

The screenshot shows the HER Academy platform interface. On the left is a sidebar with navigation links: Dashboard, Roles, Courses (230), Lessons (65), Projects (12), Modules (23), and Assessments (45). The main area displays three courses: "Python for Beginners" (Python, Beginner), "Applied Math" (Math, Advanced), and "Robotics with Legos" (Programming, Hands on). Each course card includes a thumbnail image, title, category, description, author, update date, total hours, number of lessons, and status (DRAFT, UNPUBLISHED).

Course	Category	Description	Author	Updated	Total Hours	Lessons	Status
Python for Beginners	Python, Beginner	Learn how to code now. No experience needed.	By Shannan Pulma	01/18/2022	8 total hours	5 Lessons	DRAFT
Applied Math	Math, Advanced	Math for the physical world.	By Jordan Fletcher	01/16/2022	8 total hours	5 Lessons	UNPUBLISHED
Robotics with Legos	Programming, Hands on	Bring your creation to life.	By Shannan Pulma	01/15/2022	8 total hours	5 Lessons	DRAFT

HER ACADEMY

Role: UX Designer, UI Designer, Researcher, Developer

Date: Jan. 2022 - Present

Team: Lena Furci, Shannan Pulma, Todd Slepston

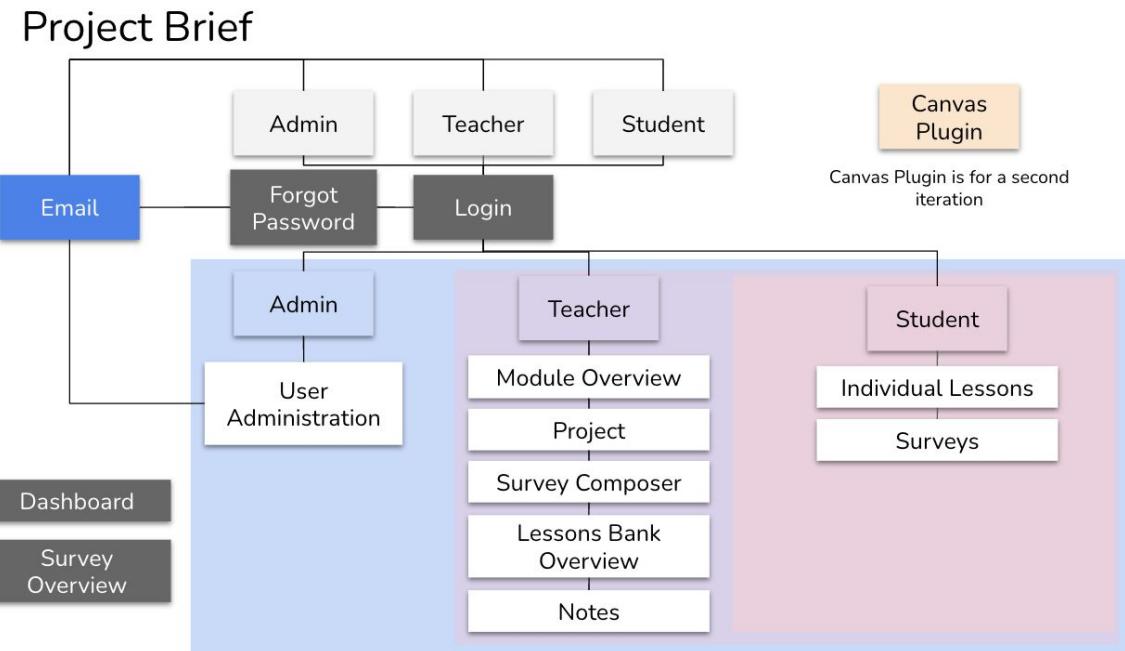
Tools: Figma, Draw.io, Miro, Google Drive, Google Meet, Bubble.io

Project overview

HER Academy is on a mission to empower every girl – and from there every child – to become a creator and designer of technology through computer science, online and in the classroom.

Whether you're coming to us as a pre-K teacher, a librarian, or a math teacher, you can be a computer scientist. HER Academy trains and empowers teachers and educational institutions to be confident experts, able to adapt our lesson plans to suit your students' diverse learning styles and interests.

The new online platform scheduled for release in August 2022 will allow schools to develop a program that supports students who are often marginalized in computer science (CS) – children from underrepresented racial and ethnic groups, children from rural or economically impoverished communities, children with neuro-diverse learning styles, and girls from all backgrounds – in learning and excelling in computer science. As they move through the program, students gain the confidence and knowledge to become designers and creators of computing technology.



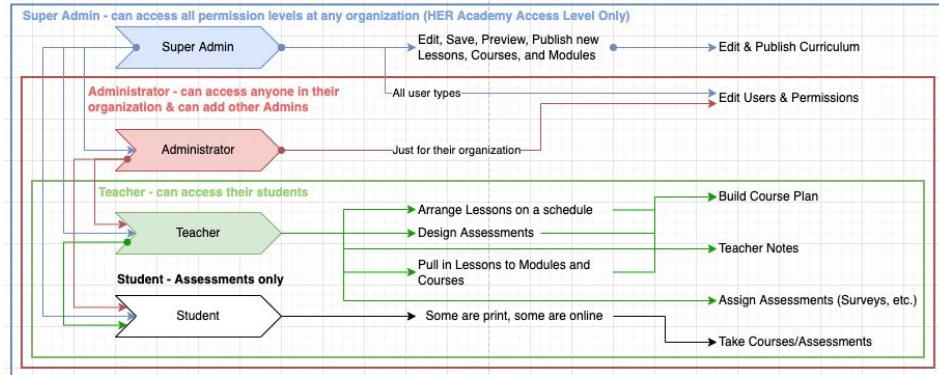
Project scope

HER Academy tasked me with building their first iteration of their custom LMS that suits their specific needs of educating teachers and students with an online platform capable of operating in a hybrid environment of in-class and at-home activities.

Problem statement

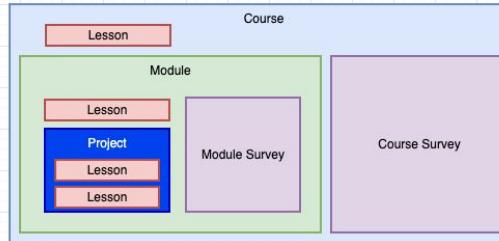
HER Academy currently uses the Google Drive platform to teach all content. All of their programs are done manually and there isn't a way to give people access they need to content in a remote and at-home environment. They would also like to scale their mission by creating a custom online experience.

Below is the product after the initial stakeholder interview. I continued to iterate on this and I will show this later on in the case study.



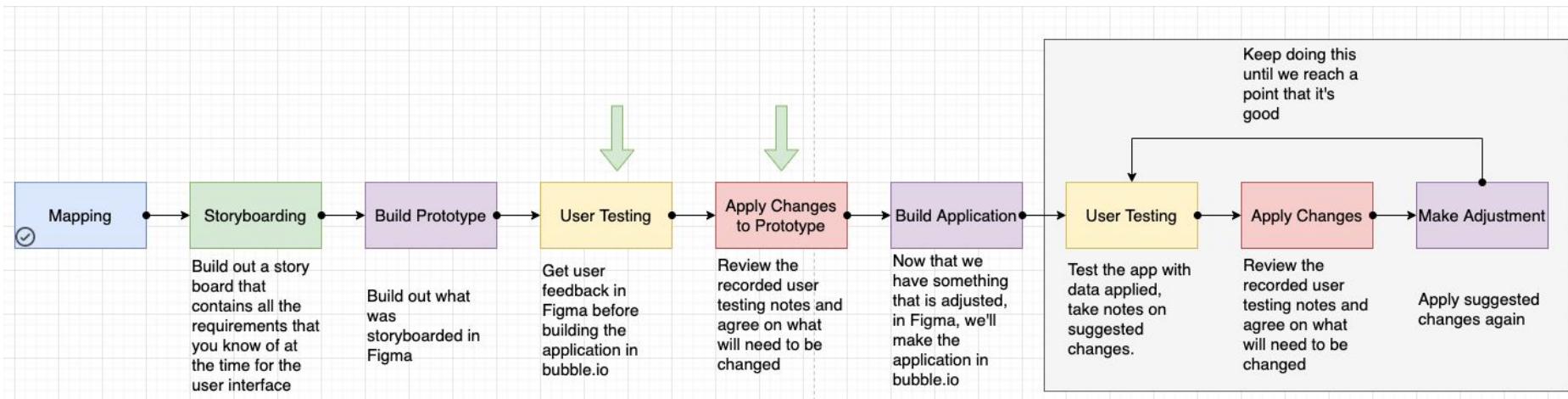
Notes

- Have a way for teachers to give feedback on lessons for HER Academy
- The teachers will design their courses and we'll want to try to integrate those courses into the 3 integrations below when the teachers make their courses
- We would want to do integrations for all of these
 - PowerSchool/Schoology: <https://developers.schoology.com/api-documentation/rest-api-v1>
 - Canvas: <https://canvas.instructure.com/doc/api/>
 - Google Classroom: <https://developers.google.com/classroom>



Design & Implementation Process

We created a roadmap of how we would handle the design and implementation project all online through remote means (email, Google Meet, Google Drive, Figma, Miro, Draw.io, Bubble.io).



The best way to build web apps without code

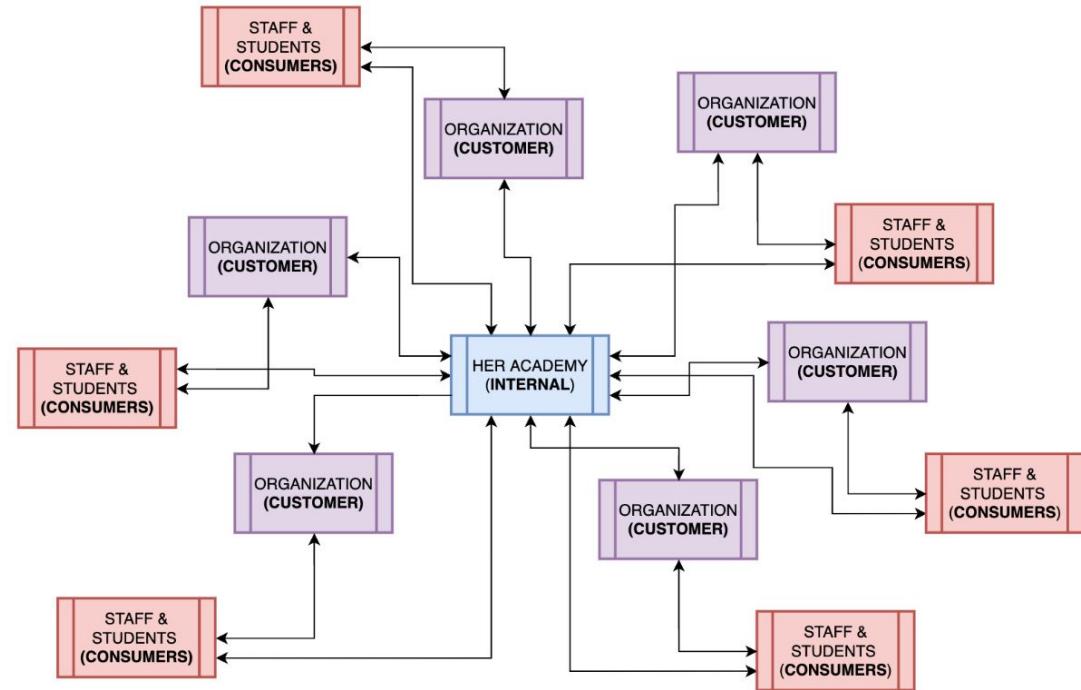
<https://bubble.io/> →

Building tech is slow and expensive. Bubble is the most powerful no-code platform for creating digital products.
Build better and faster.

High Level System Structure

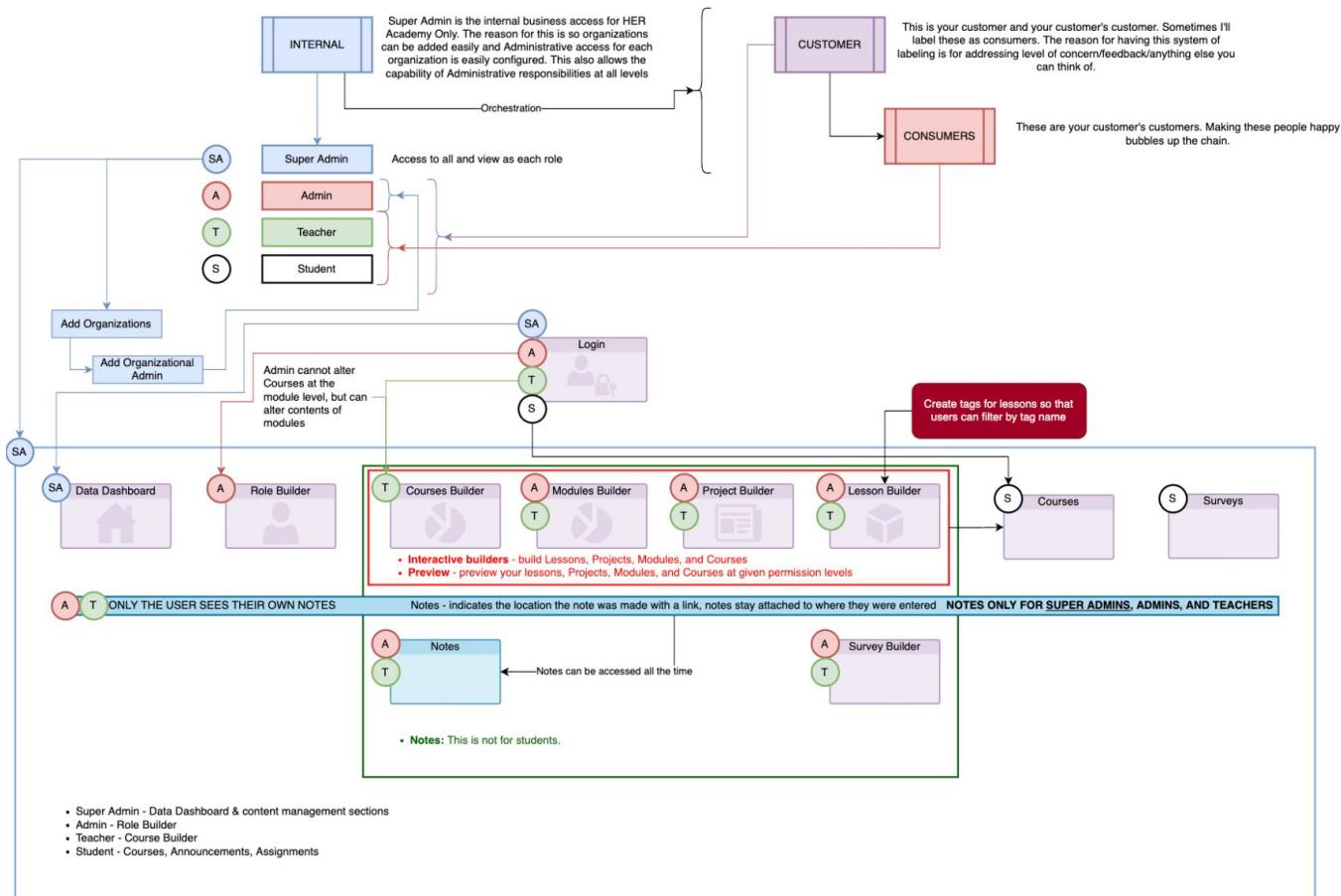
HER Academy Education Online Platform

- This is the structure of distribution of content and access control for the HER Academy Education Platform
- HER Academy will have administrative access for all levels of access in order to assist organizations, their staff, and their students
- HER Academy will be able to stand up new organizations and give administrative access to their new members
- HER Academy will also be able to add any sort of content and assist clients in setting up their content, as well as create repositories of content for organizational use



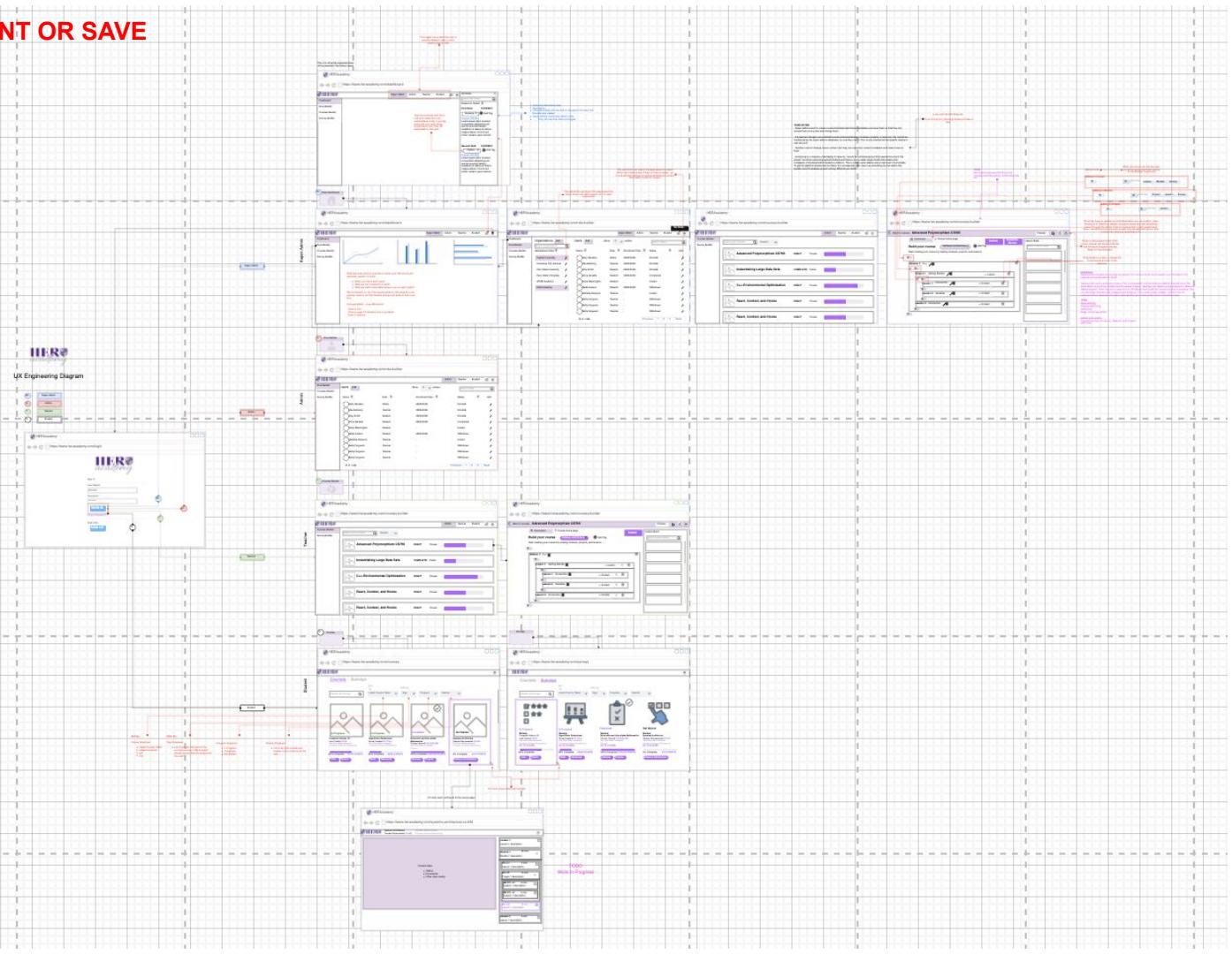
Initial Site Map

In order to take into consideration all of the possible users, we did a very high level pass at the application instance level. To the right is a sight map including Super Admin, Admin, Teacher, and Student access levels



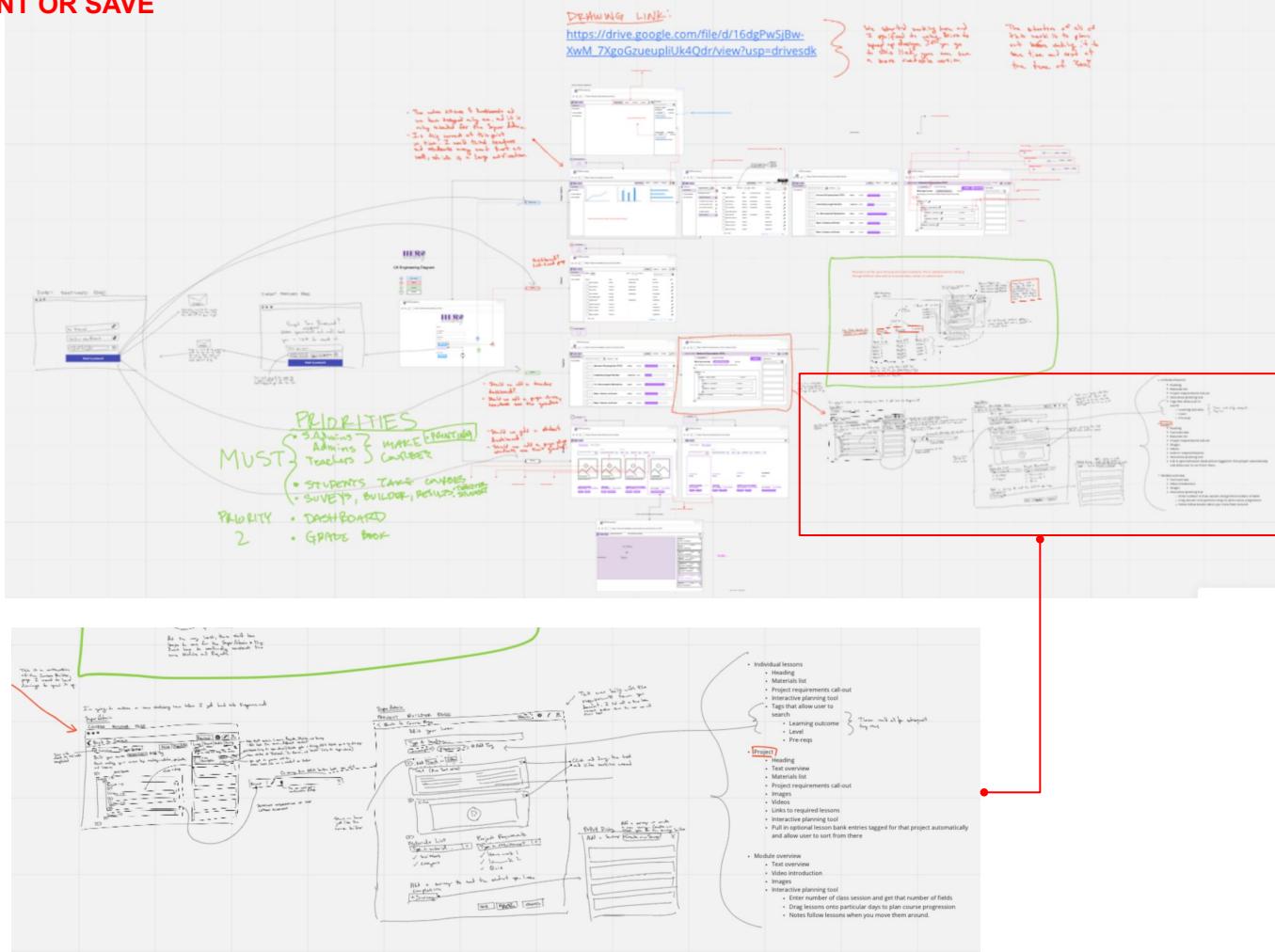
Storyboarding

At this point we had enough information to start doing some storyboarding to think out how this system would work based off of our knowledge so far. The two people that I worked with are both teachers and run HER Academy, so we started from there so that we could put out an idea to build a prototype from. We also referenced other online learning platforms to come up with our concept.



Storyboarding

To speed up the process since the storyboard was getting a bit big on an older computer, I used my iPad and Miro to start drawing on top of the draw.io storyboard to continue down the path until we hit a point of where we were ready to start prototyping.



Prototyping

After we finished storyboarding, we started prototyping in Figma to further flesh out the idea and get ready for usability testing. I generated the color scheme and a hand full of **reusable components** for the Design.

The image shows a grid of Figma prototypes for different user roles. On the left, there is a larger screenshot of the Figma interface displaying various components like Logo, Heading, Input, Button, and a color palette. A red box highlights the color palette, and a red line connects it to a grid of smaller screenshots on the right. The grid contains 16 smaller Figma prototypes, arranged in four rows and four columns. The prototypes are labeled with their respective roles: SuperAdmin, Admin, Teacher, and Student. Each prototype shows a different view of the application's interface, such as course lists, student profiles, and administrative tools. A callout bubble with an arrow points to one of the prototypes, indicating that clicking on an element will show its details.

Prototyping

Here are the **reusable components** and the color scheme used for the prototype. I prototype at a “Cinderella” level for speed. This means that it is good enough for a small project with an extremely tight deadline. Since we are going to build the app with a no-code tool, there can be pixel-perfect refinement at that stage. This follows the GV Design Sprint methodologies, which really gets ideas out fast and keeps the momentum up on projects.

Default

Dark

Primary

Secondary

Danger

Success

Warning

Course Row Element

Drag & Drop Panel

Stacked Bar Chart

Prototyping

This is the Project Permissions page where a member of HER Academy can assign permissions to Organizations and their different levels of users.

The screenshot shows the 'Project Permissions' page for a course titled 'Intro to Parabolic Math in relation to celestial bodies, gasses, vacuums, and spectral matter'. The page has a purple header with tabs for 'Curriculum' (checked) and 'Project Permissions' (unchecked). Below the header are four search bars: 'Search Organizations', 'Search Admins', 'Search Groups', and 'Search Students'. Each search bar has a magnifying glass icon and a 'Alphabetical Order' dropdown. To the right of each search bar is a '+' button followed by a user icon. The main content area displays two columns of entities. The left column lists organizations: Capital University, HER Academy, Columbus City, OSU, Stanford University, Ball State, Reynoldsburg, and CSCC. Each organization entry includes a toggle switch labeled 'ACCESS TO COURSE', a pencil icon, and a trash bin icon. The right column lists teachers: Bill Robertson, Mary Sanders, Gerti Smith, Sally Mander, Teachers (15), Deleted (1), and Debra Robertson. Each teacher entry also includes a toggle switch, a pencil icon, and a trash bin icon. A callout box points to the teacher entries with the text: 'Select a teacher on the lower left to view groups of students'. Another callout box points to the organization entries with the text: 'Select a teacher and Group on the left to view students'. At the bottom right are 'CANCEL' and 'SAVE' buttons.

Prototyping

This is the Curriculum Builder for Courses page where a member of HER Academy can drag and drop different pieces of courses as well as edit the contents, remove components, or construct new ones.

The screenshot shows the HER Academy Curriculum Builder interface. At the top, a purple header bar displays the title "Extra Solar & Interstellar Parabolic Math; Math 875-A" and a "DRAFT" status. To the right are buttons for "PUBLISH" and "PREVIEW". Below the header, a sidebar on the left shows tabs for "Curriculum" (selected), "Course Overview", and "Course Permissions". A note in the sidebar states: "You must have the Curriculum, Course Overview, and Course Permissions tabs checked to preview and publish your course." The main content area is titled "Build and edit courses" and contains a "Course title" input field with the value "Extra Solar & Interstellar Parabolic Math; Math 875-A". Below this are three main building blocks: "Lesson", "Assessment", and "Module". Each block has a title input field and a "Module Title" input field. The "Module" block is expanded, showing a nested "Project" block with its own "Project Title" input field and a nested "Lesson" block with its own "Lesson Title" input field. At the bottom right are "CANCEL" and "SAVE" buttons. On the far right, there is a sidebar with sections for "Lesson" (65), "Project" (12), "Module" (23), and "Assessments" (46). Below this are search and filter options for lessons, and a list of recent lessons: "Lesson 01" (Robotics, 01/16/2022), "Lesson 02" (Interface, 01/16/2022), and "Lesson 03" (Science, 01/16/2022).

HER Academy

heracademy.org/heroline/courses/course/curriculum/823484823848283484

Back Extra Solar & Interstellar Parabolic Math; Math 875-A DRAFT

Curriculum Course Overview Course Permissions

Build and edit courses

Course title

Extra Solar & Interstellar Parabolic Math; Math 875-A

You must have the Curriculum, Course Overview, and Course Permissions tabs checked to preview and publish your course.

Lesson Lesson Title

Assessment Assessment Title

Module Module Title

Project Project Title

Lesson Lesson Title

CANCEL SAVE

Search Lessons

Drag and drop Lessons into Courses, Modules, and Projects

Newest to oldest CREATE NEW LESSON

Lesson 01 01/16/2022

Robotics Add Tag

Course 123.45.6

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do...

Lesson 02 01/16/2022

Interface Add Tag

Course 123.45.6

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do...

Lesson 03 01/16/2022

Science Add Tag

Course 123.45.6

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do...

Prototyping

Student Dashboard

The dashboard displays the following information:

- Most recently accessed Courses:**
 - Python for Beginners (Last visited 09/18/2022)
 - Applied Math (Last visited 09/18/2022)
 - Robotics with LEGO Mindstorms (Last visited 09/18/2022)
- Time Spent on Courses This week:**

Day	Time Spent
Sunday	12 min
Monday	46 min
Tuesday	42 min
Wednesday	21 min
Thursday	33 min
Friday	25 min
Saturday	12 min
- My Assessment Results:**

Assessment	Score
Quiz 1	85%
Quiz 2	90%
Quiz 3	88%
Quiz 4	92%
Quiz 5	89%
Quiz 6	91%
Quiz 7	93%
Quiz 8	95%
Quiz 9	97%
Quiz 10	98%
Quiz 11	99%
Quiz 12	100%

This prototype has a lot of pages, so I'll share one last view of what a student view will look like.

Courses Page

The page lists the following courses:

- Python for Beginners (Last visited 09/18/2022)
- Applied Math (Last visited 09/18/2022)
- Robotics with LEGO Mindstorms (Last visited 09/18/2022)
- Intro to Game Programming (Last visited 09/18/2022)
- Prototyping for Programmers 101 (Last visited 09/18/2022)
- Intermediate Frontend Development (Last visited 09/18/2022)

Course Page

The course page for "Python for Beginners" shows the following details:

- Progress:** 100% completed
- Description:** Learn how to code now. No experience needed.
- Last updated:** 09/18/2022
- Topics:** Variables, Loops, Functions, Data Structures, Conditionals, Classes, Modules, Files, Error Handling, Object-Oriented Programming, Recursion, and API Design.
- Code Editor:** PyCharm
- Code:** HelloWorld.py
- Output:** Hello World!
- Traceback:** Enter your birth year: 1982
File "/Users/moshfeghahamedani/PycharmProjects/HelloWorld/app.py": line 1, in <module>
age = 2020 - birth_year
TypeError: unsupported operand type(s) for -: a str and a int
- Process finished with exit code 1**

StudentAnnouncements

The announcements page lists the following recent announcements:

- Lecture Rescheduling** (Sent by Lecturer 09/18/2022 08:00 AM ET)
Welcome to the new HERObot Learning platform! We'd like to welcome you and wish you luck on your new computer science courses. If you have any questions or would like to know more, please email your teacher. We're very excited to have you and are looking forward to helping you learn computer science in a new way that works for you and your goals. Happy coding!
- New Course for Beginners** (Sent by Lecturer 09/18/2022 08:00 AM ET)
Welcome to the new HERObot Learning platform! We'd like to welcome you and wish you luck on your new computer science courses. If you have any questions or would like to know more, please email your teacher. We're very excited to have you and are looking forward to helping you learn computer science in a new way that works for you and your goals. Happy coding!
- Welcome!** (Sent by Lecturer 09/18/2022 08:00 AM ET)
Welcome to the new HERObot Learning platform! We'd like to welcome you and wish you luck on your new computer science courses. If you have any questions or would like to know more, please email your teacher. We're very excited to have you and are looking forward to helping you learn computer science in a new way that works for you and your goals. Happy coding!
- Online Programming Party** (Sent by Lecturer 09/18/2022 08:00 AM ET)
Welcome to the new HERObot Learning platform! We'd like to welcome you and wish you luck on your new computer science courses. If you have any questions or would like to know more, please email your teacher. We're very excited to have you and are looking forward to helping you learn computer science in a new way that works for you and your goals. Happy coding!
- Remote Robotics Competition** (Sent by Lecturer 09/18/2022 08:00 AM ET)
Welcome to the new HERObot Learning platform! We'd like to welcome you and wish you luck on your new computer science courses. If you have any questions or would like to know more, please email your teacher. We're very excited to have you and are looking forward to helping you learn computer science in a new way that works for you and your goals. Happy coding!

Announcements Page

Usability Testing

I wrote a script to keep track of the usability testing and made a testing matrix so we can quantify qualitative feedback from UX Testing. So far we have tested 2 teachers, so we will test 3 more, and then 5 each of the Super Admin, Admin, and student roles. 5 usability tests provides 80% of the information you need and anything more is a loss of return on investment.

Background									Feedback			
2/16/2022 @ 7:15 AM ET	User Karen	Type Teacher	Grades 1-6	Subject Computer Science	LMSs Used Canvas	Grading Doesn't give grades	Remote/In Person Mostly in person, but does do some remote	Course Design -	Teacher Dashboard	Roles	Courses	Gradebook She likes the ability to input her grades
2/15/2022 @ 7:00 AM ET	Will	Teacher	9-12	Computer Science	Canvas	Does personal grading in Excel, then adds uploads Excel to Canvas	Mostly in person, but does do some remote	- Does of the design himself for regular classes - AP, he uses their materials	Doesn't like the wording of "Overall right/wrong", just use the wording "Overall"	Progress bar may not be useful.	He mentioned that he does all of that himself	- Doesn't make sense to show him his own name - uses long names for courses - so not sure if the current configuration accommodates for lot

Here is what a script looks like and the notes that are taken during the tests. These tests are much smaller than what I typically do at large firms. I'm facilitating the entire thing, so I have to do very abbreviated versions of what I do on large scale enterprise projects.

Interview Questions

1. Have you done something like this before?
2. Let me explain a little bit about what we're up to.
 - a. When we've been developing some new designs and new ideas, it's really valuable to get some fresh eyes and a fresh perspective on it, so that's how I need your help. I'd like to spend some time chatting with you about some stuff, it's pretty casual, and then I'll show you some different designs and ideas. I'll ask you a lot of questions, but I don't want it to feel like I'm testing you. I'm trying to figure out if these designs work, if they make sense, so I'm testing the designs. I'll show it to you and I'll ask you to think aloud as you're looking at these, so I'm trying to see it through fresh eyes, through your eyes.
 3. So maybe for starters, can you tell me a little bit about the work you do?
 - a. What does that involve?
 - b. Do you work remotely, kind of a hybrid, always in the office?
 4. What I want to show you is a prototype of an app. What that means is, some things will work, some things may not work, but we'll just kind of try it and there is no way to break it or anything. I just wanted to make sure to bring up again that I'm just testing the prototype and I'm not testing you. I'm going to be asking you questions, but there's not a right or wrong answer. As we do that if you think aloud, it really helps me see how the design is working.
 5. Just start asking questions of how they would do certain tasks as they go, but don't tell them how to do things.
 6. Thank them at the end.

Karen Interview 2/16/2022 @ 7:15 AM

- Teach 1-6 grade Computer Science
- She doesn't give grades so the grades graph on the teacher landing page isn't useful
- Likes the grid view of Google Slides
- She doesn't like the pictures on the courses page
- "This is so good!"
- Teacher could input their grades
- Wants the ability to put comments on their projects inside the LMS (but she doesn't currently do this)
- This would work well with older students
- With younger students it's paper and pencil
- They can give a young child access to a video to watch, but they wouldn't use the platform
- Teachers will need to go to each lesson in the "student mode" as a teacher

Will Interview 2/15/2022 @ 7 AM

- Teaches Computer Science
- Programming and Design thinking 9-12
- For the most part fully in person
- Use Canvas - does the grading and puts documents all in Canvas
 - This is accessory
 - Copies stuff in Excel
 - Has bulk importing
 - He designs all of the course work himself for most of the classes
 - For AP, he just uses their lessons
- Dashboard
 - Daily participation - curious how it's tracked
 - Overall Right Wrong
 - Doesn't like the naming of this
 - "Overall Distribution" is better
- Roles
 - Progress bar may not be useful
- Courses
 - He's going to create courses
- Gradebook
 - Doesn't make sense to have his name there
 - Names his projects and lessons long names, so they may not show up very well
- Merges Due Dates
- Toggle Publish on and off
 - Publish individual sections
 - Publish large sections
- Student Page
 - Student results separated out to show that they aren't failing
 - Place these in a separate course (Todd - can't remember what that means)
- Student Course page
 - Looks good
- Didn't think he's the target end user

At this point, this is where we are in this project!

This is a very exciting side project to be working on because I'm getting a chance to work the entire project. I have worked several projects in the past from concept to living product and enjoy it! I also enjoy working with a team and more focused on specific sections, but it is nice to have the entire overview.

The image displays a collage of six screenshots from the HER Academy web application, illustrating its various features:

- Lesson Creation:** A screenshot of the "Lesson" creation page. It shows fields for "Title" ("Intro to Parabolic Math in relation to celestial bodies, gasses, vacuums, and spectral matter"), "Learning outcome" ("Mathematics"), "Level" ("Beginner"), and "Prerequisites" ("CS101"). It also includes sections for "Add to the Materials List" (listing items like "100 Popsicle sticks", "20 cups", "25 toothpicks", "2 tennis balls", "20 eggs", and "Flame") and "Add to the Project Requirements" (listing items like "Must have 40 legs", "Needs to be able to support 100 lbs.", "Must resemble Bay George", "Must have 5 variations to try out!", "Should have a maximum of 10,000 WPMs", and "Should have no more than 4 leggies").
- Course Management:** A screenshot of the "Courses" section of the dashboard. It lists courses such as "Capital University: Ms. Robinson", "HER Academy", "Columbus City Schools", "The Ohio State University", "Stanford University", "Ball State", and "Reynoldsburg High School". Each course has a "Module 1" section with "Module 2", "Module 3", and "Module 4" sub-sections.
- Student Tracking:** A screenshot of the "Students" section for "Capital University: Ms. Robinson". It shows a grid of students (Amy Smith) across different modules and lessons, with status indicators for "COMPLETE", "IN PROGRESS", and "NOT STARTED".
- Organization Management:** A screenshot of the "Organizations" section. It lists organizations like "Capital University", "HER Academy", "Columbus City Schools", "The Ohio State University", "Stanford University", "Ball State", and "Reynoldsburg High School".
- Dashboard:** A screenshot of the main "Dashboard" showing "Top 5 Lessons" accessed since 08/03/2022. The lessons and their access counts are: CS 101 (200), MATH 346 (180), ENGINEERING 102 (170), LINEAR MATH 346 (142), and CS 101 (120).
- Analytics:** A screenshot of the "Analytics" section titled "Lessons Most Accessed by Students since 08/01/2022". A stacked bar chart shows the number of accesses for various lessons. The data is as follows:

Lesson	Accesses
CS 101 Introduction to Computer Science	200
MATH 346 Algebra 3	180
ENGINEERING 102 Mechanical Drawing	170
LINEAR MATH 346 Mathematics	142
CS 101 The Ohio State University	120
Calculus 1	97
History 101	54
Calculus 2	48
Physics for Scientists and Engineers 1	45
Calculus 3	36