Edward Phillips – Bachelors in Computer Science – Advisor: Julie Henderson
Expected Graduate Date: December 2022

Proposal for Vacation Rental Application

While interviewing for a position at a vacation property rental company, the owner of the company explained a problem that they were having. They had over 100 different properties that were spread out over fifty square miles. This posed a problem for their employees when their customers need assistance, wanted to ask question about the area, or just wanted to get in touch with a member of staff. Since their properties are spread so far apart, it is a challenge getting the closest employee to the property without having to make multiple phone calls and taking up a lot of valuable time.

Their solution was to have an application that could connect the employees to the customers. The application would provide information to the customer about the area and the company so that it was all readily available without needing to directly contact one of the employees. It would also be able to connect the customer and employee. This would cut some of the phone calls they currently take due to questions that could be answered without direct interaction. Also, this would allow their employees to be able to handle multiple customers at once and allow them to prioritize what they would have to do. The implementation of an application would allow the employees and customers to have a better experience.

Project Description

The project would be an application for the company. Each property would include a tablet with the application installed. The tablet would have the properties login information stored in it so the guest would not have to log into it every time they wanted to use the application. If the application would be logged out for whatever reason, the property would have the log in information available.

It would include a welcome page for the customers that would have basic information about the company. It would include several tabs that would answer basic questions about the company and the area. One tab would provide information about the company including the company's history, rental information such as what properties they have and pricing information. Another tab would have information about the area. This would include tourist attractions, local restaurants, and other things to do while vacationing in the area. The third tab would include the contact information and an area that would allow guest to put in request and state any problem that would need to be addressed.

That area of the application would connect to the employee portal. This portal would show a list of all the properties and locations of each property. It would also show which properties were occupied, and the customer's information such as name, arrival date, departure date, and contact information. Each request would show up as a box in the portal that would include the message that was sent with guest and property information next to it. It would be organized in a table that would timestamp each entry with the time that each request was sent. Each message would have the option of being claimed by an available employee. Once the request has been taken care of, the employee that claimed it can mark it as complete and include any notes if they are needed. Once the request is completed, it would be removed from the table so active requests would be the only thing visible here.

It would also include a manager's portal. Here, managers can create new log ins for employees and properties. They would also be able to update property information such as pricing and information about the area. This portal would show past requests. It would show how long each one of the requests

took to be claimed, who it was claimed by, and how long it took them to be completed. It would also store what the request was. It could be used to track problems that properties have so if something is a frequent problem, a solution could be implemented. It could also be used to track employee performance.

Languages, Packages, Software Requirements

Amazon AWS and Heroku would provide all the necessary software and packages need to complete this application. Specifically, the Cloud9 and Amazon RDS would be used. Cloud9 would provide the software for the user interface, and RDS would provide the backend database. The languages that would be used would be RoR, PHP, and SQL. RoR would be used to develop the GUI for the application. SQL would be used to store, retrieve, and navigate the database. PHP would be used for communication between the front and back end of the application. Heroku would build the actual application for users to view.

Personal Motivation

This idea was presented to me while I was interviewing for a job. This would be an example of what it would be like in the workplace, so it would be like gaining some real-world experience of what a programmer would have to do. A customer approaching us about a problem that they have, and then us coming up with a solution and implement the solution. It also will require a lot of different languages that are all applicable to what I could have to do in the workplace. It would give me a real understanding of what it would take to design and build an actual product.

Future Research Efforts

This project will be completed in three main steps. The first step would be to create and optimize the backend portion of the application. A total of three tables would be needed. One would contain staff and guest information. This would include login information and personal information for each individual. The second database would contain information regarding each property. The third database would store and retrieve guest requests and problems.

The second step would be to create the front end of the application. Three different portals would need to be created. The first would be the staff portal. It would need to be connected to each part of the database, and the GUI would need to be created. Next the managers portal. This would be very similar to the staff portal, but would include additional features. Lastly the guest portal would be created.

The third step would be the testing step. This would test the portals and database for potential problems that could occur. The security of the application would also be tested to ensure that no personal information could be taken from the application. A testing documentation would be created to record the tests and the outcomes.

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Schedule

Completion Date	Step of Project	Description
May 10, 2022	Software Environment Set Up	Create accounts for Amazon AWS and Heroku, and install/download all necessary packages
May 11, 2022	Create Database	Create RDS environment
May 15, 2022	Create Table for Properties	Implement table for properties. Table would include property name, location, username, password, name of guest, arrival date, departure date, and guest phone number and email
May 19, 2022	Create Table for Staff	Implement table for staff. This would include username, password, and unique ID for use in P/R table
May 23, 2022	Create Table for Problems/Requests	Implement table for problems/ requests. Table would include property name, location, guest name, comment, time sent, time completed, completed by, and any completion notes
May 30, 2022	Implement Joins for Tables	Implement the proper joins to allows the tables to communicate with each other
June 1, 2022	Back End Completion	
June 10, 2022	Create GUI for Staff Portal	Design GUI for staff. GUI will include login page. Portal will include tab that shows table of all properties and guest information of each property. It will include a second tab showing the P/R table.
June 19, 2022	Create GUI for Manager Portal	Design GUI for managers. Manger's portal would mirror staff portal but would include 2 additional tabs. One to add/delete login information for staff and properties. One to look at past P/R table entries
June 24, 2022	Enable Login Features for Staff/Managers	Link GUI to database to enable unique logins for staff/managers
July 3, 2022	Link Portal to Request/Problem Database	Link GUI to P/R table to show items

July 12, 2022	Create GUI for User Portal	Design GUI for guest users. GUI to include information about company, property, and area. Also includes area to put in entries in P/R table
July 14, 2022	Enable Login Features for Properties	Link GUI to database to enable unique logins for properties
July 21, 2022	Enable Request/Problem Feature	Link GUI to database for P/R table in staff and property sections.
July 22, 2022	Front End Completion	
August 10, 2022	Testing	Test application and features
August 12, 2022	Fill in information	Fill in initial information about properties and staff members for initial launch
August 14, 2022	Review Application	
August 15, 2022	Application Completion and Launch	Application completed

Requirements Document

ID and Type	Description	Rationale	Measurable goal	Priority	Dependencies
1- Functionality	Ensure all pages are visitable and show appropriate items	Allows for product to be used	Test all pages are visitable and load properly	1	none
1- Functionality	Logins for staff are successful	Allows for product to be used	Test all staff logins are successful	1	none
1- Functionality	Managers are able to add/delete staff	Ensures all current staff can login to application	Test 100 creations and deletions for staff members	1	none
1- Functionality	Logins for properties are successful	Allows for product to be used	Test all property logins are successful	1	none
1- Functionality	database stores and retrieves P/R all entries	Ensure P/R database functionality	Preform 100 test entries and retrievals	1	none
1- Functionality	P/R entries can be claimed by a staff member	Allows for product to be used	Preform 100 tests of P/R items being claimed	1	none
1- Functionality	Managers can access completed/past P/R entries	Allows for product to be used as intended	Test the feature 100 times for assurance	1	none
1- Functionality	P/R entries are removed from staff portal when entries are finished	Allows for product to be used correctly	Test the feature 100 times for assurance	1	none
2i - Look and Feel - Appearance	application has an aesthetic pleasing appearance	Provides better experience for guests and staff	Provide examples to customer for approval	4	1
2ii - Look and Feel - Appearance	ensure database entries are displayed in legible text	Allows for entries to be read without strain	Provide examples to customer for approval	4	1, 4iii
3ii - Usability - Personalization and Internationalization	Login names can be unique and personalized	helps logins be memorable and personalized	Test 100 creations for login credentials	4	1
3iii - Usability - Learning	managers and staff are able to use application after training	Allows for product to be used and new staff can be trained	Have all current staff train me to see if they understand the application	3	1
3vi - Usability - Convenience	application can be accessed through app shortcut as well as the web browser	Application is easier to access for guests and staff	test that application shortcut pulls up the application	3	1, 4iv
4i - Performance - Speed and Latency	logins have short load time	Provides better experience for guests and staff	Ensure login load times are less than 5 seconds on average	3	1
4i - Performance - Speed and Latency	P/R database retrieval is in adequate time	Ensures P/R entries can be retrieved/viewed in a reasonable amount of time	Ensure database retrieval completes in less than 15 seconds	3	1, 4iii
4ii - Performance - Safety-Critical	application does not lose data under power loss	Ensure data retention under a power loss to computer/tablet	Perform 10 power loss tests to ensure data is not lost if machine would lose power	2	1
4iii - Performance - Precision and Accuracy	application correctly display data from database	ensure proper functionality	test 100 unique entries for accuracy	2	1
4iv - Performance - Reliability and Availability	Multiple users are able to visit pages simultaneously	Allow for multiple users to use application	Test at least 10 users can use the application simultaneously	2	1
4iv - Performance - Reliability and Availability	All tablets/ computers can run the application	Ensures all hardware can support the application	Test that application can run on all current devices	2	1
4v - Performance - Robustness or Fault-Tolerance	database does not break if illegal characters are entered	Ensure database functionality when unique characters are entered	test all unique characters being entered and retrieved from database	2	1, 4iii
4vi - Performance - Capacity	Information in guest portal can be changed when need be	Allow for changes to be made when properties have changes to them	Test 50 changes to property database entries	3	1
5 - Maintainability and Support	Provide assistance while application is first being used	Ensures production introduction is smooth	Provide 1 month of additional services after product launch	5	1
6I - Security - Access	Application can only be accessed on private network	Ensures data and application security	Test that application cannot be accessed off of the server	2	1

6iii – Security – Privacy	Defend login information for staff and properties against SQL injection.	Protect personal data for staff and assets	Test against 5 most common SQL injection methods	2	1
6v - Security - Immunity	application immune to DOS attacks	Allows application to securely run without malicious interruption	Application run on private server without public access	2	1