.

We started our observations with an introduction and explanation of our research project. Afterwards, we provided our participants with an informed consent form to read over and sign (see Appendix A). Before starting the observation, we asked several warm-up questions in order to establish rapport with the participant and gain a better understanding of the participants in our study. We asked questions about their current status of seeking employment, issues they had in the past with applying for jobs online, and job searching sites they were already familiar with.

After answering the warm-up questions, we asked to show us how they would search online for job opportunities within three different cities. We observed the participants' actions and took notes on their steps they took to complete the activity. Afterwards, we asked any follow-up questions we had about their actions.

3. Analysis Methods

We used the AEIOU framework to organize our notes according to the activities, environments, interactions with others, objects used by users, and users/participants we observed.

We then constructed an affinity diagram of our combined notes through Miro and analyzed our observations for patterns. Together, we reviewed the observations and identified commonalities.

B. Interview

1. Participants

As a research team, we recruited our participants through personal connections. Our participants included eight adults (4 male, 4 female) between the ages of 22 and 49. All participants were actively seeking employment (or had recently sought employment) and were willing to work beyond their home location.

Table 2: Interview Participant Summary

No.	Pseudonym	M/F	Age	Occupation	Location	Cities open to relocate
1	May	F	33	Senior Product Designer	Chicago IL	NYC, Remote
2	Glo	F	26	Senior Analyst	Chicago IL	NYC, LA, Seattle, SFO
3	Jack	M	25	Credit Analyst	Skokie, IL	NYC, Atlanta, Houston
4	Al	M	22	Veterinarian Technician	San Francisco, CA	San Francisco, Boston, San Diego
5	LL	M	23	Product Logistics Manager	Santa Monica, CA	Chicago, Austin, Remote
6	DP	M	23	Personal Financial Advisor	Kankakee, IL	Chicago, Indianapolis
7	Shannon	F	49	Biology Teacher	Baltimore, MD	Washington DC, Baltimore, MD, Atlanta, GA
8	Rebecca	F	37	Claims Rep	Jacksonville, FL	Jacksonville, FL, Atlanta, GA, Miami, FL

2. Data Collection Methods

We conducted a total of 8 interviews remotely. The interviews lasted 30 minutes and were recorded for transcription purposes. We began our interview with an introduction about ourselves and the research project. We explained the purpose of the project to our participants in order to ensure that their answers would remain confidential. We then provided participants with the informed consent form for participants to read and sign.

After receiving the signed consent form we proceeded with asking our participants warm-up questions about their current job title, working in that role, the last time they searched for a job online and their overall experience searching for jobs. After getting a better understanding of the person and their current role we asked our participants our deep focus questions. We started by asking questions about how they search for jobs and use search filters. We next asked our participants questions about searching for jobs in relation to their current location. This included questions about their feelings towards relocating, searching for jobs in multiple locations and challenges during that process. Next, we asked our participants about how they use job titles when searching for jobs online. Our last deep focus questions were focused on their feelings and experience using autofill while searching for jobs.

Finally, we ended our interview by asking our participants wrap-up questions around their frustrations, preferences and ways to improve the experience of applying for jobs online.

3. Analysis Methods

Our interviews were transcribed and uploaded to Atlas.ti. We applied structural coding to the document first and then every researcher on the team completed open coding to their interview transcripts. We then combined our coding to a Miro Board and organized our codes using an Affinity diagram to find themes and high level themes. Finally, using our affinity diagram we created a persona spectrum and placed our participants on the spectrum.

C. Survey

1. Participants

As a research team, we recruited our participants through the CDM participant pool and personal connections. Our participants included 38 adults (8 male-identifying, 28 female-identifying, and 2 who preferred not to say) between the ages of 20 and 55, with the highest percentage (65.7%) between the ages of 24 to 34. All participants were actively seeking employment (or had recently sought employment) and were willing to work beyond their home location.

Q21 - What gender do you identify as?
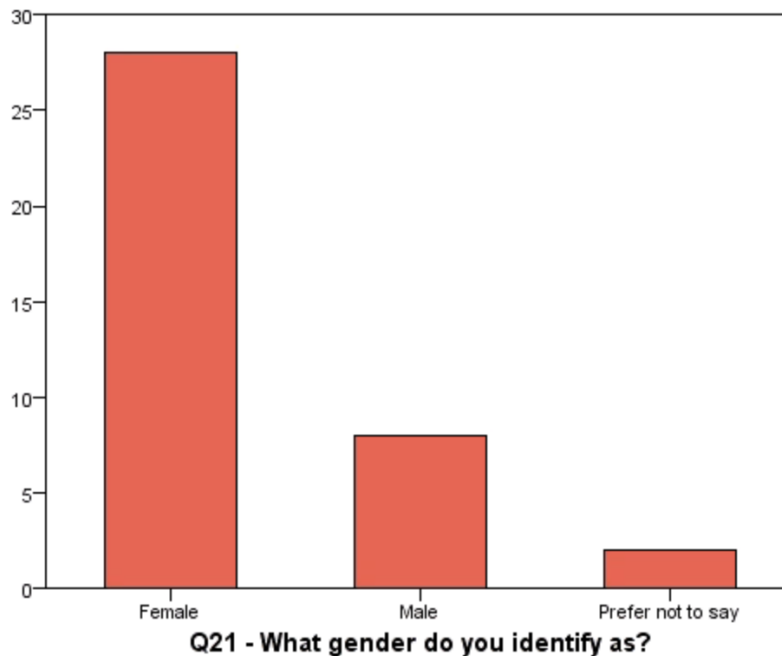
2. Data Collection Methods

We used Qualtrics to develop and host the survey. Survey results were collected between November 9th, 2020 and November 16th, 2020. The survey consisted of open-ended and selection questions. The survey consisted of six parts:

- Part 1: Warm up - We asked background questions to understand their current role, where they are at with their job search, and their current sentiment about searching for a job.
- Part 2: Job search filters - We asked about participants' search filter preferences to understand which filters were most and least important during the search.
- Part 3: Location during job search - We asked how open participants are to relocation, the amount of locations they are looking at, and their interest in searching multiple jobs at one time.
- Part 4: Job title - We asked questions to gauge how often users searched multiple job titles and if it was currently convenient for them to do.
- Part 5: Autofill with search criteria - We asked participants' if they found autofill useful in their job search
- Part 6: Demographics - We asked participants' age, gender, education level, and ethnicity.

3. Analysis Methods

We used Excel and SPSS to analyze our survey data. Our previous observations and interviews helped in formulating two hypotheses:

1. Users openness to relocation is dependant on the number of locations
2. Job seekers who find job location search filters more important are more satisfied with their overall job search

To evaluate the hypotheses, we conducted studies using the parameters and tests shown in the below table:

Hypothesis 1: Users openness to relocation is dependant on the number of locations	
Independent variable(s) Number of cities / locations searched (ordinal) Survey Question 8: Thinking about the last time you were job hunting, how many different cities did you consider during your job search?	**Test:** **Krusal-Wallis (KW) Test**
Dependent variable Openness to relocation (ordinal) Survey Question 9: How open are you to relocating for a job?	

Hypothesis 2: Job seekers who find job location search filters more important are more satisfied with their overall job search	
Independent variable(s) Search filter ranking for job location (ordinal) Q5-2 How important are each of the following job search filters - Job Location?	**Test:** **Mann- Whitney U Test** **Grouping:** Overall experience (Positive, Negative)
Dependent variable Overall job search experience (nominal) Survey Question 4: How would you describe your overall experience searching for jobs online?	

(See Appendix J - Survey Analysis)

V. Findings

From our observations, interviews, and survey, we identified common themes in relation to our research questions that job searchers follow when looking for positions in multiple locations:

1. Participants' openness to relocation
2. Job title and location were the most important search filters for users
3. Users felt autofill was convenient and sped up the search process
4. Users were more inclined to search by city and not by region

In the following sections, we present our themes and findings.

A. Themes

1. Participants' openness to relocation

All 8 of our interview participants were open to relocation with regard to their job search. We started by asking participants: "How do you feel about relocating for a job?" This question helped us gauge the level of openness participants had with regard to relocation. Some participants had strong feelings on what they needed from a job to push them to be more open about relocating. For example even though LL initially said they were open to relocation, they added that, "If it's worth the pay and benefits, etcetera, yeah I'll do it, but right now I'm in the central hub for what I do, so I don't feel I should leave." May shared a similar sentiment, saying, "I feel...open to it, but it would have to be worth it."

On the other end of the spectrum, some participants were very open to relocating and needed minimal from the company to sway them. DP stated, "I'm definitely okay with relocating to a different state." Gloria shared the same sentiment and said, "I am very open to it," when asked how she felt about working outside of her current city.

During our survey study, 31 out of 38 noted that they were at least somewhat open to relocation (≥ 3 out of 5 on the Likert scale). Participants were also asked how many different locations they are open to currently, and the mode was 3 cities. The survey results yielded that our comparisons between openness to relocation (M= 3.6053 SD=1.44333) and the number of locations a participant wanted to search (M= 2.6842 SD=1.35777) were not statistically significant (p-value ≥ .05, p-value = 0.373). Their distributions moved similarly. A participant who is extremely open to relocation could consider the same number of locations as one who feels "somewhat open". *(See Survey Analysis, Appendix J)*

2. Job title and location were the most important search filters for users

All 8 of our observation participants had the location as one of their first items searched on the page, and 5 out of our 8 participants made changes to their job title during their search. To gage this, we looked at participants searching in the location form field or including location in their job title search within one of the first two search criteria. Some even went to the extent of adjusting their location radius as well. Users went through a cyclical search when it came to location and job title. They would start the process with one location typed into the search as they looked at job opportunities. Then, they would switch to another location in the search and repeat the same search with the new location.

As Victoria was looking for UX designer jobs, she said, "I would go through and I would change out what the job title is. Like, I have a little list of what usability is termed as, like: visual designer, ux designer, usability designer. So I...typically toggle between those too and see if different jobs come up." This would continue until they felt done, or until they wanted to move to a new job search website where they would then repeat this loop. This process is noted in the sequence flowchart in Appendix J. Some participants also assumed remote work was included in their search automatically, but mentioned that they weren't sure if this was actually the case or not.

Seven out of 8 participants in our interview study follow a cyclical approach for their job search with multiple locations and job titles, validating the importance of each search filter. They will start with one

location. In that location, they'll search multiple job titles that fit the type of work they are looking for. Once they finish looking at all their desired job titles for that one location, they will switch to a new location and repeat searching with the same job titles as before. This process will repeat until they have searched all of the locations they are open to. Shannon stressed the need for searching multiple job titles by saying ""I use multiple job titles because different places describe the same job [in] different ways." May felt a similar sentiment. She noted, "Usually I'll try to, like, finish up one location before switching back and forth. I might switch the titles more, but when it comes to, like, locations, I'll do one and then the other. I won't switch as much [the location].

There was some variation in this approach between the seven participants. For example, one participant, Gloria, noted they follow this cyclical process with the slight variation of having multiple tabs open for each city rather than one tab where they switch the city each time. This allowed them to speed up their search process. She said, "I usually have a side by side comparison going on. So I'll have multiple tabs open, and for example I'll be looking at NYC is the location and I'll look at the jobs, and then I'll also, like, have LA up, or San Francisco and Seattle, so I'm actually looking at them simultaneously."

The survey results for this theme related directly to our 2nd research hypothesis. After performing some statistical tests, no significance was found when comparing overall experience to the importance of search filters; however, some proved "better significance" than others. To understand which filters may have a higher chance of improving the overall experience, we sorted the p-values from lowest to highest. Of the listing, the top 3 filters were job title (p-value =.053), job location (p-value = 0.182), and benefits (p-value=0.256). This indicated that perhaps a focus on the improvement of these filters may influence users like those participants who noticed.

Sig. (across Overall Experience) vs. Filter
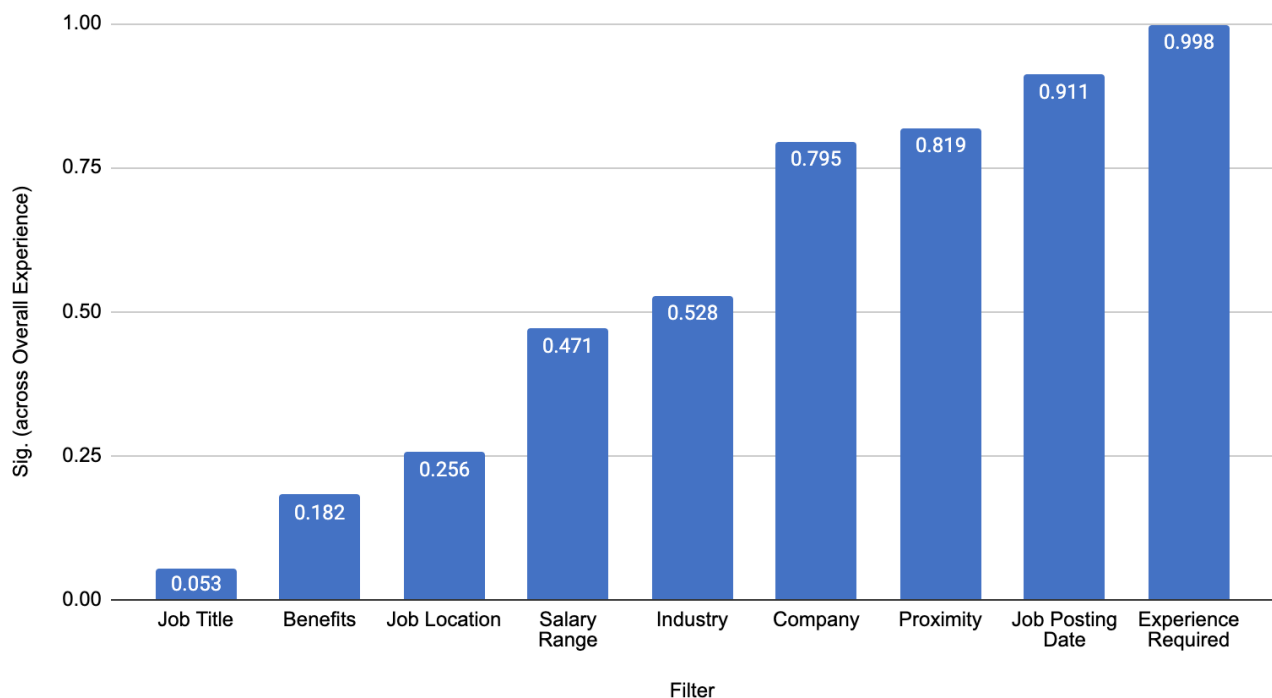
We binary coded our responses to Question 6 " Tell me more about the filters you ranked as most important. Why are these filters most important in your job search?" Our results were as follows:

- 12 out of 38 participants noted job title as one of their most important search filters
- 11 out of 38 participants noted benefits as one of their most important search filters
- 16 out of 38 participants noted job location as one of their most important search filters

Even though no significant difference was found with Hypothesis 2, we can see through our binary coding that participants regularly use the search filters of job title, benefits, and job location most. Participants provided the following notable responses expressing their sentiment on these top three search filters:

- P1: "I think job title is important because it tells me what type of job fits my skills. Salary and benefits are important because I want to be compensated according to my ability and experience."
- P30: "Job location - in order to determine what type of community the job is in: safety (safe location, walking paths, pollution, traffic, heaviness), public transportation facilities nearby… Benefits - at a time when healthcare is quite expensive, it's important to know what type of healthcare support you can expect, as well as understand PTO or leave policies. "
- P7: "The company's value and benefits that they also offer must be viewed because it determines if I want to work for them or not"

3. Users felt autofill was convenient and sped up the search process

Four out of 8 participants in our observational study noted how much easier it was when the website populated certain areas of their information automatically. During the search, these participants liked having their search criteria saved to make it easier for next time. They also appreciated when they were redirected to the company website to apply and information was filled in automatically either from the website they came from or via a document. Participants in general liked when there were as little steps as possible for them to complete an application. Mason noted that he "prefers Easy Apply" on LinkedIn because other applications can be "a real pain" when there are repetitive steps.

Five out of 8 participants in our interview sessions liked the convenience that autofill provided them in their job search process when searching in multiple locations. Participants' time to search was already increased due to searching multiple locations versus only one location, so many liked having a way to cut down on time. Participants had two interpretations of how they use autofill for information. Some participants interpreted it by having their information from their search and resume populate over to the application, while others interpreted their search criteria to be what was autofilling. We left it open to user interpretation to see what they first thought of when it came to information autofilling. No matter the interpretation, it was clear that these five participants felt a positive sentiment. LL said, "I like it a lot. It saves a lot of time," and Shannon shared the same sentiment, saying, "Yes, autofill would be convenient."

We asked our survey participants how useful it would be for job websites to autosave their search filters so that they could reuse them in future searches. 31 out of 38 participants (81.5%) responded with a positive sentiment of ≥ 4 (out of 5) on a Likert scale with regard to how useful autosave would be.

Then, we broke the responses out between two age groups, ages 29 or less (Group A) and ages 30 or more (Group B), to see if there was any different sentiment by age. Group A had 24 of the 38 participants, and 19 out of 24 participants (79.2%) had a sentiment of ≥ 4 (out of 5) in favor of usefulness. Group B had 10 out of the 38 participants, and 9 out of 10 participants (90%) had a sentiment of ≥ 4 (out of 5) in favor of usefulness. We were not able to find statistical significance in the difference in age groups when compared to usefulness of autofill features, so we can say that all age does not play a factor in autofill sentiment.
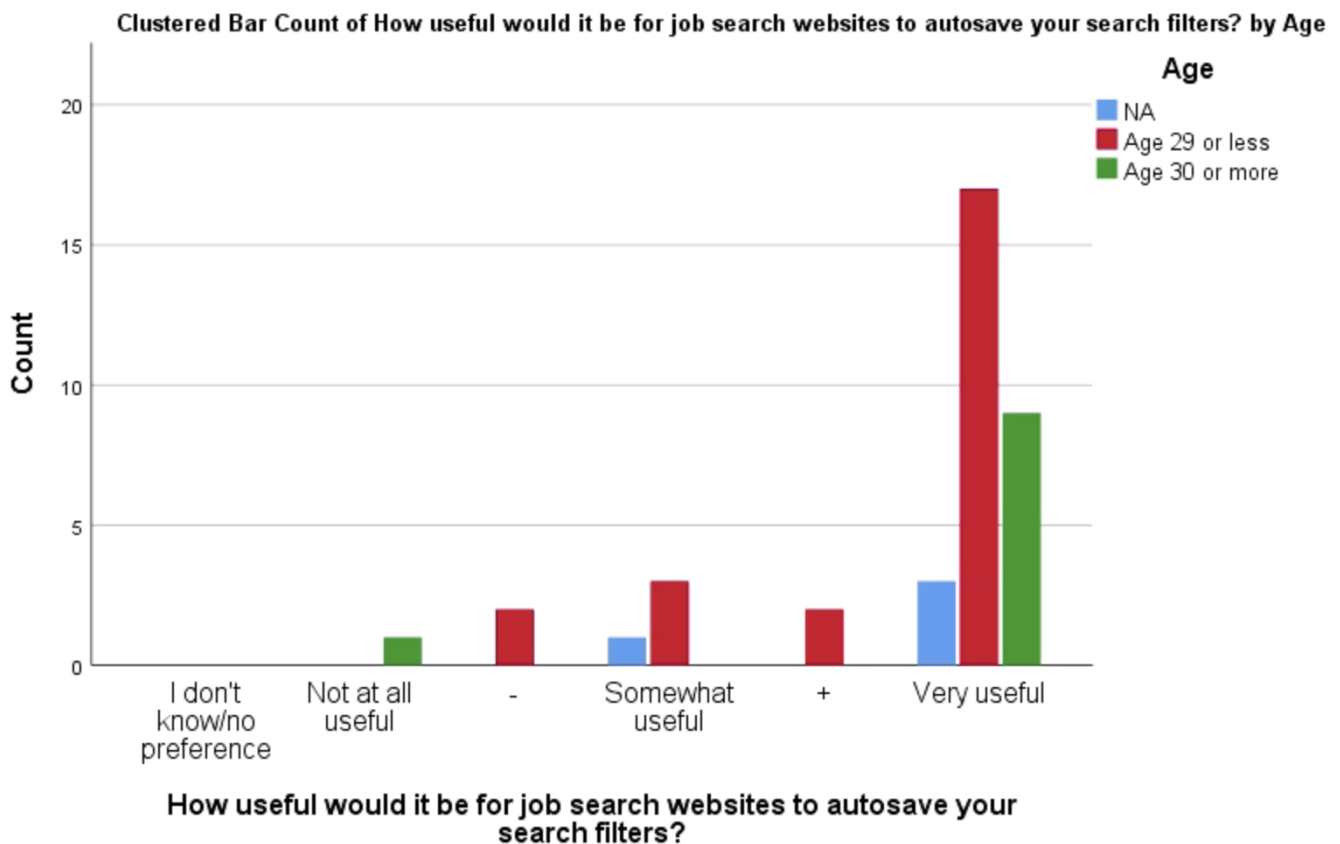
4. Users were more inclined to search by city and not by region

Five of the 8 participants felt more inclined to search using exact city names instead of searching by region. While they may be open to relocating multiple locations, these participants felt more comfortable keeping their search location more narrow with the exact locations versus broadly searching by region. Gloria didn't feel comfortable searching by region because she worried it would pull in smaller cities. She said, "I think it's because I've been only in Chicago since I graduated...it's been over 5 years now since I've been here, and Chicago being one of the bigger cities after San Francisco, Los Angeles, and New York City, I think it would be hard for me to adjust to a city that's smaller." There are limitations to

this finding since searching by region is not currently available on most job search sites, so users may have bias to the common exact city search. We noted this limitation below.

We asked our survey participants how useful they felt it was to search for location by city and by region. 29 out of 38 participants (76.3%) had a positive sentiment of ≥ 4 (out of 5) on our Likert scale with regard to usefulness of searching by city. In comparison, only 8 out of 38 participants (21.1%) had a positive sentiment of ≥ 4 (out of 5) 5 on our Likert scale when asked how useful searching for location by region was. We performed a Paired Samples T-Test to compare the usefulness when searching by city or by region, and with 95% confidence ($p < .05$) we are able to say that the difference in means for city (M = 4.39, SD = 0.97) and for region (M = 2.87, SD = 1.21) is statistically significant. Based on this statistical significance, we can say that participants felt searching for location by city is more useful than searching by region.

Usefulness of searching by city name

Usefulness of searching by region
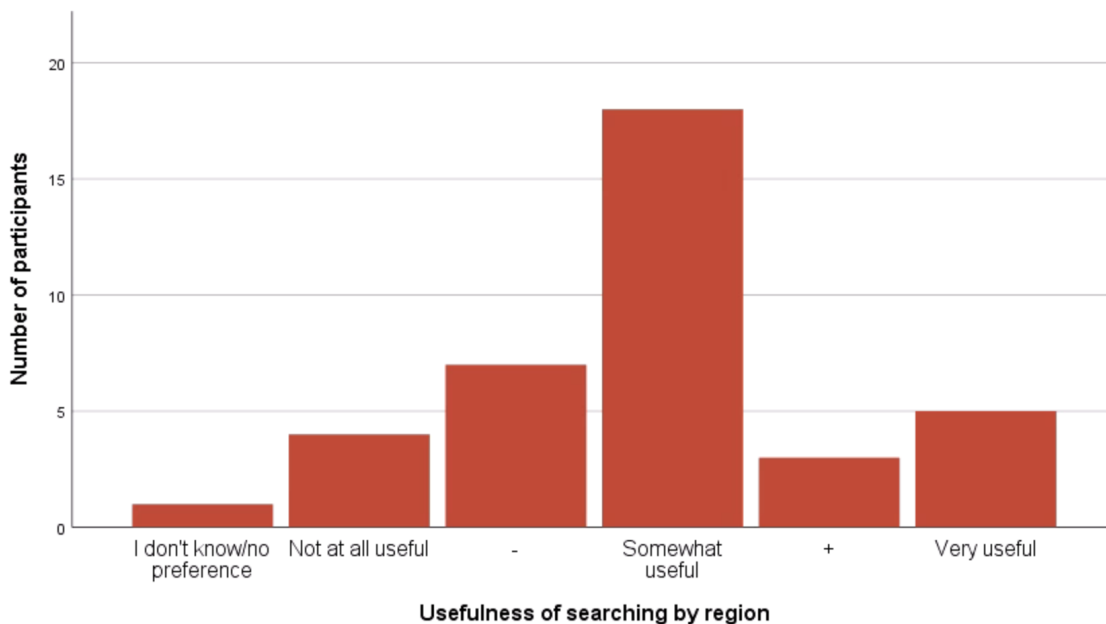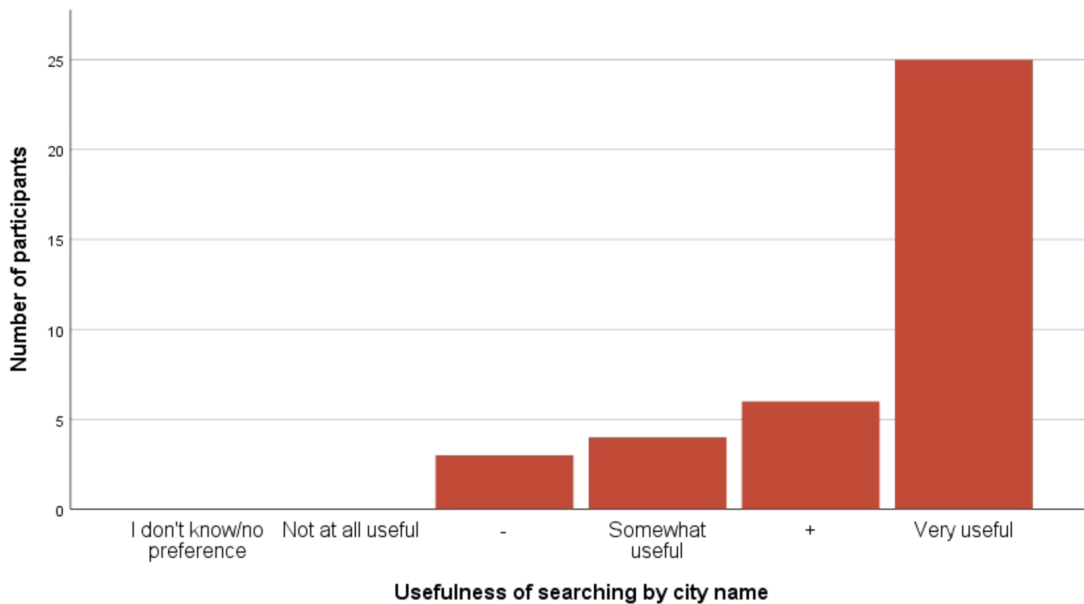
B. Personas/Profile

Spectrum

Location Importance

| 0 | 25 | 50 | 75 | 100 |

Autofill Affinity

| 0 | 25 | 50 | 75 | 100 |

Specificity of Job Title

| 0 | 25 | 50 | 75 | 100 |

Years Searching for Jobs

| 0 | 5 | 10 | 15 | 20+ |

Amount of Search Criteria/Filters

| 0 | 25 | 50 | 75 | 100 |

Demographic

Male   23   years

Houston, TX

Single

Physical Therapist

Technology

Browsers

Firefox

Quote

"
Looking for a job as a physical therapist is tough at the moment, but some websites help more than others.
"

Motivations

- Needs to find a job after being laid off
- Saving for an apartment

Goals

Larry enjoys the city life, so he prefers either Houston or Dallas while searching for jobs. He is strict with this criteria, as location is very important to him.

Frustrations

- Can't search for jobs in multiple locations at once
- Finds a small amount of jobs in his field within his state

Background

Larry is currently looking for work after being laid off in an event related to the pandemic. He is 23 years old, and grew up in the city of Houston, TX with his 2 sisters and parents. Larry graduated from UT in 2019 with a bachelor's degree in kinesiology, and began working as a physical therapist in September of 2019.

PERSONA: Abigail

Quote

"Wherever I need to be, hard work will get me there."

Motivations

- Needs to further support for her family
- Has a deep love for the industry, but wants a new company to work for

Frustrations

- High profile jobs are hard to come by on typical job searching websites
- Often times, searching for work in other regions seems impossible

Spectrum

Location Importance

| 0 | 25 | 50 | 75 | 100 |

Autofill Affinity

| 0 | 25 | 50 | 75 | 100 |

Specificity of Desired Job Title

| 0 | 25 | 50 | 75 | 100 |

Years Searching for Jobs

| 0 | 5 | 10 | 15 | 20+ |

Amount of Search Criteria/Filters

| 0 | 25 | 50 | 75 | 100 |

Goals

Abigail realizes her worth in the industry, and has an extensive LinkedIn profile she uses to search for jobs in her field. She's very open to relocating to almost anywhere in the world, but usually has a limited amount of preferences listed under her LinkedIn profile.

Background

Abigail is a 42 year old graphic designer (animator) at Disney, and is currently looking to branch out into other companies. She grew up in Santa Monica, CA, and graduated from CalArts in 1993.

Demographic

Female   42   years

Santa Monica, CA

Married

Animator

Technology

Browsers

Google Chrome

C. Scenarios

1. Larry

Larry is 23 years old and graduated with a bachelor's degree in kinesiology. He grew up in the city of Houston, Texas and has been enjoying his life there because his family remains close to him. He's

grown to love the city lifestyle as there are many restaurants, museums, sports and other things to do in these major cities. As a former physical therapist, he values the importance of maintaining a healthy lifestyle and he believes that living in the city allows him to do that comfortably.

This year Larry was laid off due to the pandemic and he has been using several websites to search for physical therapist jobs. On Friday, he used LinkedIn to search for roles related to physical therapists but found it time consuming as he would always have to start a new search for a new location or job title.

A few days later he came across a new site where he can search for physical therapist jobs. He decided to try it out as it seemed to be a promising site from the description and features that were offered. He used his PC to enter the site name and proceeded to make an account. Immediately, the job site provided an onboarding tour of the site for new users to gain familiarity. Larry didn't have trouble learning the site as they followed common design principles from other job sites.

Larry was now ready to search for physical therapists jobs with his new account and uploaded resume. He moved his cursor to the search bar and typed "physical therapist." He then proceeded to add the location and noticed he was able to enter three cities that he was interested in applying for. In this case, Larry was only interested in Houston and Dallas so he entered those two cities. He was provided with a list of physical therapist roles located in Houston and Dallas. He looked through the job postings and found many jobs that were aligned to his qualifications. Larry checked his time and saw that he needed to be somewhere soon. Before exiting he noticed a save button near the search bar where he clicked and the site asked him if he wanted to save these two job locations with the current search criteria entered for them. He immediately clicked yes and was asked to name the search criteria created for the two locations. He named it "Houston and Dallas Physical Therapist Jobs." After completing those quick steps, he turned off his PC.

The next day Larry went back to the site to look through the job positions that were generated. He signed into his account and clicked the search bar. Once he clicked the search bar there was a suggested saved list and saw his saved criteria for "Houston and Dallas Physical Therapist Jobs." He selected it and the list he was viewing yesterday was generated. Larry found this feature to be more efficient than other sites.

2.Abigail

Abigail is 42 years old and is currently working as an animator at Disney. She has worked there for ten years and is ready to take on a new career challenge. She wants to work as an animator for another company and is willing to relocate almost anywhere in the world.

She uses LinkedIn as her main website when searching for jobs online. The search function only allows her to type in the desired position along a location. She's found it quite frustrating that she can't add any more additional filters to narrow down job positions that are more up to par in relation to her current role at Disney. This makes it difficult to find a position that would allow her to make similar pay as her Disney role as she wants to still support her family.

Her colleagues recently recommended a new site for searching for jobs online. She decided to give it a try one day and created a profile. Her main goal for using this site is to find a job that allows her to make similar income while keeping the same job title. She's also open to relocation so wants to make

sure she is presented with jobs from all over the world that align to her criteria. When she signs into her account she finds the search bar at the top of the screen. She clicks on the search bar and types in her position title "animator." She notices that she can add another job title that is similar to "animator," she clicks on the suggested title "graphic designer." She wants to add more filters before submitting her search. She clicks on the filter icon and views the different filters. She finds the income filter and selects the income range that aligns to her qualifications and experience. She opens the location filter to allow for international postings and is ready to search. She submits her search and international jobs are presented to her. The postings also indicate the income range which aligns to her current role with Disney. Abigail is thrilled with the results as she was able to find high-profile positions by specifying her job title and including her criteria.

D. Priority Matrix

User Type Descriptions

- Larry: this user group prefers the city lifestyle and would only relocate for a job if it's in a major city. These users are young and have a few years of experience. This user group also values efficiency when using online sites.
- Abigail: this user group is willing to relocate to almost anywhere in the world as long as they're able to find a position that pays similarly to their current role. They have multiple years of experience in their industry.

No.	Feature	Priority	Impact	Feasibility	User Type
1	Autosave three cities and return related job information to the user from those three saved cities.	High	High	High	Larry
2	Allows users to mark specific search filters that are most important to them when searching for jobs.	High	High	High	Abigail
3	Autofill feature that allows users to search for specific roles using their saved search criteria that includes the most important search filters	High	High	Medium	Larry
4	Allow users to create, save and assign search filters for specific job positions.	High	High	High	Abigail
5	Allows users to create their own profile with an uploaded resume.	Medium	Medium	High	All
6	Feature that autofills resume information to internal job applications.	Medium	Medium	Medium	Larry
7	Most qualified positions for the candidate with search criteria considered displayed	High	High	High	All

	first after searching for a role				
8	Allow users to select up to three cities while searching for a role	High	High	High	Larry
9	Suggested feature that allows users to select similar job titles for a position. A user typing a position title will be provided with a suggested list of similar titles. The user can select titles.	High	High	High	Abigail
10	A feature that allows users to save jobs and select two saved jobs to make comparisons.	Low	Medium	Medium	All

E. Experience Maps

Larry's Job Searching Experience
Goal: To find work as a local physical therapist

Entry	Prioritize	Filter	Search	Apply
1. For Larry, job searching usually involves utilizing LinkedIn. 2. Larry heads to LinkedIn to make some edits to his profile before searching.	1. Larry thinks about his priorities, considering which attributes of a job are most important to him. 2. His priorities are listed as such: income, location, job title.	1. Larry modifies his LinkedIn profile with the filters he prioritizes for his job search. 2. He swaps out his old location for Dallas and Houston, the two cities he wants to work in the most.	1. After a few clicks, Larry is searching through job listings for both Houston and Dallas. 2. Larry realizes he's only seeing results within the domains he selected.	1. With a click on the "easy apply" button, Larry applies to any and all jobs that seem fit for him
I have to choose a domain to start searching for jobs	I need to find something close to home, or his job will require relocation due to being unable to work remotely	Searching between these two cities seems to be my best option	I must have filtered correctly, since the results I'm finding match perfectly with location and everything	I'll find something worthwhile in no time!

Abigail's Job Searching Experience

Goal: To find work as a digital animator after having a stable job for over 10 years

Entry	Prioritize	Filter	Search	Apply
1. For Abigail, she used to use LinkedIn to search for new jobs.	1. Abigail is highly experienced, so she knows where to go from here.	1. Using the options of the site, Abigail adjusts the income to her liking.	1. Abigail searches for high quality jobs in multiple countries, finding moderate success.	1. Abigail applies to 3 or 4 locations before logging out
2. She figures this will still give her the best results, plus she has constantly updated her profile over the years.	2. She knows her priorities lie mostly in her job title and income.	2. In addition to this, she opens her location filter to allow international listings.		
LinkedIn is the industry standard for my work, so I'll head there to start	Considering I'm looking for a very high end animation job, I think the biggest issue will lie in finding anywhere looking for such a position	I doubt I'll find too many high end jobs localized to my own area, so I should open the options accordingly	I know lots of people at some of these locations, but need to apply beforehand to have a chance	Trying to adjust to this searching mindset is tough, but the site seems designed accordingly

VI. Discussion

This research explored how technology could improve the job search process for users who have flexibility with job location. As more people are starting to apply for jobs online studies have found that "15% of the job search referenced a city outside their hometown," (Mansouri, Zahedi, Campos and Farhoodi, 2018). Furthermore, this project aims to understand the user needs for a digital product to improve the process of searching for jobs online across multiple states. In this study, we learned how people search for jobs and use specific search filters when applying to jobs across multiple places online.

In our first study, we observed eight participants as they searched for job opportunities across three different locations. In our observations of eight participants, we used the AEIOU framework to organize

our observation notes and identified three common themes in our participants' job search process: location of the job, position title and saved information features.

In our second study, we interviewed eight participants around their job search process when having the flexibility to relocate to a different location. In our interviews of eight participants, we used structural and open coding on Atlas.ti. We then transferred them to a Miro board where we created an affinity diagram to organize our interview notes and identified three common themes in our participants' job search process.

In our last study, we surveyed 38 participants to help confirm our hypothesis expectations. We discovered that improvement to multiple location job searching regardless of a previous experience (whether positive or negative) would be primarily about maintaining the flexibility of features that exist today, such as filters and city searching, to navigate job lists. However, better organizing and management of the information would be helpful.

A. Implications for Design

1. Participants' Relocation Openness Theme

Most of our participants were generally open to relocation, but the level of openness varied between participants. For example, while all of our eight interview participants were open to relocating, some of them noted they needed to be swayed more by incentives than others would. Our suggestion for design would be to find ways to better highlight salary, benefits, and other incentives in a way that better draws in applicants. This could be providing better helper details to hiring managers who are submitting the application to be posted on the job website.

Additionally, a participant's openness to relocation was most frequently coupled with 3 cities being considered. Knowing that a cyclical approach is typically how participants navigate through job listings, reviewing 3 cities can add complexities for participants. Based on this information, users would seek to minimize time-consuming tasks. In this case, pairing this theme with the solution of autofill/autosave could help users manage this much information. Allowing the search engine to autosave the cities selected and return related, organized information to the user would help to manage the results of all interested cities.

2. Job Title and Location Search Filters Theme

Participants have filter preferences. Decisions on filter usage were greatly influenced by individual circumstances. Participants attributed filter importance to family, accessible public transportation, good salaries, etc. The most popular search filters (e.g., job title, location, benefits) coincided with those needs. The keys to a successful design may be to provide the choice of which filter to elevate for a personalized experience.

Furthermore, we went into our survey with the assumption that these two filters would be toward the top for level of importance. Because of this, we asked question 15: "How interested are you in being able to search for jobs across multiple locations using a single search (e.g., "Copyediting jobs in Chicago or Atlanta")? 36 out of 38 participants in our survey responded "somewhat likely" through "very likely." This shows a need for design to accommodate for a combined filter that allows for multiple cities and

potentially multiple titles to be searched at once. In a sense, the "work smarter, not harder" quote applies to how participants feel these search criteria should function in the experience, which pairs well with our theme in VI.A.1 as well.

3. Autofill Convenience Theme

All of our previous themes fit the mold for wanting to minimize time consumption in the job search, and the theme of "Autofill Convenience" is no different. Our participants liked having search information saved to make it easier when searching for jobs and when being redirected to the company website to fill an application. This was supported in our interviews (N=5) and surveys (N=31) as participants felt that the autofill was convenient and gave them an opportunity to send more applications in a shorter period of time when searching in multiple locations. This indicated that our product should include an autofill feature that allows users to save their own customized search criteria that includes the most important search filters for the applicant. Furthermore, the autofill feature will apply the same criteria that the job applicant created when applying to different locations.

4. City Search Theme

When we were discussing our research questions, we initially thought searching by region may be of interest users wanting a more broad search. Based on our interviews (N=5) and surveys (N=29), participants felt that searching by city is more important than searching by region. Only eight out of 38 participants had a positive sentiment to searching by region. One participant mentioned strong interest in specific cities because they fit their current lifestyle and offer many job opportunities. This indicated that our product should include a feature that allows users to select multiple cities and compare similar roles in order to make more informed decisions and increase efficiency.

B. Limitations and Future Work

Our first limitation is that our sample size was small for all three studies (observational, interview, and survey). In addition, we were only able to observe the process of searching for a job and not the actual application process where our participants would fill the application. The actual application process could provide beneficial information around the autofill feature. This data from that observation could be used to improve the job search process for people with more flexibility in location.

In addition, there are limitations to our question asking participants their preference on searching location by city or region. Searching by region is not currently available on most job search sites, so users may have bias to searching by city name.

For our future work, we would look more into the top three filters (job title, benefits, and job location) to get a holistic viewpoint on how they can be improved for multiple location search. We would also interview new participants with regard to our question 15: "How interested are you in being able to search for jobs across multiple locations using a single search (e.g., "Copyediting jobs in Chicago or Atlanta")? This was a new question we had not asked in our interviews, and 36 out of 38 participants in our survey responded "somewhat likely" through "very likely."

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VIII. Appendix

A. Informed consent blanks - Observation

ADULT CONSENT TO PARTICIPATE IN RESEARCH

Online Job Searching

Principal Investigator: Ava Allen

Institution: DePaul University, Chicago, Illinois, USA

College: College of Computing and Digital Media (CDM)

Faculty Advisor: Andrea Sanders

Key Information:

What is the purpose of this research?
We are asking you to be in a research study because we are trying to learn more about online job searching. This study is being conducted by Ava Allen, Erika Brentar, Joey Reyes, and Miguel Rodriguez at DePaul University as a requirement to obtain his/her master's/doctoral degree. This research is being supervised by his/her faculty advisor, Andrea Sanders. There may be other people on the research team assisting with the study.

We hope to include about 8 people in the research.

Why are you being asked to be in the research?
You are invited to participate in this study because you are searching for a job or have searched recently for a job in your desired field. You must be age 18 or older to be in this study. This study is not approved for the enrollment of people under the age of 18.

What is involved in being in the research study?
If you agree to be in this study, being in the research involves observation of your actions as you are searching for a job online.
Using the browser and search engine of choice, you will be asked to search for a desirable job as though no observation were being conducted.
Wrap-up questions about the process will be asked after the observation ends.

The interview will be screen recorded and transcribed into written notes later in order to get an accurate record of what you said and your actions performed during the observation.

Are there any risks involved in participating in this study?
You may feel uncomfortable or embarrassed about the observation taking place, but we are simply asking that you treat this as an ordinary job search that you have done or will do in the future. You do not have to answer any question asked if you do not want to.

We cannot promise complete confidentiality for the information you tell us, because everyone in the focus group will hear what you have said and it is possible that they may repeat something you said to someone outside the group.

Are there any benefits to participating in this study?
You will not personally benefit from being in this study.

We hope that what we learn will help contribute towards greater knowledge to be gained on the subject of online job searches.

How much time will this take?
This study will take about 15 - 20 minutes of your time. The observation portion will take around 15 minutes, while the asking and answering of questions will take around 5 minutes.

Other Important Information about Research Participation

Can you decide not to participate?

Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences, penalties, or loss of benefits if you decide not to participate or change your mind later and withdraw from the research after you begin participating.

You may withdraw from the research at any time.

The researcher may remove you from the study without your consent, if you do not follow the instructions, if your situation changes and you no longer meet the inclusion criteria for the study, or you are no longer able to complete the study tasks.

Who will see my study information and how will the confidentiality of the information collected for the research be protected?

The research records will be kept and stored securely. Your information will be combined with information from other people taking part in the study. When we write about the study or publish a paper to share the research with other researchers, we will write about the combined information we have gathered. We will not include your name or any information that will directly identify you. Some people might review or copy our records that may identify you in order to make sure we are following the required rules, laws, and regulations. For example, the DePaul University Institutional Review Board may review your information. If they look at our records, they will keep your information confidential.

To prevent others from accessing our records or identifying you should they gain access to our records, we have put some protections in place. These protections include using a code (a fake name, a study ID number, etc.) for you and other people in the study and keeping the records in a safe and secure place using a password protected computer, encrypting our records, etc.

The recordings will be kept until accurate written notes have been made, then they will be destroyed.

You should know that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court or to tell authorities if you report information about a child being abused or neglected or if you pose a danger to yourself or someone else.

Please be aware that disclosing experiences with sexual or relationship violence during the course of research does not constitute a formal report to the University and will not begin the process of DePaul providing a response. If you are seeking to report an incident of sexual or relationship violence to DePaul, you should contact Public Safety (Lincoln Park: 773-325-7777; Loop: 312-362-8400) or the Dean of Students and Title IX Coordinator (Lincoln Park: 773-325-7290; Loop: 312-362-8066 or titleixcoordinator@depaul.edu). Individuals seeking to speak confidentially about issues related to sexual and relationship violence should contact a Survivor Support Advocate in the Office of Health Promotion & Wellness for information and resources (773-325-7129 or hpw@depaul.edu). More information is available at http://studentaffairs.depaul.edu/hpw/shvp.html. Individuals are encouraged to take advantage of these services and to seek help around sexual and relationship violence for themselves as well as their peers who may be in need of support.

If you do disclose an experience with sexual or relationship violence, we will also provide you with a resource sheet containing this information at the end of the study.

Who should be contacted for more information about the research?
Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study or you want to get additional information or provide input about this research, you can contact the researcher at [Ava Allen - aallen42@depaul.edu
Erika Brentar - ebrentar@depaul.edu
Joey Reyes - jreyes81@depaul.edu
Miguel Rodriguez - mrodr119@depaul.edu]

This research has been reviewed and approved by the DePaul Institutional Review Board (IRB). If you have questions about your rights as a research subject, you may contact Susan Loess-Perez, DePaul University's Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu.

You may also contact DePaul's Office of Research Services if:

Your questions, concerns, or complaints are not being answered by the research team.
You cannot reach the research team.
You want to talk to someone besides the research team.

You will be given a copy of this information to keep for your records.

Statement of Consent from the Subject:

I have read the above information. I have had all my questions and concerns answered. By signing below, I indicate my consent to be in the research.

Printed name: _____

Date: _____

B. Observation protocol

OBSERVATION PROTOCOL

STEP 1: INTRODUCTION
Introduce yourself and the project
My name is _____. Thank you for meeting with me today. I'm
working on a DePaul research project about the process of searching for jobs online. I would like to
know more about how you search for career opportunities that fit your needs.

Explain the purpose of the project
The research conducted today will be used for our school project and
only our team will know your identity. Outside of our team, your
identity will remain confidential. The purpose of this study is we are
trying to understand the process of searching for a job online that cooperates with your location and
schedule. We are interested in observing all of the steps users take in this process. With these
observations, our goal is to answer our research question: How can the job search process be
improved for users who have flexibility with location?

Explain what will happen
There are no right or wrong ways to carry out an activity, or right or
wrong answers to my questions; We'll simply observe your actions as a user interacting with your
preferred systems. As you perform the activity, your actions and comments will be noted and you will
be asked to describe what
you are doing. You may be asked questions before, during, or after
performing the activity. This meeting shouldn't last longer than 30 minutes.

Informed consent
This activity is voluntary. You have the right not to demonstrate any
activity or answer any question, and to stop the inquiry at any time or
for any reason. Your actions and responses will be confidential and
used only in connection with this class assignment. Only your first
name will be used to identify you. If you wish, you can use a
pseudonym rather than your real name.

Give participant the informed consent form

Please read over the informed consent form and feel free to ask any questions.

STEP 2: WARM-UP
Establish a rapport with the participant
To make the participant feel more comfortable during the activity, let them understand (again) that no
one can (or will) observe their actions except our group or the professor. Feel free to reiterate any
consent details the participant is confused with. Let the participant know that they can forego typing
any highly personal details into forms when carrying out the activity.

Question:
Are you actively seeking employment?

Question:
Have you had issues in the past with applying for jobs online?

Question:
What sites are you familiar with using to apply for jobs online?

STEP 3: OBSERVATION

Let's move on to the activity. In the next 15 minutes, we'd like to
observe how you'd search for a job from the very beginning of the process. We'll set up screen sharing so there's no need to tell us what you're doing, as we'll be able to see just fine. Feel free to make comments. We won't help with navigation but can answer questions if necessary. Do you have any questions before we get started?

Pause for questions

Great! Let's get started.

> *If participant noted in Warm-Up that they are currently looking and know what cities, have them search with those cities in mind:*
> I know you said you have been looking for a job and know what cities you're interested in…
>
> *If participant does not have cities in mind, have them pick 3 cities they are interested in:*
> Think of 3 cities you would be interested in working in…

Question:
...What are your priorities when comparing job options?
[Note down]

Now can you show me how you would search for a job?

Observe the participant
Let the participant perform the activity. Only interrupt if absolutely
necessary. Take note of your questions and save them for the wrap-up.

STEP 4: WRAP-UP
Follow-up Questions
I have some follow-up questions I'd like to ask:
Ask any specific questions you wrote down during observation.

Examples below:

"Can you clarify why you do this?"

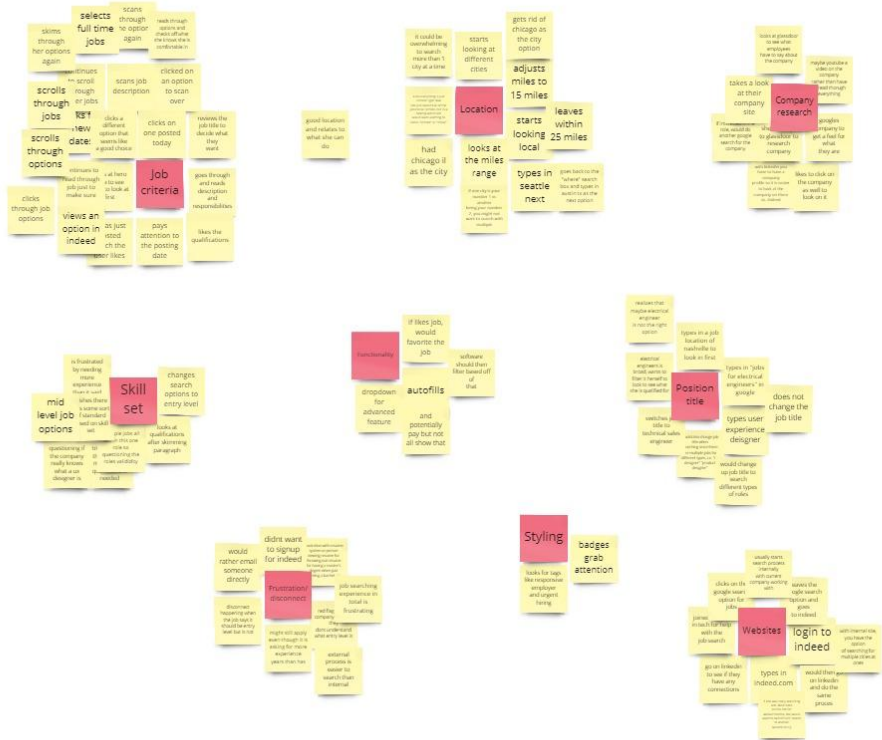"I noticed you initially selected [blank], why is that?"

Participant's questions
Do you have any questions for me at this time?

Answer questions

Alright, that's all for the activity. Thank you so much for participating, we may contact you again for a follow-up in the coming weeks. Have a great rest of your day and thank you again!

C. Affinity diagram - Observations

D. Informed consent blanks - Interview

ADULT CONSENT TO PARTICIPATE IN RESEARCH

Online Job Searching

Principal Investigator: Ava Allen

Institution: DePaul University, Chicago, Illinois, USA

College: College of Computing and Digital Media (CDM)

Faculty Advisor: Andrea Sanders

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research is being supervised by his/her faculty advisor, Andrea Sanders. There may be other people on the research team assisting with the study.

We hope to include about 8 people in the research.

Why are you being asked to be in the research?
You are invited to participate in this study because you are searching for a job or have searched recently for a job in your desired field. You must be age 18 or older to be in this study. This study is not approved for the enrollment of people under the age of 18.

What is involved in being in the research study?
If you agree to be in this study, being in the research involves an interview of your online job search habits specific to searching in multiple locations. At the end we will have wrap up questions and you will have the chance to ask us any questions you have.

The interview will be screen recorded and transcribed into written notes later in order to get an accurate record of what you said and your actions performed during the observation.

Are there any risks involved in participating in this study?
You may feel uncomfortable or embarrassed about the interview taking place, but we are simply asking that you treat this as an ordinary job search that you have done or will do in the future. You do not have to answer any question asked if you do not want to.

We cannot promise complete confidentiality for the information you tell us, because everyone in the focus group will hear what you have said and it is possible that they may repeat something you said to someone outside the group.

Are there any benefits to participating in this study?
You will not personally benefit from being in this study.

We hope that what we learn will help contribute towards greater knowledge to be gained on the subject of online job searches.

How much time will this take?
The interview will take about 30 minutes of your time.

Other Important Information about Research Participation
Can you decide not to participate?
Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences, penalties, or loss of benefits if you decide not to participate or change your mind later and withdraw from the research after you begin participating.

You may withdraw from the research at any time.

The researcher may remove you from the study without your consent, if you do not follow the instructions, if your situation changes and you no longer meet the inclusion criteria for the study, or you are no longer able to complete the study tasks.

Who will see my study information and how will the confidentiality of the information collected for the research be protected?

The research records will be kept and stored securely. Your information will be combined with information from other people taking part in the study. When we write about the study or publish a paper to share the research with other researchers, we will write about the combined information we have gathered. We will not include your name or any information that will directly identify you. Some people might review or copy our records that may identify you in order to make sure we are following the required rules, laws, and regulations. For example, the DePaul University Institutional Review Board may review your information. If they look at our records, they will keep your information confidential.

To prevent others from accessing our records or identifying you should they gain access to our records, we have put some protections in place. These protections include using a code (a fake name, a study ID number, etc.) for you and other people in the study and keeping the records in a safe and secure place using a password protected computer, encrypting our records, etc.

The recordings will be kept until accurate written notes have been made, then they will be destroyed.

You should know that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court or to tell authorities if you report information about a child being abused or neglected or if you pose a danger to yourself or someone else.

Please be aware that disclosing experiences with sexual or relationship violence during the course of research does not constitute a formal report to the University and will not begin the process of DePaul providing a response. If you are seeking to report an incident of sexual or relationship violence to DePaul, you should contact Public Safety (Lincoln Park: 773-325-7777; Loop: 312-362-8400) or the Dean of Students and Title IX Coordinator (Lincoln Park: 773-325-7290; Loop: 312-362-8066 or titleixcoordinator@depaul.edu). Individuals seeking to speak confidentially about issues related to sexual and relationship violence should contact a Survivor Support Advocate in the Office of Health Promotion & Wellness for information and resources (773-325-7129 or hpw@depaul.edu). More information is available at http://studentaffairs.depaul.edu/hpw/shvp.html. Individuals are encouraged to take advantage of these services and to seek help around sexual and relationship violence for themselves as well as their peers who may be in need of support.

If you do disclose an experience with sexual or relationship violence, we will also provide you with a resource sheet containing this information at the end of the study.

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about the study or you want to get additional information or provide input about this research, you can contact the researcher at [Ava Allen - aallen42@depaul.edu
Erika Brentar - ebrentar@depaul.edu
Joey Reyes - jreyes81@depaul.edu
Miguel Rodriguez - mrodr119@depaul.edu]

You will be given a copy of this information to keep for your records.

Statement of Consent from the Subject:

I have read the above information. I have had all my questions and concerns answered. By signing below, I indicate my consent to be in the research.

Printed name: _____

Date: _____

E. Interview Protocol/Script

Research questions:

- **How can the job search process be improved for users who have flexibility with location?**
    - What are user needs when searching for jobs across multiple states?
    - How do people use search filters to find relevant job listings?

Screener questions:
- Are you currently searching for a job online?
- Have you searched for a job online in the past year?
- Have you searched for jobs in more than one location?
- Are you over the age of 18?

STEP 1: INTRODUCTION

Introduce yourself and the project
My name is _____. Thank you for meeting with me today. I'm working on a DePaul research project about the process of searching for jobs online. I would like to know more about how you search online for job opportunities.

Explain the purpose of the project

The research conducted today will be used for our school project and only our team will know your identity. Outside of our team, your identity will remain confidential. The purpose of this study is that we are trying to understand the process of searching for a job online that cooperates with your location and schedule. We are interested in hearing your opinion in this process.

With these interview questions, our goal is to answer our main research question: How can the job search process be improved for users who have flexibility with location?

Explain what will happen

There are no right or wrong answers to my questions; We'll simply ask questions about your actions pertaining to job searching with your preferred systems. Your responses will remain confidential. As you answer each question, your comments will be noted and we may ask follow-up or clarification questions. This meeting shouldn't last longer than 30 minutes.

Informed consent

This activity is voluntary. You have the right not to demonstrate any activity or answer any question, and to stop the inquiry at any time or for any reason. Your actions and responses will be confidential and used only in connection with this class assignment. Only your first name will be used to identify you. If you wish, you can use a pseudonym rather than your real name.

{Give participant the informed consent form}

Please read over the informed consent form and feel free to ask any questions.

STEP 2: WARM-UP

Establish a rapport with the participant

To make the participant feel more comfortable during the activity, let them understand (again) that no one can (or will) observe their actions except our group or the professor. Feel free to reiterate any consent details the participant is confused with. Let the participant know that they can forego providing any highly personal details regarding their job search when answering questions.

We have a few questions we'd like to begin with:

Questions:

- What is your current job title?
- How long have you been working in this role?
- When was the last time you searched for a job online?
- What has been your overall experience searching for jobs online?

STEP 3: DEEP FOCUS

Great. Let's move on to some more deep focus questions. Please let us know at any point if you need clarification on any of our interview questions asked.

Questions:

- **I would like to start by understanding a bit more about how you search for jobs**

    - Thinking about the last time you searched for a job online, what did your job search process look like? What search filters did you use to find jobs you were interested in?"
    - What was the most important search filter for you?
    - What were the least important search filter for you?
    - What do you do after a job posting catches your eye?

- **Next, I have a few questions with regard to your location during the job search**

    - How do you feel about relocating for a job?
    - How do you feel about working in a city outside of where you currently live?
    - Some people might be interested in working only in specific cities, others might be interested in working anywhere within a general geographic region, and others might be open to relocation anywhere within the U.S. Which of these descriptions would you say best describes you?
        - Tell me more about that.
    - Earlier you mentioned that you have searched for jobs across multiple cities. I'd like to learn more about your experience finding job opportunities across different locations.
        - How do you search for jobs in multiple locations?
        - Do you keep track of jobs you are interested in that are in different locations?
            - If so, how?
        - When you are searching for jobs in multiple cities, do you have a preferred location out of the choices?

- ■ Have you experienced any challenges related to searching for jobs across multiple locations?

- **Now I'd like to transition to asking you more about how you use job titles when searching for jobs online**
  - ○ Thinking about the last time you searched for a job online, what types of job titles did you search for?
    - ■ [If more than one title is mentioned] What motivated you to search for multiple job titles rather than just one?
    - ■ How did you know which job titles would be appropriate to use?
    - ■ Can you describe your process of searching for jobs using multiple job titles?
    - ■
  - ○ How easy or difficult was it to find jobs you were qualified for based on the job titles you entered?
  - ○ Have you ever searched using multiple job titles while also searching for jobs in more than one location? What did this process look like for you?
    - ■ Did you experience any challenges during this process?

- **Finally, I have a few questions on having information autofill during your job searches**

  [note if they have questions on what we mean by this, we are referring to having job search information autofill for the user based on their previous searches]

  - ○ Have you ever had your information autofill during your online job search based on your previous searches?
    - ■ If so, how did you feel about that experience?
      - ● What do you like about that? Dislike?
    - ■ If you haven't, what would you expect to happen?
      - ● What advantages, if any, would you expect to experience by having a site autofill your information based on previous searches?
      - ● What disadvantages, if any, would you expect to experience by having a site autofill your information based on previous searches?
    - ■ What job search websites have you noticed your information autofill on?

STEP 4: WRAP-UP

Follow-up Questions

Thanks for your answers on those. Before we finish our interview, I have some follow-up questions I'd like to ask:
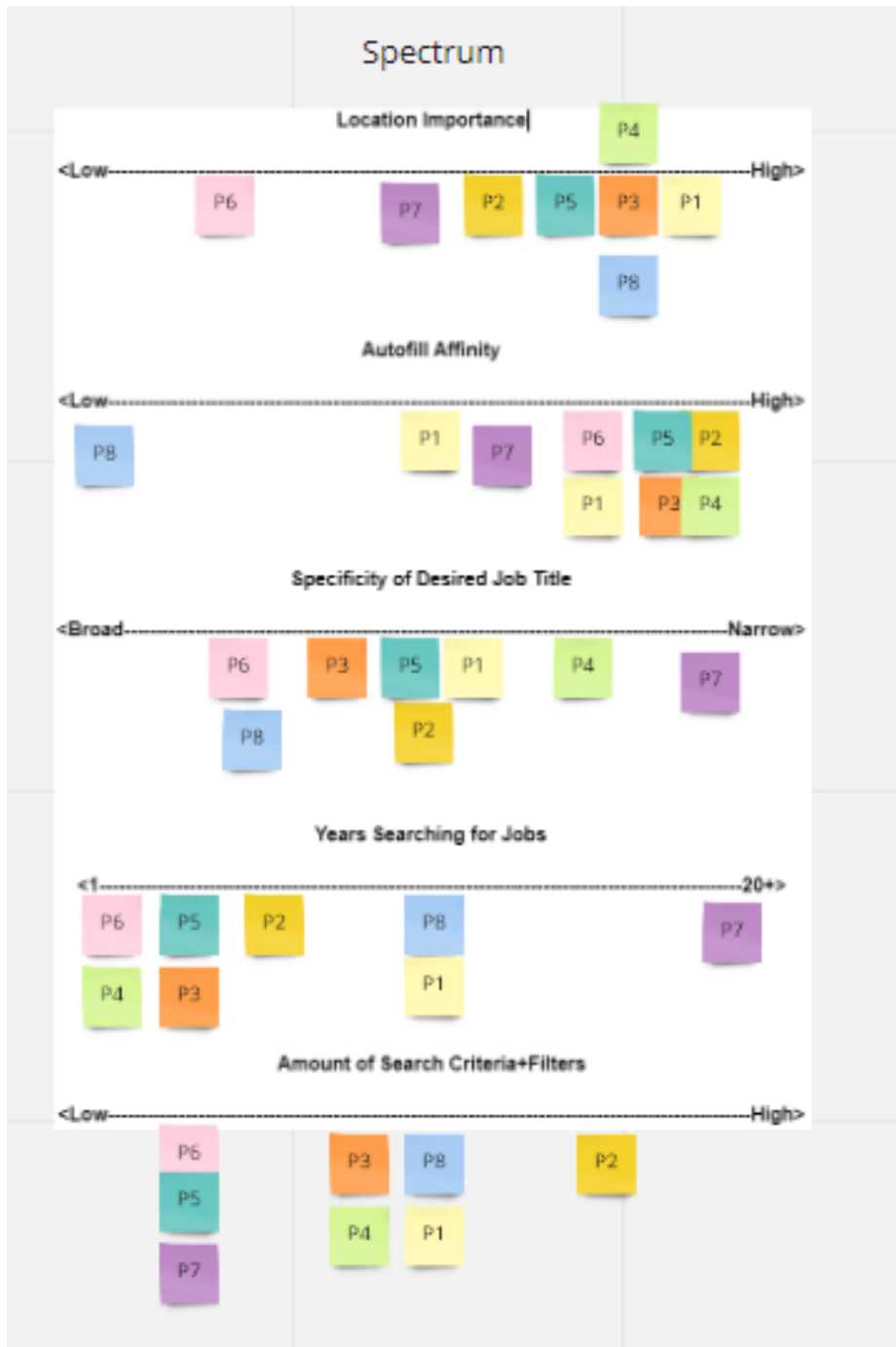
Questions:

- What, if anything, is the most frustrating to you about using job sites?What features are the most important to you on job sites?
- What, if anything, could improve your experience of finding and applying to jobs online?
- Is there anything you feel I should have asked about the online job search with regard to location that I did not ask?
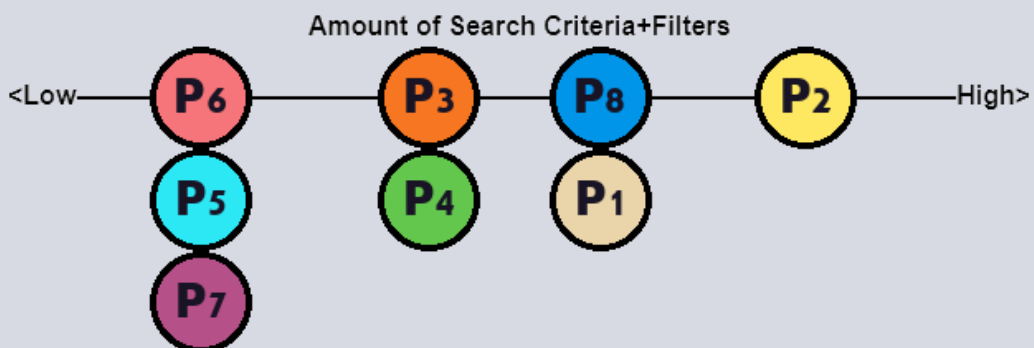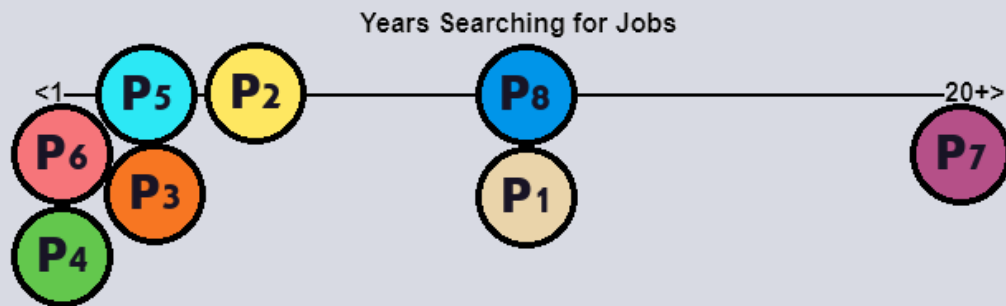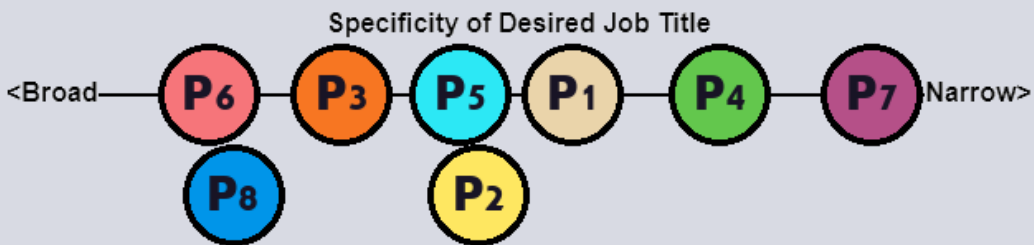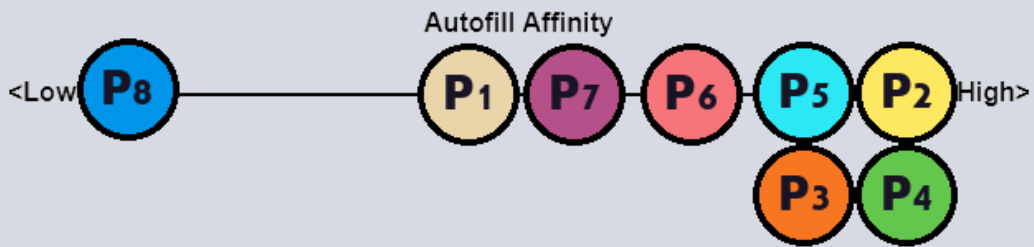- Is there anything you would like to ask me about our research project?

Alright, if you have no other questions for me, then those are all the questions we have for you today. Thank you so much for participating, we may contact you again for a follow-up in the coming weeks. Have a great rest of your day and thank you again!

F. Affinity Diagram - Interviews

G. Spectrum

Spectrum

Location Importance

<Low--High>

P4, P6, P7, P2, P5, P3, P1, P8

Autofill Affinity

<Low--High>

P8, P1, P7, P6, P5, P2, P3, P4

Specificity of Desired Job Title

<Broad--Narrow>

P6, P8, P3, P5, P2, P1, P4, P7

Years Searching for Jobs

<1--20+>

P6, P5, P2, P4, P3, P8, P1, P7

Amount of Search Criteria+Filters

<Low--High>

P6, P5, P7, P3, P8, P4, P1, P2

Location Importance

<Low — P6 — P7 P2 P5 P3 P1 — High>
P4
P8

Autofill Affinity

<Low P8 — P1 P7 P6 P5 P2 High>
P3 P4

Specificity of Desired Job Title

<Broad — P6 — P3 — P5 P1 — P4 — P7 Narrow>
P8 P2

Years Searching for Jobs

<1 — P5 P2 — P8 — 20+>
P6 P7
P3 P1
P4

Amount of Search Criteria+Filters

<Low — P6 — P3 P8 — P2 — High>
P5 P4 P1
P7

H. Informed consent blanks - Survey

ADULT CONSENT TO PARTICIPATE IN RESEARCH

Online Job Searching

Principal Investigator: Ava Allen, Erika Brentar, Joey Reyes, Miguel Rodriguez

Institution: DePaul University, Chicago, Illinois, USA

College: College of Computing and Digital Media (CDM)

Faculty Advisor: Andrea Sanders

Key Information:

What is the purpose of this research?
We are asking you to be in a research study because we are trying to learn more about online job searching. This study is being conducted by Ava Allen, Erika Brentar, Joey Reyes, and Miguel Rodriguez at DePaul University as a requirement to obtain his/her master's/doctoral degree. This research is being supervised by his/her faculty advisor, Andrea Sanders. There may be other people on the research team assisting with the study.

We hope to include at least 30 people in the research.

Why are you being asked to be in the research?
You are invited to participate in this study because you are searching for a job or have searched recently for a job in your desired field. You must be age 18 or older to be in this study. This study is not approved for the enrollment of people under the age of 18.

What is involved in being in the research study?
If you agree to be in this study, being in the research involves completion of a survey on your online job search habits specific to searching in multiple locations. At the end, you will have the chance to ask us any questions you have via input field.

The survey will be filled out via Qualtrics and will be anonymous.

Are there any risks involved in participating in this study?
You do not have to answer any question asked if you do not want to. For questions that are required, there is an opt-out option.

Are there any benefits to participating in this study?
You will not personally benefit from being in this study.

We hope that what we learn will help contribute towards greater knowledge to be gained on the subject of online job searches.

How much time will this take?
The survey will take about 20 minutes of your time.

Other Important Information about Research Participation
Can you decide not to participate?
Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences, penalties, or loss of benefits if you decide not to participate or change your mind later and withdraw from the research after you begin participating.

You may withdraw from the research at any time.

The researcher may remove you from the study without your consent, if you do not follow the instructions, if your situation changes and you no longer meet the inclusion criteria for the study, or you are no longer able to complete the study tasks.

Who will see my study information and how will the confidentiality of the information collected for the research be protected?
The research records will be kept and stored securely. Your information will be combined with information from other people taking part in the study. When we write about the study or publish a paper to share the research with other researchers, we will write about the combined information we have gathered. We will not include your name or any information that will directly identify you. Some people might review or copy our records that may identify you in order to make sure we are following the required rules, laws, and regulations. For example, the DePaul University Institutional Review Board may review your information. If they look at our records, they will keep your information confidential.

To prevent others from accessing our records or identifying you should they gain access to our records, we have put some protections in place. These protections include using a code (a fake name, a study ID number, etc.) for you and other people in the study and keeping the records in a safe and secure place using a password protected computer, encrypting our records, etc.

The recordings will be kept until accurate written notes have been made, then they will be destroyed.

You should know that there are some circumstances in which we may have to show your information to other people. For example, the law may require us to show your information to a court or to tell authorities if you report information about a child being abused or neglected or if you pose a danger to yourself or someone else.

Please be aware that disclosing experiences with sexual or relationship violence during the course of research does not constitute a formal report to the University and will not begin the process of DePaul providing a response. If you are seeking to report an incident of sexual or relationship violence to DePaul, you should contact Public Safety (Lincoln Park: 773-325-7777; Loop: 312-362-8400) or the Dean of Students and Title IX Coordinator (Lincoln Park: 773-325-7290; Loop:

312-362-8066 or titleixcoordinator@depaul.edu). Individuals seeking to speak confidentially about issues related to sexual and relationship violence should contact a Survivor Support Advocate in the Office of Health Promotion & Wellness for information and resources (773-325-7129 or hpw@depaul.edu). More information is available at http://studentaffairs.depaul.edu/hpw/shvp.html. Individuals are encouraged to take advantage of these services and to seek help around sexual and relationship violence for themselves as well as their peers who may be in need of support.

If you do disclose an experience with sexual or relationship violence, we will also provide you with a resource sheet containing this information at the end of the study.

Who should be contacted for more information about the research?
Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study or you want to get additional information or provide input about this research, you can contact the researcher at

[Ava Allen - aallen42@depaul.edu
Erika Brentar - ebrentar@depaul.edu
Joey Reyes - jreyes81@depaul.edu
Miguel Rodriguez - mrodr119@depaul.edu]

You will be given a copy of this information to keep for your records.

Statement of Consent from the Subject:

I have read the above information. I have had all my questions and concerns answered. By signing below, I indicate my consent to be in the research.

Printed name: _____

Date: _____

I. Survey Questionnaire

Introduction

We are asking you to participate in this survey study because we would like to better understand people's experiences when searching for a job in multiple locations. This study is being conducted by Ava Allen, Erika Brentar, Joey Reyes and Miguel Rodriguez.

To participate in the study, you must meet the following requirements

- Have you searched for jobs in more than one location?
- Are you over the age of 18?
- Are you currently searching for a job online?
  OR
- Have you searched for a job online in the past year?

This survey will take approximately 30 minutes of your time. Your responses will remain completely anonymous, and we will not collect any private, identifiable information. Your participation is voluntary, and you can exit the survey at any time.

By clicking next, you agree to participate in the survey.

Survey Questions

WARM UP			
Question	Instructions	Answer	Rationale
What is your current job title?	Text entry	Open ended	To identify current groups of workers responding to the survey
How long have you been working in this role?	Select one	Scale 1. 0-1 years 2. 2-4 years 3. 5-7 years 4. 8-10 years 5. 11+ years	To determine if years of experience has any correlation with how they search for jobs in multiple locations
When was the last time you searched for a job online?	Select one	Scale 1. Less than a week ago 2. 1-2 weeks ago 3. 3-4 weeks ago 4. 2-4 months ago 5. 5-7 months ago 6. 8-10 months ago 7. 11+ months ago	To identify if last time searched has any effect on response
How would you describe your overall experience searching for jobs online?	Select one	Scale 1. Negative 2. Somewhat negative	To gather a brief understanding of users job search and identify a sentiment

		3. Neutral 4. Somewhat positive 5. Positive 6. I don't know	

How users search for jobs			
Question	Instructions	Answer	Rationale
How important are each of the following job search filters for you?	Matrix 1. Job Title 2. Job Location 3. Experience required 4. Salary range 5. Proximity (distance from job location) 6. Date job listing was posted 7. Company 8. Benefits 9. Industry	10. Not at all important 11. - 12. Somewhat important 13. - 14. Very important 15. I don't know	To understand what filters users use most and least in their search while also comparing the features against each other
Tell me more about the filters you ranked as most important. Why are these filters most important in your job search?	Text input	Open ended	To gather a deeper understanding on their most important filter
If you had any filters ranked as not very important, why are those not important in your job search?	Text input	Open ended	To gather a deeper understanding on their least important filter

Location during job search			
Question	Instructions	Answer	Rationale
Thinking about the last time you were job hunting, how many different cities did you consider during your job search?	Select one	1. 1 2. 2 3. 3 4. 4 5. 5 6. 6+ 7. I don't know	To identify the amount of places users generally search in

How open are you to relocating for a job?	Select one	Scale 1. Not at all open 2. - 3. Somewhat open 4. - 5. Very open 6. I don't know	To determine how users feel about relocating
For the previous question, why do you feel this way about relocating for a job?	Text input	Open ended	To understand in more details the user's reasoning for their want for relocation
When you are searching for jobs in multiple cities, do you have a preferred location out of the choices?	Select one	1. Yes 2. No 3. It depends 4. I don't know	To better understand if there is a primary city vs secondary cities
Have you experienced any challenges related to searching for jobs across multiple locations?	Text input	Open ended	To identify if any challenges were missed in our previous questions
How useful for you is it to search for location with the following filters?	Matrix 5. City name (e.g., Chicago) 6. Region (e.g., Midwest) 7. Country (e.g., USA) 8. Distance from preferred location (e.g., within 50 miles of Chicago)	1. Not at all useful 2. - 3. Somewhat useful 4. - 5. Very useful 6. I don't know / no preference	To understand how narrow or broad users search for location
What, if any, out of the previous location filters mentioned do you wish were more commonly available on job search websites? As a reminder, the location filter options include:	Text input	Open ended	To understand if users are interested in different location search options

1. City name (e.g., Chicago) 2. Region (e.g., Midwest) 3. Country (e.g., USA) 4. Distance from preferred location (e.g., within 50 miles of Chicago)			
How interested are you in being able to search for jobs across multiple locations using a single search (e.g., "Copyediting jobs in Chicago or Atlanta")?	Select one	Scale 1. Not very likely 2. Somewhat likely 3. Likely 4. Very likely 5. I don't know	To understand if this is a feature users would be interested in
Do you keep track of jobs you are interested in that are in different locations?	Select one	1. Yes 2. No 3. Sometimes 4. I don't know	To identify if users keep track of their job searches

Job title when searching multiple locations			
Question	Instructions	Answer	Rationale
How often do you search for jobs using more than one job title? For example, this can include searching for completely separate job roles (e.g., "Copywriter" vs "Adjunct Professor") or similar job roles that may have different job titles (e.g., "Copy editor" vs "Copywriter")	Choose one	1. Rarely 2. - 3. Sometimes 4. - 5. Always 6. I don't know	To understand how often users are searching multiple job titles over multiple locations
How convenient or inconvenient is the process of searching for jobs across multiple job titles?	Choose one	1. Not at all convenient 2. - 3. Somewhat convenient 4. -	To understand how the current job title search process is for multiple locations

		5. Very convenient 6. I don't know	
Autofill with search criteria			
Question	Instructions	Answer	Rationale
How useful would it be for job websites to autosave your search filters so that you could reuse them in future searches?	Choose one	Scale 1. Not at all useful 2. - 3. Somewhat useful 4. - 5. Very useful 6. I don't know	
Demographics			
Question	Instructions	Answer	Rationale
How old are you?	Text entry	Open ended	To determine if age has any effect on response
What gender do you identify as?	Select one	1. Female 2. Male 3. Nonbinary 4. Prefer not to say	To understand if gender has any correlation with the job search
What level of education have you completed?	Select one	1. High school/GED 2. Some college 3. Associates 4. Bachelors 5. Some postgrad 6. Masters 7. PHD 8. None of the above	To determine if level of education plays a role in the job search process
What is your ethnicity?	Select one	1. American Indian or Alaska Native 2. Asian 3. Black or African American 4. Hispanic or Latino 5. Multiracial 6. Native	To determine if ethnicity plays any factor in the job search

		Hawaiian or Other Pacific Islander 7. South Asian 8. White 9. Prefer not to say	
Tell us about anything you wish to share or add:	Text input	Open ended	To ensure no questions or details have been missed

J. Survey Analysis

Hypothesis 1 Results

Test performed: Kruskal-Wallis (KW) Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Locations is the same across categories of Openness.	Independent-Samples Kruskal-Wallis Test	.373	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

Independent-Samples Kruskal-Wallis Test

Locations across Openness

Independent-Samples Kruskal-Wallis Test Summary

Total N	38
Test Statistic	4.254[a,b]
Degree Of Freedom	4
Asymptotic Sig.(2-sided test)	.373

a. The test statistic is adjusted for ties.

b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

Descriptive Statistics

	Mean	Std. Deviation	N
Locations	2.6842	1.35777	38
Openness	3.6053	1.44333	38

Correlations

		Locations	Openness
Locations	Pearson Correlation	1	.100
	Sig. (2-tailed)		.550
	Sum of Squares and Cross-products	68.211	7.263
	Covariance	1.844	.196
	N	38	38
Openness	Pearson Correlation	.100	1
	Sig. (2-tailed)	.550	
	Sum of Squares and Cross-products	7.263	77.079
	Covariance	.196	2.083
	N	38	38

Hypothesis 2 Results

Test performed: Mann-Whitney U

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Job Location is the same across categories of TEMP GROUP.	Independent-Samples Mann-Whitney U Test	.505[a]	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .050.

a. Exact significance is displayed for this test.
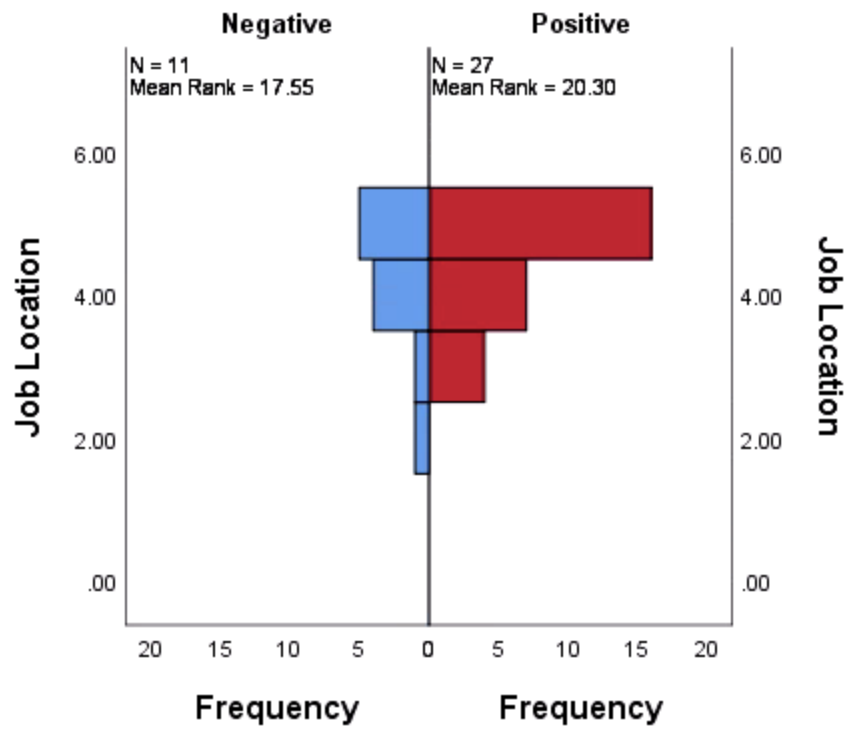
Independent-Samples Mann-Whitney U Test

Job Location across TEMP GROUP

Independent-Samples Mann-Whitney U Test Summary

Total N	38
Mann-Whitney U	170.000
Wilcoxon W	548.000
Test Statistic	170.000
Standard Error	27.879
Standardized Test Statistic	.771
Asymptotic Sig.(2-sided test)	.441
Exact Sig.(2-sided test)	.505

Independent-Samples Mann-Whitney U Test

K. User Flow Diagram