**Senior Project Proposal**

Justin R. Pike

Senior Project Design

Michael O’Neill

Fall 2023

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**Student Information**

* Name: Justin Pike
* Degree: Bachelor of Science – Computer Science
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* Expected Graduation Date: December 2024

**Problem Statement**  
 Homeowners associations (HOA) have long been a topic of frustration for homeowners across the country and is increasingly becoming a reality of more homeowners as newly built subdivisions require them. While some of the frustrations such as rules, restrictions and fees are issues that do not have a common or satisfactory solution for all, inefficient management and transparency are issues that can be addressed. A homeowners association should be able to effectively collect and manage the personal data of homeowners as required for operations, communicate effectively to its homeowners through a number of forums convenient and appropriate to the homeowner, efficiently collect and levy dues for the homeowners and make access to pertinent homeowners association information as uncomplicated as possible. These issues can mostly be attributed to poor data management practices which can be addressed, and the issues have a solution which can go a long way to solving some of the hostility and frustrations that build within homeowners associations and help promote better communities.

I propose that these simple administrative issues can be addressed through a functional website which facilitates the collection and storage of homeowner information, allows the free flow of communication through announcements, emails, recommendations, and surveys, promotes transparency through upload and viewing of pertinent homeowners associations documents and effectively tracks and allows for collection of homeowners association dues and fines.

**Project Description**

The general idea is to create a portal that a homeowner can log in where they can update their personal information, view pertinent HOA information, view, and pay any associated bills answer any questions/surveys from the HOA. From the HOA management perspective, allow the input of new fines/dues, update HOA information and documents, create new surveys and view survey data, post announcements and send email communications as necessary. From the administrator perspective, there will be a need to grant management permissions to certain users when they are in management positions.

**Initial Project Details**

*Proposed Implementation Language(s)*

The expected languages to be utilized in this project are SQL for building and querying the database and HTML/CSS for customization of the website other than that which is provided by Oracle APEX. These languages are well within my scope, and I have produced several projects utilizing them before. I anticipate that there may be a need for a small bit of JavaScript which I have also utilized previously.

*Additional Software/Equipment Needed*

I will require an Oracle APEX account in order to complete the proposed project. At this time there will not be any additional software or equipment required for implementation.

*Personal Motivation*   
 The proposed project will allow me to combine and enhance skills in front-end development by utilizing the resources offered through Oracle APEX while also customizing the website, using skills learned through User-Interface design, with HTML, CSS, and JavaScript. This project will also allow me to revisit and hone skills in database analysis, design, build and management. The growth of data in this technology and information driven world is exponential and there will be a continuing and growing need to store, protect, and manage this data and provide users with proper synthesis and presentation of that data. This project allows me the opportunity to practice those skills which I view are needed for future applications.

*Outline of Future Research Efforts*

I assess that this project should be broken up into four separate phases (See below). Currently I am in phase 1, which is the planning phase, where I am analyzing the entirety of the problem and how my solution satisfies that problem and then determining what my proposal actually requires. The requirements specification is a deliverable the at will be submitted and approved by the end of the semester. Phase 2 focuses on the back-end of my proposal which is a database. I anticipate that the analysis of the database design and ensuring proper relations between entities will be the bulk of this phase in terms of time. The database creation and building out of the tables and loading of data will be lesser amount of work. I anticipate and would allocate a one-month window for this phase. Phase 3 will focus on the front-end development. Analysis is again required for this phase so that the website is properly designed and achieves that interface that I intend for it to have. At a minimum I intend to provide a low-fidelity mockup of the intended design. Next, I would generate all the necessary pages through APEX and create all the necessary accounts. At this point before any more customization of the look and feel of the website, I would ensure at all requirements outlined in the requirements specification are met before moving on to more customization. I anticipate that this will actually take the majority of the time for the project as the design could be tweaked endlessly. Phase 4 would be reserved for testing and refactoring the website.

* Planning (Fall 2023)
  + Proposal (Deliverable
  + Problem-set Analysis / Database Design
  + ERD (Deliverable)
  + Requirements Specification (Deliverable)
* Back-end (Spring 2024 – 1 month)
  + Implement Database Structure with all tables, keys, constraints, sequences, and triggers needed.
  + Adjust database and model as necessary to meet requirements.
  + Sample Data Creation
* Front-end (Spring 2024 – 2 month)
  + Low-Fidelity Mockups (Deliverable)
  + Page Creation
  + Component Integration and Design
  + Business Logic
  + User authentication
  + Ensure functional requirements are met.
  + Further customization in terms of User Interface
* Testing / Refactoring (Spring 2024 – ½ month)
* Documentation