

Expert Search

Indiana University Bloomington

+

Eli Lilly & Company

Team

UX Design Team



Antara Jagtap

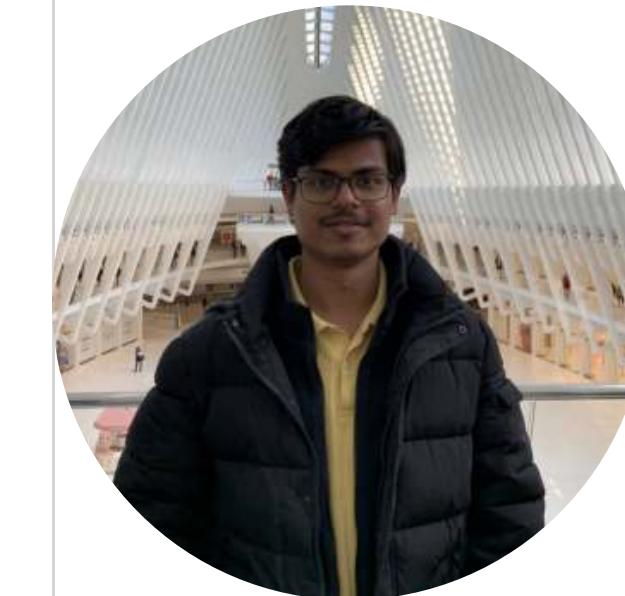
MS in HCI



Yao Li

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Development Team



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Overview



Eli Lilly & Company's organization is comprised of many different elements, including research, medicines development, manufacturing, digital health, global services, and more. As such, there are immensely technical and knowledgeable resources who exist in and throughout the organization.

Problem

People struggle to find resources to fulfill technical components of projects. This may be direct help on a project, but also requests for consultation or mentorship.

Additionally, they need a platform which will serve as a location of employees to explore, expand their skillsets, and grow their cross-disciplinary expertise.

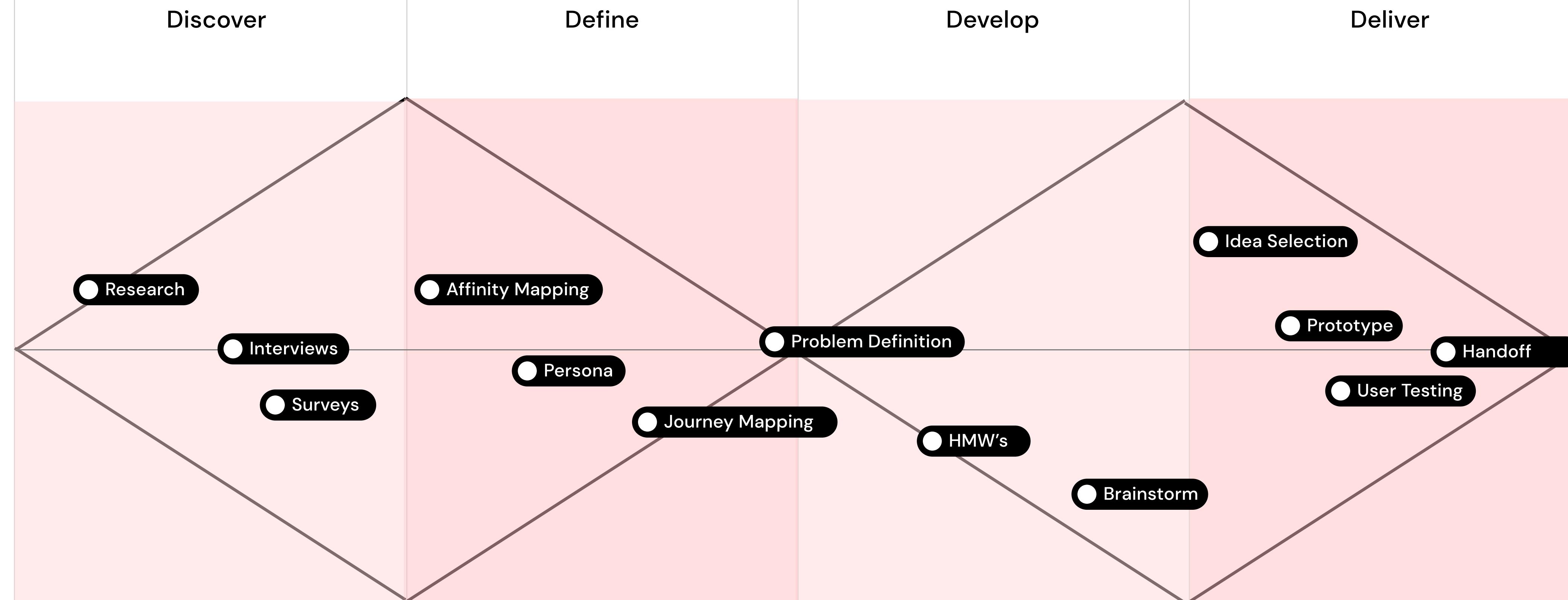
Challenge

What tools can we use to find an 'expert' within Lilly?

How do we create an interface that will allow users to provide their expertise information, and also allow project managers search that information effectively?

Design Process

Double Diamond Process

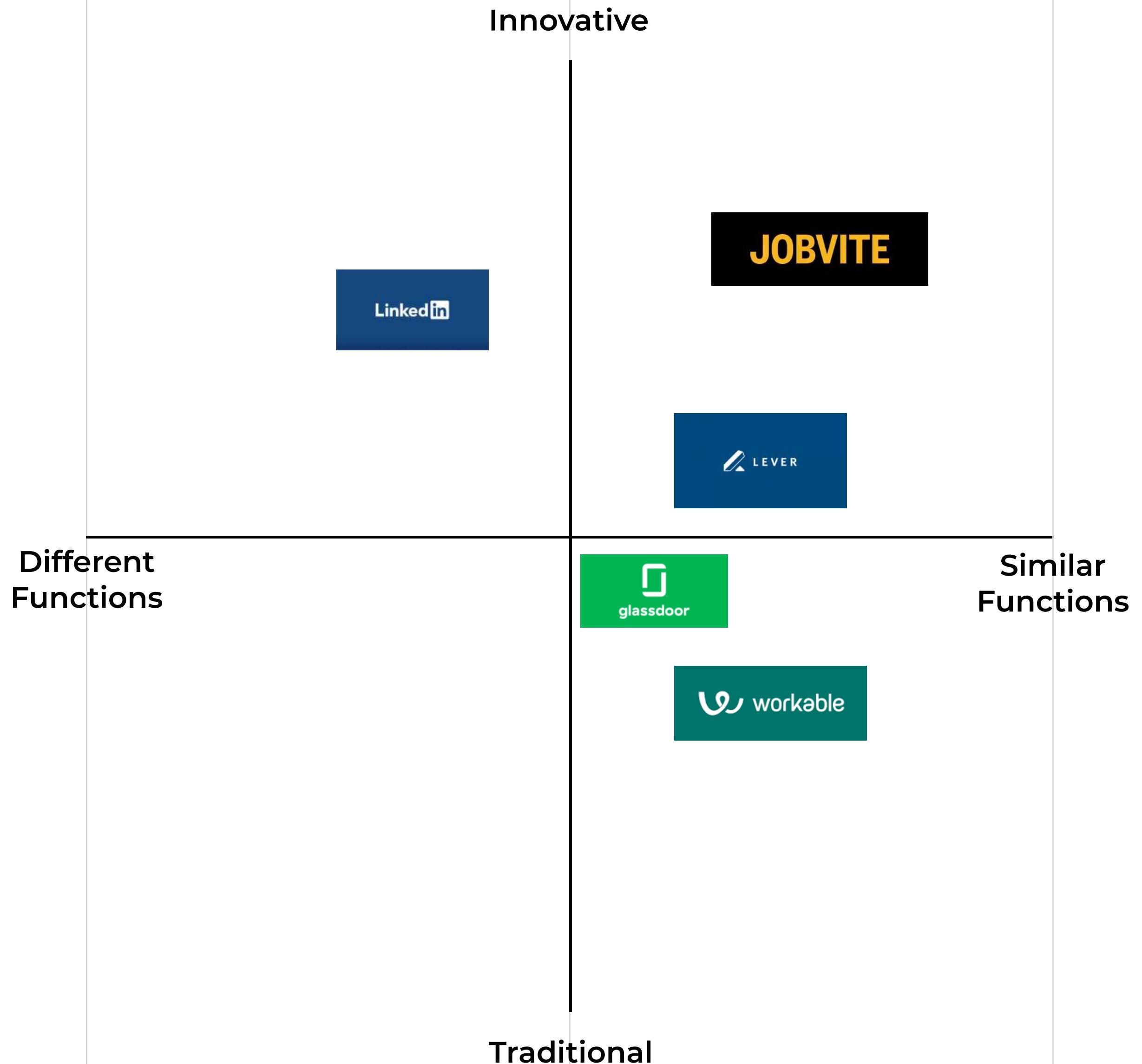


Companies Evaluated

We did a broad sweep of competitors to compare while touching different industries and business types across a number of business sizes.

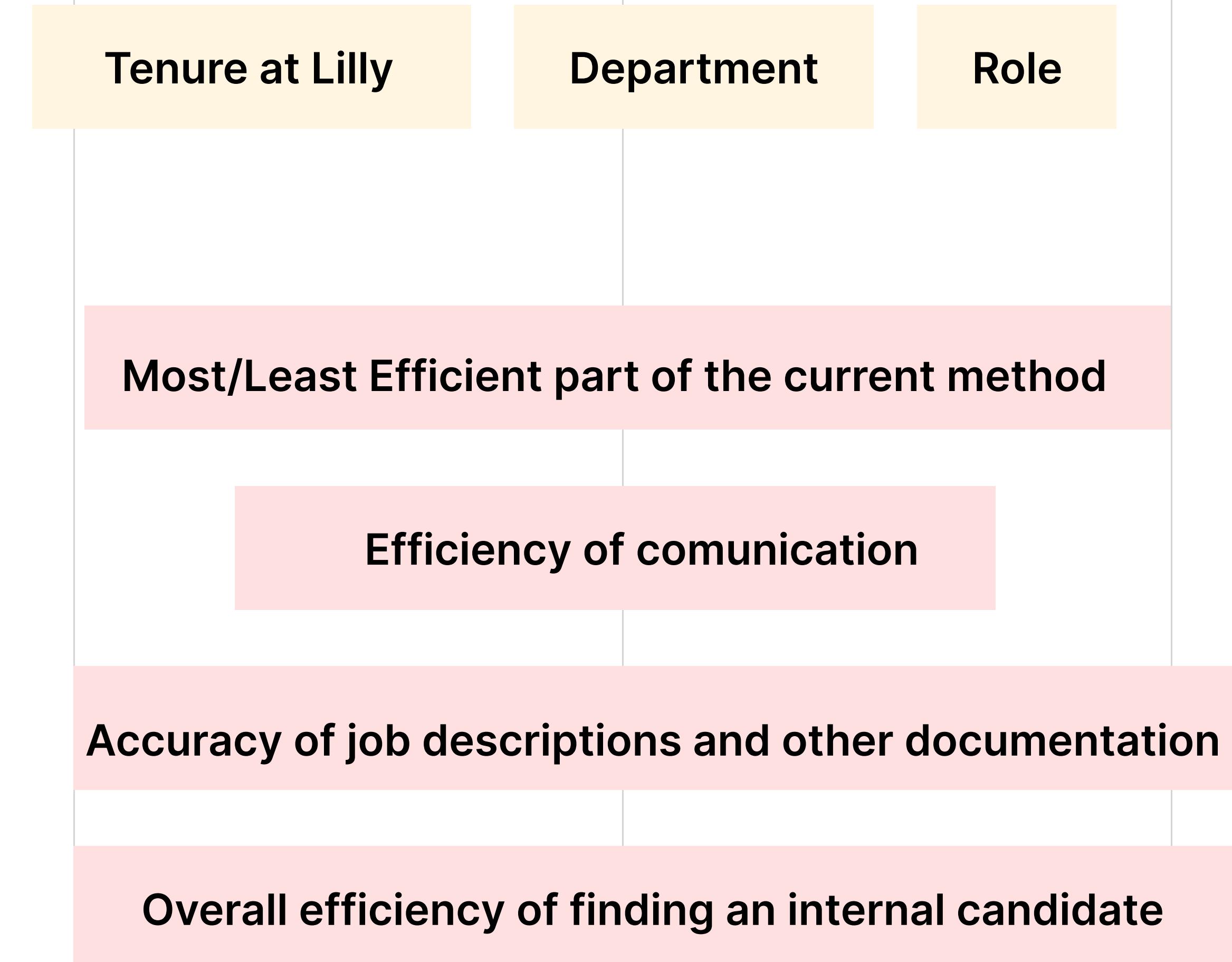
We then analysed different models being implemented by the competitors to attract more customers.

This graph plots brands in relation to our design frame from an innovative standpoint as well as in business similarity.



Surveys

Conducting a survey in regards to the current methods of searching candidates for projects at Lilly helped us understand the data in a quantitative manner for us to analyse the problems in detail



In-depth Interviews

GOALS:

- To understand who all is involved in the process/ at what stage.
- Discovering the tools and methods that are used while making decisions.
- To understand the information needed while posting for a job
- To understand the hiring and onboarding process for a candidate.
- Try to understand the painpoints while searching for a candidate.

Process

Word of mouth communication for short term projects

Leverage contract resources - for new hires

Getting leads through friends in the organization - informal conversations - casual process

Timeline extends to 3 months due to back and forth communication between various teams

Painpoints

Judging quality of the skillset - deep understanding and specific skills needed

Different areas might need different judgement criterias for candidates
(Marketing: prove of work/ pass a test etc)

Awareness of things you want to be involved in - motivation for career growth

Trying to identify or narrow down the candidate's previous experiences that can be leverage to the new role/ project

Interviewers wrap up
method is not well defined. Every hiring processes do their own thing. It should be a well presented discussion amongst all interviewers

Key Insights

Compliling all our research, we found out some key insights. This helped us understand and focus on our design frame and drive our design process further.

- 1 Human tendency to trust endorsements given by experts in a particular field.**
- 2 Need for prioritization of information discovery - present only relevant data to reduce time and improve efficiency.**
- 3 Multiple stakeholders involved - seamlessness of the process is crucial**

Persona



Bryan Warren

AGE	45
ROLE	Director
DEPARTMENT	UX Design
TENURE	15 years
LOCATION	Indianapolis
TECH LITERACY	High



I want to find an ideal candidates for my projects with required core skillsets.

Core needs

- Find candidates with the ideal skillset that matches upcoming project.
- Validates the quality of skillset from an unbiased and objective perspective
- A structured application process for internal referal project
- A collaborative platform for evaluating the candidates across teams through the hiring process

Frustrations

- Candidates skillset do not match with the job description.
- The depth and quality of skills is hard to evaluate.
- Back and forth communication with the hiring teams.

Journey Mapping

User

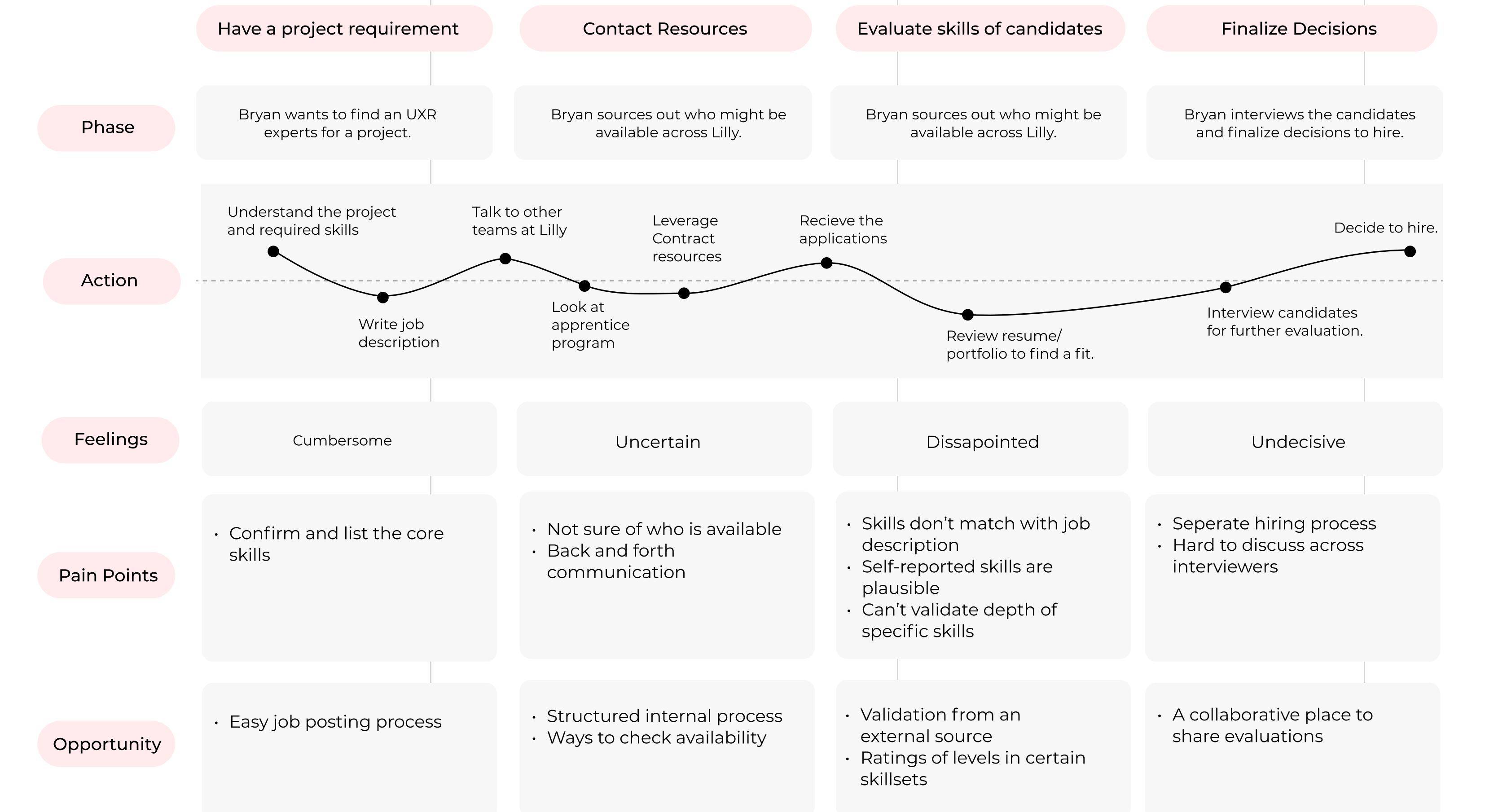
Bryan is a UX Director at Eli Lilly.

Scenario

He wants to find a senior UX Researcher for a project.

Expectations

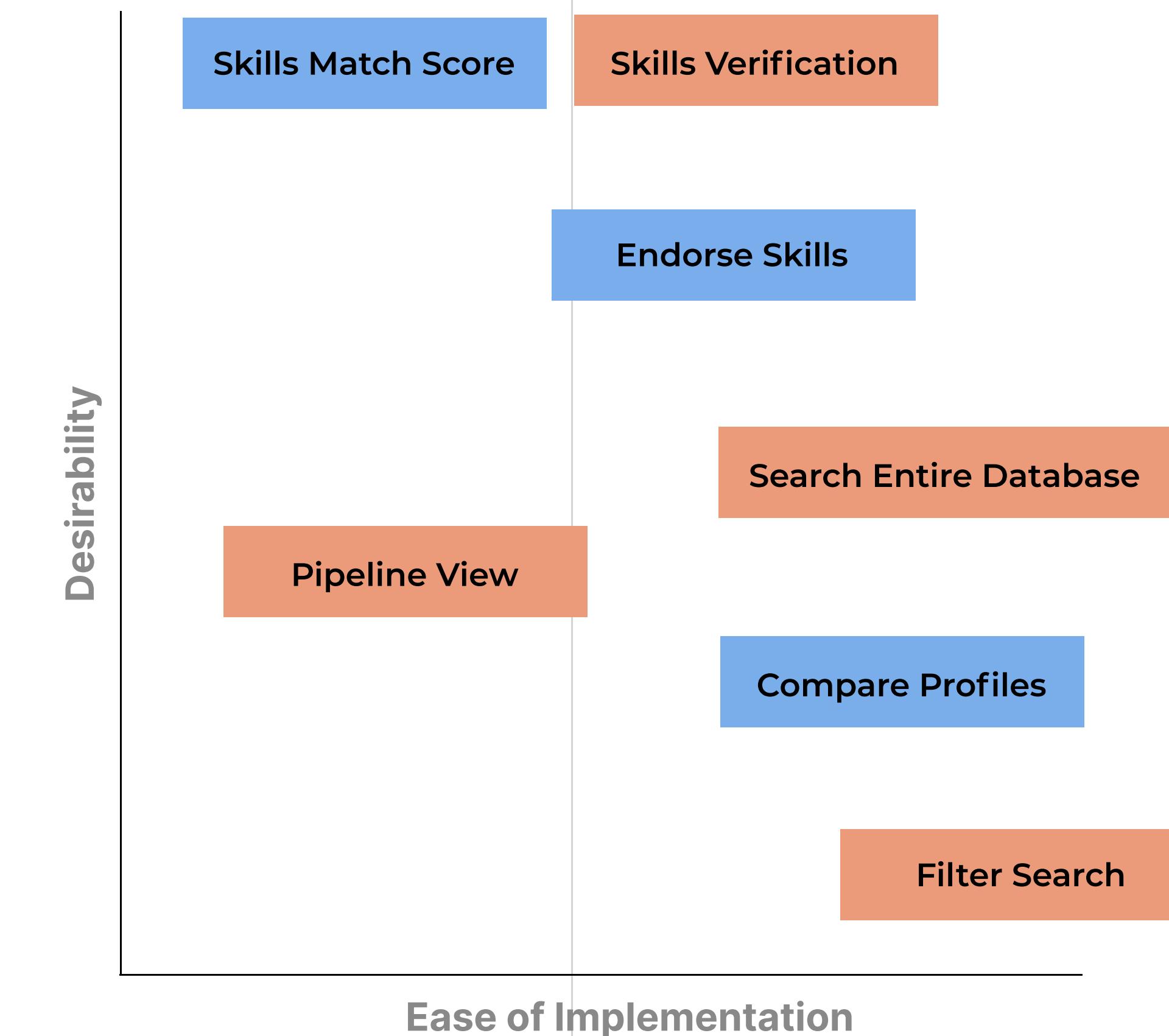
Experienced knowledge and deep-level skills in the UXR field



Feature Prioritization

The main features were identified keeping the design frame in mind

Structuring the information and separating the main features from the secondary helped in concept evaluation



Wireframes

We made low-fidelity wireframes of the initial ideations and tested out the flow with 2 users to get more clarity.

Qualified Candidates			
	Internal	External	
Recruitment Source	Name	Position	Contribution Index
<input type="checkbox"/> Internal			
<input type="checkbox"/> LinkedIn			
<input type="checkbox"/> Jobboard			
<input type="checkbox"/> Referral			
<input type="checkbox"/> Website			
Department			
<input type="checkbox"/> Select All			
<input type="checkbox"/> Finance			
<input type="checkbox"/> Design			
<input type="checkbox"/> Sales			
<input type="checkbox"/> Marketing			
Job Level			
<input type="checkbox"/> Director			
<input type="checkbox"/> Manager			
<input type="checkbox"/> Senior			
+ Add Filter			

Role	Candidates	Pipeline	Activity
All time	All Candidates	v	
RA Applied	R Shortlisted	I Interview	D Disqualified
One Name Qualifications +1 day ago			
+ Add candidate			+ Hired

Candidate Name #00010m	Location ★ 4.2 / 5 Download Resume	
Matched Skills	Verification	Contribution Index
skill 1 skill 2 skill 3 skill 4	By 2 Unverified By 1	0 20 40 60 80 100
other verified skills skill 5 skill 6 skill 7	Match Score	1 .50 0 .50 1
Projects	Match Profile	Skill 1 Skill 2 Skill 3 Skill 4 Skill 5 Skill 6 Skill 7
Reviews	Reviews	1 2 3 4 5
Skip this candidate	Invite to Apply	

Awesome!
New candidate has been invited!

Candidate Name Location ★ Ratings (2 Reviews)	Show candidate details	Browse more matches
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Iterations

We moved on to mapping the high level functionalities of the applications and made changes to the features and flows that were not well received during the user testing.

This screenshot shows a job posting interface. At the top, there are three tabs: 'Projects' (underlined), 'My Discussion', and 'My Career Path'. A circular profile picture of a woman is in the top right corner. Below the tabs, there is a large input field with a right-pointing arrow icon. To the right of the input field, there are sections for 'Project Name', 'Job Description', and 'Timeline'. Under 'Job Description', there is a placeholder text: 'Amet minim mollit non deserunt ullamco est sit aliqua dolor do amet sint. Velit officia consequat duis enim velit mollit. Exercitation veniam consequat sunt nostrud amet.' Below 'Timeline', there is a section for 'Required Skills' with a list of three items: 'Amet minim mollit', 'Amet minim mollit', and 'Amet minim mollit'. To the right of the list are three colored status indicators: green (checkmark) for 'matched', yellow (checkmark) for 'partly matched', and red (cross) for 'not matched'. Further down, there is a 'Job Poster' section with a profile picture of a man named Alex, described as 'Sr. Manager in Marketing Department'. A 'Start a conversation' button is located to the right of this section.

This screenshot shows a job posting interface similar to the one above, but with different content. The tabs at the top are 'Projects', 'My Discussion' (underlined), and 'My Career Path'. A circular profile picture of a woman is in the top right corner. Below the tabs, there is a large input field with a greyed-out placeholder. To the right of the input field, there are sections for 'Project Name', 'Job Poster', 'Candidate', and 'Progress'. Under 'Job Poster', there is a profile picture of a man named Alex, described as 'Sr. Manager in Marketing Department'. Next to him is a 'People invited' section showing three small profile pictures and a '+ invite' button. Under 'Candidate', there is a profile picture of a man named John, described as 'UX Designer in Design Department'. Below these sections is a 'Schedule a meeting' button. At the bottom, there is a horizontal progress bar consisting of five dots connected by a line.

Final Concept Walkthrough

[Click here to access the Hi-Fi Screens](#)

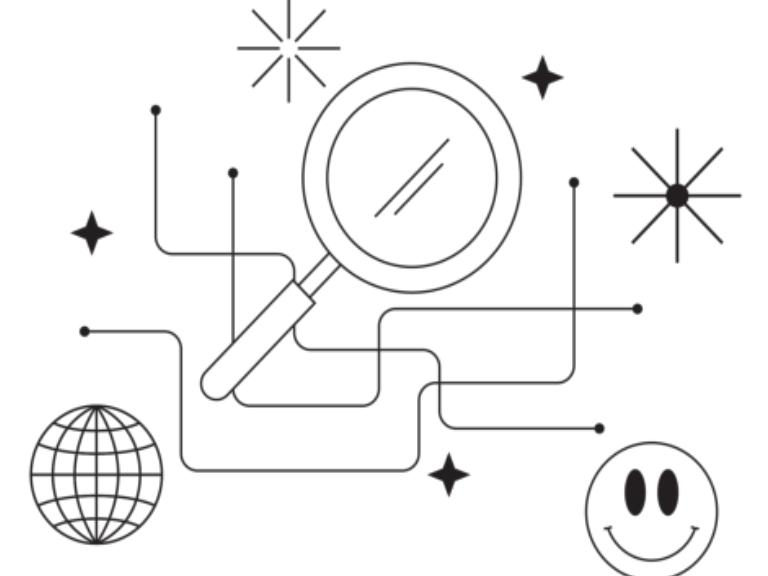
Home Job Board | Log In Sign Up

Lilly

Expert Search System

Nulla Lorem mollit cupidatat irure. Laborum magna nulla quis ullamco cillum dolor.

Search for a job here Search



Popular Jobs

Sr. UX Designer Apr. 10
James Smiths · Design Team
Amet minim mollit non deserunt ullamco est sit aliqua dolor do amet sint. Velit officia consequat quis enim velit mollit. Exercitation veniam consequat sunt nostrud amet.
DESIGN FULL-TIME Apply

Sr. UX Researcher Apr. 10
James Smiths · Design Team
Amet minim mollit non deserunt ullamco est sit aliqua dolor do amet sint. Velit officia consequat quis enim velit mollit. Exercitation veniam consequat sunt nostrud amet.
DESIGN FULL-TIME Apply

Sr. Front-end Engineer Apr. 10
James Smiths · Design Team
Amet minim mollit non deserunt ullamco est sit aliqua dolor do amet sint. Velit officia consequat quis enim velit mollit. Exercitation veniam consequat sunt nostrud amet.
DEVELOPMENT FULL-TIME Apply

Our Features



Accurate Search
Nulla Lorem mollit cupidatat irure.
Laborum magna nulla quis ullamco.



Rating System
Nulla Lorem mollit cupidatat irure.
Laborum magna nulla quis ullamco.

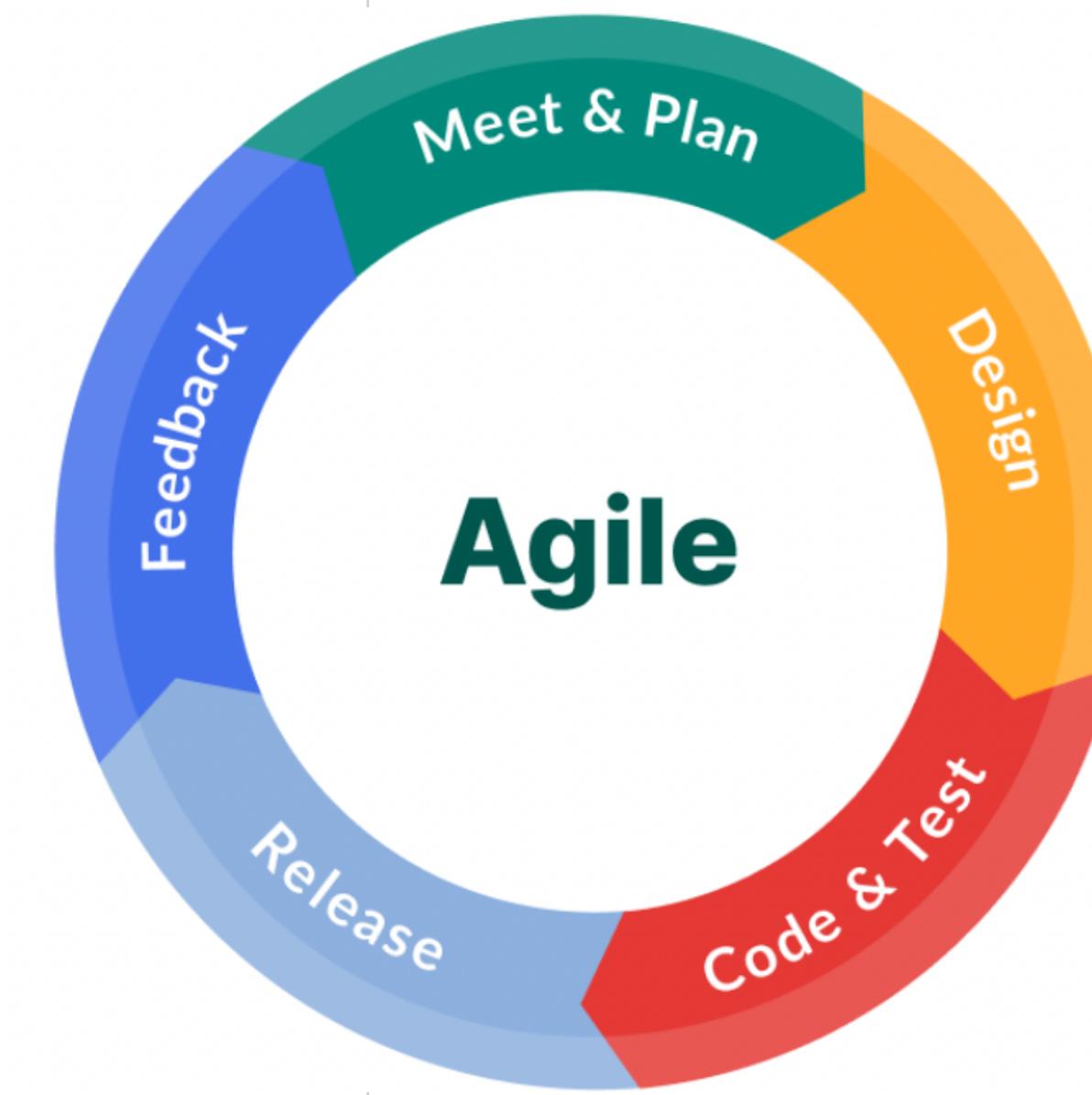


Internal Referrals
Nulla Lorem mollit cupidatat irure.
Laborum magna nulla quis ullamco.

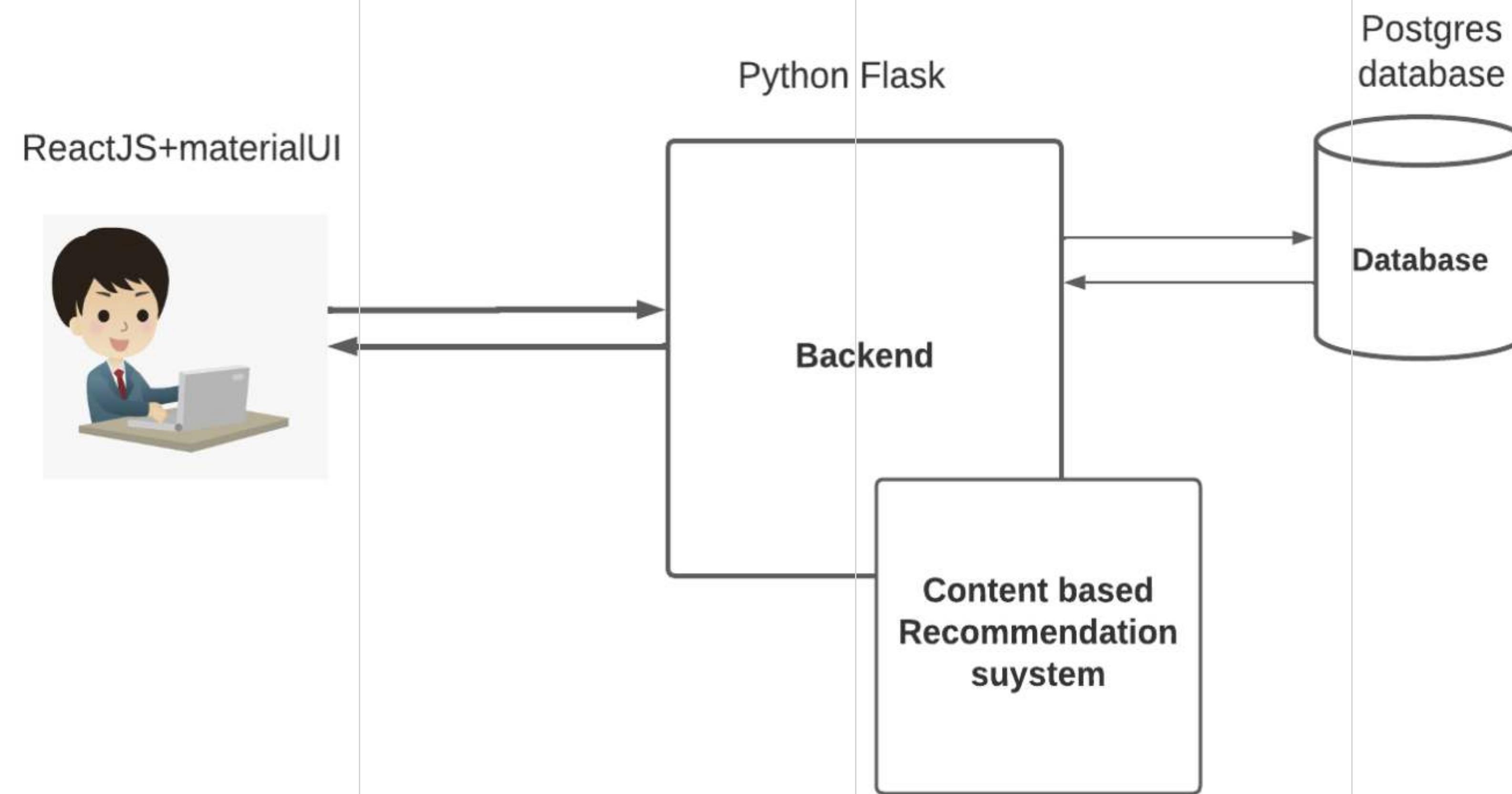
Development Process

User Stories

1. Dataset search
2. Dataset generation
3. Recommendation system search
4. Technology stack discussion
5. Data storage planning
6. UI development
7. Backend development
8. Recommendation system development
9. Final testing



Architecture Diagram



Technology Stack

DATASET
PREPARATION

**Python,
Faker Module**

Faker to produce data to
get maximum accuracy in
recommendation

Included attributes number
of projects, experience in
each skill, total industrial
experience

FRONTEND

**ReactJS +
Material UI**

Interaction with the
backend using axios
library

Dynamic UI design for
candidate recommendation

BACKEND

**Python Flask +
Postgres database**

Interaction with frontend
using Restful API

Content based
recommendation system
for searching candidates

RECOMMENDATION
SYSTEM

**Python, Numpy, Pandas,
Tkinter modules**

Implementing the
recommendation system
based on the query results
from Backend.

Given different weights to
features for getting
accurate results for
recommendation system.

Database Generation

- Employee Dataset Features
 - a. corporate experience,
 - b. the number of skills they had,
 - c. the total number of experience they had for each skill.
- Used the Faker module and python logic to synthetically generate data.
- Included the IU Student data to expand the dataset and create variance in it.

```
def makeProfile(expIndustry):  
    #total number of skills  
    i = rn.randint(1,7)  
    skillExp,skill,project = [],[],[]  
    for j in range(i):  
        y = rn.randint(1, expIndustry)  
        skillExp.append(y)  
        x = rn.choice(skill_set)  
        while x in skill:  
            x = rn.choice(skill_set)  
        skill.append(x)  
        if y > 5:  
            project.append(rn.randint(5,10))  
        elif y > 2:  
            project.append(rn.randint(3,5))  
        else:  
            project.append(rn.randint(1,3))  
    workLoc = rn.choice(lstLoc)  
    return (skillExp, skill, project, workLoc)|
```

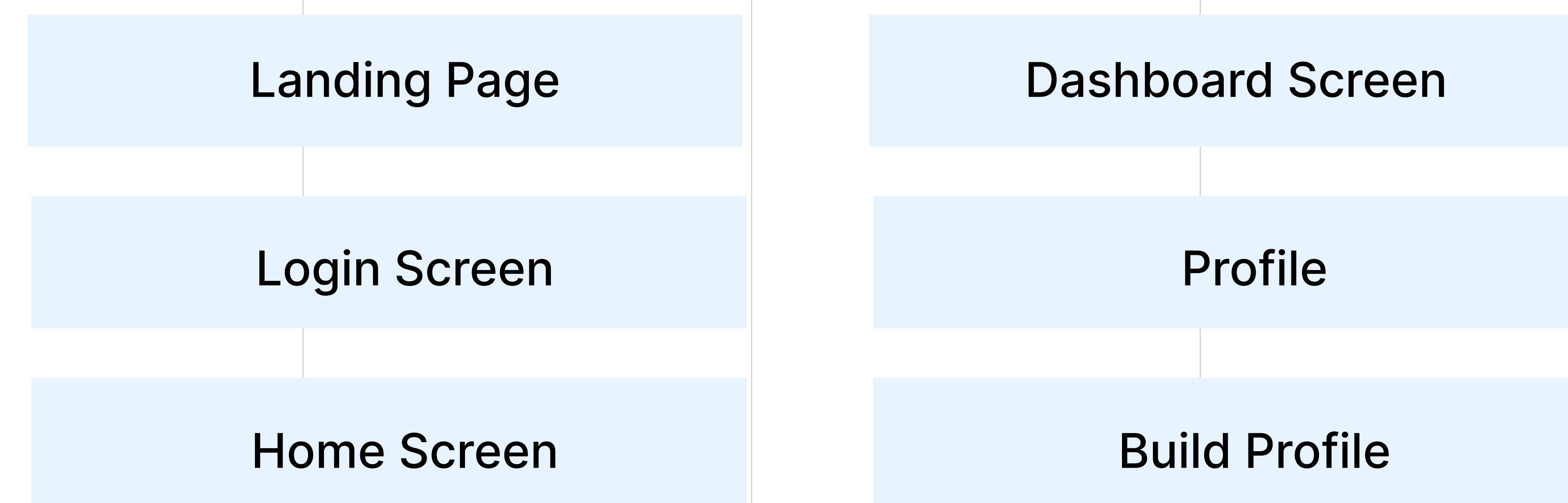
Employee Dataset

Emp ID	Worker Name	Skill Set	Corporate Experience	Skill Experience	Number of Projects completed with Skill	Current Work Location	EmailId	Password
1001	Richard Fletcher	Docker	18	4	4	Washington	richard.fletcher@lilly.com	██████████
1002	Billy Riley	HTML/CSS,Flask,C++,Java,Kubernetes,Python	13	5,6,2,6,5,10	3,10,3,9,5,6	San Deigo	billy.riley@lilly.com	██████████
1003	Jason Morrow	HTML/CSS,Python,NodeJS,Kubernetes,BootstrapReactJS,Tableau	15	13,4,13,3,5,9	6,5,7,3,3,8	Branchburg	jason.morrow@lilly.com	██████████
1004	Megan Hernandez	PowerBI,Springboot,Java	14	4,14,13	3,9,6	Indianapolis	megan.hernandez@lilly.com	██████████
1005	Connor Clarke	BootstrapReactJS,NodeJS,Kubernetes,RestAPI,PowerBI	4	2,2,4,3,1	1,2,3,3,3	Branchburg	connor.clarke@lilly.com	██████████
1006	Kristina Chavez	HTML/CSS,Kubernetes	14	3,9	4,6	San Deigo	kristina.chavez@lilly.com	██████████

Student Dataset

Student ID	Student Name	Degree Enrolled in	Skill Set	Corporate Experience	Skill Experience	Number of Projects completed with Skill	Current Study Location
2000404601	Luke Rogers	Bachelors	C++,C#	0	3,2	1,3	Bloomington
2000404602	Dr. Chelsea Crosby	Bachelors	Power BI	0	1		4 Bloomington
2000404603	Mario Sullivan	Masters	Tableau,Go,Pascal,React JS	4	1,1,3,2	3,3,2,4	Bloomington
2000404604	Kenneth Steele	Bachelors	Go,C#,Python,HTML,Ruby,CSS,Tableau	0	3,4,4,3,3,4,1	2,2,4,4,4,1,1	Bloomington
2000404605	David Wilcox	Masters	React JS	1	1		3 Bloomington
2000404606	Jeffrey Carpenter MD	Bachelors	XML,React JS,Angular,C++,Ruby,Power BI,HTML	0	1,3,2,3,2,4,3	3,4,1,3,2,2,4	Bloomington
2000404607	Ann Wilkerson	Masters	C,XML,R	0	4,2,1	3,3,3	Bloomington

Frontend Development Structure



Backend Development Structure

Endpoints

/getprofile

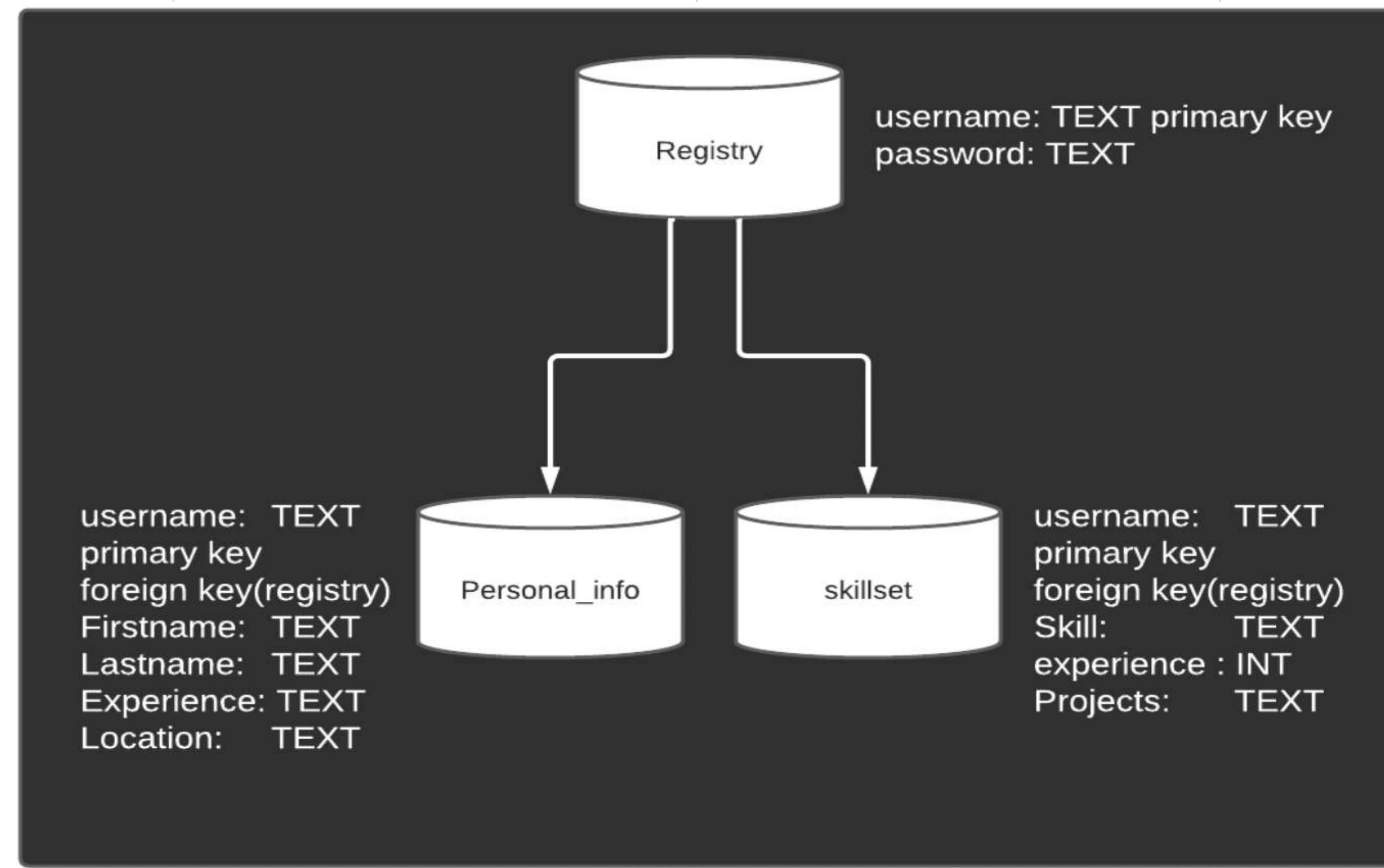
/buildprofile

/login

/getcandidates

/signup

Database Design



Recommendation System

Used weighted average for below parameters

SKILL

LOCATION

EXPERIENCE

```
[ ] #HR Choices of stuff he wants [[C++,1,4,1,Cambridge],[Python,1,2,2,Cambridge]]. input: [Skill,Corpexp,Skillexp,num of proj, location]
# Define Weight Dictionary
# All parameters have a max weight of 5 so 5*4 = 20 is max weight possible

skill_set_weight = {'C':5,'C++':4,'C#':4,'Java':5,'Python':5,'R':3,'Ruby':3,'Javascript':5,'HTML':2,'React JS':3,'Angular':1,'Tableau':5,'Power BI':5,'Go':5
# Corporate and skill exp Weight, where index value of weight corresponds to his corporate exp
corp_exp_wgt= [3,1,1,1,2,2,2,2,3,3,4,4,4,4,4,5,5,5,5] # Index 0 has been given 3 so that a fresher is not at a complete disadvantage
skill_exp_wgt=[0,1,1,1,2,2,2,2,3,3,4,4,4,4,4,5,5,5,5] # Index 0 has been given weight 0 cause if the person isnt skilled at that but has listed it cause
num_of_proj_wgt =[0,1,1,1,2,2,2,2,3,3,4,4,4,4,4,4,5,5,5,5] # Index 0 has been given weight 0 cause if the person has done no project then we wont give him
work_loc_wgt = [5] # Currently location doesnt matter so weight of 5 has been given to all
```

```
[ ] hr_choice = [['C++',1,4,1,'Cambridge'],['Python',1,2,2,'Cambridge']] # input: [Skill,Corpexp,Skillexp,num of proj, location]
```

Challenges

- Generating dataset
- Mismatch between the collaboration of both teams due to time constraint
- Access to more users for research and testing

Future Scope

- Improve Recommendation System by adding more features in it.
- Extend the portal for external candidates.
- Extend the system application for finding mentors for learning new things or for discussions.

Thank you!

Any questions / feedback?