Road Infrastructure Monitoring (Argus System)

Integer LLC

Soltuion outlook

- System capabilities

- Data sources

- Situations to be controlled

- Areas of solution application

- Creation of a single monitoring centre

- Integration capabilities

- Reference cases

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System capabilities

Implementation of Argus System solves following complex tasks:

- video monitoring of construction project implementation, monitoring of commissioning and subsequent operation of equipment

- monitoring of equipment operation quality, analysis and indication of possible causes of degradation and further failures

- control over the condition of road bed, complex engineering facilities and structures (bridges, tunnels)

- assessment and forecasting of traffic situation depending on current traffic conditions, weather forecast, time of a day, lighting conditions, season, etc.

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Data sources

The Argus System receives data from various sensors and systems used as data sources:

information from own systems of monitoring and control of power supply, ventilation, lighting, heating, SOS terminals, etc.

ESMS (engineering structures monitoring systems)

video cameras

lighting, temperature, humidity, carbon oxide concentration sensors, own weather stations

information from the Civil Defense and Emergency Situations Departments, Weather Service

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Situations to be controlled

- Monitoring of construction progress in the course of construction works, meeting construction schedules
- Monitoring of the quality of engineering equipment operation
- Data collection, analysis of failures and emergencies in equipment operation for the system training in subsequent predictive analytics
- Forecasting of failures and malfunctions based on ML data, planning of procedures and time limits for the Predictive Maintenance
- Forecasting of traffic situation depending on current traffic conditions, weather forecast, data from video analytics systems
- Monitoring of the conditions of road bed and road structures. Integration of IoT devices in a monitoring and decision-making system
- Keeping of preset safe climate and lighting conditions
- Registration of violations of the traffic rules, detection of road accidents, traffic jams, unauthorized stops (including those for repair)
- Visualization of places of events with geo-referencing or location in a structure

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Coverage

Bridges	Overhead roads	Tunnels	Roads
• Integration with ESMS (engineering structures monitoring system) • Monitoring of technical condition of bridges • Control of timely maintenance of bridges and their service systems	• Integration with ESMS (engineering structures monitoring system) • Automated record keeping of operation resources of overhead roads engineering systems • Control of timely maintenance of overhead roads and their service systems	• Carbon oxide level control • Ventilation systems control • Control of lighting, transport indications • Smart control of speed, traffic flows • Notification of the occurred and potential emergencies • Monitoring and provisions for vehicles safety in tunnels	• Road bed quality control: pits, potholes • Monitoring of foreign objects on roads • Road bed temperature control: • Traffic situation control: speeds of traffic flows, meeting the traffic rules, occurring accidents, vehicle parking

Creation of a single monitoring centre

For the purpose of easy and effective operation we can create a single monitoring centre on turnkey conditions with the following aims:
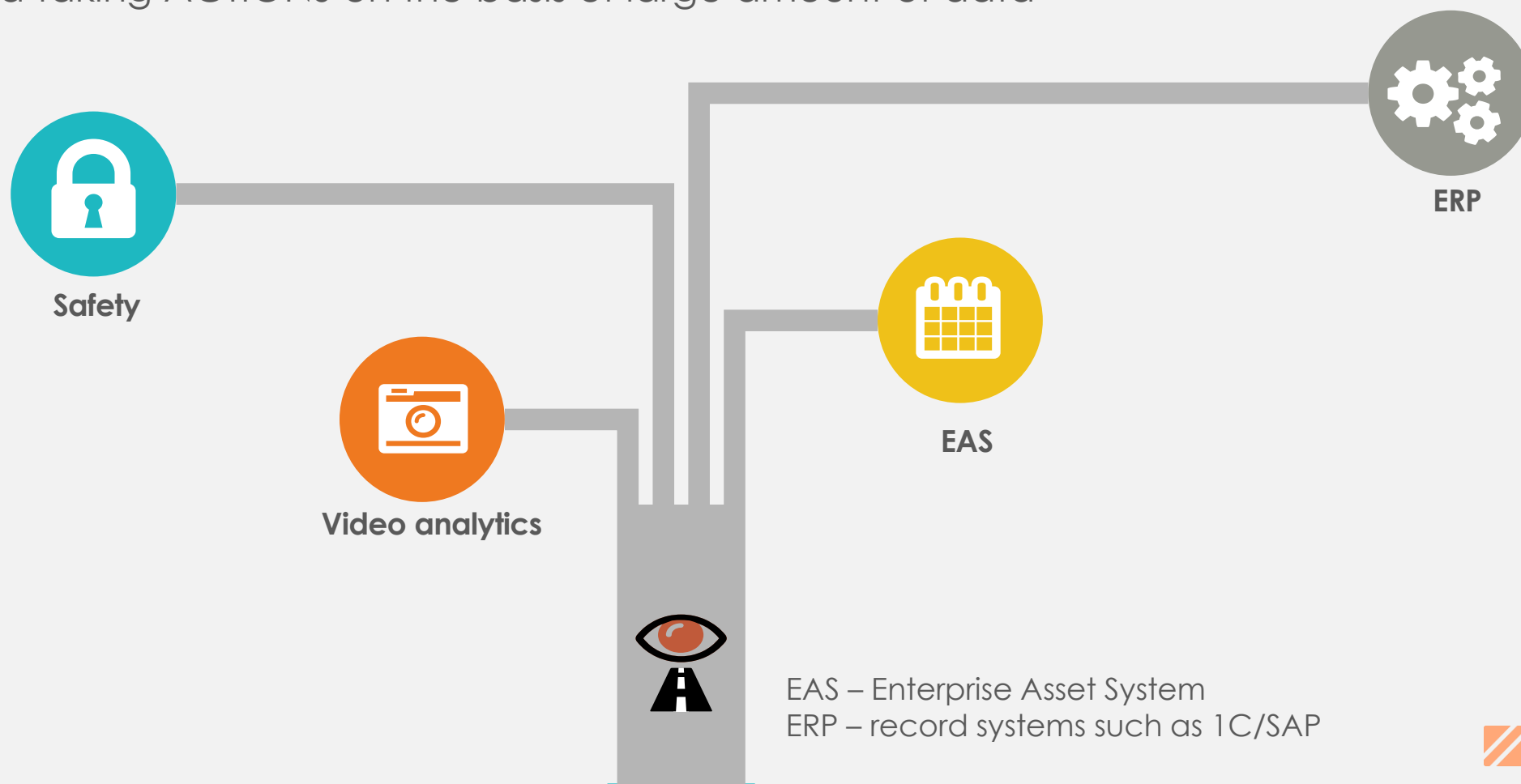
- Collection, accumulation and processing of a lot of reports and information

- Prompt analysis of information, making management decisions and implementation of measures

- Visualization of emergences on a videowall or at workplaces of duty personnel

- Single centre of communication and interaction of various services (ambulance, emergencies department, department of internal affairs)

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Integration with external systems

Integration of Argus with external systems provides a synergetic effect in making DECISIONS timely and taking ACTIONS on the basis of large amount of data

Safety

Video analytics

EAS

ERP

EAS – Enterprise Asset System
ERP – record systems such as 1C/SAP

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Examples of implementation

The following projects have been realized by now:

<u>with the Ministry of Defense institutions</u>
- analysis and visualization of vehicle movement data on the geophysical basis

<u>with the bank from the Russia's top 5</u>
- Video monitoring (video analytics in the 2nd phase) > 550 areas, with identification of abnormal behavior patterns

<u>with Rosavtodor</u>
- obtaining of information and monitoring of traffic situation from > 1000 sources of events, registration of climatic and weather conditions reported by weather stations

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