ARCHITECTURE DESIGN OF SYSTEM
The web GIS application, HoLSAT, is designed to be a compact and highly efficient tool that is simple and powerful. The application adopts a well-established paradigm of three-tier architecture, commonly used in business information systems, which consists of three well-defined tiers: a presentation tier (Tier 1); a business logic tier (Tier 2); and a database tier (Tier 3).

ALGORITHM DESIGN OF LOCATION EVALUATION
To identify the suitability of potential location, HoLSAT predicts the indicator of business success of each location site based on the optimal model-based decision rule estimated by existing hotels’ historical performance data. This decision rule has been long regarded as a reliable benchmark in business location studies, and it is expected to alleviate potential subjective judgment bias from “location experts.” In the context of the hotel industry, a three-step general framework is used to discover an optimal hotel location by bootstrapping the decision rule from a regression model of profitability, whereas another framework proposed a seven-stage hotel location method to select location site for new hotels based on level of profitability. These hotel performance indicators include, but are not limited to, revenue per available room (RevPAR), profit, labor productivity, and efficiency score.

For prediction purposes, several algorithms are employed to establish the relationship between the business success indicator of the location and a set of explanatory variables: linear regression; projection pursuit regression; artificial neural network; support vector regression; and boosted regression.

EMPIRAL EXAMPLE AND WEB INTERFACE
To demonstrate the usefulness of HoLSAT, we predict possible hotel location sites in Beijing based on the historical records of performance of existing hotels. Our data set cover 309 star-rated hotels in Beijing and include comprehensive hotel operation and performance data of each hotel property. At the outset, a dependent variable should be selected to reflect the superior performance associated with the location as an indicator of business success. As suggested by the past literature, several candidates may be used, such as labor productivity, occupancy rate, RevPAR, and efficiency score from data envelopment analysis (DEA). In this example, we first use RevPAR (in CNY) as the dependent variable because it is the most effective yardstick reflecting the supply–demand balance of hotel rooms. After that, we apply the same methodology to examine the hotel location prediction models using other business success indicators. Guided by previous literature and the results from preliminary model calibration, a set of explanatory variables is specified to predict hotel performance. These variables include location attributes and hotel individual characteristics. Location attributes include:

- The number of years the hotel has been open.
- The number of restaurants in an 800-meter radius of the hotel, to capture the effect of public goods and services.
- The weighted road density in a 2-kilometer radius of the hotel, to gauge accessibility.
- The hotel’s geographic distance to the nearest subway station, in kilometers.
- The star rating of the hotel, as an indicator of status in hierarchy.
- The total number of beds the hotel offers for accommodation.

CONCLUSIONS AND IMPLICATIONS
A completely automated solution process is not feasible because of the complex and multifaceted nature of hotel location selection. Those location models cannot substitute intelligent decision making. Incorporating managerial insights and judgments is paramount when formulating location strategies. The prediction generated by the hotel location prediction model only provides a baseline for further analysis, and this prediction can be adjusted.