Project Charter

Victoria Housing Rental Consolidator

SYSTEM ANALYSIS SOLUTIONS

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1.0 Introduction

1.1 Document Version

Version	Date Created	Comments
1.0	Oct 4, 2021	Initial Document

1.2 Executive Summary

The Victoria Housing Rental Consolidator project aims at developing a system that consolidates and scrapes housing rental information (links) on UsedVictoria, Kijiji, and Craigslist to support individuals in need of housing around the University of Victoria (UVic). Users entering the system will search for listings based on a range of criteria and look for information on three different sources all at once. This project aims to address the complications associated with finding a rental house in the Capital District Region in Victoria and help build a reliable platform for renters to find housing information. The key stakeholders involved in this project are intended users, who are mainly UVic staff and students, as well as members of the Housing Consolidator (HOCO) Organization. Throughout the duration of the project, database, server, frontend and backend implementations will be required along with deliverables including numerous reports on design and analysis.

1.3 Authorization

X_____   X_____
        HOCO (Sponsor)   Connor Hickton (Project Manager)

2.0 Overview

2.1 Context

Within the Capital Regional District of Victoria, especially near the University of Victoria (Uvic), the need for housing rentals remains high with students returning to campus and a soaring level of housing prices in Victoria. Despite the high rental prices, another urgent issue is the lack of housing resources available. According to Canada Mortgage Housing Corporation, the vacancy rate in the Greater Victoria region is 2.2% as of October 2020 (Raymond, 2021). The pandemic adds to this crisis by further limiting the number of housing units in the rental market. It had been reported that some landlords had chosen to convert bedrooms into office space to adapt remote working (Raymond, 2021).

Looking at Uvic in particular, in the school year of 2021-22, there would be an estimated 76% of students arriving from outside Greater Victoria (Bell, 2021). Although the school offered guaranteed on-campus housing for first year students, this offer might be put on hold with 400 or 500 first-year students who would not have spots in university residences, making the number of students looking for off-campus higher than previous years (Bell, 2021).

The establishment of the Victoria Housing Rental Consolidator project may not resolve the issue of housing shortage, but it can help mitigate the crisis by having all the available information consolidated and forming a more unified platform to create a more convenient hunting process for renters.

2.2 Need

The project will aim to solve the complications and stress in looking for rental housing information that is scattered among several service websites. This includes UsedVictoria, Kijiji, and Craigslist Victoria. Different websites have different user interfaces and may not contain the most comprehensive information about the properties that are actually available. Therefore, with the current scheme, one may often need to check multiple websites for up-to-date postings, which can be very time consuming, especially for students whose needs for finding a place to stay can become more urgent when approaching the start of a semester. Furthermore, a renter may only be aware of one or two websites, thus limiting the ability to find the most suitable rental place with restricted resources.

2.3 Scope

In Scope	Out of Scope
Inspect information on the service websites	Look for service websites apart from UsedVictoria, Kijiji, and Craigslist
Check how information is stored on the websites. E.g. HTML vs. API	Connect with user's personal accounts on the service websites
Use web scraping techniques -- Set trigger value related to housing rentals information across the service websites; Set script to run periodically for constant updates on new postings	Save users' data, and information
Constant maintenance to manage duplicate listings across the service websites	Allow users to post listings

Remove bad postings. E.g. Posts without major requirements such as: price, description, or postal code	
Conduct testing for the designed website/system to avoid crashes and check for usability issues	
Deploy a hosting or server that supports up to 5,000 concurrent users	

2.4 Stakeholders

Stakeholders affected by this project include The Housing Consolidator (HOCO) Organization and System Analysis Solutions, who are the client and project analysts respectively; any individuals who are seeking rental housing within the Victoria Capital Regional District (composed mainly of UVic staff and students), who are the intended user base of the project; and the organizations involved with the websites Craigslist Victoria, Kijiji, and UsedVictoria, whose web traffic and server load may be influenced by the use of the Housing Consolidator.

2.5 Objectives

The Housing Consolidator aims to streamline the process of searching for housing rentals on the websites Craigslist Victoria, Kijiji, and UsedVictoria by consolidating all listings in a single place, and having one set of search parameters and filters apply to all three external websites. In doing so, the housing consolidator will make the process of finding housing rentals in Victoria faster and easier.

3.0 Project Approach

3.1 Team Organization and Roles

- Brennan Wilkes: Director of Web Technologies
  - Manage website development process.
  - Set standards for design in conjunction with marketing communications.
  - Create new web pages and update existing web pages as necessary.
- Arsh Singla: Principal Software Engineer
  - Analyze and troubleshoot applications
  - Work with the team in planning, prioritizing and executing assigned tasks within the deadline.
  - Assist in risk management and mitigation activities.
- Connor Hickton: Project Manager
  - Risk identification and mitigation.
  - Budgeting and responding to incoming project requests.

- - Resource estimation and making sure milestones and deadlines are met.
  - Leo Ma: Requirements Analyst
    - Gather, analyze, document and validate the needs of project stakeholders.
    - Produce UI mockup screens.
  - Chris Wong: Client & Public Relations
    - Monitor client opinion about particular issues.
    - Advise management on policy issues and communication strategies.
    - Evaluate communication activities and recommend future actions.
  - Joonah Bae: Project Analyst
    - Develops the Project scope and project plan.
    - Coordinates the project.
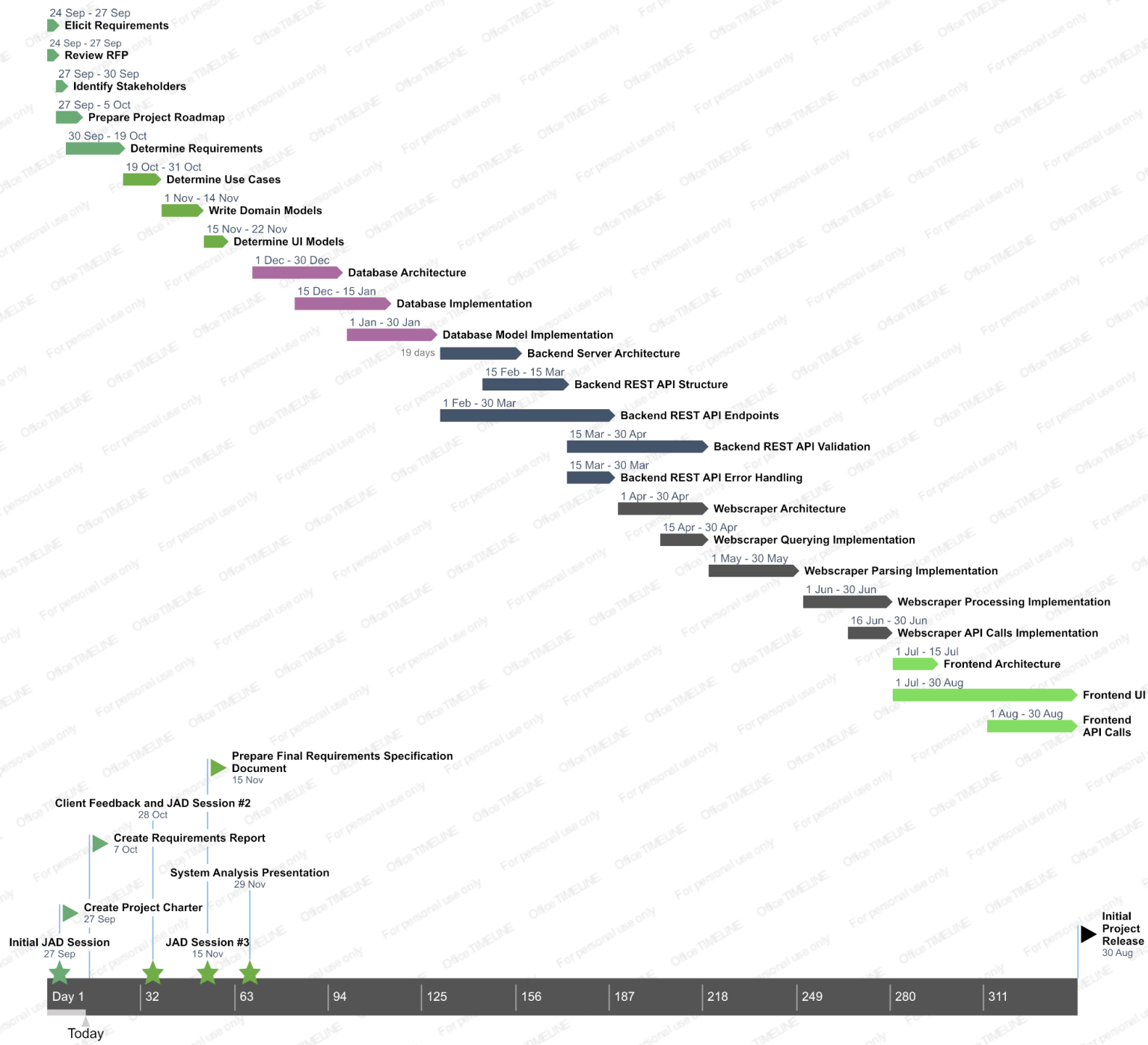   - Manages the Project risks, Constraints and Dependencies.

3.2 Work Breakdown Structure

The Victoria Housing Rental Consolidator project will undergo five main development phases. First, a requirement analysis and design phase will elicit the primary goals and requirements, as well as design solutions. This phase will include client-designer JAD sessions, as well as asynchronous requirement elicitation, and will produce documents such as a project charter, requirements document, and requirement specification document. Domain models, database design, and user interface mockups will be created.

Phases two through five will develop and test the project. Phase two will focus on developing the project database, including acquiring and testing the necessary architecture, developing the database structure, and implementing the database models from entity relationship diagrams. Phase three will develop REST API, starting with the basic server architecture, before developing the REST endpoints themselves. Phase four will develop the serverless web scraper, again starting with the basic architecture, then developing the querying and data-parsing, before finally developing the data processing functionality, and API calls. Finally, phase five will develop the application frontend, implementing the UI mockups, and API calls.

3.3 Milestones

Figure 1: Project milestone Gantt Chart

24 Sep - 27 Sep
Elicit Requirements

24 Sep - 27 Sep
Review RFP

27 Sep - 30 Sep
Identify Stakeholders

27 Sep - 5 Oct
Prepare Project Roadmap

30 Sep - 19 Oct
Determine Requirements

19 Oct - 31 Oct
Determine Use Cases

1 Nov - 14 Nov
Write Domain Models

15 Nov - 22 Nov
Determine UI Models

1 Dec - 30 Dec
Database Architecture

15 Dec - 15 Jan
Database Implementation

1 Jan - 30 Jan
Database Model Implementation

19 days
Backend Server Architecture

15 Feb - 15 Mar
Backend REST API Structure

1 Feb - 30 Mar
Backend REST API Endpoints

15 Mar - 30 Apr
Backend REST API Validation

15 Mar - 30 Mar
Backend REST API Error Handling

1 Apr - 30 Apr
Webscraper Architecture

15 Apr - 30 Apr
Webscraper Querying Implementation

1 May - 30 May
Webscraper Parsing Implementation

1 Jun - 30 Jun
Webscraper Processing Implementation

16 Jun - 30 Jun
Webscraper API Calls Implementation

1 Jul - 15 Jul
Frontend Architecture

1 Jul - 30 Aug
Frontend UI

1 Aug - 30 Aug
Frontend API Calls

Prepare Final Requirements Specification Document
15 Nov

Client Feedback and JAD Session #2
28 Oct

Create Requirements Report
7 Oct

System Analysis Presentation
29 Nov

Create Project Charter
27 Sep

Initial JAD Session
27 Sep

JAD Session #3
15 Nov

Initial Project Release
30 Aug

| Day 1 | 32 | 63 | 94 | 125 | 156 | 187 | 218 | 249 | 280 | 311 |

Today

Major Milestones

3.4 Deliverables

Project Phase	Deliverable	Date
Design and Analysis	Project Charter	2021-10-07
	Requirements Report	2021-10-19
	Use Cases Report	2021-10-31
	Domain Models Report	2021-11-14
	UI Models Report	2021-11-22
	Final Requirements Specification Document	2021-11-28
Database Implementation	Database Architecture	2021-12-30
	Database Core Implementation	2022-01-15
	Database Model Implementation	2022-01-30
Server Implementation	Backend Server Architecture	2022-02-27
	Backend REST API Structure	2022-03-15
	Backend REST API Endpoints	2022-03-30
	Backend REST API Validation	2022-04-30
	Backend REST API Error Handling	2022-03-30
Web Scraper Implementation	Web Scraper Architecture	2022-04-30
	Web Scraper Querying Implementation	2022-04-30
	Web Scraper Parsing Implementation	2022-05-30
	Web Scraper Processing Implementation	2022-06-30
	Web Scraper API Calls Implementation	2022-06-30
Frontend Implementation	Frontend Architecture	2022-07-15
	Frontend UI	2022-08-30
	Frontend API Calls	2022-08-30

3.5 Risks, Assumptions, and Constraints

3.5.1 Risks

Risk ID	Risk Description	Probability	Impact	Planned Mitigation
1	Having only three JAD sessions with our clients may not be enough to elicit all requirements	H	H	Alternative requirement elicitation techniques and communication channels
2	Future design or structure changes to websites the web scraper depends upon may compromise the scraper.	M	H	The web scraper must be designed in a maintainable, extendible, SOLID way.
3	A small development team may not be able to keep up with development deadlines.	L	M	A buffer time may be needed before project release.
4	The online real estate market may change, requiring the scraper to support new, more popular real estate websites	M	M	The web scraper must be designed in a maintainable, extendible, SOLID way.

3.5.2 Assumptions

| Assumption ID	The following is assumed:
1	Payment to the analyst team will come staggered at a reasonable rate throughout the development cycle.
2	Data publicly available on scraped sites may be used legally.
3	All source code and R&D related to the project is the property of HOCO

3.5.3 Constraints

Constraint ID	Constraint
1	Reliance on external 3rd party services and websites to populate rentals
2	Duplicate properties on multiple sites must be detected.

4.0 Project Organization

4.1 Project Team Structure

Figure 2: Project Team Organization Chart
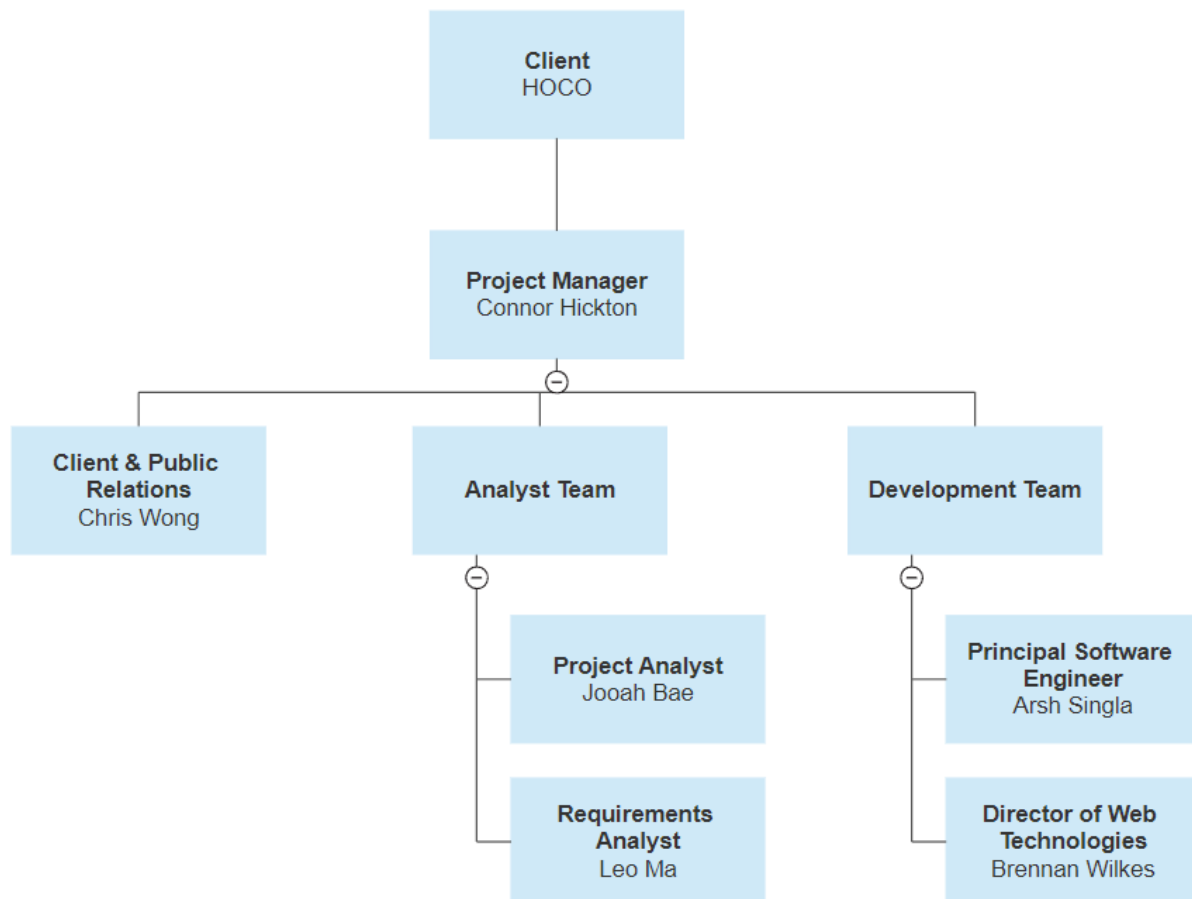
4.2 Project Facilities and Resources

Office, Lab and Conference Space

The University of Victoria provides investigators and research staff with secure individual spaces, and secure storage space for project records. Dedicated Classrooms and Labs are available and can be used for task development, project meetings, data analysis and paper writing.

Computer/Computing

The University of Victoria provides developers with powerful computing and printing. Additional computers available for project use are located in the Engineering and Computer Science building. The School's technical support group provides support for all analysts and research staff computers. The University offers Windows 10/Linux as a primary research file server supporting approximately 1TB of data space and providing collaborative sharing of files and programs for research, data is backed up daily.

Major Equipment

The University of Victoria offers several Xerox workcentre machines for project use at cost. These multi-function print, copy, FAX, and scan and have full color capability.

Library resources

Electronic and paper based library resources are available through the University of Victoria resource Center and the Mcpherson Library. Most of the holdings here are available electronically or through the library interface.

Statistical consulting
The University of Victoria for Statistical Consulting provides statistical and intellectual support to University researchers, including all aspects of the design, analysis and interpretation of investigations in science and industry. Statistical expertise is offered for issues of design, choice of methods and developing a detailed plan of analysis. The Center also assists clients with data analyses and the preparation of reports, abstracts, papers and formal presentations.

5.0 References

Raymond, Y. (2021). *"There's a fair amount of panic": UVic students face unprecedented housing shortage*. CTV News Vancouver Island. Retrieved from https://vancouverisland.ctvnews.ca/there-s-a-fair-amount-of-panic-uvic-students-face-unprecedented-housing-shortage-1.5567883

Bell, J. (2021). *UVic students battle "crazy" rental shortage*. Western Investor. Retrieved from https://www.westerninvestor.com/british-columbia/uvic-students-battle-crazy-rental-shortage-4268284

6.0 Glossary

Term	Definition
API	Application Programming Interface
Backend	The system components that are not directly accessed by the user, responsible for storing and manipulating data.
Craigslist	A website for buying and selling items including real estate.
Frontend	System of digital user interfaces displayed to the user.
HOCO	The Housing Consolidator Organization
JAD	Joint application design, the process used in the life cycle area of the dynamic systems to collect business requirements.
Kijiji	A website for buying and selling items including real estate in Canada.
REST	Representational State Transfer, a software architectural style
SOLID	A mnemonic acronym for five design principles intended to make software designs more understandable, flexible, and maintainable.
UsedVictoria	A website for buying and selling items including real estate in the Victoria Area.
UVic	University of Victoria
Web Scraper	A tool for extracting data from websites.