

# Big Data and use of AI in IoT

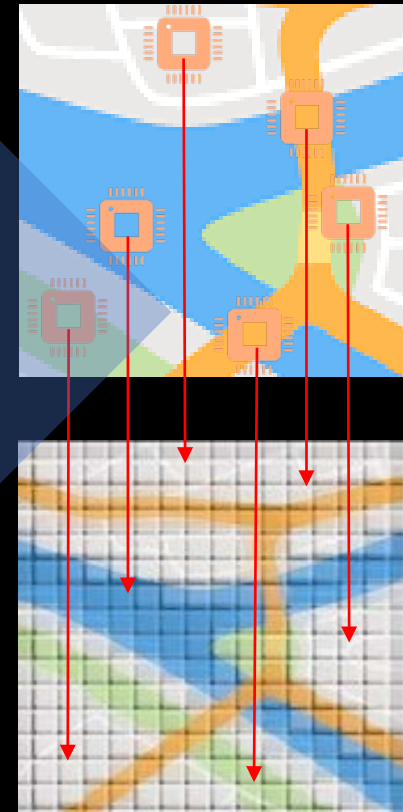
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# IoT → Big Data → AI → Innovation



## Digital Twin



Using the **Big Data** withdrawn from these connected devices we can create a Digital Twin of the physical world. **AI** Analytics on Digital Twin is expected to drive:

1. Optimization and Automation of the existing business process.
2. Inventing new business models, solutions, and products.

# IoT Applicable Fields



Smart Factory



Connected Marketing



Innovation, Reduced Time to Market



Connected Gaming



Micro-Payment



Smart Grid



Connected Supply Chain



New Work Style



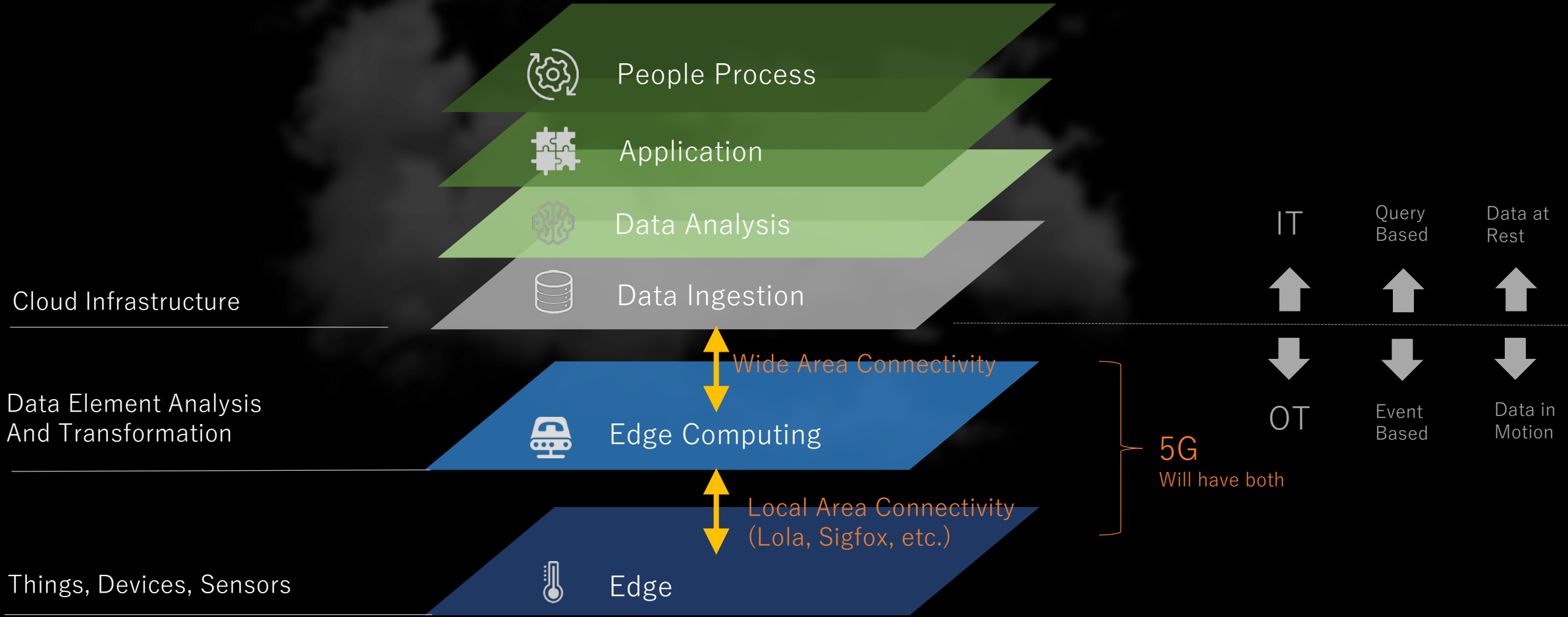
Physical Cyber Security



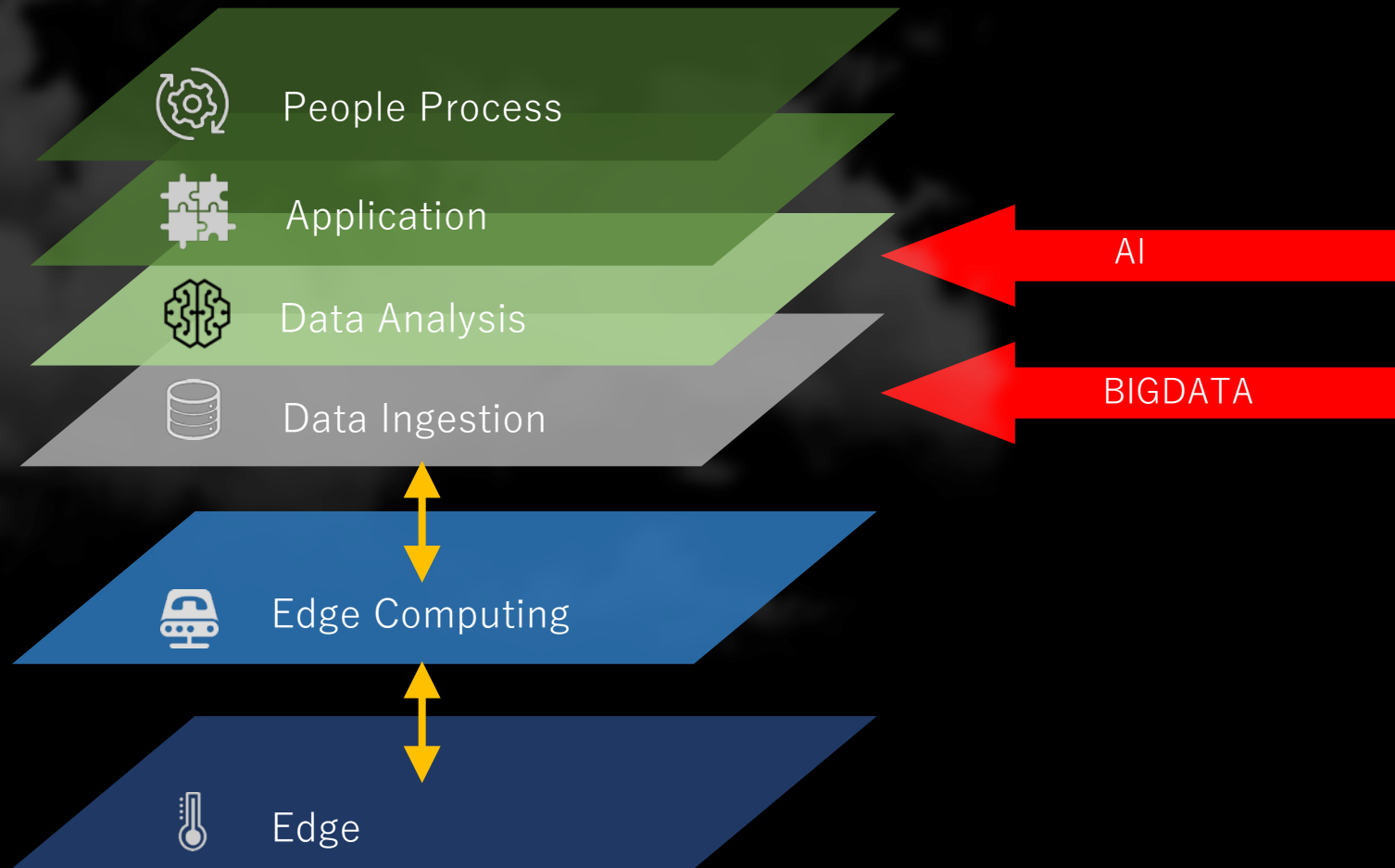
Business Process Outsourcing



# IoT in process layers

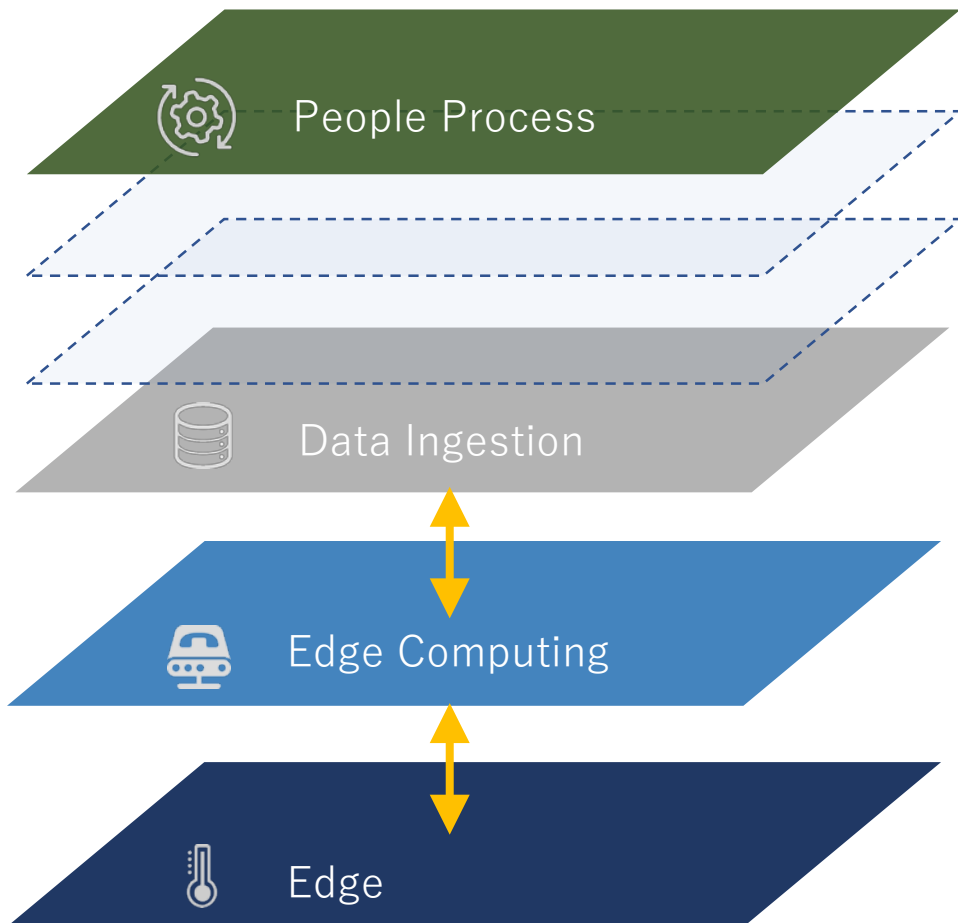


# Roll of BIGDATA and AI in IoT

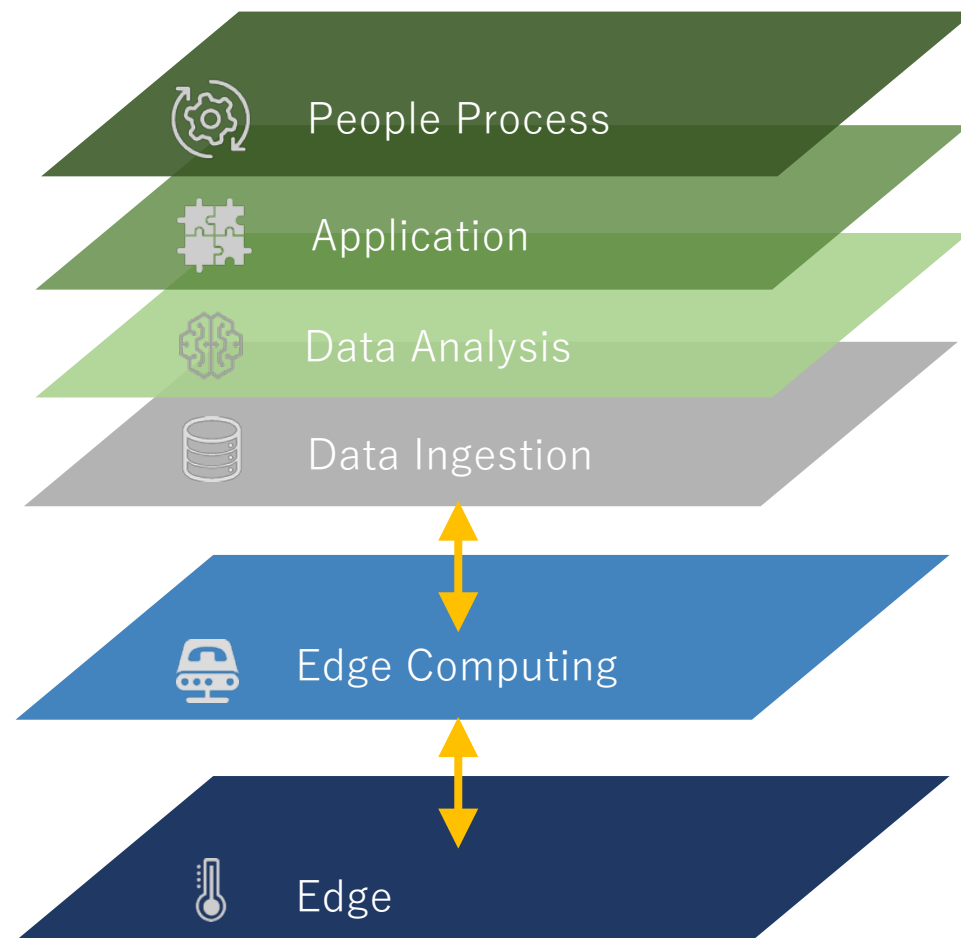


# USE CASE: Automobile IoT

OT → Optimization



OT + IT = Supply & Demand Matching  
(→ UBER)

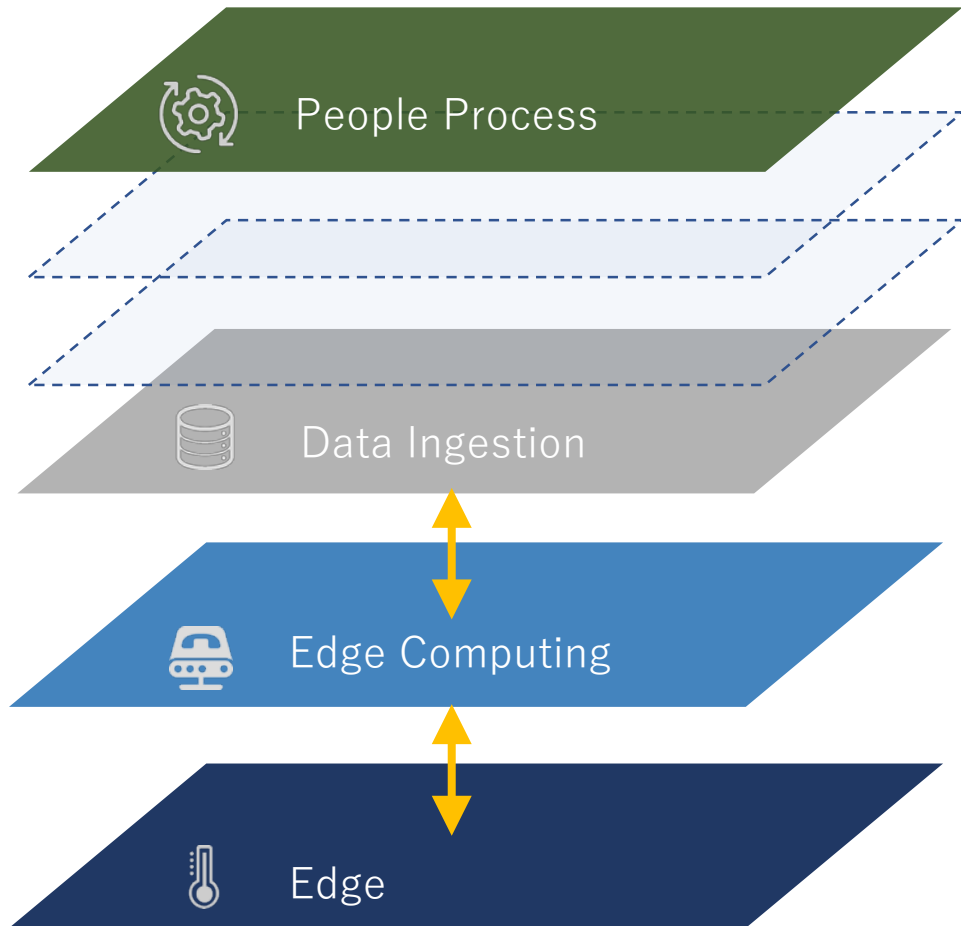




A wide-angle photograph of a port at dusk. The sky is a deep blue, transitioning from a lighter orange glow near the horizon. On both sides of a central waterway, there are large, complex gantry cranes. The cranes are illuminated with warm yellow lights, and their long jibs extend into the air. In the center of the waterway, a large container ship is docked, its deck and superstructure also lit up. The lights from the cranes and the ship create long, shimmering reflections on the calm water surface. The overall scene is one of industrial activity and modern infrastructure.

PORT IoT

# USE CASE: Port IoT ( OT = Optimization )

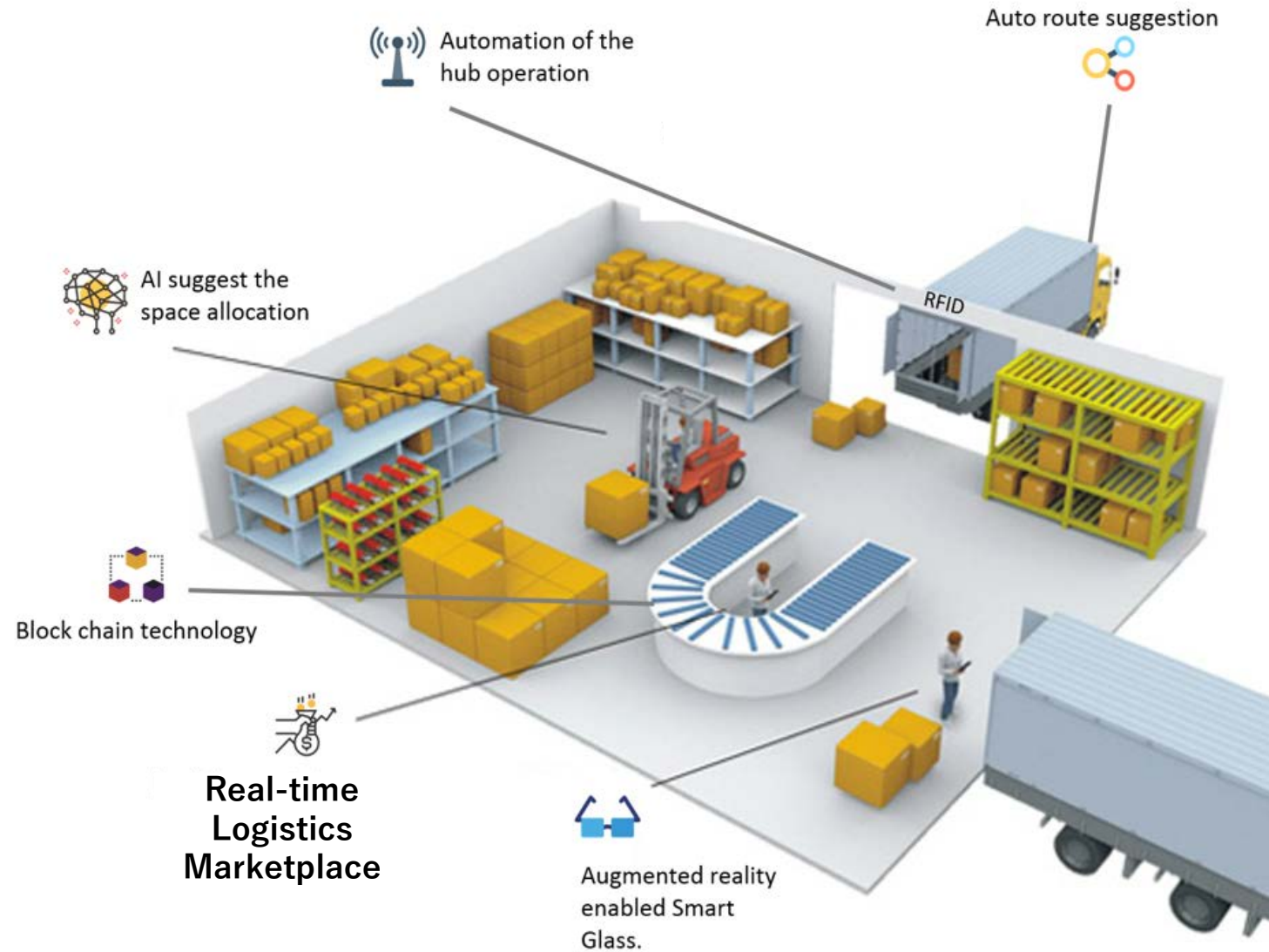
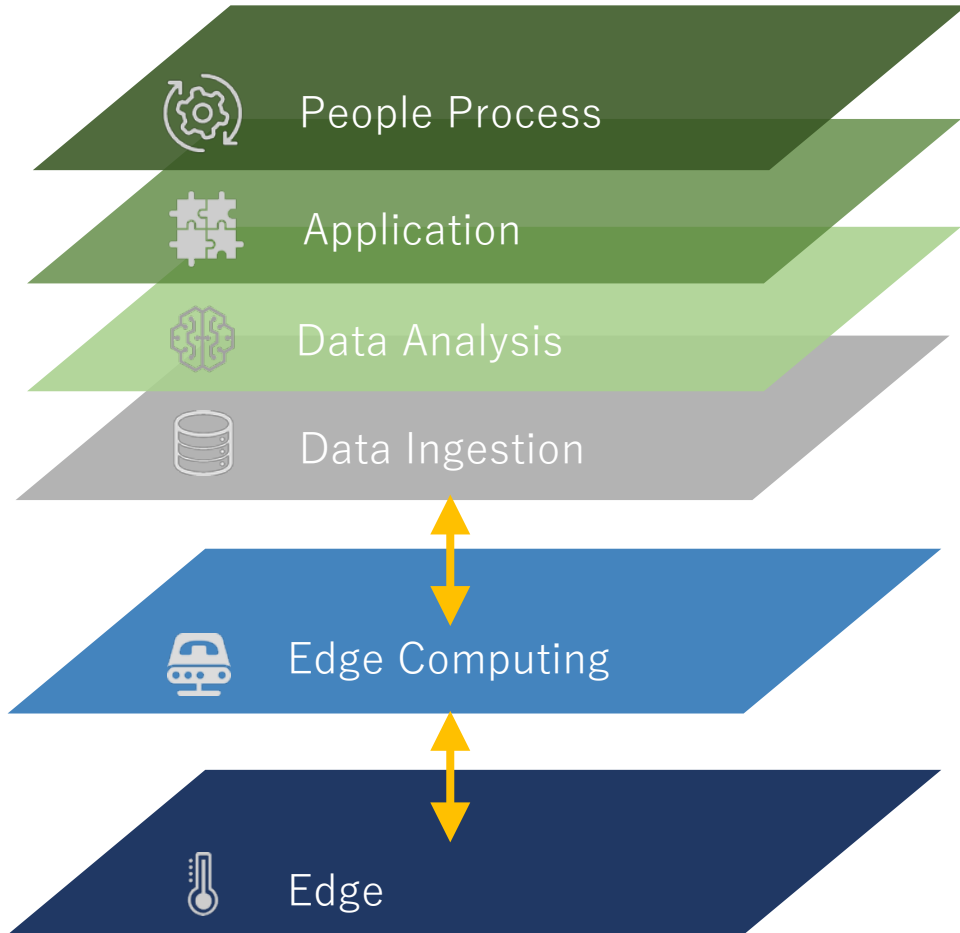


Main Win: Port is capable of higher through-put

- (1) Less cost per container
- (2) More competitive than rival ports
- (3) More TAX income



# USE CASE: Port IoT (OT + IT = Smart Logistics = New Business model)





# Smart Cities





Smarter Sustainable Stress-free world

we can proudly inherit to our children

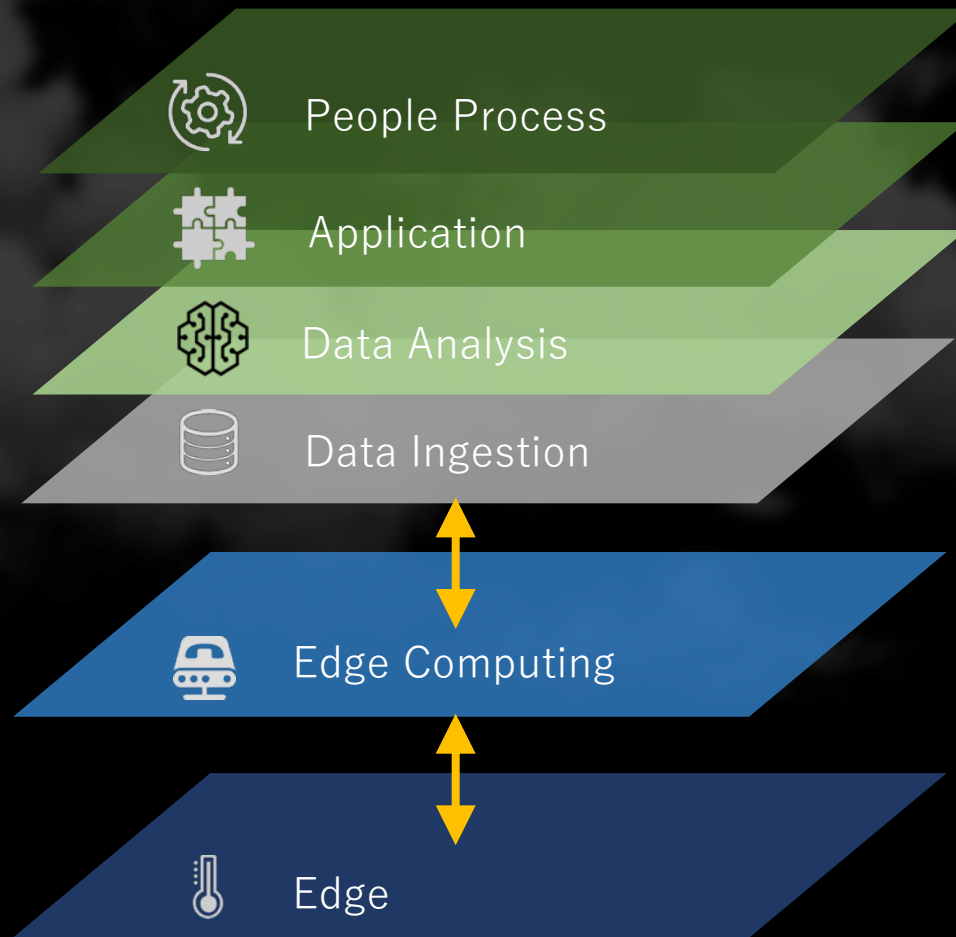


**Solution**

~~constraints~~



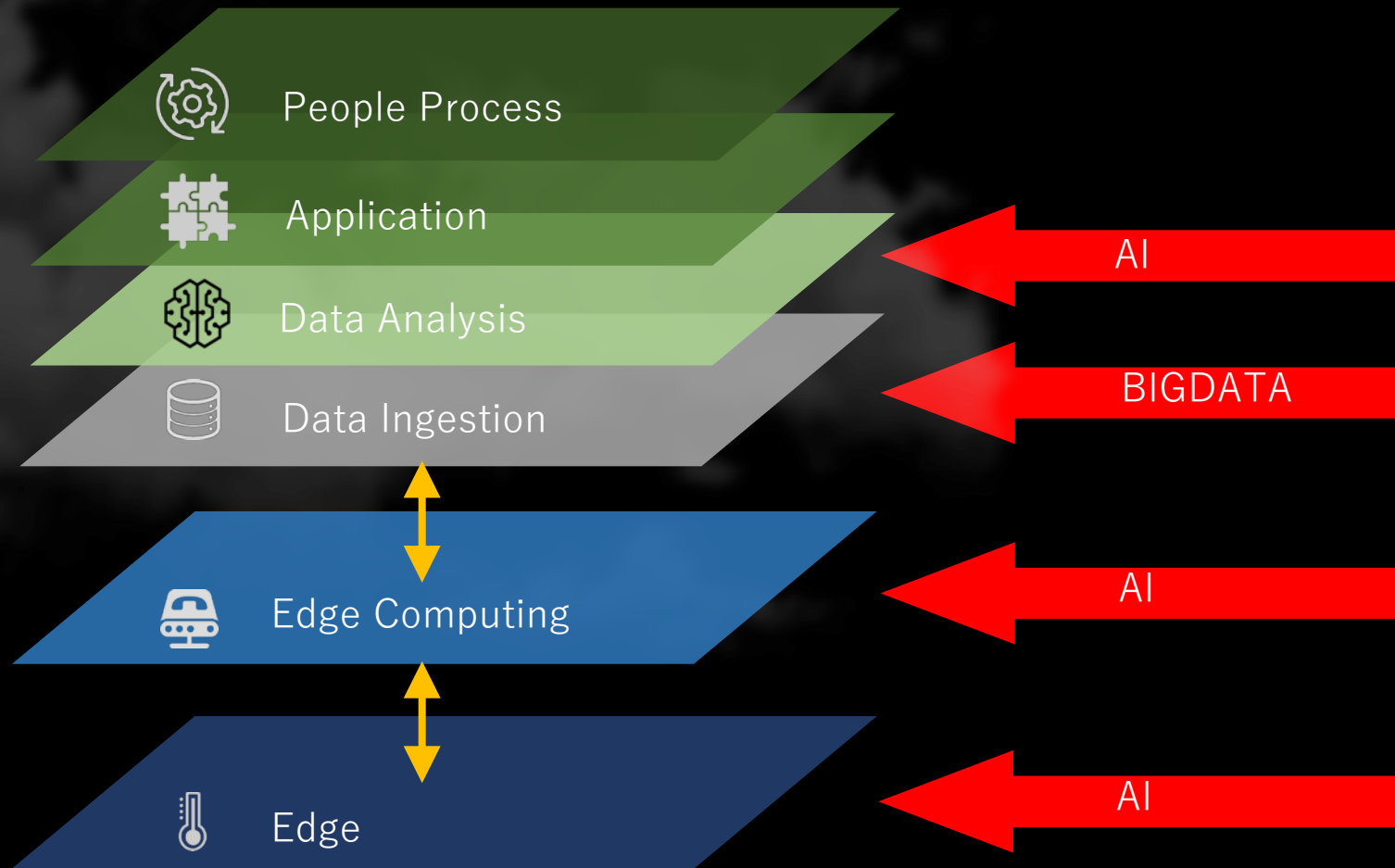
# Issues in IoT



Not capable of performing  
Real-time data analysis  
and feedback

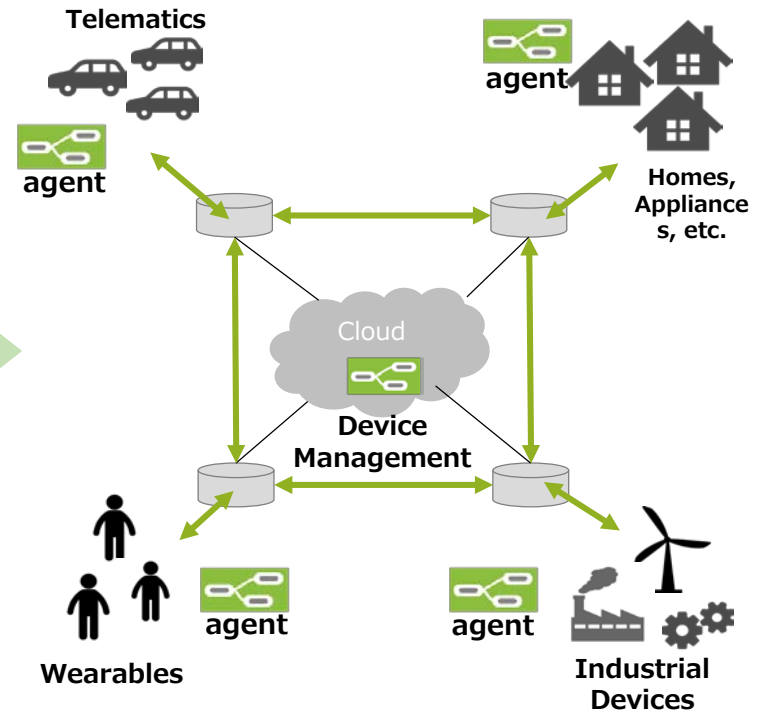
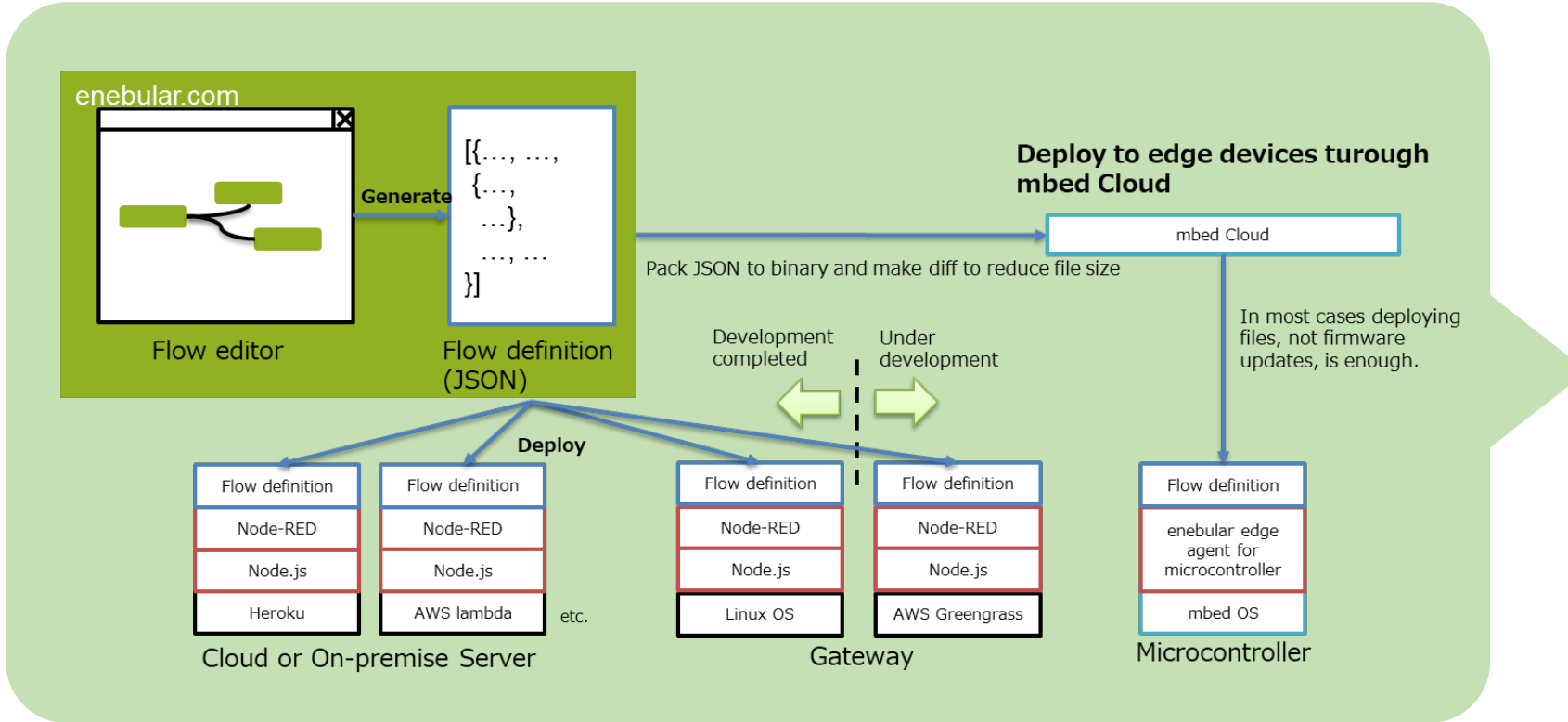
**ISSUE:** Devices will  
Generate data faster  
than IT side can  
ingest it

# Solution



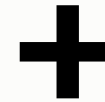
# Distributed Edge Computation

AI model inference derived on cloud could be deployed to the edge devices for performing edge computing

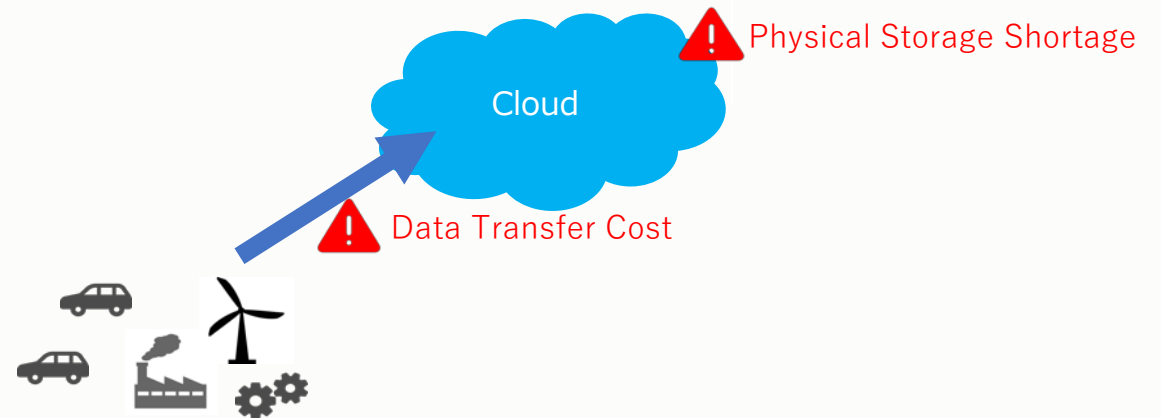




: Web Based



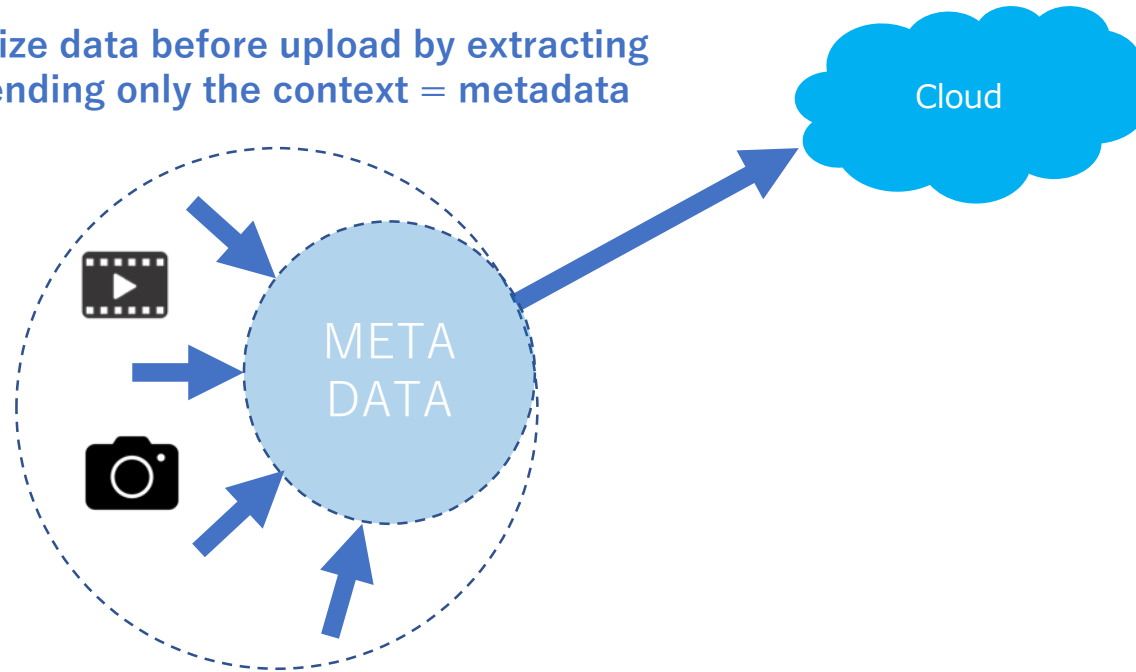
IoT Data: Physical World Based



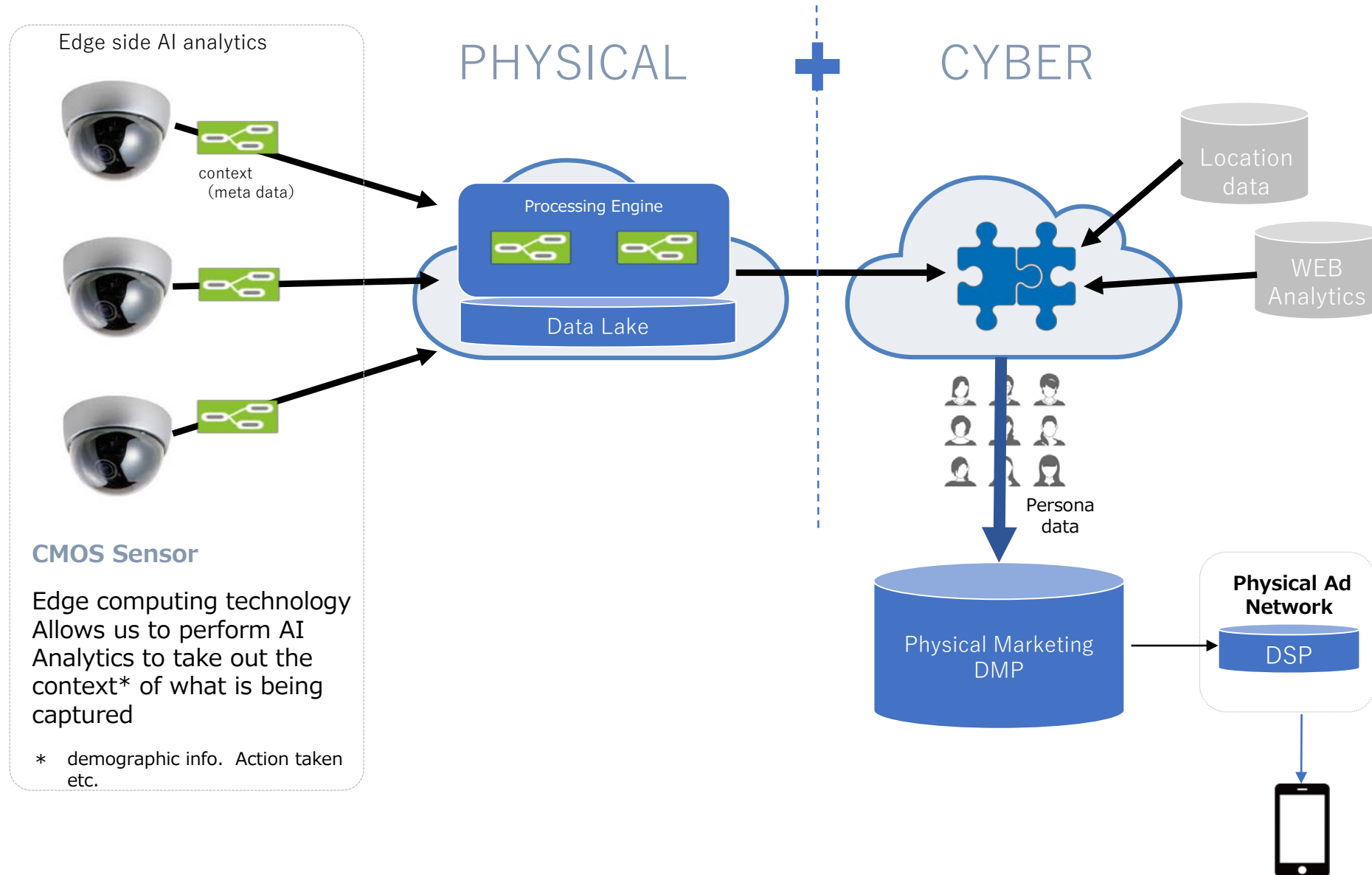


# Minimizing IoT Data

Minimize data before upload by extracting and sending only the context = metadata



# Use case Example : IoT and Edge Computing



## AI in IoT

AI is based on Deep Learning algorithms. Deep Learning involves automatic feature detection from data. Data types in IoT and techniques used in each are:

Data Set	AI
Image and Sound	Convolution Neural Networks (CNN)
Transactional data, Sequences	Long Short Term Memory (LSTM)
Text	Natural Language Processing
Behavior	Reinforcement learning

The difference between other fields and IoT is the volume of data and need for sophisticated real time implementations of the same models. T

Usage of the models or derived solutions are different for each IoT verticals.

IoT Vertical	AI
Manufacturing	Predictive maintenance, anomaly detection, missing event interpolation
Marketing	Churn modelling, Behavioral Prediction
Sales	Cross-sell Up-sell model, Customer life time value

WHAT IS COMMON both vertically and horizontally is the fact that **large amount of data is required** to derive these models.



DATA

is the new oil





Are businesses willing to share their most valued asset?





DATA

is the new SOIL





Without the rain...

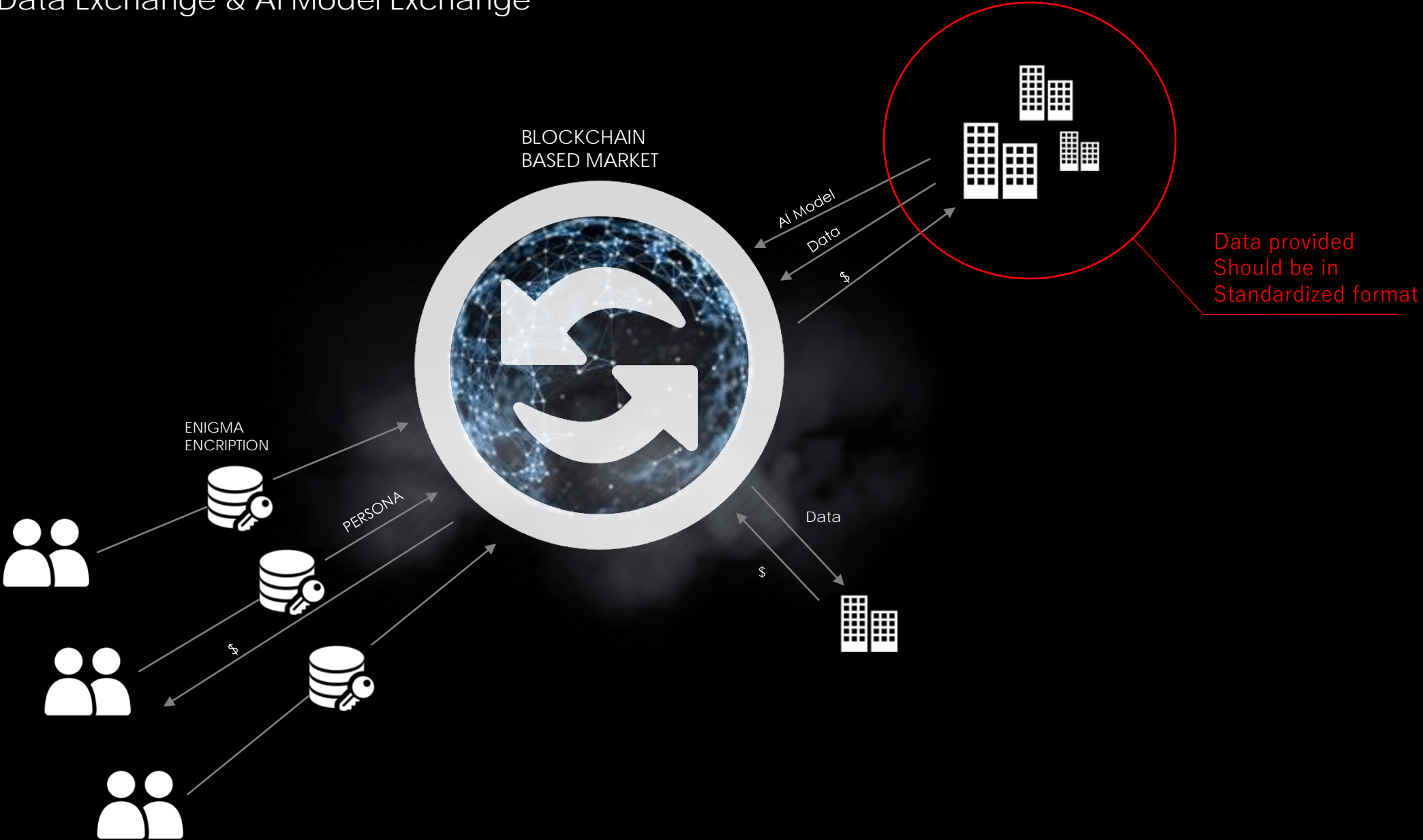




We need to increase Data Liquidity by [incentivizing](#) and [shaping the data flow](#) for the data providers.

- (1) Customer - Privacy
- (2) Businesses - Core Competency

# Incentivizing: Data Exchange & AI Model Exchange



How can we contribute?



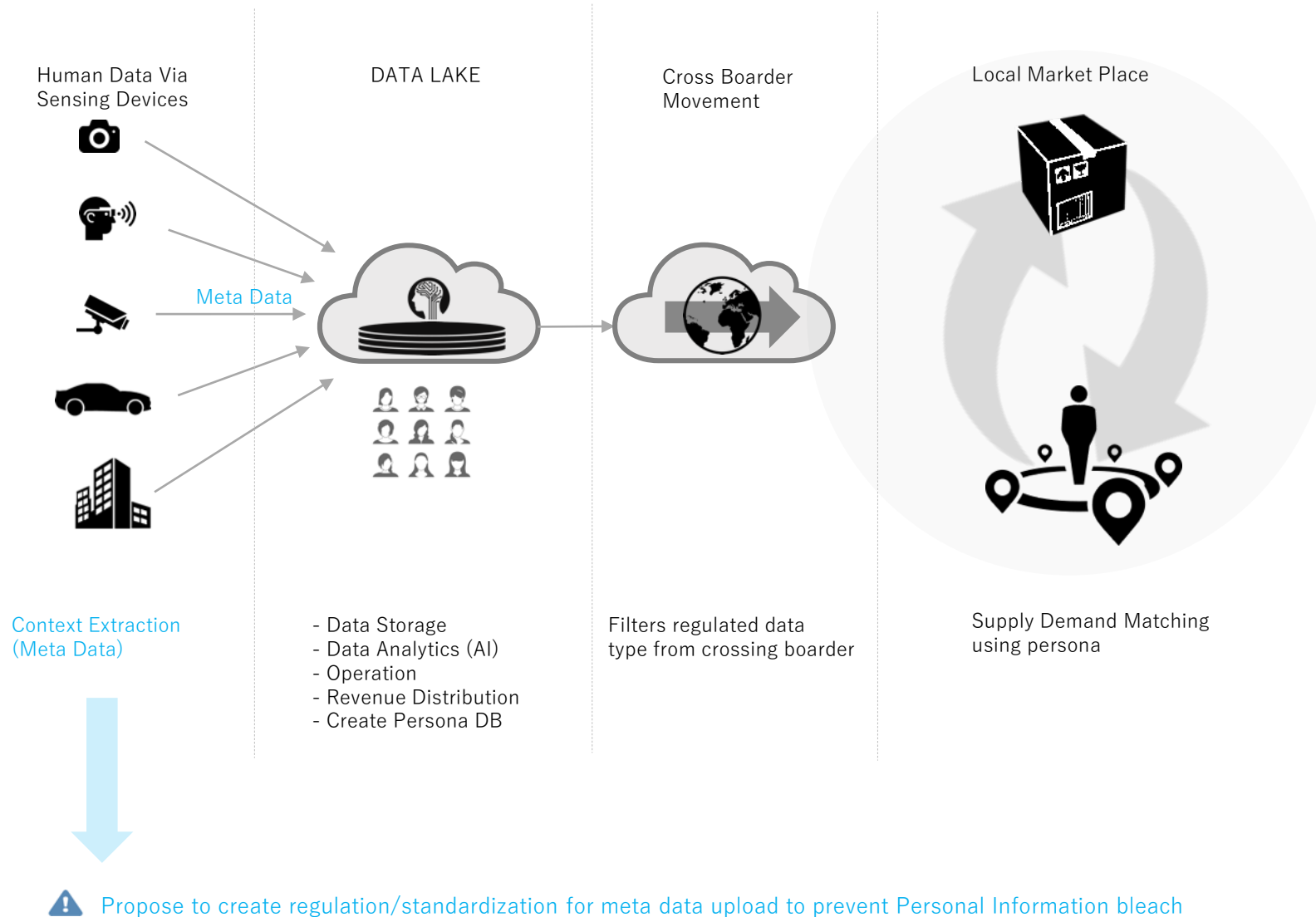




Shaping the Data Flow by [Standardizing IoT data](#)



# Privacy policy in human data acquisition and data transfer in world of IoT



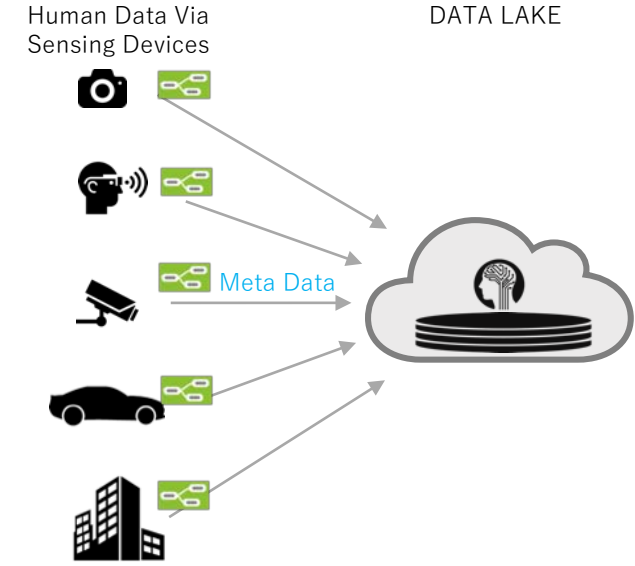
## Convergence of IoT and Marketing

New businesses are bringing about major revolutions based on sophisticated IoT Devices, such as cameras, microphones, etc., and the data they create, combined with AI is creating this opportunity. This is expected to yield numerous innovations to the world. However, from the perspective of protecting privacy, problems may arise due to collecting and storing (and reusing) the personal information data generated by these devices.

Due to these conditions, we believe it will be necessary for international institutions to regulate/standardize the collection and utilization of IoT data.

We would like to make a proposal to present at this forum, so we kindly request an opportunity to present our proposal.

# Metadata



Context Extraction (Meta Data)



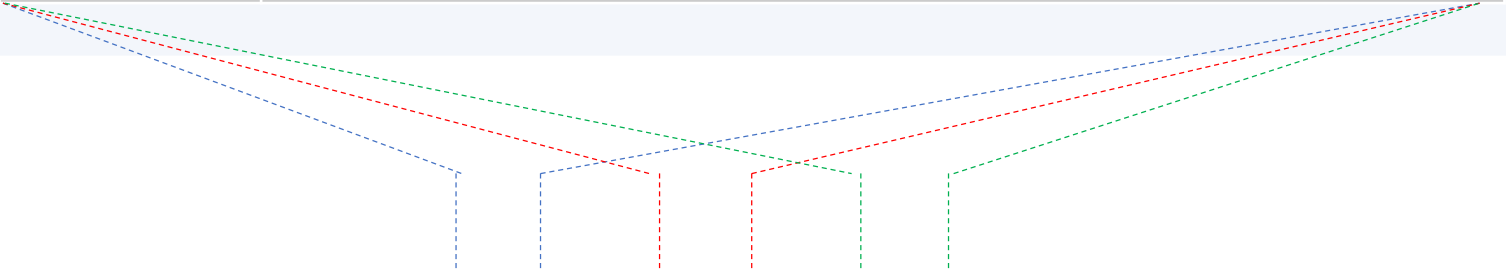
## Metadata created from video context (Full Set)

Meta Data Type	Data
Time Stamp	Time
Demographics	Age, Gender, Height, Build, Skin Color
Facial Feature	Eye Color, Eye Type, Hair Color, Hair Type, Nose Type, Mouth Type, Ear Type, Scars, Relative Distance
Action	Buying, Walking, Running, Standing, Sitting, Talking, Stealing, Holding, Attacking, etc.
Feeling	Normal, Happy, Sad, etc.
Object	Object Type, Object Color, Object Size, What Object
Environmental	Weather, Temperature

USA

FRANCE

JAPAN



IoT Data Standards for  
Smarter Sustainable Stress-free world



## Summery

- IoT data will contribute greatly to data explosion.
- This big-data is the fuel for advancing AI technology.
- In order for
- By Standardizing IoT data, we can increase the liquidity of the data, contributing to the realization of smarter, stress-free world

## Next Steps

- Project team member, Leader
- Objective & Scope
- Output (Recommendation, Regulation, White paper)
- Scheduling and next steps (teleconference)

# Use case Example 1: Sports Data Lake

