# Midwest Realty Group

# Senior Design Project Feasibility Report

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# Abstract

This document’s goal is to explore the feasibility of a senior design project that provides a software solution for the Midwest Realty business. The document will give background on the client (Midwest Realty Group) and the problem to be solved, the design decisions that the project team will have to make, any spikes the team has done in preparation, the stories that refine the software solution, any security concerns imposed by the project solution, how the project is to be maintained after completion, and a discussion of the ownership of the project. Upon finding that the project team has enough time and can procure the necessary resources, the project will be deemed feasible.

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# Introduction

This document has been written with the purpose of explaining the senior design project with Midwest Realty Group. The project’s main goal is to provide a web application for customers and employees of Midwest Realty to submit and manage repair tickets. More information about the purpose of the project can be found in the Background and Stories sections.

Also in the background section, Midwest Realty’s current workflow is described as well as the process that the project team will be taking to improve upon that workflow.

In the Design Decisions section, the design of the project is discussed. Among the decisions, the risks and dependent decisions are discussed as well.

The Spikes section describes the testing and learning about the environment in which the team will be working are discussed.

Stories have their own section and are associated with the project’s main purpose, so this section should be reviewed after background.

In the security, maintenance, and legal sections, the project is laid out for future development and improvement as well as maintenance so Midwest Realty Group can make the most use of this project.

# Background

This section is about the background of Midwest Realty and the project. It will outline what Midwest Realty Group does and how the project will improve Midwest Realty Group’s current workflow.

Midwest Realty Group is a Portage, Michigan based company that provides a full range of Real Estate products to their clients across the country. They have approximately 10 full time personnel in the office with about an additional 20 out in the field. They own multiple properties, especially in the Kalamazoo area, and provide services to each location. Some of these services include basic repairs and maintenance, grounds keeping, parking lot maintenance, and snow plowing.

Every day, hourly employees must drive into the Portage office to receive their daily tasks to be completed. If they are out at a job, they cannot easily report updates in a timely manner or track their time simply. Upper management keep long projects on a whiteboard that they organize based on priority. To help streamline the process and organize projects, a web app will be created to allow customers to submit tickets with details and severity. Midwest’s project manager will be able to assign tickets to his hourly employees from anywhere he has an internet connection.

Once tickets are created and assigned, employees will be able to submit comments, purchases, and track their time. They can also assign a status to their ticket to let the customer know how their job is coming along. Management will be able to track the process of the ticket from creation until completion.

Management will be able to see all open jobs and projects they have queued to be completed later. Having all of their projects online will help protect their information, keep it organized, and accessible from anywhere in the world. The web application will be accessible from a number of mobile operating systems (Android and iOS) and desktop operating systems (depending on the web browser used).

# Design Decisions

The design decisions for a project are the fundamental decisions about a project’s language, tools, and structure. They should make the project easy to maintain, develop, and update.

Design decisions are mostly based upon what will be the most maintainable for Midwest Realty Group after the project is finished. Decisions where this was the driving factor are the decisions to use Node and Angular.JS for the coding languages (since they’re heavily documented and popular) and FireBase for the database. Midwest Realty will also be able to expand the functionality of the web app whenever they see fit because the code will be documented and kept on their personal BitBucket account.

# Spikes

Spikes are used for testing the functionality of any of the tools developers need. This means they can be anything from testing out the web framework to exploring the added functionalities of Bootstrap and Angular.

In this project, the use of JavaScript is pretty integral. The project team plans to use Node.JS primarily for the program. So far, the project team has written initial spikes to test database connection logic (such as adding tickets and users). In doing this, the risks have been verified that are associated with the web framework and also made sure things would work the way the team wants them to.

The project also uses Angular heavily in this project, so the team wrote a simple program in Node to demonstrate the posting feature to the database. This spike was used to test how well the development environment would work and also to get used to the syntax and features of the language.

In all, these simple tests allowed the team to verify the risks associated with the project and the chosen design decisions. It also allowed the team to explore the framework and associated language better.

# Stories

In this section, the project specifications will be discussed as well as the resources required to complete the project and how they are being secured.

The primary software specification for this project is that the web front-end be able to nicely and neatly show tickets that employees have to work on each day with the ability to create more. Our goal is to allow a user to login, be able to see the tasks they have to complete for the day in a calendar list or weekly list form, be able to change that list accordingly and add more or take away from that list, all with extra features to come. The programming language used to do this project will be done in JavaScript using Angular and Express as the frontend and backend frameworks along with firebase as the database. This will all be secured with multiple forms of authentication, mainly the use of google firebases google authentication will keep things secure without us having to do much work.

The resources required to complete this project include using the whiteboard that Midwest Realty currently uses, and seeing how they currently handle their ticketing system which may mean we need to see excel forms along with others.

# Security

In this section, the security needs of the project will be discussed. Midwest Reality isn’t primarily a technological company, so they’re will require some basics to ensure this project is secure.

The web application will ensure that passwords and usernames will be hashed before going into the database, and uncashed when being pulled. The web application will have to have a lockout feature that logs the user out after 30 minutes of inactivity. The user’s session will be secured with google auth and will be hashed and secured with firebase. And In the case that a user forgets their password, the project design team will have to come up with a simple, yet secure way for users to retrieve or reset their credentials.

The major security concern for the project is handling the secure sign-in of employees and tenants into the web interface. Logic will have to decide what user gets access to what information and features. The project has a few options to handle this concern. Firstly, hiding the password input so that nothing is displayed in the field is an option. Another option is to hash the password after the user has entered it to ensure better security. A third option is to use two step authentication. All of these are simple enough to implement and really depends on the preference of Midwest Realty as to which is implemented.

# Maintenance

This section will discuss how the project will be maintained after it has been completed and handed over to Midwest Realty. Maintenance includes ongoing costs, disaster recovery options, and installation costs for any of the software pieces. Documentation will play a large role in this effort as the major cost to the company will be recurring AWS, FireBase, and Heroku subscriptions.

Ongoing costs for the project are minimal. The project is currently being built with free tiers/trials of the above mentioned services. After the application starts to take a heavier load of traffic, the cost should be less than $300 annually.

Disaster recovery options for the project include instilling a frequent backup policy. This ensures that any catastrophic failure of the front-end can be quickly rolled back. The project would also implement an error page so that users would be notified when if the page is experiencing any problems. Plans for the project are to have automatic backups of the database with FireBase’s next highest payment plan. Backups will be sent to Amazon Web Services and will be safe. The code for the webapp will be hosted on BitBucket.

For installation costs, there will only be the fees required to keep the database server up as mentioned above. The website is hosted by Midwest’s existing hosting service. As the project stands now, there is no cost for the trial services. They will only be charged once traffic picks up.

Maintenance of the project will include periodic feature additions that Midwest would like to see in the future. Documentation will be maintained during the project’s development and handed over to Midwest Realty at its completion. It is possible that they pass their code along to their outsourced IT group, TeamLogic IT. Errors will be passed along to TeamLogic IT or one of the existing project team members, pending a contractural agreement to keep someone on board. Other than generic updates and routine server maintenance, there are no major maintenance concerns from the project’s perspective.

# Legal

This section will discuss the ownership of the project and its contents. This section will also address the non-disclosure agreement between the project team and Midwest Realty Group. The NDA remarks on what is allowed to be shared with the public and what is not.

The ownership of the project will be turned over to Midwest Realty at the completion of the project. The project team will retain the right to display any code they have written for the project for any interview opportunity or resume. Midwest Realty Group has not currently decided to write up an NDA.

# Summary

This section serves the purpose of summarizing all of the above information and determining if the project can be feasibly done in the timeframe that has been allotted. The project has a refined enough scope that the team feels it can be done within the timeframe specified. The resources required are either freely available, provided by Midwest Realty Group, or already set up by the group. The ownership of the project has been agreed upon by both the team and Midwest Realty Group. With all of the necessary pieces in place and barring any unforeseen circumstances, the project team feels confident in stating that the project is feasible.