Trendskout
READY TO USE AI PLATFORM

IT as profit center with automated machine learning

E-BOOK

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INTRODUCTION

Artificial intelligence or AI is far from just about advanced algorithms in high-tech sectors.

Introduction

The **growing global demand** for machine learning capacity exceeds supply. To bridge the gap between supply and demand, **Automated Machine Learning is enabling a new class of data scientists to meet this demand for capacity**, the citizen data scientist.

Gartner[1] defines a citizen **data scientist** as a person who develops advanced diagnostic, predictive or prescriptive models whose own primary role is outside the field of statistics or analytics. Many data analysts and business intelligence professionals are likely to advance into roles as citizen data scientists. **Automated Machine Learning is an ideal solution for them to take that leap.**

With **Automated Machine Learning**, you don't need to6+ be a data scientist by training to generate predictive insights immediately. If you use tools like Tableau, Power BI or Excel, you often already have more than enough technical baggage in your pocket to get started with Automated Machine Learning.

The next fundamental shift in the evolution of analytics is already underway. Next-generation automated analytics technologies are changing the way analytics is approached. Just as self-service BI solutions like Power BI had a major impact on Business Intelligence, Automated Machine Learning will change the game again.

Early adopters of Automated Machine Learning **praise the unprecedented speed to gain insight and greater competitive advantage**. Gartner predicts for 2023 that augmentation will create 2.8 billion euros in business value and 6.2 billion hours of labor productivity

Automation is no cause for alarm in this one. These solutions are aimed at combining the knowledge of data with the power of Machine Learning. Where business intelligence and visual analytics allow you to understand what happened in the past, Automated Machine Learning lets you navigate the future. Or put another way, Automated Machine Learning automates the repetitive tasks of Machine Learning, and allows IT teams to focus on innovation and solidifying their position as a profit center in the organization.

https://www.gartner.com/newsroom/id/3570917

Automated Machine Learning

Trendskout automates the machine learning process from data ingestion to model operationalization. It delivers immediate value and unparalleled ease of use - no complicated math or scripting required.

Trendskout automates feature engineering, and finding key insights and hidden patterns, among other things. The underlying technology accelerates analytical investigation of millions of variable combinations that would take too much time for manual human analysis.

Applications for both AI and Deep Learning are driven by algorithms, data, and parameters, all three of which work together precisely for best performance. The choice and interaction between algorithm, data processing and parameterization - also known as hypertuning - is performed independently by the Trendskout AutoML. This speeds up the entire process: from conceptualization to delivery of a high-performance application for AI and Deep Learning.

For this, Trendskout works with all the advanced Machine and Deep Learning frameworks such as Tensorflow, XGBoost, Apache Spark, Theano, Scikit Learn and more. This supported by a visual drag & drop editor

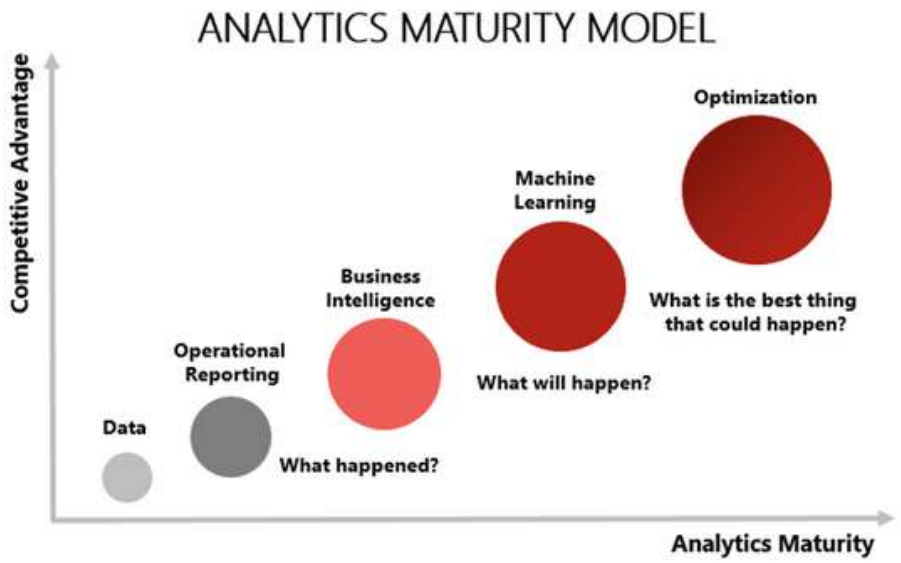
- Ingestion of data sources,
- Selecting target variables to predict,
- Automatic generation of feature extraction, feature selection reports, and searching through numerous possible data transformation algorithm-hypertuning combinations by our Genetic Algorithm,
- Rapidly operationalize models.

Machine Learning developments that used to take weeks or months can now be completed in hours. By inserting Trendskout Automated Machine Learning into existing reporting or processes, the time between insight and action is drastically reduced.

In this whitepaper we discuss how to get started with Automated Machine Learning. We introduce several Machine Learning concepts, give important data preparation tips, and give a roadmap on how to apply Trendskout to your data. Finally, we make the connection with the role of a modern IT team and these evolutions.

Getting Started with Machine Learning

Before we get into machine learning, let's take a look at the analytics maturity model and how it complements business intelligence and analytics.



The maturity of analytics begins with turning raw data into reports to reduce intuition-based decision making. Data is aggregated into data warehouses. At this level of analytics maturity, most of the time is spent retrieving, aggregating and preparing data. Little time is left for data analysis.

In the next phase, business intelligence is used to understand what has happened in the past with analytical olap cubes, pivot tables, data visualization and dashboards. These essential data-driven decision tools typically require manual development processes to aggregate counts, sums and averages. Findings often reflect a single point in time and typically do not take into account statistical significance.

Automated Machine Learning

Machine learning is used to predict what will happen. Machine learning allows systems to automatically learn from past experiences without being explicitly programmed. Machine learning establishes statistically significant relationships between inputs, fixed variables and target variables. Automated Machine Learning speeds up the process.

Machine learning can efficiently analyze large amounts of data that contain too many variables for manual business intelligence or traditional statistical analysis techniques. Time series, regression, neural networks, decision trees, classification, random forests, support vector machines and many other types of machine learning algorithms can automatically pick up the signal in the data. Hidden patterns and trends in data that the human mind cannot detect are identified.

Common use cases for applying Automated Machine Learning include: financial credit scoring, churn prevention, inventory optimization, direct marketing, conversion modeling, pricing, forecasting, fraud detection and risk management.

“Machine Learning does not replace Business Intelligence, but complements it.”

Benefits of Automated Machine Learning include:

- Saves time by quickly evaluating billions of combinations,
- Finds the signal in the noise, uncovers hidden patterns and trends that are invisible to the human eye,
- Improves accuracy by applying Deep Learning techniques that are not feasible for a manual approach,
- Reduces bias - bias - in decision making through pure data driven insights vs human interpretation of reports,

Business intelligence skills are a solid foundation for applying Automated Machine Learning, and accelerate the application of valuable insights. Domain knowledge, problem solving and data are the cornerstones of success.

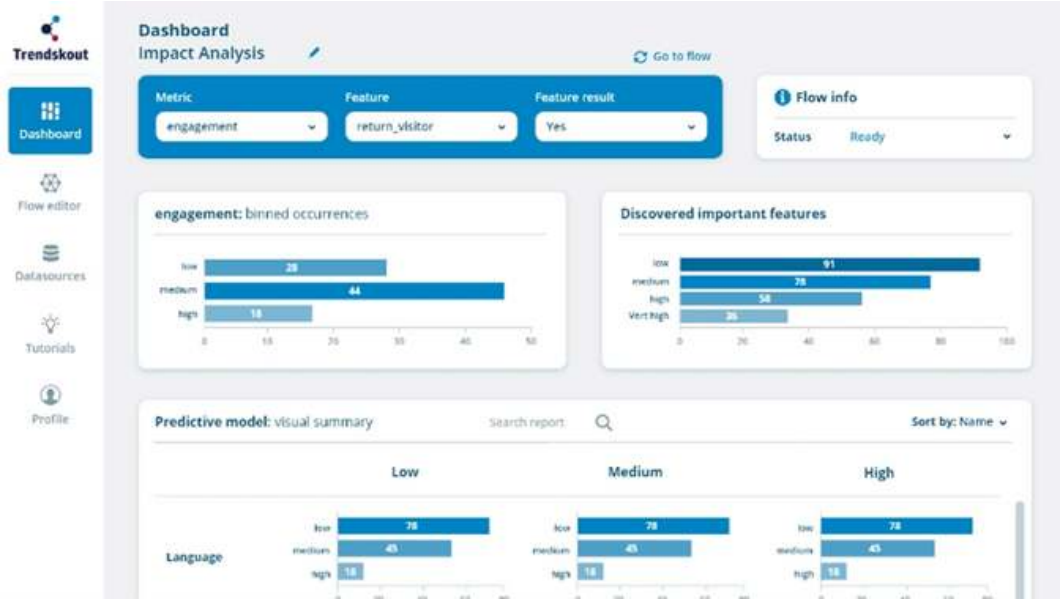
Data preparation and transformation

Data collection and preparation is a crucial step in any Machine Learning project. Trendskout offers numerous techniques and automations to make this process run as efficiently as possible, but understanding the meaning of data for your organization is not possible for an AI. Selecting the right data is closely related to choosing the right optimization target.

Once the data is selected, it can be quickly added as a data source in our system. These can be relational databases, text files, NoSQL databases, datalakes or combinations thereof.

"In addition to finding the best model, Trendskout also automates the necessary data transformation of your data."

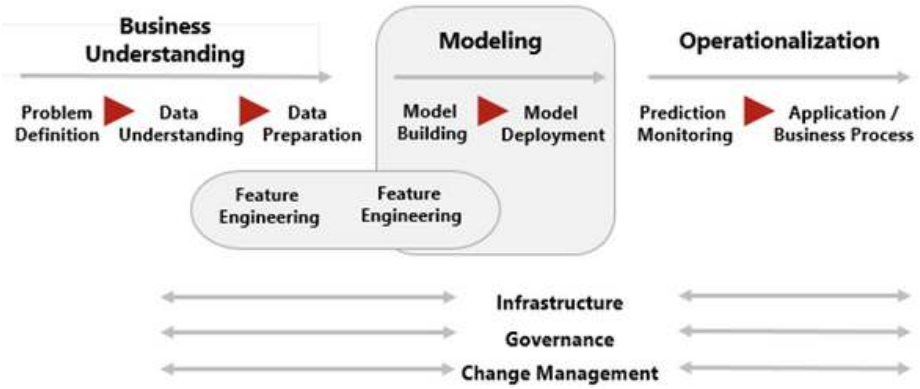
Via the built-in dataprepper you can link data sources together, giving semantic meaning to your data that is then used by the Automated Machine Learning engine. This does not mean that you have to do all kinds of scripting yourself, your data is unlocked with a Data Prepping wizard that does all the necessary technical transformation and cleaning itself.



An iterative process

Similar to Kimball-dimensional modeling used in business intelligence projects, the process for developing high-quality machine learning models is iterative in nature. Never start a project without first thinking about stakeholders, workflow and how your machine learning solution will be integrated into business processes to make a positive impact. A best practice is to start with small, quick win projects to gain momentum and build on the momentum.

Success lies in identifying opportunities and implementing as many of them as possible. You can get started by using data that is already available, after all data sources will never be complete or perfect. Modern data preparation and Automated Machine Learning allow you to move quickly.



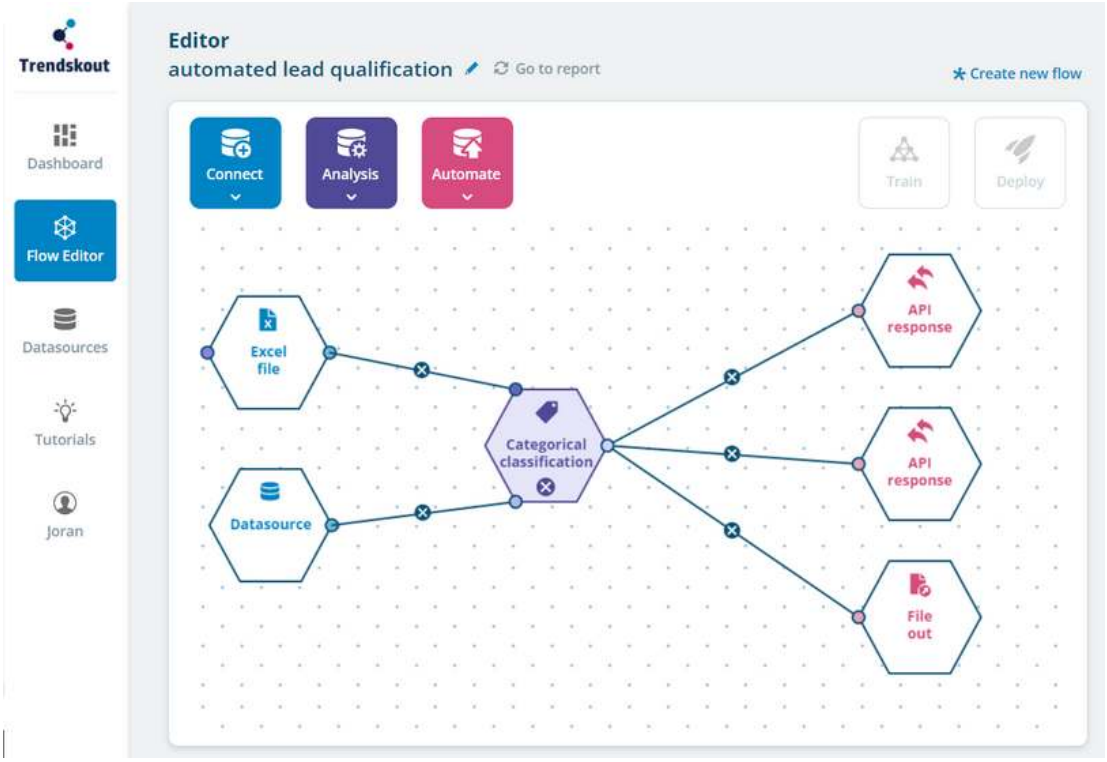
The machine learning process begins with domain knowledge. This first important step focuses on defining the right problem to solve, recognizing the business goals and requirements. After selecting a problem, data collection begins. During this step, you become familiar with available data sources, identify data quality issues, and perform exploratory analysis. During data preparation, data is further processed.

During modeling, you select a target to predict and the Automated Machine Learning platform automatically starts training hundreds of predictive models, scoring and ranking them on selected quality metrics.

After Trendskout has found the right combination of data transformations, algorithm selection and hypertuning you are ready to operationalize the resulting model. To do this, you can choose from different Automate actions that simplify the application of your model:

- Different plug-ins for common systems,
- API endpoints,
- Database connections,
- FTP,
- NoSQL & Datalakes export,
- ...

"Data is constantly changing. Drift detection and automatic model updates are standard in the Trendskout platform."



IT as a profit center - Conclusion

IT professionals have been at the forefront of innovation for decades. Machine Learning and related technologies bring numerous opportunities to further solidify this role. To capitalize on these opportunities, it is crucial for IT teams to focus on the right added value. Unlocking this value lies in a co-creation process with the business user to answer a predictive issue, with an IT team that acts as a citizen data scientist and data professional guiding the business user through the data landscape.

At Trendskout, it is our experience that performing time-consuming and complex tasks to create a Machine Learning model bring little added value to this co-creation process and can often be perceived as slowing down. By using Automated Machine Learning, these tasks can be automated and the IT team can further profile itself as a profit center.

Next steps

- Explore the different applications and industries where Trendskout's Automated Machine Learning technology is deployed at https://trendskout.com/
- Learn in detail how our technology works at https://trendskout.com/product-tour/
- Our vision for Automated Machine Learning https://trendskout.com/product-tour/auto-ml/
- Learn what Automated Machine Learning means for you? Book your demo at https://trendskout.com/demo/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