



IoT business tool to increase efficiency and safety of cement transportation



Accelerate performance

- Compares the distribution operations schedule to their actual execution in order to enhance visibility of operations and ensure in time, in full, safe and correctly invoiced cement shipments. Combines distribution activity with inbound logistics
- Validates transportation contract terms, calculates contractual and real transportation costs. Supports electronic assignment of transportation orders to drivers balancing workload, transportation safety and customer satisfaction
- Automatically supervises loading / unloading safety rules, monitors driving profiles
- Supports real-time collection of data, based on human transactions (e.g. daily check-list filled by drivers / inspectors at warehouses)
- Enhances protection from product shrinkage

IoT technology

- e-TRACK on-board unit integrating a network of sensors is installed on the cement silo trucks to automatically acquire real-time operations data

- Itinerary data
- Identity of persons and assets
- Loading / Unloading safety transactions
- Silo pressure

- A mobile application is used to enhance operations efficiency and safety, communicating

- Transportation orders to drivers
- Drivers daily safety check list

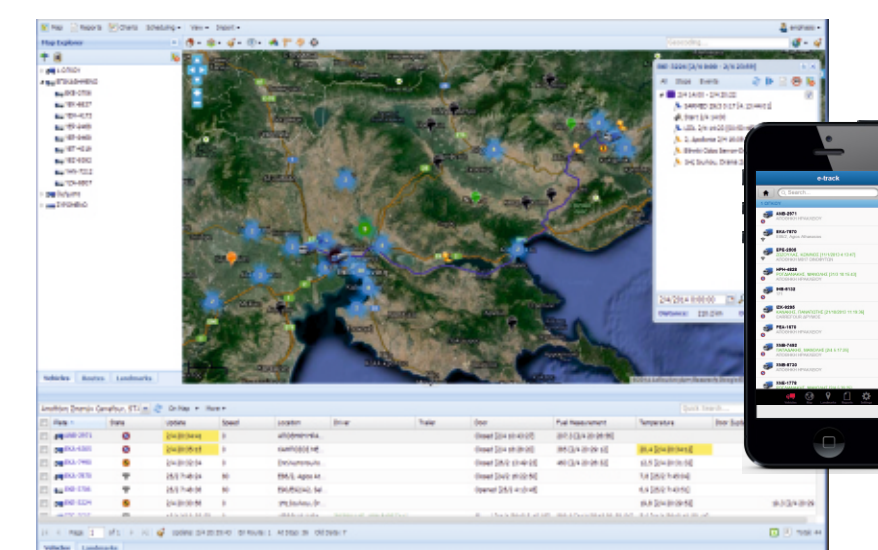
- Operations data are combined with business data, available in the corporate IT infrastructure (customer orders, transportation contacts and schedule), in order to evaluate KPIs on business efficiency, safety, cost and quality of service. Users receive exception notifications, ensuring fast reaction

Business Model & Corporate IT Infrastructure

- Fleet data
- Customer orders
- Distribution schedule

Field Operations Sensor Data & Mobile Transactions

- | | |
|---------------------------|--------------|
| Sensor data | Mobile data |
| • Silo truck localization | • Check-list |
| • Silo pressure / safety | |
| • Driver profile | |



KPIs Evaluation

- On-time delivery
- Actual cost per client

Operations Support

- Balance job assignments
 - Assign new job
 - Report on exceptions
- Notifications**
- Delayed delivery
 - Unsafe unloading process