

The Atos logo is displayed in a large, white, sans-serif font.

Madrid: Situational Awareness Supporting Public Transport Passengers

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SMART CITIES DAY

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What triggers our work?

- Multiple initiatives work on improving mobility in cities
- Citizens are of very different nature and the required solutions are also heterogeneous
- How can we exploit emerging technologies for helping public transport passengers?



Atos

VE Semantic Discovery
VE Registry

VE Management

Data Analytics

Social Networks

Experience Sharing
Ranking and filtering

Machine Learning
Complex Event Processing

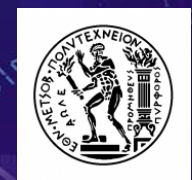


Data Management

Security & Privacy

Key Management
Encryption
Authentication and
Non-repudiation

Data integrity
Data preprocessing
Data storage and manipulation



Madrid Mobility Scenario **Atos**



Empresa Municipal de Transportes
Public Transportation Company



Rationale

Improve user experience of **passengers with special needs** and their **caregivers**

Technical Objective

Analyze user's context and react to changing conditions

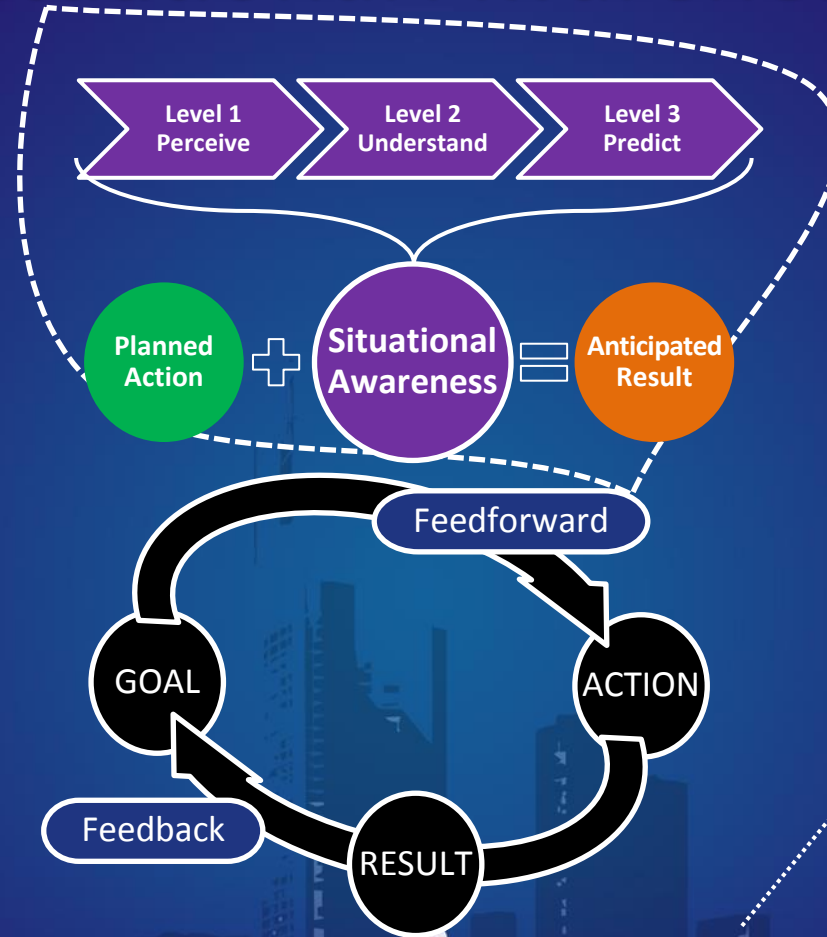
Approach

Monitor data from over 3000 heterogeneous sensors and use knowledge derived from historical and real-time data analysis

Use Case

Dynamic Traffic Jam Detection

Situational Awareness



The thresholds used in the equation that detects a good (or bad) traffic state

Define traffic congestion detection boundary automatically and optimally for predicting congestion points

1 - Cloud Data Storage

- Information datasources are connected to Apache Kafka
- Secor transforms data into Swift objects using Parquet format
- Objects are annotated with Metadata and indexed in ElasticSearch



2 - Machine Learning

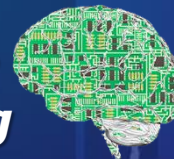
- Retrieves data from Cloud Storage using Metadata search
- Contextual Models with respect to time and day of week, max/mix speed values, location of buses or passenger, ...
- Exploit historical data for finding optimized threshold values



Spark



Machine Learning

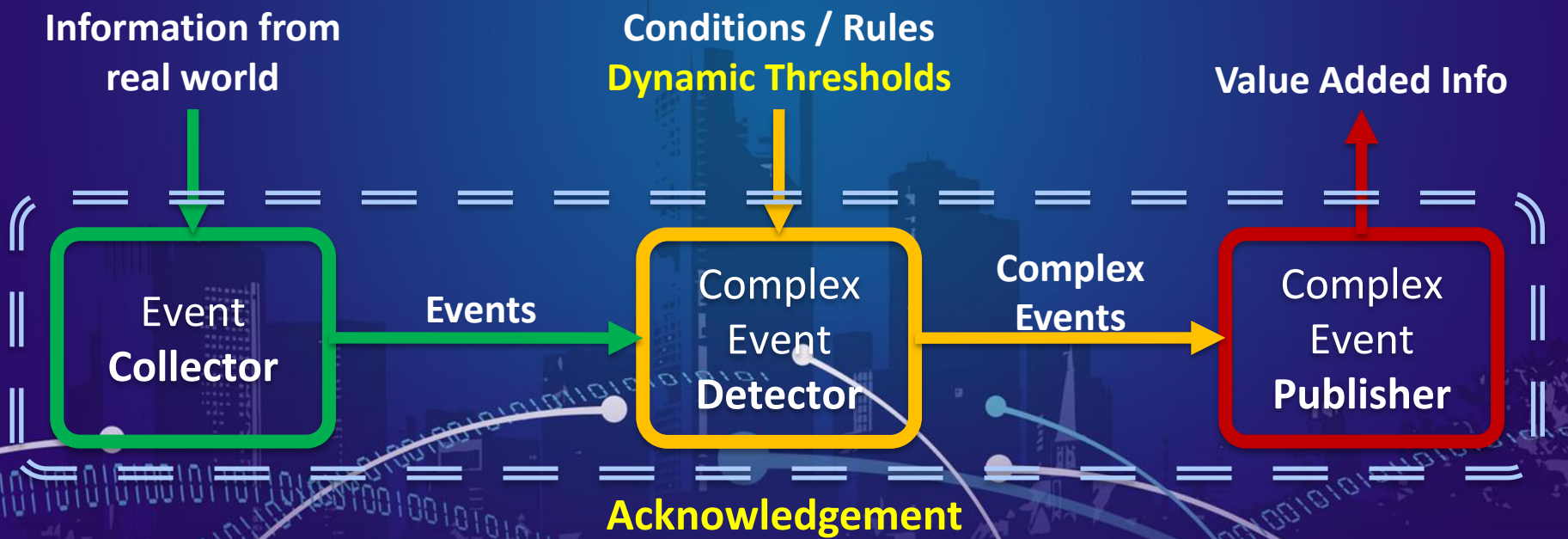


Acknowledgement

Adnan Akbar – University of Surrey, UK

3 - Complex Event Processing

- Making things aware of the conditions and events that impact their behavior
- ATOS μ CEP: Lightweight, small memory footprint, low consumption



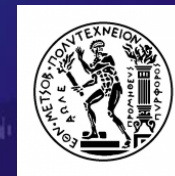
Future Work

- Applicability of IoT to this kind of services is a must for breaking the gap between technology innovation and society
- There is still a long trip till the exploitation of the full potential of the infrastructure deployed in cities
- Next step: Move from concepts, architectures and interfaces to a working implementation (less than 1 year)



Thank you

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