Rationalizing Real Estate Investment Decisions Using

DATA SCIENCE

Using Analytics for multi parameter investment worthiness of properties and neighborhoods

CASE STUDY

homeunion

Online Marketplace For Real Estate Investing

background

Client : HomeUnion

Headquarters : Irvine, California

▼ HomeUnion is a leading online marketplace for real estate investing, with fully managed properties sourced through due diligence and data analysis. It also provides post-purchase market intelligence, portfolio analysis and management oversight for investors

▼ HomeUnion simplifies real estate investing by removing the guess work out of investing. Using data science techniques, the company aims to empower investors to choose portfolios and acquire assets tailored to their investment goals

challenges

To improve investment decision making, HomeUnion wanted to build data driven tools that helped investors assess investment options. The key challenges in doing this were:

◤ **Handling an extremely large volume of data**
HomeUnion had a very large volume of data. Additionally, updated feeds needed reprocessing and made data processing complex

◤ **High variability in data sources and availability**
For statistical modeling, HomeUnion needed data on multiple factors like crime rate, employment, income, schools, rental trends, etc. This data came from multiple sources and varied in its frequency, creating the need for a Big Data Pipeline ProcessingFactory

◤ **Statistical analysis of data**
Each factor identified for quantifying investment decisions, depended on a number of attributes. Building algorithms to rate these attributes and creating statistical models for arriving at the relevant predictive indices was a need

"Subjective opinions have long guided real estate investment decisions, making portfolio investments risky. We enable our investors with data driven decision making and model driven recommendations on investments"

*Narayanan Srinivasan
CTO, HomeUnion*

talentica
SPREAD YOUR WINGS

"

Data Science will be the backbone of most futuristic solutions. Our solution for HomeUnion takes a data driven approach to a domain which has always relied on subjective judgment. We are thrilled at the possibilities this could have.

Manjusha Madabushi
CTO, Talentica

solution

Talentica put in place a Data Science based solution that could collect, process, model and analyze data to generate accurate insights. These insights would enablepredictive tools that helped investors in making better portfolio investment decisions.

A team of data scientists worked along with our product development team in order to work on this solution.
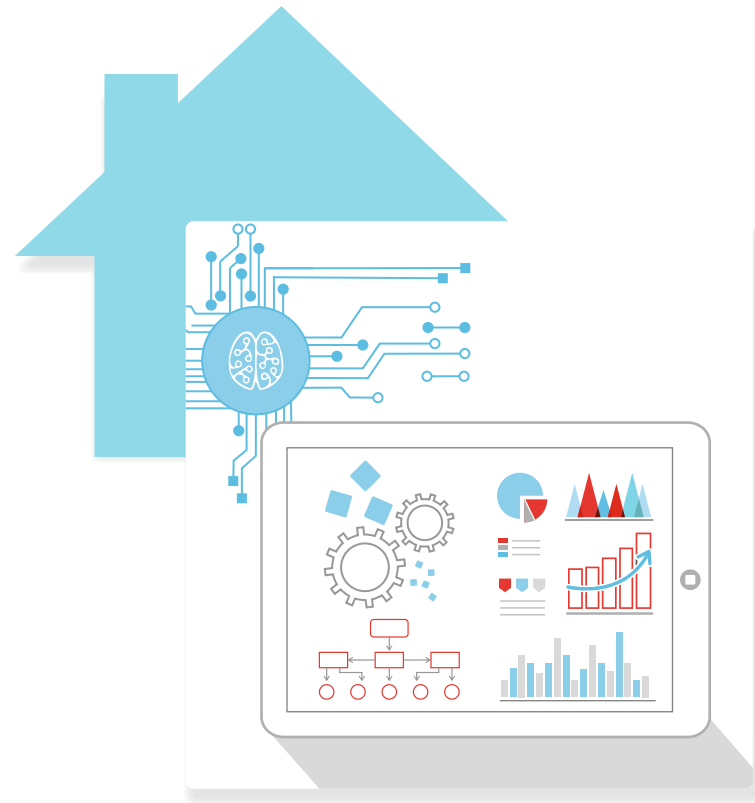
RAW DATA COLLECTION AND PROCESSING

◤ Since data for all the identified features was not available from a single source, we developed an automated data ingestion ecosystem to receive data from multiple public/private and free/paid sources

◤ APIs were configured to collect feature data, based on the frequency of its publishing/updation. This data was stored on our Big Data environment

◤ To process such a large volume of data we put in place a Big Data based solution using Map/Reduce, Hadoop, R and Python systems to crunch very large volumes of data growing on a daily basis.
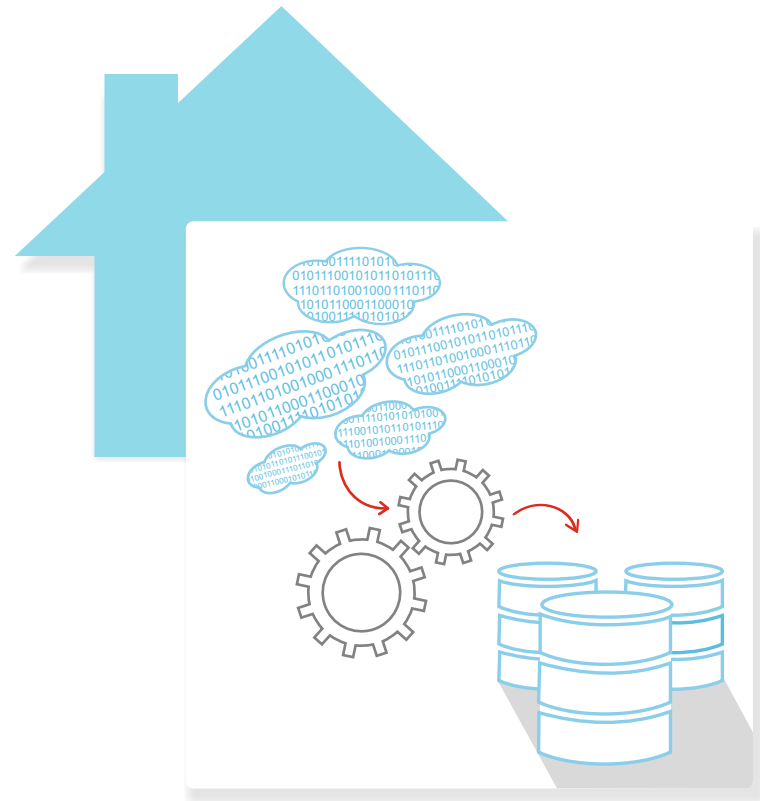
EXPLORATORY ANALYSIS AND FEATURE ENGINEERING

◣ Using the cleaned and prepared data derived from data processing, our data scientists worked on readying the data for use by the algorithms that were to be built

◣ The team brainstormed to come up with

* Factors that drive real estate investment decisions
* Features essential to the statistical model

◣ Exploratory analysis and feature engineering techniques were used to reduce the number of features to only the most integral ones, that would produce the most accurate and relevant insights when modeled

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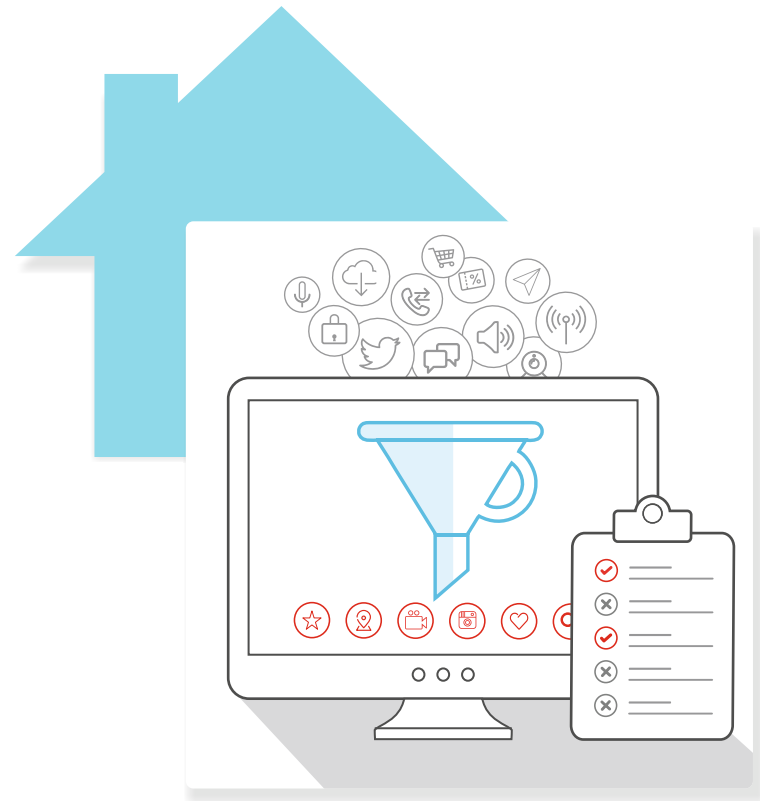
BUILDING MACHINE LEARNING ALGORITHMS AND STATISTICAL MODELS

▼ Taking the parameters selected from the feature engineering step, we used open source tools/programming languages R, Python and Hadoop, to build machine learning algorithms

▼ Various regression and machine learning techniques were used to build models for:

* Neighborhood Investment Rating: Rating every US neighborhood for its investment potential
* REALestimate: Forecasting the return on investment on every property
* Predicting the right offer for anchoring an optimal winning bid
* Time-series based Price trends on various US geographies
* Predicting the likely rent for every property in the US
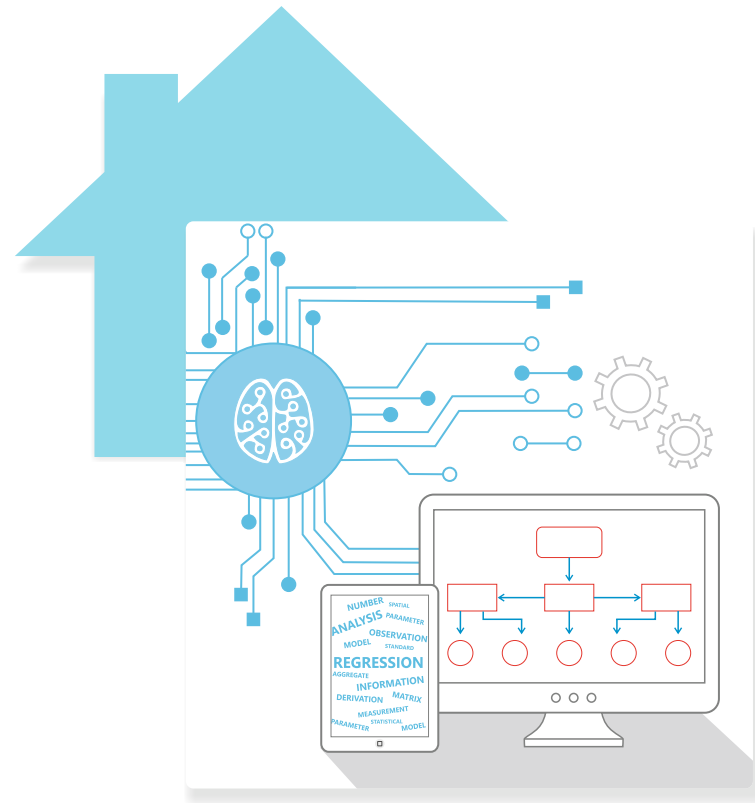
DATA DRIVEN INSIGHTS AND ANALYSIS

▼ The machine learning algorithms and statistical models were run using an automated flow built on the Big Data environement

▼ The relevant feature data was then modeled to generate trends/forecasts for investment risk, sale price range, rent prediction and price appreciation, etc. at multiple geographic levels

technology

▸ Technology stack: Single page app with Java Spring stack for the server

▸ Databases: MySQL, Vertica, Redis

▸ Mobile: iPhone, Android, Phonegap, Cordova plugins

▸ Reporting: Jasper Reports, D3.js

▸ Data Science: R, Python, Hadoop, Elastic Search, PIG.

▸ Build and CI: Maven and Jenkins

results

FEATURE RICH PRODUCT

▼ Partnering with Talentica, HomeUnion was able to launch an end to end solution for real estate investment portfolio management

▼ From Acquisition to property management for buyers, market intelligence for buy/ hold / sell decisions, and investment plans tailored to achieve investor goals, HomeUnion does it all

EASIER INVESTMENT DECISIONS ENABLED MORE DEALS

▼ Backed by data driven insights and accurate assessment of investment worthiness, portfolio investment decisions became easier

▼ This enabled HomeUnion to close more deals each month than before

ENABLING MULTIPLE REVENUE STREAMS
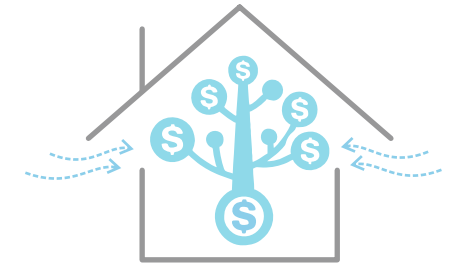
▼ With Talentica as a partner, HomeUnion was able to launch a multifaceted product as per their business plan, with revenue streams such as; property price predictions, property yield, sale price range and rent estimates

contact us

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