



Final Report: Team 6

CS5604: Information Storage and Retrieval

Department of Computer Science, Blacksburg, VA 24061, November 30, 2023

Presented By: Mary Kate McGranahan and
Sunday Ubur

Deliverables for Team 6

- A single consistent UI to support all of the personas:
 - Curator
 - Experimenter
 - End-user doing research
 - Administrator working with reports and analyzing trends
 - Manager of system operations
- Authentication System
 - Create a way for users to securely sign up and login to the system

Process

1. Create a single consistent user interface:

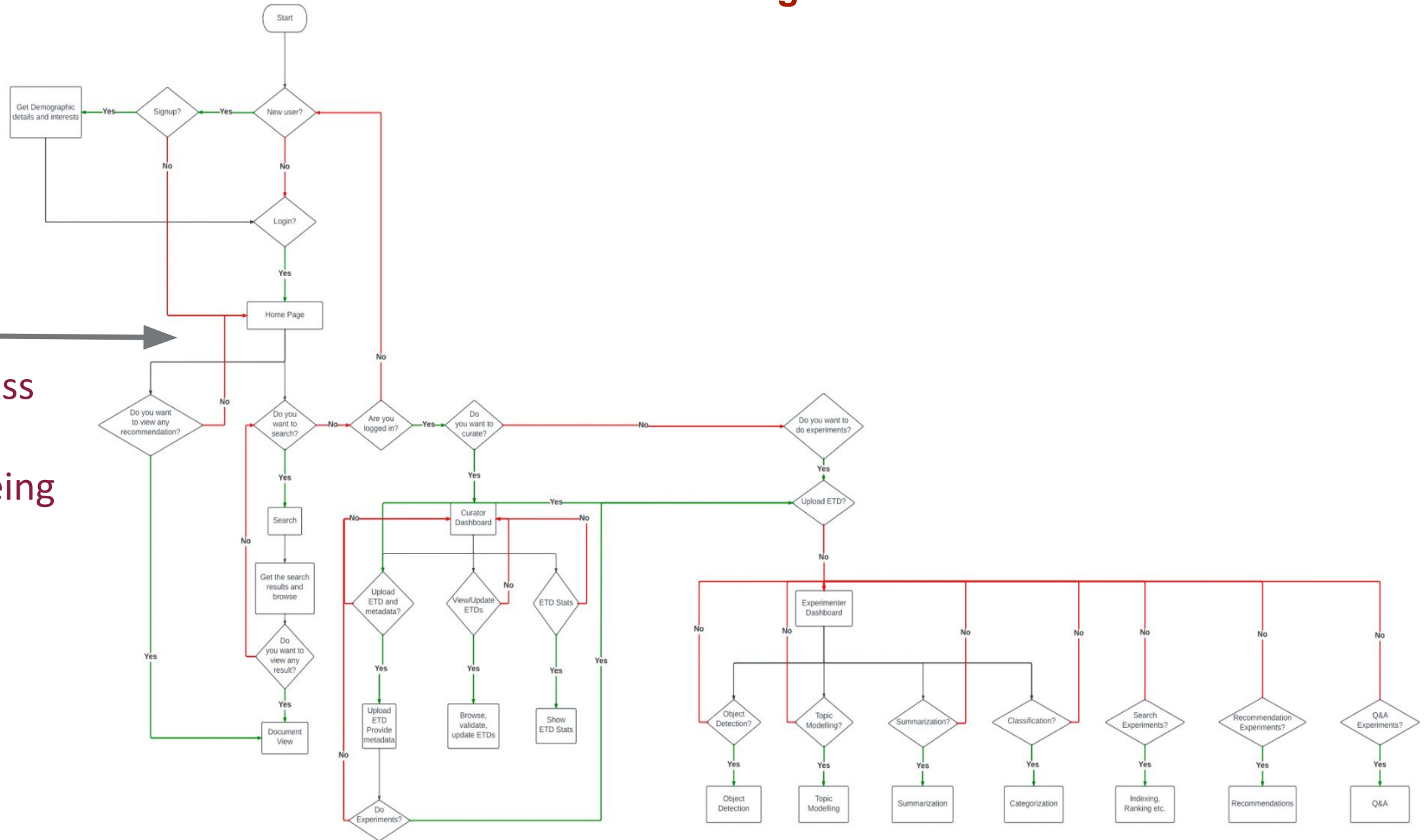
- Redesign the user flow from last year taking into account new features and authentication
- Create wireframe designs for a single consistent user interface
- Communicate with teams and receive feedback on what end-user interactions their systems require
- Implement these changes in the actual UI

Process

2. Authentication System

- Edit previous signup interface
- Design UML diagrams for login process and consult with other teams for feedback
- Work with Team 5 to save user details in the database for signup
- Work with Teams 2 and 3 on saving user preferences information during signup to enhance recommendation and topic modeling

Old User Flow Diagram

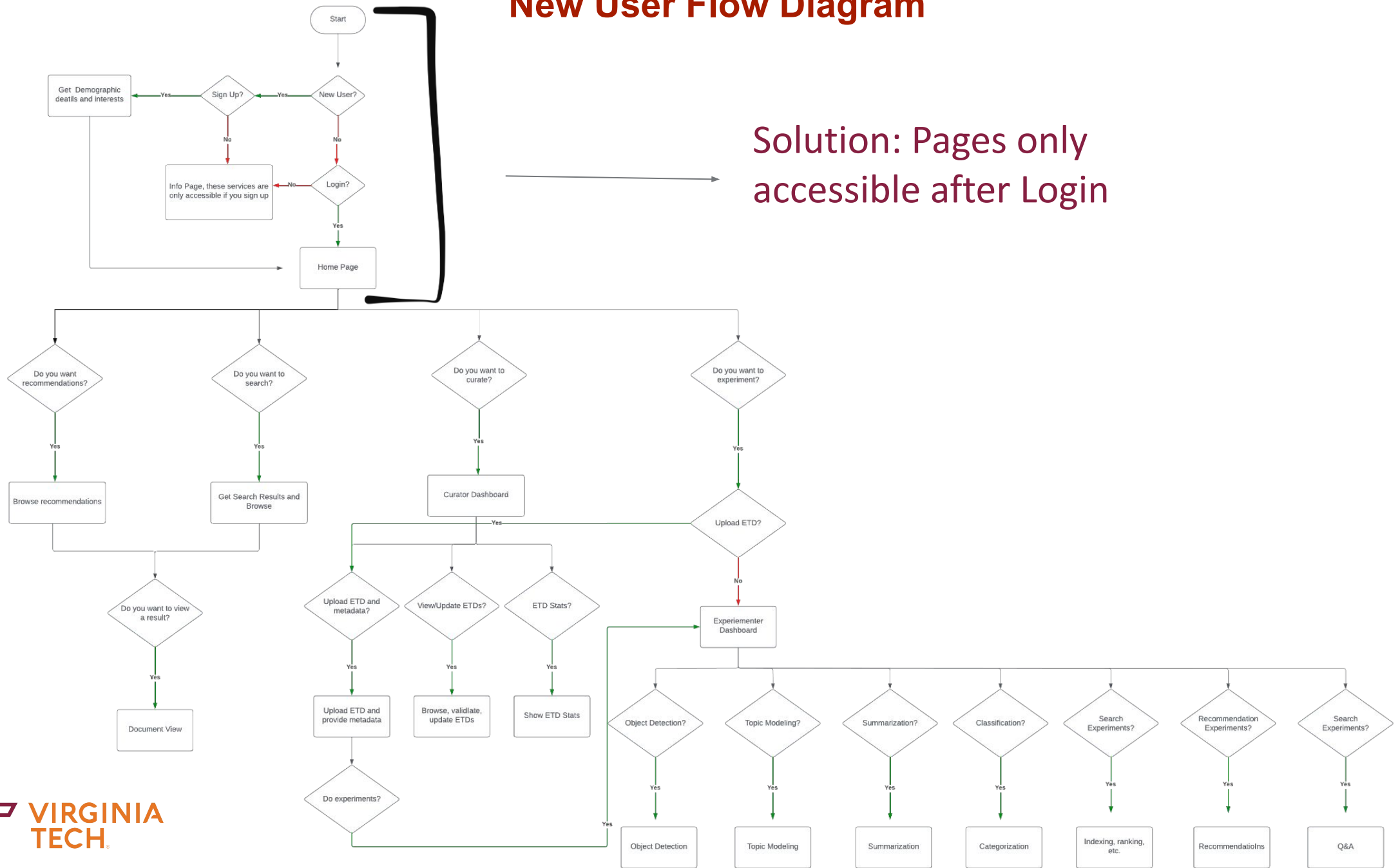


Problem: →
Could access
search
without being
logged in



New User Flow Diagram

Solution: Pages only accessible after Login




Wireframe Iterations

Experimenter and Curator Page Designs

Original Curator Page Design

Curator View

ETD



Upload ETD

Choose Files

No file chosen

UPLOAD

Copyright © [Virginia Tech](#) 2023



Two Page Design after Feedback

Curator View

ETD

Search

Curate

Profile

Settings

Logout

Single ETD Processing

List Processing

Batch Processing

Curator Second Screen

ETD

Search

Curate

Profile

Settings

Logout

Object Detection

Topic Assignment

Summarization

Classification

Indexing

All of the Above

Experimenter and Curator Page Designs

Final Design after more Feedback

Curator View

The Curator View interface features a sidebar on the left with the following links: Search, Curate, Profile, Settings, and Logout. The main content area is divided into two tabs: "Specify ETDs by ID" and "Specify ETDs by Collection". The "Specify ETDs by ID" tab contains a text input field labeled "List IDs". The "Specify ETDs by Collection" tab contains three text input fields labeled "Name", "Description", and "ETDs List". A dropdown menu labeled "Select Curation Function" is located below the tabs, with a list of options: Topic Assignment, Summarization, Classification, and Indexing. Hand-drawn arrows point from the text "tabbed choices" to the "Specify ETDs by Collection" tab and from "Dropdown text" to the "Select Curation Function" dropdown.

ETD

Search
Curate
Profile
Settings
Logout

Specify ETDs by ID

List IDs

Specify ETDs by Collection

Name

Description

ETDs List

Select Curation Function

Dropdown text

Topic Assignment
Summarization
Classification
Indexing

tabbed choices

Dropdown text

Repeated a similar process for
other screens

Final Screens

ETD

LOGIN

Sign in

Email Address *

Password *

☐

Remember me

SIGN IN

[Forgot password?](#)

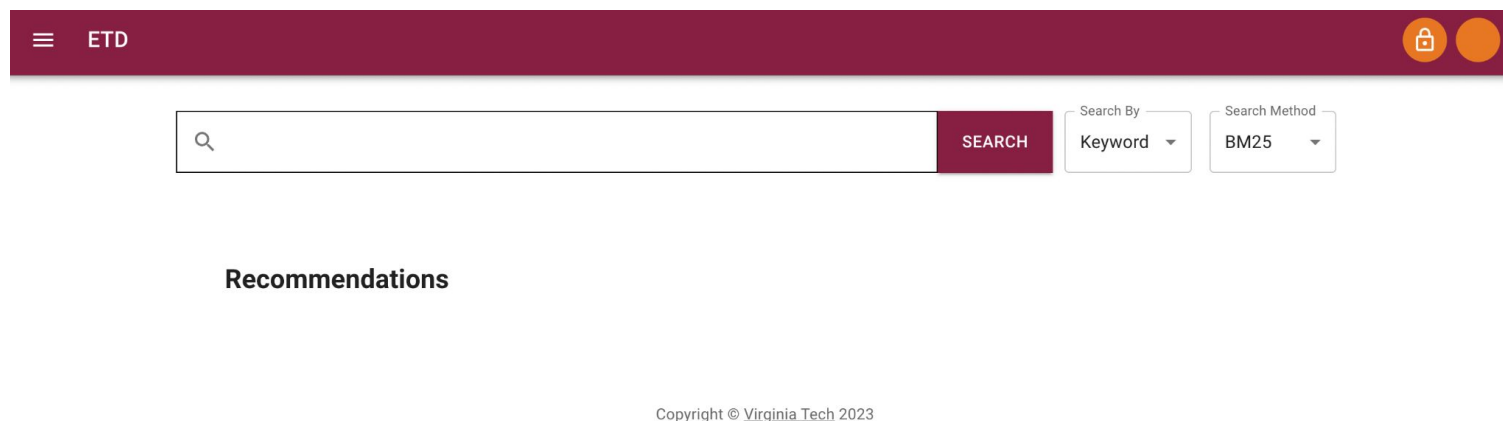
[Don't have an account? Sign Up](#)

Copyright © [Virginia Tech](#) 2023

Sign in Page

The first page a user is taken to is the Sign in page; they will not be able to access any other pages until they get through this screen or chose to sign up

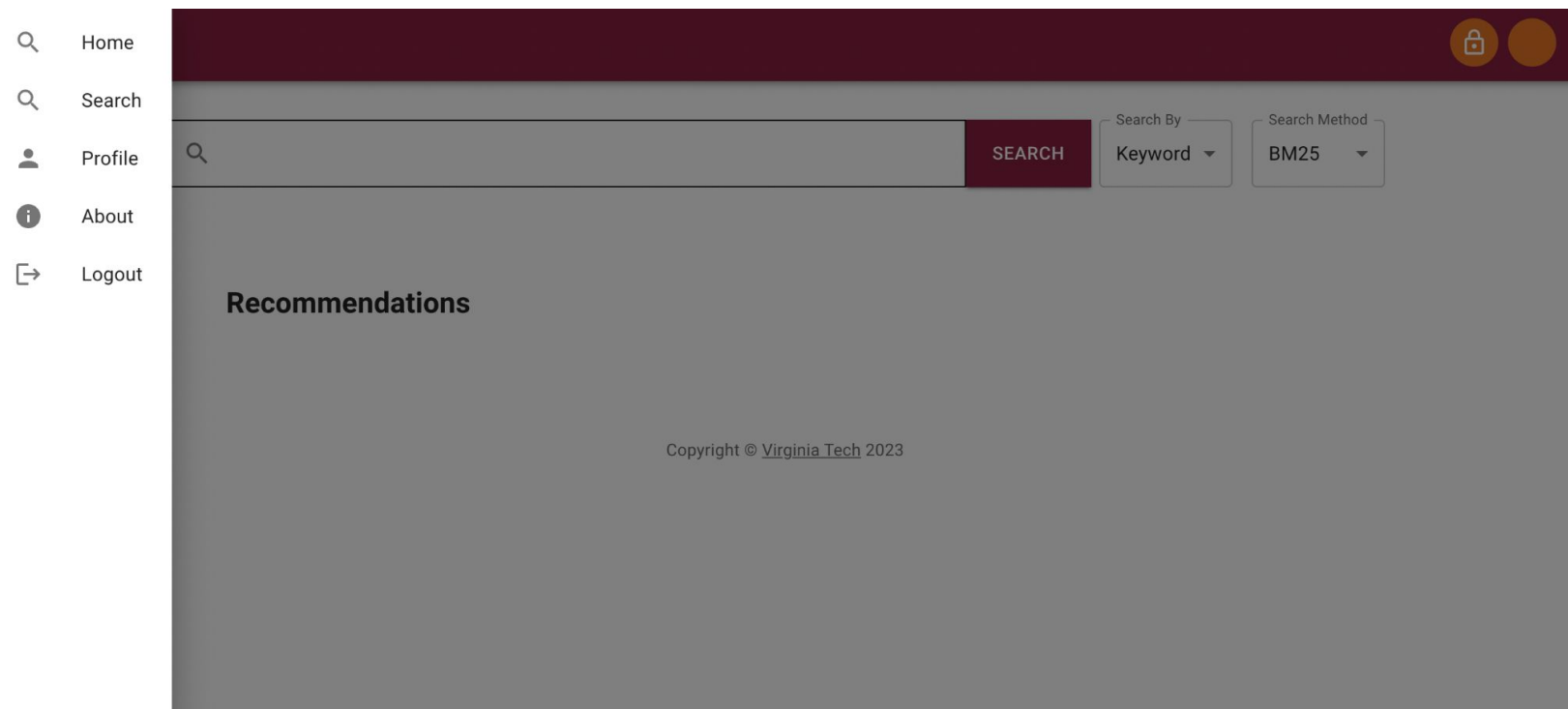
Figure 1

A screenshot of a web application interface. At the top is a dark red header bar with a hamburger menu icon and the text 'ETD' on the left, and a lock icon and a solid orange circle on the right. Below the header is a search area with a text input field containing a magnifying glass icon, a red 'SEARCH' button, a 'Search By' dropdown menu set to 'Keyword', and a 'Search Method' dropdown menu set to 'BM25'. Below the search area is a section titled 'Recommendations'. At the bottom center, there is a small copyright notice: 'Copyright © Virginia Tech 2023'.

Interface for General User

Once a user is signed into the system, they are taken to the search and recommendations page

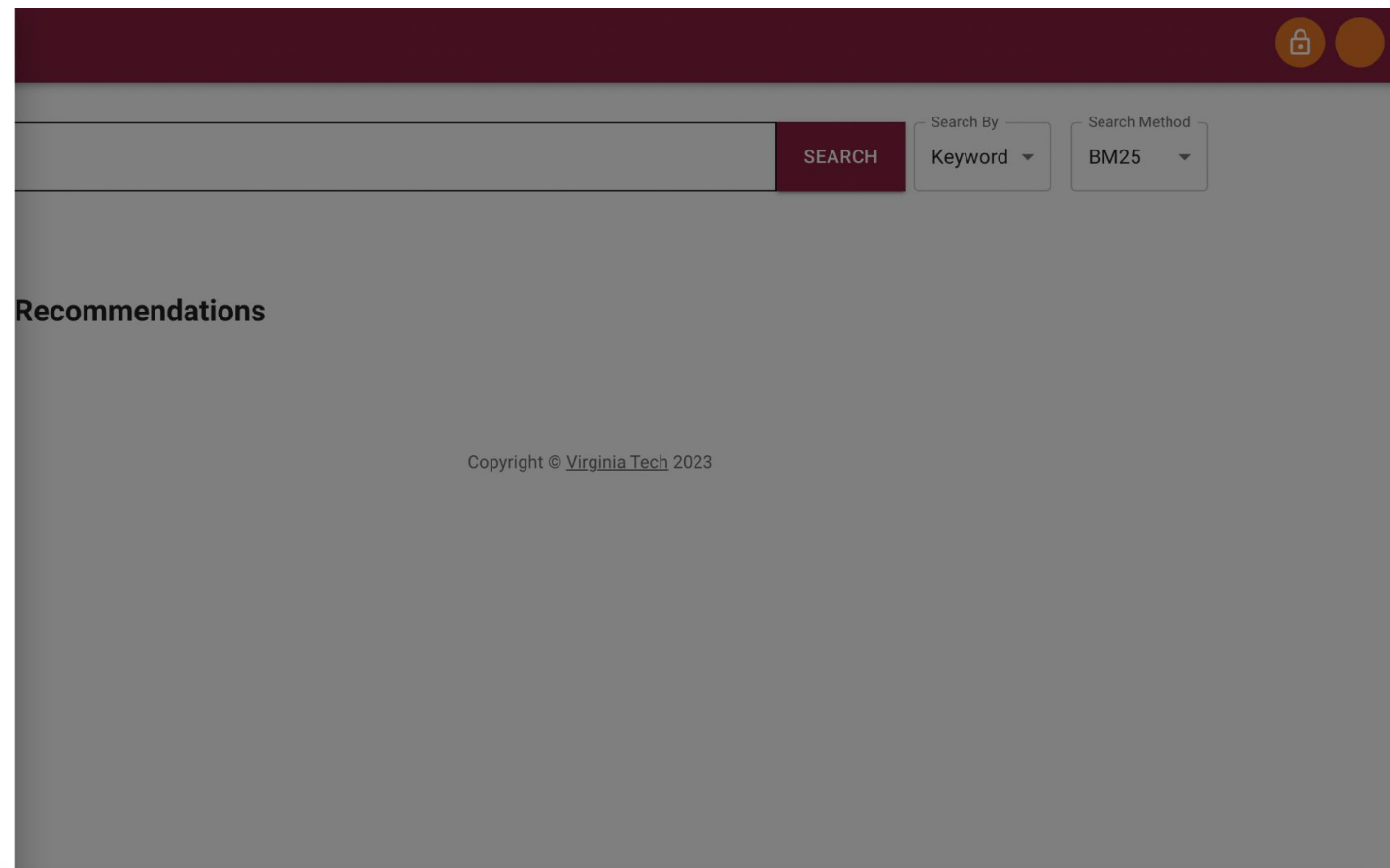
Figure 2



Menu for General User

If the user is a general user, these are the menu options they will be limited to (no access to experimenter or curator pages)

Figure 3



Menu for User with Experimenter and Curator Permissions

If the user is an experimenter or curator, they will be able to see more menu options including a Settings page that contains the admin interface

Figure 4



Curator Page

Curator View

Specify ETDs by ID

List IDs

Name
Description
ETDs List

Select Curation Function

Click to select ...

SUBMIT

Figure 5

A curator can analyze the ETD system, change, update and upload contents to the collection, as shown in Figure 5

Experimenter First View

Specify Collection:

Name

Description

ETDs List

Select Experiment:

Click to select...

Classification and Summarization

Indexing and Ranking

Experiment Type

With feedback from teams, we have created the experimenter pages, shown in Figures 6-9

Here, Experimenter can choose between Classification & Summarization OR Indexing & Ranking experiment

Figure 6

ETD

Classification and Summarization Experiments

Search ETD...

Select Summarization Model

ModelTextRank

Select Classification Model

ModelSciBERT

Classification & Summarization Experiment

Based on the Experimenter's selection from the dropdown options, they are taken to a second page to make the selections specific to their experiment.

Figure 7 shows how an Experimenter can run a Classification and Summarization experiment.

Figure 7

Indexing and Ranking Experiments

Ranking Experiments

Choose Experiment ▼

Number of Documents

Search Method
BM25 ▼

Keyword Search Vector Search

RUN EXPERIMENT

Indexing Experiments

Add Experiment Name

Add Experiment Option

SPECIFY COLLECTION

RUN EXPERIMENT

Copyright © Virginia Tech 2023

Indexing & Ranking Experiment

Figure 8 shows how an Experimenter can run Indexing and Ranking experiments

Figure 8

Admin Page

First Name	Last Name	Email	Affiliation	Role	Assign Role
john	Doe	user1@vt.edu	Virginia Tech	user	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>
Jon	Wick	user2@vt.edu	Universal Studios	user	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>
Jackie	Chan	user5@vt.edu	Virginia Tech	curator	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>
Barry	Allen	barry.allen@vt.edu	Cadmus	user	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>
Mike	grayson	mike.g@vt.edu	VT	user	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>
test	user	user3@vt.edu	VT	user	<div>ASSIGN EXPERIMENTER</div> <div>ASSIGN CURATOR</div>

Admin Page

Users with an admin role can also access an admin page, shown in Figure 9, through the settings menu selection. They are then able to assign users experimenter and curator privileges

Figure 9

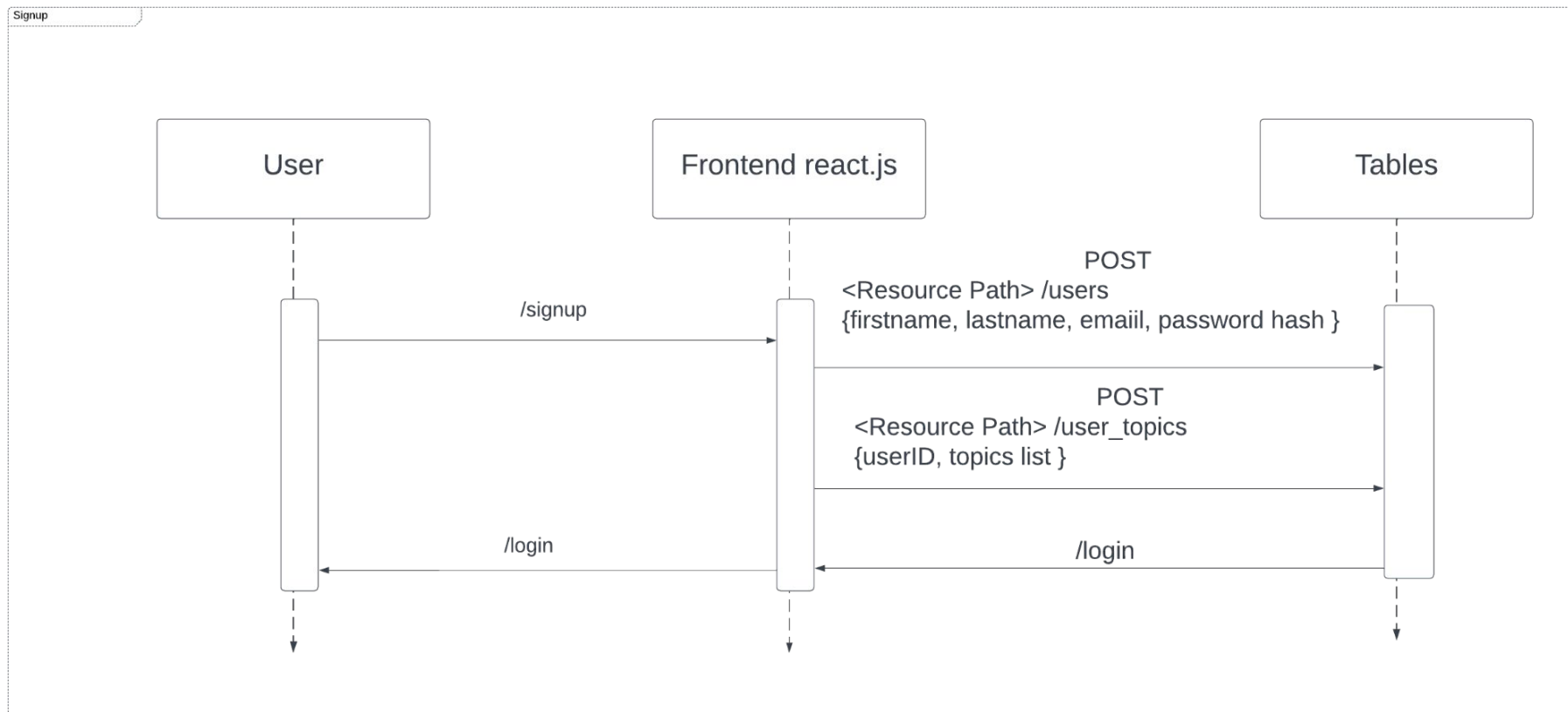
Signup and Authentication

Team 6 took on a crucial role in revamping the system by establishing a functional signup and authentication system for users. This component, previously dysfunctional in the system's earlier version, was deemed essential for both bolstering security measures and elevating the overall user experience.

Designing the Login and Signup Process

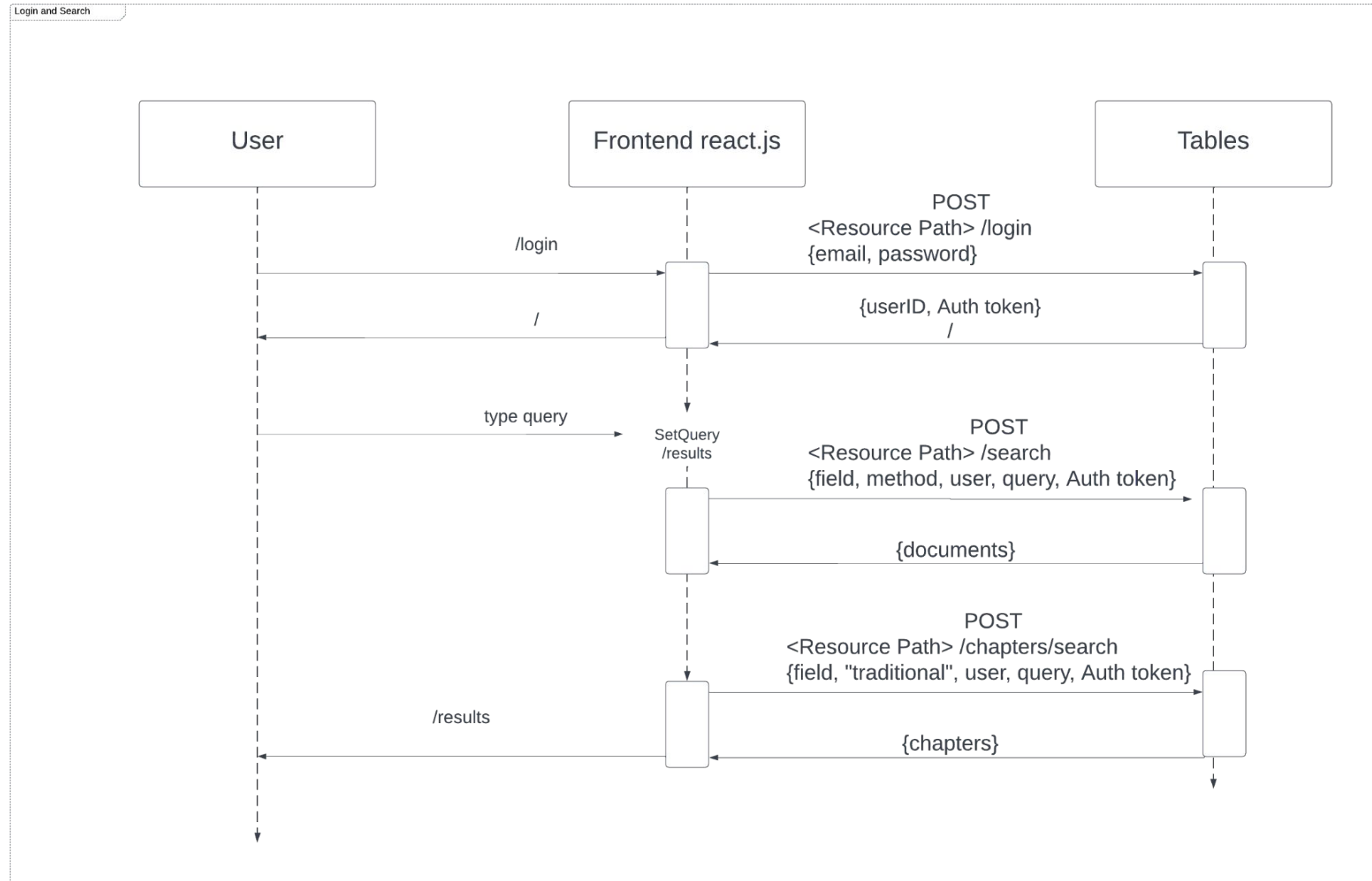
UMLs were created in collaboration with Team 5 to decide how the frontend would communicate with the database to handle permissions

Signup UML



Designing the Login and Signup Process

Login UML



Designing the Login and Signup Process

Another addition to the signup were topics of interest a user could select based on topic modeling done by Team 3 and categories based on the ProQuest categories that would help with Team 2's recommendation system.

Designing the Login and Signup Process



Signup

First Name *	Last Name *
<input type="text"/>	<input type="text"/>
<input type="text" value="University/Organization *"/>	
<input type="text" value="Email Address *"/>	
<input type="text" value="Password *"/>	

Topic and Category Selection:

To best utilize the system's recommendation features, please select up to 5 entries using the following two menus, so you can identify the best Categories (from the ProQuest system) and Topics (based on topic modeling) that are of particular interest to you.

Categories *	▼
Topics *	▼

Designing the Login and Signup Process

ProQuest Categories

First Name *	Last Name *
Agriculture	
Architecture	
Behavioral sciences	
Biological sciences	
Business	
Communications and information sciences	
Education	
Engineering	
Environmental sciences	
Fine and performing arts	
Geosciences	
Health and medical sciences	
History	
Interdisciplinary	
Language and Literature	
Mathematical and physical sciences	
Philosophy and religion	
Social sciences	

Topic Modeling Topics

0: task, memory, cognitive, brain, tasks, visual, performance, processing, experiment, information

2: core, formation, mass, evolution, thesis, source, history, secondary, young, observations

4: urban, city, land, planning, spatial, air, areas, building, development, space

5: concentrations, water, concentration, ph, treatment, treatments, increased, samples, growth, total

6: body, loss, subject, field, family, features, feedback, female, fiber, fields

7: quantum, phase, wave, transition, liquid, solid, global, basis, field, coupled

9: algorithm, network, algorithms, problem, system, data, networks, performance, optimization, systems

11: problem, theory, equations, problems, space, finite, solution, method, equation, solutions

13: design, user, users, software, computer, building, technology, digital, information, system

15: soil, climate, water, north, area, variability, land, data, change, study

17: electron, ion, charge, energy, molecular, dynamics, molecules, state, structure, transfer

18: food, consumption, choice, products, access, weight, selected, behaviors, requirements, hypothesis

19: error, distance, recovery, index, mean, density, correlation, prediction, values, volume

21: al, et, underlying, 15, formation, ii, primarily, structures, structural, importance

22: structures, study, young, female, factors, failure, family, features, feedback, fiber

23: political, government, public, states, economic, international, state, united, policy, national

24: leadership, service, services, relationships, delivery, lack, traditional, industry, relevant, successful

26: students, school, teachers, education, student, study, learning, teacher, college, schools

27: children, child, parents, family, intervention, study, adults, social, behaviors, age

28: available, oxygen, metal, surface, co, protein, ph, carbon, surfaces, reduction

29: flow, velocity, pressure, model, boundary, motion, fluid, layer, numerical, wave

30: community, social, study, research, organizations, interviews, members, organization, communities, management



Summary of Main Accomplishments

- In collaboration with other teams, we achieved the consistent single UI goal
 - Created the new curator UI
 - Created an Admin UI to view users and assign roles
 - Separated general user and user-specific recommendation searches
 - Created the new Experimenter pages
- Enhanced the Authentication and restricted access to Curator, Experimenter and Admin pages
- Improved the ProQuest categories and topics for user during signup to support user recommendations

For Future Work

- Administrator working with reports and analyzing trends
 - Proper logging and recording of user actions
- Topic Modeling User Interface
- Testing and improving experiments pages
- More secure login system
 - Limiting user access to only verified users

Thank You for Your Assistance

- Professor Fox
- Xiao Liang
- Team 5
- Nikhil Ram

Questions?