



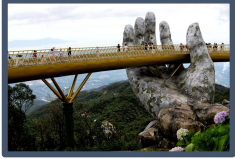
sensoworks
SENSING THE FUTURE

**The future of infrastructure monitoring and
construction sites**



TECHNOLOGIES FOR THE SUPPORT OF MONITORING

INDEX



Context



Bidirectionality of solutions: sensing and acting



Functions of an IoT monitoring platform



Open Source technologies for IoT functionalities



Examples

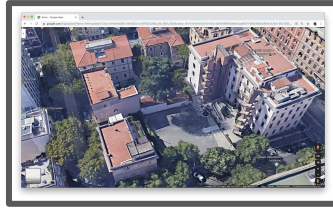


Examples

Highways



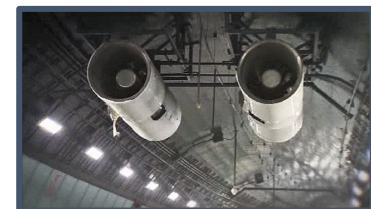
Buildings



Tunnels



Tunnels' Fans



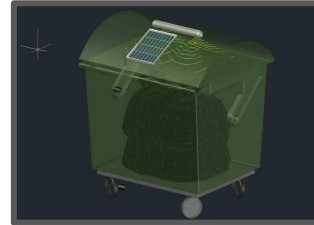
Sewers



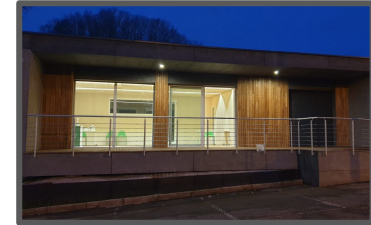
Wrong-way
detection



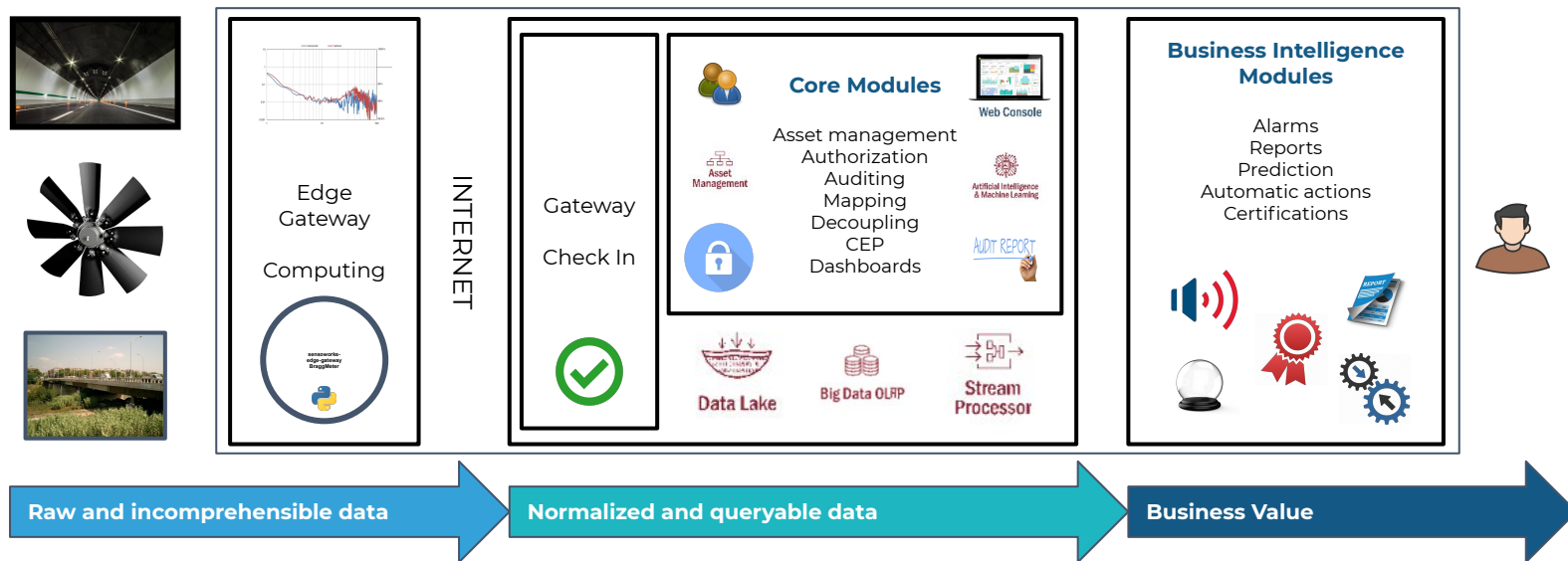
Waste
Management



e-Pop-Zeb



From raw data to business value



#edgecomputing

#sensing

#cloud

#microservices

#iot

#bigdata

#prediction

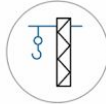
#blockchain

#bi

Features of a Monitoring Solution

INNOVATIVE NON-INVASIVE SENSORS

CONSTRUCTIONS



HIGHWAYS



TUNNELS



BRIDGES



SEWERS



PLATFORM



Functionalities

SENSORS MONITORING

- Ground movements
- Structure load variations and deformations
- Vibrational states and stress caused by external forces
- Structural shifts

AUTOMATIC ACTIONS

- Remote control of devices
- Customizable alarms for anomalous measurements sent via email, social, text message or a phone call
- Danger alerts sent to facility management

CUSTOMIZABLE REPORTS

- Big data generated by the sensors is collected and stored to generate periodic and customizable PDF reports
- Get insight information on the infrastructure's health status and any possible deterioration

PREDICTIVE MAINTENANCE

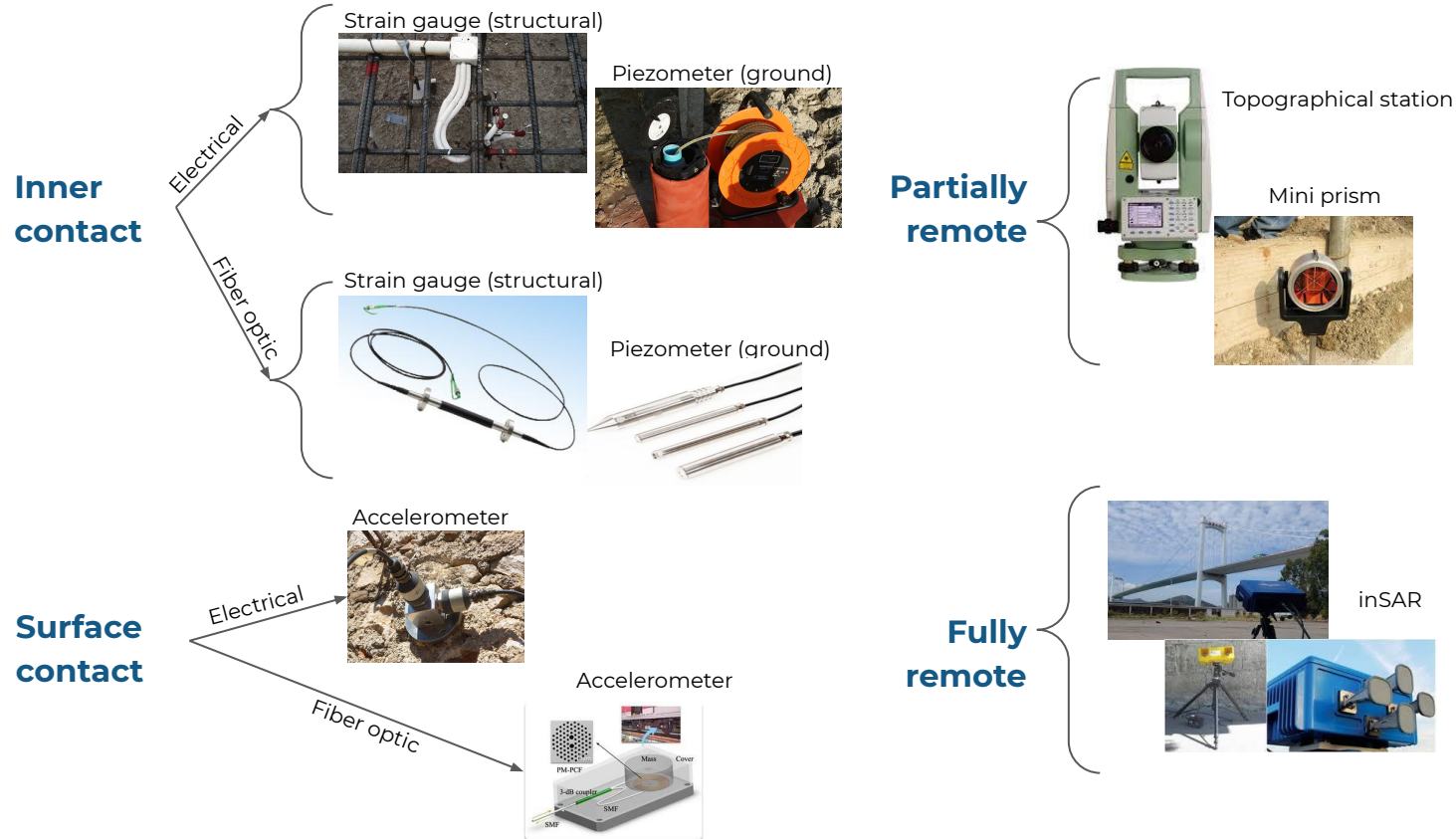
- Fire prevention
- Time before breakdown calculation
- Future costs and intervention evaluation
- Prevention of total/partial structure failure

BLOCKCHAIN CERTIFIED

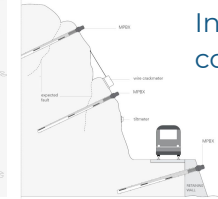
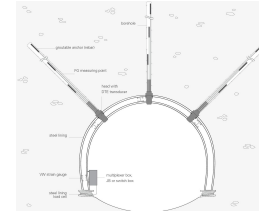
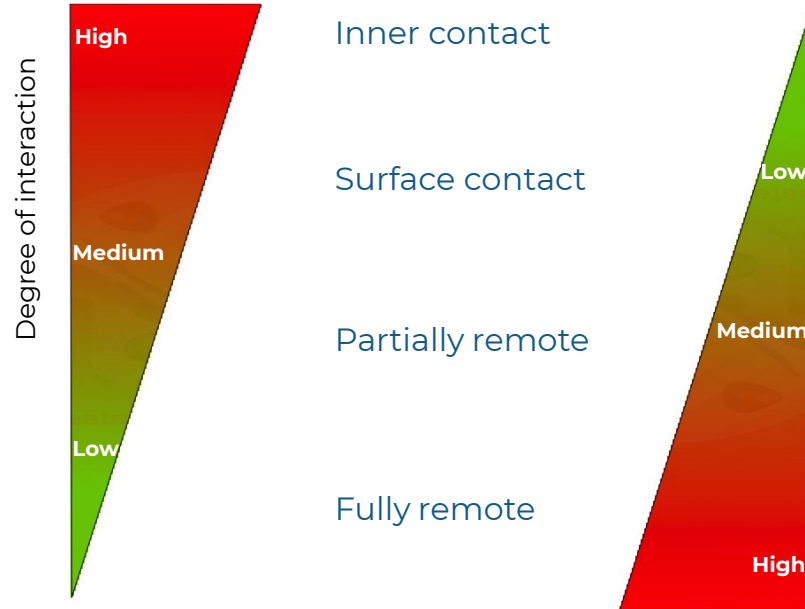
All data collected is guaranteed by blockchain, a shared and immutable data structure whose content once written is not editable or deletable.



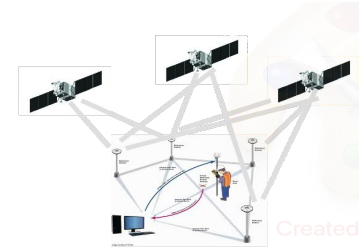
Types of monitoring



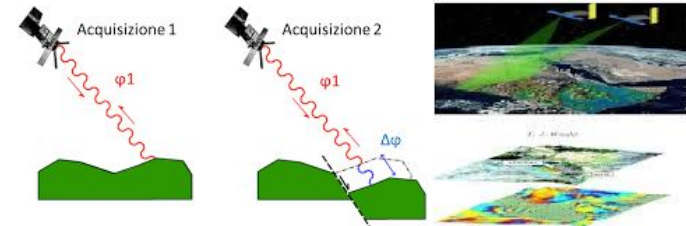
Types of monitoring



Inner/surface contact sensors



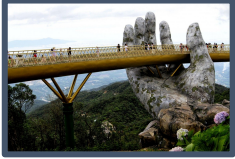
GNSS



InSAR



INDEX



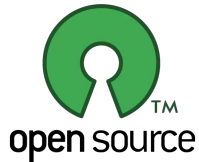
Context



Bidirectionality of the solutions: sensing and acting



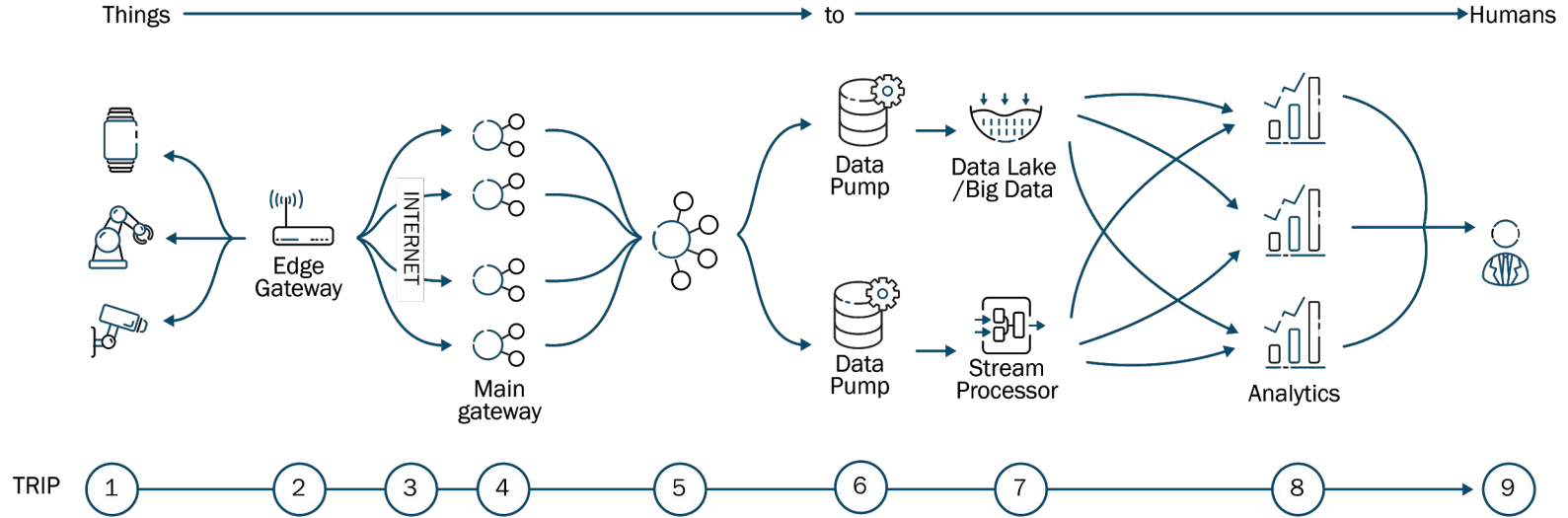
Functions of an IoT monitoring platform



Open Source technologies for IoT functionalities

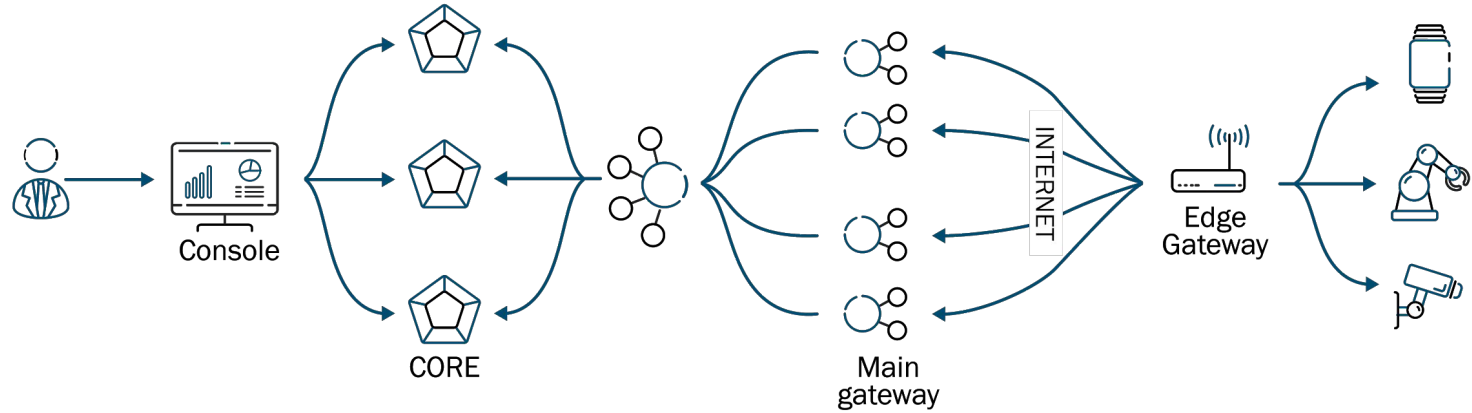


From Things To Humans



From Humans To Things

Human → to → Things



INDEX



Context



Bidirectionality of the solutions: sensing and acting



Functions of an IoT monitoring platform

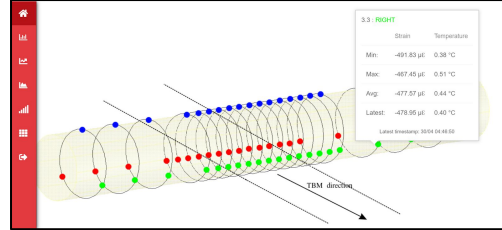
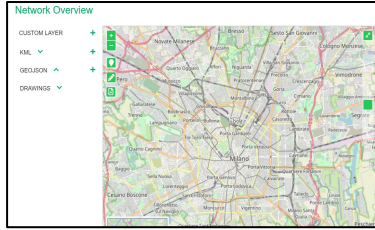


Open Source technologies for IoT functionalities

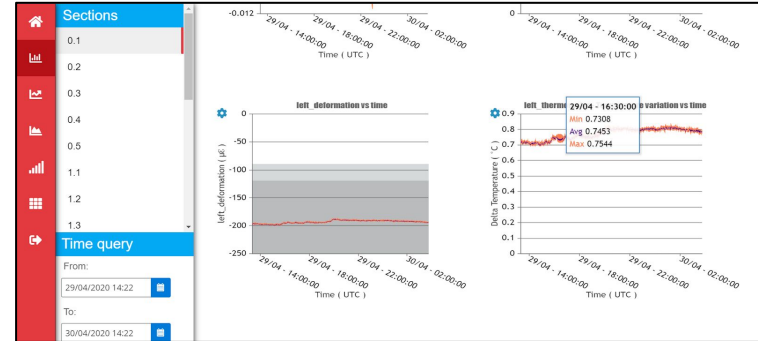
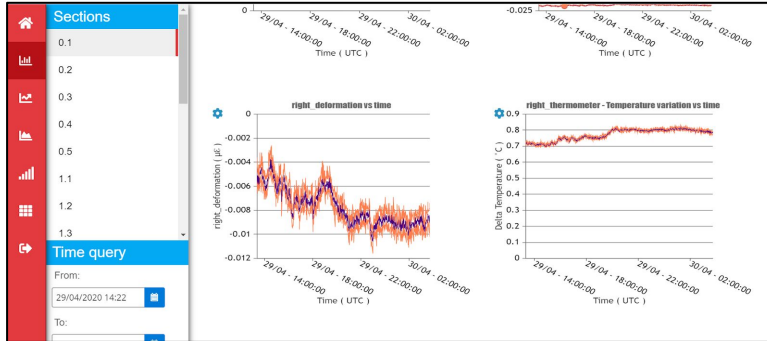


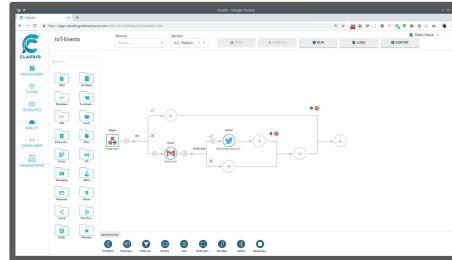
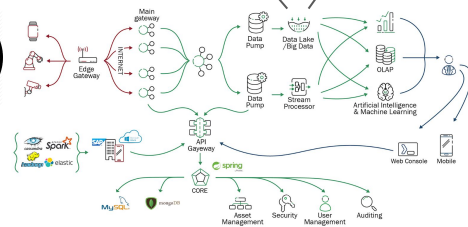
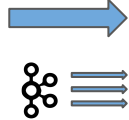
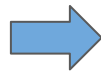


Navigate into the collected data



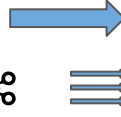
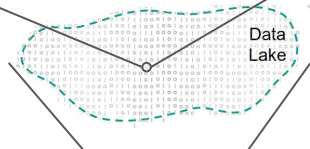
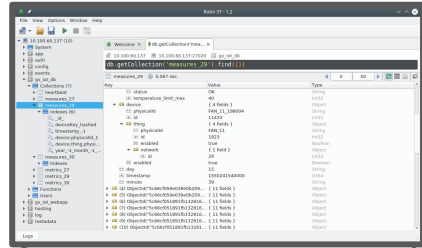
Device	Min Value	Average Value	Max Value	Latest Value	Latest UTC Timestamp
deformation_lateral	0.02 mm	0.02 mm	0.02 mm	0.02 mm	30/04 04:46:50
deformation_vertical	-0.02 mm	-0.02 mm	-0.02 mm	-0.02 mm	30/04 04:46:50
deformation_left	-200.01 $\mu\epsilon$	-192.82 $\mu\epsilon$	-186.89 $\mu\epsilon$	-193.64 $\mu\epsilon$	30/04 04:46:50
deformation_right	-0.01 $\mu\epsilon$	-0.01 $\mu\epsilon$	-0.00 $\mu\epsilon$	-0.01 $\mu\epsilon$	30/04 04:46:50
deformation_upper	-369.35 $\mu\epsilon$	-363.78 $\mu\epsilon$	-358.76 $\mu\epsilon$	-364.23 $\mu\epsilon$	30/04 04:46:50
thermometer_left	0.69 °C	0.78 °C	0.83 °C	0.79 °C	30/04 04:46:50
thermometer_right	0.69 °C	0.78 °C	0.83 °C	0.79 °C	30/04 04:46:50
thermometer_upper	0.11 °C	0.20 °C	0.25 °C	0.22 °C	30/04 04:46:50



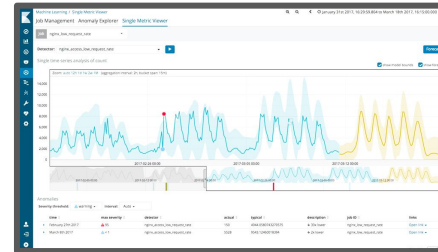
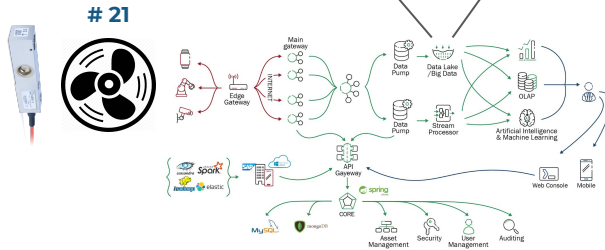
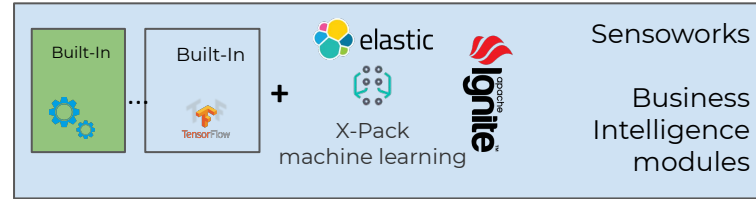
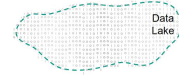


FAN # 21 is not working nominally.
Rotation frequency went out of range.
Limit was 1500 rpm.
Detected 1765 rpm

Predictions



...



FAN #21
is likely to be failing
in 2 months



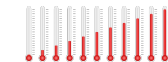
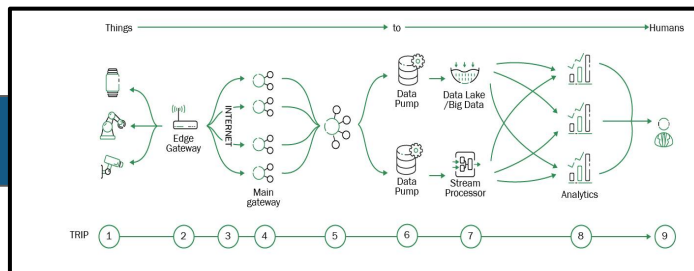
Automatic actions



Temperature is increasing



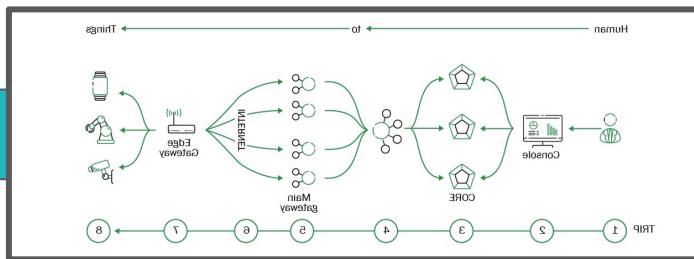
Sensing



FAN #21 is not working nominally. Temperature is too high



Acting





Data certification

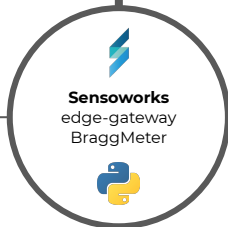


Fiber cable

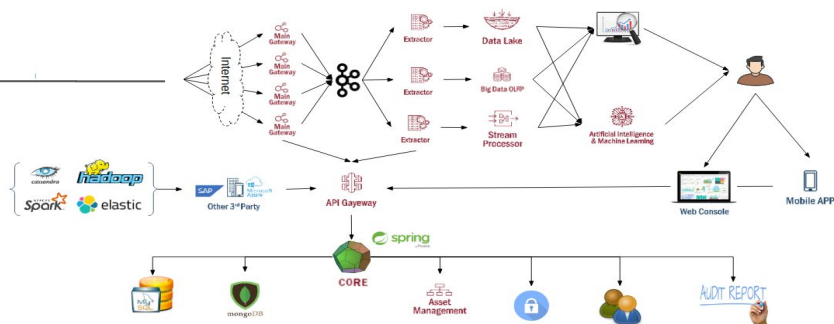
LAN cable



Run



BLOCKCHAIN



INDEX



Context



Bidirectionality of the solutions: sensing and acting



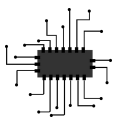
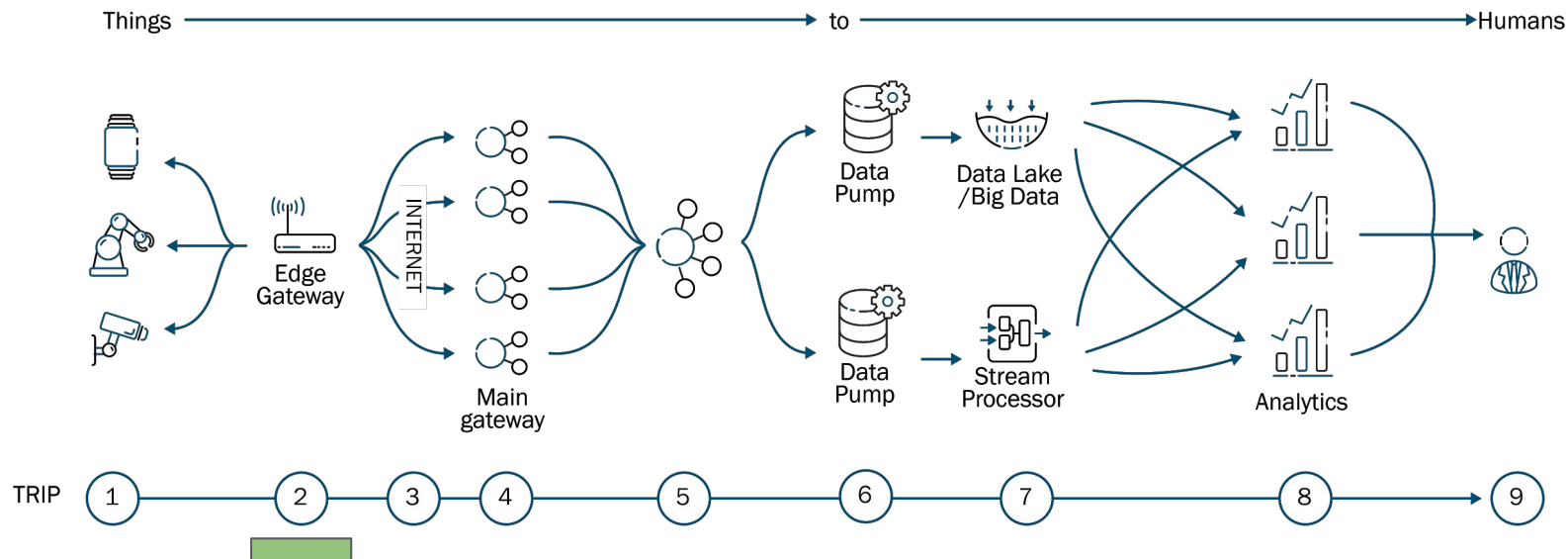
Functions of an IoT monitoring platform



Open Source technologies for IoT functionalities



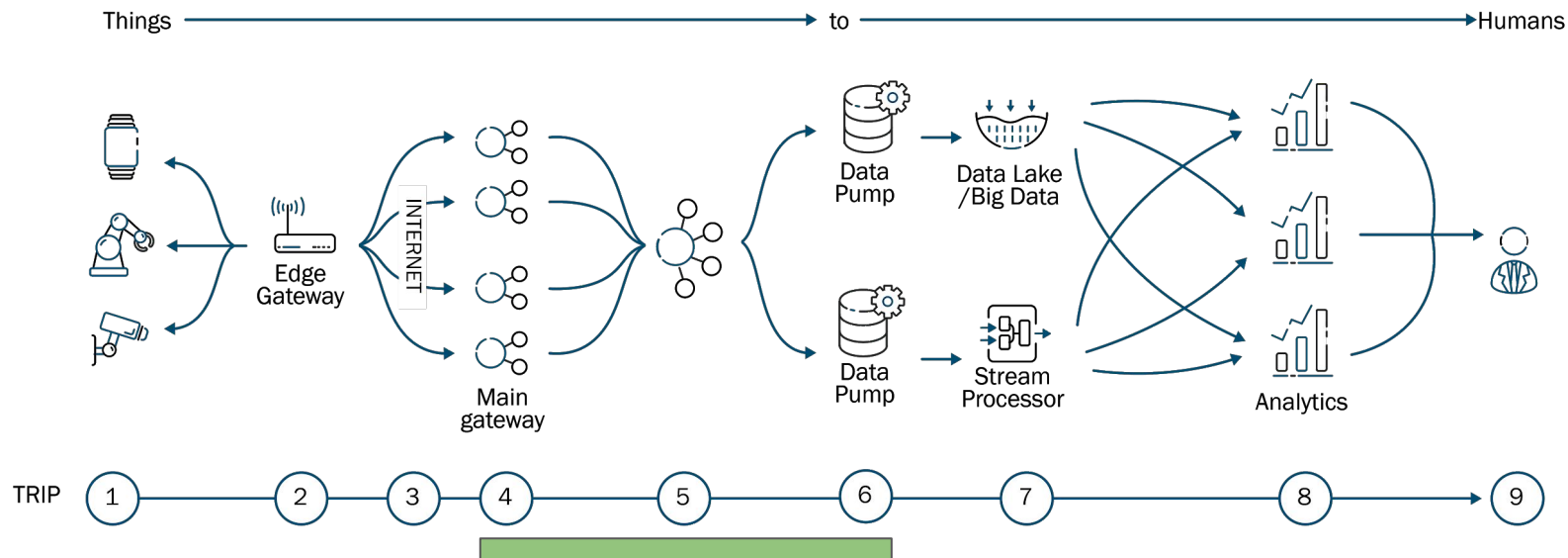
From raw data to business value



+



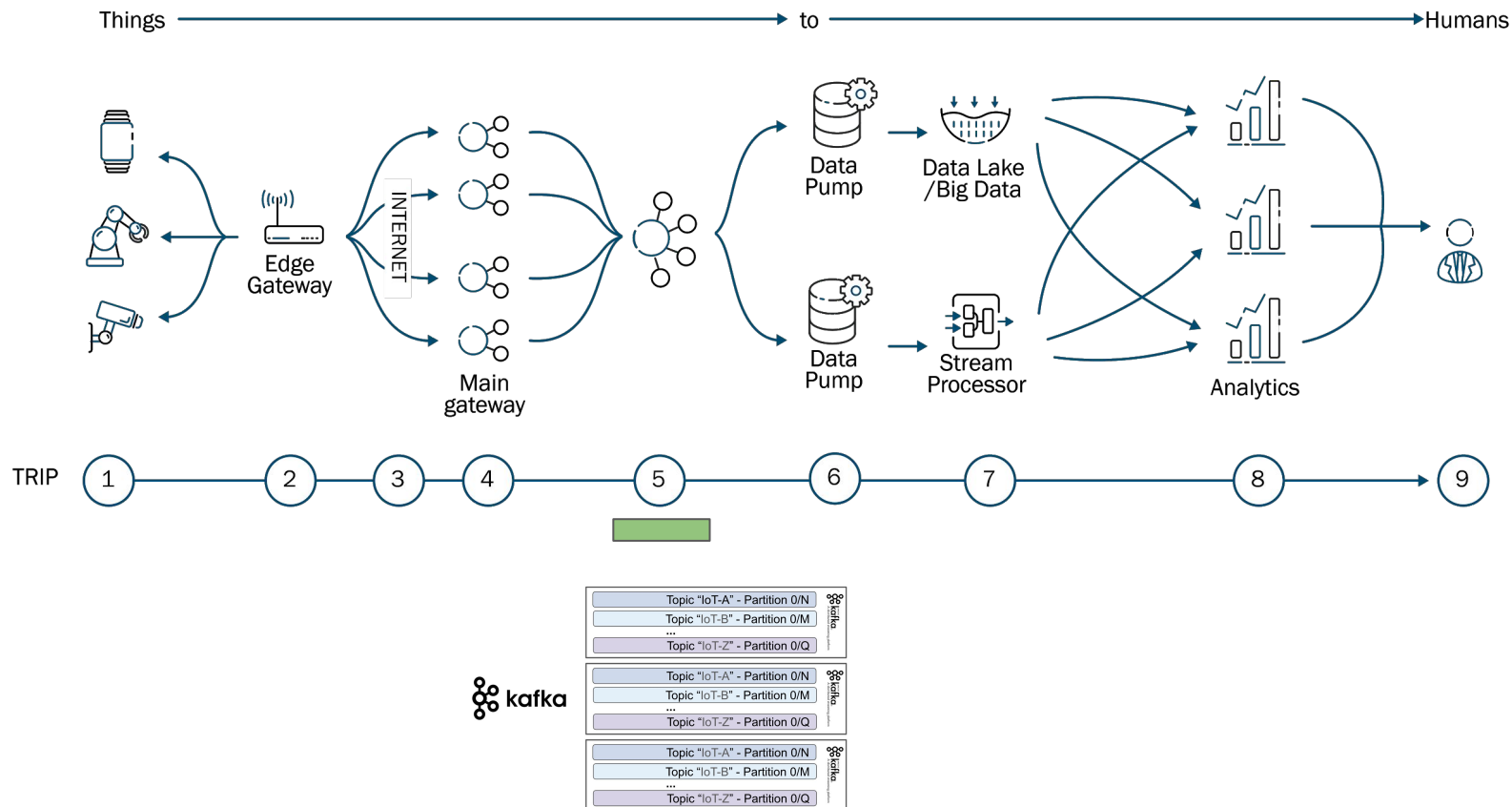
From raw data to business value



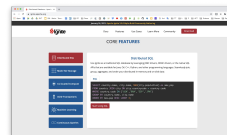
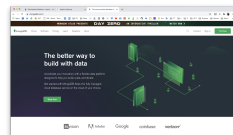
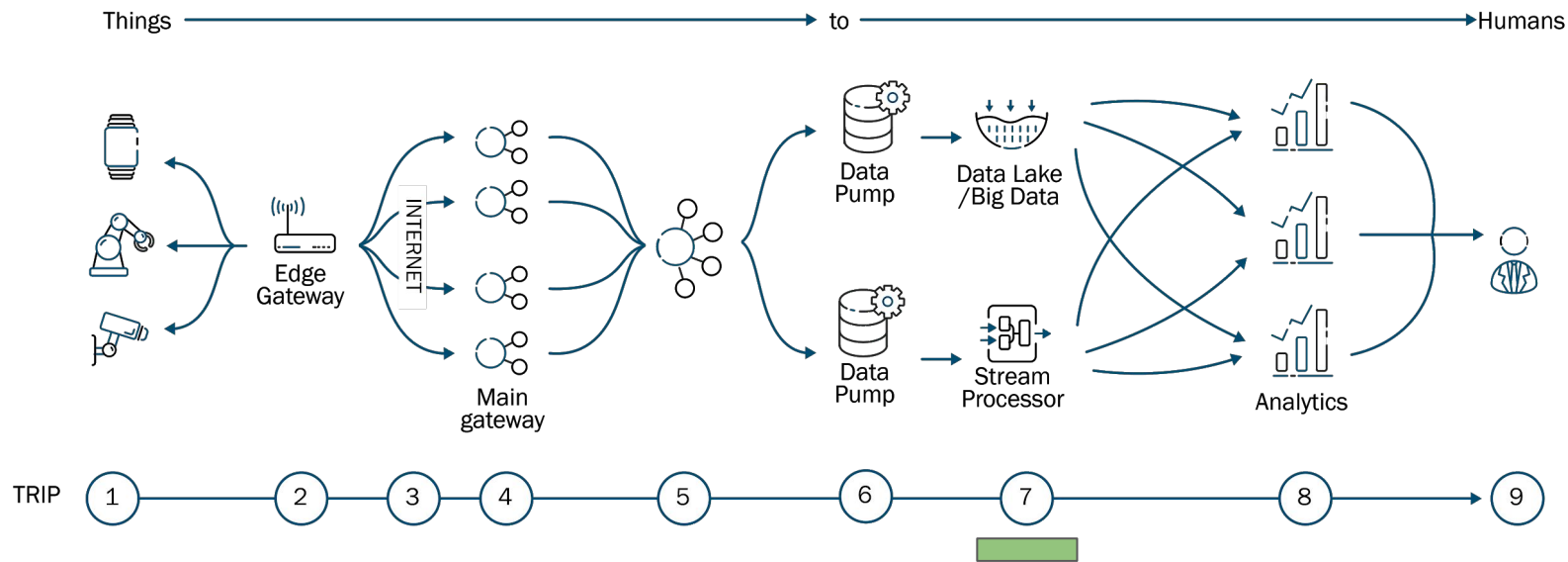
kubernetes
for
Microservices



From raw data to business value

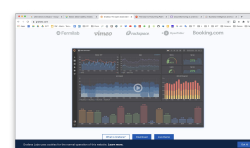
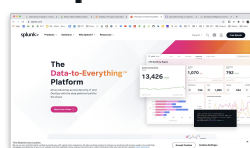
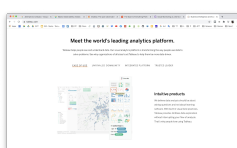
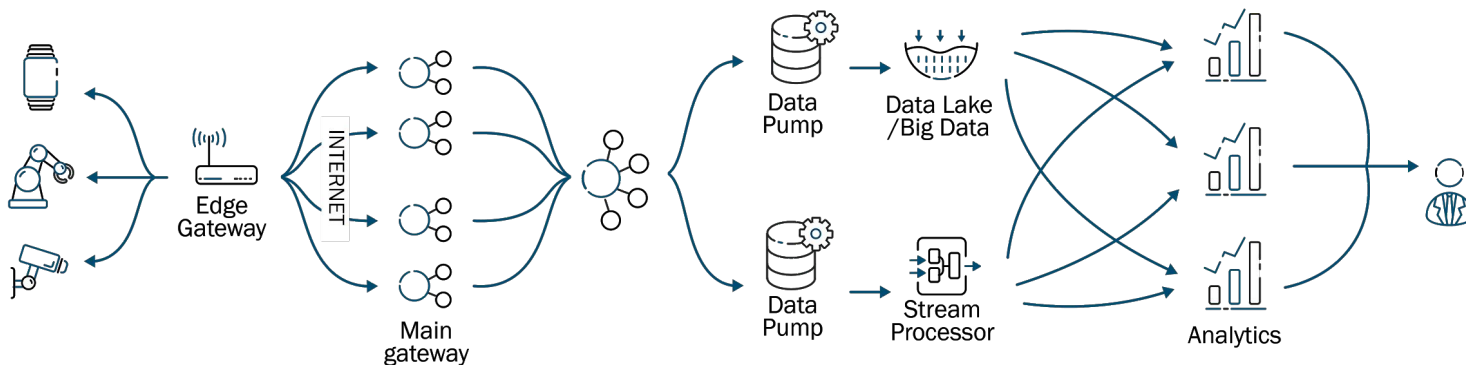


From raw data to business value



From raw data to business value

Things —————> to —————> Humans





sensoworks
SENSING THE FUTURE

For more information

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Senior Solution Architect

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