**Automated Valuation Model for Saudi Arabian Real Estates**

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# Introduction

## 1.1 Purpose

This Software Requirements Specification (SRS) document outlines the requirements, components, workflow, and methodology for an Automated Valuation Model (AVM) designed to provide accurate property valuations in Saudi Arabia, with a focus on undiscovered neighborhoods.

## 1.2 Scope

The scope of this SRS includes the identification of requirements and components for the development and implementation of the AVM, ensuring the involvement of a subject matter expert and addressing the unique needs of the Saudi Arabian real estate market.

# Overall Description

## 2.1 System Perspective

The AVM will be a **standalone** software application (API) or an **integrated module** within an existing real estate platform, providing users with instant property valuations based on key components and market data.

## 2.2 User Characteristics

The primary users of the AVM will include real estate professionals, property buyers, sellers, investors, and financial institutions (banks).

# Specific Requirements

## 3.1 Needs

3.1.1 Subject Matter Expert (SME) in the Field

* The AVM development process should involve an SME with extensive knowledge of the Saudi Arabian real estate market.
* The SME will collaborate with the development team to ensure the AVM addresses local market nuances and specificities.
* SME should provide the rules and numbers to adjust the price

3.1.2 Average Prices in Undiscovered Saudi Arabian Neighborhoods

The AVM should be able to calculate average prices for undiscovered neighborhoods using alternative data sources and advanced data processing techniques.

To reach the full coverage, the following should be done:

1. Subdivide the neighbors into N divisions
2. Count transactions
3. Empty divisions should be assigned a base price (BP)

## 

## 3.2 Components

3.1.3 Data cleansing and analysis

1. Building vs Land in recent transactions
2. Discarded outliers in recent transactions
3. Auto prepare and adjust AQAR data (weekly)

3.2.1 RS Score (*Walaa*)

* The AVM should incorporate the RS score as a significant feature in estimating property values.
* The system should calculate the RS score based on the proximity to essential amenities such as grocery stores, schools, and restaurants.
* The score should take into consideration all factorns that affect the prices of real estates
* The score formula is as the following:

, where w is the weight of the category and c is the count of services within a certain radius

3.2.2 Line Distance between Real Estate and Main Streets in Cities (LD)

* The AVM should calculate line distances between a property and main streets in cities using geospatial data.
* The system should consider these line distances as an important component in the valuation process.

3.2.3 Prices of Similar Real Estates and Their Distance

The AVM should perform a comparative analysis, considering the prices of similar properties and their distances from the target property.

The system should use property area size, historical prices, lines and roads to identify comparable properties.

**60%** AQAR **40%** MOJ

3.2.4 Recency of Similar Transactions

* The AVM should take into account the recency of similar transactions to ensure that property valuations are aligned with prevailing market dynamics.
* The system should prioritize recent transactions in the valuation process. The system will start with **6 months** recency and will take **1 year** maximum.

# Workflow and Methodology

4.1 Data Preprocessing

The AVM will preprocess the collected data, including cleaning, normalization, and feature extraction.

4.2 Workflow implementation

* The AVM will not employ machine learning algorithms and techniques, rather it is going to rely on statistics and mathematics.
* The testing will be done using a sample of historical data in MOJ and AQAR

4.3 Model Deployment

The AVM will be deployed as a standalone application (API)

4.4 Mathematical Equation

4.4.1 Workflow

Diagram

Description automatically generated

4.4.2 Mathematical Equation

# Testing Methodology

Testing should be continues, with each change either using a lookup of data (for auto testing) or by an expert