I-BiDaaS Real – life industrial and operational experiments

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Different and international competitive scenarios have been selected for developing, implementing and evaluating the real-world industrial experiments in the EU H2020 I-BiDaaS project. Three data providers, namely CAIXA (CaixaBank), CRF (Centro Ricerche FIAT SCPA) and TID (Telefonica I+D), belonging to the banking, manufacturing and telecommunication sectors respectively, have defined eight real-world, industry-lead experiments where I-BiDaaS solution is being tangibly validated.

No.	I-BiDaaS Use Case	I-BiDaaS Dataset	Data Provider
1	Accurate location prediction with high traffic and visibility	**Mobility Data** (Synthetic)	TID (Telecommunications)
2	Optimization of placement of telecommunication equipment	**Mobility Data** (Synthetic)	TID (Telecommunications)
3	Quality of Service in Call Centers	**Call Center Data** (Real & Synthetic)	TID (Telecommunications)
4	Enhance control of customers to online banking	**Online Banking Control** (Real Tokenized)	CAIXA (Banking)
5	Advanced analysis of bank transfer payment in financial terminal	**Bank Transfer** (Real Tokenized)	CAIXA (Banking)
6	Analysis of relationships through IP addresses	**IP Address** (Synthetic & Real Tokenized)	CAIXA (Banking)
7	Maintenance and monitoring of production assets	**SCADA** (Real Anonymized) **MES** (Real Anonymized)	CRF (Manufacturing)
8	Production process of aluminium Die-casting	**Aluminum Die-casting** (Real Anonymized & Synthetic)	CRF (Manufacturing)

I-BiDaaS Application to the Telecommunication Sector - TID

Telecommunications industry collects massive amounts of data that act as the catalyst for business improvement. TID is testing three use cases in order to

improve the customer experience by employing advanced Machine Learning techniques. Part of the effort of improving the customer experience is focused around the employment of voice activated bots that help the users accomplish tasks related to the network configuration and operation.

Use Case 1 - Accurate Location Prediction with High Traffic and Visibility

The first use case aims to optimize network operations by providing caches and optimal antenna locations. I-BiDaas is developing algorithms in order to improve the routing and placement of the telecommunication equipment that is already in place or arrange accordingly the new equipment obtained. The goal of this experiment is to test I-BiDaaS solution efficiency with respect to the prediction of places with high traffic and congestion events in order to optimise their resource distribution. For this use case, synthetic data have been used.

Use Case 2 - Optimization of Placement of Telecommunication Equipment

The second use case aims to improve routing and placement of telecommunication equipment that is already in place, or to arrange accordingly the new equipment obtained. Different analytics algorithms and data processing methods are applied to synthetic data. The goal of this experiment is to test I-BiDaaS solution efficiency with respect to the optimization of placement of telecommunication equipment.

Use Case 3 - Quality of Service in Call Centers

The third use case addresses the challenge of developing speech technologies that transform audio calls into relevant information for the call centre that can be used to assess its performance and/or to screen automatically phone calls. The objective of this experiment is to test I-BiDaaS solution efficiency with respect to the automatic predicting of customer satisfaction.

For Telecommunication use cases, anonymized/synthetic data are analysed to predict changes in the number of connected mobile phone users per sector and the Customer Satisfaction Index (CSI).

I-BiDaaS Application to the Financial Sector - CAIXA

CAIXA, as a representative of the financial sector in the project, is testing three use cases that revolve around the huge amount of data collected by the different sources (ATMs, online banking services, employees' workstations, external providers' activity, network devices, etc.).

Use Case 4 - Enhance control of customers to online banking

This use case of CaixaBank focuses on analysing the mobile-to-mobile bank transfers ordered through online banking (web and application). It focuses on assessing that the controls applied to authenticate the user are applied adequately (e.g., second-factor authentication) according to PSD2 regulation and depending on the context of the bank transfer.

Use Case 5 - Advanced Analysis of bank transfer payment in financial terminal

The second use case for CAIXA aims to detect the differences between reliable transfers and possible fraudulent cases, in particular, when the transfer is done outside normal physical office hours. The goal of this experiment is to test the efficiency of the I-BiDaaS solution in the context of anomaly detection in bank transfers from employees' workstations.

Use Case 6 - Analysis of relationships through IP address

The third use case for CAIXA aims to validate the usage of synthetic data and the usage of external big data analytics platforms. It is deployed in the context of identifying relationships between customers that use the same IP address in their connections to online banking. CAIXA stores information about their customers and the operations they perform (bank transfer, check their accounts, etc.) using channels such as mobile apps or online banking. The goal of this experiment is to validate the use of synthetic data for analysis, if the rules act in the same situations as with the real data and to test the time efficiency of the I-BiDaaS solution.

For financial use cases, data analysts are using synthetic/tokenized data for developing algorithms and tool performance testing or proof-of-concepts' validation skipping the strict security and privacy internal validation procedures of CAIXA.

I-BiDaaS Application to the Manufacturing Sector - CRF

Manufacturing industry, represented in the I-BiDaaS project by CRF, generates an enormous amount of heterogeneous data from various devices, systems and applications that enable manufacturers to develop new methodologies for the Big Data era. CRF is testing two use cases in order to demonstrate the ability to exploit I-BiDaaS solution to take profit of the near real-time shop floor data and to apply sophisticated statistical assessments.

Use Case 7 - Maintenance and monitoring of production assets

The first use case for CRF has been selected to use Big Data to optimise an industrial process in a plant and to set a predictive maintenance procedure. Predictive maintenance allows preventing faults before they happen by doing

maintenance at the right time (not too late or too early, to avoid inefficiencies). The goal of this experiment is to test the I-BiDaaS platform, using different methods adapted to different users (expert/ non-expert) across silos: different companies, departments and competences are involved.

Use Case 8 - Production process of aluminium casting

The second use case for CRF aims to improve the quality of the process, to make it more stable and to cut costs to repair or rework the engine defects. Big Data analysis aims to improve the quality of processes, with the aim of finding the most significant parameters to monitor and control. The goal of this experiment is to test the efficiency of the I-BiDaaS solution in the context of correlating defects with the production process parameters and resetting these to prevent repairs and reworks.

For the Manufacturing use cases, data analysts are using real or anonymized data, retrieved from the production lines, used for continuous improvement of algorithms in order to avoid cost breakdown, micro or macro stoppages and decrease of quality level. Unnecessary actions, such as preventive or planned maintenance, retooling, refurbishing, or repair of products, will be drastically reduced.

Outputs from all real-life industrial experiments are collected and analysed to determine the efficiency, operability, usability, robustness, performance, and privacy awareness of the experiments.

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