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Deloitte's AI-based forecasting solution: Clairvoyance

Peering into the Future

Deloitte's versatile forecasting solution Clairvoyance leverages AI to improve forecasting accuracy over classical methods.

The Need

Knowledge is power. Knowledge of future events is... even more power. While no one can reliably predict wide-reaching effects far into the future, the potential rewards have motivated individuals and organizations around the world for centuries to pursue this elusive goal.

Whether pre-empting shifting market sentiment, preparing for supply chain shortages, reading early warnings to avert disaster, or trying to gain an upper hand in commerce... predicting the future is a hugely desirable aim. It is also big business, with organizations employing expert modelers to obtain even a small and fleeting advantage within a narrow field of application and a short time-horizon.

Much time and energy has been invested into the area, producing such sophisticated statistical models as ARIMAX, which capture many dynamics and form a de-facto baseline for future expectations. Nevertheless, sophisticated models often miss the mark by great margins, which can lead to costly mis-informed action, at times worse than doing nothing at all.

Part of the problem lies with the complexity of the "systems" models attempt to forecast. Few systems operate in a bubble; rather they respond to external effects and, in turn, exert influence on other systems. In an ever increasingly inter-connected world, there are too many inputs, too many interactions for traditional methods to accurately model. Traditional models garnered a poor reputation in the run-up to the 2008 financial crisis, their rulesets failing to capture wider effects that their modelers did not see or did not want to see. At the same time, the modern day flood of data offers new forecasting opportunities. 🟢

Our Solution: Clairvoyance

Deloitte's sophisticated forecasting solution Clairvoyance utilizes the modern capabilities of machine learning (ML) to harvest information from time-series data in order to deduce an expected trend. The tool cycles through multiple algorithms, evaluates their performance, and provides the user the option to select the optimal basis for the forecasting model.

Clairvoyance validates its performance through back-testing in the form of in-sample analysis before delivering the prediction (out-of-sample) into the specified future periods. It then benchmarks the prediction against the most advanced classical statistical methods, notably ARIMAX.

While able to produce a forecast purely on the basis of data history, Clairvoyance is also able to integrate assumptions on the future development of selected features into its forecasting. It achieves this via the "Scenario Manager", where the user may augment the historical dataset with assumptions about potential development of model input features.

Even in cases of extreme volatility – virtually unpredictable – the Scenario Manager provides a means for the analyst to quickly assess possible outcomes, ranges of expected results, sensitivity to various input factors.

Clairvoyance accommodates a wide set of features and multiple sources – e.g. combining historical client cash flows with external factors, such as macroeconomic trends.

Combining automated modeling, algorithm optimization, and scenario accommodation into a single, intuitive user interface, Clairvoyance is an indispensable tool for Controllers and Risk Managers in any data-rich business.

Advantages/Benefits

· Greater forecasting accuracy, beyond the limits of traditional models.

· Highly adaptable to the individual situations of the industry or organization – depending only on the delivered data.

· Intuitive guided or expert user interfaces, providing a healthy balance of modeling standardization (including data integrity tests) and customization for greater optimization.

· Accommodating a wider breadth of inputs, scalable to deep and wide datasets and flexible for multiple granularities.

· Use of scenarios to consider multiple potential futures and their respective impacts.

Example Use Cases

• **Liquidity/cash flow forecasting**
For those companies operating in fiercely competitive environments, nothing stays the same. Rolling forward past months is at best a conservative placeholder, at worst a miscalculation, which requires holding substantial buffer to compensate for estimation error.

• **Growth/sales budgets**
It is the classic duel: management challenges with "unrealistic expectations" in the face of lackluster proposals from a sales force motivated by variable compensation. Reasonable and achievable expectations lay somewhere in between… but where?

• **Supply chain/material delivery reliability**
With commodity price shocks, raw material shortages, upstream production outages, limited options for alternative suppliers… what possible scenarios could a manufacturing operation face?

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