Artificial Intelligence to Drive Process Mining and Business Optimization

Challenge

- How to use AI to drive business?
- Benefits of Clustering for process mining and business optimization
- What can AI predict and how?

Benefits

- Detect unwanted cases to control risks
- Identify best practices to increase sales
- Monitor process in real time for better quality control
- Boost on-time delivery and SLA success

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A Phd (Dr.techn.) in statistical signal processing from TU Vienna in 2012, Post-Doc at ETH Zurich and TU Vienna, and Assistant Professor for Machine Learning in Aalto University in 2015.
Research focused on limitations and efficient solutions for large-scale machine learning problems arising in various domains.
A passionate teacher of the principles underlying machine learning and artificial intelligence, a textbook author and "Teacher of the Year 2018" by the department of Computer Science at Aalto University.

Aalto University

www.aalto.fi

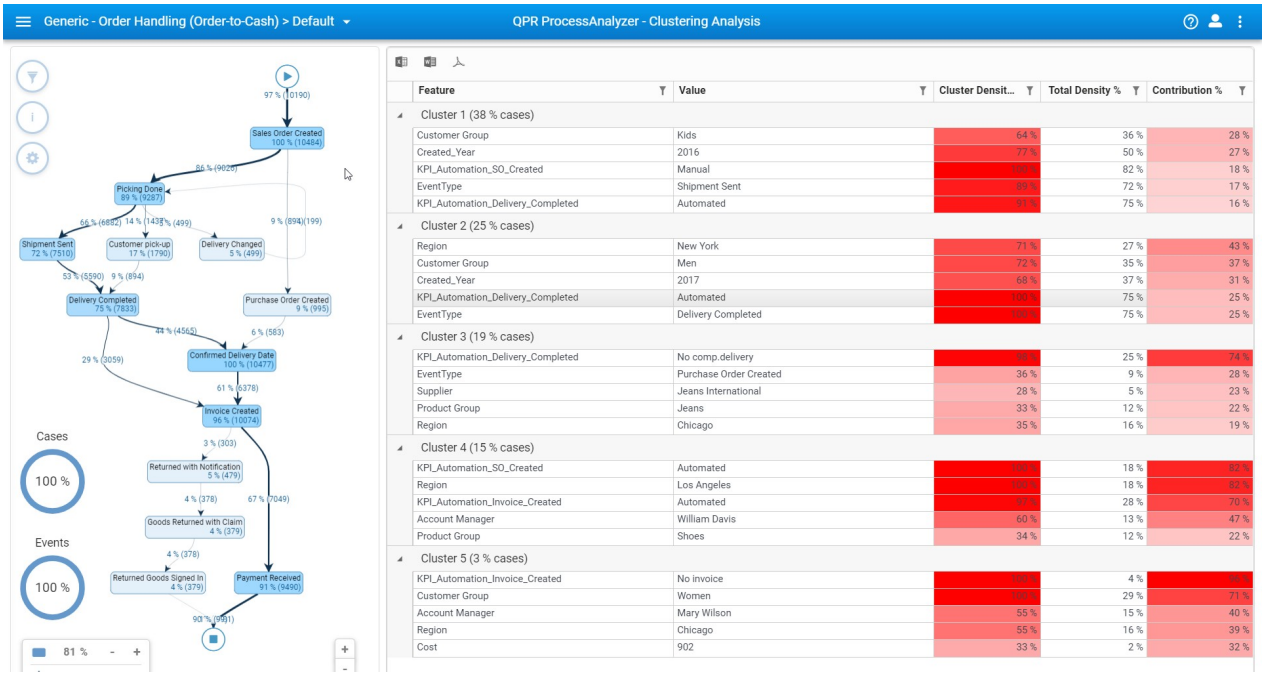
Finland's second largest university, located in Espoo, whose operation showcases Finnish government's will to foster innovation and experiment in higher education.

Staff:	**3,000+**
Endownment:	**700 million EUR**

Machine Learning

Machine learning, a sub-field of artificial intelligence, has been affecting our lives fundamentally. It is a way to extract useful information out of tons of data. Using machine learning allows businesses to improve the quality and quantity of service, thus increase sales and customer satisfaction.
"*I find it highly fascinating to see how machine learning can help to make businesses more economic and to improve their value. Thanks to QPR Conference, I'm able to be in contact with people from application domains.*" – says Alexander.
This paper will focus on two machine learning methods namely clustering and prediction, which are both equipped in QPR ProcessAnalyzer.

QPR



Clustering

Clustering is a basic machine learning methodology which is now included in QPR ProcessAnalyzer as one of the fundamental features. When data is loaded into the software, default configuration immediately groups process mining cases into clusters and shows the most important characteristics for each cluster. This helps the analyst to find similar cases within a large process mining model and thus easily separate the "apples and oranges" from each other.

"Clustering is essentially about finding groups in data points for various uses in business realm" says Alexander, *"such as identifying customer segments, understanding similarities and differences of business cases, or detecting quality issues."*

Clustering analysis utilizes the full case history (ie. the event types visited) as well as business data (ie. the case attributes) in a unique combined way to identify similarities within cases.

Identify best-practice cases to increase sales

Process Mining helps businesses to see the big picture, in which they can discover and understand both of their strengths and weaknesses.

Clustering method does not only bring unwanted cases to light, but also highlights the best practices. This helps business to achieve better efficiency, increase sales, and even detect suitable opportunities for RPA.

Detect unwanted cases to control risks

Process mining, or clustering methodology, allows businesses to detect undesirable cases, which results in better risk management and control.

"*With Process Mining, we could spot anomalies,*" says Alexander, *"these anomalous process cases which are often difficult to find now will be handled and taken care of."*

By using clustering method, managers can identify cases with poor performances, then performing Root Cause Analysis QPR ProcessAnalyzer to get comprehensive insights into such unwanted cases and shed lights on areas that need corrective actions.

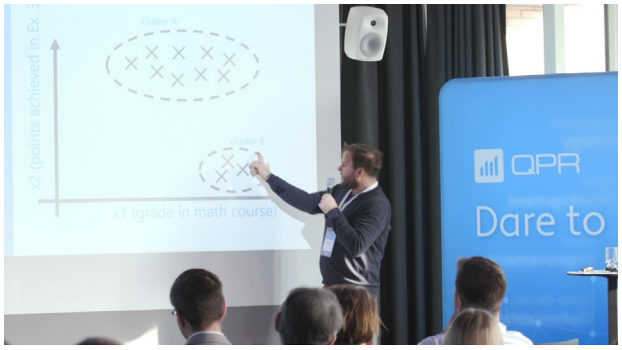
"I like this visual description of how the process flow is and how the cases are related. To always have a graphic visual representation of data is crucial to data management."

Alexander Jung,
Assistant Professor, Aalto University

Prediction

Prediction is one of the most popular and successful classes of machine learning method, thanks to its diverse applications, widespread utilization and profitable outcome. *"Ninety-nine percent of what you hear about AI method are prediction methods"*, says Alexander, *"prediction is about supervised machine learning to process raw data into powerful insights."*

QPR ProcessAnalyzer allows users to monitor case-level predictions in a dashboard, send periodically report to management and service teams, as well as immediate notification to case-specific stakeholders.



"Prediction is supervised machine learning to process raw data into powerful insights."

Alexander Jung,
Assistant Professor, Aalto University

Superior quality control

Process mining deals with transaction-based data much faster compared to traditional analytics and turns a vast amount of data into meaningful insights almost instantly. Thanks to prediction methods, managers can identify potential failures in the system and take corrective actions on a real-time basis. As business landscape faces constant changes in today's world of digitalization, process mining will undeniably become a powerful tool for superior quality control.

"Process mining allows you to react in time to cases that seem to fail their promise and fix the issue before your customers get disappointed," says Teemu Lehto, Vice President in Process Mining at QPR Software.

Accelerate time of delivery and meeting SLAs

"Prediction reads into the descriptions of a process case in a log file as text, and it aims at predicting the probability that this process case will either be delayed or successful," says Alexander.

As QPR ProcessAnalyzer is equipped with case-level prediction function, the tool allows business to predict the success of on-time delivery of meeting the service level agreements. In case of probable failures, managers can use Root Cause Analysis in the software to have a holistic understanding of the problems, then make suitable adaptations. As a result, time of delivery and meeting SLAs will be improved once business can fully comprehend the strengths and weaknesses in their process.

QPR ProcessAnalyzer Machine Learning Solutions

- QPR ProcessAnalyzer hosted in Amazon AWS cloud
- Integrated Accord.NET ML framework

QPR Software Plc

QPR Software Plc (Nasdaq Helsinki) provides process mining, performance management and enterprise architecture solutions for digital transformation, strategy execution and business process improvement in over 50 countries. QPR software allows customers to gain valuable insights for informed decisions that make a difference.

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