

Seagulls
- sky is the limit

Wells Fargo Technology Hackathon 2022

Increasing our Diverse Customer Reach – Leveraging Innovative
Technologies to Identify Growth Opportunities

Se^ag_gU|1sV22

respect diversity in color, strength, ability and origin

*Trivia – each letter used in
SeagullsV22 is written using
different font, font size, style
and font color ☺*

Summary

Deliver a comprehensive digital solution to extract, process, curate and offer diversity dimensions of businesses

Top 5 (business perspective)

- Analysis of publicly available data offered by Govt / Govt authorized entities
- Comprehensive search for business information in the public domain
- Optical Character Recognition to get text from images
- Analyze data and derive diversity insights
- Report of diversity dimensions of the business across factors such as women or minority ownership, ethnicity, Veterans & LTBT.

Top 5 (technical implementation)

- APIs to extract and store authentic datasets
- Web crawler to search for Company data in the internet including LinkedIn
- Computer Vision to process and extract text from images
- Natural Language Processing (NLP) to clean and analyze information to derive diversity data points
- Dashboard to display diversity dimension and insights

Solution alignment to Technology 6S Strategy

Secure
Azure Cloud
Resource groups,
IAM and RBAC

Stable
Resiliency of
services are
achieved by HA

Scalable
Services can be
auto scaled on
Cloud on demand

Skill
Team learnt and
used Managed
Services in Azure

Speed
Agile practices,
single
responsibility

Success
Solution caters to
all asks of
problem

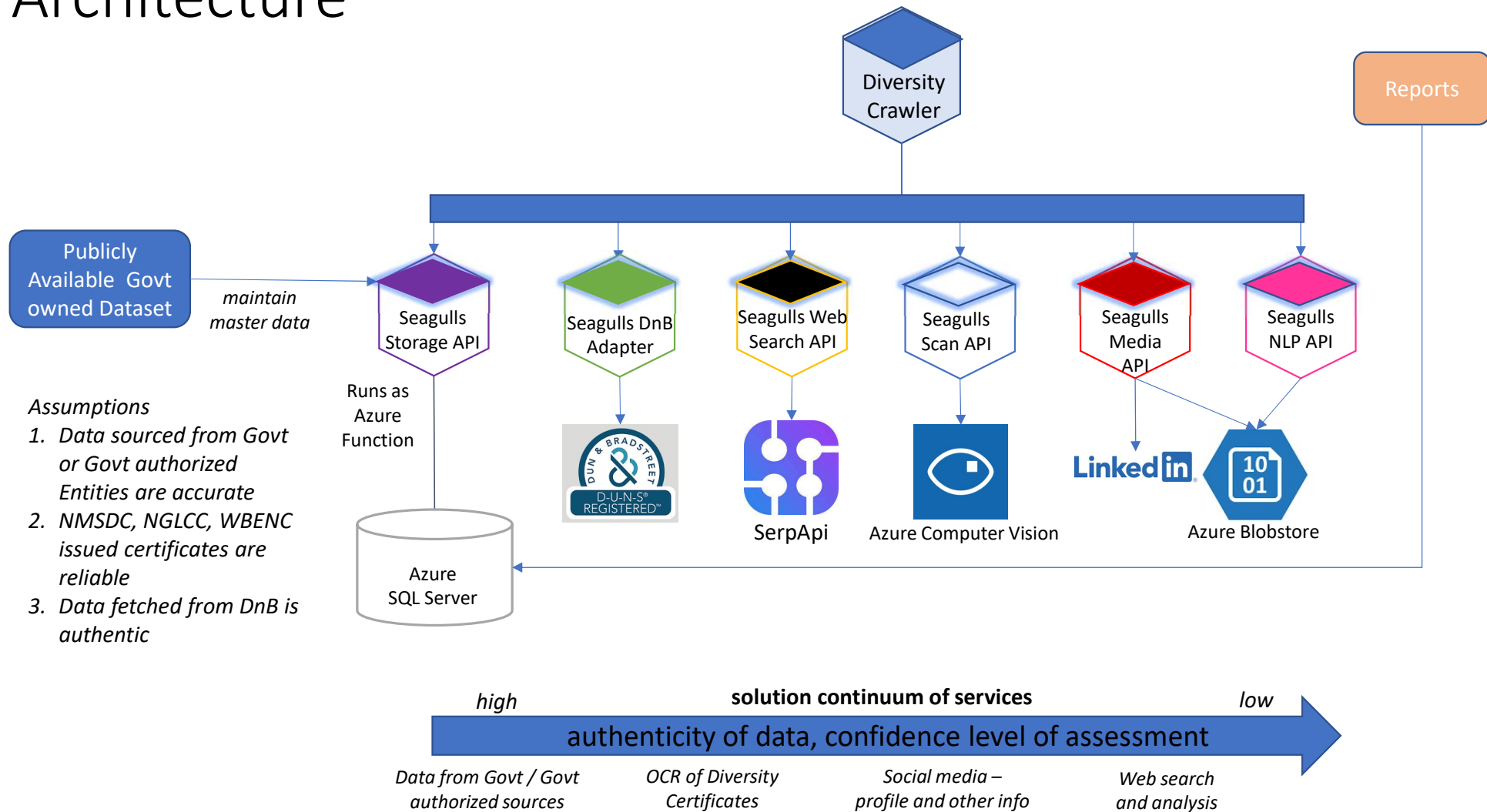
Diversified Technology Stack



User Stories



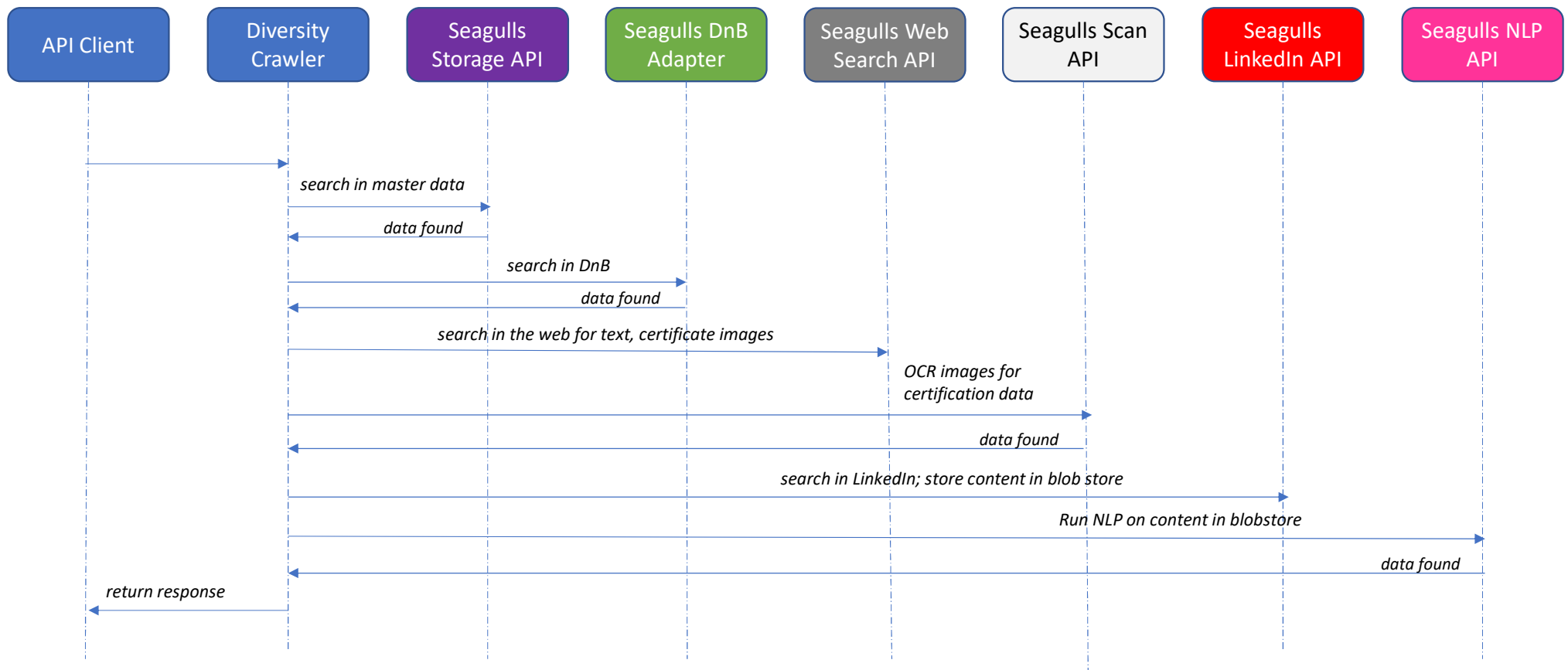
Architecture



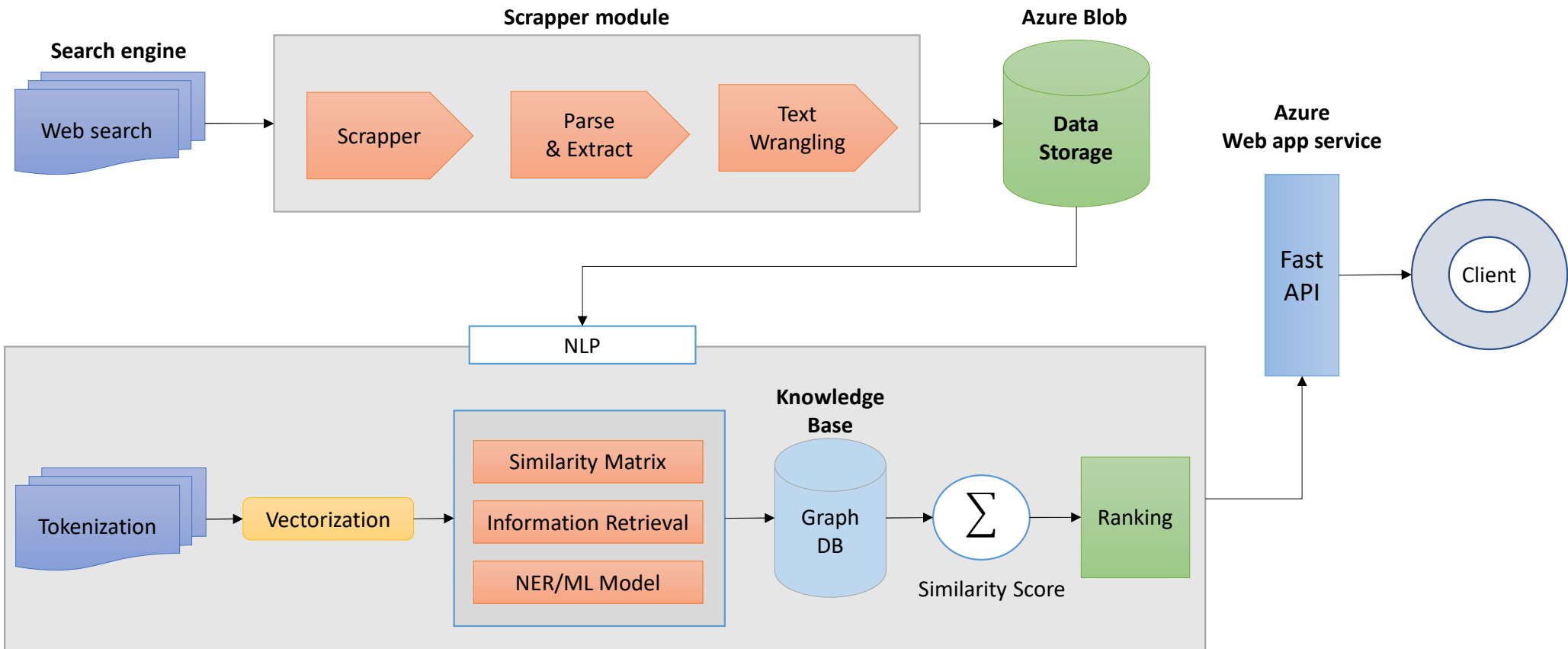
Services

| Service | Purpose | How it works? | Technology |
|-------------------|---|---|--|
| Diversity Crawler | The core Orchestrator. This is the entry point for client requests. | This drives the execution of other services to identify diverse dimensions for given input | Spring Boot application |
| Storage API | Performs all data management operations on the company profile | API that executes CRUD operations on company entity. Access to the Company entity and all its diversity dimension data is managed by this Service | Azure Functions .Net Core component Azure SQL Server |
| DnB Adapter | Connects to DnB API | Searches information about a given company in DnB registry via the API | Spring Boot application |
| Web Search API | Searches for information such as text, images or documents in the web | Gathers information from the web for a given query and stores the information as blobs | SerpAPI Azure blobstore |
| Social Media API | Searches for information in social media sites such as LinkedIn and Twitter | Gathers information from the LinkedIn and Twitter for a given query and stores the information as blobs | LinkedIn API Azure blobstore Selenium Web driver |
| Scan API | Extracts text from an image and provides diversity certification data | Performs OCR on given set of images to identify if a given business is certified from WBENC, NMSDC, NGLC etc. | Azure Computer Vision |
| NLP API | Analyses text information collated from web to identify diversity dimension | Executes ML on the text data | Python ML libraries Beautiful Soup Selenium Web driver, NLTK |
| Reports | Dashboard to display diversity insights | Extracts data from the company profile data store and displays the data in various perspectives | Grafana |

Sequence Diagram



NLP Based Diversity Model Diagram

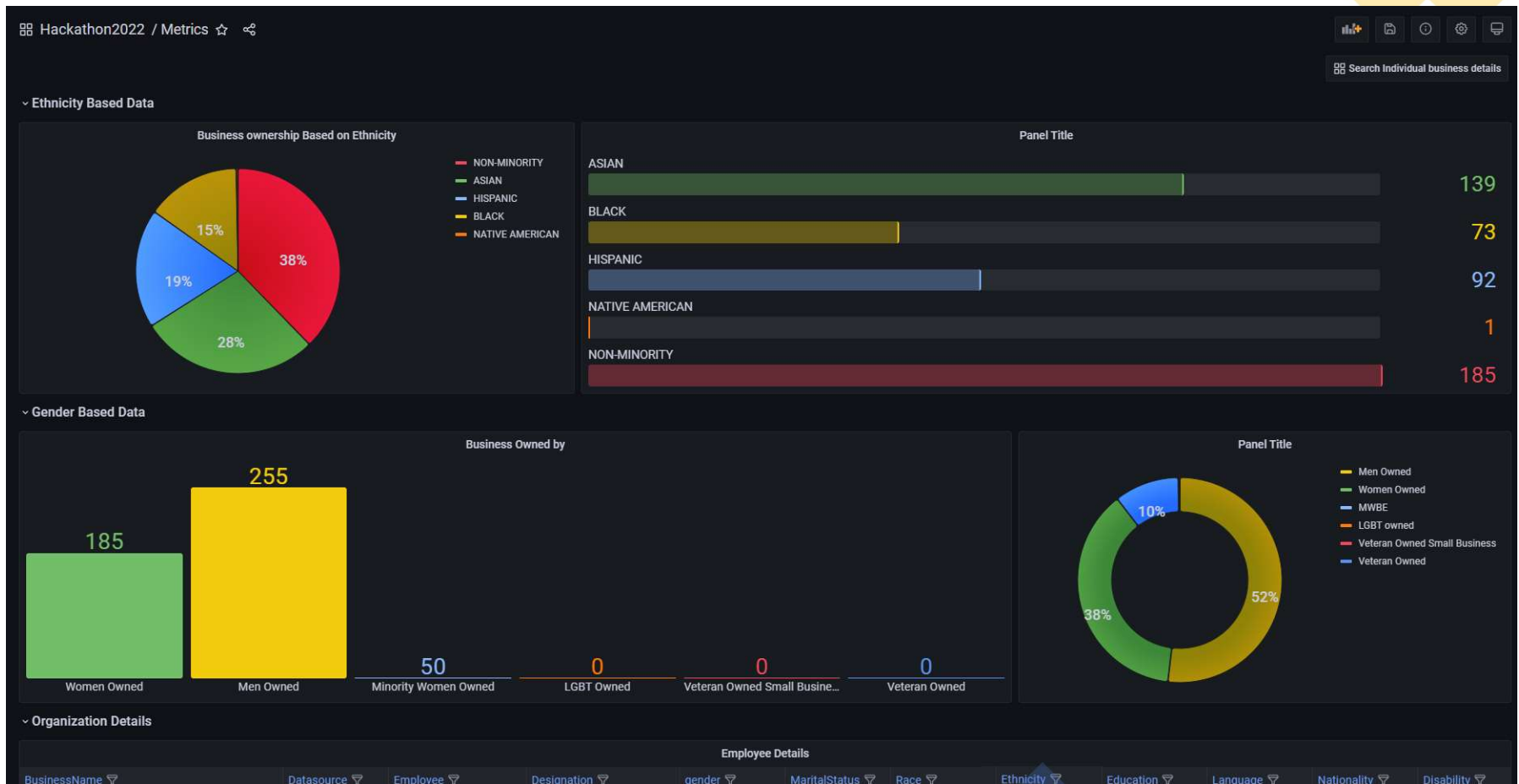


Publicly available Datasets

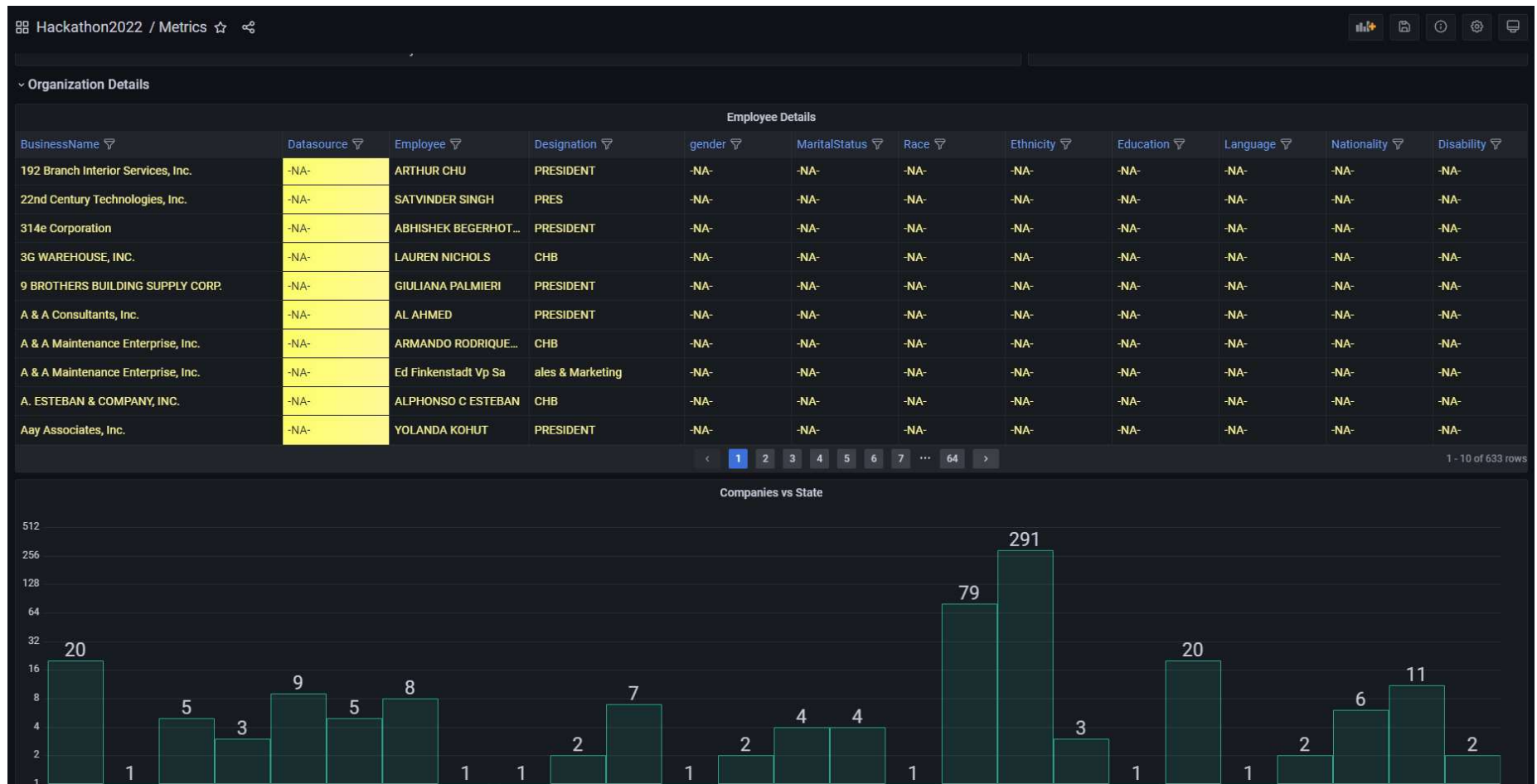
List of few datasets published by few States in United States of America are identified. These data were loaded into our data base and considered as master data.

| Source | URL |
|---|--|
| Virginia State Small Business Supplier Diversity (SBSD) | https://www.sbsd.virginia.gov/directory/ |
| Maryland – Department of Transportation (MDOT) | https://www.mdot.maryland.gov/tso/pages/index.aspx?pageid=90 |
| California - Caltrans | https://dot.ca.gov/programs/civil-rights/dbe-search https://ucp.dot.ca.gov/licenseForm.htm |
| New York – Data catalog M/WBE, LBE and EBE certified business list | https://catalog.data.gov/dataset/m-wbe-lbe-and-ebe-certified-business-list |
| | |

Diversity Dashboard



Diversity Dashboard (continued)



Business level diversity data

Hackathon2022 / Diversity and Enterprise - Interactive Dashboard

Enterprise

Talson Solutions, LLC

Metrics

| Organization | | | | | | | Ownership Details | | | | |
|-----------------------|-----------------|-----------------|--------|---------------|-------------|------------------|-------------------|-----------------------|-------------|------------|--|
| Talson Solutions, LLC | | | | | | | BusinessName | Talson Solutions, LLC | | | |
| Organization Details | | | | | | | OwnershipType | BLACK | | | |
| Address | City | State | Zip | Country | PhoneNumber | BusType | Women Owned | No | | | |
| 41 N 3RD ST FL 1 | PHILADELPHIA | PA | 19106 | Philadelphia | 2155929634 | -NA- | MBE | Yes | | | |
| | | | | | | | WBE | No | | | |
| | | | | | | | MWBE | No | | | |
| | | | | | | | LGBTBE | -NA- | | | |
| | | | | | | | VOSB | -NA- | | | |
| | | | | | | | VeteranOwned | -NA- | | | |
| Employee Details | | | | | | | | | | | |
| Datasource | Employee | Designation | gender | MaritalStatus | Race | Ethnicity | Education | Language | Nationality | Disability | |
| NLP | ROBERT S BRIGHT | MANAGING MEMBER | M | Married | Black | African American | Bachelor Degree | English | American | -NA- | |