MICHIGAN STATE UNIVERSITY

Project Plan Presentation

MSU – HFH Research Synergy Vanguard Portal (RSVP) 2.0

The Capstone Experience

Team Henry Ford Innovations RSVP

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Spring 2025

From Students…
…to Professionals

Project Sponsor Overview

- Henry Ford Health is one of the nations leading academic medical centers
- Operates 13 hospitals in Michigan
- Treated over 4 million patients in 2023
- The official medical services provider for the Lions, Tigers, Pistons, and Red Wings

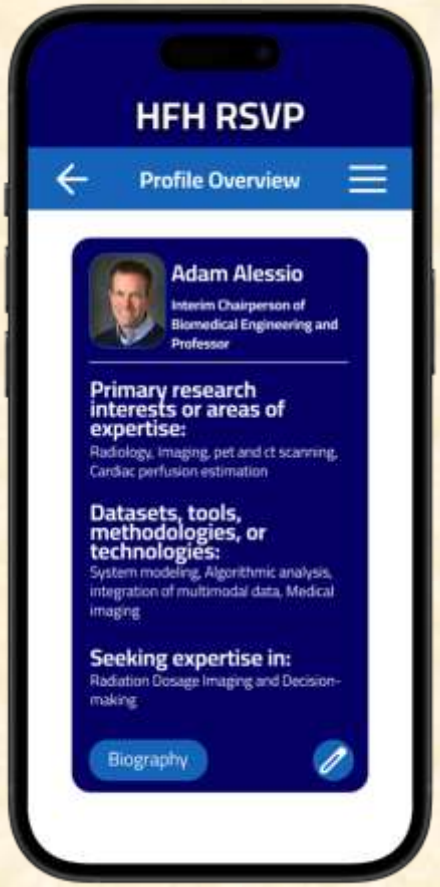
Project Functional Specifications

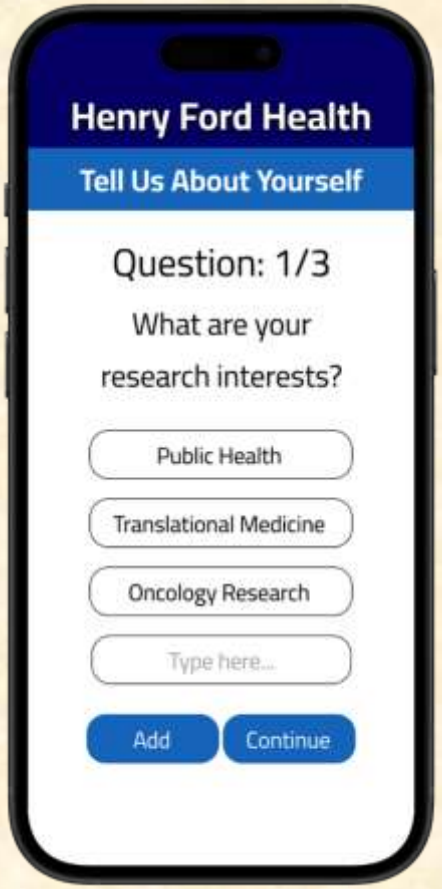
- Aims to connect capabilities of MSU researchers with the clinical needs of HFH
- Search algorithms and automated matching will work to facilitate meaningful collaborations
- Web and Mobile App based platform usable only to MSU and HFH members
- Storable, editable, removable profiles and information

Project Design Specifications

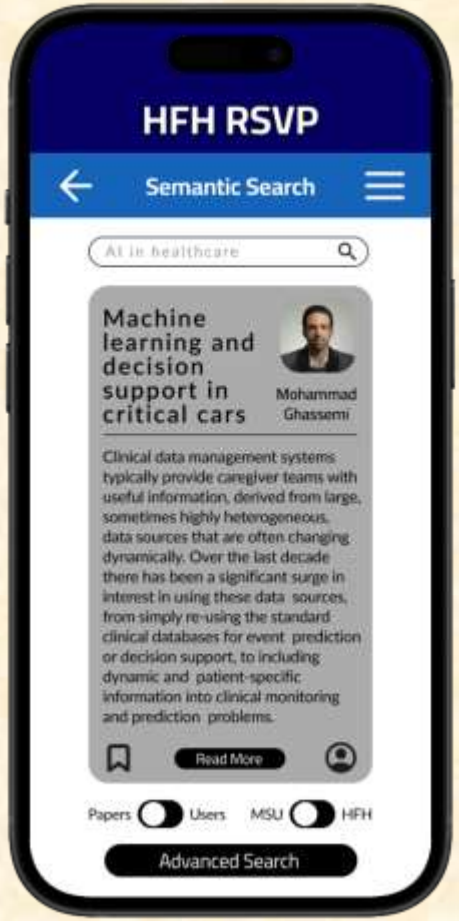
- Secure login and profile creation
- Improving database schema to make data fetching much faster
- Migrating web system to iOS mobile app
- Adding advanced options for semantic search to eliminate ambiguity when fetching data
- Enhance admin capabilities: ability to add and remove users from the system

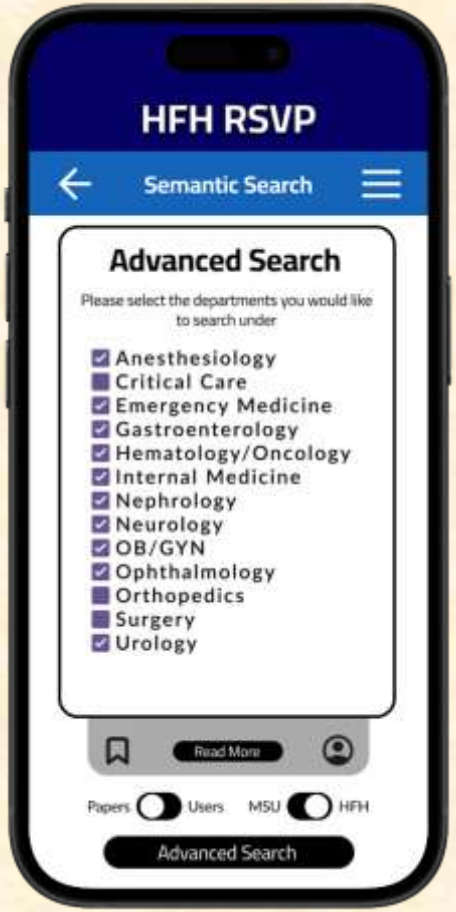
Screen Mockup: iOS Application





Screen Mockup: iOS Application





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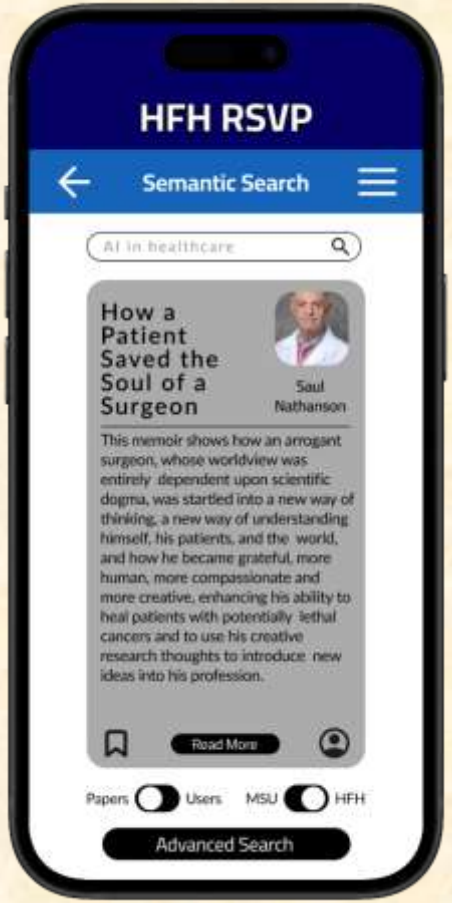
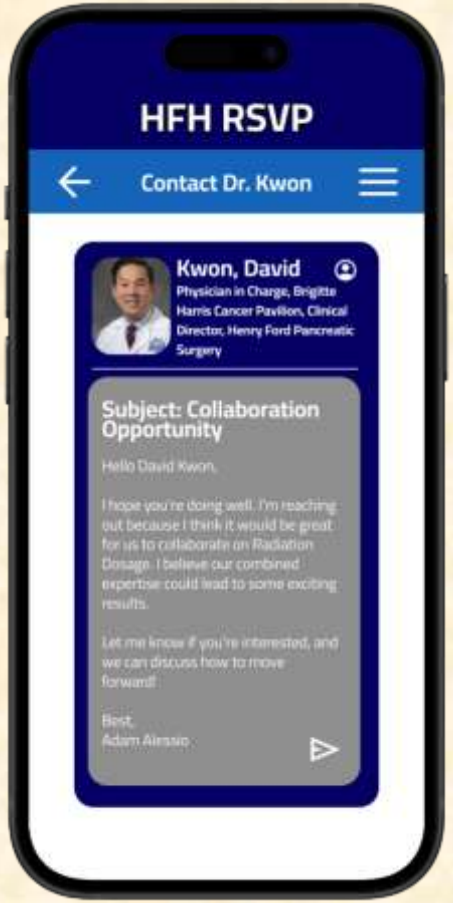
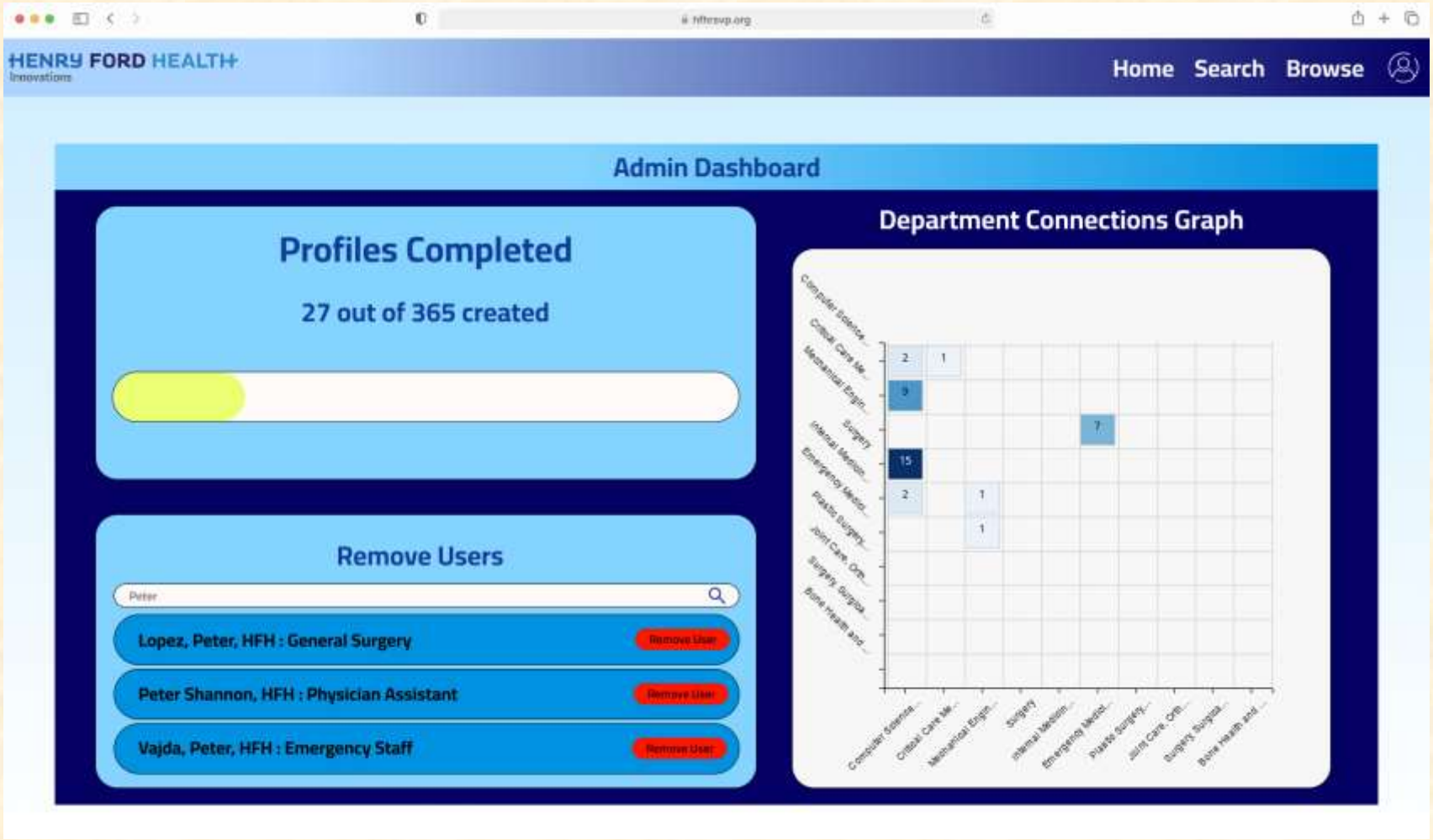
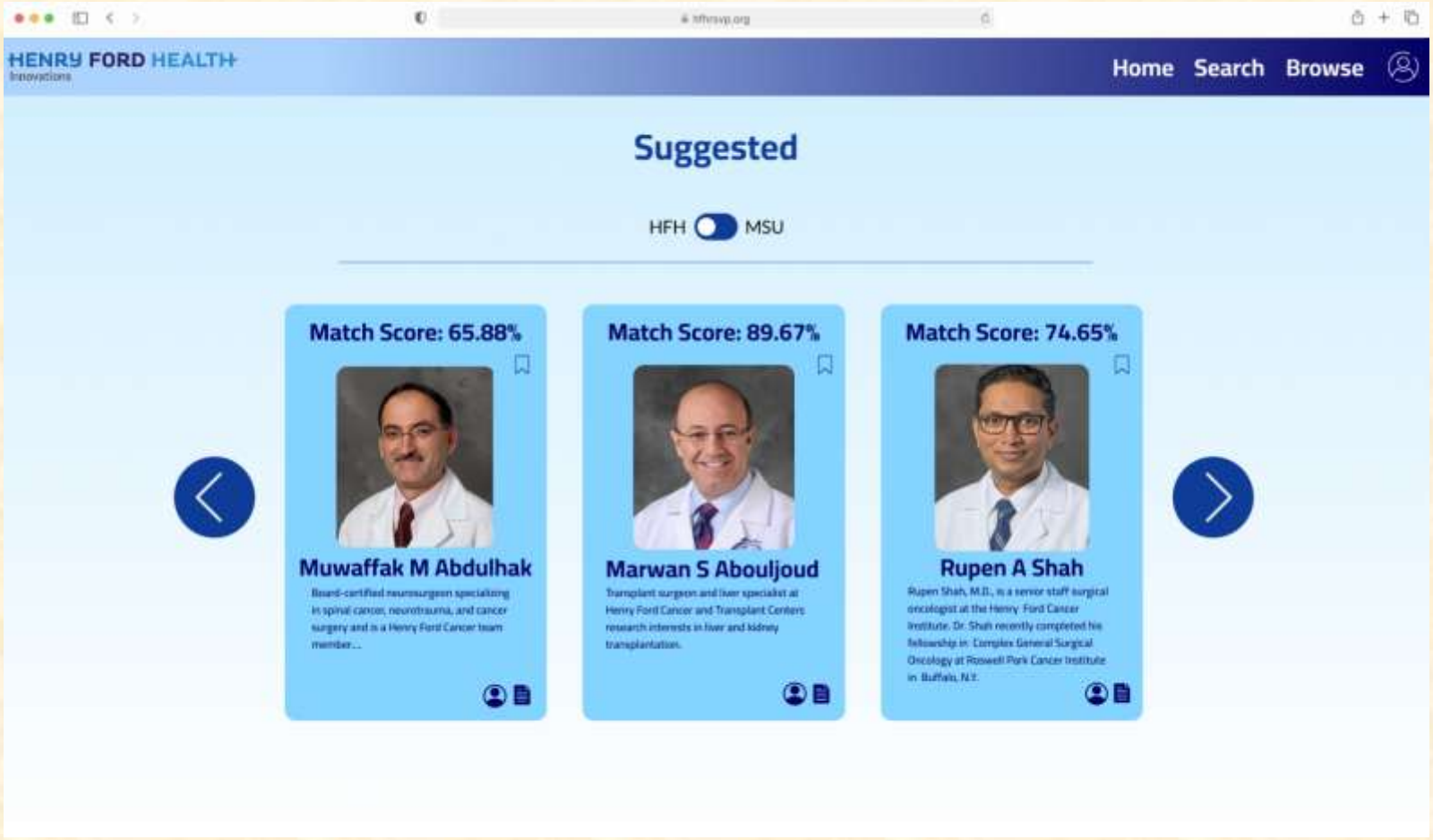




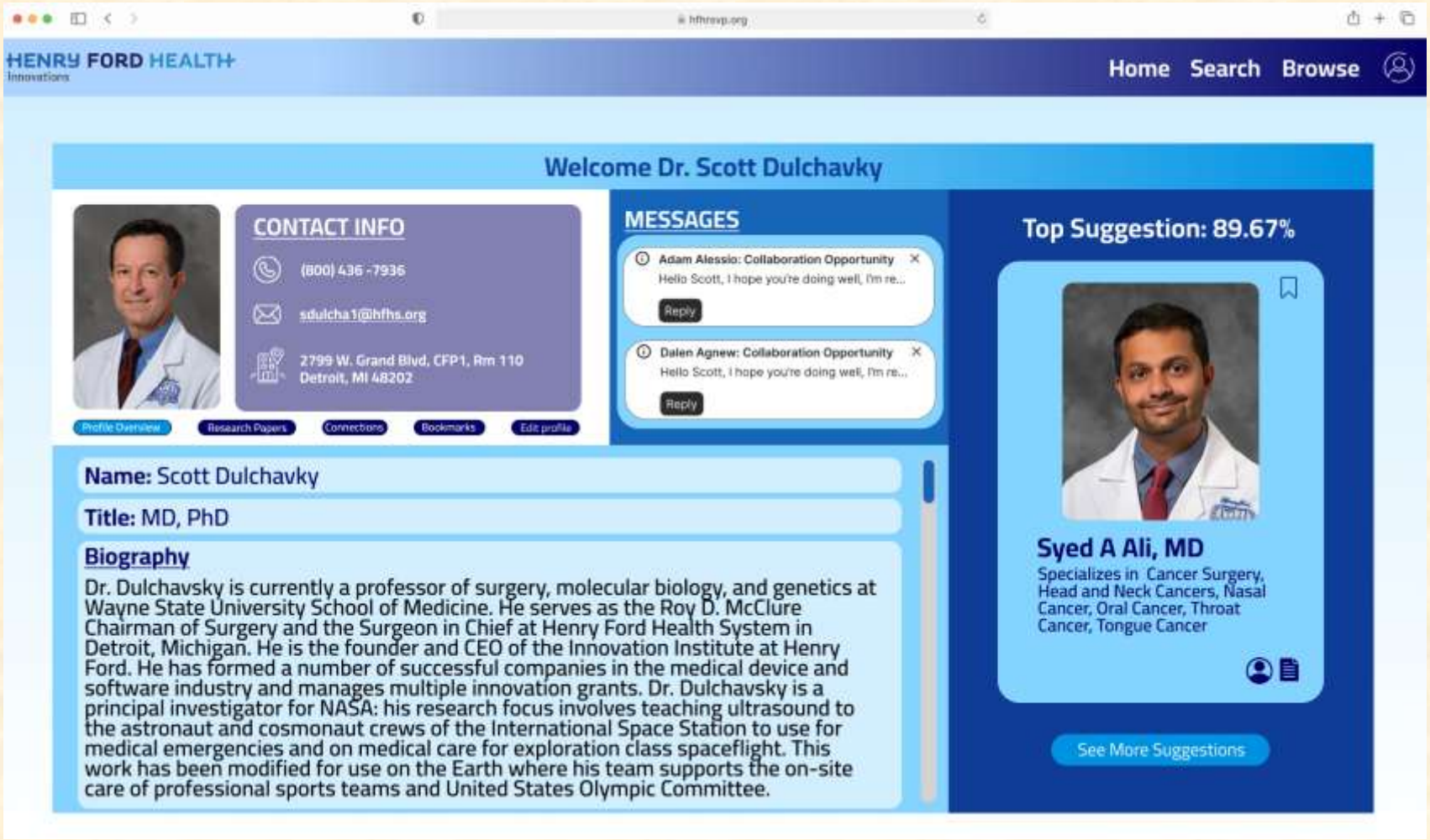
Screen Mockup: Admin Privileges



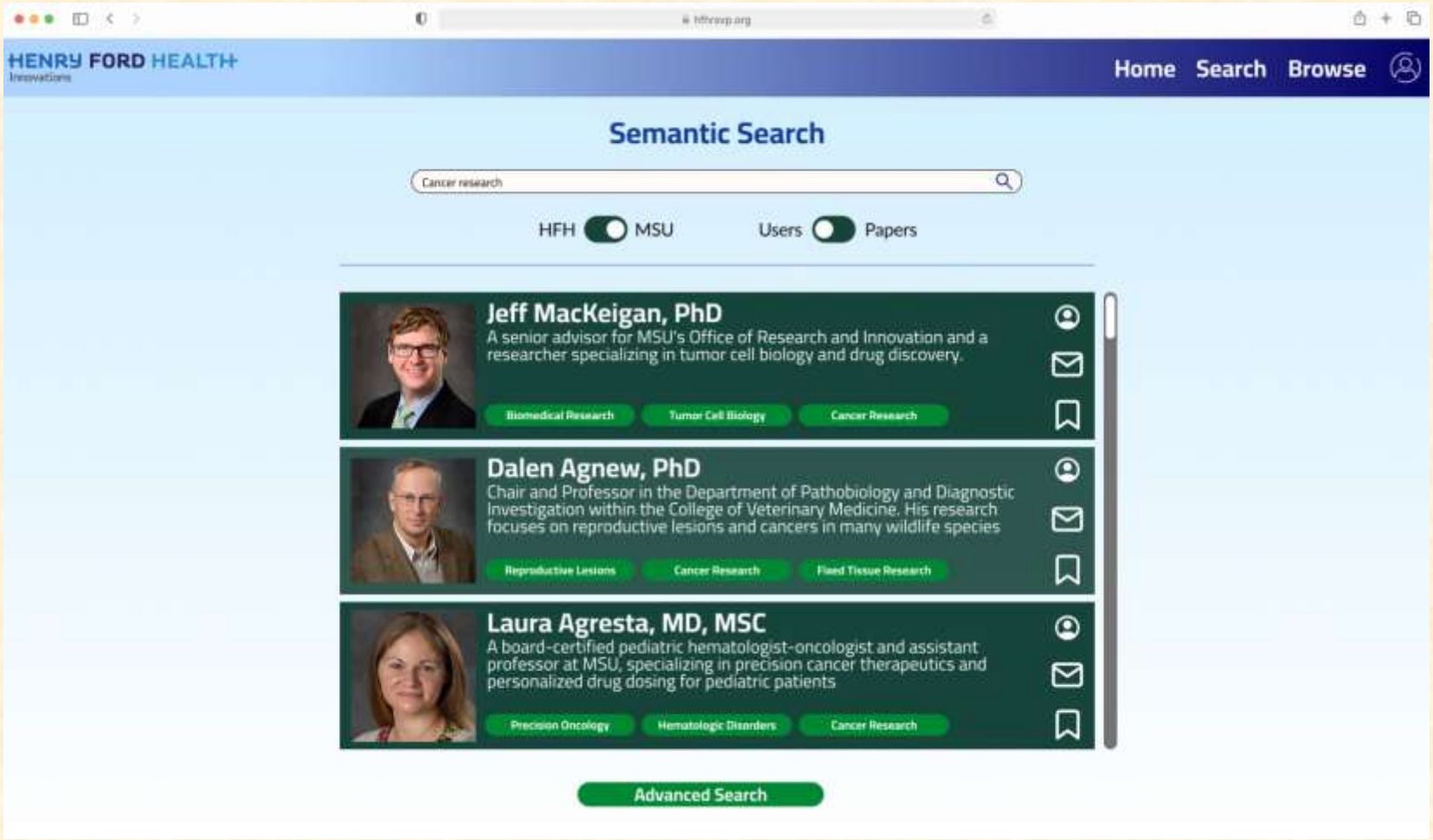
Screen Mockup: Suggested Page



Screen Mockup: Profile Page



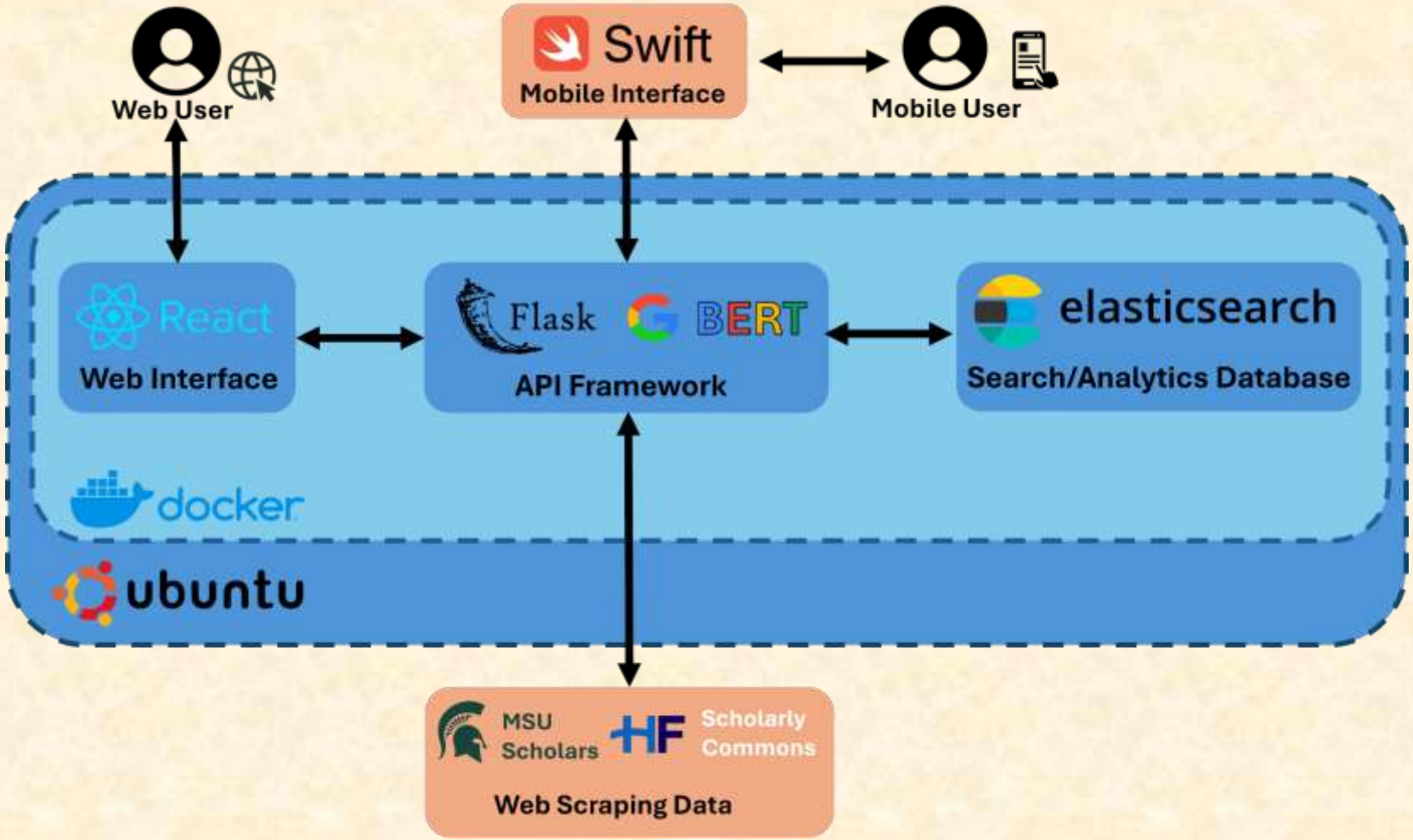
Screen Mockup: Semantic Search



Project Technical Specifications

- Front end implemented with React based portal along with HTML, CSS, and JavaScript
- Back end powered by Flask which handles search queries and editing of user profiles
- Back end will store data on Elasticsearch
- Back end utilizes BERT to provide a similarity score for user search engine results
- iOS Mobile App implemented with Swift

Project System Architecture



Project System Components

- Hardware Platforms
  - Physical Linux Server

Software Platforms / Technologies

- React (Front end)
- Flask (Back end)
- BERT (Back end)
- Elasticsearch (Back end)
- Python (Back end)
- Docker (Containerization)
- Swift (Mobile Application)

Project Risks

- Mobile Migration and Connection
  - Not sure how to connect mobile application to web database securely
  - Research how to extract user data from Flask, including best practices for security
- BERT and Elasticsearch RAM Usage
  - If multiple people are using the site, excessive RAM usage causes search and other functionalities to slow down
  - Research Elasticsearch RAM settings, if there's no way to improve, switch database software, possibly SQL
- Scraping New User Data
  - The database needs to be constantly searching for new hires to prepopulate some parts of their profile
  - Monitor performance under different scraping conditions, discuss with client a possible scraping schedule that aligns with new hires
- Convenient Verification for HFH users
  - Not sure how to get reliable access to a verification method such as OAuth to aid HFH users in easy signup and access to the portal
  - Confer with MSU and HFH client to discuss what user data we have access to, then work with MSU IT to learn how to safely use and store it

Questions?