A D V E C T A S

Excellence in your decisions

POLL

• Do you use AI today?





We do Analytics. Nothing else.



DIFFERENT LEVELS OF ANALYSIS STEP BY STEP

Competitive advantage		
Data Science Business Intelligenc	ce Optimize operations w.r.t. predictions 2 Decision Optimization	
	What will probably happen? 1 Machine Learning	Proactive
	Self service BI Drillable, dynamic, created by business	Reactive
	DashboardsDrillable, dynamic, often created by IT	
	Standard Reports Aggregated, static, scheduled	
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AI IN MARKETING

AI is big in marketing...

Marketing and Sales prioritize AI and ML higher than any other department in enterprises today.^[1]

... for supposedly good reason

75% of enterprises using AI and ML enhance customer satisfaction by more than 10%. ^[2]



AI HYPE

Al is often predicted to 'revolutionize' marketing.

According to Gartner's latest report on digital marketing^[3], AI has since last year reached the peak of inflated expectations.

Gartner Hype Cycle for Digital Marketing and Advertising, 2019









MACHINE LEARNING IS "TRAINED" ON DATA

Split the data into a train set and a test set (much like school exercises and exams)

Count number of correct answers produced by the test set and give it a "grade" (accuracy, precision, recall, etc.)









SUPERVISED LEARNING

Needs labelled data.

Can be split up in two types:

- Classification (e.g. cat or dog)
- Regression (e.g. 350kr +- 37kr)





PREDICT CHURN

Challenge

Some customers are more likely than others to switch supplier (price hunters). The customer commits to a new supplier, which makes win-backs tough.

Solution

Predict whether a customer will terminate its contract. The prediction is based on factors such as type of agreement, consumption patterns, and interactions.

Tech

Classification with a XGBoost model based on a snapshot of recent interactions with the company, type of agreement, consumption, etc.

Business value

The company can now prioritize its marketing better for retaining the customer base, rather than winning back they who have already left. They have also made themselves more relevant to customers by providing customized offers at the right time.

< Energy company >



PREDICT CROSS-SALES

Challenge

Some customers only buy a few types of the bank's products / services. Without knowing the customer's preferences, it is difficult to be relevant in their marketing.

Solution

Twin-based model based on customer data, historical transactions and activities. Consumption of different product groups per customer was predicted as a salespotential and then compared with actual sales to find unutilized potential.

Tech

LightGBM model written in Python and deployed on a Microsoft SQLserver.

Business value

Targeted campaigns and offers to customers with high purchasing potential per product / service instead of broad campaigns in order to become more relevant to customers with increased sales as a result.

< Bank & Insurance company >







UNSUPERVISED LEARNING

Finds groups/clusters in the data.

Find anomalies (long distance from any group).





MARKET BASKET ANALYSIS

Challenge

Customers expect that offers and promotions are always relevant. If you have a larger assortment it will guickly become complex and difficult to find combinations of products that are usually sold together. You also want to know if a product drives sales of other products.

Solution

Statistical calculations to find which products are bought together and different association rules; which products drive positive or negative sales of others. Ability to filter out sales during desired periods.

Business value

Decision support for creating and following up campaigns. Better understanding of sales and complex patterns that can arise and be utilized.

Tech Developed in Python with the Dask framework for parallelizing data prep.

To find combinations of products, bindings to C ++ and algorithms like Apriori and FPgrowth were used.



ADVECTAS

< Large retail company >

SUMMARY OF SURVEYS/REVIEWS

Challenge

Receives several thousands of survey responses every year. Analyzing these are very timeconsuming and human bias might affect the result. Often, only a small selection of texts is read to try to form a holistic view.

Solution

Find recurring topics (groups of words that are often used together). This is a statistical approach which is independent of language. It's also possible to track topic magnitude over time to follow up actions.

Tech

Topic modeling with LDA (Latent Dirichlet Allocation) and NMF (Non-negative matrix factorization) developed in Python. Visualized in several different BI tools as well as standalone HTML.

Business value

Impartial summary of texts. Big time savings. Ability to identify and act on insights that otherwise drown in large masses of text.



ΑΟΥΕСΤΑS

< Swedish region >





REINFORCEMENT LEARNING

Learn iteratively.

Define goal / punishment function.









DEEP LEARNING

Complex model.

Can solve difficult problems.

Needs a lot of resources (data and computational power).







Zalando has a research team consisting of 15 doctors in machine learning and are at the forefront of AI in clothing retail, releasing a lot of open-source tools.

They represent every garment mathematically based on how they look (fashion-DNA), which makes up their analytics core.

By using these representations of unstructured data, they can enhance their applications.





REPRESENTATION OF GARMENTS







APPLICATION: STREET-TO-SHOP







APPLICATION: STREET-TO-SHOP







SUPERPERSONAL

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DECISION OPTIMIZATION

Calculate optimal decisions

Does not learn from training data. Optimization is done based on **constraints**.

Machine learning and predictions can help in defining those constraints.

A D V E C T A S Excellence in your decisions $x \in X$

OPTIMIZE SHIFT SCHEDULING

Challenge

24/7 operations and other staff-intensive operations have a great need to put in place reliable and resource efficient shift schedules. With tools like Excel, the process is time consuming and the risk is great for mistakes and sub-optimality.

Solution

With decision optimization, the process can be streamlined. Together with machine learning, demand can first be forecasted and the schedule optimized automatically thereafter.

Tech

Developed in Python with optimization engines like CPLEX.

Business value

An automated scheduling process can save countless hours of administrative time. An optimal schedule also ensures an efficient use of resources.

< Swedish municipality >

KEY TAKEAWAYS

- The possibilities with AI in marketing/sales are prosperous
- Al is a combination of machine learning models
- Machine learning only solves a specific problem
- You need to apply some business logic to your predictions
- Just get started and fail fast!

THANK YOU!

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