

An Intelligent Web-Based Real Estate Portal Using Modern Web Technologies

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ABSTRACT

The real estate sector has grown fast because of digital technologies. Traditional real estate systems are often slow because they rely on processes like brokers visiting properties in person and not having clear information. This leads to delays and inefficiency. This research paper talks about building an Intelligent Web-Based Real Estate Portal using web technologies like React.js, Node.js, Express.js, MongoDB and cloud services. The portal lets buyers search and filter properties online. Sellers can. Manage their property listings. Administrators can check listings. Manage users. The system keeps user data safe handles information efficiently. Has a user-friendly interface. The goal is to save time make things more transparent and improve communication between buyers and sellers. The Real Estate Portal also plans to add features, like AI-based recommendations predicting property prices and virtual property tours in the future.

Keywords: Real Estate Portal, MERN Stack, Property Listing System, Modern Web Technologies, Secure Authentication, Intelligent System.



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1. Introduction

The digital world has changed a lot of things including the real estate industry. Over the years websites have made it a lot easier for people to buy, sell and search for properties. People now use websites to look at property listings compare prices and talk to real estate agents. However many online real estate platforms are still pretty basic. Do not offer much in terms of smart features or personalized recommendations. What people want is more than static property ads they want to be able to search for properties in a smart way get personalized suggestions interact with the website in real-time and have a smooth experience whether they are using a computer, tablet or smartphone.

The real estate industry has a lot of property data, user interactions and transactions which creates both opportunities and challenges for real estate platforms. Big data can help people make decisions and predict trends. It also requires good data management, processing and system architecture, which can be a challenge for real estate platforms.

An Intelligent Web-Based Real Estate Portal aims to solve these problems by combining web technology with data processing, which is a really good idea for real estate platforms. Modern web technology, such as design, APIs, cloud databases and real-time communication enables scalable and interactive platforms, which is what people want from real estate platforms. When you pair this technology with machine learning and recommendation systems it can really improve property discovery and user engagement for real estate platforms.

The proposed system uses full-stack web development to create an architecture with a frontend interface, backend services and a database layer, which's a good way to build real estate platforms. The frontend provides a to-use and responsive experience on desktops, tablets and smartphones which is important for real estate platforms. The backend handles business logic, authentication and API communication while the database stores. Retrieves large amounts of property and user data, which is a lot of work for real estate platforms. The intelligent recommendation engine analyses user behaviour, search history and preferences to suggest customized properties, which's really helpful for people using real estate platforms. Security and privacy are also very important for real estate portals because property transactions involve information. So, the system must have authentication, data encryption and secure API communication, which is crucial, for real estate platforms. Secure development practices ensure that users trust the real estate platform and feel secure which is what real estate platforms need to do.

2. Related Work

Recently people have been working on ways to make online real estate services better by using technologies. They have been looking at things like searching for properties making the experience better for users and making sure the system can handle a lot of people. They have also been trying to make recommendations that're smart. However, most of these systems do not have everything they need like personalization that uses intelligence, automatic verification and the latest web technologies, which is what the new online real estate service is trying to do. This part of the paper talks about what other people have done and how the new online real estate service fits in with what's already out there, in terms of online real estate services.

1. Traditional Real Estate Portals

There are well known real estate websites like Zillow, Realtor.com, Magic Bricks and 99acres that have property listings online. These websites have filters and you can search for properties. You can search by location or price. The type of property you want. Traditional Real Estate Portals have some problems.

Some of the problems with Traditional Real Estate Portals are:

- They do not change to fit what the user likes. The filters are the same for everyone.
- People have to enter all the information, about properties by hand. This means the information is sometimes wrong or not complete.
- There are many properties to look at. Users get overwhelmed because they have to look through all the listings. They do not get properties that're just right for them.

Traditional Real Estate Portals have made it possible to search for properties online.. They do not use artificial intelligence to make the search better. This means Traditional Real Estate Portals do not always show users the properties they really want to see. Traditional Real Estate Portals need to improve so they can help users find properties that're just right for them.

2. AI-Based Recommendation Systems in Estate

Some people have done research on using machine learning and data mining for real estate. They looked at things like property prices. Made recommendations.

For example: they made models that can predict how much a property will cost. These models use things like where the property's how big it is what amenities it has and what is happening in the market. This helps people who are buying or selling properties know what a fair price is. These models do not really help people when they are looking at properties online.

There are also systems that recommend properties to people based on what they like. These systems look at what people like and what they have done in the past to make recommendations. Usually these systems are not part of a bigger website.

These studies show that AI can be really useful in estate. They do not really talk about how to make it work on the web or how to make it work in real time or how to make it work for a lot of people or how to make sure the listings are accurate. AI-Based Recommendation Systems in Real Estate can be very helpful. There is still a lot of work to be done on AI-Based Recommendation Systems, in Real Estate.

3. Web-Based Real Estate Platforms with Advanced Features

Some people are working on making real estate websites by adding new features to them. They want to make it easy for people to find what they are looking for on these Web-Based Real Estate Platforms. They are trying to make Web-Based Real Estate Platforms simple for users to find properties on. People are doing this so users can find what they need quickly on Web-Based Real Estate Platforms.

- **Interactive Search Interfaces:** Some people think using maps and filters that change when you use them is an idea for Web-Based Real Estate Platforms. This way users can see information about properties in a way that's easy to understand on Web-Based Real Estate Platforms.
- **Mobile Real Estate Apps:** A lot of real estate apps are made for phones and tablets so people can look at properties on their devices using these Mobile Real Estate Apps. Most of these Mobile Real Estate Apps still need people to type in words to search. They do not have advanced features like Web-Based Real Estate Platforms. These new features make Web-Based Real Estate Platforms easier to use for people.

Web-Based Real Estate Platforms need to get better at combining design with tools to make them more useful for users of Web-Based Real Estate Platforms.

Web-Based Real Estate Platforms still have a lot of room to get better when it comes to features on Web-Based Real Estate Platforms.

Web-Based Real Estate Platforms need to improve so they can help people find properties easily, on Web-Based Real Estate Platforms.

4. Intelligent Systems for Property Evaluation

People have done some research on using Artificial Intelligence for checking out properties and finding fraud. For example:

- **Looking at Pictures for Property Verification:** Artificial Intelligence models use computer vision to look at property pictures to find things that do not match or to detect differences between the inside and outside of a property.
- **Finding Things in Listings:** Machine learning algorithms find prices that are not normal or listings that are the same, which can mean someone is trying to cheat.

Although these things help us learn ways to do things they are often just ideas or only used for research rather, than being used in big websites that people can actually use.

3. Research Methodology

The research methodology for developing the Intelligent Web-Based Real Estate Portal is designed to integrate modern web technologies with data-driven intelligence to improve property search, personalization, and system performance. The methodology combines software engineering practices,

real estate domain analysis, and recommendation system modeling to build a scalable and user-centric platform.

The research process is divided into the following stages:

1. Real Estate Domain Analysis
2. System Requirement Identification
3. Web Portal Architecture Design
4. Data Collection and Processing

3.1 Real Estate Domain Analysis

The first phase involves studying the real estate market and identifying user behavior patterns. The following observations were made:

- Buyers prioritize location, price, amenities, and property size.
- Sellers require efficient listing management and inquiry tracking.
- Agents need tools for managing multiple clients and properties.
- Users expect mobile-friendly and fast-loading web platforms.
- Property search often involves comparing multiple listings.

This domain analysis helps in identifying key system features and intelligence requirements.

3.2 Problem Statement

We have a lot of real estate websites but real estate websites have some problems.

- There are many properties to look at on real estate websites.
- Real estate websites do not give users suggestions.
- Real estate websites have filters but they do not rank properties based on what users like.
- When many people use real estate websites at the time they are very slow.
- Real estate websites do not change based on what users do.

Therefore the main problem that real estate websites need to solve is:

To make a real estate website that's big and smart and can give users personalized property suggestions help users search for properties quickly and keep users safe when they use the website using the latest technology that real estate websites can use.

3.3 System Architecture of the Web Portal

The web portal we are talking about has a design with many layers.

1. Presentation Layer is what the user sees, the frontend.
 - It has a user interface that works well on devices
 - You can. Filter things easily
 - Properties are shown in a way
 - It works on phones and computers
2. Application Layer is the backend, where all the work happens.
 - It uses something called API services
 - It makes sure only the right people can use the portal

- It does all the business logic
 - It also has a recommendation engine
3. Data Layer is where all the information is stored, the database.
- It has a database of properties
 - It has a database of user profiles
 - It keeps a record of what people search for
 - It keeps a record of all transaction
4. Intelligence Layer is where the smart stuff happens.
- It gets the data ready for use
 - It uses algorithms to make recommendations
 - It. Scores things

This design makes it easy to add new things and maintain the portal.

4. Research Methodology

1. Data Collection and Description

The portal uses two kinds of data: property data and user behavior data.

Property Data has attributes.

- Each property has an ID
- It has a location, like a city or area
- It has a price
- It is a type of property
- It has a number of bedrooms and bathrooms
- It has a size
- It has amenities like a pool or gym
- It has pictures and descriptions

User Data is also collected.

- We get registration details
- We get search history
- We get click activity
- We get data
- We get inquiry records

All this data is stored in a format and used to analyze things and make recommendations, about properties.

2. Result Evaluation & Analysis

The Result Evaluation & Analysis section examines the effectiveness, performance, and overall impact of the developed intelligent real estate portal. The system was evaluated based on performance metrics, recommendation accuracy, usability, scalability, and security.

The bellow image shows the **homepage banner** of a real estate website.

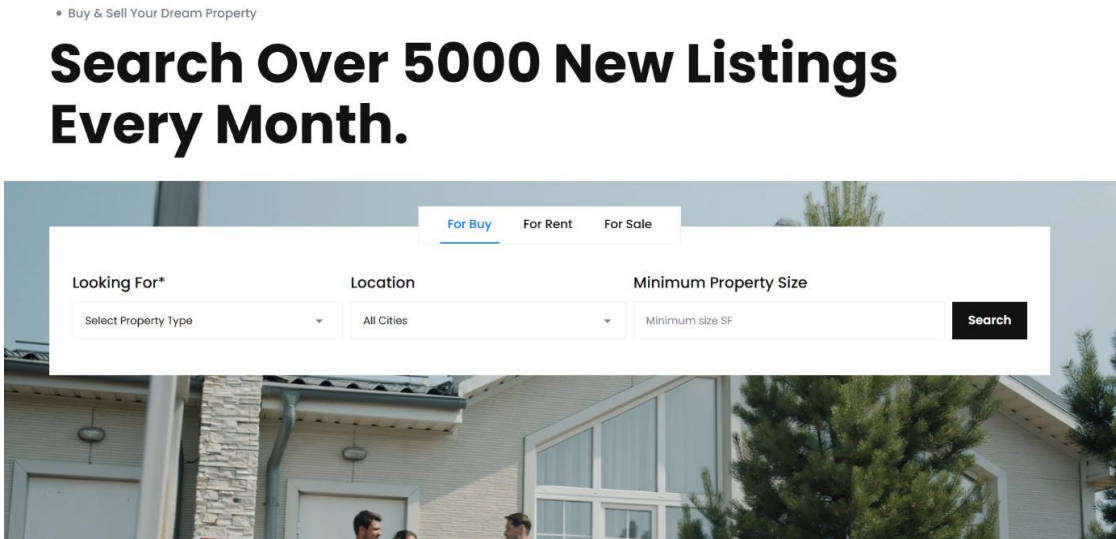


Fig 1: Modern Real Estate Property Search Landing Page

Below is an image of the Property Listing page for a real estate website. This is where people can look for properties and narrow down their search using things like what kind of listing it's what type of property it is, what category it falls under and where it is located. They can see the results in a grid that shows pictures of the properties how much they cost, where they are and some important details like how bedrooms they have and how big they are. The page also lets people sort the properties in ways like seeing the newest ones first. There is also a map that people can use to find properties, in areas, which makes it easier and more fun for people to find properties they like. The Property Listing page is a part of the real estate website and it helps people find properties that fit what they are looking for.

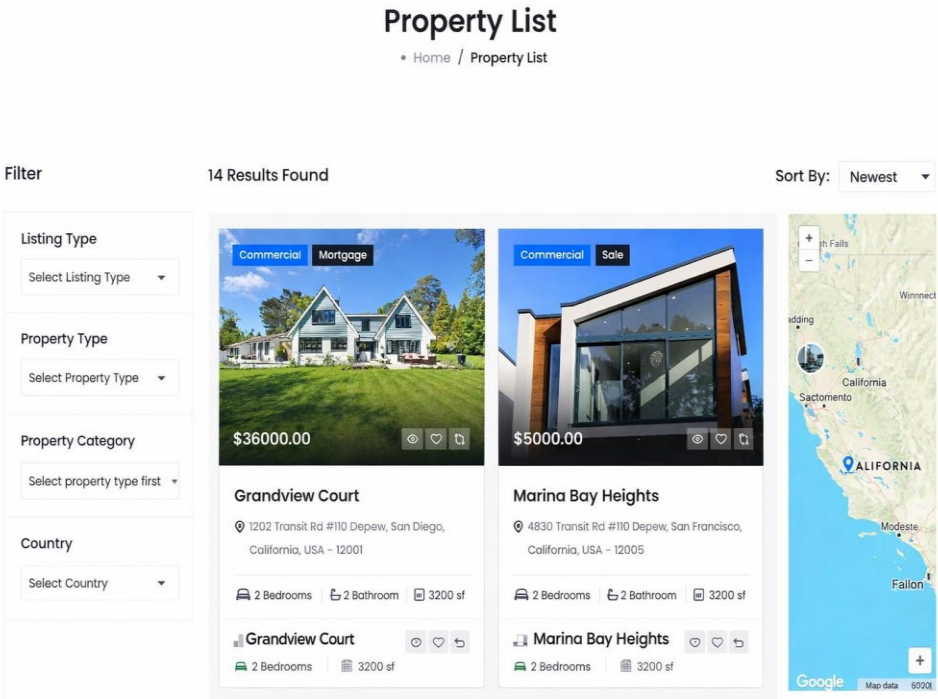


Fig 2: Interactive Property Search and Map-Based Listing Module

The both image shows the Contact Us page of the Intelligent Web-Based Real Estate Portal, featuring company contact information (phone, address, and email) along with a user inquiry form that collects first name, last name, email, phone number, and message to enable direct communication between users and the platform administrators.

Contact Us

• Home / Contact Us



(123-458-987254824185)



45/7 dreem street, albania
dnobod, USA



demo@mail.com

First Name *

Minal

Last Name *

KHADGI

Email Address *

minalkhadgi@gmail.com

Phone Number *

8767305344

Message *

First Name *

Minal

Last Name *

KHADGI

Email Address *

minalkhadgi@gmail.com

Phone Number *

8767305344

Message *

Hello, I am interested in property-related details. Please share the location, price, size, and other important information. You can also contact me for further discussion. Thank you.

Submit →

Fig 3: Contact Us and User Inquiry Form Interface

After visiting the platform, users must sign in through the authentication page by entering their registered email address and password, with additional options such as “Remember Me,” “Forgot Password,” and “Sign Up,” ensuring secure access to personalized features like property listings, saved searches, and user dashboards within the Intelligent Web-Based Real Estate Portal.

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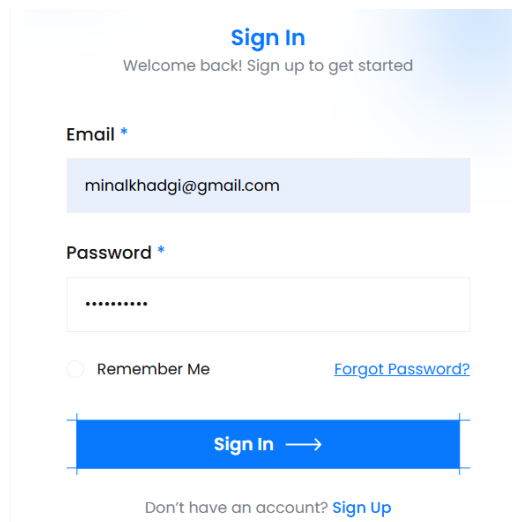


Fig 4 : Registered User Sign-In Portal

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