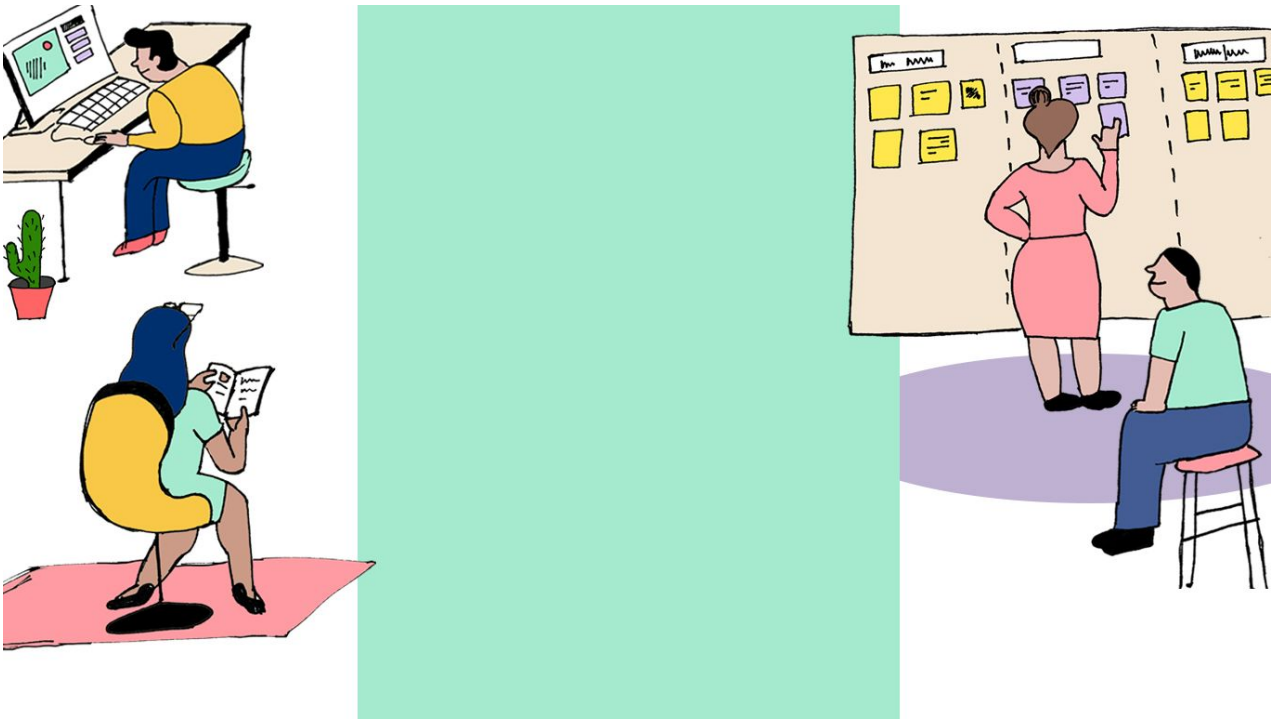
INFOVIZ

Demystifying User Experience

Michelle Chen, Kaushiki Priyam & Varshine Chandrakanthan



Project Goals

The Nielsen Norman Group, considered as a key leader in user-centric design, defines User Experience (UX) as "[encompassing] all aspects of the end-user's interaction with the company, its services, and its products." While this definition covers the nature of UX, it does not reveal what entails a UX practitioner's job and skill sets. As a newcomer to the field, it is easy to want to design products for the user, but it's hard to figure out where you fit the best within the design process. Moreover, compensation differs between various roles and skills, and it can be a driving factor to which position you want to pursue.

This visualization project is aimed at helping prospective and aspiring UX professionals to explore the relationships between UX skills and UX positions, in hopes of demystifying this exciting, emerging field.

The tasks that each visualization is targeted towards are:

1. Educational Background: Explore the educational background of UX professionals The goal of including this visualization is to motivate a person who is interested in UX but unsure if he/she fits into 'the circle of UX'. The user should leave with an impression that UX professionals come from diverse backgrounds and with some noteworthy percentages.

2. Design Process: Design process from Nielsen Norman Group mapped with roles from six chosen companies and design agencies

This infographic comes second in our flow to show the design process from Nielsen Norman Group. The infographic contains six tabs - each dedicated to one company or design agency - and it maps where each industry role fits in the design process.

3. UX Skills Loom Chart: Following the infographic on design process, we have the loom chart of the skills. The skills are pulled from the job descriptions of the 6 companies - 4 technology companies and 2 design agencies. The goal of this visualization is to build on the design process and give an overview of the skills that are regularly employed by each UX role. The users gets two-way flexibility to explore - one by choosing a position which highlights the skills related to that position. Another, by selecting a skill that lets them see the positions that employ it.
4. Salaries Bars: This is a simple yet powerful bar chart that is implemented using Tableau. The goal including this visualization is to inform the users about the salaries in UX field and let them compare it across companies.

Related Work

1) Futureof.design - Kaushiki

Before starting on our own website for Demystifying UX, we browsed through several websites to gather inspirations for our project. One such website that really stood out for us was the Futureof.Design that presents a visual story of Future of Design in startups.

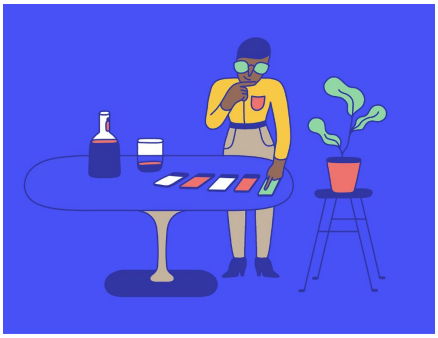
This website is relevant to our final project as its purpose is in line with our goal of understanding how UX operates in the tech ecosystem.

Inspiration 1 - Clear, distinct sections: We acquired the idea of having distinct sections in the website for each topic, after navigating through the Futureof.Design's organisation. Each section deals with only one type of insight, with a clear flow that helps to understand subsequent sections.

Inspiration 2 - Representing salaries data: We were unsure early on whether including salaries data would be relevant for demystifying the field of UX. But after going through the experience of this website, we were convinced in our decision to include the salaries data and bring out the distinctions between different companies.

Inspiration 3 - Illustrations and Color Theme:

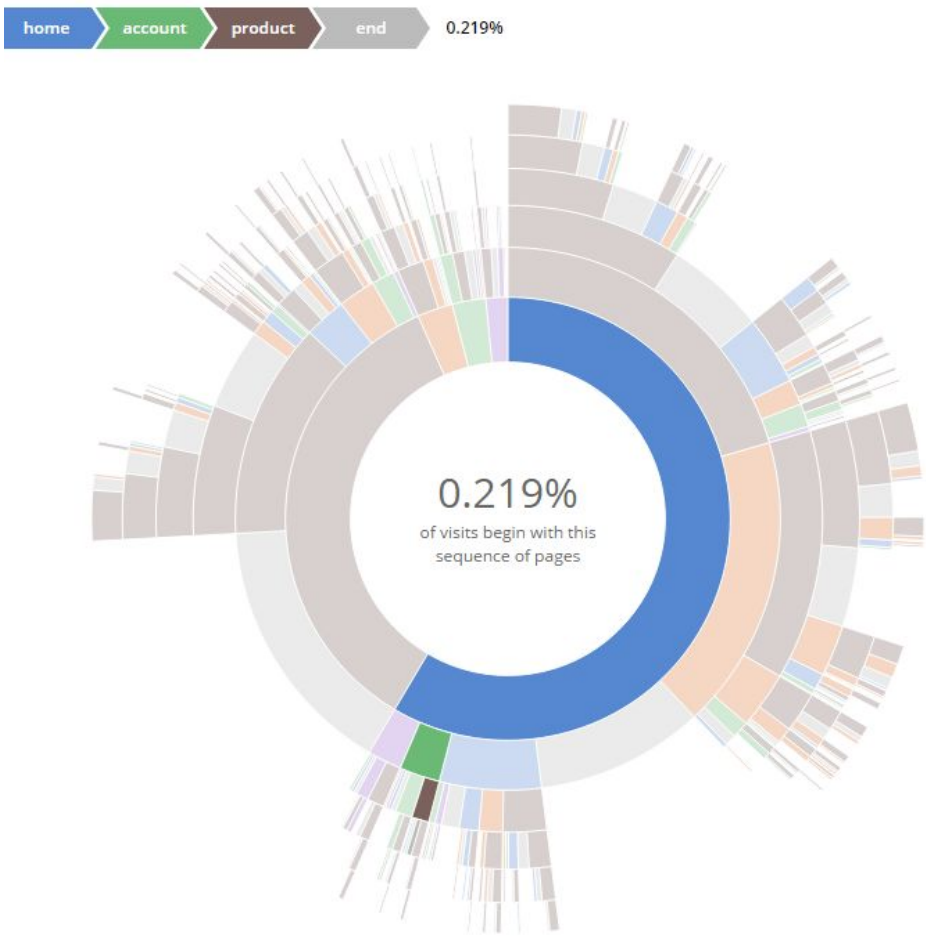
We loved the overall effect of the illustrations and color theme on this website. It felt welcoming and friendly, and that was the feeling we wanted to give our visitors too. Thus, we decided to recreate the illustrations and include them in our website.



2) D3 Sunburst - Kaushiki

Our first section in the visualisation was the educational background from the Nielsen Norman Group survey. We wanted to let the users see the diversity of the educational backgrounds for UX Professionals as well as note the percentages as reported in the survey result. We found an interactive d3 sunburst visualization that would highlight the region being hovered upon and show the percentage related to it which fit our purpose of showing the education backgrounds and its percentages.

Additionally, it also included the breadcrumb trail with the hierarchy of the data.



3) UXPA Careers Survey - Kaushiki

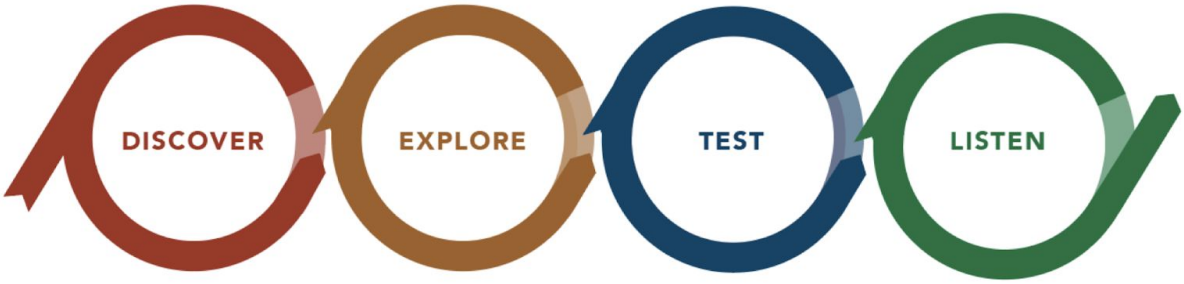
The User Experience Professionals Association (UXPA) conducts survey every year to gather data on the salaries of the UX Professionals. Although the survey data itself didn't make it into our final project (due to unavailability of original dataset and more visibility to data in Nielsen Norman Groups' survey), the survey report for 2016 helped us shape our initial understanding for the salary visualisation.

4) Nielsen Norman Group UX Careers Survey - Varshine

The Nielsen Norman Group put out a survey in 2013 that discussed the education and training of people in UX careers. The survey, that had 963 respondents, covered topics such as what User Experience meant and what activities got covered under it, whether UX professionals are satisfied with their jobs, what education and training they went under and details on landing a good UX jobs. Amongst the topics covered in the survey, data on the education fields was particularly helpful for aspiring UX professionals to understand how they could fit into UX.

5) Nielsen Norman Design Process - Varshine

The process of UX is defined differently by various organizations. We used the structure presented by the Nielsen Norman Group to help create baseline for understanding the what the design process looks like and various activities are carried out under each one of the phases.



6) Company Job Descriptions - Varshine

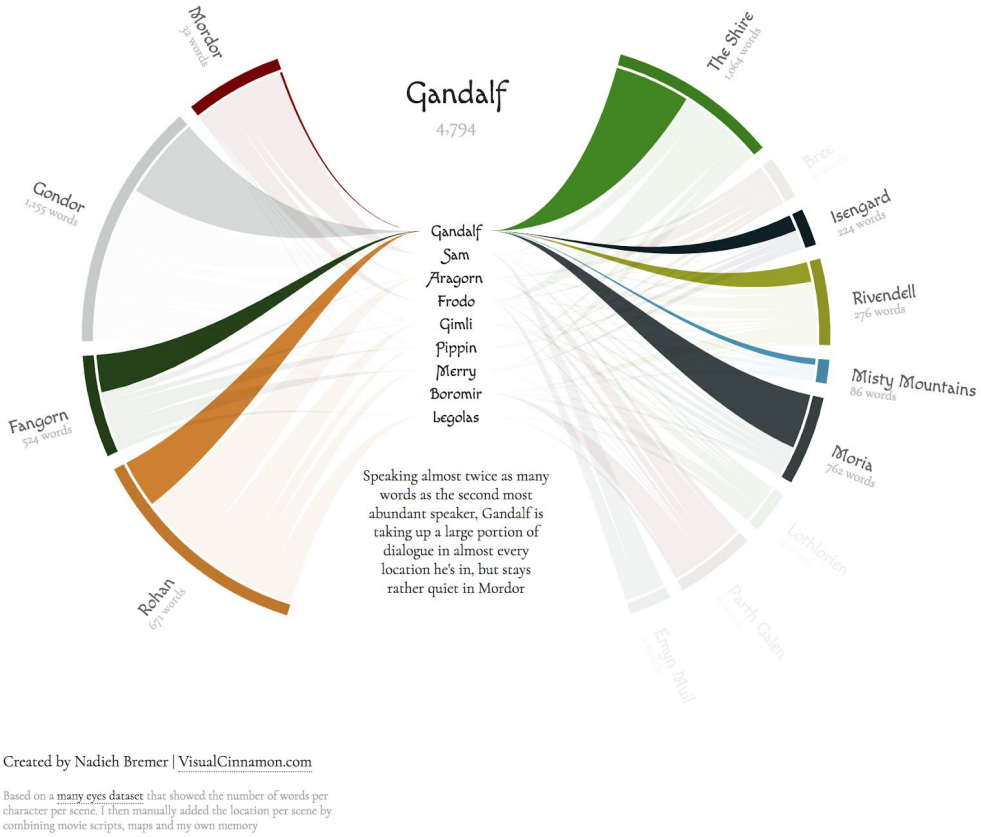
Each of the company job descriptions were extracted from each of the company's career page. The careers page gave us an idea as to how the teams were organized and what terminology was used within the company. For example, from the Google's Career's page, we learnt that all UX roles was under the term "Design" and within Design, the roles were organized into UX Engineer, UX Researcher, Interaction Designer, Motion Designer, Visual Designer and UX Strategist. From the above list we picked roles that included User Experience and dived deeper to understand the skill set needed for each role.

All career pages have been listed under References.

7) D3 Loom Chart - Michelle

We wanted to display information about UX skills in a compelling way, to show what skills different UX position titles require. One of the visualizations we found was the D3 Loom chart, which shows the connections between two groups of entities. One can hover over an item in the inner group (i.e. Gandalf) and see what connections it has to items in the outer group (see figure below). Alternatively, one can also hover over an item in the outer

group (i.e. The Shire), and see how it connects to items in the inner group. We thought we can use this with UX positions as the inner group, and the various skills as the outer group.



8) PayScale.com - Michelle

We wanted to provide salary information on UX positions in some way in our project, since salary is an important factor to consider in a career. We wanted to compare salaries across different UX positions, so we looked at information from PayScale. PayScale collects information on salaries, experience levels, skills, gender, and more through their users' salary profiles, and puts together a page displaying this information for each position title. There were pages for UX Researcher, UX Designer, UX Architect, Product Designer, and more.

9) Glassdoor.com - Michelle

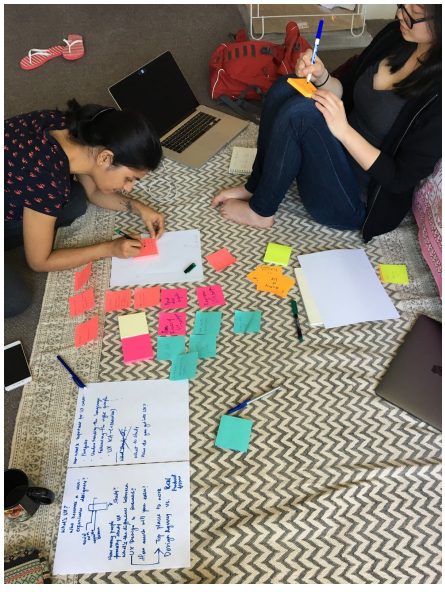
We also wanted to look at salary differences between various companies. For this, we searched for UX position salaries on Glassdoor for the 6 companies and agencies we focused on. For each position title at a company, Glassdoor has a page that breaks down the salary for the position. We were interested in the average base salary for the UX positions, and comparing them between the companies.

Design Process

Overview:

1. Decide the story
2. Gather information
3. Design - Individual Visualisations & Website
4. Create visualizations on tools
5. Website development
6. Evaluation
7. Enhance experience

As we embarked on creating our visualization, we started with determining what information we wanted to share and forming a story with the information. As aspiring UX professionals ourselves, we thought about what information we wished we knew when we first started to consider UX as a field. We wrote down points and created an affinity diagram to see the high-level groups in order to know what data we need in this project.



We then started to create a flow for our project by arranging the order of the groups, in addition to sketching out some visualization ideas.

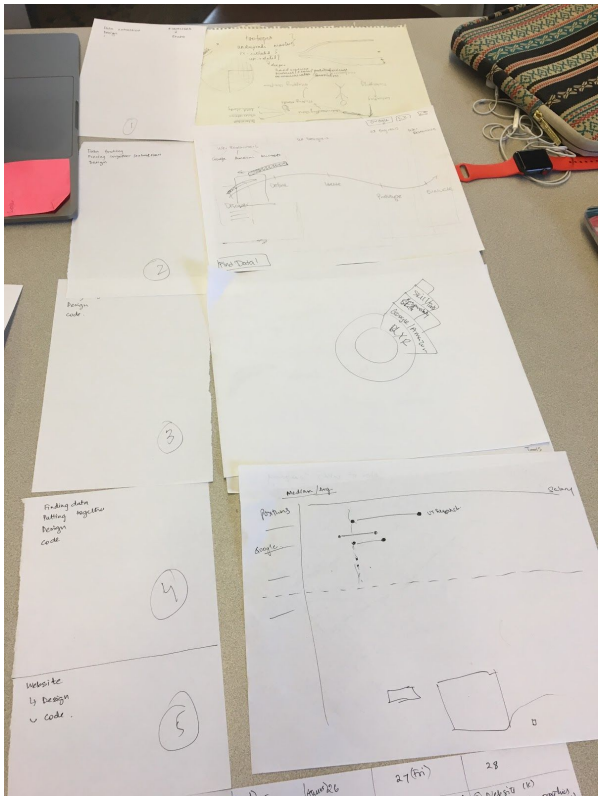
The next step was gathering the data we needed for the visualizations. As mentioned earlier, we looked at data from PayScale, Glassdoor, and job descriptions on company career pages.

UX Jobs Data

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

	A	B	C	D	E	F	G	H
1	Company	Position Title	Average Base Sala	A/B Testing	Analysis	Benchmark s	Brainstormir	Collaboratio
2	Amazon	User Experience Designer	$103,274	No	No	No	No	No
3	Amazon	User Experience Researcher	$119,312	No	No	No	No	No
4	Facebook	Product Designer	$137,688	No	No	No	No	No
5	Facebook	User Experience Researcher	$135,138	No	Yes	No	No	No
6	Google	User Experience Designer	$116,184	No	No	No	No	No
7	Google	User Experience Engineer	$121,567	No	Yes	No	No	No
8	Google	User Experience Researcher	$122,651	Yes	No	Yes	No	No
9	Huge	Interaction Designer	$72,057	No	Yes	No	No	Yes
10	Huge	Product Designer	$73,051	No	No	No	No	No
11	IDEO	Interaction Designer	$80,287	No	No	No	No	Yes
12	IDEO	User Experience Designer	$80,500	No	Yes	No	No	Yes
13	IDEO	User Experience Researcher	$90,856	No	No	No	Yes	Yes
14	Microsoft	User Experience Designer	$103,953	Yes	Yes	No	Yes	Yes
15	Microsoft	User Experience Researcher	$111,399	Yes	No	Yes	No	No
16			Stage 1	Test	Explore	Test	Explore	N/A
17			Stage 2		Test			
18			Stage 3		Listen			

As we collected data, we continued to iterate on our design based on what is feasible with the data that we have gathered. We also searched for inspiration on visualizing the data, such as looking at the D3 Sunburst and D3 Loom charts, and charting out a Tableau dashboard. We then created a paper prototype with a plan on what kind of visualization each section would contain.



From there, we distributed the work and implemented the visualizations in D3, Tableau, and Illustrator. As we progressed, we built the website to embed and display the visualizations. Finally, we worked on the text copy for the descriptions to introduce the overall site, as well as the individual sections.

Visualizations

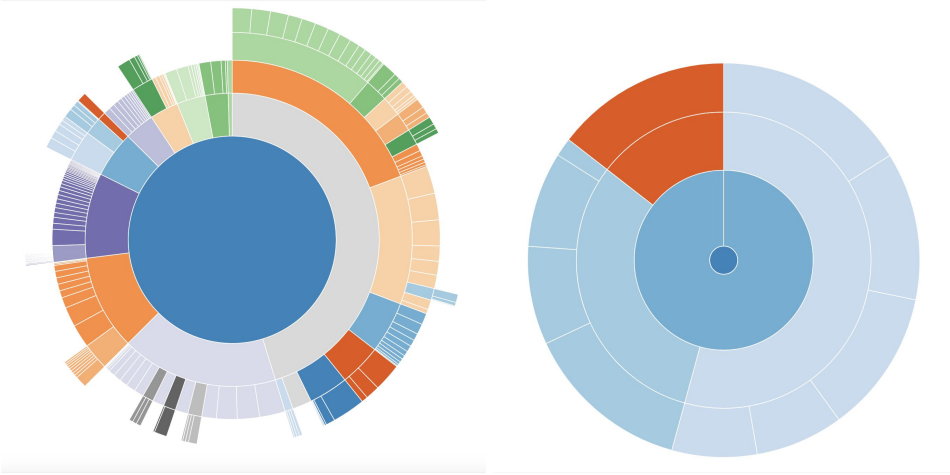
UX Professionals Education Background Sunburst

Data: Nielsen Norman Group Survey Report

Tools: D3.js, HTML5/CSS3

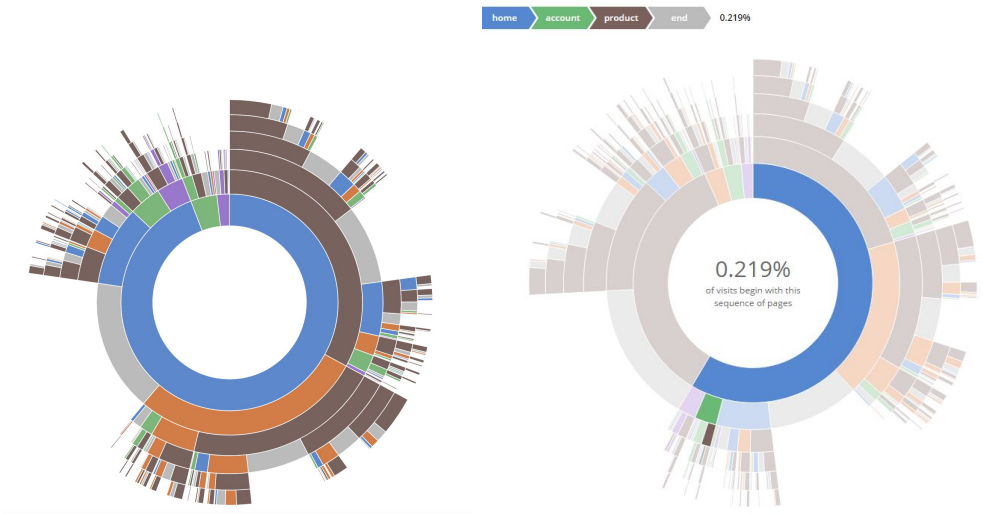
How we went about building it: This visualization was built with the goal of providing clarity on the educational background of the UX professionals, in a way that gives a feeling to the viewer about their fit in UX despite being from an unrelated background. We wanted the user to explore this chart for all fields and note some percentages as an insight from the chart. Thus, we decided to build an interactive chart.

For this we started with the zoomable sunburst chart in d3 made by Mike Bostock. The zoomable sunburst had the typical hierarchical structure of a sunburst with the capacity to zoom in on any content.



Zoomable sunburst in action: Clicking on a node zooms the chart in to that node. Can get confusing.

After trying out the visualization for our educational dataset, we realized that the visualization can get confusing for the visitors, and adding the descriptions and percentages to it would only make it worse. Thus, we decided to go for a simpler interactive layout in which the nodes have a fixed location and the percentages are shown in the center.

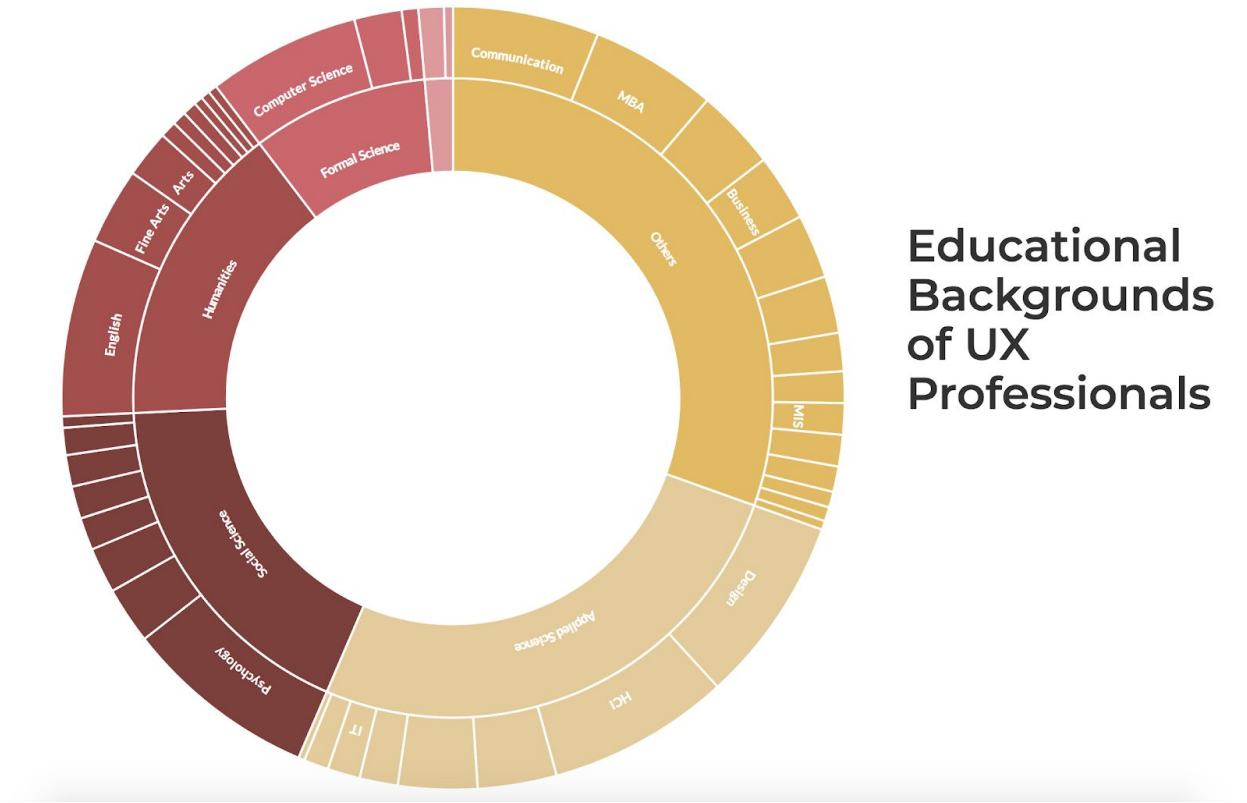


Sequences sunburst by Kerry Rodden[1]: Clean layout with ample space to show the descriptions. Breadcrumb and highlighting adds to the clarity of the visualization during interaction.

The main challenge after finding the suitable visualization was to fit the text in the shape of an arc in the circles. I reviewed the text on an arc tutorial by Visual Cinnamon[2] which helped me fully understand the path variable in d3.

[1] https://bl.ocks.org/kerryrodden/766f8f6d31f645c39f488a0befa1e3c8
[2] https://www.visualcinnamon.com/2015/09/placing-text-on-arcs.html

After writing the path code and integrating it each dataset in the sunburst. We had the final visualisation. In this, the users could hover over a field to highlight it and see the related data in the center of the sunburst.



UX Professionals Educational Background Sunburst: Gives a snapshot of the backgrounds of UX professionals and lets the user explore the rest - revealing the percentages as they explore.

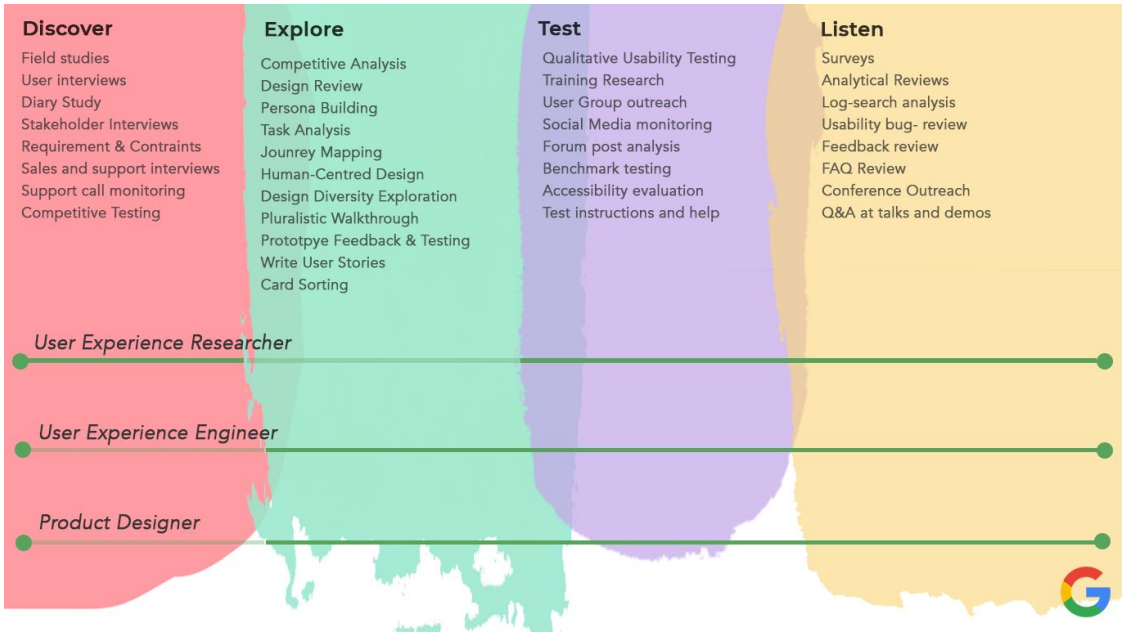
Design Process Infographic

Data: Nielsen Norman chart on “UX Activities in the Product and Service design cycle”. Skills required for each role was extracted from the company’s career pages.

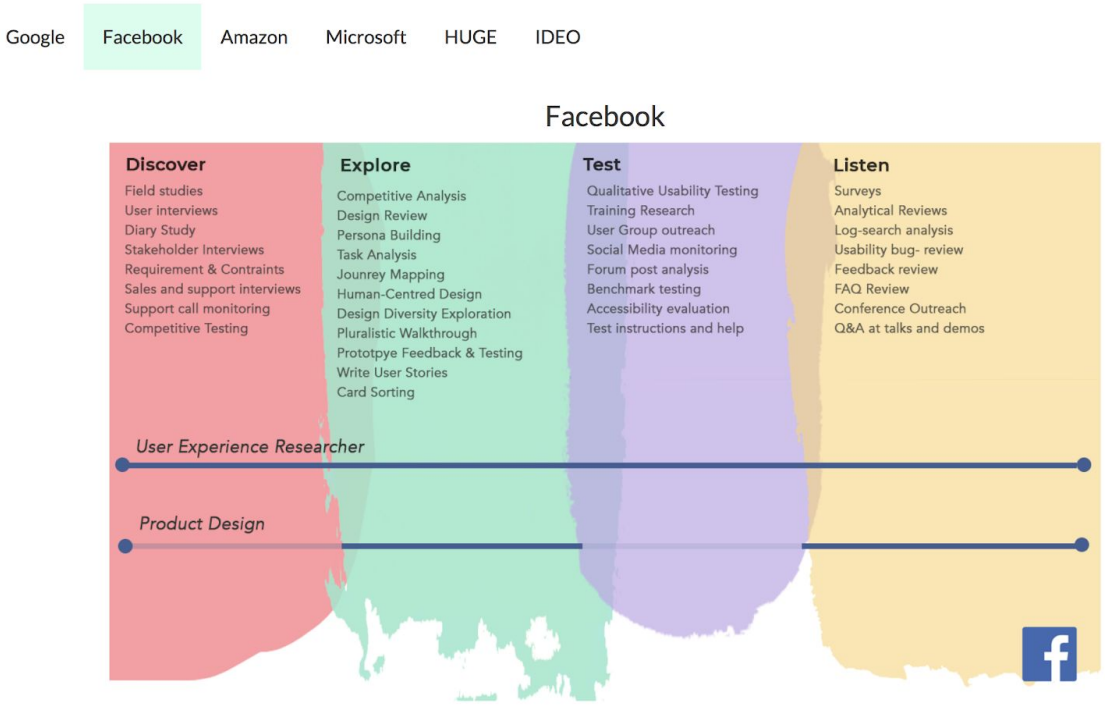
Tools: Adobe Photoshop, Google Sheets, HTML Tabs

How we went about building it: This infographic provides a baseline for the UX process which is provided by Nielsen Norman Group and the ability to compare how different positions across companies play a role at each of these the step in the Design Process. The information provided by the Nielsen Norman Group of the typical UX process and the methods involved at each step is matched with the different skills that job descriptions provide for roles within their company. The step is followed by mapping each individual role to various steps within the design process. After following the above steps, we represented the roles of each company across the process, highlighting phases where they would play a pivotal role and indicating phases where they would be in the background.

Example: After understanding the different phases within the Design Process, the viewer can choose a company of interest - in this cases Google. From the graph, it can be seen that a person who worked as a UX Researcher at Google would play a pivotal role during the Design, Test and Listen phases, but will remain in the background for the Explore phase. A person who worked as UX Engineer would be active during the Explore, Test and Listen phase but remain in the background during the Discover phase.



Snapshot of infographic per company. This one shows various roles in UX at Google.



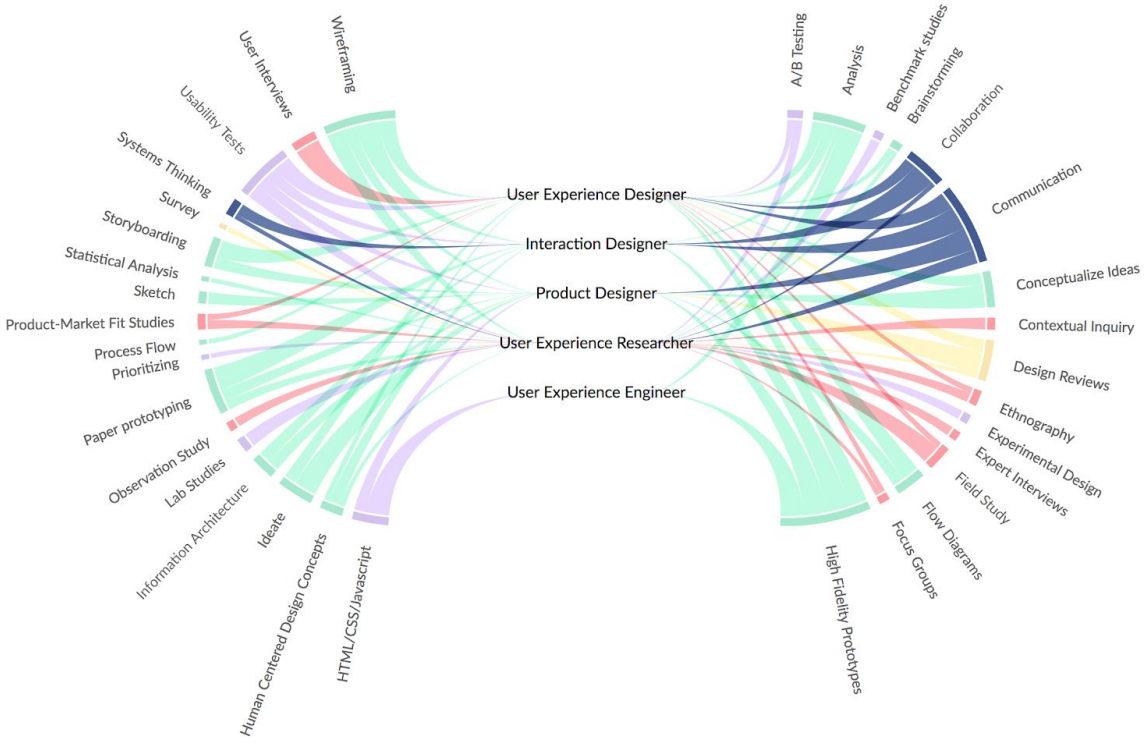
Tabbed infographic for each company. Users can select the company from the tabs on top.

UX Skills Loom Chart

Data: Company Job Descriptions, Nielsen Norman Group Design Process

Tools: D3.js, HTML5/CSS3

How we went about building it: The Loom chart displays information on which skills are mentioned in the job descriptions of specific UX job titles across the companies we looked into. Drawing guidance from Nadieh Bremer's d3.loom chart[3], we designated the different UX position titles as the inner group, and the skills as the outer group. Hovering over an item displays its connections to other items in the graphic.



Loom chart indicated all the skills and the various positions.

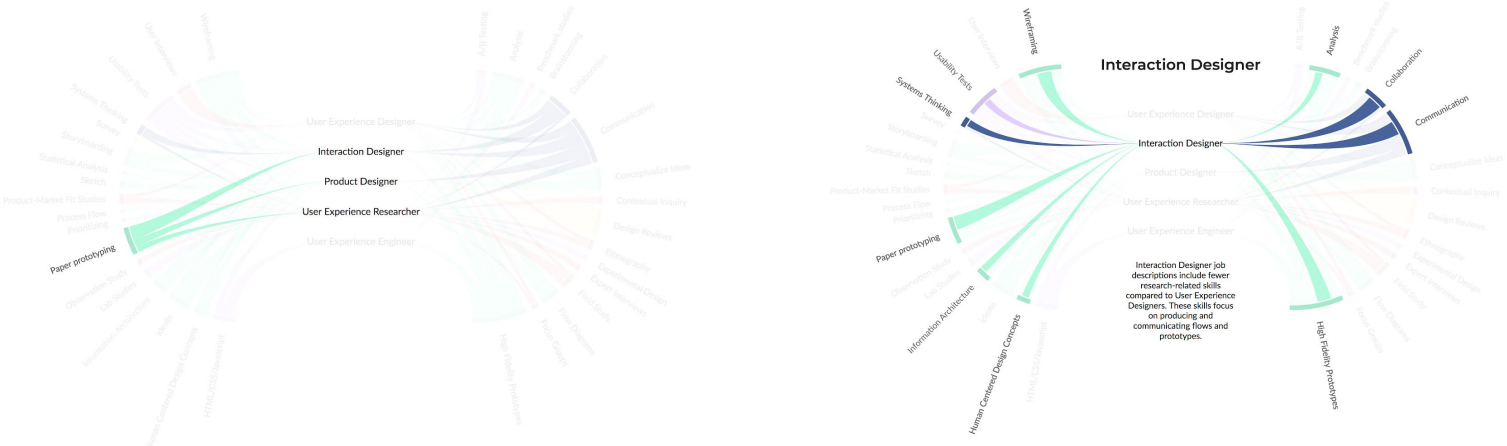
[3] https://www.visualcinnamon.com/2017/08/d3-loom.html

The width of each chord corresponds to the percentage of job descriptions with the position title from our collection that mention the particular skill.

In the JSON file, the data for each chord was presented as a data point. So for each skill, we took the number of job descriptions with the position title that mention the skill and divided it by the total number of job descriptions with the position title, and set it as the 'size' or width of the chord. If there are no job descriptions for the position title that mention the skill, then there is no data point.

```
{
  "skill": "Paper prototyping",
  "position": "Product Designer",
  "size": 0.5
},
```

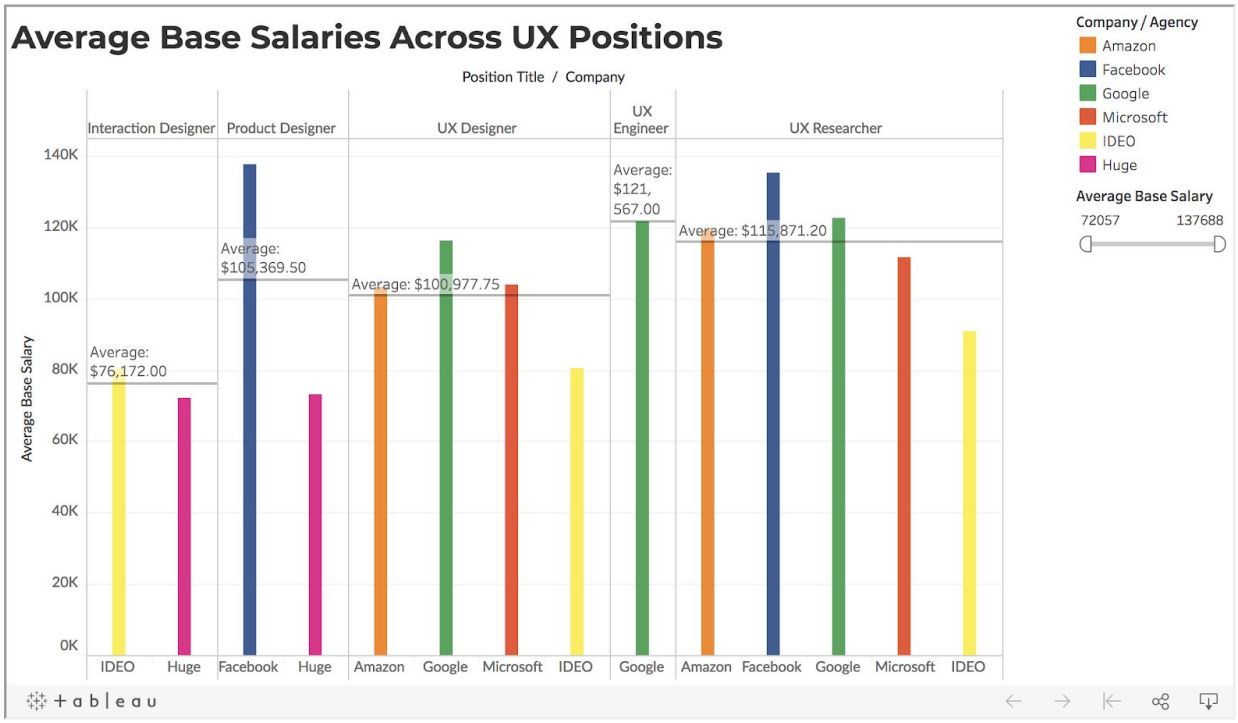
The color of the chords correspond to the first phase within Nielsen Norman Group's design process that the skill is used. The same colors from the Design Process Infographic are used. However, there are certain skills that are not tied to the design process; we added an additional dark purple color for the miscellaneous skills.



Left: When the user hover overs a skill; Right: When a user hovers over the role

As the user hovers over one of the skills, the chart highlights which position titles have job descriptions that mention the skill. Alternatively, when the user hovers over the position title, the position's skills are highlighted and a description briefly describing the position's skills is displayed. The description points out key comparisons or patterns to note for the user.

UX Salaries Tableau Dashboard



Bar graphs representing the salaries across various company positions.

Data: Glassdoor.com

Tools: Tableau Public

How we went about building it: We wanted users to be able to explore and compare salaries across not just the different UX job positions, but also across the companies and

agencies. For the UX salaries Tableau dashboard, we took the list of UX job positions across the companies and created a CSV file of the company, position title, and average base salary. We decided to break it down by position title so that the user can easily compare the difference between jobs of the same title but at different companies. This way, we can also display the average for the job title across companies. We decided to stick with a traditional bar chart as it presents this information in a clear and familiar manner to viewers. The colors of the bars correspond to the companies, and we used the companies' respective dominant brand colors. Furthermore, we built filtering functionalities to the visualization so that viewers can select one or more companies to view and compare job position salaries at the selected companies, as well as the ability to filter positions based on a salary range.

Evaluation

In this section, we will break down the feedback obtained via usability tests conducted during the project showcase along with the steps taken to correct them.

Evaluation during project showcase

UX Professionals Education Background Sunburst

Feedback:

- Left a deep impression regarding the educational backgrounds
- 'Diversity in UX Backgrounds' is misleading - thought it would cover gender/race diversity

- The color palette of the chart makes it difficult to read the text
- Users couldn't notice the % of each background at the center
- The breadcrumbs could be more closely associated with the graph itself

Changes made:

- Highlighting the text at the center of graph that indicated the Education background as well as the percentage from it
- Couple the breadcrumbs more closely with the graph
- Change title to "Academic Diversity"

Design Process Infographic

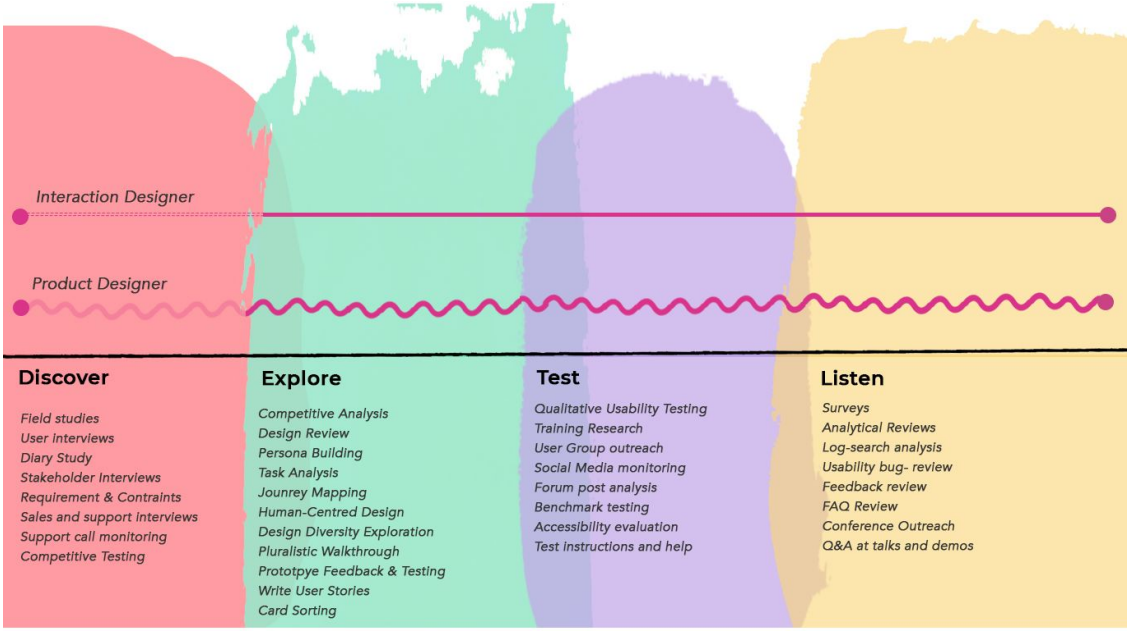
Feedback:

- Distinctions between the different types of lines is unclear
- More clarity on the varied thickness between the lines
- Activities under each phase aren't readable
- Users confused of the "paint effect" of the background of the infographic

Changes made:

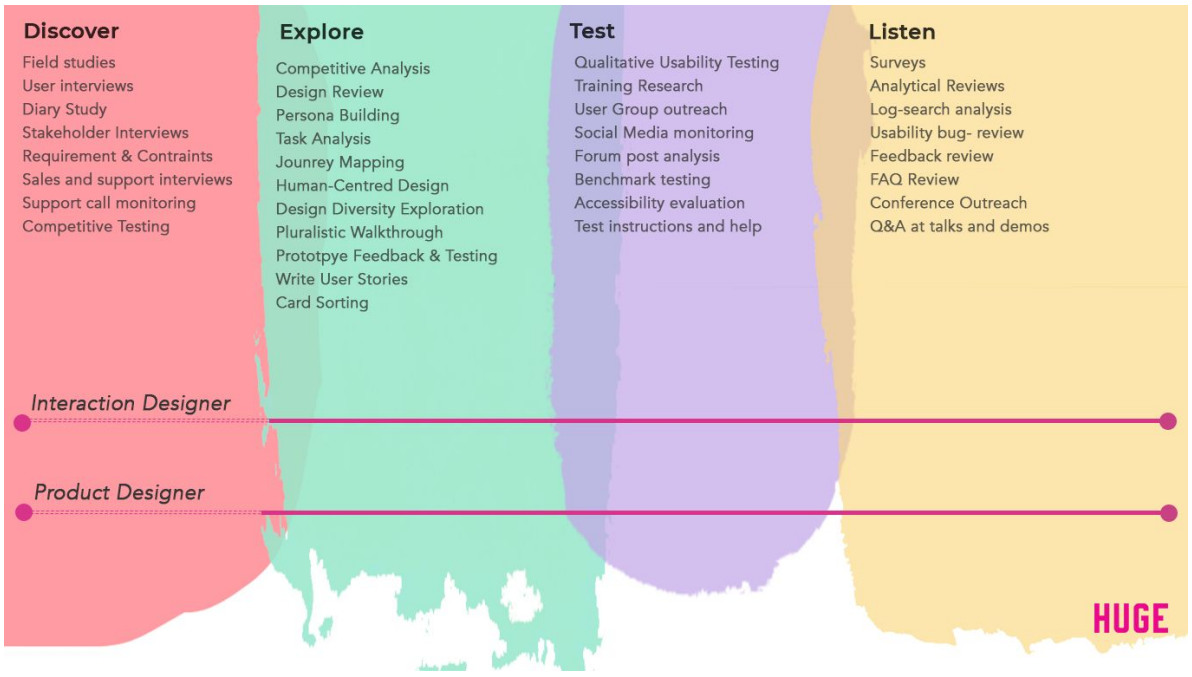
- Switching the roles to the bottom and the activities on top, bringing the user attention first to the design process and the variation in role amongst different companies
- Made thickness of lines consistent
- Highlighted the different roles

Before changes:



Initial version of infographic with activities placed below and roles placed above.

After changes:



Revised infographic with activities placed above and changes to style

UX Skills Loom Chart

Feedback:

- The color palette looks very good on this chart
- The descriptions of each role is great
- Difficult to understand that the color scheme related to the different phases highlighted in the infographic preceding this visualization

Changes made:

- Provided a legend for this chart to understand the color scheme

UX Salaries Tableau Dashboard

Feedback

- Add years on the salaries graph

Changes made:

- Years added to sources

What users took away from the overall visualisations:

- Learned that design field is diverse and every company needs designers with specific set of skills
- There's a different combination of skills per position title
- Learned that people come from different backgrounds; comforting for someone new to the field
- Liked the fit in the design process to understand where roles fit in

Links

The website is hosted on GitHub pages through the following link:

Website Link: https://kaushiki-priyam.github.io/

The project repository is on Github. One of the visualizations is on Tableau Public which is embedded on our website.

GitHub - https://github.com/kaushiki-priyam/UX-Vizards

UX Salaries Tableau Public -
https://public.tableau.com/profile/michelle.chen1152#!/vizhome/UXJobs_SalaryData/AverageBaseSalariesAcrossUXPositions?publish=yes

We have also included the final dataset that we used for the visualizations.

Dataset -

https://docs.google.com/spreadsheets/d/1GWPJS-dkF_K_xCjWsFAJNXjBCcYhQbB2N5cuzdIh4J0/edit?usp=sharing

Group Contribution Breakdown

S No.	Tasks	Project Member
1.	Ideation	All
2.	Brainstorming	All
3.	Synthesis and story outline	All
4.	Data gathering: Salaries data, Skills data, process data	Michelle
5.	Data gathering: Education, process data per position, job descriptions	Varshine
6.	Visualization research - Sunburst & Loom charts	Kaushiki
7.	Visualization research - Salaries	Michelle
8.	Visualization research - Infographic	All
9.	Github Setup and website hosting	Kaushiki
10.	Education Background Sunburst - design & code	Kaushiki
11.	Infographic - design & code	Varshine
12.	Skills Loom chart - design & code	Michelle
13.	Salaries Tableau chart - design & code	Michelle
14.	Website Content	Kaushiki & Michelle
15.	Website Illustrations	Varshine
16.	Evaluations	Michelle

References

1. **NN/G Survey**: https://www.nngroup.com/reports/user-experience-careers/
2. **NN/G Design Process**: https://www.nngroup.com/articles/ux-research-cheat-sheet/
3. **Company Links**: The key words were sourced from multiple job descriptions

Company	Position Title	Link
Google	User Experience Researcher	https://careers.google.com/jobs#t=sq&q=j&li=20&l=false&j=UX+Researcher&jc=USER_EXPERIENCE&jcoid=7c8c6665-81cf-4e11-8fc9-ec1d6a69120c&jcoid=e43afd0d-d215-45db-a154-5386c9036525&
Google	User Experience Designer	https://careers.google.com/jobs#t=sq&q=j&li=20&l=false&j=User%20Experience%20Designer&jcoid=7c8c6665-81cf-4e11-8fc9-ec1d6a69120c&jcoid=e43afd0d-d215-45db-a154-5386c9036525
Google	User Experience Engineer	https://careers.google.com/jobs#t=sq&q=j&li=20&l=false&j=UX+Engineer&jc=USER_EXPERIENCE&jcoid=7c8c6665-81cf-4e11-8fc9-ec1d6a69120c&jcoid=e43afd0d-d215-45db-a154-5386c9036525&
Facebook	User Experience Researcher	https://www.facebook.com/careers/teams/design/
Facebook	Product Designer	https://www.facebook.com/careers/teams/design/
Amazon	User Experience Researcher	https://www.amazon.jobs/en/search?base_query=user+experience+&loc_query=
Amazon	User Experience Designer	https://www.amazon.jobs/en/search?base_query=user+experience+&loc_query=
Microsoft	User Experience Researcher	https://careers.microsoft.com/us/en/search-results?keywords=user%20experience
Microsoft	User Experience Designer	https://careers.microsoft.com/us/en/search-results?keywords=user%20experience
IDEO	User Experience Researcher	https://www.ideo.com/jobs/design-research
IDEO	Interaction Designer	https://www.ideo.com/jobs/interaction-design
Huge	Interaction Designer	https://www.hugeinc.com/careers/jobs/
Frog	Interaction Designer	https://www.frogdesign.com/careers/jobs/1023832

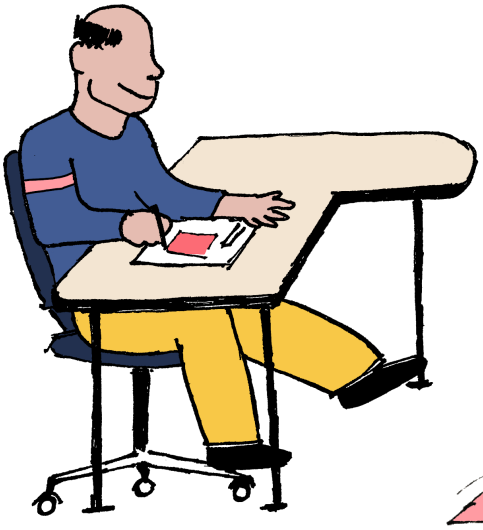
4. **Glassdoor** - Collected on April 25, 2018

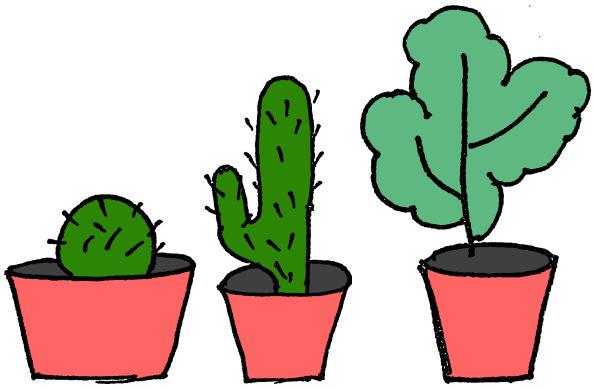
Company	Position Title	Link
Google	User Experience Researcher	https://www.glassdoor.com/Salary/Google-User-Experience-Researcher-Salaries-E9079_D_KO7,33.htm
Google	User Experience Designer	https://www.glassdoor.com/Salary/Google-User-Experience-Designer-Salaries-E9079_D_KO7,31.htm
Google	User Experience Engineer	https://www.glassdoor.com/Salary/Google-User-Experience-Engineer-Salaries-E9079_D_KO7,31.htm
Facebook	User Experience Researcher	https://www.glassdoor.com/Salary/Facebook-User-Experience-Researcher-Salaries-E40772_D_KO9,35.htm
Facebook	Product Designer	https://www.glassdoor.com/Salary/Facebook-Product-Designer-Salaries-E40772_D_KO9,25.htm
Amazon	User Experience Researcher	https://www.glassdoor.com/Salary/Amazon-UX-Researcher-Salaries-E6036_D_KO7,20.htm
Amazon	User Experience Designer	https://www.glassdoor.com/Salary/Amazon-User-Experience-Designer-Salaries-E6036_D_KO7,31.htm
Microsoft	User Experience Researcher	https://www.glassdoor.com/Salary/Microsoft-User-Experience-Researcher-Salaries-E1651_D_KO10,36.htm
Microsoft	User Experience Designer	https://www.glassdoor.com/Salary/Microsoft-User-Experience-Designer-Salaries-E1651_D_KO10,34.htm
IDEO	User Experience Researcher	https://www.glassdoor.com/Salary/IDEO-UX-Researcher-Salaries-E9948_D_KO5,18.htm
IDEO	Interaction Designer	https://www.glassdoor.com/Salary/IDEO-Interaction-Designer-Salaries-E9948_D_KO5,25.htm
Huge	Interaction Designer	https://www.glassdoor.com/Salary/Huge-Interaction-Designer-Salaries-E139928_D_KO5,25.htm
Huge	Product Designer	https://www.glassdoor.com/Salary/Huge-Product-Designer-Salaries-E139928_D_KO5,21.htm

Final Dataset used:

https://docs.google.com/spreadsheets/d/1GWPJS-dkF_K_xCjWsFAJNXjBCcYhQbB2N5cuzdIh4J0/edit?usp=sharing

Illustrations:





THE END.