Research Deliverable - Situated Biology

I. Long Term Goal

The long term goal of this website is to get students excited about STEM research and the biodiversity around them. In a 2-3 year period we expect this website to be used in at least 1 mandatory introductory level science course in each of the participating universities. By having students actively engage with campus ecosystems using 'citizen science' throughout the semester, Dr. Gates hopes to promote research in the STEM field while also collecting data that researchers can study. Dr. Gates also believes that by pushing NCSU and ECU students to participate in actual science, they will develop a sense of self efficacy that will promote their involvement in the STEM field.'

II. Challenges

A. Getting researchers involved in the Citizen Science projects and actively using the gathered data in their research.
B. Getting professors to alter their course structure to accommodate the new website and citizen science.
C. Ensuring students have the required technology and time to complete the required tasks outside of class.

III. Experience Map

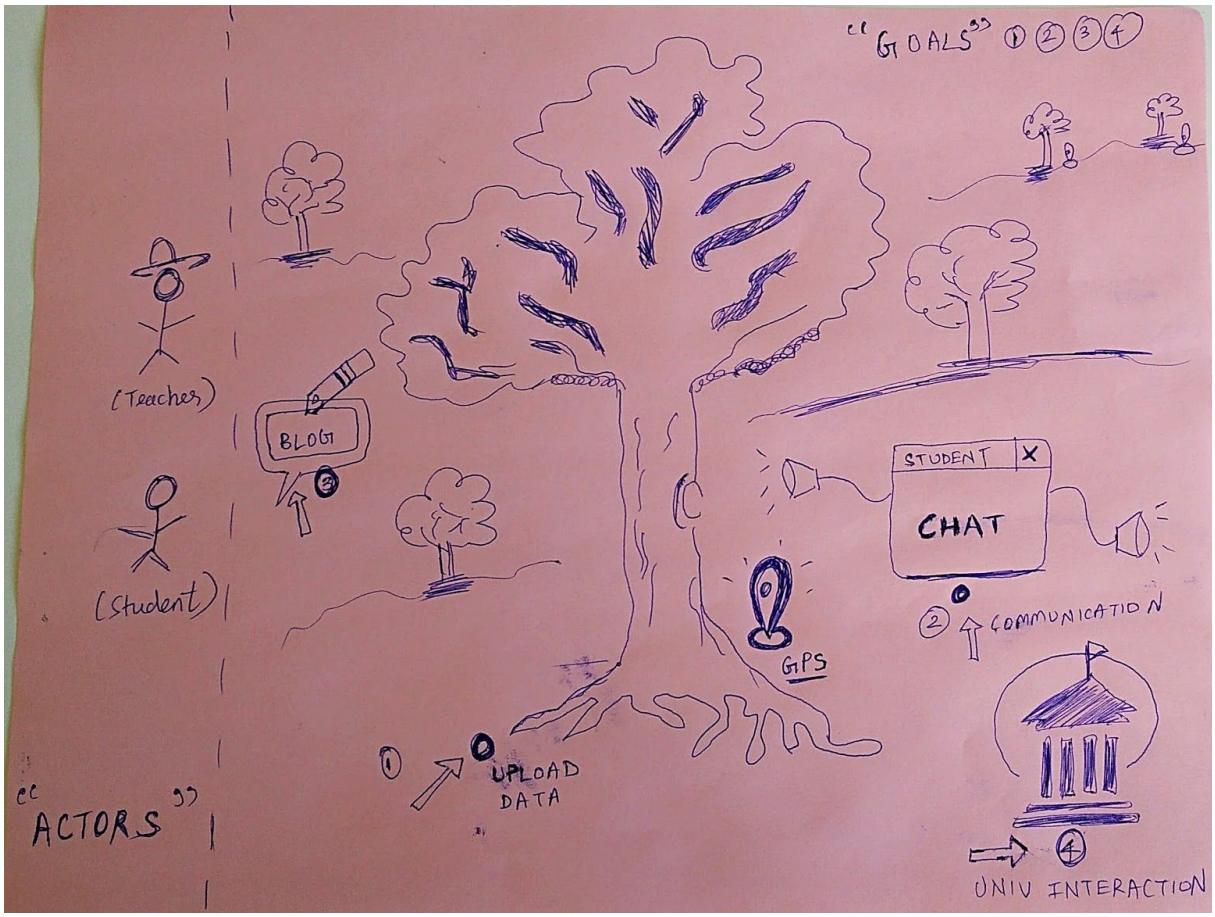

Figure 1: Overview exhibiting the primary and secondary features, actors of the website

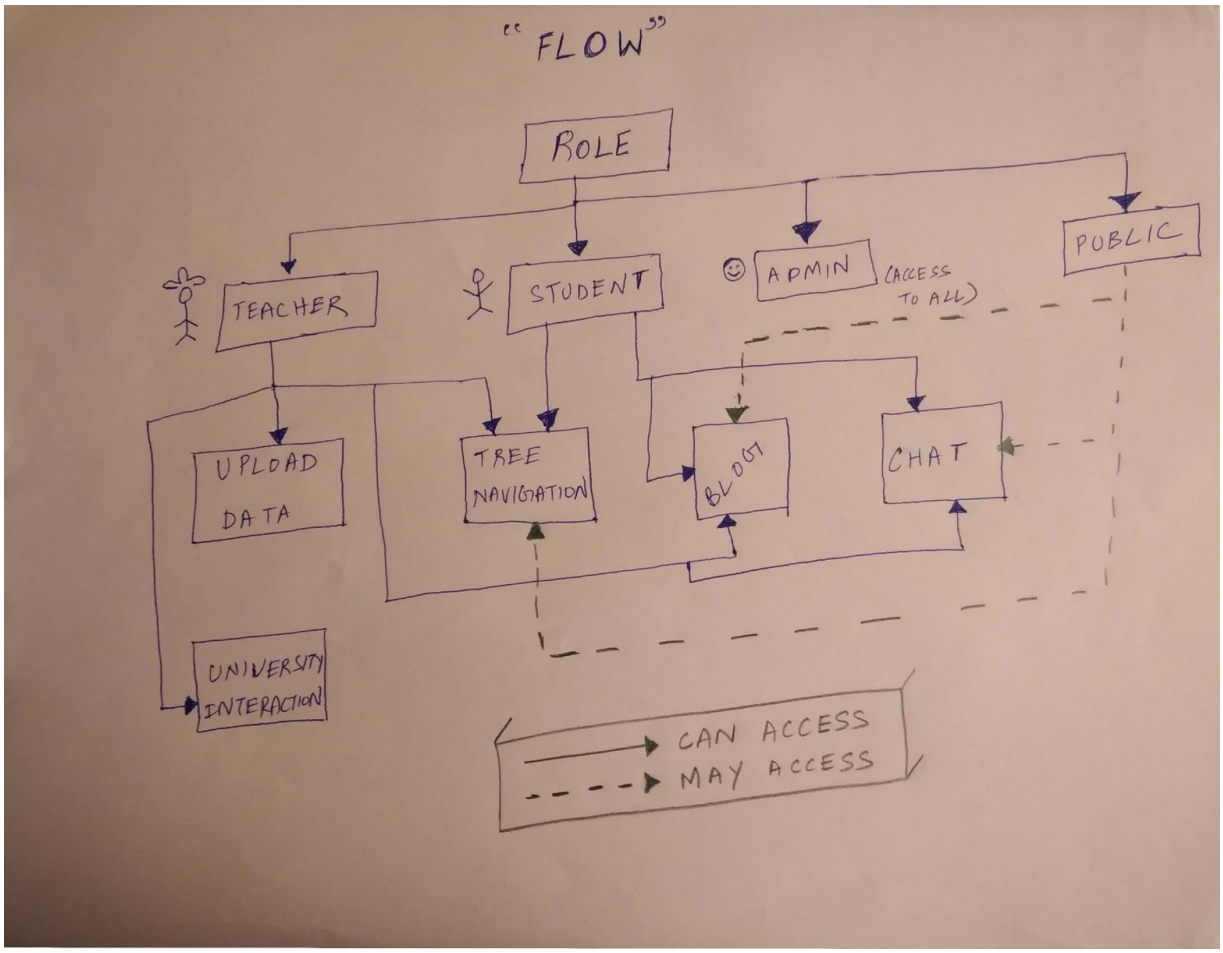

Figure 2 : Flow exhibiting role based access to various sections of the website

IV. Expert Consulting

We met with Dr. Gates, our only expert where the following information was discussed:

1. All of the information described on this document as that was the point of the meeting
2. Dr. Gates' vision for this project
    a. Including the information in the summary above, the website should be minimalistic and simple with an interactive UI.
3. Other citizen science websites as examples for what Dr. Gates might expect the final product to look like
4. A few of the expected pieces to be included in the completed website
    a. Using a map of NCSU campus with widgets for each tree that we have collected data for
    b. Retaining information for trees over time and displaying a timeline of information about each tree
    c. Possibly using keyword searching to analyze trends over time

d. Possibility of a tutorial page for those who may be unfamiliar with biology
e. Possibly having different UIs for different categories of individuals, i.e. professors vs. students

V. Problem/Opportunities

A. Data Management

a. How might we build an intuitive map-based representation of the data? 1 1 1
b. How might we display data for trees after they have been selected from the map?
c. How might we collect the necessary data from the students?
d. How might we handle archiving/storing previous information?
e. How might conflicting data be settled? 1
f. How might we handle duplicate (validate) data ?

B. Student Interaction

a. How might we provide feedback to students that allows them to see how their participation is being used to aid in scientific research? 1
b. How might we provide a system that allows for and encourages student interaction with each other (Blog/Chat)? 1 1 1 1
c. How might students be organized into groups to complete tasks as a team?
d. How might GPS data be used without raising privacy concerns for students?

C. Citizen Science Integration

a. How might we create a method for researchers to quickly access/convert the gathered data into a form that can be manipulated, viewed, studied, and/or represented in their publications? 1 1 1
b. How might we involve researchers so that they can have direct interactions with students? 1
c. How might we encourage more Citizen Science projects to adopt this methodology?

VI. Potential Solution

We envision a website that presents various users (teacher, student etc) to navigate to a tree (using GPS eg., Google maps) to explore the tree and its surroundings (ecosystem). We are thinking of a rich, dedicated, and most importantly, responsive user interface for each of the features we introduce here. The primary features include exploring a tree, comparing a tree with another tree, presenting the user to interactively study the items within and surrounding the tree, viewing the tree across various seasons, uploading or updating tree and its related data. Secondary features include blogging, chatting and university interactions. Although the website is open to the public, certain features are enabled only for specific roles. Hence there is an authentication mechanism in place to identify relevant user.

VII. Target

We plan for our primary target to be a student/teacher, and their event to be viewing and comparing tree stories/data.