InmoDecision

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CCBDA Final Project

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Introduction

InmoDecision is a cloud web application designed to assist in real estate investment decisions. It integrates open housing market data with real-time social media sentiment analysis to provide a comprehensive view of property opportunities, considering both prices, location, and public opinion.

AWS Infrastructure

The project leverages various AWS services, including ECR for Docker image storage, ECS and Fargate for container execution, S3 for data storage, IAM for security, CloudWatch for logging, and CloudFormation for infrastructure provisioning.

Scalable Hosting with ECS & Fargate

The application utilizes Amazon Elastic Container Service (ECS) as its container orchestration platform, with AWS Fargate enabling serverless execution of containers without managing underlying EC2 instances.

Centralized Data Storage in S3

Amazon S3 serves as the central object storage solution for both ingested data and processed outputs, with multiple buckets organized for structured, semi-structured, and unstructured data, including real-time sentiment analysis results.

Streamlit Frontend on Elastic Beanstalk

The Streamlit frontend application is containerized using Docker and deployed on AWS Elastic Beanstalk, which simplifies the deployment process and decouples the web interface from backend processing services.

Streamlit Application: Inmodecision

Property Listings Explorer

An interactive map of Barcelona lets users explore property listings with custom filters and view key statistics like price distributions and top neighborhoods by listings.

Real State Investment Plan

Projects future cash flows based on user-inputted financial data to help assess the profitability and viability of a property investment.

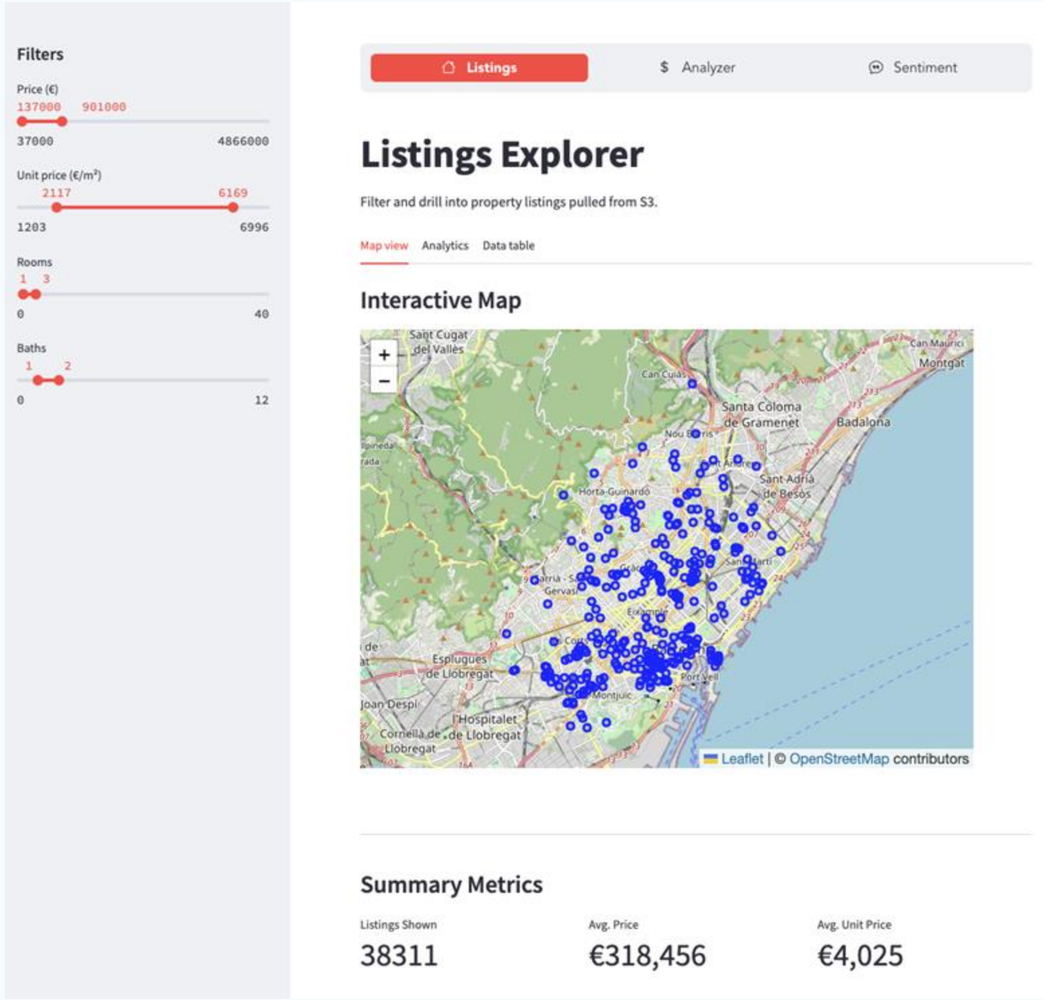
Price Predictor

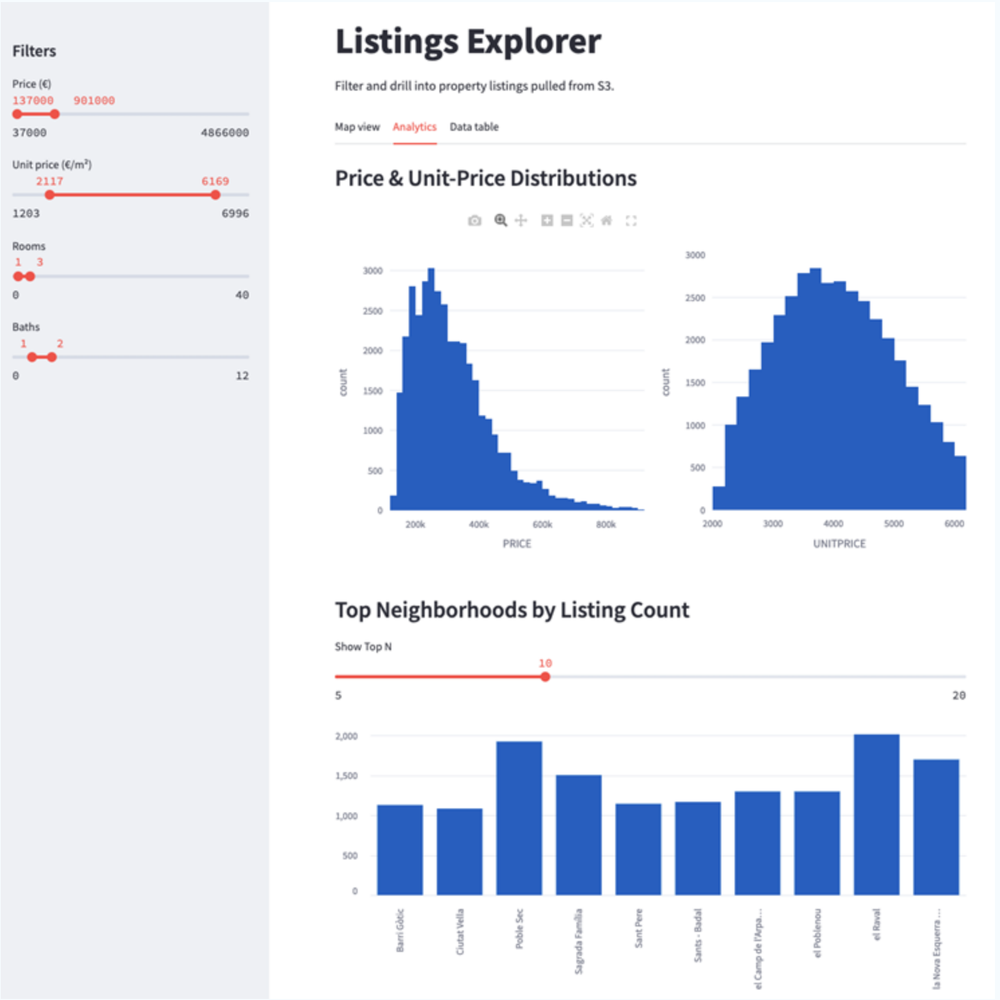
Makes use of a machine learning model trained on listing data to predict property prices and indicate whether a listing is over or underpriced compared to the market.

Sentiment Analysis

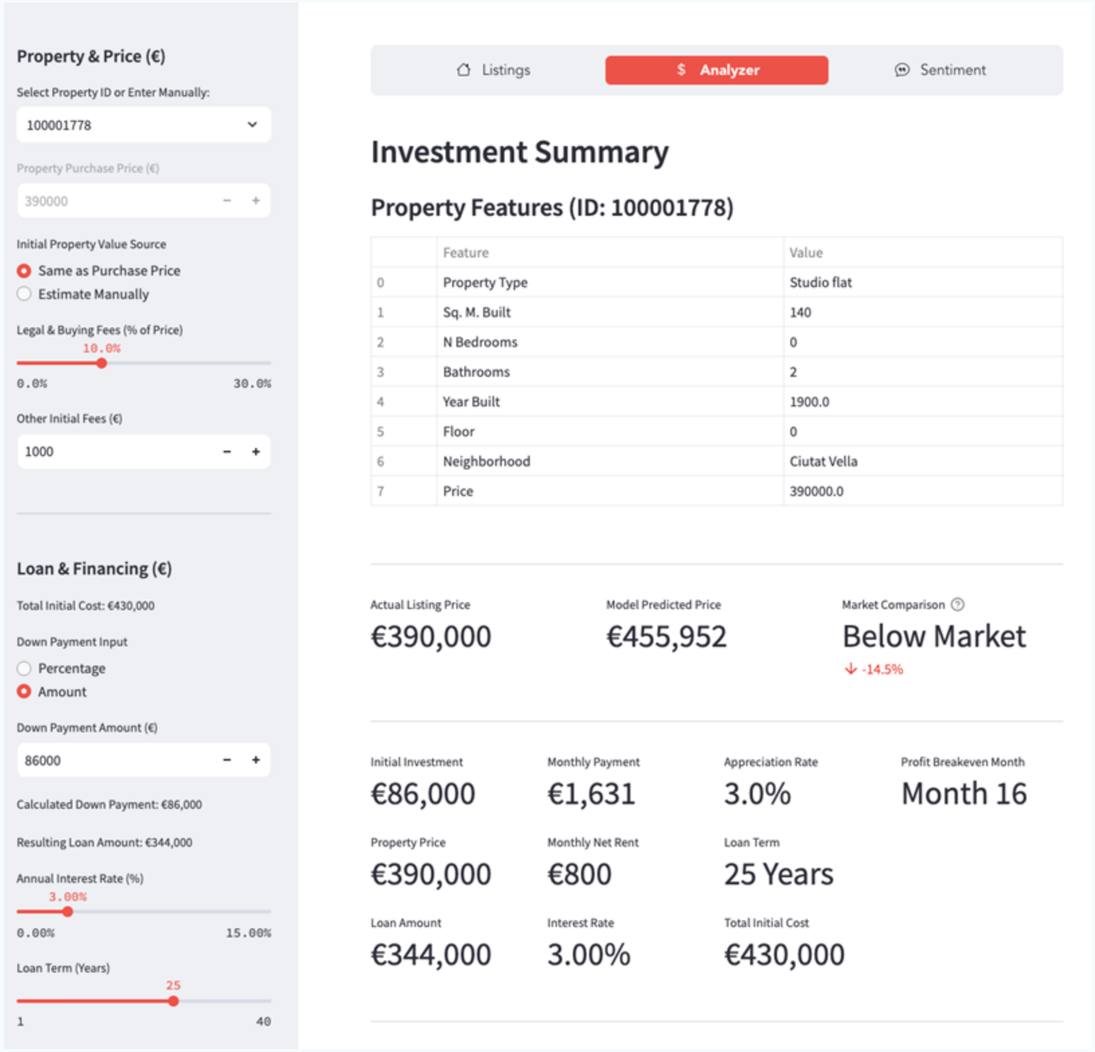
Processes social media posts in real time, analyzing sentiment using natural language processing to provide insights into public opinion on property-related topics.

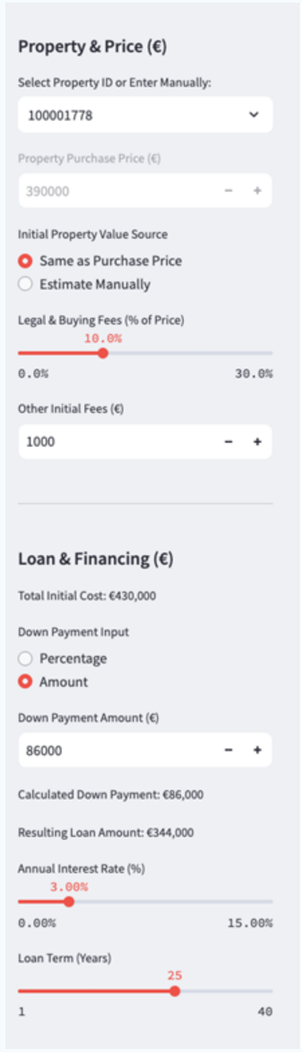
InmoDecision - Listing

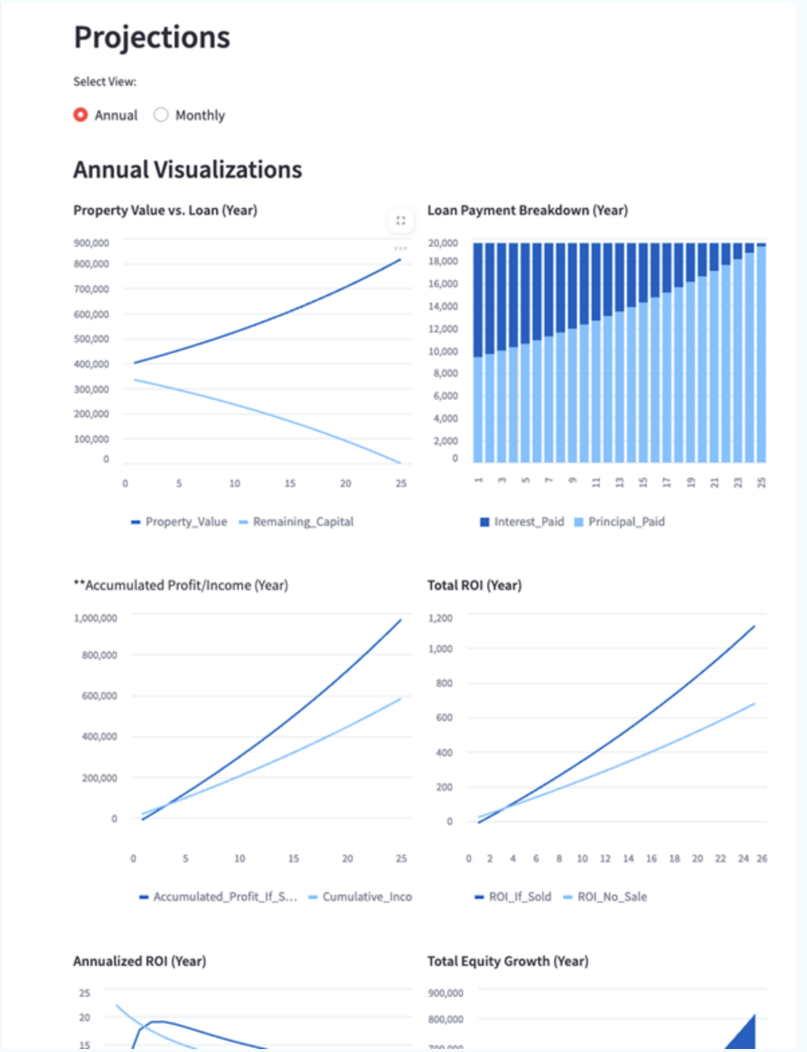




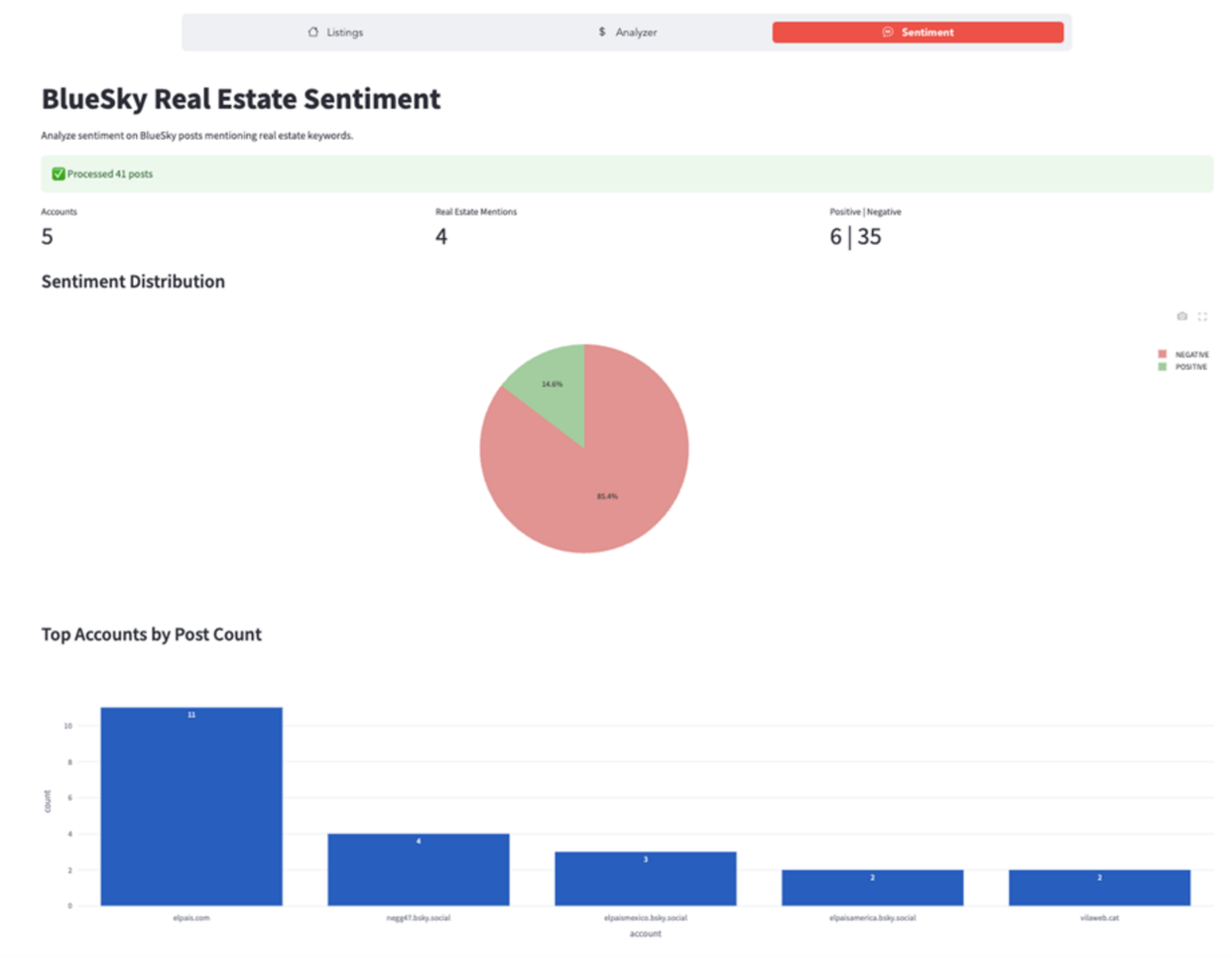
InmoDecision - Investment



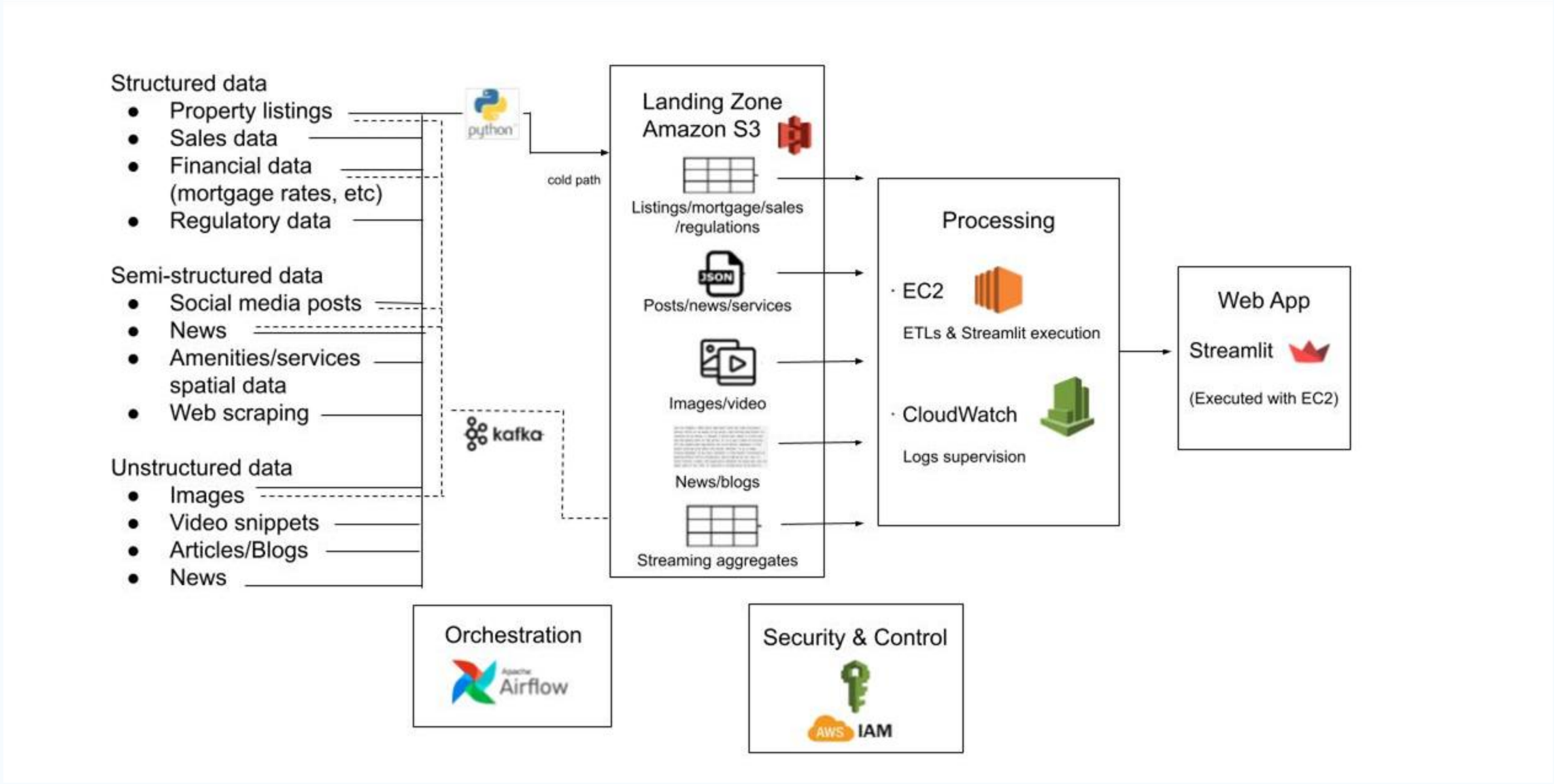




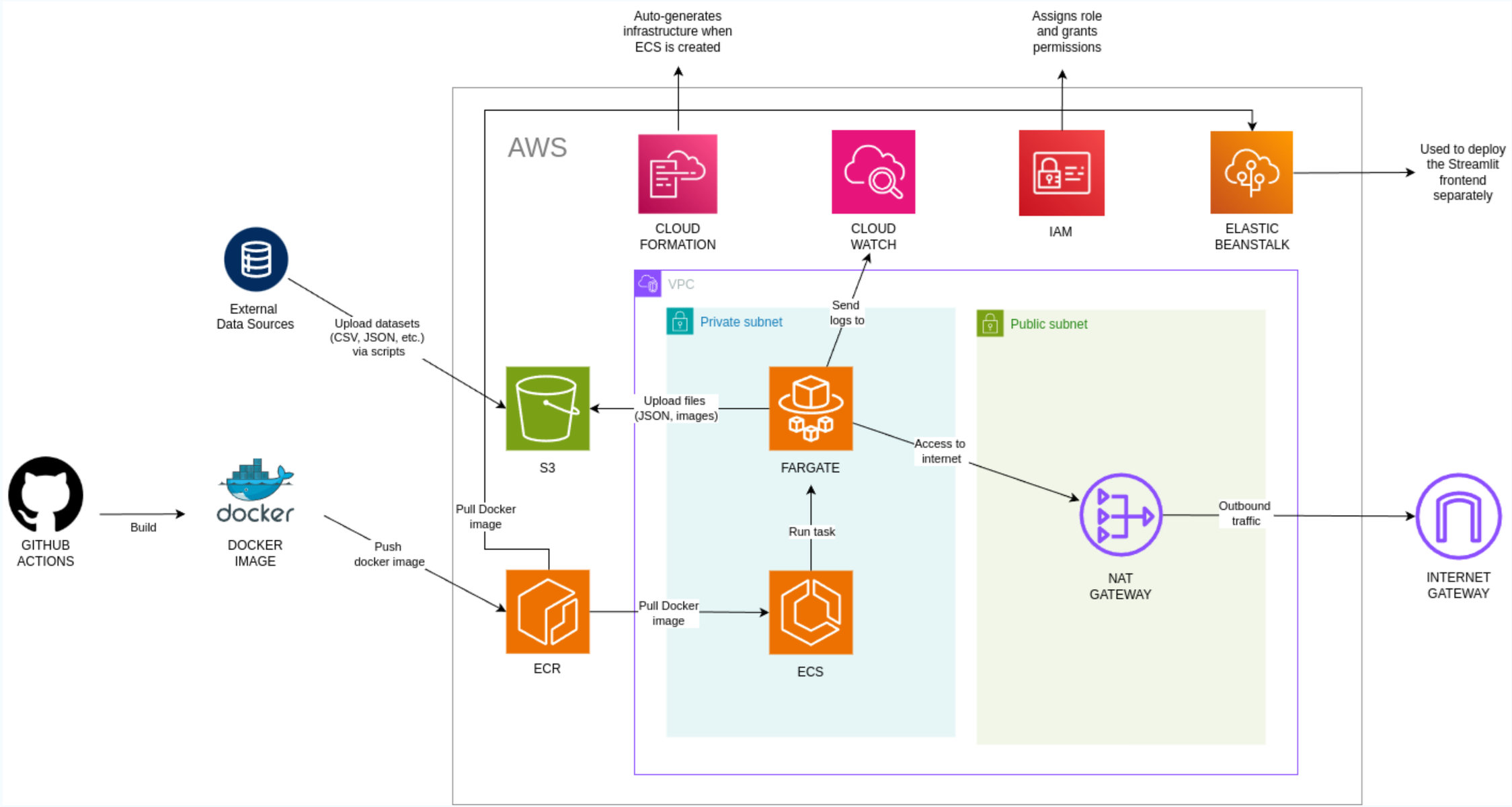
InmoDecision - Sentiment Analysis



Scope changes: Initial architecture diagram



AWS System Architecture



Data Sources

Idealista

For live property listings, pricing, and region-level property attributes.

idealista

Government Open Data

Spain's Instituto Nacional de Estadística (INE), Open Data Barcelona and the European Central Bank Data Portal for property price indexes, demographics, and economic indicators

Open Data BCN

INE Instituto Nacional de Estadística

EUROPEAN CENTRAL BANK

Streaming Bluesky Posts

To monitor real-time conversations related to real estate.

Bluesky

Programming Languages, Frameworks, Libraries and Additional Tools

GitHub and GitHub Actions

Docker and Docker Compose for service orchestration

Python for all components (ETL, API, and dashboard)

Kafka-Python for Data ingestion

Airflow for orchestration

Streamlit for the front-end

Takeaways

InmoDecision

Deploying with managed cloud services (as Fargate and Elastic Beanstalk) simplifies **maintenance** and improves **scalability**.

Integrating **open data** with **real-time analysis** enables decision-making, which is highly valued in companies.

Knowledge of **cloud computing** and **AWS services** enables the development of market-ready products that deliver value at low economic cost, without server maintenance and with virtually unlimited scalability.

Social media **sentiment analysis** provides valuable context to complement structured economic and property data.

Hands-on experience with **IAM, VPC, NAT Gateways,** and **CloudWatch** offered real-world cloud computing challenges.

Applying **Twelve-Factor methodology** ensures portability, traceability, and scalability

http://inmodecision-prod.eba-e2pznz2d.eu-west-1.elasticbeanstalk.com/

Thanks!