EUROPEAN UNIVERSITY OF LEFKE
FACULTY OF ENGINEERING

TRNC HOME SPOTTER

By
VICTOR MAYOWA ADEDAYO
20140273

A dissertation submitted in partial fulfilments for the degree of
Bachelor of Science
In
Computer Engineering
20th December 2023

Supervisor: Asst. Prof. Dr. Cem Kalyoncu

Abstract

The main aim of this project is to build up a real estate web application for the TRNC (Turkish Republic of Northern Cyprus). The major outlook behind project this project is to develop a web application which makes apartments and residential buildings easier to access in the TRNC. Real estate agents in the TRNC can be challenging on individuals as there is no preciseness in services rendered. Therefore, this project addresses a web application which provides its users access to detailed information on properties, including prices, pictures, locations, and a comment section.

Table Of Contents

1.Introduction

1.1 Problem definition

There is usually a great distress when it comes to buying a house/acquiring a residence. This project seeks to ease the home searching process in the TRNC. In the scope of the TRNC, buying a house can be incredibly challenging. The TRNC has been described for decades as a prominent landscape for tourism and infrastructural expansion which also dates to a long history of foreign influence and hegemony, from ownership by the Ottoman Empire in the 16th century to the British Empire occupation in the 18th century which continued till the mid 90's where the island gained its independence, the island at that time occupied by Greek and Turkish Cypriots got separated by the Turkish military into the Greek-speaking south and Turkish-speaking north as a result of aggravations in inter-communal hostilities. The Turkish Republic of Northern Cyprus became a republic in 1983, and it is recognised solely by Turkey, this history plays a labyrinthine role in the country's property market. Over the years, the landscape of the TRNC has drawn in an influx of tourists, investors, students, and other purposed-filled entrants which is shown to have scaled the infrastructural development in the country, from schools to estates, hotels, local business stores etc. This also led to an increase in demand of real estate agents who help buyers find suitable properties, negotiate and seal deals, provide credible information to buyers and market properties for sellers to seek potential buyers. This had been demonstrating remarkable functionality prior to recent peculiar events involving real estate agents misguiding buyers in property advertisement and negotiations, misinformation of such gravity that they could also qualify as criminal offences as they often cause the buyer into making a wrong decision. The significant issues posed to buyers are stated below:

- Limited information accessibility: buyers could only know as much as they were being told by the agents thereby hindering access to make informed decisions.
- Unreliable search processes: information regarding buildings, rooms and prices are inefficient due to lack of precision in information retrieval.
- Communication barriers: often times there is no direct communication link between the buyer and the seller, which is a challenge to most buyers.

This project aims to develop an extensive web application that allows users to search for properties with ease in the TRNC. The application will provide detailed insights to buildings, locations, rooms, pricing, contacts, and community feedback. This project will leverage JavaScript in designing it front end and backend from a user-friendly interface to backend features like property listings and engaging with property owners through a feedback configuration.

1.2 Goals

This project aims to tackle the preceding intricate challenges. The goals of this project are highlighted below:

- The use of JavaScript combined with other utilities to create comprehensive property search web application which allows users to search for apartments and residential buildings with respect to preference such as location and available rooms.
- Provide users with thorough information on each property including rooms, map locations, residence image, and pricing details.
- Synchronising direct communication between the buyers/users and the sellers/property owners reducing the need for third party facilitators.
- Implement a community engagement system enabling buyers/users to share their experience, provide feedback on properties and ask questions prompting a collaborative community.
- Design a comprehensible user-friendly platform ensuring a cohesive and delightful experience for users of different technical proficiency.

Purpose of this project

This project plays a vital role in the reforming the real estate experience in the TRNC. The purpose of this project is to:

- Provide property seekers with an effective means to make informed decisions when searching for properties.
- Ease the property search process by minimizing the scale of residences to a single application.
- Bridge communication gaps between users and property owners by eliminating intermediaries and facilitating a better transaction.

Benefits of this project

- Enhanced user experience as search process becomes much more efficient and enjoyable.
- Public/societal liaison as people come together to share, insights and experiences about properties and information regarding locations.
- Promoting the growth of the TRNC real estate market as it attracts both buyers and sellers.

2. Literature Survey

This project defines a web app for the TRNC that allows users to find apartments and residential buildings, view the buildings, rooms, location, price, contact of the owner, and comments from other people. The implementation of web applications in finding properties has been progressively utilised over the years. In [1], a novel architecture is proposed for home rental applications, which is implemented on the concept of smart contracts. This (smart contract) operating as the autonomously executable protocols leveraged the transparency, the immutability, and the security inherent in blockchain technology. Advocating for the transformative impact of smart contracts, the project posited that the enhancement of the efficiency, reliability, and trust in home rentals. Through the navigation of intermediaries, cuts in transaction costs, and cinching stringent enforcements of its statutory obligations, the project strives to simplify the rental process. The tangible proof of this lies in the prototype of a home rental web application. Built up on the Ethereum blockchain using Solidity to exhibit the project's viability. A major contrast distinguishing this project from mine is the strategic choice of a blockchain-based approach focused on delivering heightened security, reliability, and trustworthiness while mine underlines simplicity, economical, speed and compatibility. Another implementation could be seen in [2], this project aimed to effect a comprehensive user study aimed at accessing the usability and user satisfaction with functionalities including property search, booking and review features. Its technical framework constituents are Django used as its development stack, PostgreSQL, and Google maps API for geospatial integration. Its methodology consisted of a flexible approach combining quantitative analysis of data including evaluation principles measured on efficiency, learnability, and satisfaction, and qualitative analysis of data displaying data collection techniques such as questionnaires, interviews, and surveys. Following a thesis test, the nuanced difference between this project in comparison to mine was its focus as it centred on web application evaluation contrasting with my project's primary focus on development. This distinction serves as an insight for my project as its features are drawn from thoroughly examined user needs and preferences. In [3], A tutorial guide unfolding the creative pattern of developing a home rental web application in lens view to MySQL and JavaScript, two pivotal technologies in the web development landscape complexly leading, planning, coding, testing, and designing phases. Encompassing crucial elements such as database design, web page aesthetics and meticulous testing, the project serves as a meticulous guide, bolstered by downloadable source code and insightful screenshots, the project not only aims to impart essential web development skills but also to kindle the flames of creativity in the coder to begin their own web app development endeavours.

3. Background Information

3.1 Required software

- **Node.js:**
  It is widely used in backend development as it creates a runtime environment where users can run JavaScript code without a web browser, compatible with database operations it interacts with systems and processes requests from client-side application.

- **Visual Studio Code:**
  It is an extensively used code editor efficient in building GUI applications and working with APIs development as it also provides a benevolent interface for implementing code as it is compatible with the project's language.

- **PostgreSQL:**
  A sophisticated open-source relational database management system standardly used in applications like web and mobile, for managing, retrieving, and storing data as it draws its functionalities from the commonly known SQL (Structured Query Language).

- **React.js:**

this is widely used JavaScript library used which will be used in the project to build its dynamic user interfaces. Its virtual DOM makes it suitable for designing interactive and responsible web applications.

3.2 Other software

- **Figma:**

  Unlike other frameworks, this is a design tool that enables great visually attractive and interactive patterns for websites and mobile applications. It will be used to simplify the design process in this project

- **Git:**
  Distributive version control system used in tracking codebase modifications and aa community with other users. Functions as a code repository in this project.

4. Modules

4.1 Property Listings

This depicts the main aspect in the applications. Users can search for residential building and apartments effortlessly, some of its key features include:

4.1.1 Advanced Search

Users can become more informed when searching for apartments and residential buildings filtering through barriers such as location, price range and other utilities.

4.1.2 Comprehensive Property Description

Each property provides an elaborate description of its constituents, including rooms, pricing details, location on a map and exquisite images of the property.

4.2 User Profile

This submodule creates a personalised space improving users' performance by allowing a unique space or users to manage their preferences, saved listings, and accessibilities.

4.2.1 Profile Creation

Distinctions between buyers and sellers in profile accessibilities and controls, while both users can save favourite listings, sellers can actually modify their properties.

4.3 User Dashboard

This is a personalized space where users can customise their preference and get informed with the community.

4.3.1 Unique Dashboard

Users' customisation to individual satisfaction.

4.3.2 Community Interaction

Comment section accessibility creating an informed society as individuals ask questions, provide responses, and share encounters.

4.4 Testing and Quality Assurance module

This ensures the validity and verification of the application by testing its functionalities and reliability. Its features include;

4.4.1 Unification Testing

Ensuring all modules are functionally in line with each other.

4.4.2 Unit Testing

Components are examined individually to ensure their viability

4.4.3 Verification testing

External systems are used to ensure the applications functionality is correct.

4.5 Security Procedures

These are measures put in place to enforce user data is protected and the applications is secured.

4.5.1 Secure Authentication

Security measured enforced are user login information including a username and password and sellers require an image authentication with a valid identification document.

4.5.2 Accessibility Controls

Accessibility restrictions to some of the functionalities dependent on user roles e.g buyer, seller, admin etc.

4.5.3 Consistent Security Audits

Conducting regular security checks to identify potential security threats and implement measures to counter them.

5. Risk Analysis

In this project, through absolute assessment, monitoring, and mitigating, the potential risks posed to this application are:

Risk	Description	Impact	Likelihood	Mitigation Strategy
Technical perplexity	The web application involves compound search algorithms alongside constant data updates affecting the systems performance.	High	Moderate	Consistent code review to identify potential threats and loopholes. Eliminating complex logic without affecting its functionality.
Legal and regulatory compliance	Ignorance regarding the TRNC rules having potential legal threat.	High	Medium	Keeping up with government regulations to ensure compliance and consultation of legal experts to ensure profound knowledge of regulations.
User participation	Lesser user engagement as there is difficulty in navigating the application e.g. some functionalities do not work, or the designs are obnoxious.	Medium	Low	Ensuring the user has a unique participation attribute such as a customised dashboard. UX design should be thoroughly tested, and UI design should be user satisfactory
Integration complication	Defects in third party tools e.g. APIs, integrating with the application	Low	Low	Thorough tests should be conducted at each successive progression off the application. Restrain volume of third-party integration enhancing focus to essential functionalities.

6. Ethics

In this project, some ethical accounts and measures considered and put in place are:

- Ensured the integrity of user data by implementing strong measures to secure it preventing unwanted access and trustworthiness [4].

- Promoting and online community, which enforces ethical guidelines to discourage discrimination and any form of crude conduct [5].
- Enforcing techniques to improve the application making it optimal at best in its abilities and ensuring user's satisfaction [6].
- Users have an insight to the cause for information provided fully understanding their data functionalities ensuring clearness and credibility [7].

These ethical measures aim to create a web application environment that support user interaction and ideas, regard for other users and overall, an interactive digital community.

7. Conclusion

In conclusion, the TRNC home spotter project aims to create a web application that helps anyone interested in purchasing a property in the TRNC. Leveraged with JavaScript, this project aims to simplify the search process in the TRNC thereby implementing time management, increased accuracy, creating a social interactive community and an increased rate of user's satisfaction.

7.1 Benefits

This project is beneficiary in bare ways as it not only gives me an advantage, but it also aids the users of the application. This project benefits the uses in the following ways:

Ease in residence search in the TRNC as users can now acquire properties from any location around the world without apprehension of time, preference, or unaffiliated financial impositions from third party sellers.

Benefit to Users

Mental composure as individuals can now have access to credible information regarding residents to be purchased and ensure their criteria is met before purchase is made as they are now more informed.

Establishment of an interactive community as individuals can now connect with other people in their regions and discuss relative matters of interest.

Buyers can now connect directly with sellers and vice versa eliminating communication barriers

Benefits to me

Skill development as I get to advance my web development competence with JavaScript, implementing designs with both interactive and dynamic interfaces, and working with database management systems, improving my overall programming dent.

Improved project management capabilities as I get to research different publications, relative projects and draw out a revised thesis and conclusion.

This project builds my discipline and focus as I will be working on a functional web application, building diverse parts of the project. General improvement can be seen with day-to-day activities improving ethical conduct.

I chose this project cause of three reasons. Firstly, I live in the TRNC myself and the distress in acquiring a residence here is a pending issue which affects a lot of people, particularly international students coming into the country. Secondly, misinformation being spread around by third party agent can be misleading and leads to buyers making uniformed decisions and lastly, the lack of a social community in the real estate sector here is a real setback as it helps to foster credibility, awareness, and unification.

7.2 Future Works

I wish to continue working on this project upon convocation, feedback gotten from users and other innovations would facilitate forward advancements ensuring it is built to user's satisfaction. Some future considerations are extensions to mobile application, increased community, and dashboard features, and an improved communication channel.

8. References

You should write your references which you found at your research and literature survey. You can use APA 6 Format

[1] Chen, J., & Liu, Y. (2016). A smart contract based on blockchain for the rental of apartments. In 206 IEEE international conference on Cloud Computing and Intelligence Systems (CCIS) (pp. 293-296). IEEE https://doi.org/10.1109/CCIS.201.7819780

[2] Lee, J., & Lee, J. (2015). Developing and validating a citizen-centric typology for smart city services. Government information Quarterly, 32(4), 453-463. https://doi.org/10.1016/j.giq.2015.08

[3] R. K. Patel, "How to design a home renal webapp using PHP and MYSQL," IEEE Softw., vol. 40, no. 2, pp 10-15, Mar./Apr. 2023

[4] European Data Protection Supervisor. Retrieved from https://edps.europa.eu/data-protection/our-role-supervisor/publications/privacy-design/principles_en

[5] Facebook. (n.d.). Community Standards. Retrieved from https://www.facebook.com/communitystandards/

[6] Nielsen, J. (1995). 10 usability heuristics for user interface design. Nielsen Norman Group. Retrieved from https://www.nngroup.com/articles/ten-usability-heuristics/

[7] Federal Trade Commission. (2016). Cross-device tracking: An FTC staff report. https://doi.org/10.2139/ssrn.2890502