Business intelligence and data modelling (BI Platform)

SKYTOLL

Business Intelligence (commonly referred to as BI) is a tech-driven approach that employs data and analytics to identify, process, and present actionable information. In simpler terms, **BI transforms raw data into meaningful insights**. This enables companies to understand business operations better, make informed decisions, and anticipate future trends. Through BI, companies can **make data-driven decisions**, increase their **operational effectiveness**, understand their customers, and recognize market trends.

Leveraging almost 15 years of expertise in the domain of intelligent transport information systems - and from the utilities domain - we've developed **specialized BI platforms** tailored to various business needs. Our knowledge encompasses the **entire BI process**, from creating data architectures to establishing extraction-transformation processes, and finally, integrating straightforward reporting tools. Notably, our platforms are equipped to **process tens of millions of records daily**, maintaining consistency and reliability.

Our BI Process

- **Data Extraction** – We tap into multiple sources to gather raw data relevant to your business. Our knowledge of the tolling systems domain offers us an advantage in data extraction accuracy.

- **Transformation** – Drawing from our history of handling diverse transport data types from satellite GNSS, through ANPR and GSM, we refine and process the data to ensure it's accurate, reliable, and ready for analysis.

- **Loading** – After refining, the data is transferred to a dedicated environment where it is stored and made accessible for reporting and analysis.

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More information:
qrfy.com/p/2023_bi

- **Reporting and Analysis** – Once securely loaded, the data serves as a foundation for insightful reports and in-depth analyses. This step transforms the stored data into actionable insights, helping businesses make informed decisions and plans. Our experience with tolling and utilities systems and their various components allows us to understand and implement customer's reporting needs.
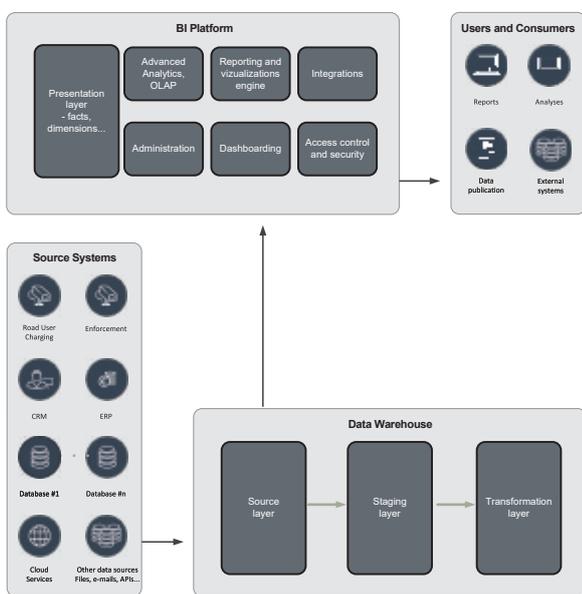
Core Features of Our BI Platform

- **Scalability** – As often required for handling vast transport datasets, our platforms are built to handle large data volumes, with the capacity to process tens of millions of records each day.

- **End-to-End Solution** – Drawing from our comprehensive work in intelligent transport information systems, we provide a thorough BI solution, encompassing everything from data extraction and transformation to analysis and reporting.

- **Comprehensive and Clear Reporting** – Our platforms are adept at generating comprehensive reports, granting businesses a deeper insight into their operations.

- **Export Capabilities** – Our platform supports efficient exporting of data and reports in multiple formats and through various delivery methods (CSV, XML, e-mail, web services, database link, etc.). This also allows sharing of the selected data and reports with third parties and systems, such as local authorities or research organizations, if required.

- **Customizability** – The solution is adaptable to different business requirements - whether you require a complex data warehouse or a straightforward reporting solution, our platform can be tailored to your needs. Our involvement with integrating satellite GNSS, microwave DSRC, ANPR, smart metering and other technologies gives us the ability to develop ingestion of data from any data interface. Sharing of the data or reports via any required communication channel is possible, as is advanced data processing, including various machine learning techniques.

- **Access control** – Control over platform access, report viewing, and data exports can either be managed via the platform or integrated into the customer's existing access control framework (such as Active Directory).

Example system architecture

The following diagram presents a possible architecture of the solution. In this case, the BI platform is built on top of a Data Warehouse – either pre-existing or supplied as a part of delivery.

In this sample architecture, the data is extracted from the source systems (such as the tolling system, CRM, ERP, relational databases, and other sources) and stored in the data warehouse. On top of the data warehouse, the BI platform itself is built, covering all the previously mentioned functions via dedicated modules. Finally, the resulting reports and analyses are made available to the users and other consumers (i.e., external systems and third parties).
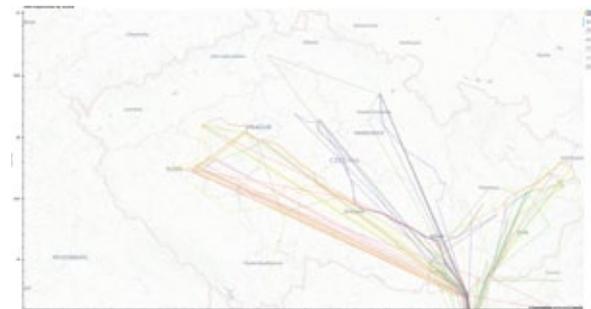
An alternative architecture could be a standalone self-contained platform, handling the ETL process, storage aspect, and Business Intelligence features in one solution.
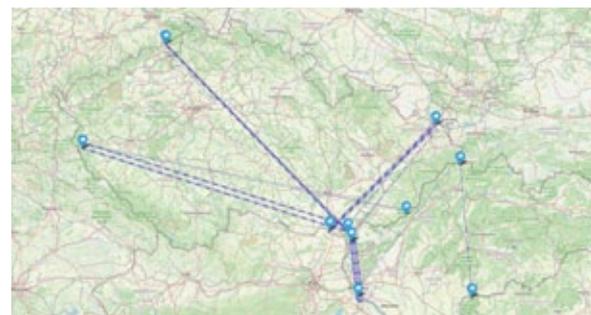
Example reports and visualizations
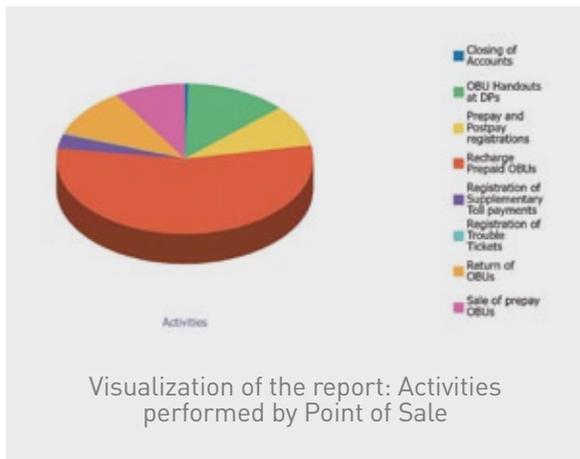
Visualizations:

Aggregated visualization of alarms from distributed devices

Detecting and visualizing anomalous vehicle trajectories

Visualization of the volume of vehicle transits through the region

Visualization of the report: Activities performed by Point of Sale

Reports:

• Enforcement reports
Enforcement events per period or area, Enforcement events per type or equipment type, statistics of LPNs, images, device communications...

• Accounting reports
Supplementary toll, Prescribed toll accounting, payments, debt transactions...

• Data look-up reports
Search for LPN, customer, location history etc.

• Other reports
Reports for administrative procedures or offenses, KPI (key performance indicators) reports, equipment failures etc.

Why Choose Our BI Platform?

• Proven Track Record
We've successfully delivered several DWH and BI projects over the years, showcasing our consistency and capability.

• Tailored Solutions
With a background in creating custom transport solutions, we're adept at tailoring our BI platforms to meet your specific requirements and legislative constraints.

• Versatility in Expertise
Whether you need a robust BI platform to manage large amounts of data or a simpler solution for straightforward reporting, our team is able to handle both complex and simple tasks.