Operator Simulation Station at Hydropolis Water Institute

Piotr Słomianny, Michał Slósarz, Krzysztof Czupryński

mpwik wrocław

APOSTROPHE

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Agenda

- MPWiK Wroclaw
- Hydropolis Institute
- MPWiK PI System
- PI System in Hydropolis Institute
- New Challenges and Road forward

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- Established in 1871
- 700 employees
- Turnover: 100 mil euro
- 2 water treatment plants
- 1 wastewater treatment plant
- New Technologies Center and 2 research stations
- Hydropolis Institiute

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WATER DISTRIBUTION

- 2000 km
- Water production: 45 mil m^3 per year
- 48 000 water meters
- Grey cast/ductile iron, steel, PEHD, PCV
- ∅ 80 mm – 1200 mm

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WASTEWATER COLLECTION

2000 km

Wastewater:
51 mil m³ per year

77 wastewater pumping stations

Bricks, stoneware, concrete, PCV, GRP

Diameters

- up to 3,5 m

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HYDROPOLIS

- Education center
- 4 000 m²
- 8 unique zones
- 300 000 visitors per year
- Prestigious awards

DEMO

HYDROPOLIS

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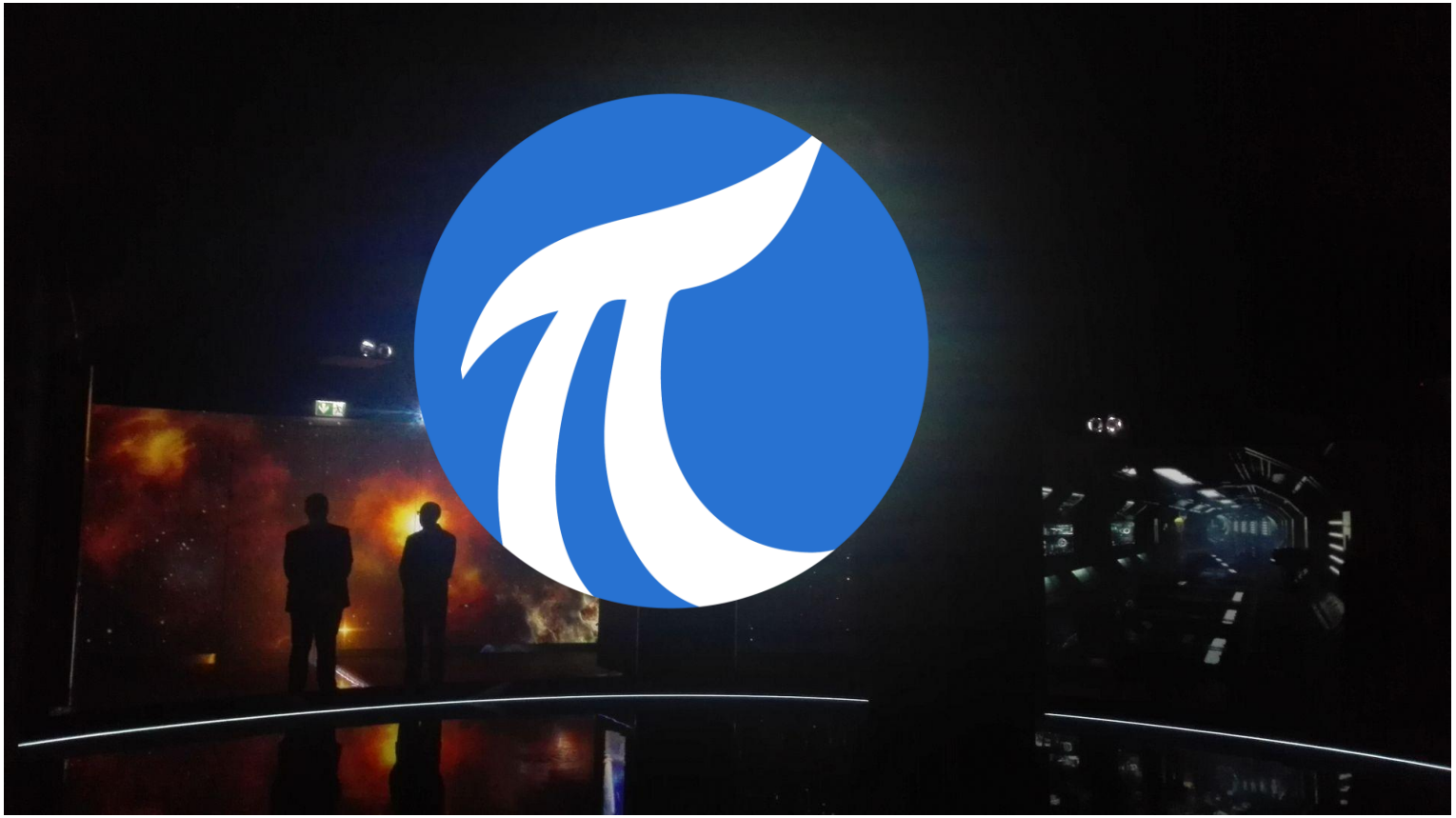
Hydropolis Institute – PI System



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PI System to connect all real-time data sources

- Water Production - Siemens SCADA
- Water Network – Flow Meters
- Pressure Meters
- Noise loggers
- Weather Station
- Sewage well level sensors
- Piezometers

Connect Point

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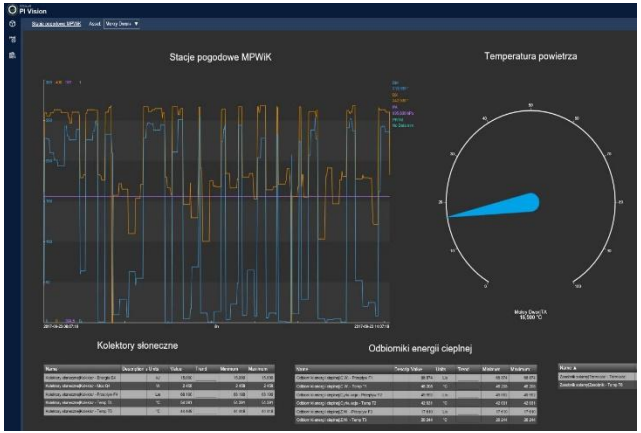
PI System Visualization



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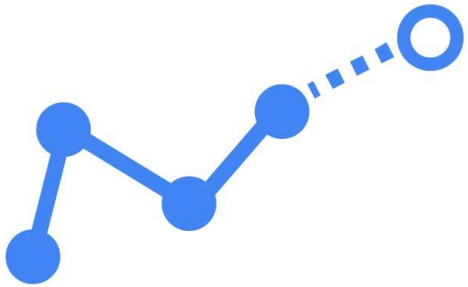
Red Carpet Incubation Program

The Red Carpet Incubation Program (RCIP) from Microsoft and OSIsoft helped MPWiK to connect production and customer

Data, we operate with Azure Machine Learning in:

- Forecast water demands for future scheduling (next 24 hours)
- Provide data relations allowing for the creation of predictive analytics models
- Schedule better pump and production planning



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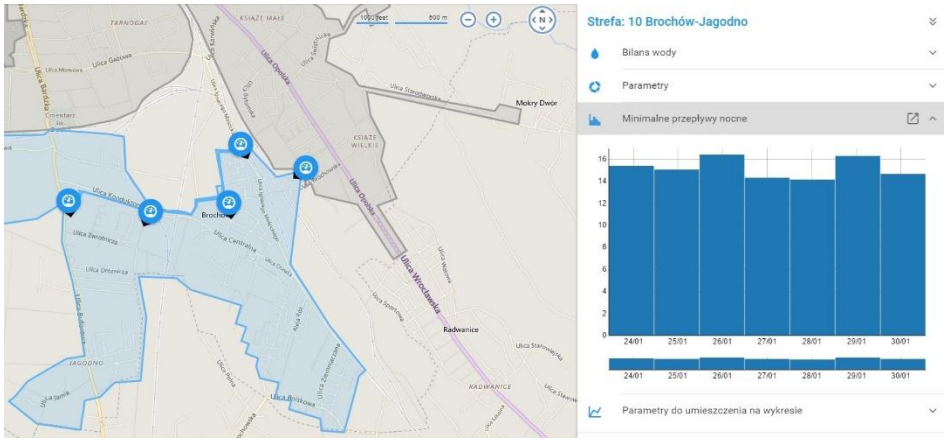
PI System connection to business intelligence and SmartFlow Prediction System

- Data from water production is visualized in the Tableau System
- PI system is a part of big data service infrastructure for delivering information about water leaks
  - Transfer data for Service
  - Notification about data transfer status
  - Maintain quality for DB connection



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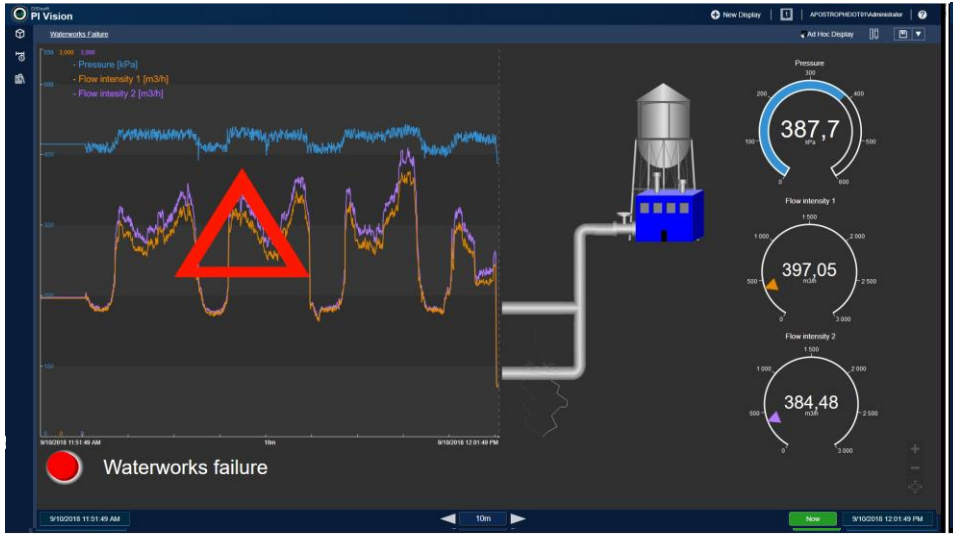
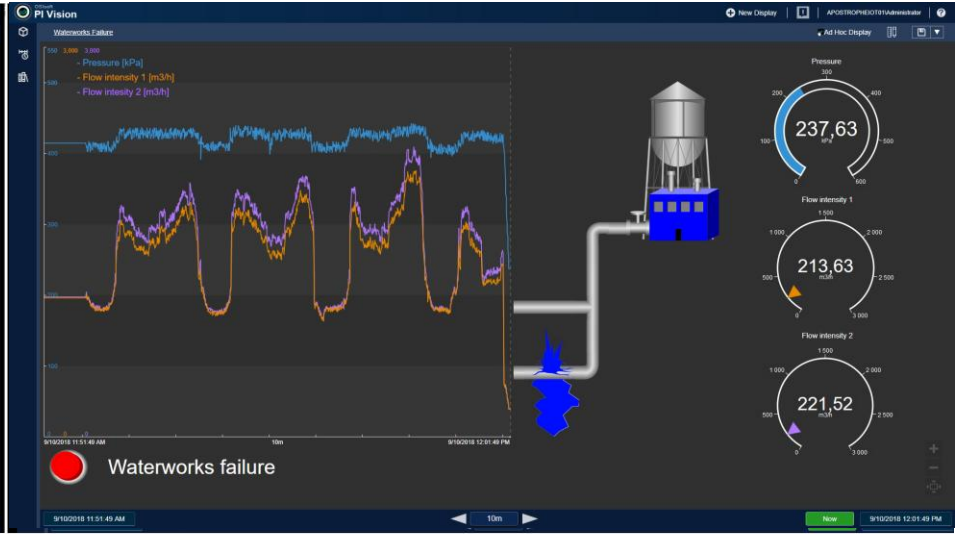
The Solution: PI System based simulation station showing real case events as viewed and resolved by MPWiK operators





Press the red Button to simulate a pipe break

First the operator sees a warning (prediction) and then sees the event happen

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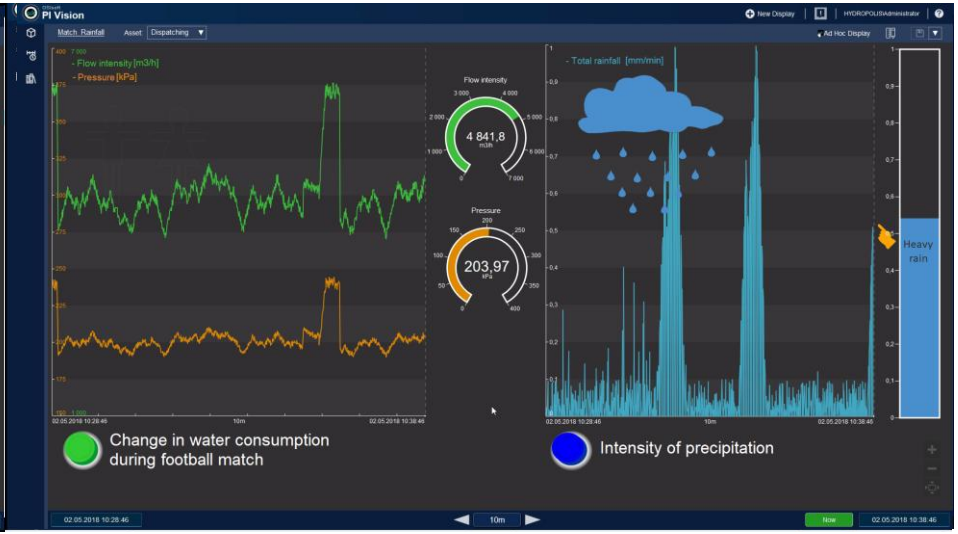
The Solution: PI System based simulation station showing real case events as viewed and resolved by MPWiK operators



Press the green to simulate a football match OR Press the Blue Button to simulate intense Rain Fall
First the operator sees a warning (prediction) and then sees the event happen

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DEMO

Football match demo

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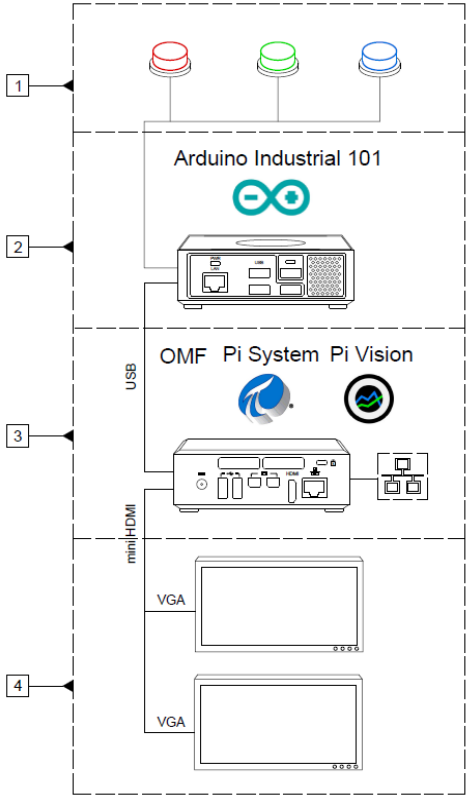
The Solution: PI System based simulation station showing real case events as viewed and resolved by MPWiK operators

APOSTROPHE

Operator Simulation using:

- **OMF** to integrate simulated data inputs from **Industrial Arduino**
- **PSA** used to initiate proper Video simulation played in unison
- **PI Event Frames** which captured specific events (football match, flooding or pipe break)
- **Automation** work to bring mechanical control buttons to Arduino



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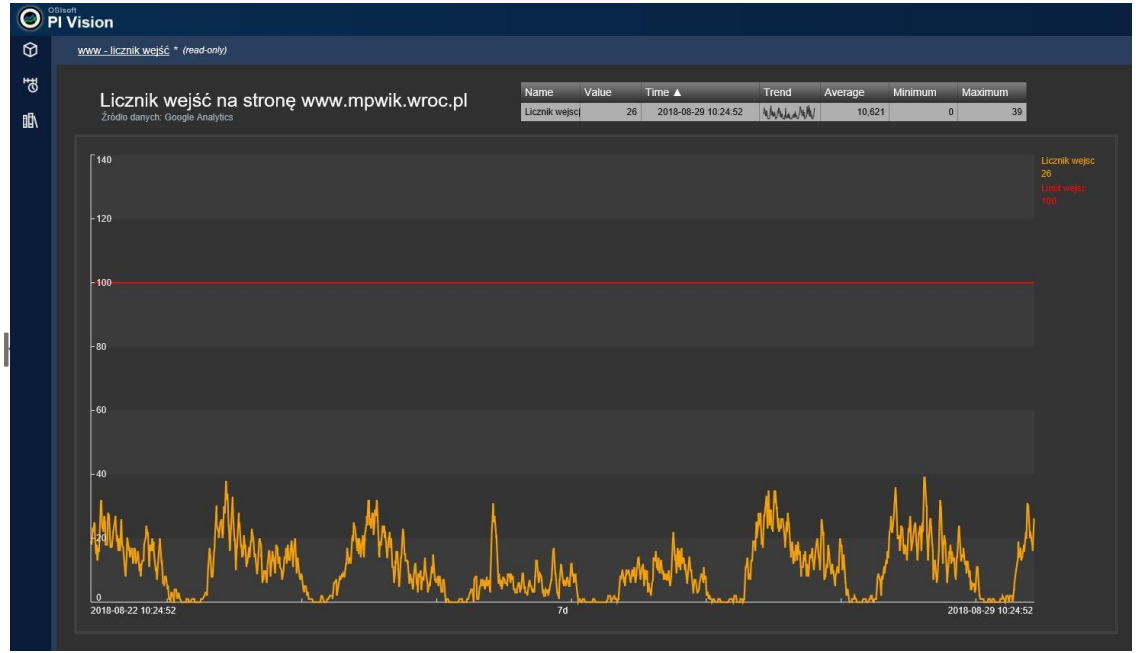
The Solution: PI System alert based on Google Analitycs stats

PI system is a part of communication system

- Connection to Google Analitycs platform
- Verification of number of users logged on the MPWiK website and alerting MPWiK support after exceeding 100 sessions
- Quick response to breakdowns



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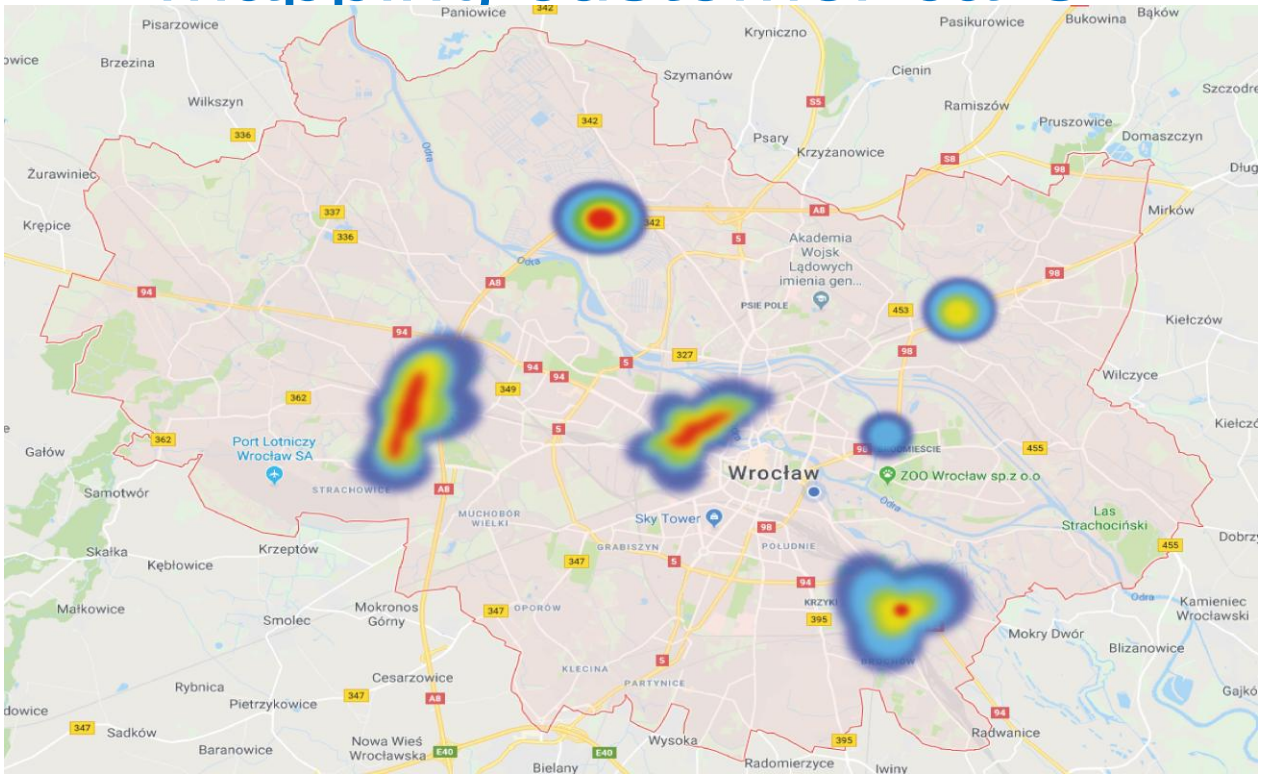
Quick definition of breakdowns location by mapping customer calls



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Operator Simulation Station at Hydropolis Water Institute

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CHALLENGE

One of MPWiK's task in the city is to educate and inform the people of Wroclaw about how important water is and what MPWiK does

- Teach people how certain events impact water production
- Show how people can save water
- Achieve our strategic goals

SOLUTION

The PI System infrastructure used in MPWiK shows specific events on the Operator Simulation Station.

- The Hydrpolis started the partnership with OsiSoft – educational license
- The exhibit was created to show how water impacts society
- We launched this exhibit for visitors.

RESULTS

Hydropolis Operator Simulation Station is one of the most popular exhibits in the Institute.

- Every year, over 300 000 visitors can see this exibit
- Poeple visiting Hydropolis know more about how we function now

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Speakers

- **Piotr Słomianny**
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- CFO/CIO
- MPWiK Wroclaw

- **Michał Ślósarz**
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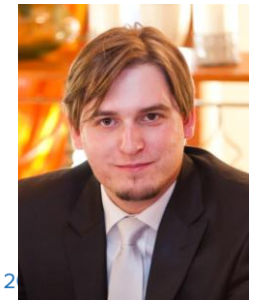
- IT Manager
- MPWiK Wroclaw



- **Krzysztof Czupryński**
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- CTO
- Apostrophe IT Sp. z o.o.

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Questions?

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