System Architecture Document

Human Family Team

CS 499: Senior Design Project

University of Kentucky

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Introduction and Goals

Customer

Our customer is the Human Domino Effect Team lead by Stephanie Fairchild Fister. She is the main customer for Human Family Team, the website, and for the Human Domino Effect, the game.

Problem Statement

The goal for this project is to add shopping functionality, improve the forum, and clean up the existing wording and phrases in order for the website to go live.

Product Vision

Customer

The Human Domino Effect Team

Need/Value

Learning does not just happen at school. It also needs to happen at home. The website aims to bridge the gap between school and home, so the child has more opportunities to learn. The website provides guides for parents to better bridge the gap.

Target Users

Parents (both in need of advice and giving advice), School administrators, and teachers.

Background

Children are affected by their peers, either to the child's benefit or detriment. The website provides parents with resources to better understand and raise their children. The website aims to give all children a good upbringing, which in turn helps all children in school.

Differentiator

This site would be run by educators and advice would be given from qualified educators. In an age of disinformation, especially surrounding parenting, this website hopes to provide helpful and qualified tips.

Justification

Teachers and parents alike need better ways to connect in the digital world. This gives a way for teachers to easily reach parents and give them advice without having to meet individually. This also makes it easier for others to join in on the Human Domino Effect project/game.

Requirements Overview

When we met with our customer, she gave us three big areas that she wanted to work on. The first and biggest area was a shop page for families and educators to buy supplies for learning and supplies related to the human domino effect. We are thinking this will have a lot of stories under it, like creating the shop button, create the shop page (How it looks) setting up a method for invoicing, etc. The next big point the customer made was creating a better/friendlier language across the website. We decided to make this an epic with a story for rephrasing each page on the website. The third point the customer made was to add a pop up when a user first logs onto the website to enter the age of the kid. We were thinking of making this another epic with only a couple stories, like one for the initial pop up, one for creating the text entry, and one for creating the educator bypass.

List of Epics and Stories:

Shop

- As a user, I want to be able to navigate to a shop page.

- As a user, I want to see a clean and easy to navigate shop page.

- As a user, I need to be able to send an invoice for my purchases.

- As a user, I want to see a list of what I am buying.

- As a user, I want there to be items for me to purchase.

Rephrasing

- As a user, I want clear wording and phrasing on the website

- As a user, I want clear visual to understand how to navigate the website.
- As a customer, I wish to be directed by links to resources.

Age Pop Up

- As a parent, I need to input my student's age for specific information about the game for them.

- As a school administrator, I need to bypass the age question to access resources for all students.

Architecture Constraints

Our system is a website, so the following constraints are mostly in place to fit that format

- The website needs to be universal

  This means that the website should be accessible from all web browsers, including mobile. Due to mobile devices screen having a much smaller size we need to make sure all buttons and pictures are visible and clickable on mobile browsers.

- One semester

  Our customer's main goal is to have the website live by the end of the semester so any unfinished features we have by then will need to be cut so that we can push a finished/polished product.

- Language

  Our website is meant to be used by educators and families. We have a google doc with all the language we are supposed to use to create a comfortable and friendly environment for the users of our site. This constraint isn't very limiting, it will just take time on our part to make sure we use this language across the site.

Solution Strategy

We are helping build the website for the "Human Family Team". This application uses flask to make API calls to the database. The database is managed with SQLite3, API calls by flask, and Python and HTML both work to create a nice front-end for users. Currently, the site can be broken down into the "Building Blocks" information, which contains information for students about important characteristics a good person should have. We also have the "shop" page, which will contain a form for customers to fill out and create an invoice for the "Human Family Team". Last, we also have the forum part of the website. This will contain posts by teachers to help parents better understand how to educate their children and general advice a parent might want. They all share the front-end and back-end designs. The forum and shop will be dynamic in their content but will access the back-end in the same manner the static "Building Blocks" access the database.

Building Block View

Context Diagram

This is the context and scope diagram. It displays a visual representation of the overview of our project. At the top of the diagram, we see three key users outlined: Families of Students, Teachers and School Administrators, and a Moderator. As we move down the diagram, we see the specifics of how each of these users will interact with our website and what they need from it. We then come to our software systems and containers. The diagram outlines the basic functions and objectives of the website. Lastly the diagram outlines the invoice and inventory, two key components of our website, and the main goals we want to achieve in our project.
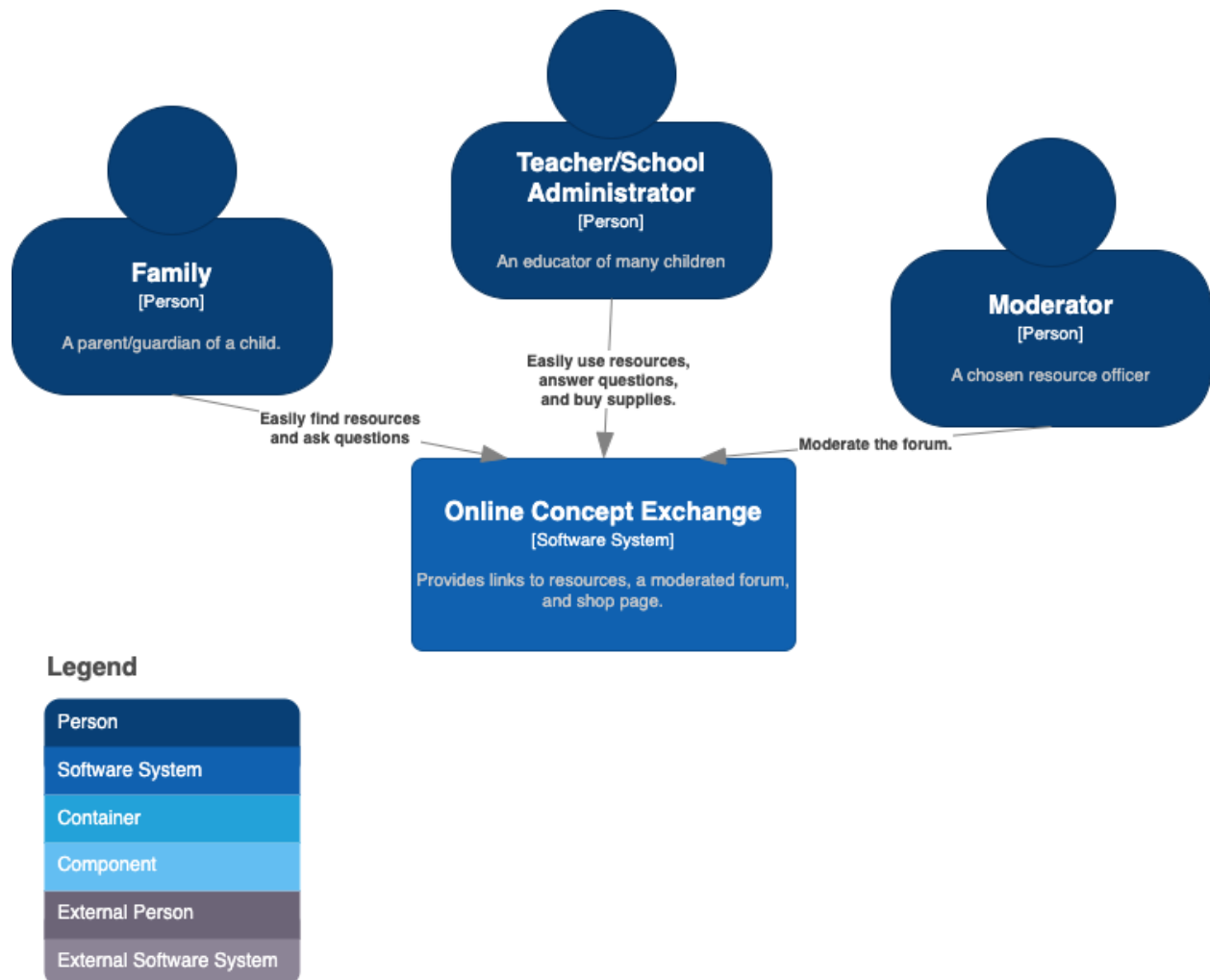

Figure 1: Context and Scope Diagram

Container Diagram

This diagram highlights the important interfaces that are involved with the Human Family Team project. First, we have a family member or person that acts as the user of the site. The site was named "Online Concept Exchange" by the previous group. So, the system title

"Online Concept Exchange" is the given name for the system users access. The front end of our website is just a single page application that is generated by Flask. The application is what the user sees and interacts with. The details about the application are shown in the Runtime Diagram. Flask is the container for the backend API that retrieves the data for the user from the database. The database contains and stores several important pieces of information like account information and posts and comments that are located on the forum.
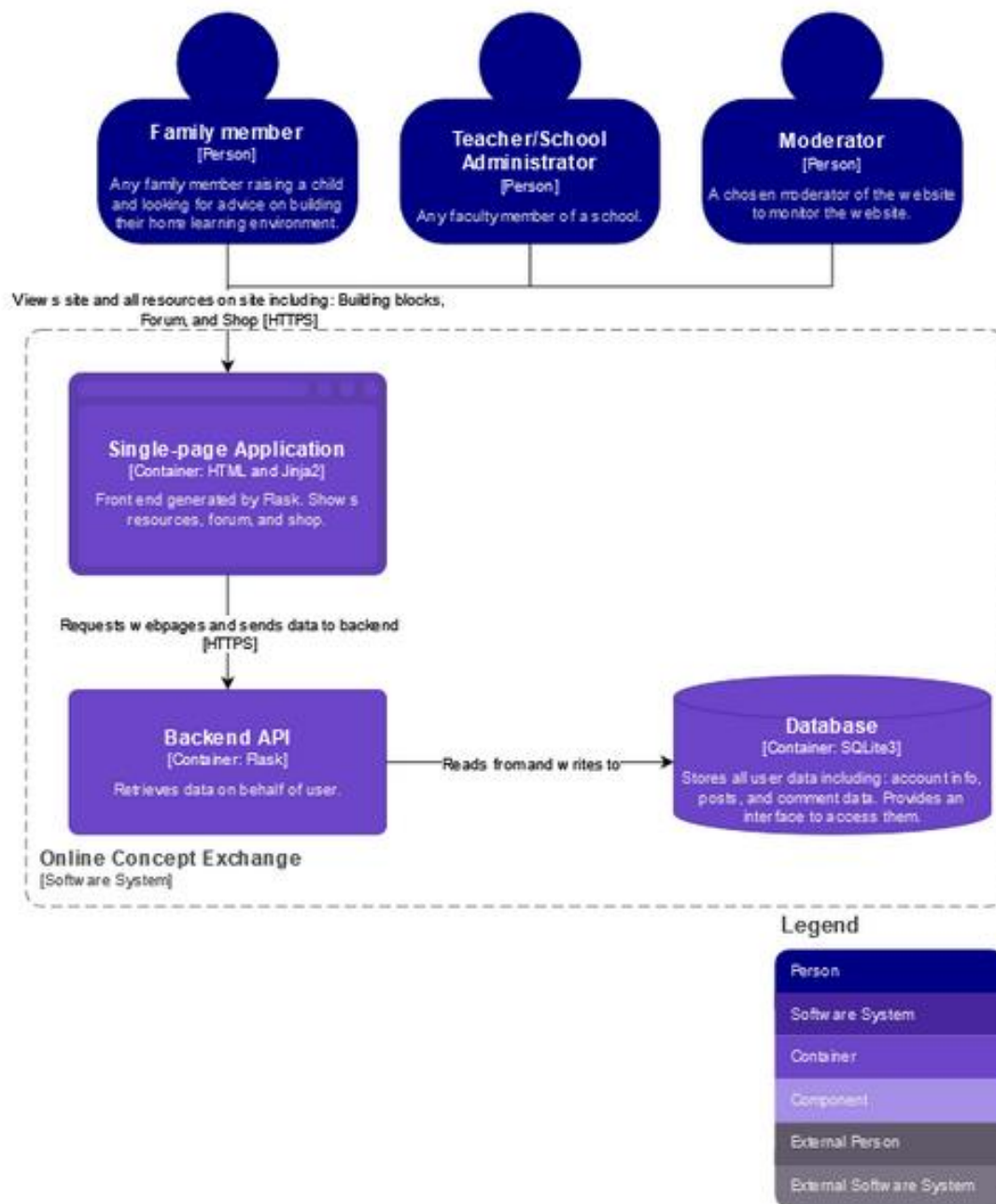

Figure 2: Container Diagram

Runtime Diagram

This runtime diagram shows the full picture of what a user has the ability to experience on the website. As shown in the image, the user begins on the welcome home screen with a prompt to enter your child's age or with the option to override as an educator. From that screen, the user is able to visit the shop, forum, or resources page. It is important to note that these pages are accessible from all pages outside of it. To get to the cart screen, you must look at the shop screen first. You can send your invoice for your desired items in the cart view.
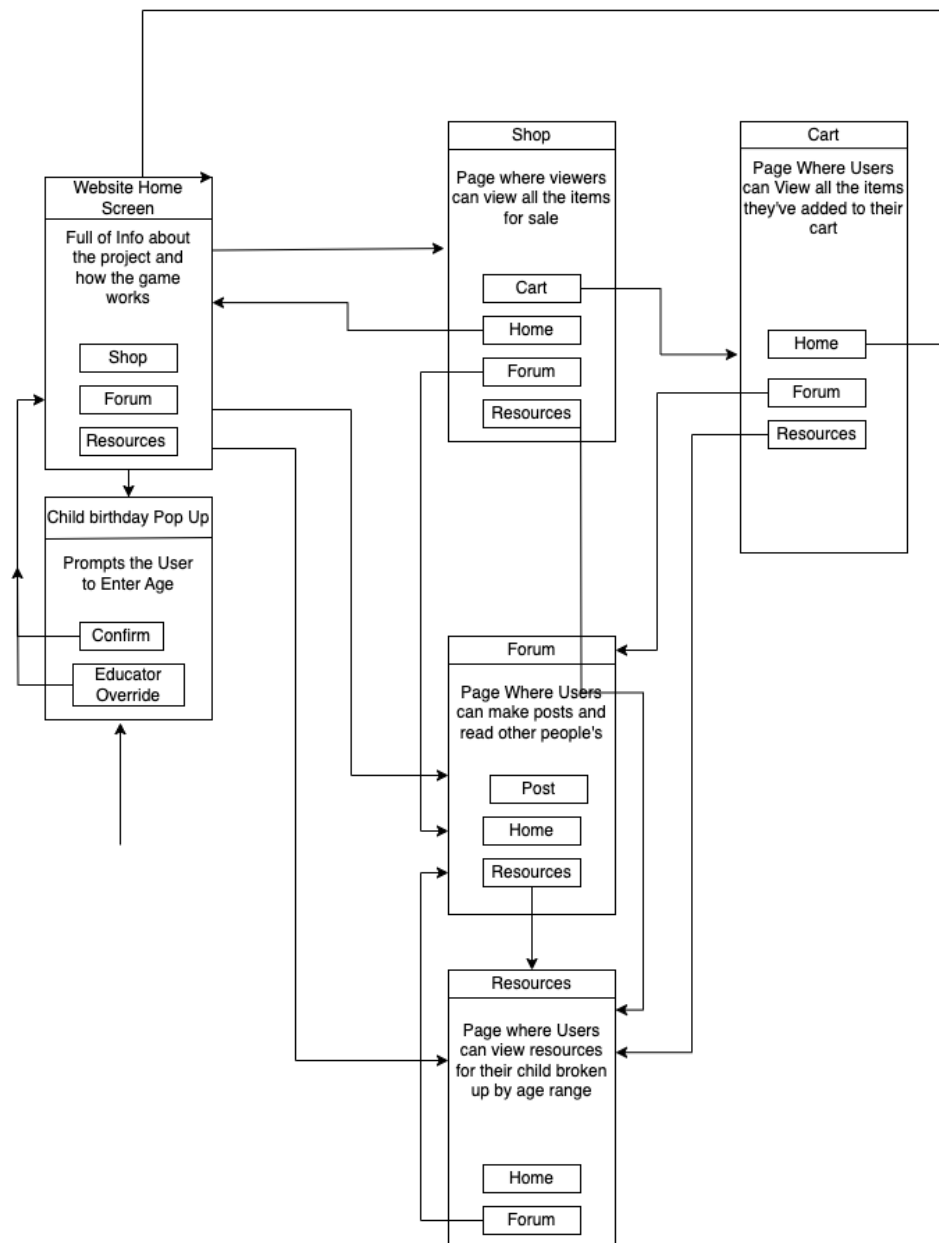

Figure 3: Runtime Diagram

Architectural Design Decisions

Since our website has already had significant progress, we're having to make decisions on some of the final parts. We are tasked with finding a good password hasher to secure users' accounts, creating a shopping page, finishing the forums, and working on other small pages such as contact us. Many of our decisions rely on the decisions already made before us. We plan to have a shopping page that creates an invoice rather than allowing customers to instantly purchase materials. This decision was made because Stephanie feared other companies might buy some of the products to copy them. Having a request system will allow her to screen buyers and ensure her work will not be stolen and instead used for their intended purposes. Another decision we'll be making is creating the forum. The forum currently relies on the account system to be ready. Once we chose a secure password hasher our forum should be ready to go live. The last big decision we'll be making is how we'll clean up the wording on the website. Stephanie wants to make sure the website doesn't come off as "creepy". So, along with developing the shop page and finishing the forums we'll also pay close attention to our wording.

Quality Goals

Of the highest importance to our stakeholders for our quality goals are functional suitability, maintainability, and usability. Our customer has expressed great need for the site's utility functions to work properly, including a forum, resource page, and shop page. These stated needs must be provided by our website to meet the quality standards of our stakeholders. The site also needs to be easily maintained. This is a great goal for this project since the customer has limited technical experience and needs to maintain the website for years to come on her own. For usability, we have three main focuses. Our goals are to implement a clean and neat design layout on all pages for easy readability for the user on the website, increase functionality from the existing site so that the stakeholder/customer is satisfied with the progress, and include detailed documentation and comments throughout the code so that the next group to work on this project is able to make progress quickly.

Risks and Technical Debts

Our customer has expressed her desire multiple times to expand this project outside the college of engineering. She would like to involve many other students with their respective fields of study and connect them with the elements of this entire Human Family Team that could be improved. For example, involving marketing and financial students to improve the website design and help with the economic side of this project. If we had time, our team could assist in connecting these students and presenting to others what has already been accomplished on the project and what needs to be done and improved.

Glossary

<u>API</u>: (Application Programming Interface) set of rules to allow separate software to communicate.

<u>Flask</u>: makes website development easier to run and execute with Python.

<u>Forum</u>: discussion platform page for users to post and interact with one another

<u>HTML</u>: (Hyper Text Markup Language) language used to create and format web pages.

<u>Pop Up:</u> User interface section that appears as a user first enters the website with a prompt

<u>Python</u>: widely used programming language used for web development, data analysis, and more.