

PROF. DR. BARIŞ SÜRÜCÜ

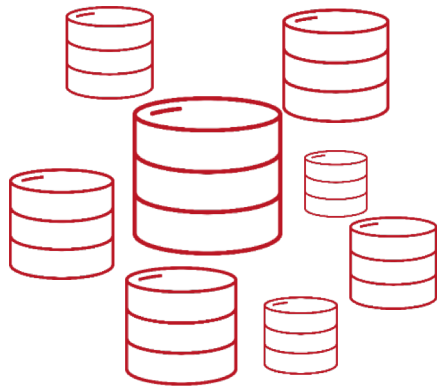


ORTA DOĞU TEKNİK ÜNİVERSİTESİ
İSTATİSTİK BÖLÜMÜ



GAUSS STATISTICAL SOLUTIONS
ENHANCER
ODTÜ TEKNOKENT

How can we use Machine Learning?



Collect your data

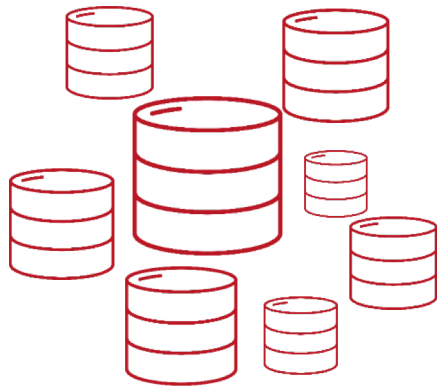


Understand your data
Structure your data statistically



Obtain your models
&
Perform your tasks automatically

What do we need?



Data

+



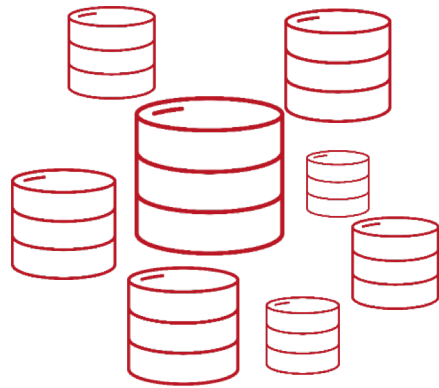
Business Experts
&
Data Science Team

+



Statistical Tools
&
BI Tools

Solution Infrastructure



Big and complex data



Data integration and
transformation



Predictive Modelling

Predicts the likelihood of future occurrence of a targeted event or situation using historical records.



Pattern Recognition

Reveals interesting, unexpected or valuable associations in large data sets.



Visual Analytics

Allows you to combine all data to follow processes with easy and understandable visuals.

Industry 4.0

Statistical Models - ML

$$\Pr \left[\begin{array}{c} \text{Failed} \\ \text{Products} \end{array} \right] = ?$$

15 significant parameters

Performance

	Good Products	Failed Products
Predict Good	%99.01	
Predict Failed		%94.64

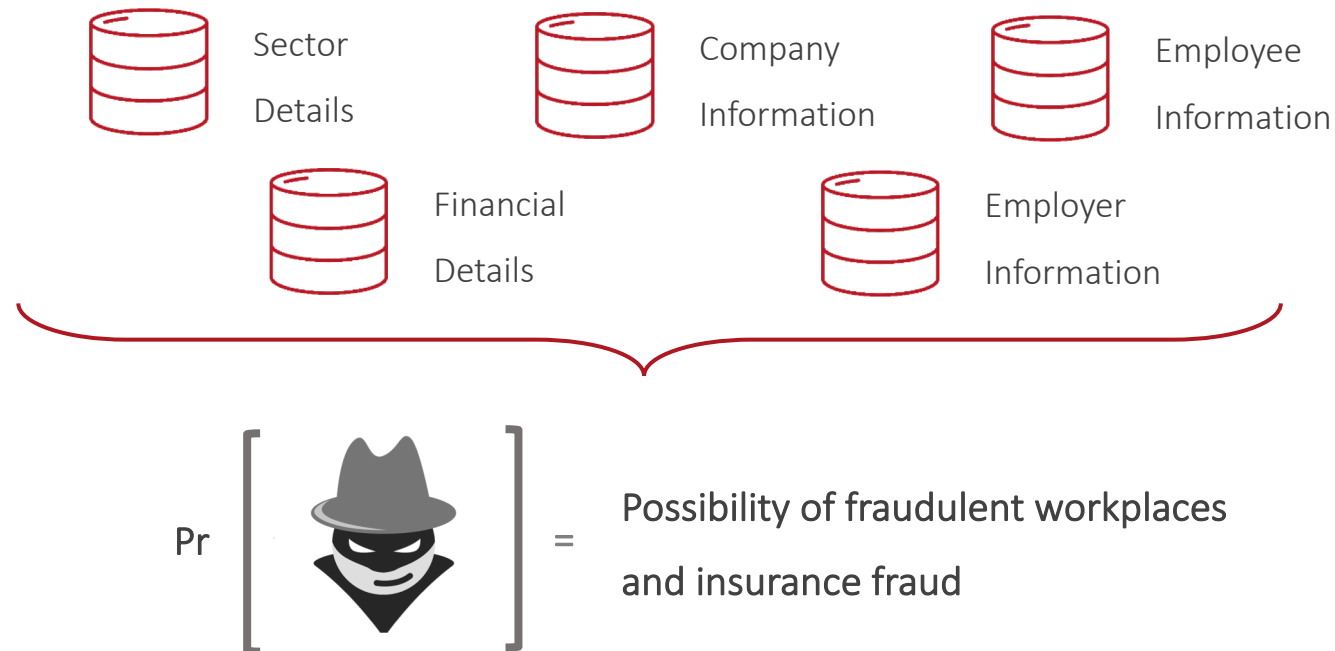
Correct Prediction

Incorrect Prediction

Social Security Institution



Using the past data, a decision support system was developed for the preliminary detection of fraudulent workplaces and insurance fraud.



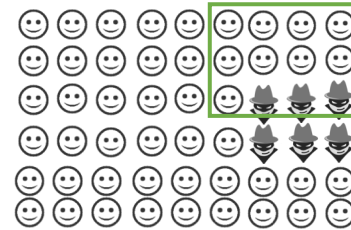
Social Security Institution

Statistical Models - ML

$$\Pr \left[\begin{array}{c} \text{Fraudulent} \\ \text{workplace} \end{array} \right] = ?$$

10 significant parameters

Acquisition



81 times more efficient

If only 30.000 companies are inspected

Randomly

9.6

Fraudulent
workplaces are
caught

By Model

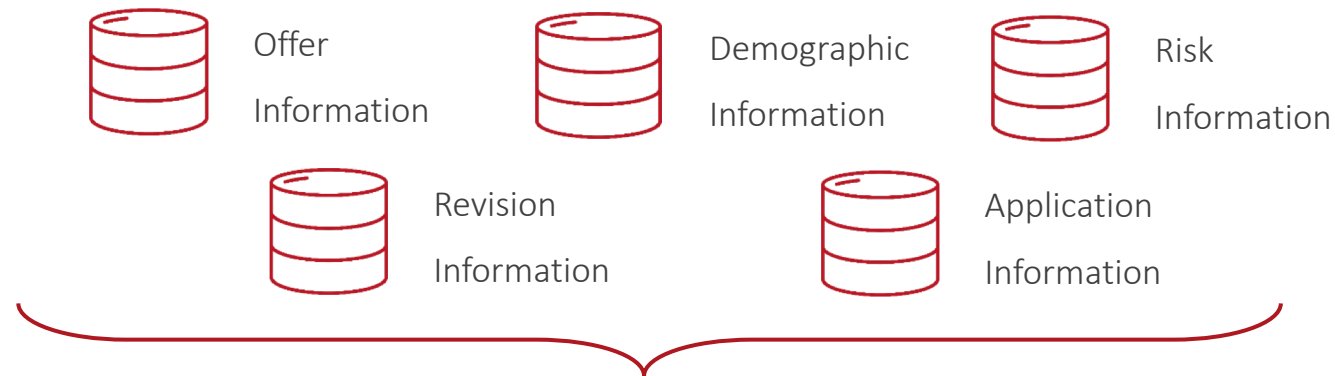
780

Fraudulent
workplaces are
caught

Finance



The decision support system was developed by modeling the probability of loan repayment in line with the offer / revision details of the loan proposals made by the customers.



$$\Pr \left[\checkmark \right] = \text{Possibility of the given offer to turn into credit}$$

Finance

Statistical Models - ML

$$\Pr \left[\begin{array}{c} \text{Turning into} \\ \text{credit} \end{array} \right] = ?$$

14 significant parameters

Acquisition



3.2 times more efficient

If only 1.000 offers are revised

Randomly

211

turns into credit

By Model

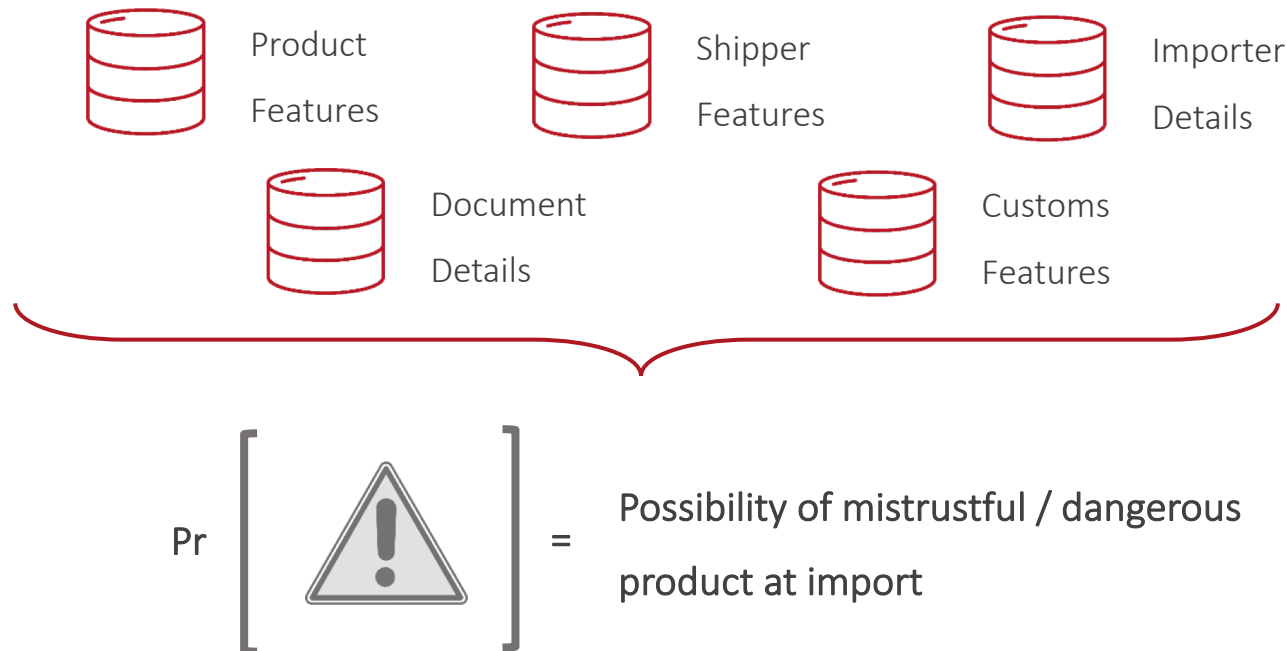
675

turns into credit

Ministry of Economy



A decision support system was developed to identify the safety of imported products using information in the TAREKS database.

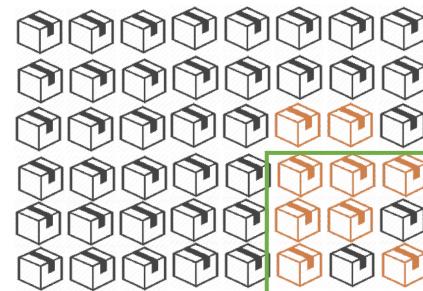


Statistical Models - ML

$$\Pr \left[\begin{array}{c} \text{dangerous} \\ \text{product} \end{array} \right] = ?$$

11 significant parameters

Acquisition



13.4 times more efficient

If only 1.000 tests are inspected

Randomly

33

dangerous products

By Model

441

dangerous products



Board behavior was modeled using past information in the database. A decision support system was developed for project approval processes by calculating the possibility of each project being supported by the board.



Company
Information



Project
Information



Budget
Details



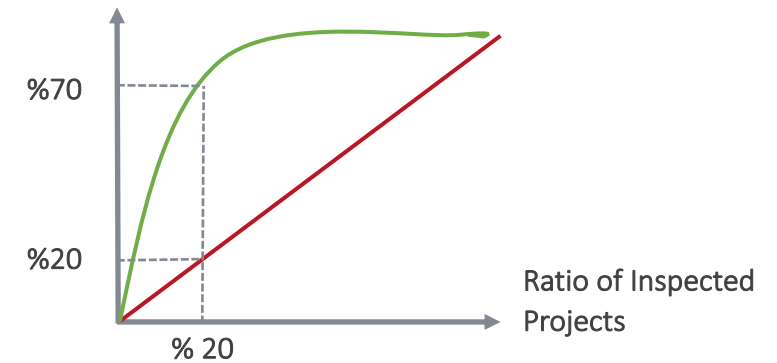
Reviewer
Information



Reviewer
Evaluation

%73 *true decisions* **3.5** *times more efficient*

Detection Ratio of Projects to be Approved by the Board



Pr  = Possibility of Supporting
Projects by the Board

Central Bank of Turkey



A reporting automation was designed for the analytical calculation flow of the Housing Price Index.

- + All calculation steps were carried out by the system.
- + The time taken for calculations was reduced from 8 hours to minutes.
- + The system gave better results with the help of the anomaly detection algorithms.

Insurance



Customer behaviors were modeled using 86 different variables. **Customer loss & transfer scores** are calculated to determine the campaigns to be made specific to BES customers.



Contract
Details



Consultant
Information



Customer
Information

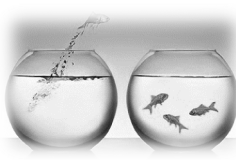


Fund & Collection
Information

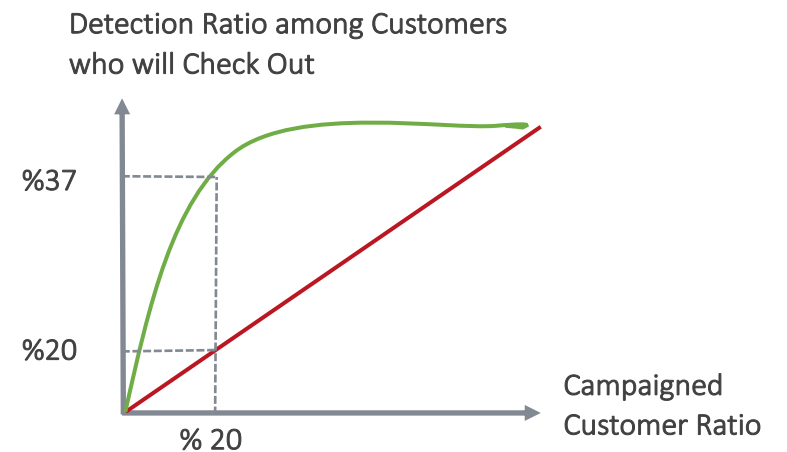


Request & Complaint
Information

Pr  = Customer loss
Score

Pr  = Customer transfer
Score

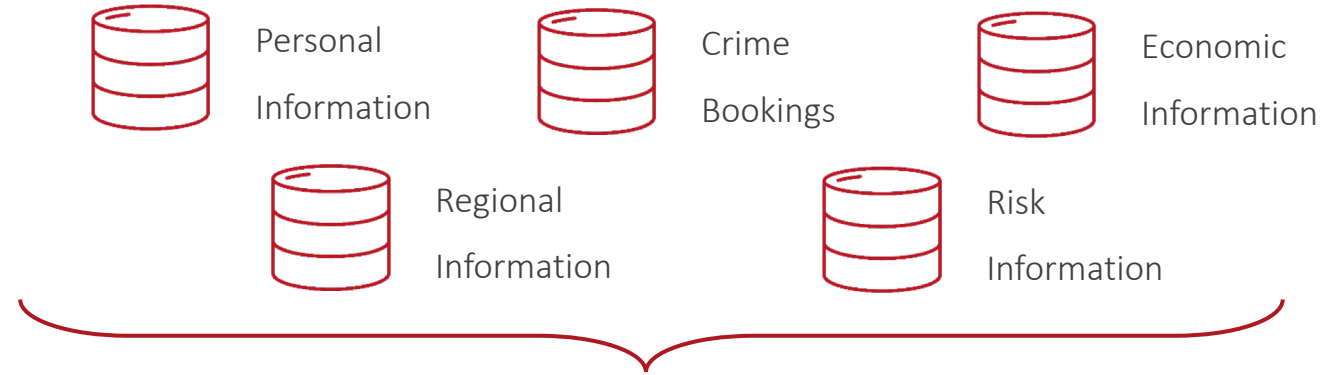
%92 *true decisions* **4.2** *times more efficient*





UNICEF & Ministry of Justice

Risk evaluation system for children in Turkish probation services was developed by using data learning techniques to increase the efficiency and effectiveness of the juvenile justice system.

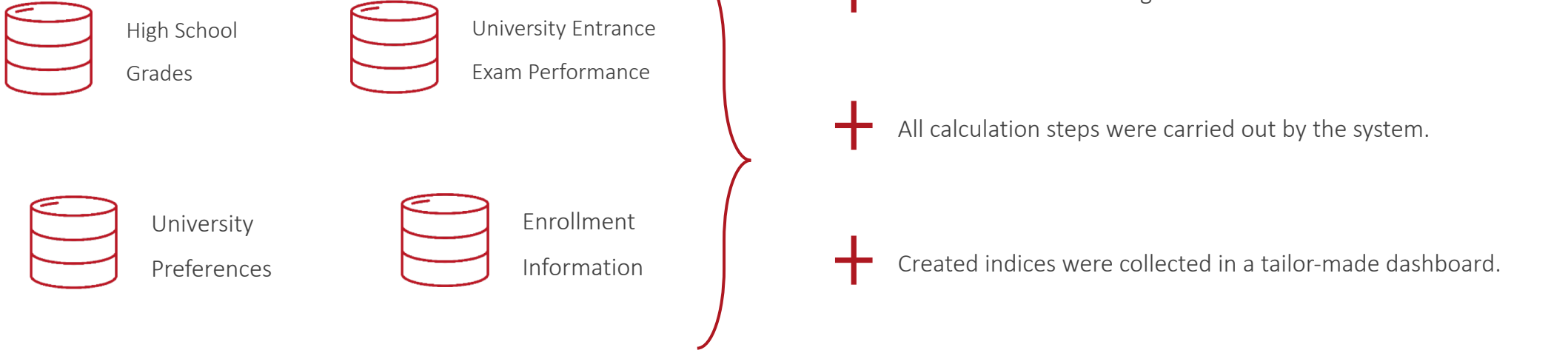


$$\Pr \left[\text{Handcuffs} \right] = \text{Possibility of re-perpetration of children}$$

Ministry of Development



Analytical tools have been produced to assess the educational background of the citizens of the Republic of Turkey. Interfaces have been developed for the end user via created indices.



Call Center



In order to increase the credit card sales rates made through the call center, a predictive calling algorithm has been developed the possibility of the customers to answer and to accept credit card.



Customer Information



Calling Details



Calling Results



Call Center Employee Information

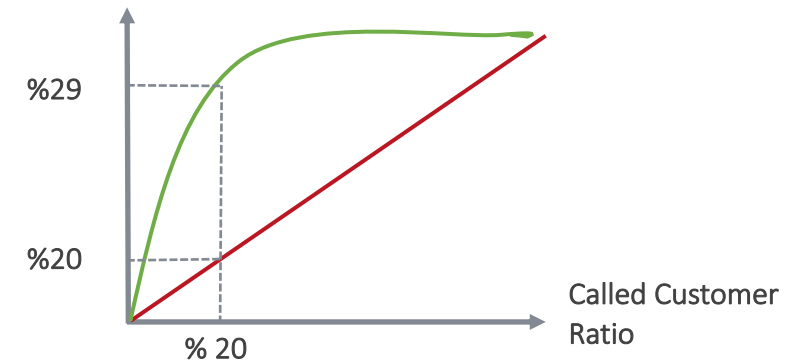
$\Pr \left[\text{Phone Icon} \right] = \text{Answering Score}$

$\Pr \left[\text{Checkmark Icon} \right] = \text{Credit Card Acceptance Score}$

%86 *true decisions*

3.4 *times more efficient*

Detection Ratio among Customers who will Accept Credit Card





A revolutionary way of interaction for business users to
make predictions using automated machine learning

Predictive BI Software



Predictive Storytelling



Enhance

Explore the depths of the stories between variables



Predict

Develop robust prediction algorithms in a matter of minutes



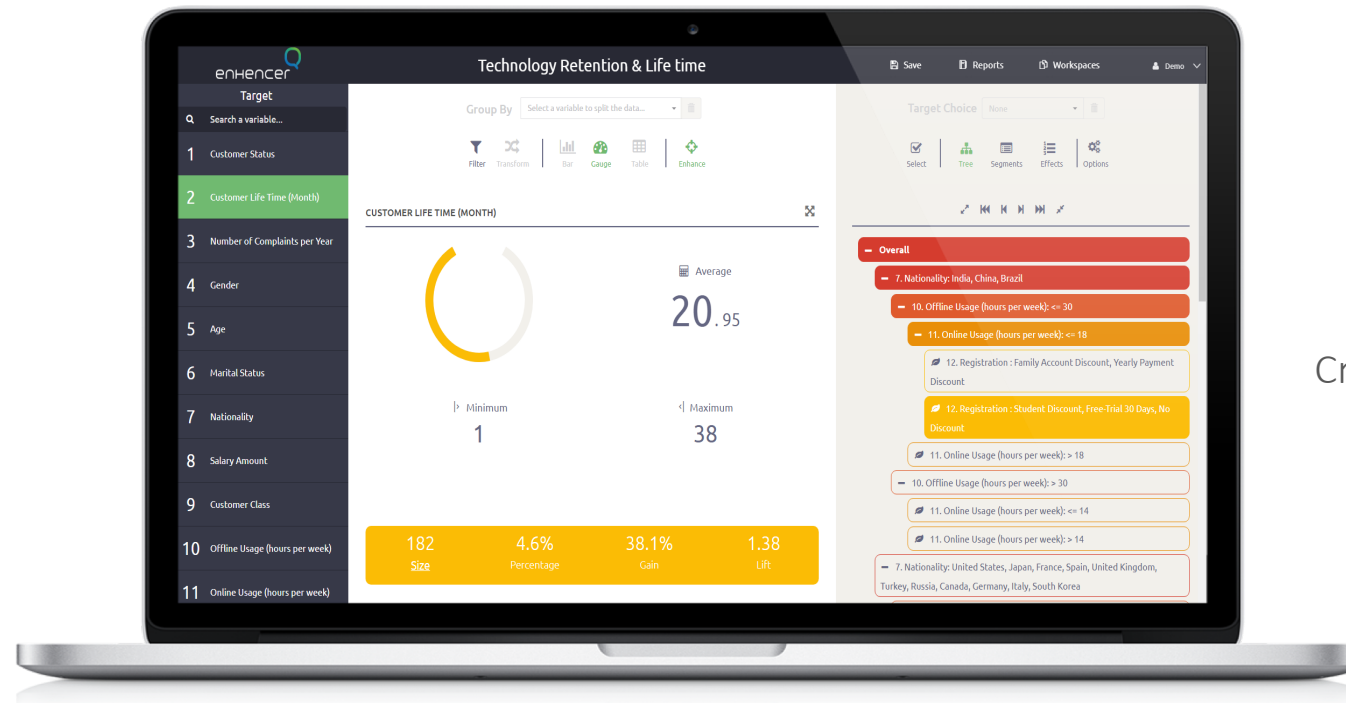
Connect

Connect to your tables in the database or import data files



Integrate

Create prediction function in any format to get analytical actions



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