



Real Estate Predictions 2022

How AI can enhance urban planning,
asset management and investments

Advanced analytics for the cities of the future



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Customized AI tools can support a review of large files for Real Estate research, quality checking data and providing insights into the driving factors behind trends. Scenario simulation and an evaluation of their impact can be used to enhance key decisions on investing, budgeting and planning. In this article, which includes a case study, we discuss how to harness the exponential power of AI for urban planning, asset management and investment decision-making for the cities of the future.

Understanding current and future supply-demand dynamics

Urban planning, asset management and investment decision-making are key factors for the cities of the future. They require a clear understanding of the current and future supply-demand dynamics and underlying macro-economic factors. Currently, this is a challenge. The Real Estate market data that is required for city and master plans, including supply, transactions, price and rent information, typically comes in disparate source formats. Also, the correlation of economic metrics, such as Gross Domestic Product (GDP), oil price, and construction financing, is often not clearly articulated. This complicates the study of their true impact on Real Estate demand.

This is where machine learning and AI tools come in. Existing historical data can readily be incorporated into such a tool or algorithm in a structured and standardized way. Next, relevant information can be reproduced by means of a consistent standard Extract, Transform and Load (ETL) Process.

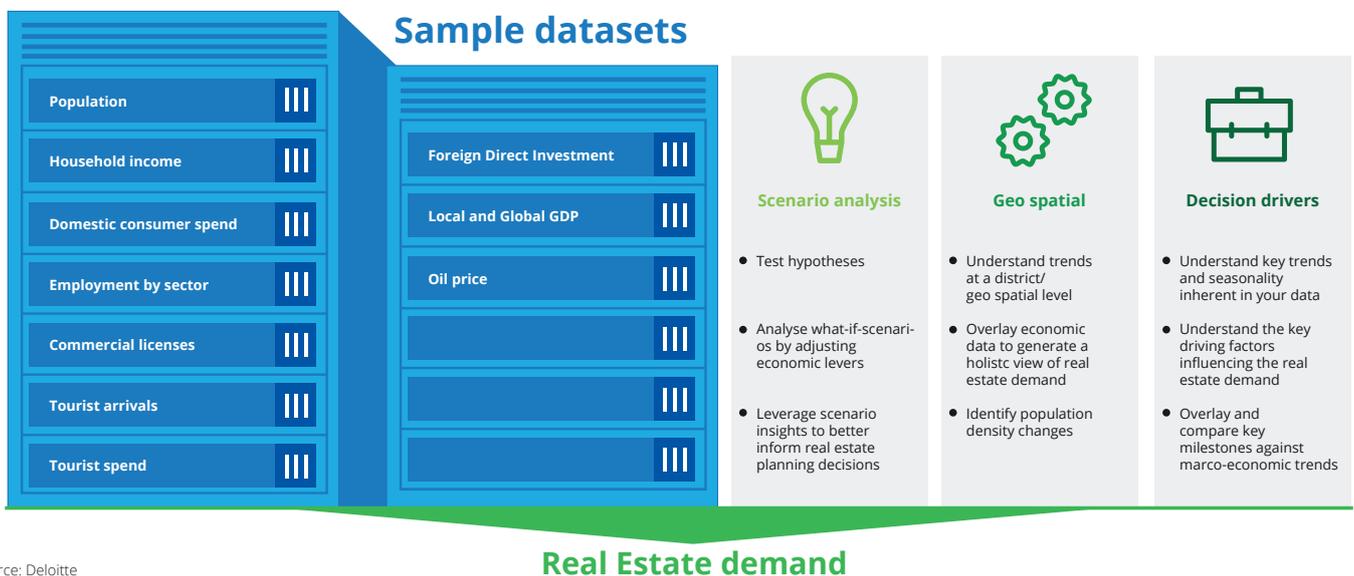
Scenario analysis based on enriched data sets is helpful as well, as it can show the impact of future trends. These data sets incorporate asset-level information, macro-economic data and public opinion. This analysis can be augmented by linking, where possible, future Building Information Modelling (BIM) and smart city data. Ultimately this will enable asset managers to interact with these customized and

highly interactive analytics, made available in easily digested formats. Wherever and whenever. The solution can assist property owners and asset management companies, in addition to providing planning departments and developers with the information needed to support demand-driven decision-making.

Defining the data framework

The starting point for building a customized forecasting tool is the review of a range of variables and interlinkages driving Real Estate demand. In order to define the framework for the forecasting analysis, historic data can be assessed to find a potential correlation of factors.

Figure 1: Real Estate data framework



The above framework can be delineated further into sector level demand drivers, including:

- **Residential:** Scenarios
 - Net additional demand for residential units can be overlaid with information on household income, pricing/rents and occupancy by district.
 - Transaction data for residential units, which reflects investor and occupier demand, can be factored into the analysis to derive a demand-supply gap analysis for the sector.
- **Retail:** An assessment of consumer spend, retail asset transactions, occupancy by district and Gross Leasable Area (GLA) per capita to review supply gap, if any.
- **Hospitality:** Tourism indicators and information on multiple occupancy factors and the average length of stay to estimate the total demand in the number of room nights.
- **Offices:** Information on employment by sector and the GDP growth forecasts to estimate demand for offices, i.e. GLA.

- **Industrial:** Assessment of industrial sector employment, trade and e-commerce activity.

Customized tools can support a review of large files for Real Estate research, quality checking data and providing insights into the driving factors behind trends. Scenario simulation and an evaluation of their impact will then enhance key decisions on investing, budgeting and planning.

Case study: The use of Deloitte’s Intuition accelerator to build a forecasting tool for a city planning department in the GCC

Deloitte has developed an integrated decision-making framework for a city planning department in the Gulf Cooperation Council (GCC). The tool was created to study the historic trends within the residential, retail, office, hospitality and industrial sectors, along with relevant macro-economic indicators to provide forecasting for key metrics using Deloitte’s time series accelerator, *Intuition*.

Intuition is a bespoke forecasting engine that automates the process of identifying unique and complex trends within a data set by passing the data through different

algorithms, to pair the most predictive algorithm with the provided data. The final solution also enabled a sophisticated scenario modeling component where the users can plan for certain cases, identify potential key drivers and ultimately ensure that better planning takes place for large or small scale events in the future.

A fully customizable consumption layer was built as a web-based and mobile-friendly interface for key stakeholders in the Real Estate development lifecycle to access the outputs and forecasts. This included macro-economic and sector-specific forecasts, the ability to run scenarios for changes in low, medium and high impact drivers, and to use the tool to gain a full view of the Real Estate landscape. The solution also enables key stakeholders to interact with the tool in different ways through an easy-to-use interface, further driving adoption in the business.

Forecasting is split into two different stages. The training step facilitates the creation of the models while the second step is the deployment of the models into the solution.

Figure 2: Forecasting overview



The training step takes the raw data and transforms it into training data for the machine learning model. These models are validated for accuracy and are then incorporated into the solution to make forecasts.

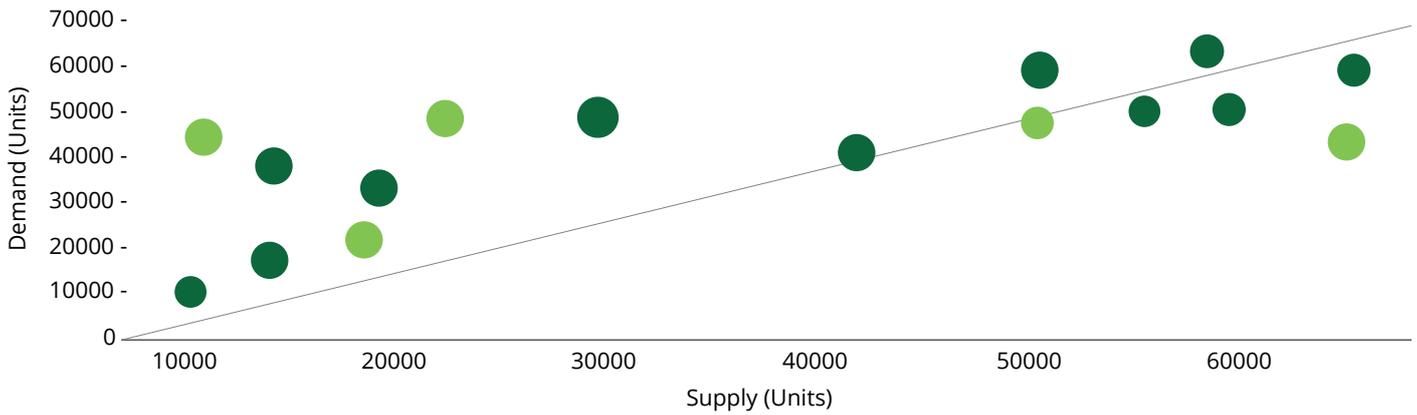
Models deployed within the solution run quarterly, using data from the uploaded data template. The **data template** is the fully categorized information for each Real Estate sector that supplies both the forecasting model and the performance indicators dashboard.

Once the data is uploaded, it is transformed for ingestion into the model, checked for stability and baseline forecasts are produced and stored. The baseline forecasts are validated and, along with the model, used for the scenario analysis.

Figure 3: Scenario analysis extract

Residential Sector-Scenario Impact Comparison

A comparison of scenarios in the residential sector indicating whether the demand has been met or if there is an undersupply or oversupply of units



Source: Deloitte

Harnessing the power of AI

As the above case study demonstrates, to thrive in a disruptive economy, key decision makers can harness the exponential power of AI to drive real, tangible outcomes. This will help them to greatly improve the urban planning, asset management and investment decision-making that is needed for the cities of the future.

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