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# **Developing a Dynamic Real Estate Listings Portal with User-Friendly Design**

Home project in subject: Building Distributed Systems

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Masters in Information  
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## **Author's declaration of originality**

I hereby certify that I am the sole author of this thesis and this thesis has not been presented for examination or submitted for defence anywhere else. All used materials, references to the literature and work of others have been cited.

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## **List of tables**

Table 1. Comparison of User Data in Estonian Real Estate Portals 20.02.2024.....	9
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## List of figures

Figure 1. kv.ee initial filters .....	9
Figure 2. kv.ee advanced filters.....	10
Figure 3. city24.ee initial filters.....	10
Figure 4. city24.ee advanced filters .....	11
Figure 5. kinnisvara24.ee initial filters.....	11
Figure 6. kinnisvara24.ee advanced filters .....	12
Figure 7. Figma design of product landing page. ....	14
Figure 8. Figma design of product listings search page .....	14
Figure 9. Figma design of product add listing page .....	15
Figure 10. Project ERD .....	16

## Table of contents

1	Introduction .....	6
1.1	Background and Rationale .....	6
1.2	Problem Statement .....	6
1.3	Objectives of the Study .....	7
1.4	Scope and Limitations .....	7
1.5	Structure of the Thesis .....	7
2	Analysis .....	8
2.1	Modern Advancements of Real Estate Listing Portals .....	8
2.2	State of Active Real Estate Portals in Estonia .....	8
2.2.1	User Interface .....	9
3	Methodology .....	13
4	Development of the Real Estate Listings Portal .....	14
5	Summary .....	17
6	References .....	18

# **1 Introduction**

As technology advances rapidly, the real estate industry has experienced a major shift. Online real estate websites have significantly changed how buyers, sellers, and professionals find and deal with properties. These websites have created new opportunities for market analysis, data gathering and decision-making that have not been properly utilized. Ranging from user experience issues to technological limitations. This thesis aims to address these challenges by developing a sophisticated real estate listings portal, leveraging the latest technological advancements to enhance user interaction and market accessibility.

The primary objective of this thesis is to solve key problems present in current real estate portals. These problems include suboptimal user interface design and the lack of personalization in property recommendations. By addressing these concerns, the project seeks to significantly improve user-friendliness resulting in user-friendly design.

## **1.1 Background and Rationale**

In recent decades, the rapid advancement of technology has totally transformed numerous industries, with the real estate sector being no exception. The online real estate portals have revolutionized the way individuals and real estate brokers engage in the buying, selling and renting of properties. These platforms have streamlined property transactions and introduced new opportunities for market analysis and data utilization. Despite these advancements there remain challenges that have yet to be fully addressed. The purpose of this thesis is to explore these challenges and develop a real estate listings portal which enhances user interaction and accessibility compared to already existing real estate listing portals.

## **1.2 Problem Statement**

While online real estate portals have simplified the process of property transactions, they exhibit a pattern of suboptimal user interface designs and lack personalized property recommendation features. These limitations can lead to user frustration, inefficient property searches, and missed opportunities for both buyers and sellers. The goal of this

thesis is to identify and address these key problems and create a real estate portal with improved user-friendliness.

### **1.3 Objectives of the Study**

The primary objective of this study is to develop a dynamic and user-friendly real estate listings portal. This involves:

- Designing an intuitive and aesthetically pleasing user interface that simplifies navigation and property search.
- Implementing personalized recommendation features to enhance user experience and match users with suitable properties more effectively.

### **1.4 Scope and Limitations**

This study will focus on the design and development of a real estate listings portal. The scope includes user interface design and implementation of basic personalization features. The study will not include financial aspects of real estate transactions or any integration of legal frameworks.

### **1.5 Structure of the Thesis**

The thesis is structured as follows:

- **Chapter 2: Analysis** – This chapter will provide an analysis of existing online real estate portals.
- **Chapter 3: Methodology** – The tools used in the creation of the portal.
- **Chapter 4: Development of the Real Estate Listings Portal** – This chapter will cover the process of designing and developing the portal, including the implementation of user interface and personalization features.
- **Chapter 5: Summary** – This chapter will summarize the development and its findings. Acknowledge found limitations, and suggest areas for future research.

## 2 Analysis

This chapter provides a general overview and essential understanding of the current advancements in the real estate market, and how the advancements benefit real estate listing portals by creating better user experience. In addition, this chapter offers an analysis of currently active real estate portals in Estonia.

### 2.1 Modern Advancements of Real Estate Listing Portals

The real estate market in 2024 is undergoing significant transformations driven by technological advancements, shifting market dynamics, and evolving consumer behaviors. Key trends include:

- **PropTech Sector Development:** Primarily focused on profitability of online rental screening software to improve rent payment reporting and to prevent possible fraudulent activities by tenants. The screening software are offered by real estate listing portals like realtor.com. [1] [2]
- **Sustainability and Eco-Friendly Listings:** With a growing focus on building energy-efficient building, the demand for low energy cost homes as increased. [3]
- **VR and AR for Property Viewing:** Virtual Reality (VR) and Augmented Reality (AR) are transforming property viewing experiences. These technologies allow users to take virtual tours of properties, offering a more immersive and detailed perspective than traditional photos or videos. [4]

### 2.2 State of Active Real Estate Portals in Estonia

This chapter will cover three different Estonian real estate portals.

- **kv.ee**
- **city24.ee**
- **kinnisvara24.ee**

Two of these portals, **kv.ee** and **city24.ee** use a REDE (Real Estate Data Exchange) standard which hasn't been updated since the year 2007. It also includes a variety of outdated, set in stone examples and guidelines. [5]

Table 1. Comparison of User Data in Estonian Real Estate Portals 20.02.2024

	Price/Month (€) Cheapest Sale Listing	Active Listings (Rent)	Active Listings (Sale)	Visitors/Day
<b>kv.ee</b>	37.99€ [6]	6129 [6]	16 433 [6]	104 951 [6]
<b>city24.ee</b>	33.9€ [7]	6040 [8]	13 560 [8]	~ 25 000 [9]
<b>kinnisvara24.ee</b>	12.5€ [10]	4713 [11]	11 998 [11]	~ 27 000 [12]

The number of visitors actively updating can only be found in **kv.ee**. For **kinnisvara24.ee** an estimated number can be found in a blog post and for **city24.ee** the estimated number is mentioned on their contacts page.

From the three previously mentioned options (see 2.1 Modern Advancements of Real Estate Listing Portals, **page** 6) only Sustainability and Eco-Friendly Listings are accounted for in Estonian Real Estate Listing Portals. This mainly comes from Estonian Business and Innovation Agency offering a housing loan guarantee with 10% of the estates price as self-financing for energy efficient homes while for others, banks require at least 15% self-financing. [13]

### 2.2.1 User Interface

All three real estate portals offer initially visible filters and their own version of advanced filters. Well compare how many filters each portal offers for Property Type: flat. First, we have **kv.ee** with 11 easily accessible filters at the top of the page.

The screenshot shows the initial filters on the kv.ee portal. The filters are organized into several sections: a top navigation bar with icons for Flats, Houses, Sharehouses, New development, Plots, Premises, and More...; a main filter section with dropdowns for Sale and Tartumaa, checkboxes for 'Only private users' and 'Possibility to change', a list of locations (Annikoru, Kapsta, Karijärve, Kobilu, Konguta), and input fields for Rooms (from - until) and Price (from - until); and a search bar at the bottom with the text 'Keyword (sauna, Kadriorg..), object ID search'. The search bar also includes a 'FIND FROM MAP' button and an 'ADVANCED SEARCH' dropdown.

Figure 1. kv.ee initial filters

After clicking on advanced filters, a sub section opens offering another 11 filters.

The image shows the 'kv.ee' website's advanced filters section. At the top, there's a navigation bar with icons for Flats, Houses, Sharehouses, New development, Plots, Premises, and More... Below this, the filters are organized into several sections: 'Sale' (with checkboxes for 'Only private users' and 'Possibility to change'), 'Location' (a dropdown for 'Tartumaa' and a checkbox for '- Konguta vald'), 'Rooms' (from/until), 'Price' (from/until), and 'MY SEARCHES' (a note about saving searches). The main filter area includes: 'AREA' (minimum/maximum total area), 'FLOOR (MIN - MAX)' (minimum/maximum floor), 'BUILDING MATERIAL' (checkboxes for stone, wooden, panel, and log houses), 'CONDITION' (checkboxes for Development, all brand-new, Good condition, renovated, sanitary renovation done, and satisfactory), 'ENERGY CERTIFICATE' (a row of buttons A through H), 'Balcony', 'Parking', 'Sauna', and 'Box-room'. At the bottom, there's a 'BUILT YEAR' (min/max) and a search bar with a 'SEARCH' button. The interface is in English, as indicated by the 'ENG' dropdown in the top right.

Figure 2. kv.ee advanced filters

Like **kv.ee** filters at the top of the page are also offered by **city24.ee**. This portal offers 14 initially visible filters which is the most of all three portals. But in return 11 of the filters are hidden behind another click to open a dropdown before any values can be set.

The image shows the 'city24.ee' website's initial filters section. At the top, there's a navigation bar with links for New projects, Agent finder, News, Home loan, Favourites, My searches, ENG, Sign in or register, and Place ad. Below this, the filters are organized into a grid of property types: New project (179), Apartment (7051), House (2132), House share (560), Cottage (253), Land (2312), Commercial (894), Garage (148), and Modular house (122). Below the grid, there's a 'Sale' and 'Rent' toggle, an 'Area select' dropdown, and a search bar. The main filter area includes: 'Price', 'Size', 'Rooms', 'Floor', 'Year built', 'Energy class', 'Condition', 'Extras', 'House material', and 'Date added'. At the bottom, there's a '+ Other filters...' button and a 'CLEAR' button. The interface is in English, as indicated by the 'ENG' dropdown in the top right.

Figure 3. city24.ee initial filters

This is also the case for advanced filters (“Other filters” on **city24.ee**). This exposes another 5 filters inside a dropdown.

+ Other filters...
CLEAR

### Other filters

From owner  
Only private user ads
☐

Virtual tour  
Interactive 360° view of the object
☐

Open house  
Closest open house days
☐

Special offers  
Listings in Special Offer Section
☐

Rent to own  
Rent to own listings
☐

Figure 4. city24.ee advanced filters

**kinnisvara24.ee** offers filters on the left side of their webpage. With 10 initial filters and 19 filters hidden behind advanced filters (“Detailed search” on **kinnisvara24.ee**).

7865

Apart...

2296

House

522

Hous...

191

Cott...

168

New ...

2293

Land

3418

Com...

196

Gara...

Sell

Rent out

Short re...

County

City

District

Enter keyword

Rooms

min

-

max

Pindala

min

-

max

Price

min

-

max

Unit

€

€/m²

Detailed search →

Search (7863)

Clear

Figure 5. kinnisvara24.ee initial filters

Clicking on “Detailed search” opens a modal in the middle of the page with another 19 filters.

Detailed search

From owner

Videos

Borders with water

Open day

360 tour

New developments

Permit to live

Top floor

Floor

min

-

max

Construction year

min

-

max

Land area

min

-

max

Comforts

Extras

Materials

Energy class

Water

Heating source

Sewage

Property condition

Figure 6. kinnisvara24.ee advanced filters

### **3 Methodology**

.NET 8, C#, Javascript, Figma

## 4 Development of the Real Estate Listings Portal

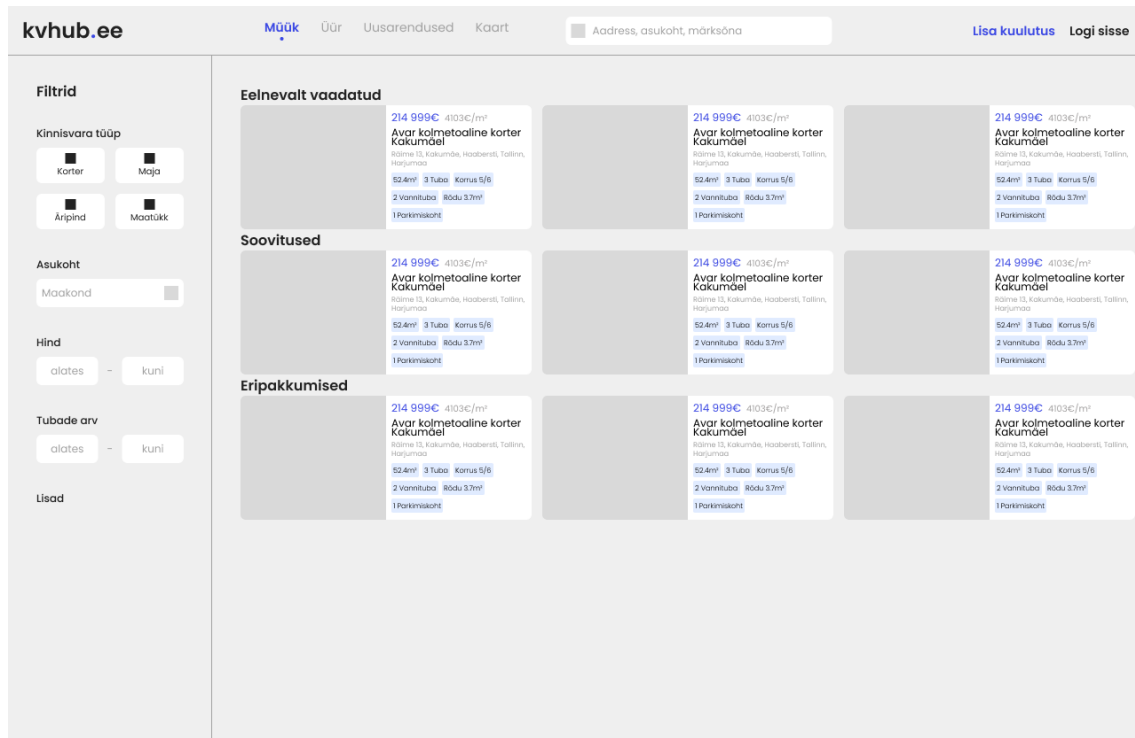


Figure 7. Figma design of product landing page.

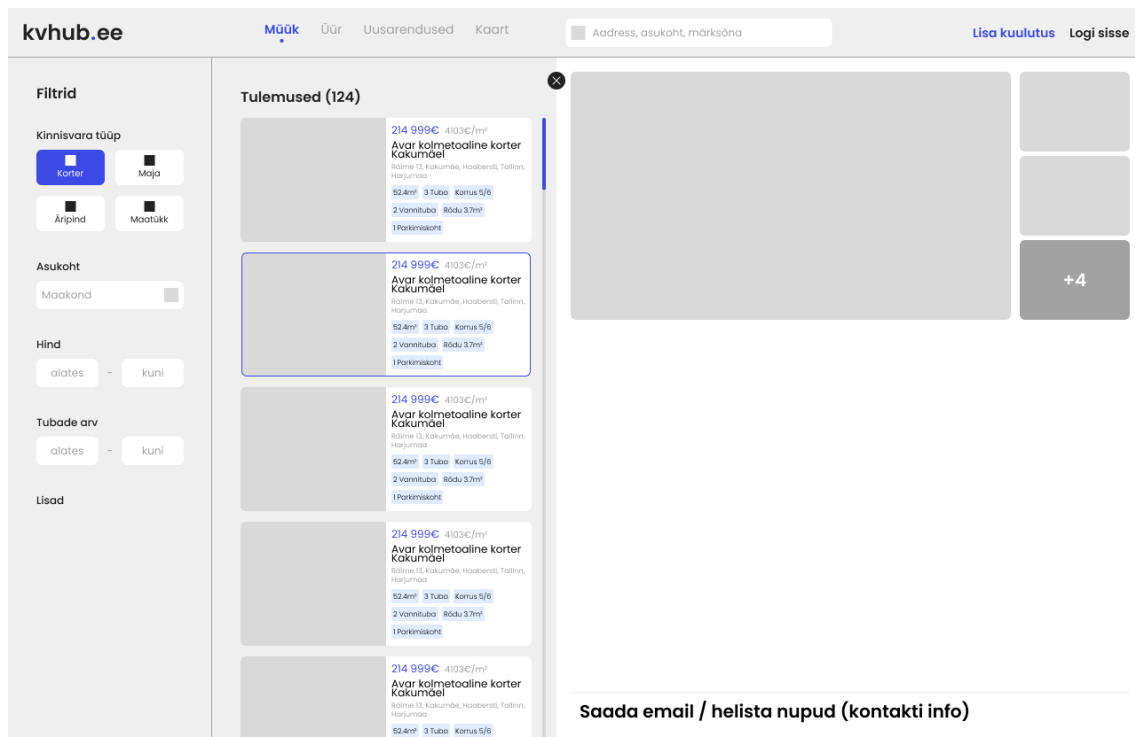


Figure 8. Figma design of product listings search page

Müük

Üür

Uusarendused

Kaart

Address, asukoht, märksõna

Lisa kuulutus

Logi sisse

Lisa uus kuulutus

Kinnisvara tüüp

Korteri

Maja

Äripind

Maatükk

Address

Maakond

Hind

0

Ülejäänud kuulutuse väljad

Eelvaade

+4

Saada email / helista nupud (kontakti info)

Figure 9. Figma design of product add listing page

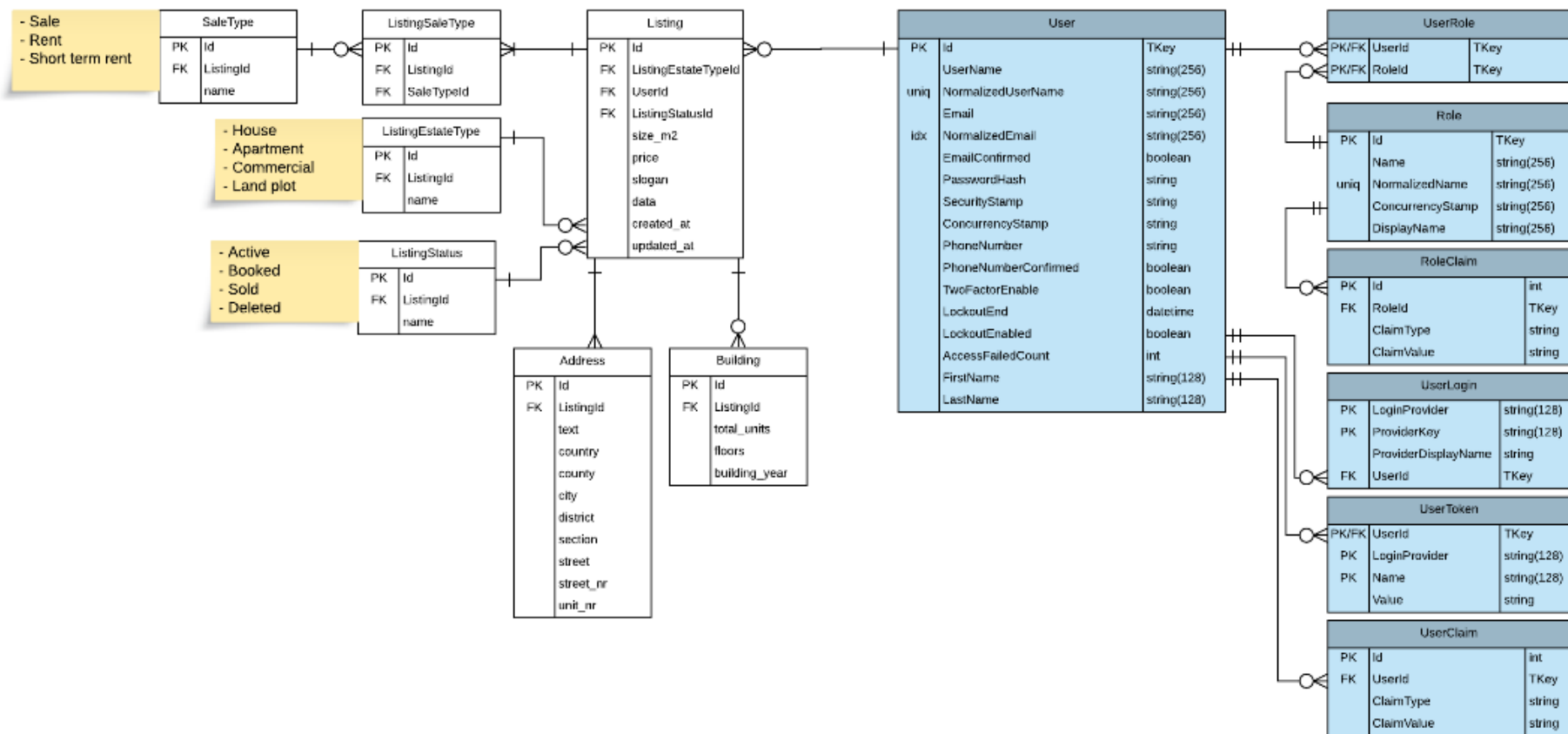


Figure 10. Project ERD

## 5 Summary

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