



**DATA MINING PROJECT
FOR JAPAN TOBACCO INTERNATIONAL**





ABOUT JAPAN TOBACCO INTERNATIONAL

Japan Tobacco International (JTI) is a leading international tobacco company selling one of world's best-known brands including Winston, Camel and Mevius. The company sells its brands in 120 countries and employs over 26,000 people around the world at 367 offices, 26 factories, 9 research & development centers and 5 tobacco processing facilities. JTI's goal is to become the most successful and most responsible tobacco company in the world which corporate strategy is based on the following pillars:

- Build and nurture outstanding brands,
- Continue to enhance productivity,
- Sharpen focus on responsibility and credibility,
- Develop human resources as a cornerstone of growth with a focus on continuous improvement.

Objectives mentioned above require effective and efficient tools for analyses of historical data as well as predictions of appearing threads and weaknesses.

PRODUCTIVITY ENHANCEMENTS

Production companies, like leading international tobacco manufacturers, generate huge amount of data coming from production lines. Machines that are used in the production process create very specific data, which is impossible to be analyzed and used in business manner with simple analytical tools. However, usage of this unstructured and previously unanalyzed data is crucial from productivity enhancement and optimization point of view. For this purpose data mining solutions are being implemented in following areas:

- Quality analysis of manufactured goods depending on machines parameters,
- Failure analysis and causes leading to breakdowns and errors,
- Failures predictions,
- Planning and scheduling optimal production process.

Listed applications of data mining models enables

to make decisions that significantly impact costs reduction, decrease downtimes and overall enhance the productivity.

DATA MINING PROJECT FOR JTI

JTI decided to cooperate with Comarch Data Science team in area of data mining for production lines improvements and rejects optimization. During the proof of concept project two major goals were achieved:

- Estimation of the number of rejects in each month in following year for each machine based on different machine models.
- Estimation of the duration of downtimes in each month in following year for each machine depending on different machine models.

Outputs of both parts included estimated predictions for 2 machines types (maker and packer) for a following year and validation of models based on historical data. Estimations obtained from the models were trained on historical data for past 3 years. The outputs were dependent on parameters such as:

- machine speed,
- shift,
- team,
- material

Different methodologies were applied for each machine – for makers data was aggregated on the shift level, while for packers on minutes level. The whole solution was developed with the R language and R Studio Platform.

Described solution enabled JTI to predict future rejects and downtimes during the production process, which overall led to productivity enhancement.

CUSTOMER'S PERSPECTIVE

“We are fully satisfied for technical solution which was done by Comarch BI team, as all of our expectations and goals were met. Also, we would like to thank the BI Data Science team for their engagement and effort.”

OĞUZHAN KESTIK
PROCESS ANALYST
MANAGER

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Comarch is a provider of complete IT solutions for telecoms. Since 1993 the company has helped CSPs on 4 continents optimize costs, increase business efficiency and transform BSS/OSS operations. Comarch solutions combine rich out-of-thebox functionalities with high configurability and are complemented with a wide range of services. The company's flexible approach to projects and a variety of deployment models help telecoms make networks smarter, improve customer experience and quickly launch digital services, such as cloud and M2M. This strategy has earned Comarch the trust and loyalty of its clients, including the world's leading CSPs: Vodafone, T-Mobile, Telefónica, E-Plus, KPN and MTS.

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