

Managing Made Easier

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Overview

For most rental owners, there is lots of work to manage their properties. From applications, to complaints, to maintenance. What if there was a piece of software that helped make managing rentals much easier? My idea is to create a piece of software that would allow people to create an account, apply, pay rent, register complaints, contact fellow tenants, and put in notices for maintenance. The idea would consist of a website, and would have different sections based on the user type signed in.

Entering an application to rent a property. People who would like to apply could make an account and enter their information into a preliminary application. The owners could then use that information to do background checks, and credit checks. If the applicants are accepted, the software could also handle the signing, through a program such as docusign. This process could be completely virtual, or renters could make an appointment to see the property in person. This schedule would be available on the website as well. If the tenant wishes they could also take a virtual tour of the property on the website as well.

Message boards for tenants. As with any group of people, there can be moments of discord between tenants. A message board would allow for communication, and there could also be a feature to message the owner directly to lodge a complaint. This would allow for both community among the tenants, and quick problem solving should any issue arise.

Paying their rent. Collecting all the rent from either a tenant's door or from the mail can become a challenge. This software will make paying one's rent as simple as clicking a button. Using something such as a paypal extension, or any other cash app service. This would allow tenants to pay their bills with ease on time. Every tenant will be able to view their balance on the website, and if any fee should need to be added it will automatically appear. The owners will have the ability to manually enter payment as well through their admin accounts.

Entering notices for maintenance. As with any piece of property whether it is a car or a house, maintenance is required. A major problem with my clients' rentals is that their tenants wait before contacting them about maintenance. In some cases this has caused more problems than the original one. This feature would allow tenants to input any notice of maintenance and the priority they deem it. For example, an overflowing toilet would be labelled urgent and a message would be sent immediately out to the owner with the tenant information and maintenance notice attached. Though a cracked screen would be labeled low priority.

This idea is a piece of software, available over a website and compatible across all devices, that will handle the management, scheduling, payment, and consideration between tenant and owner. Today, people everywhere pay so much of their profits to organizations to do exactly what this application could do. This piece of software will be exponentially useful for my client, but could also be converted to be useful with Radford University as well. Great management is the key to any successful business and with this software, management would be made easy.

Goal

As a computer science major, concentrating in software engineering building this website will be an imperative experience and a significant way to showcase my abilities as a Software Developer. With this ever changing world it is important to note that Automation of regular tasks has become the new normal, especially after the COVID outbreak in 2020. The article *Will COVID-19 be the tipping point for the Intelligent Automation of work? A review of the debate and implications for research* states “Three main themes underpin the argument for increased adoption of IA following COVID-19. These themes are: consumer preferences changing to favour of IA; increasing familiarity of IA technologies; and increased business confidence in IA.” The quote highlights the importance of Intelligent Automation (IA) of the rental process.

After some research into other types of management software, it seems that there is great need for usability for both the owner and the tenant. The idea for this website will not only have functionality for the tenant, but also a lot of management tasks will be handled for the owner. Based on the current system, we have a lot of similar features as other property websites. My goal is to continue to add to and change the website to allow for every task of management possible to be automated. Citing the importance of automation in business the article *IT-enabled business transformation: from automation to business scope redefinition* states, “Even standard IT applications when accompanied by corresponding changes in internal business processes, can result in significant advantages.” This article highlights the importance of the growing online world with its ever changing abilities for automation.

This full automation of management will not only save time for owners and tenants, but will also create a seamless line of communication that will allow for transparency. It is important to remember that renting is a business transaction, and seeing as people become very attached to their homes this can be forgotten. Citing *Basics of creating platforms for automation of business processes of logistics*, an article written about creating automation keeping in mind the importance of business practices, “The process of building business processes involves building its infrastructure, which includes automation systems for this business process.” Keeping this in mind, the infrastructure of the website will be modified to ensure business transparency. With Managing Made Easier we will be able to keep renting from Jarrett properties a professional automated experience.

Specifications

- Website Application
 - Available for use on all devices
- Google based Hosting, Database, Storage, etc
 - All utilizing a platform named *Firebase*
- Agile Software Development
 - “In software development, agile practices involve discovering requirements and developing solutions through the collaborative effort of self-organizing and cross-functional teams and their customer/end user.”

Current System User Stories

- “Given the user navigates to the **sign up** page and enters an email, password, and verifies their password, then the user should be signed in and have a new account created.”
- “Given the user navigates to the **sign in** page and enters an email and password, then the user should be signed in.”
- “Given the user is signed in as an owner, when accessing the owner portal the user can click **Add New Listing**, then the owner should be able to input the listing information and view this listing after it was added.”
- “Given any type of user accesses the page, when clicking on the **search** link in the top right corner, the user should then be taken to the search page and will see all the listings available.”
- “Given the user is signed in as an owner, when accessing the owner portal the user can click **Update Listing**, then the owner should be able to view all the listings and click on one to update.”
- “Given any type of user accesses the page, when clicking on the **contact** link in the top right corner, the user should then be able to view the contact page and enter information/questions in the text areas to send to the owner.”
- “Given any type of user accesses the page, when clicking on the search link in the top right corner and choosing a listing to view, the user then should be taken to the **view listing page** and will see all the information related to the listing.”
- “Given the user is signed in as an owner, they should be able to navigate to the **owner portal** and see the options to add, delete, and update listings.”
- “Given the user is NOT signed in as an owner, when trying to access the owner portal the user will then see a message **You are not authorized to access this page.**”
- “Given the user is signed in as an owner, when accessing the owner portal the user can click **Delete Listing**, then the owner should be able to view all the listings and click on a listing or delete.”
- “Given the user navigates to the sign in page, when entering an email and password, then the user should be able to see a green message saying they have **successfully signed** in and will be redirected.”

- "Given the user navigates to the **sign up page**, when entering an email, password, and verifying my password, then the user should be able to see a green message saying they have successfully signed up and will be redirected."
- "Given the user navigates to the view listing page, they should be able to see a **map** with the same location as the address listed."
- "Given the owner navigates to the owner portal and clicks on **Add Announcement**, the owner should be able to create an announcement and view it after submission"
- "Given a tenant navigates to the tenant portal and clicks on Announcements, the tenant should be able to **view all announcements** listed."
- "Given an owner navigates to the owner portal and clicks on **Activate/Deactivate a Listing**, the owner should be able to select a listing and either mark it as activated or deactivated. Additionally, the owner can link the listing to a user and set the actual rent."
- "Given an owner navigates to the owner portal and clicks on Activate/Deactivate a Listing, Delete a Listing, or Update a Listing, any **deactivated listings should appear grayed out.**"
- "Given any user navigates to the listings page, any **deactivated listings should not be visible.**"
- "Given an owner navigates to the owner portal and clicks on **Delete a Listing**, the owner should be able to select a listing to delete and confirm it. The page should then scroll to the top and a notification should appear informing the owner that the listing was successfully deleted."
- "Given an owner navigates to the owner portal and clicks on Add a Listing, the owner should be able to fill out the form and select the property type to be an apartment. Upon submitting the form, the owner should be **redirected to the view listing page** and the property type should be correctly identified as an apartment."
- "Given a **tenant with a property** linked to them navigates to the tenant portal, there should be the following icons: Pay Rent, Announcements, Maintenance Request, and Renew Lease. The Pay Rent and Announcements icons should link to the appropriate pages."
- "Given a **tenant without a property** linked to them navigates to the tenant portal, there should be the following icons: Announcements, Schedule Walkthrough, and Apply to Rent. The Announcements icon should link to the appropriate page."
- "Given the owner navigates to the owner portal and clicks on **Update a Listing**, and then selects a listing to edit, the owner should be able to see the images associated with the listing underneath the description box."
- "Given the owner navigates to the owner portal and clicks on Update a Listing, and then selects a listing to edit, the owner should be able to select the **trash can icon to delete** images underneath the description box."
- "Given the owner navigates to the owner portal and clicks on Update a Listing, and then selects a listing to edit, the owner should be able to **select Choose Files to add more images**"
- "Given a tenant with a property linked to them navigates to the pay rent page, they should be able to see their **current balance calculated**"

- “Given a tenant clicks the **“Paypal” button**, a new window should pop up asking the tenant to sign into Paypal to go forward with processing the payment.”
- Given that a user without a property accesses the Apply Page, the spelling mistake should no longer be present.
- Given that any user accesses the **Contact page**, the boxes should be symmetrical.
- Given that any user accesses the View listing page, they should be able to make the **image full screen**, using the button underneath the image.
- Given that any user accesses the View Listing page, the facebook button should appear as a small circle and not an elongated oval.
- Given that any user with an account accesses their portal, **there should be a change password tile**. This tile should take the user to a fully functional change password page.
- Given that the owner accesses the maintenance requests page, the requests should be listed by address rather than email.
- Given that the owner accesses the mark rent as paid page, the dropdown should include addresses rather than emails. Additionally, the user should be able to search for an address using the text box.
- Given that the owner accesses the rent log page, the logs should be listed by address rather than email.
- Given that the owner accesses the add additional fees page, the dropdown should include addresses rather than emails. Additionally, the user should be able to search for an address using the text box.
- Given that the owner accesses the view/delete fees page, the fees should be listed by address rather than email.
- Given that any user with an account forgets their password, they should be able to select the forgot password button on the sign-in page. The user should then be brought to a fully functional **forgot password page** where they can enter their email and be sent a link to reset their password.
- Given that the owner accesses the **activate/deactivate listing page** and hovers over any listing, the icon that appears should be a user with a lock.
- Given that any user accesses the search listings page and searches for criteria that populate no results, the user should see the message **“There are no listings that match those search criteria.”**
- Given that any user with an account accesses the view announcements page, they should see the **posted date on each announcement**.
- **Given that any user with an account goes to the scheduling page, they should see a list of available appointment times.**
 - *This needs to be updated to client specification*
- **Given an owner is signed in and navigates to the calendar page, they should be able to view all appointments on the calendar**
 - *This needs to be updated to client specification*
- **Given that any user with an account navigates to the scheduling page, they should be able to sign up for an appointment time slot.**
 - *This needs to be updated to client specification*

- **Given that an owner has made an announcement, they should receive an email with the announcement contents**
 - **Failed Acceptance Tests with client**
 - **This needs to be updated to client specification**
- **Given that any user has registered, and an owner has made an announcement, they should receive an email with the announcement contents**
 - **Failed Acceptance Tests with client**
 - **This needs to be updated to client specification**
- Given that a user visits the contact page, and they fill out the form, the owner should receive an **email with the contents of the contact page**
- Given that a user with a property visits the maintenance page, and they fill out the form with a non-emergency, the **owner should receive an email with the contents of the contact page**
- **Given that a user with a property visits the maintenance page, and they fill out the form with an emergency, the owner should receive an email with the contents of the contact page that is marked urgent**
 - **Failed Acceptance Tests with client**
 - **This needs to be updated to client specification**
- Given that a user visits the apply page, and selects to upload their files, the owner should **receive an email with the contents of their upload**
- "Given the owner navigates to the owner portal and clicks on **Mark Rent as Paid**, the owner should be able to enter an amount paid, select a user, and indicate whether or not they wish to mark additional fees as paid."
- "Given the owner navigates to the owner portal and clicks on **Rent Log**, the owner should be able to view the payment history separated by tenant in **reverse chronological order**."
- "Given the owner navigates to the owner portal and clicks on **Add Fees**, the owner should be able to enter an amount, description, and select a user."
- "Given the owner navigates to the owner portal and clicks on View/Delete Fees, the owner should be able to **view fee history** separated by tenant in reverse chronological order."
- "Given the owner navigates to the owner portal and clicks on View/Delete Fees, the owner should be able to view a **paid fee with a crossed out title** and the payment date in the description."
- "Given the owner navigates to the owner portal and clicks on View/Delete Fees, the owner should be able to **delete an unpaid fee**."
- "Given a tenant with a property linked navigates to the tenant portal and clicks on **Rent Log**, the tenant should be able to view their payment history in reverse chronological order."
- "Given a tenant with a property linked navigates to the tenant portal and clicks on **View Fees**, the tenant should be able to view their fee history in reverse chronological order."
- "Given a tenant with a property linked navigates to the tenant portal and clicks on View Fees, the tenant should be able to **view a paid fee with a crossed out title** and the payment date in the description."

- "Given the owner navigates to the owner portal and clicks on **Add an Announcement**, the owner should be able to add an announcement and then view that the new announcement appears on the top of the view announcements page."
- "Given the owner navigates to the owner portal and clicks on Maintenance Requests, the owner should be able to view the **maintenance requests from all users in reverse chronological order**."
- "Given the owner navigates to the owner portal and clicks on Maintenance Requests, the owner should be able to **view emergency requests in a reddish-pink**."
- "Given the owner navigates to the owner portal and clicks on Maintenance Requests, the owner should be able to **view resolved requests as crossed out**."
- "Given the owner navigates to the owner portal and clicks on Maintenance Requests, the owner should be able to **resolve an unresolved request**."
- "Given the owner navigates to the owner portal and clicks on **Update an Announcement**, the owner should be able to select an announcement and be taken to an update page where the owner can edit the announcement's information and save the changes."
- "Given the owner navigates to the owner portal and clicks on **Delete an Announcement**, the owner should be able to select an announcement and delete it."
- "Given a tenant without a property navigates to the **Apply page**, they should be able to download the documents and upload the completed ones. "
- "Given a tenant with a property pays their rent, they should be able to see a **confirmation page confirming that the payment** went through."
- "Given the owner adds a new listing that does not have a tenant connected to it, the **new listing should be displayed on the home page**."
- **"Given the owner navigates the owner portal and clicks the calendar icon, the owner should be able to see a calendar displaying all upcoming appointments and events"**
 - *This will be updated to client specification*

Projected Features

As this is a project that I have started in a previous class, I will be finishing building this website. My goal is to take all client, user, and professor feedback and put together a final product that is both usable and professional. The current system consists of two Portals, Owner and Tenant, with functionality for the respective user types. Building off of the current system, below are listed features the client has requested.

Owner Portal

- The owner is able to review pay logs for properties.
 - **It will be necessary that the owner be able to access these pay logs in a pdf that will be printable. This pay log will also need to keep track if there was any missed or late payment. The formatting of this pdf will be discussed with the client.**

- The owner get's emails from an automated email address for information regarding the website.
 - **The client would like to receive text messages for important updates from the website, such as maintenance requests.**

Tenant Portal

- The user is able to submit a copy of their Application currently, but the client is wanting a more automated approach.
 - **This feature will require more work, as the client is expecting the users to be able to complete an application on the website.**
- The user should be able to access the credit and background check services from the website
 - **The application process should be expanded to allow for users to access these services, as well as information on what exactly needs to be done.**
- The user should be able to pay fees and rent.
 - **The paypal accounts and basic pairing have all been set up, but extensive testing and security is needed for this feature to be usable.**
- The user should be able to schedule an appointment for a walk through.
 - **The basic library and page has been set up, but the client is expecting a more automated approach for scheduling appointments to make this easier for tenants.**

Along with the above features it is also important to make note of nonspecific features that need to be addressed with the conclusion of development of this website, including **Security, Search Engine Optimization**, and **Documentation**. Security needs to be ensured, not only for payment but also for any confidential Tenant information. Search Engine Optimization will be very helpful in regard to prospective tenants, we want to create a website which brings as many people as possible without the need to pay for advertisements. Lastly, documentation for this website is imperative for use. This is something I have found many websites seem to be lacking. I wish to create thorough documentation of all features of the website that will allow for ease of use for my client and their tenants.

User Stories for Project Features

- **“As a Tenant, I should be able to submit a payment with real money, certified through Paypal”**
 - Our current system is utilizing a Sandbox account, this will have to be activated as a real account and thorough testing will be requires
 - Estimated Story points: 5
- **“As an Tenant, I should be able to download an editable PDF.”**
 - Work has already started on this.
 - Estimated Story points: 3
- **“As an Owner, I should receive the PDF via email.”**
 - This feature has code in place but a few things need to be set up before it works properly

- Security on this piece of the website will need to be ensured, I am planning on reaching out to the Cyber defense team for some advice on how exactly we should encrypt personal data.
- Estimate Story Points: 2
- **“As an Tenant, I should receive email updates from the website.”**
 - The feature requires full use of the library we are using for emails.
 - Estimated Story Points: 2
- **“As a Tenant, I should be able to access the background check system from the website”**
 - This is done through another web service. Though documentation of how this works will need to be added as well.
 - Estimated Story points: 2
- **“As a Tenant, I should be able to access the Credit check system from the website”**
 - This is done through another web service. Though documentation of how this works will need to be added as well.
 - Estimated Story points: 2
- **“As a Tenant, I should be able to schedule an appointment.”**
 - This feature has been added but the client is thoroughly unsatisfied with what we delivered.
 - Research has been done as to using a totally new service and completely reworking this portion of the website
 - Estimated Story points: Pending more review
- **“As an Owner, I should be able to schedule an appointment.”**
 - The owner side of this feature has also frustrated the client, this is why I am considering doing a total rework on these pages
 - Estimated Story points: Pending more review
- **“As a Tenant, I should receive an email notification of announcements on the website”**
 - Mailgun needs to be setup with billing before this can be functional
 - Estimated Story points: Pending more review
- **“As an Owner, I should receive text messages for urgent updates from the website”**
 - Server side learning will be required
 - Possibly solving current problem of urgent email messages
 - Estimated story points: Pending more review
- **“As a user I should be able to sign in from main page, instead of a separate sign in page”**
 - Possible adding signin box to header of page
 - Requires feedback from client
 - Non Urgent (Will implement after Go-Live)
- **Search Engine optimization of website**
 - Requires some research and implementation
 - Estimated Story points: 8

- **Overall Automation tests for all features being added to Code base, and any updates to existing tests**
 - Estimate Story Points: 15
 - This will be completed in small increments throughout the sprints.

Milestones

The first step will be meeting with the client to prioritize our next move with the website. My hope is to set a specific “Go live” date (the day the website will be fully usable and available to the public).

Once priorities have been set and a “Go live” date has been picked, I will go deeper into the planning process. I plan to use the Agile method of Software development, as it is the method used at my place of work. This includes planning out short *Sprints* (usually about two weeks), in which I will complete all the tasks I have laid out. At the end of a *Sprint*, I will meet with both my client and my Mentor to get feedback on my work and prioritize any new features or problems. After a sprint has finished the planning phase will start again, and the cycle will continue.

I will be making a more specific plan once my capstone is approved and the meeting with my client is complete, but I would assume the “Go live” date will be sometime in the middle of November (my projected date is November 12th). That would give us ample time to not only make any quick last minute adjustments, but also get feedback from the clients' tenants.

The list of bolded features in the *Projected Features* section will be broken down into tasks that will be workable throughout my *Sprints*. From what I have listed above, I will have a total of 20 weeks, allowing for possible breaks. I will plan for about 8 *Sprints* total in this development process. Which would allow one major task per sprint, along with any bugs and minor changes requested by the client.

Client feedback is very important with the project, but overall usability is also very important. I plan to make usability a top priority and I will be seeking out opinions from not only other professors, but also regular users.

Overall, my plan is to utilize the Agile method of development, focusing on Client and user feedback to create a website that will be usable long after this capstone project is completed.

NOTE: Projected Sprint schedule in Separate PDF Document

Budget

Monetary resources have already been discussed with the client, once the system goes live for the public there will be small fees associated with some features of the application.

Conclusion

This website will be not only an amazing learning experience for me, but will be a great resource to a local company. It is very important to me to not only finish with a great product for my Capstone, but also create something that will be usable long after I graduate college. I am very excited to continue work on this website, and I look forward to seeing the final product.

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Sprint 1 (July 12th - 25th)

- Main Goal: Overall start up of process
- Client meeting for prioritization throughout the development cycle
- Starting Documentation based on current system
- Automation suite testing and possible updates
- Setup billing process for Mail gun (Email sending service used by website)
- Testing for current abilities with email message of website, adding task tickets for updating emailing on website

Sprint 2 (July 26th - August 8th)

- Main Goal: Pay Pal functionality
- Start research into secure email for application pdf
- Continuing Documentation
- Testing Automation suites, updating and adding if functionality changes

Sprint 3 (August 9th - 22nd)

- Note: I will be on vacation through half of this sprint
- Main Goal: Application updates
- Create autofill PDF
- Continuing Documentation
- Testing Automation suites, updating and adding if functionality changes

Sprint 4 (August 23rd - September 5th)

- Note: School starts in this sprint
- Main Goal: Finish Application page
- Add Credit check and background check information to website along with documentation of process
- Updates for email notifications on website
- Thorough testing on this Feature

Sprint 5 (September 6th - 19th)

- Main Goal: Updating Appointment to new system
- Investigation into sending text messages for urgent maintenance requests
(Work with client to see if urgent email notifications are necessary as well)
- Continuing Documentation
- Testing Automation suites, updating and adding if functionality changes

Sprint 6 (September 20th - October 3rd)

- Main goal: Continuing with Appointment system (The original appointment system took three sprints to set up, I am assuming two will be enough time for me to get this up and running)
- Continue working with sending text messages for urgent maintenance requests
- Continuing Documentation
- Testing Automation suites, updating and adding if functionality changes

Sprint 7 (October 4th - 17th)

- Subject to change based on client feedback and overall progress on website
- Main goal: Finishing text Message notifications and Email notifications
- Research for Search Engine Optimization
- Finishing Documentation
- Testing Automation suites, updating and adding if functionality changes

Sprint 8 (October 18th - November 1st)

- Subject to change based on client feedback and overall progress on website
- Main Goal: Website should be ready for launch with all testing data deleted and actual properties added to website.
- Database cleanout
- Valid data input
- Testing suites should be passing
- Continue working with Search Engine Optimization

Sprint 9 (November 1st - 14th)

- Subject to change based on client feedback and overall progress on website
- Main Goal: Website testing
- Group of real users utilizing application
- Continuing Search Engine optimization
- Pairing website with other applications used by client (ex: Facebook)
- Automation test suites run daily

Current projected Go-Live Date November 14th

- Users will be able to use application with live data
- Tenants will be creating accounts and utilizing application
- If there are properties for rent at this time, listings will be available on the website and application process will be handled.

First payment period with live website

Rent is due on December 5th, this will be the first time tenants will be able to pay their rent through the website

- Go live date a couple weeks before payment cycle allows for any major issues to be ironed out before transactions are processed by the website.

Post Go-Live

- Automation testing will continue
- Maintenance of website
- Support for users with any issues with website
- Documentation updates if necessary
- Creation of final project presentation