Microsoft

IoT in Action

#IoTinActionMS

Microsoft

Architecting the Intelligent Edge

Carl Coken
GM, IoT Partner Innovation, Microsoft

Maarten Struys
Sr. Technical Specialist, Microsoft

IoT in Action

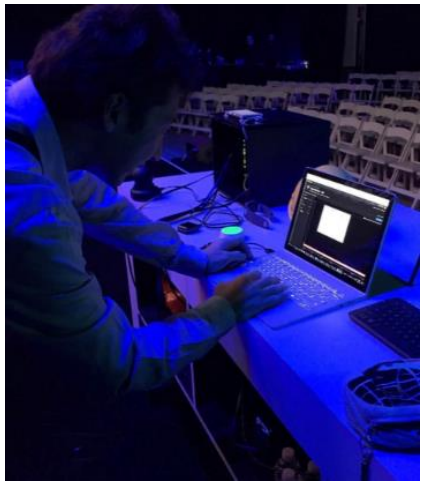
The Evolution of IoT in Action

ncd.io

Year 1 2017

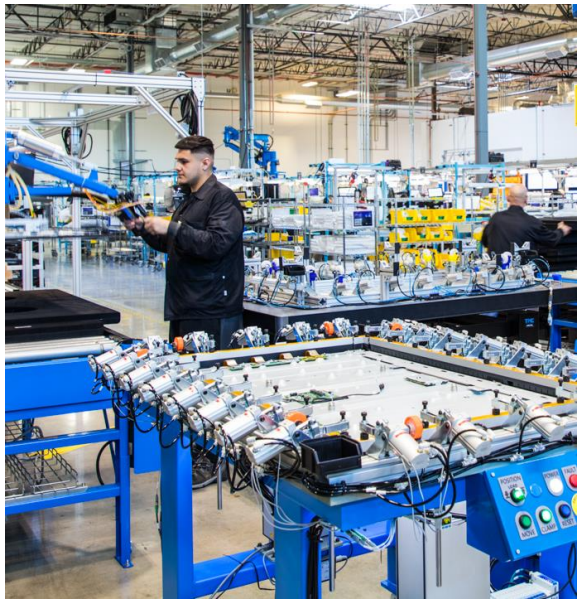
The Evolution of IoT in Action

Insight



Year 2 2018

The Evolution of IoT in Action

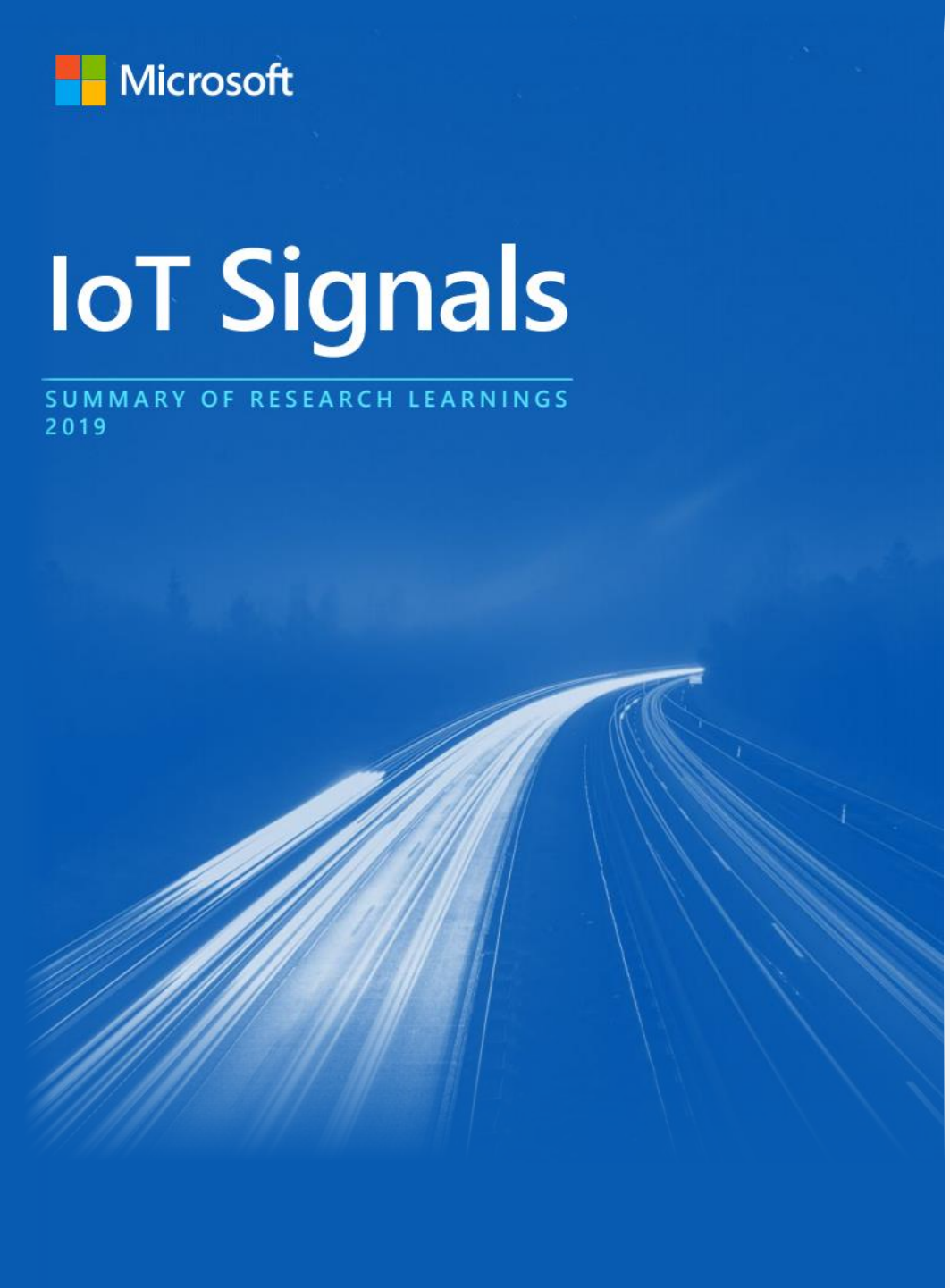


Year 3 2019

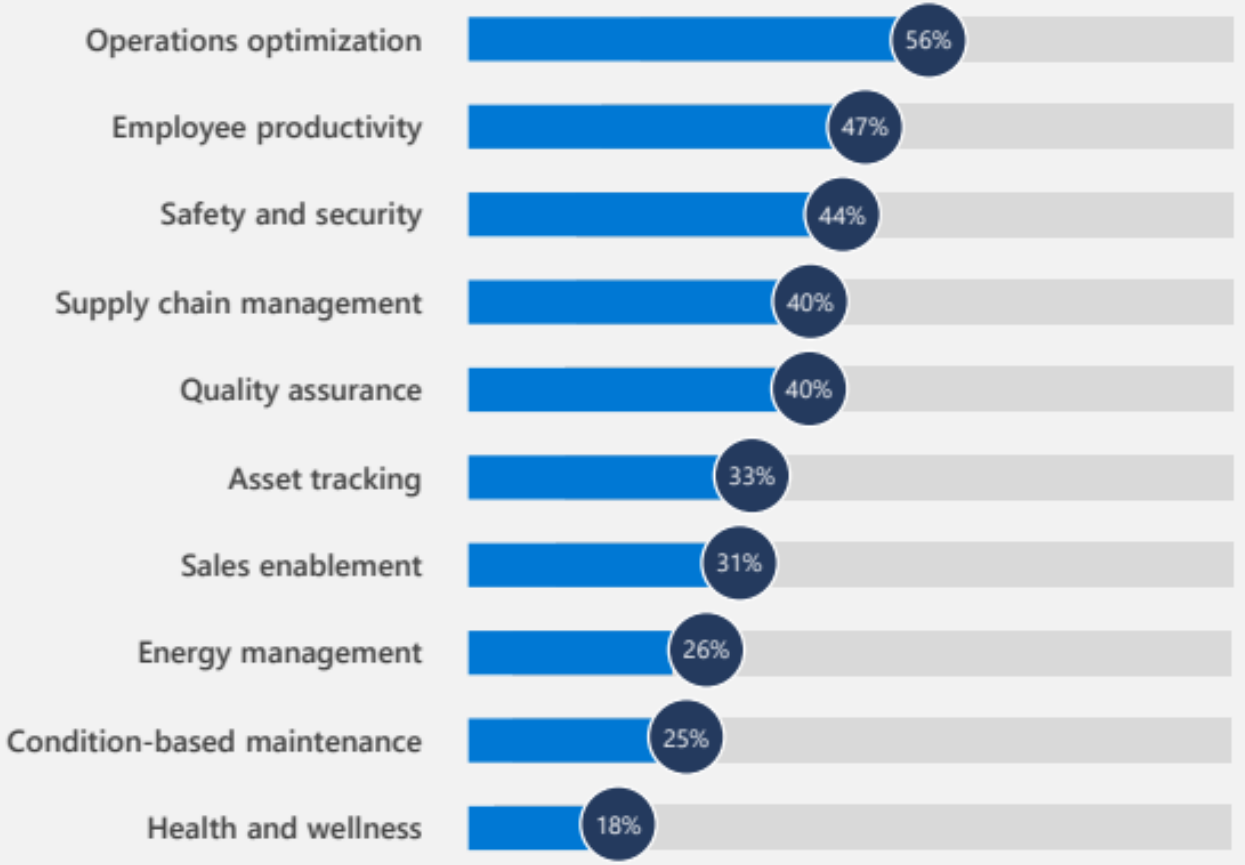
Microsoft

IoT Signals

SUMMARY OF RESEARCH LEARNINGS
2019



Reasons for IoT adoption



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IoT Signals

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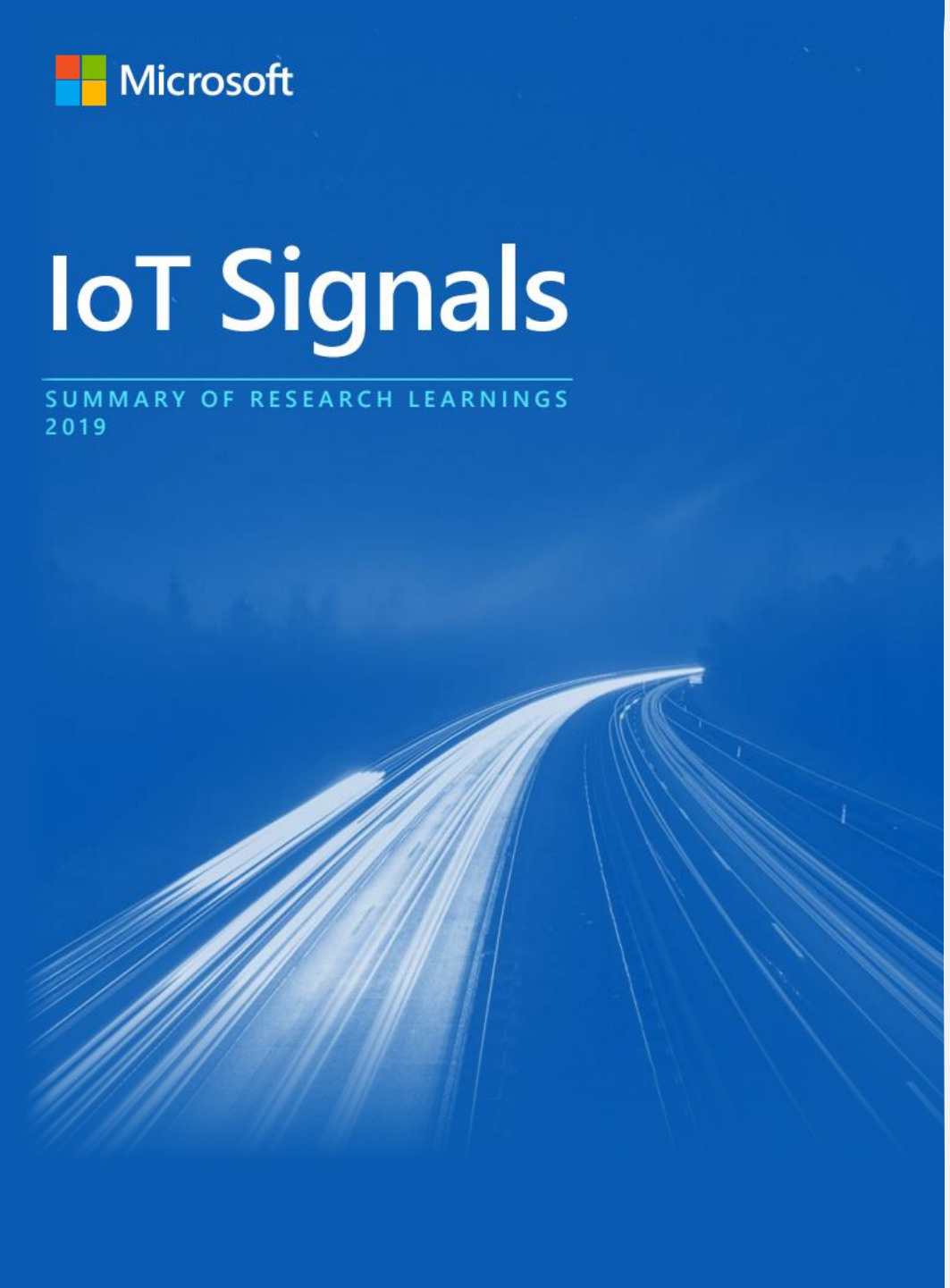


Additional top use case by industry

RETAIL/ WHOLESALE

Supply chain optimization	64%
Inventory optimization	59%
Surveillance and security	48%
Loss prevention	44%
Energy optimization	40%

TRANSPORTATION

Fleet management	56%
Security, surveillance, and safety	51%
Manufacturing operations efficiency	40%
Vehicle telematics and infotainment	38%
Predictive maintenance	33%

GOVERNMENT

Public Safety	48%
Infrastructure and facilities management	40%
Regulations and compliance management	38%
Fleet and asset management	37%
Incident response	29%

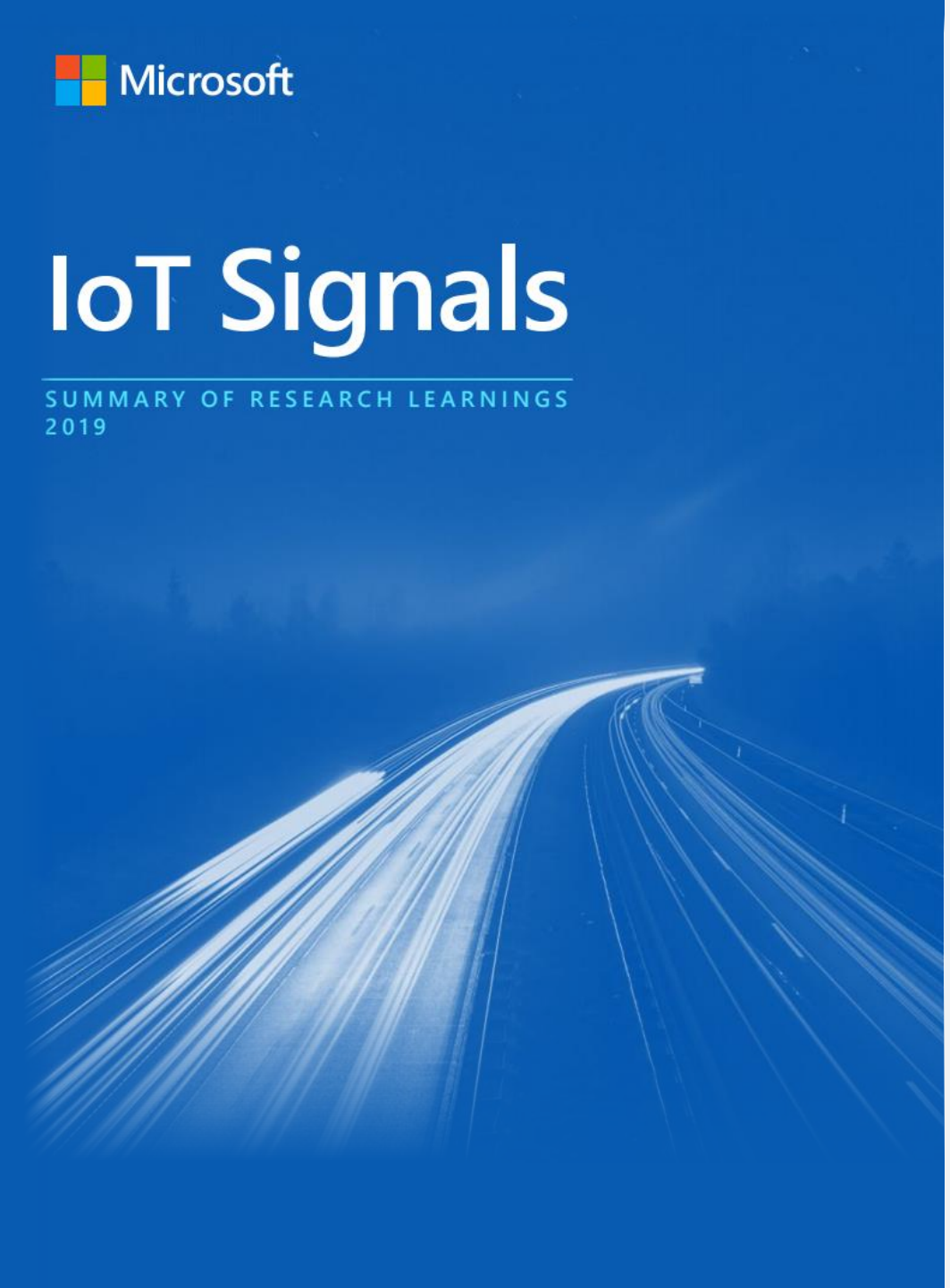
HEALTHCARE

Tracking patient, staff, and inventory	66%
Remote device monitoring and service	57%
Remote health monitoring and assistance	55%
Safety, security, and compliance	53%
Facilities management	42%

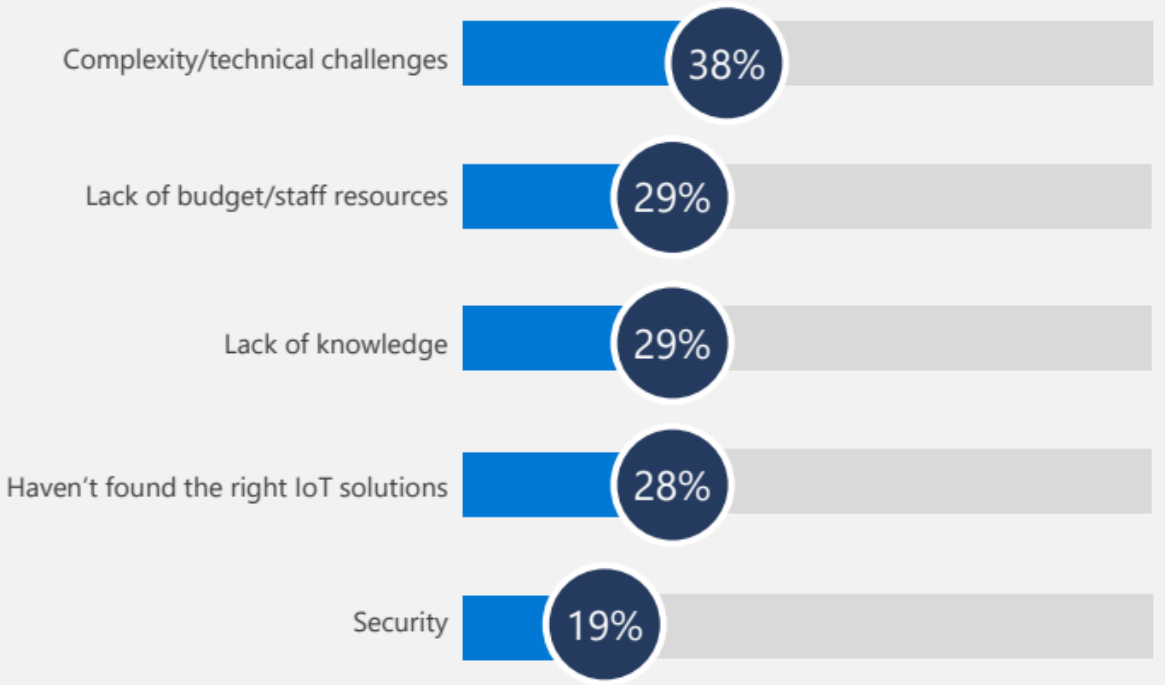
Microsoft

IoT Signals

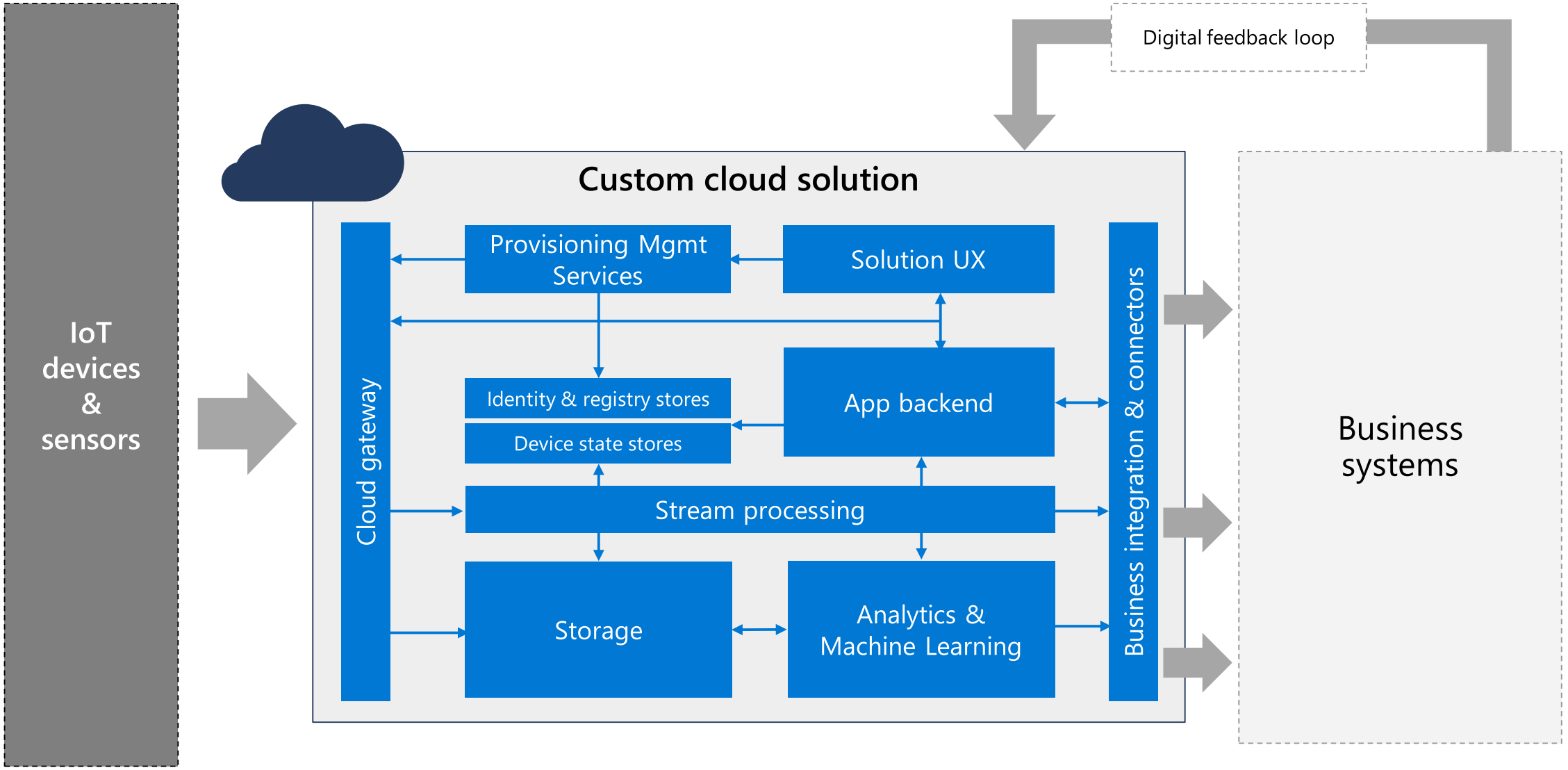
SUMMARY OF RESEARCH LEARNINGS
2019



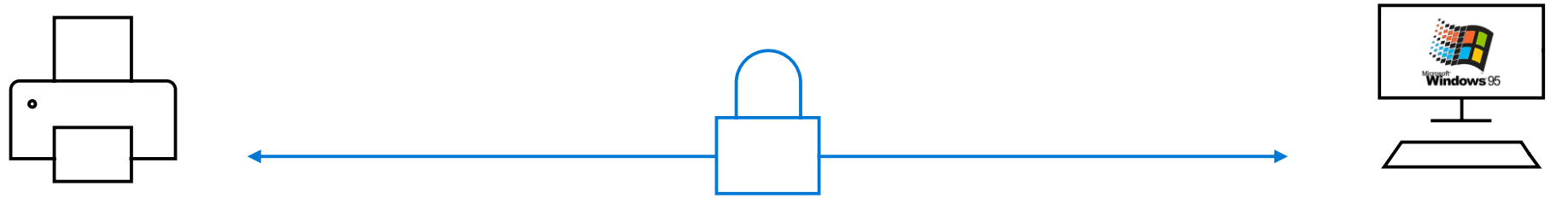
Top challenges



Solution architecture—DIY



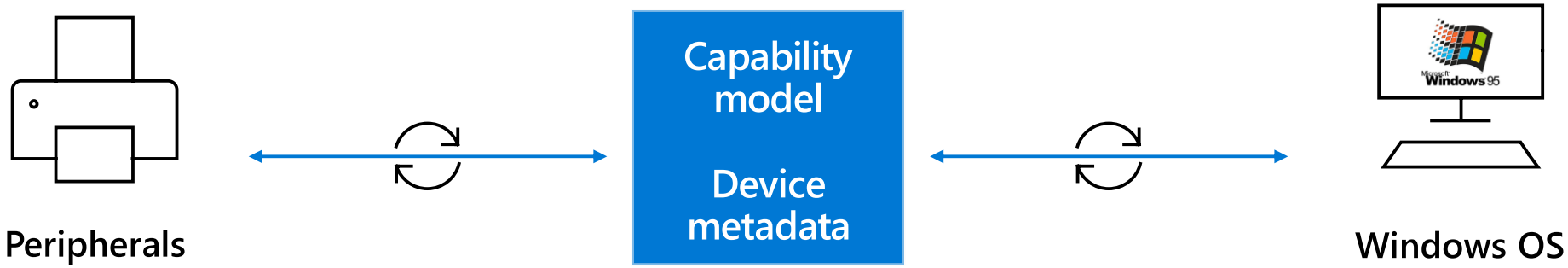
We had a similar challenge in the past…



Peripherals

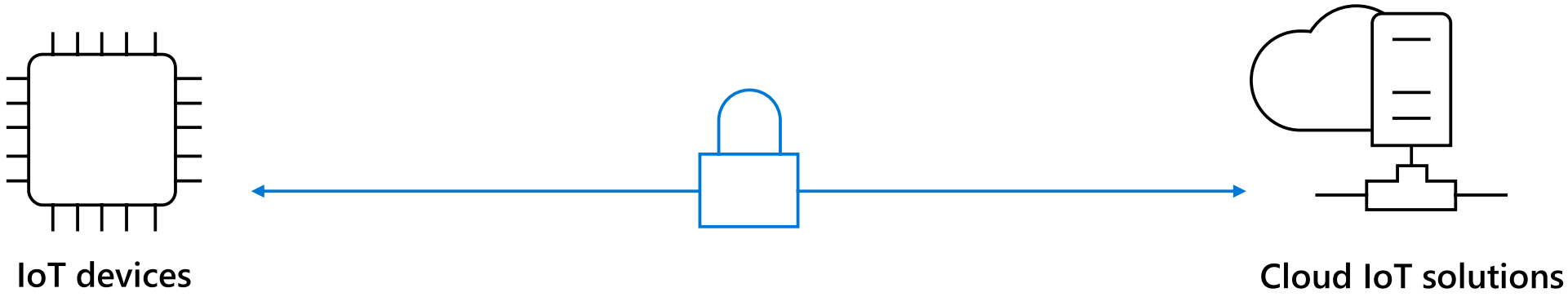
Windows OS

That was solved with Windows Plug and Play



Devices published their capability models and adhered to them
Windows used the capability model to know how to interact with them

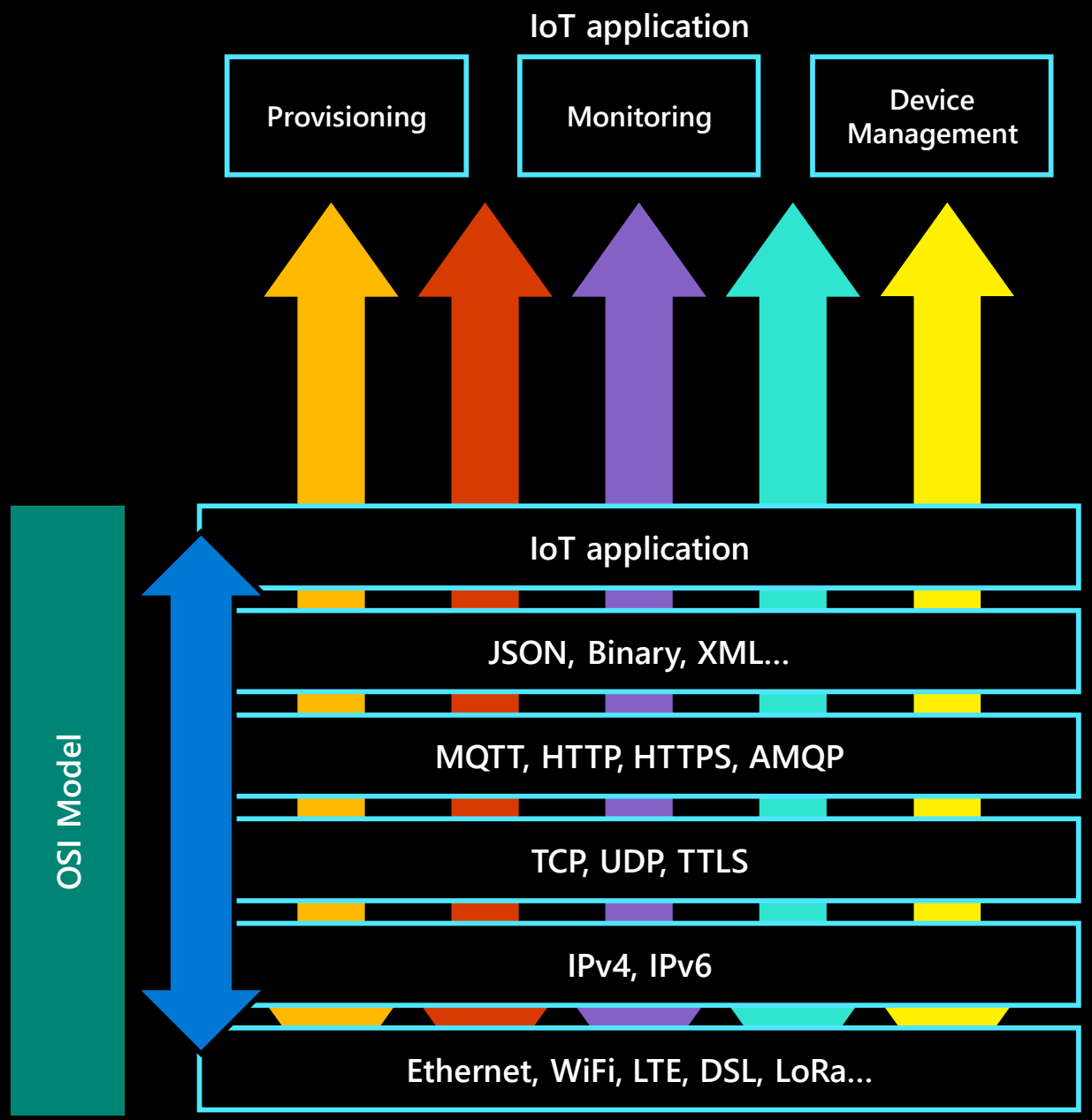
IoT today



Tight coupling between software on device and IoT solution in the cloud

Connecting hardware is very "hard"

Provisioning
Configuration
Device management
Deployment
Monitoring

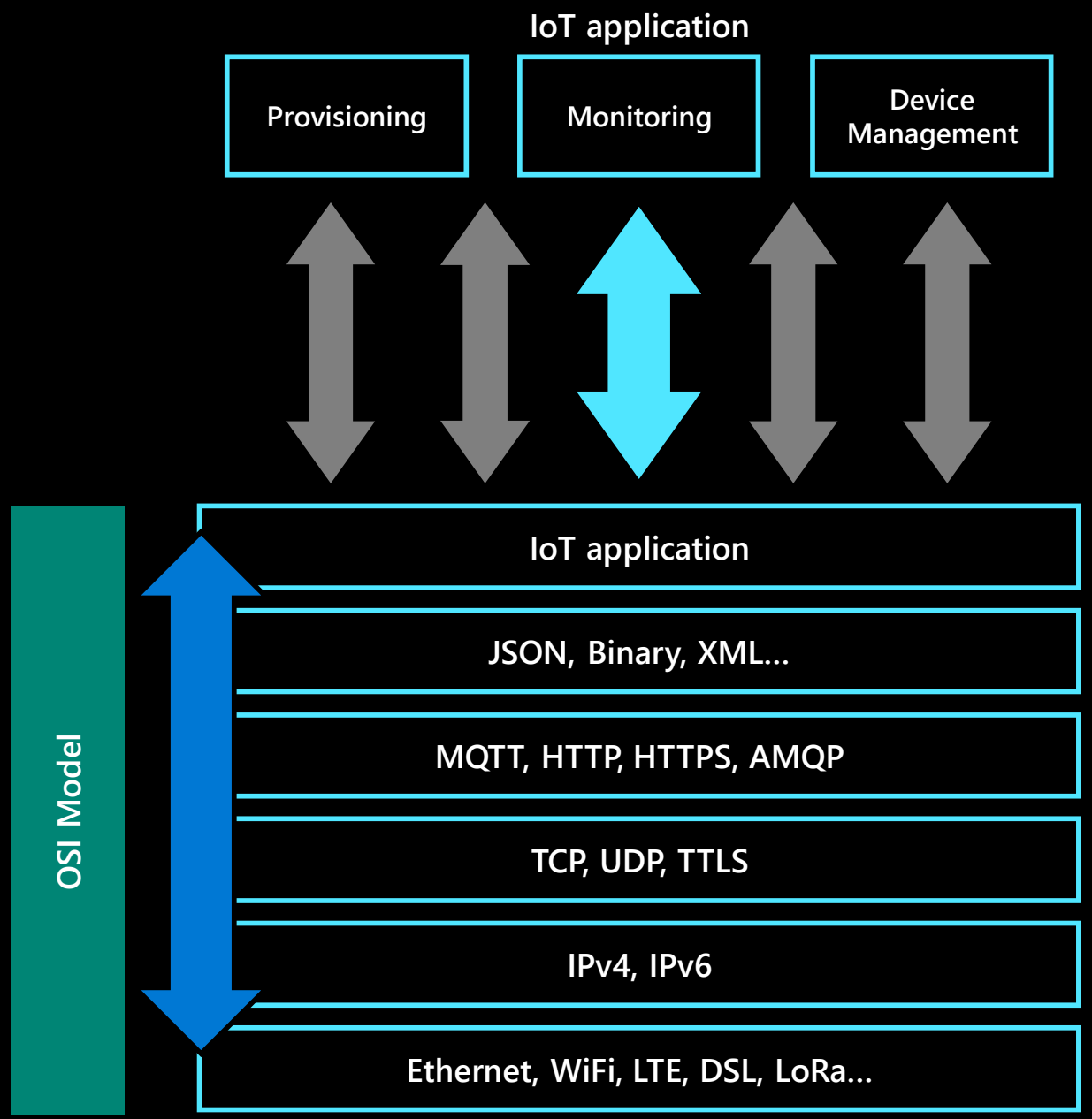


IoT Plug and Play defines common language

A platform feature to describe models and capabilities to Cloud

Based on Digital Twin definition language

Open source based on open standards (JSON-LD, RDF)



Benefits

Solution developers

Dramatically reduces the effort needed to build software on devices

Customers and partners

Large ecosystem of devices that just work with Azure IoT solutions, without any development required

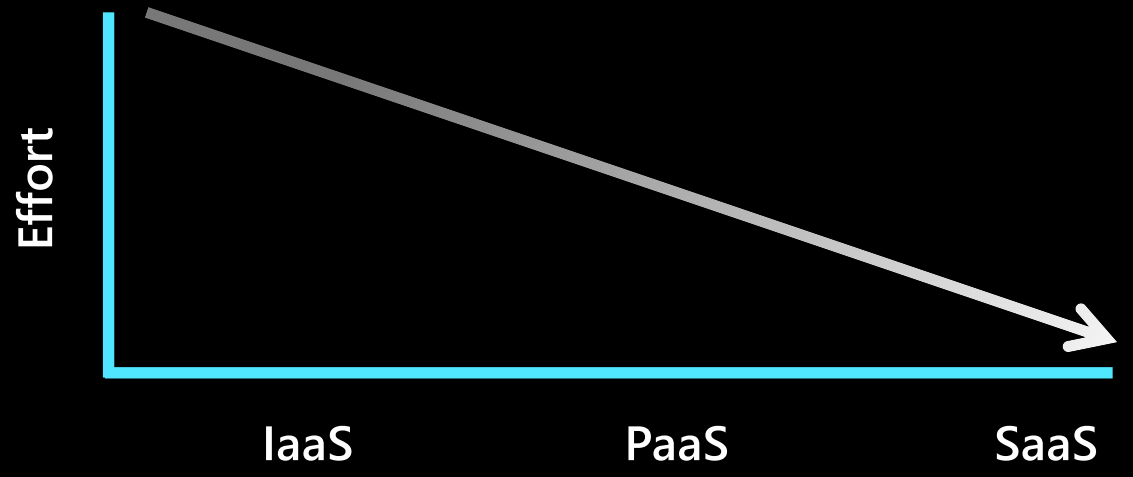
Device builders

Certify your device for IoT Plug and Play and it can be used with thousands of Azure IoT solutions

In public preview

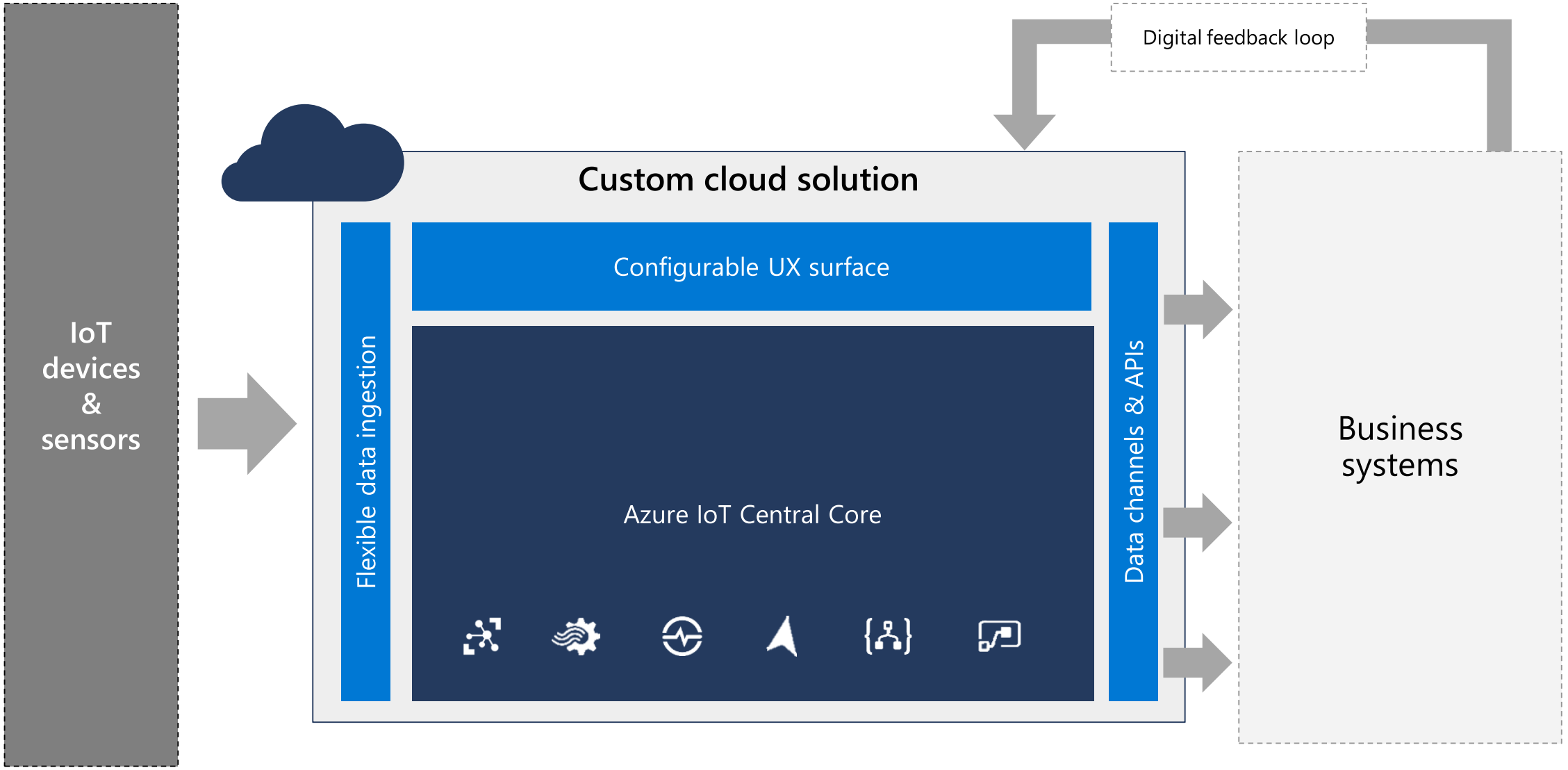
http://aka.ms/IoTPlugandPlay

Making IoT seamless



The total effort to build and operate an IoT Solution is rapidly decreasing

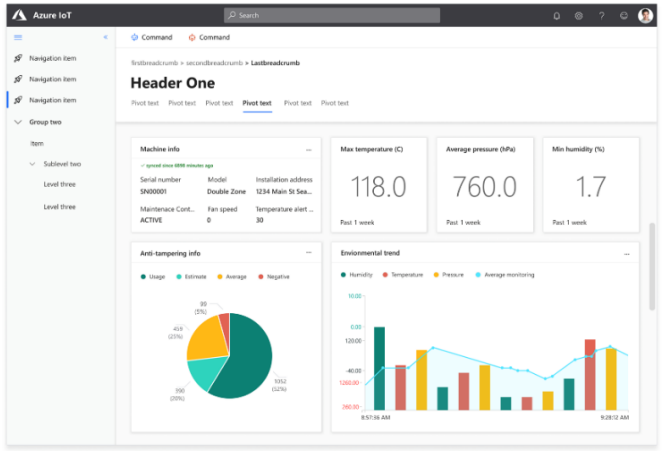
Solution architecture—IoT Central



Azure IoT Central

IoT app platform with security, global scale, high availability, disaster recovery built in

- Device connectivity and management
- Telemetry ingestion and command and control
- Monitoring rules & triggered actions
- User roles and permissions
- Dashboards, visualization and insights
- Fully hosted and managed by Microsoft



- Maps, location telemetry and geofencing
- Device Bridge
  Ingest data from other clouds
- Continuous Data Export
  Bring data into downstream business applications

- White labeling
  Your SaaS – Your Brand
- IoT Plug-and-Play
  Public Preview
- IoT Edge support
  Incl. Module Management
- Multi-tenancy & RBAC
- Extensibility
  APIs
- Solution Builder App Templates

IoT Central App Templates

App templates for Priority Industry Verticals

App Templates for Industries

Retail
Digital distribution center
In-store analytics
Checkout, Condition monitoring
Connected logistics
Smart inventory management

Healthcare
Continuous patient monitoring

Energy
Smart meter analytics
Solar power monitoring

Government
Water quality monitoring
Water consumption monitoring
Connected waste management

IoT Central App Templates

App templates for Priority Industry Verticals

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Government
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Water consumption monitoring
Connected waste management

Challenge #1

Getting connected

Challenge #2

Making it easier to combine services to “do something”

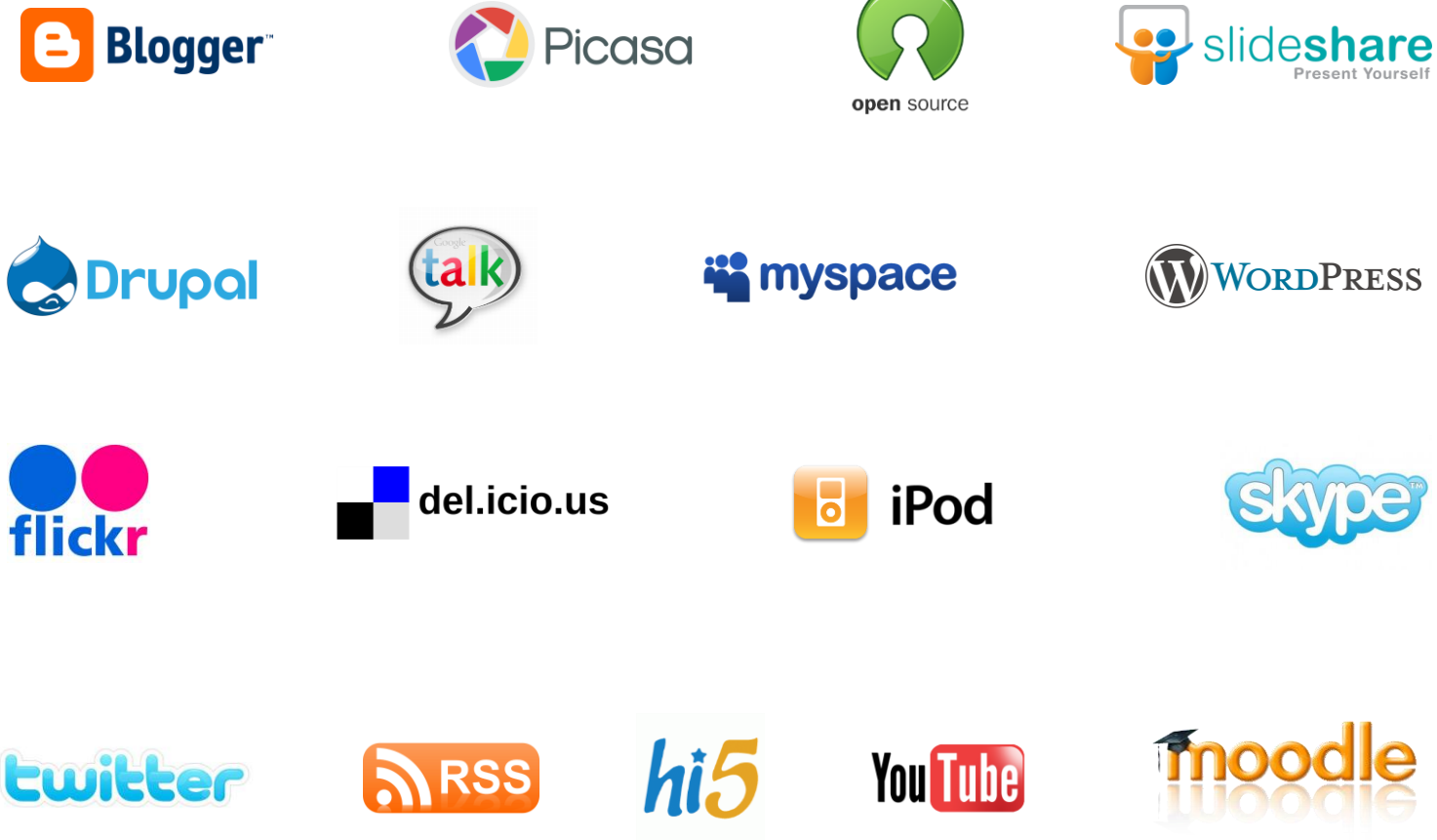
Challenge #3

Making it easier to use the data; it’s massive

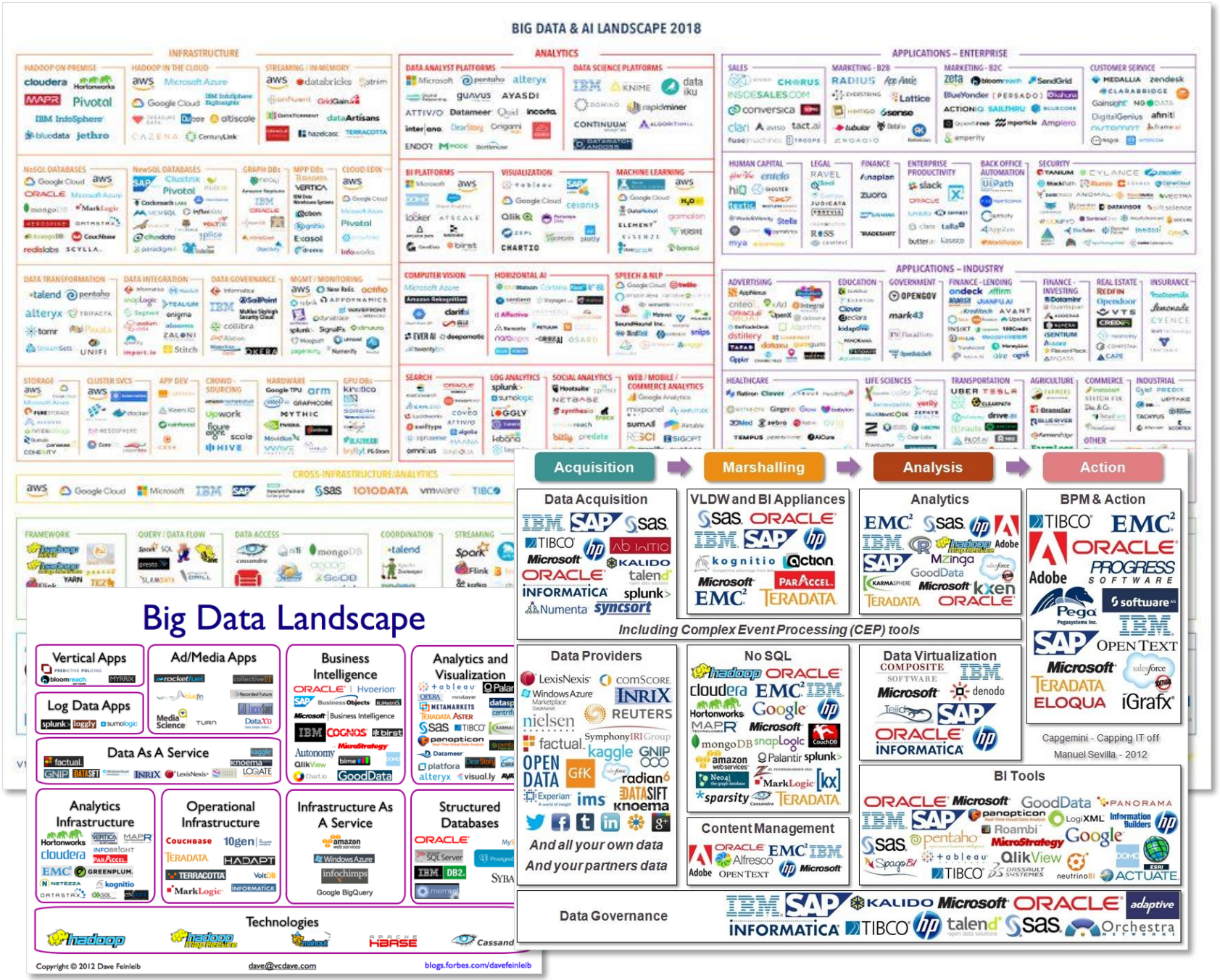
“We’ve been here before”

“Big Data” started with Web 2.0

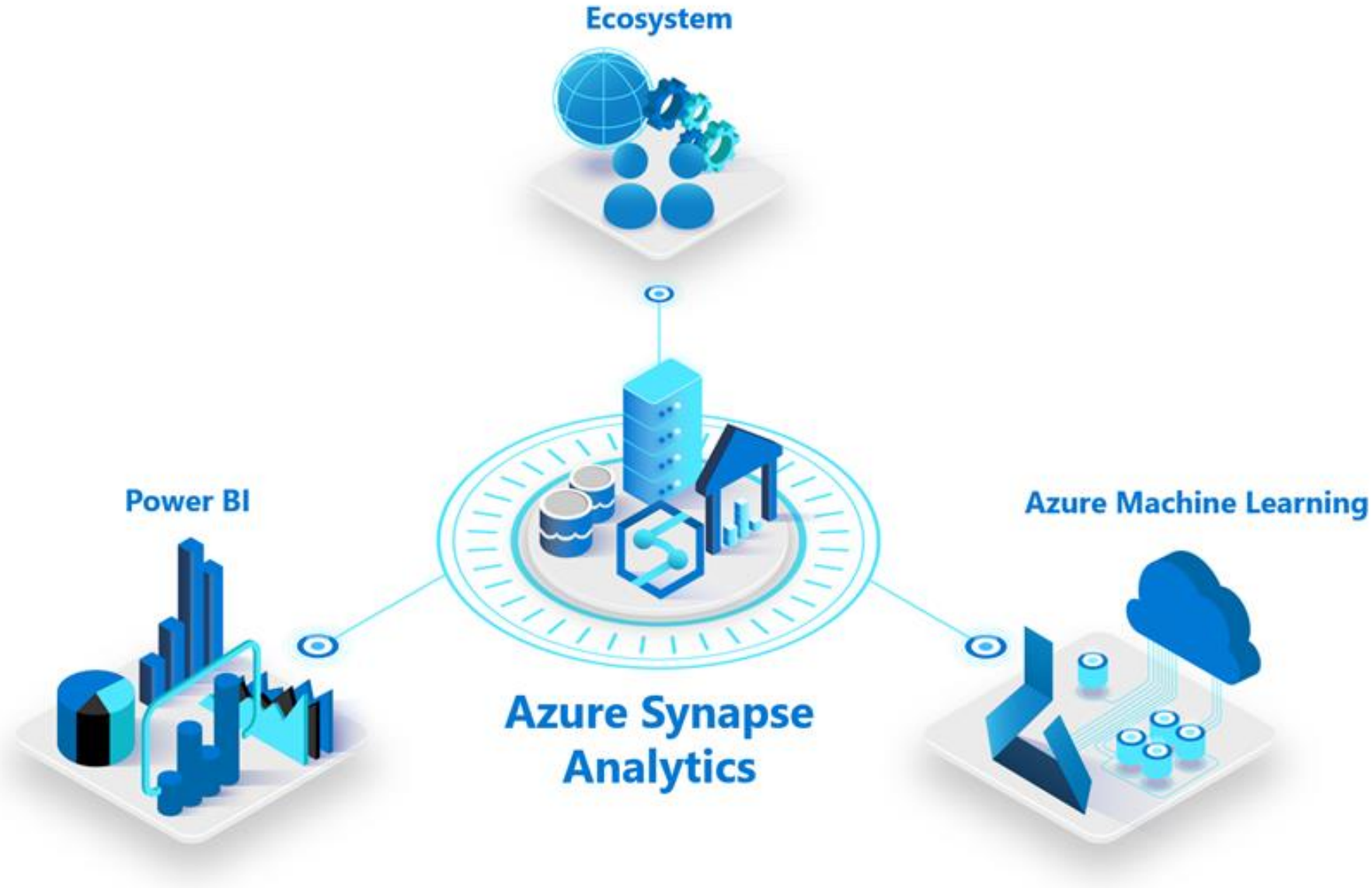
Web 2.0 technologies



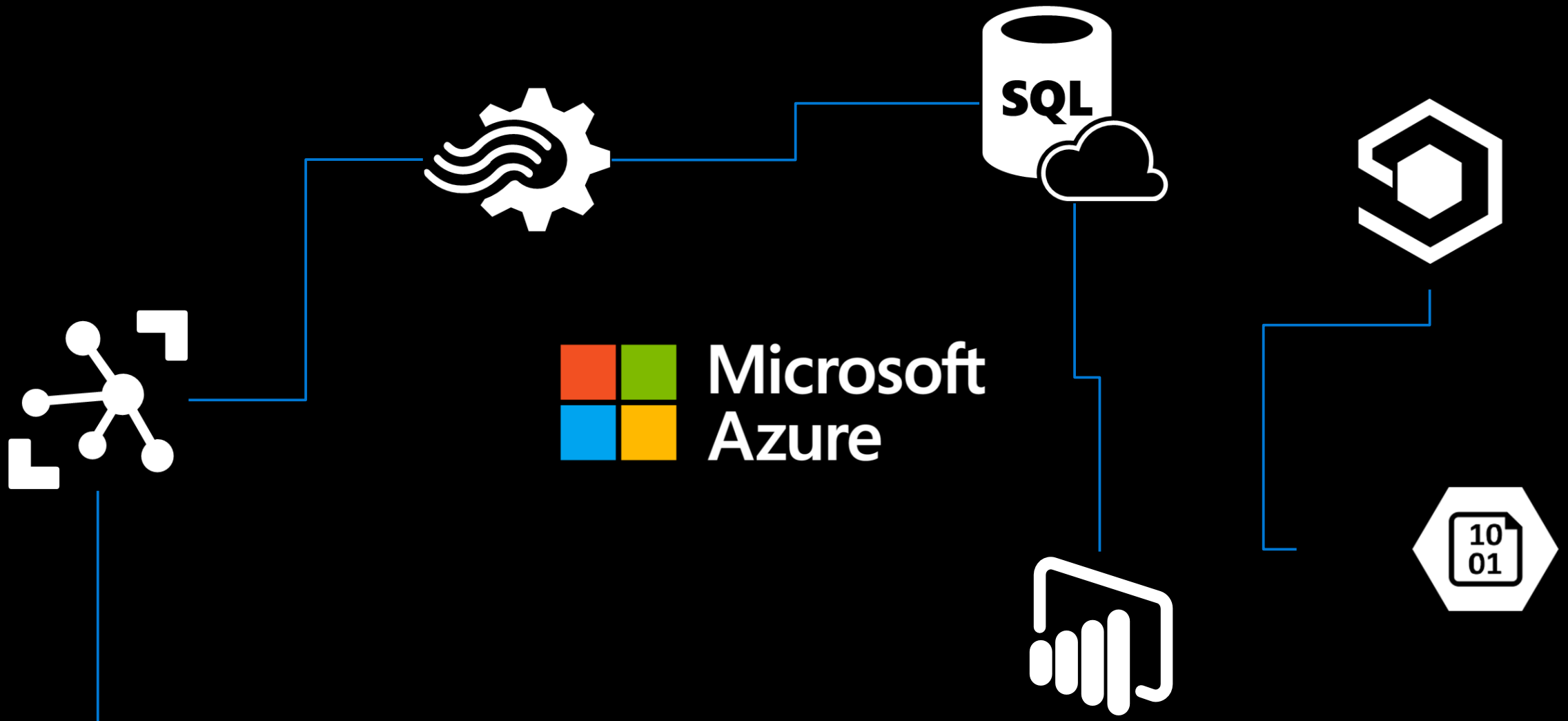
Remember these?



“Big Data” challenge 2.0

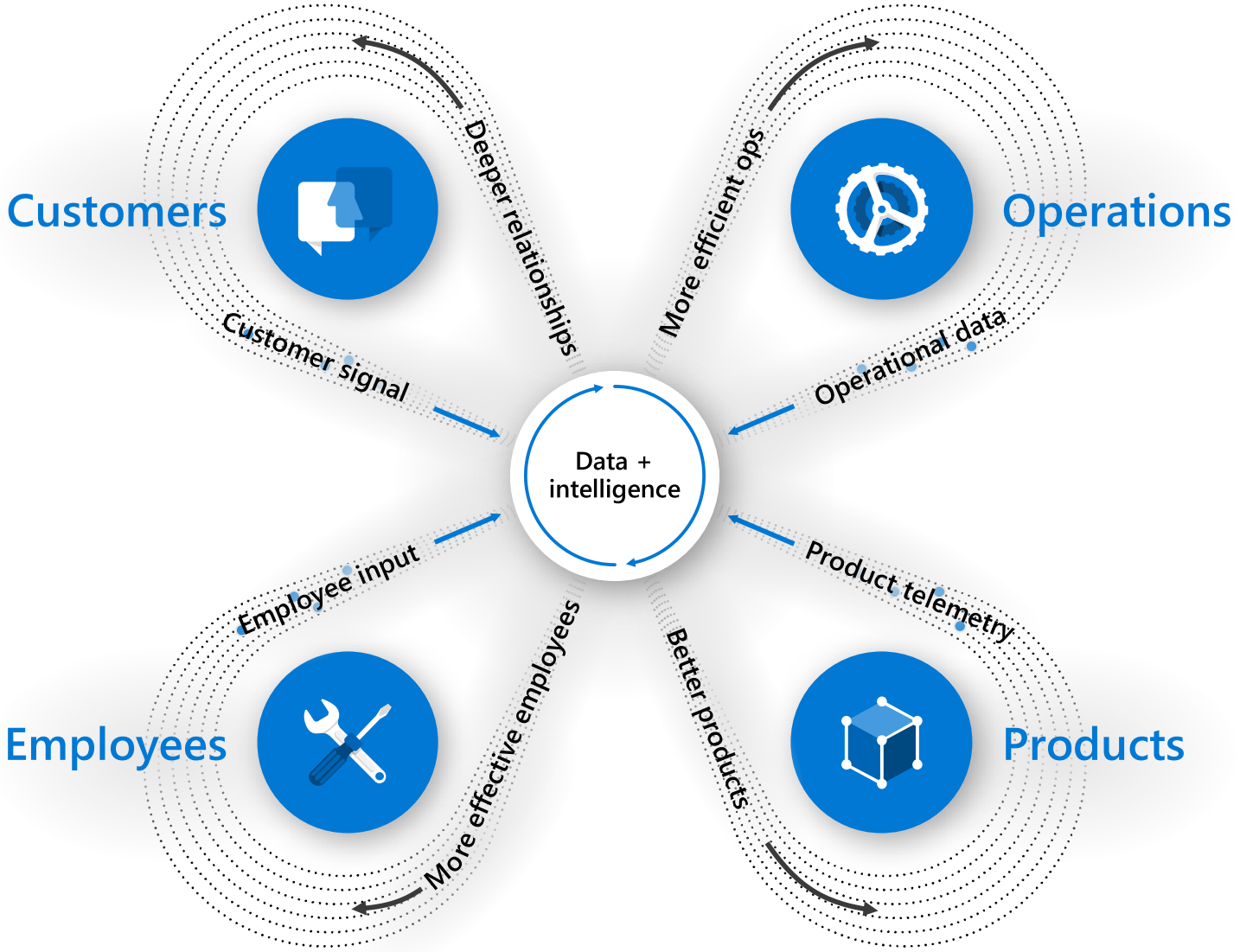

Ecosystem
Power BI
Azure Machine Learning
Azure Synapse Analytics


Microsoft
Azure


SQL
Microsoft
Azure
10
01

The digital feedback loop

1. Data: Capture digital signal across business
2. Insight: Connect and synthesize data
3. Action: Improve business outcomes



What is confidential computing?

The ability to store, transport, **and act** on compute workloads without compromising privacy of data and intellectual property

Why confidential computing in IoT

Intelligent edge computing creates the need to protect code and data in use in addition to protection in storage and transit

Code and data confidentiality

Proprietary code and algorithms

Sensitive data like patient information and ML models

Actions from insights

Safe actions from insights out of intelligent edge processing

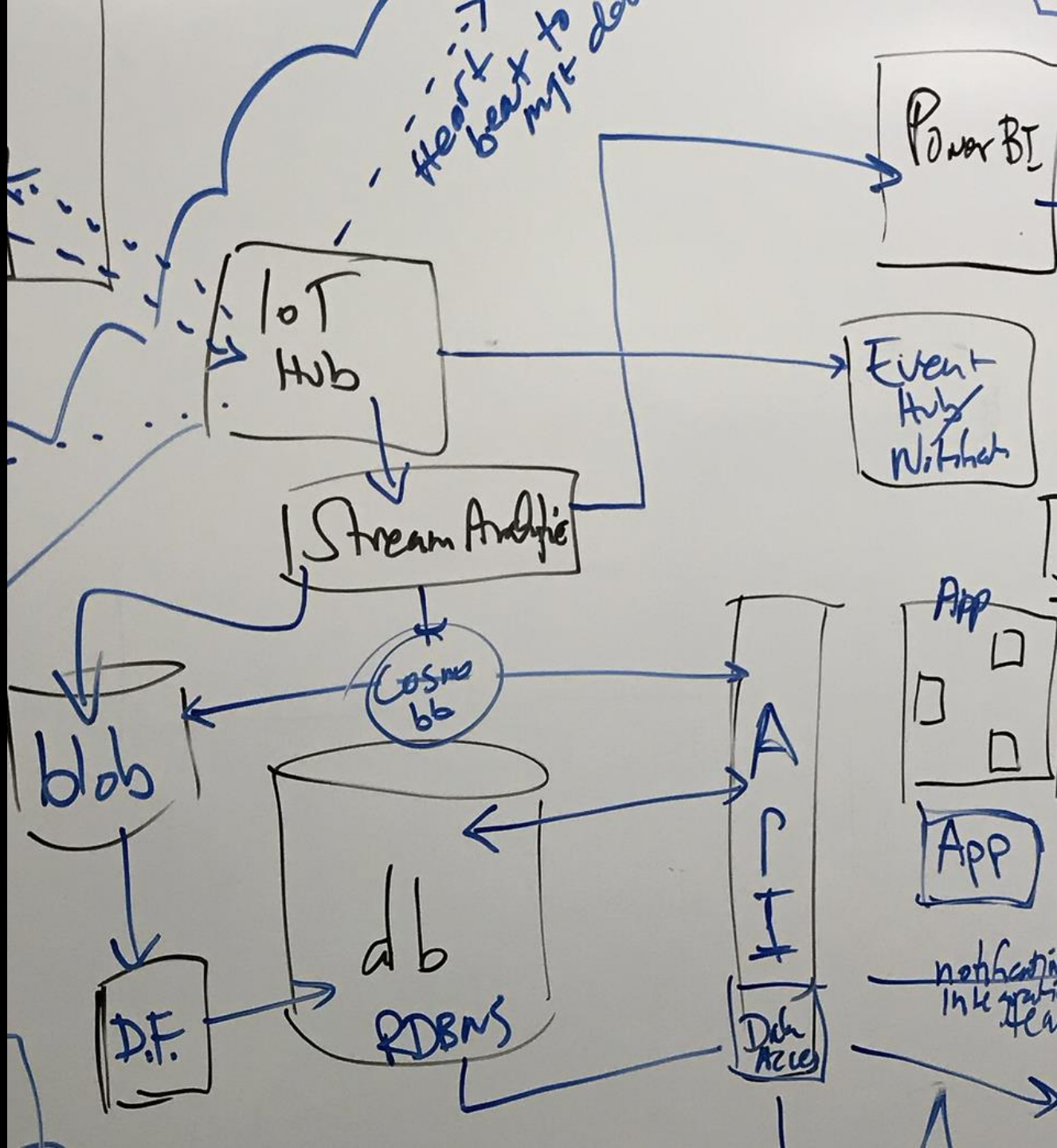
Trustworthy I/O for command and control of critical infrastructure

Valued transactions

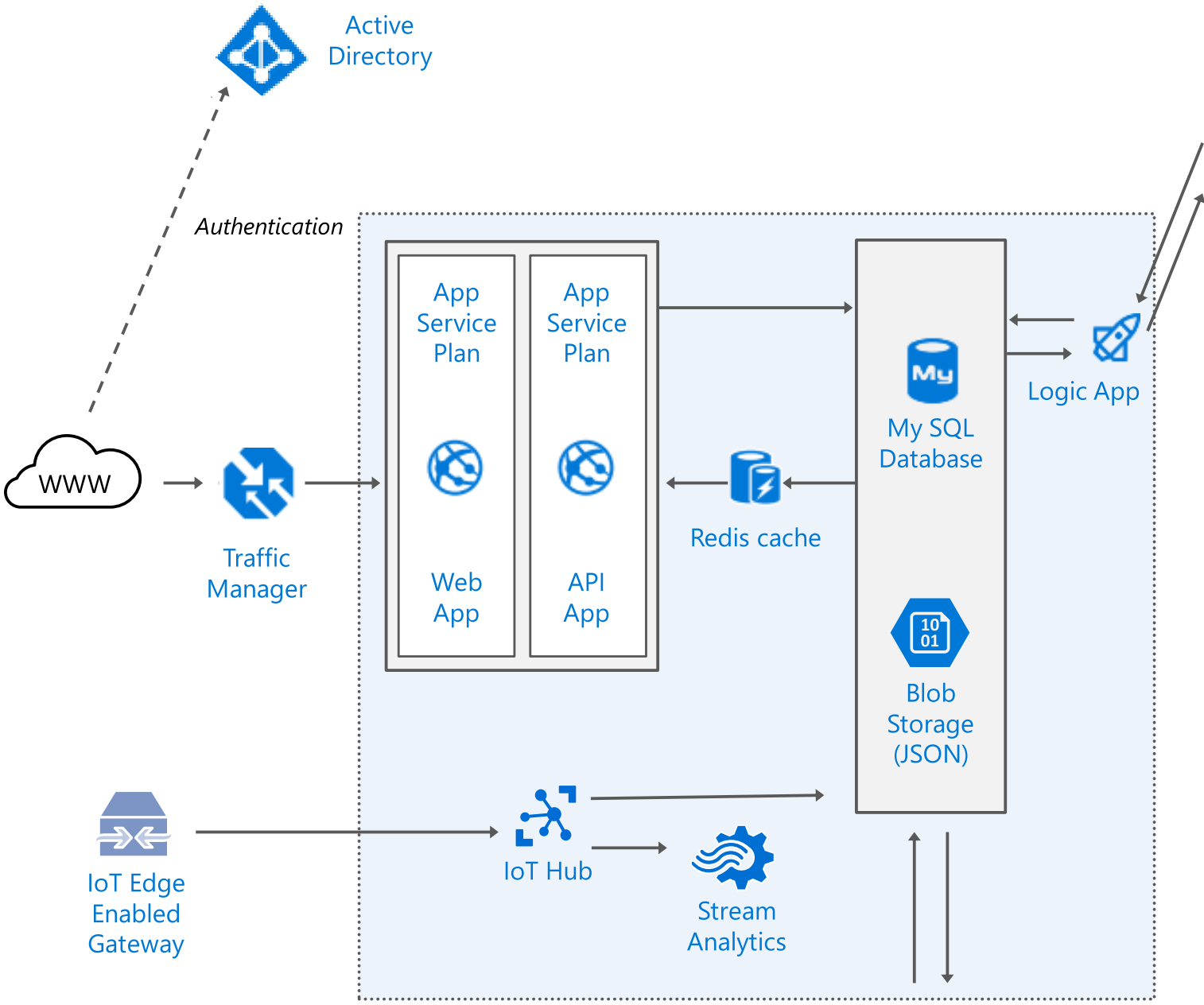
Metering actions for billing

Events tracking e.g., violations for warranty management

The anatomy of the architectural design session



The output


Active Directory
Authentication
WWW
Traffic Manager
App Service Plan
Web App
App Service Plan
API App
Redis cache
My SQL Database
Logic App
Blob Storage (JSON)
IoT Edge Enabled Gateway
IoT Hub
Stream Analytics

Partners make more possible

Microsoft

IoT in action: Smart Mobility

Dr. Marija Zima-Bockarjova

IoT in Action

Smart mobility, why?

Urbanization

By the year 2050,
70% of the world's population will live in cities
UN Study

Digitalization

By 2020,
more than 33 billion devices with Internet access will be used worldwide
Strategy Analytics Studies

Sustainable energy

By 2025,
The solar market will grow to
150 GW (15 x Swiss peak demand)
Frost&Sullivan

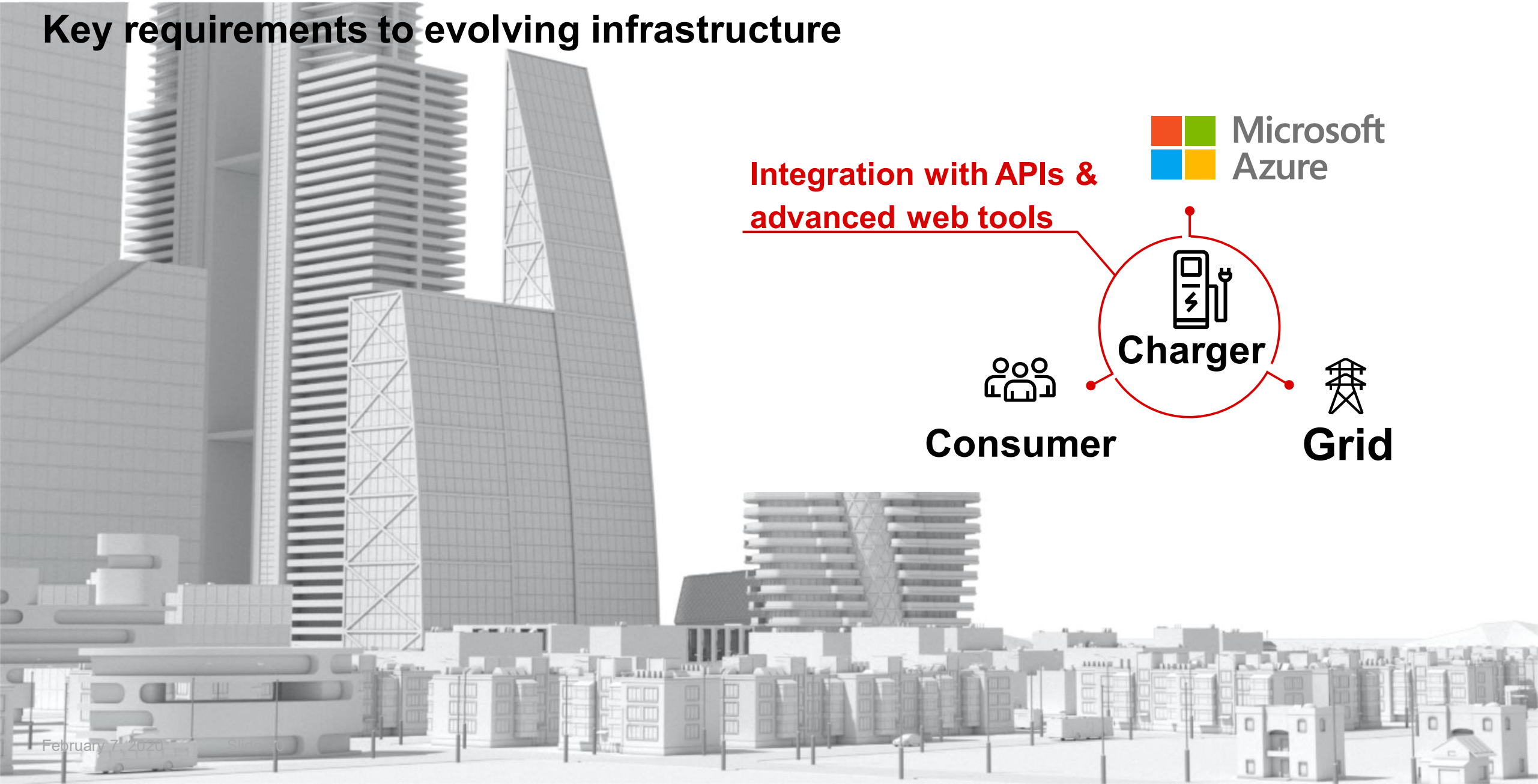
Flexible demand

By 2040,
Electric vehicles will account for over 55% of new car sales
Bloomberg


Transport contributes to almost quarter of CO_2 emissions

ABB Ability™ enterprise, asset management, and service for smart mobility

Key requirements to evolving infrastructure



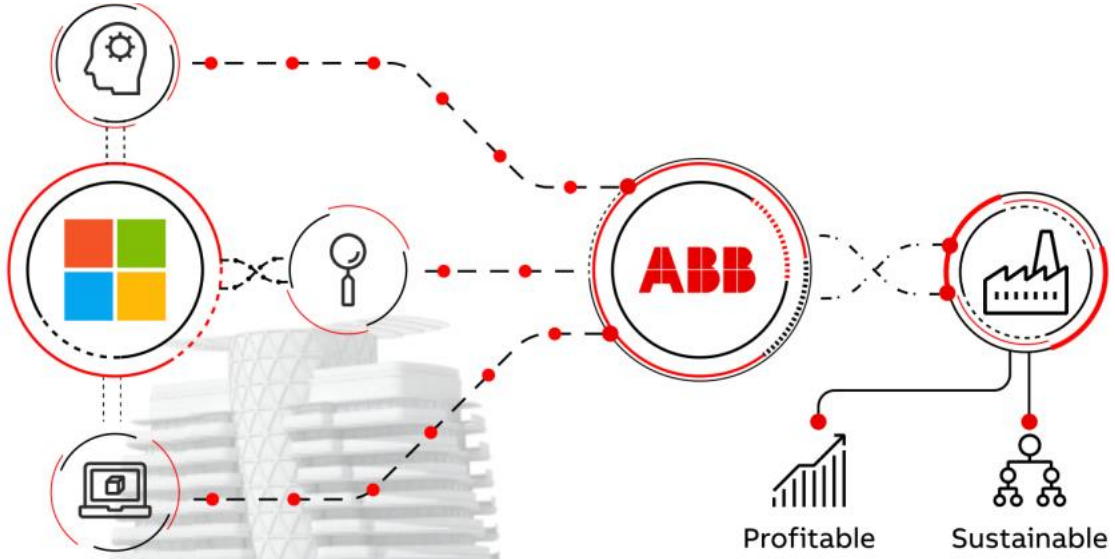
Our ABB Ability™ platform – home for ABB digital solutions, is built on

Microsoft Azure

- Scalable
- Cybersecure
- Interoperable platform,

  allowing rapid development

ABB converts industrial data into fuel for business



Connected solutions allow EV owners to…

ABB Ability™

Microsoft Azure

..access a reliable and cost efficient charging thanks to cloud connected assets

- Help EV-drivers in case of questions
- Maintain and service chargers at the lowest cost
- Conveniently pay for charge sessions

Reliable 24/7 connectivity is fundamental for the commercial operation

EVI Global Service support

ABB Ability™

Microsoft Azure

ABB is able to **diagnose more than 90%** of the service cases remotely, **solving over 75%** of these cases without any on-site intervention.

This results in **significant savings on down-time**, **travelling**, **transportation**, **man-hours** and **resources**.

Charger care increases the safety, profitability and availability of our customers charging network

ABB Ability™ Energy Management Solutions for smart mobility

Opportunity charging for maximum driver convenience

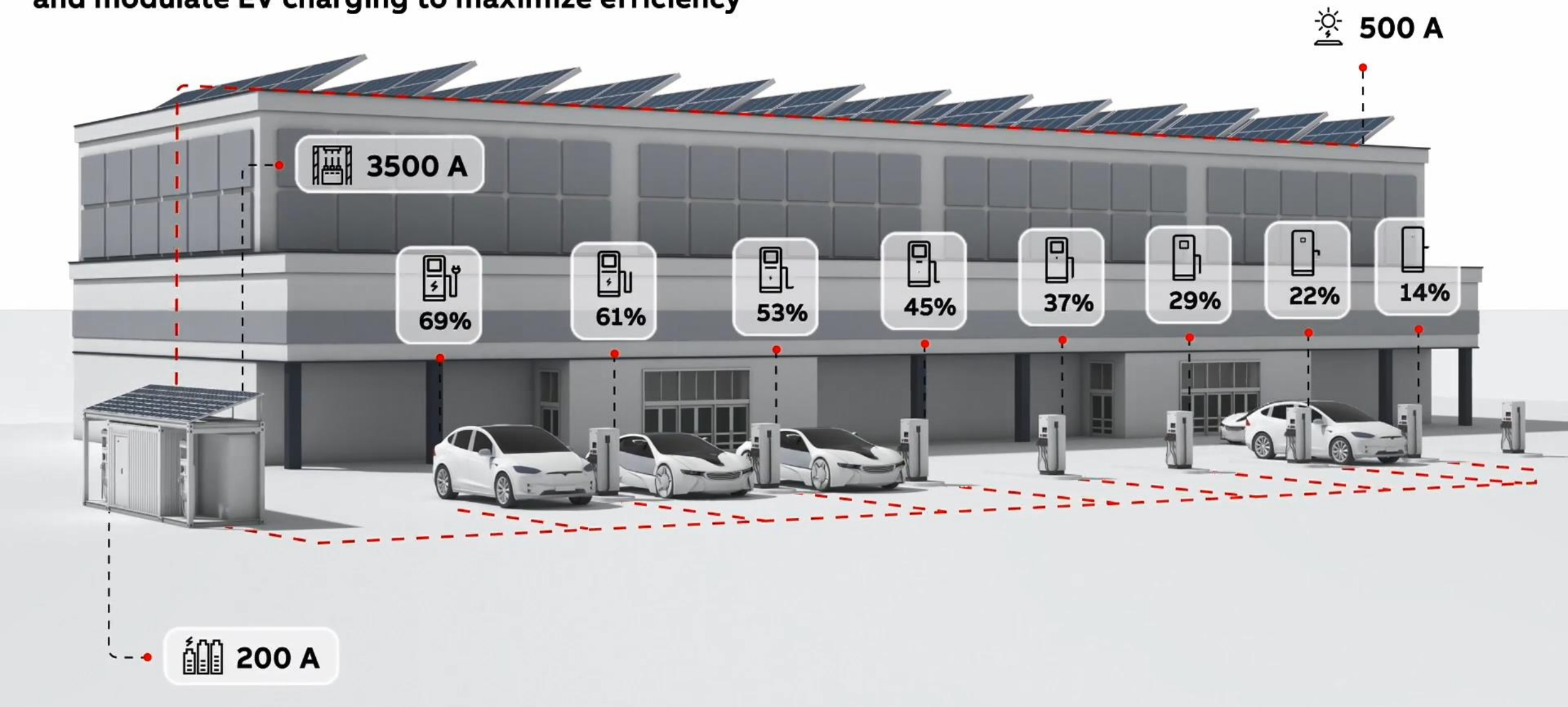
Opportunity charging for maximum driver convenience

Integration of e-mobility with digital solutions

Microsoft Azure

ABB Ability™

The Adaptive Level of Energy Management is flexible to accommodate larger capacity
Its advanced monitoring capabilities sense changes in grid usage
and modulate EV charging to maximize efficiency



Successes

ABB and Volvo to electrify Gothenburg's city streets

Starting in 2020,
157 new Volvo electric buses will start operating on the streets of Gothenburg, Mölndal and Partille, powered by charging infrastructure solutions from market leading provider,
ABB

This represents an important step towards achieving a sustainable public transport solution.

ABB fast charge installations

Proven technology in the field since May 2010
now in **81 countries**

Electrify America

IONITY

Total more than 13.000 fast charging units sold

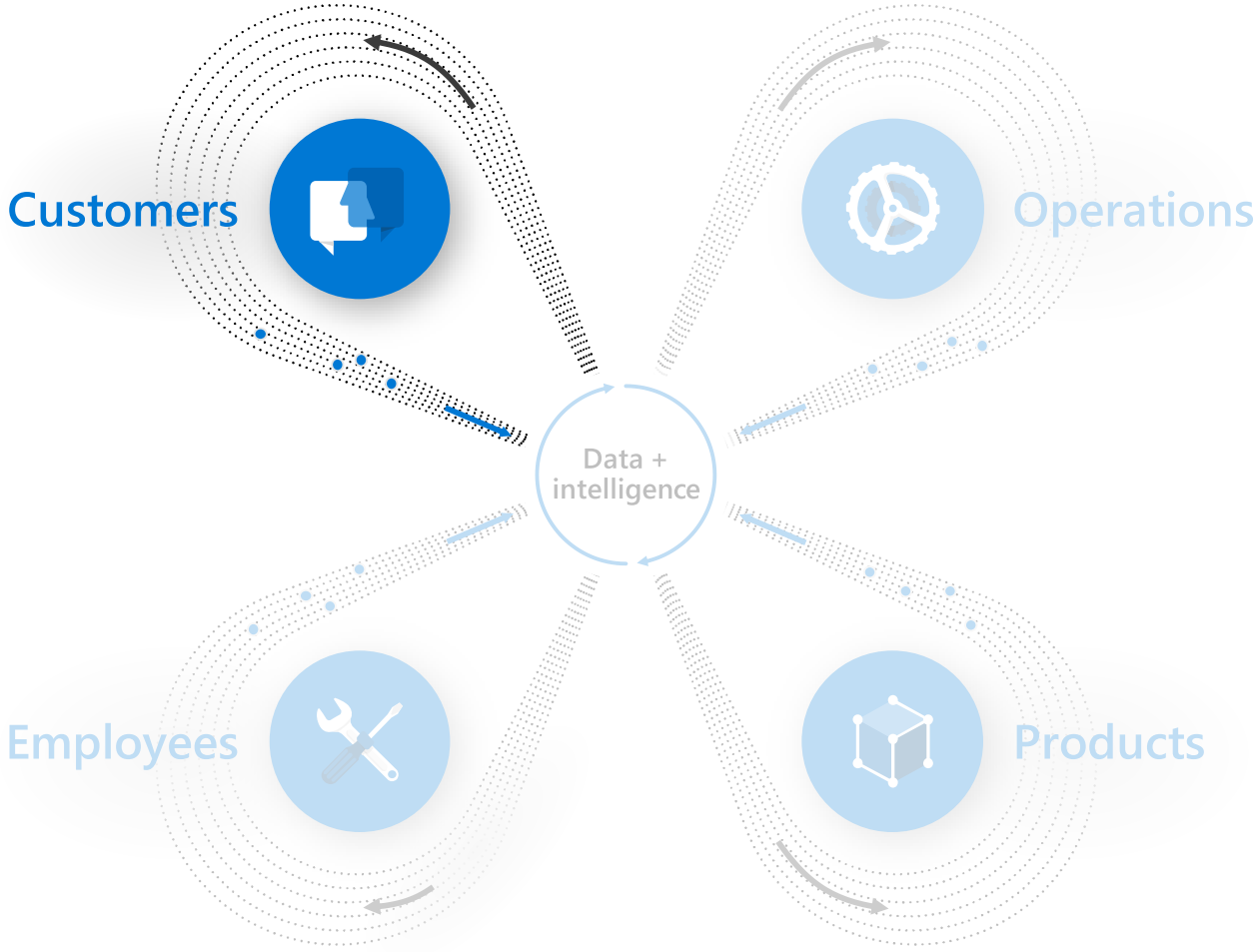
≥ 10 kW
more than **2.300 pcs 150-450 kW High Power Charging systems (for car and bus)**

Microsoft

We iterate on it with our partners

This is what we mean by our greatest strength is our ecosystem

We can help create the better process this way together



Microsoft

moovit

Shaping the Future of Urban Mobility with MaaS

Yovav Meydad
Chief Growth & Marketing Officer

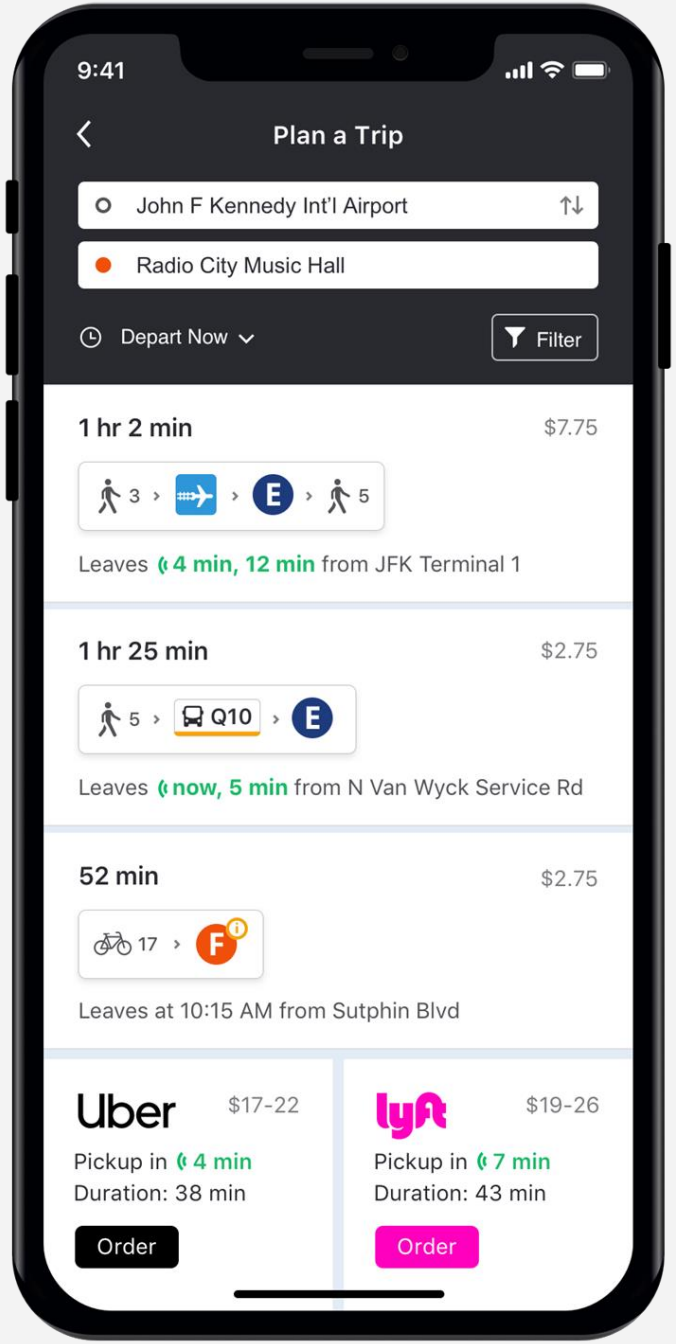
IoT in Action

Moovit simplifies urban mobility
all around the world

The Simplest and Most Intuitive Mobility App in the World

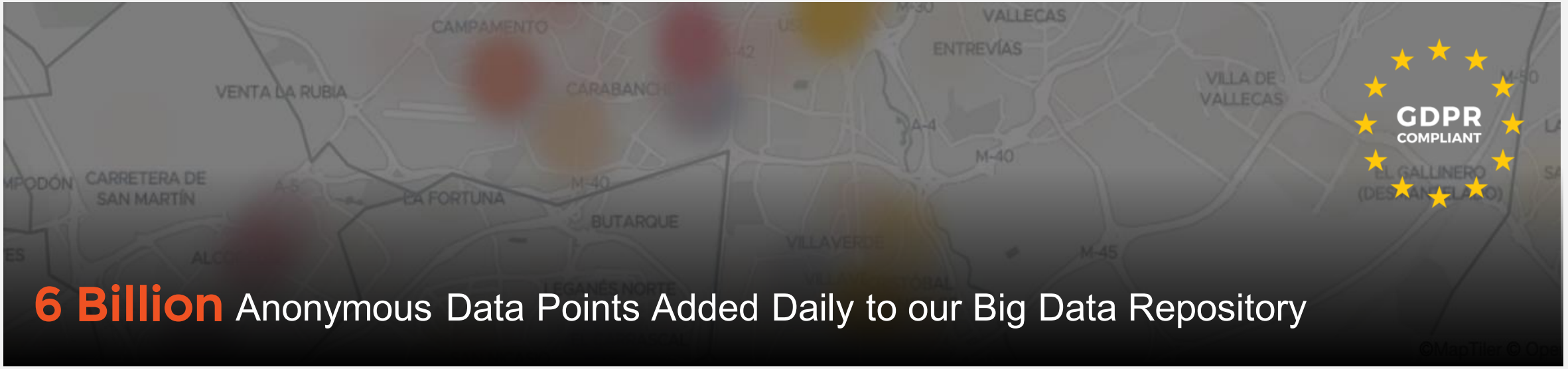
> If you need to get anywhere by mass transit, you need Moovit.
> It will open up a new world for you…

USA TODAY



moovit

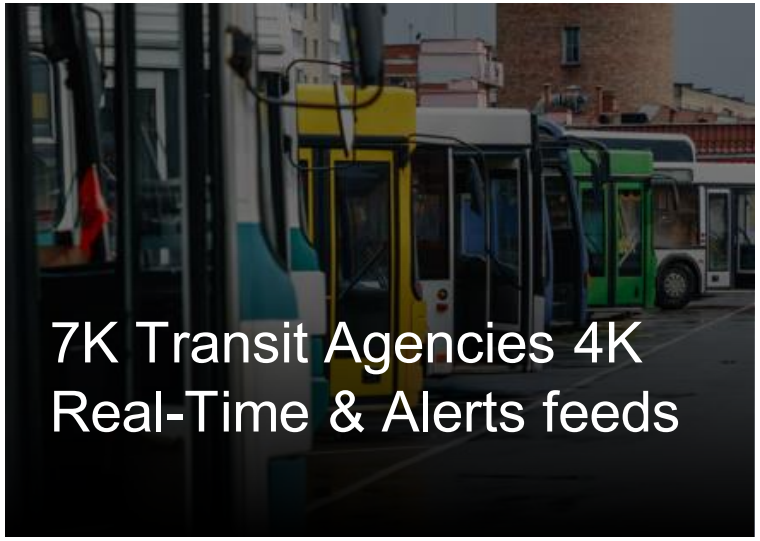

+680 Million Users Worldwide
Adding +1 Million New Users Every Day, With **Zero Marketing Budget**


CAMPAMENTO
VALLECAS
ENTREVÍAS
VENTA DA RUBIA
CARABANCHEL
VILLA DE VALLECAS
A-4
M-40
CARRETERA DE SAN MARTÍN
A-5
LA FORTUNA
M-40
BUTARQUE
VILLAVERDE
M-45
GDPR COMPLIANT
6 Billion Anonymous Data Points Added Daily to our Big Data Repository

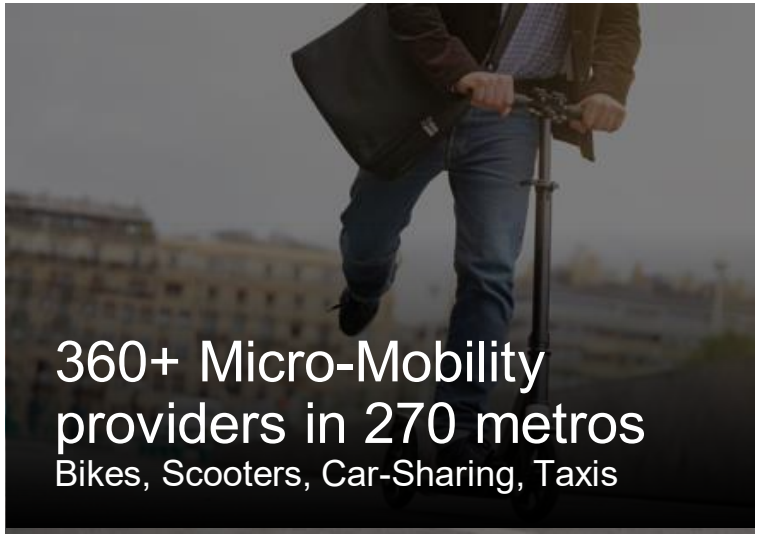
moovit


Service in 3000 Cities, 97 Countries

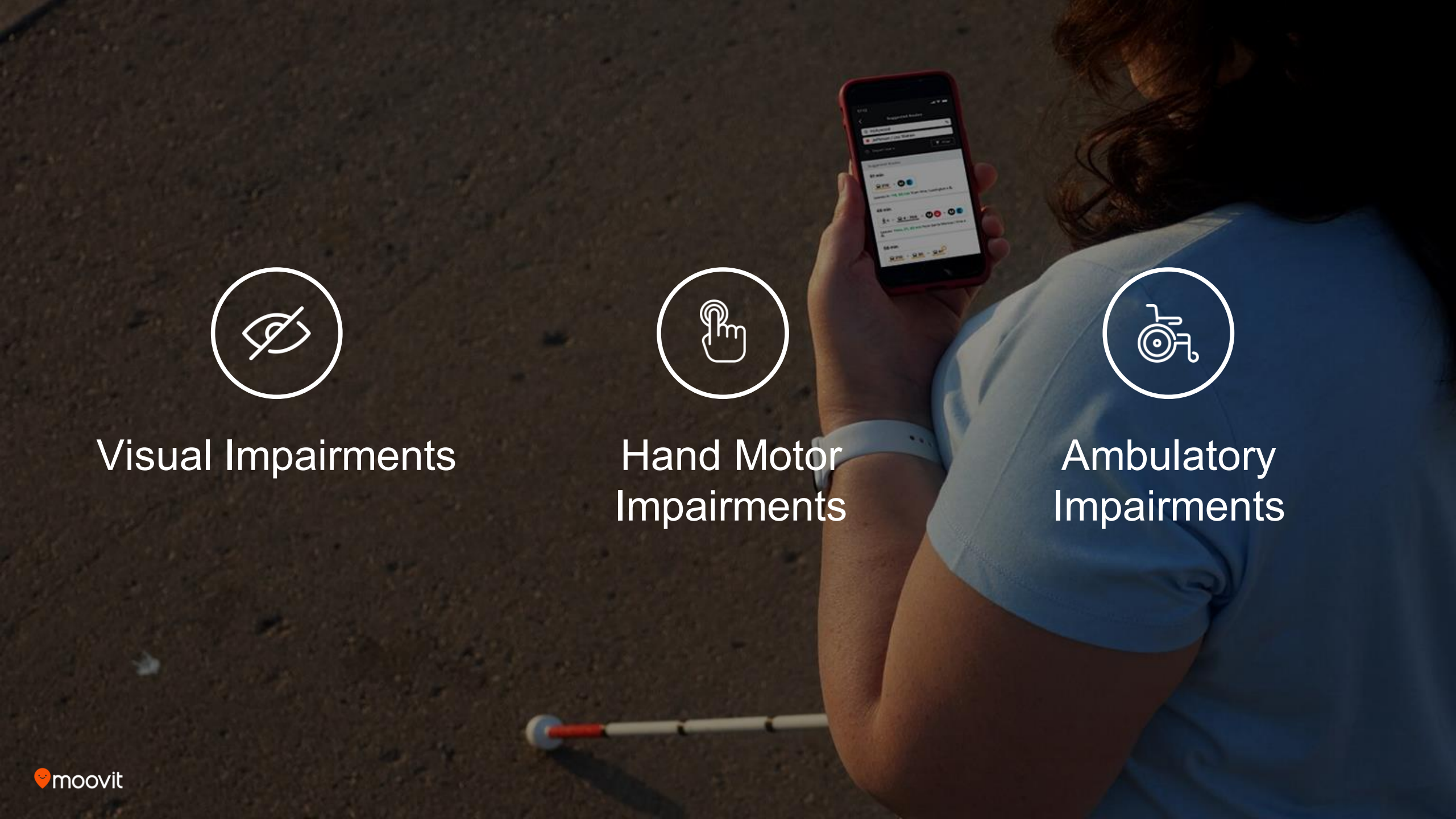

Hallo
Tag
Kaixo
Buna
Hello
Salut
45 Languages


7K Transit Agencies 4K
Real-Time & Alerts feeds


5.6 Million Stops


360+ Micro-Mobility
providers in 270 metros
Bikes, Scooters, Car-Sharing, Taxis

moovit


Visual Impairments
Hand Motor Impairments
Ambulatory Impairments
moovit

For Consumers

World's leading Urban Mobility app

For Cities & Transit Agencies

Microsoft Co-Sell Partner

SaaS platform to manage & operate their MaaS offering

For Businesses

Microsoft Azure

Moovit Transit APIs to power their mobility offering

Most Powerful Multimodal Trip Planner

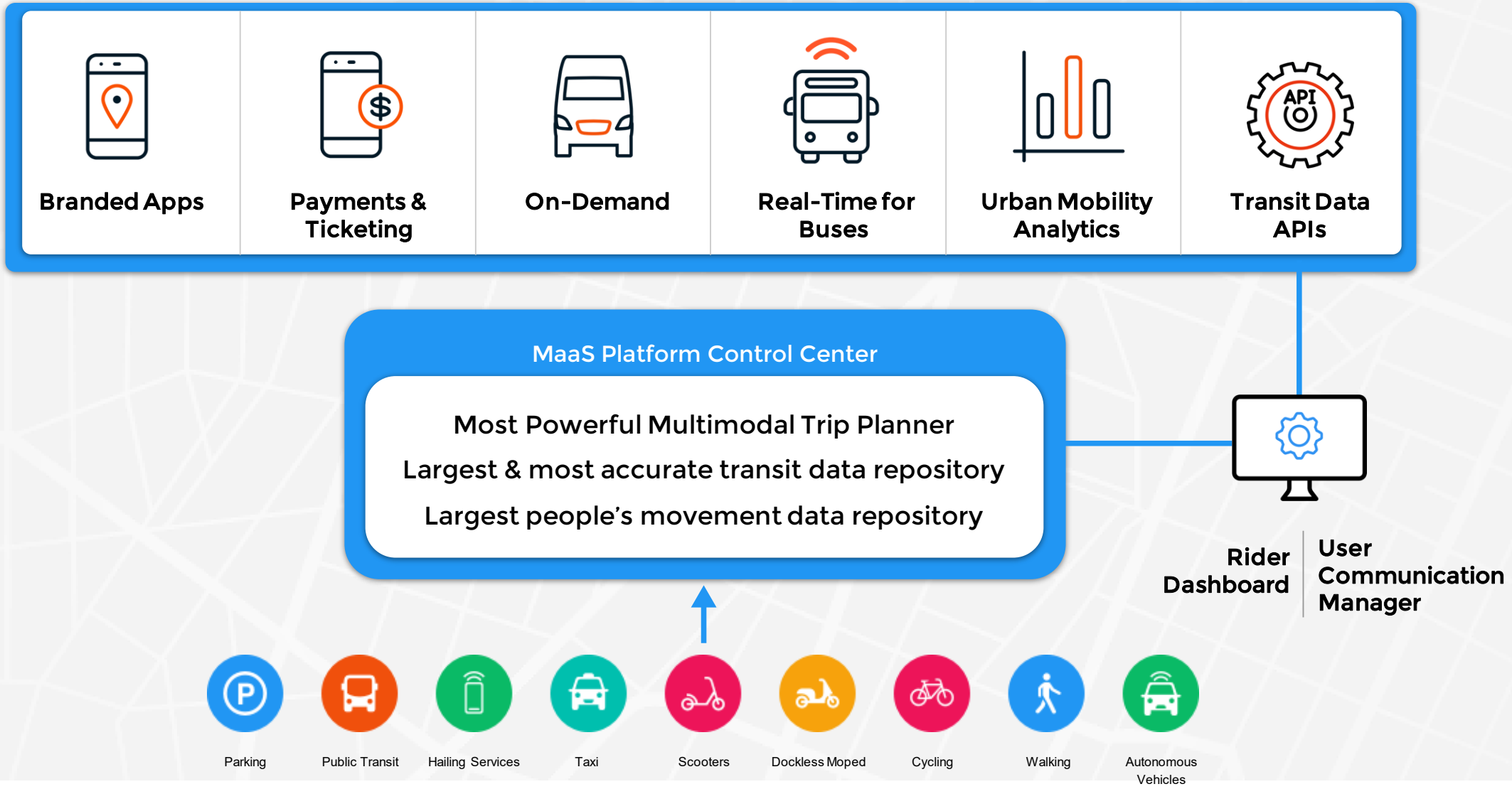
Largest & most accurate transit data repository

Largest people's movement data repository

Parking | Public Transit | Hailing Services | Taxi | Scooters | Dockless Moped | Cycling | Walking | Autonomous Vehicles

moovit

Moovit MaaS Platform

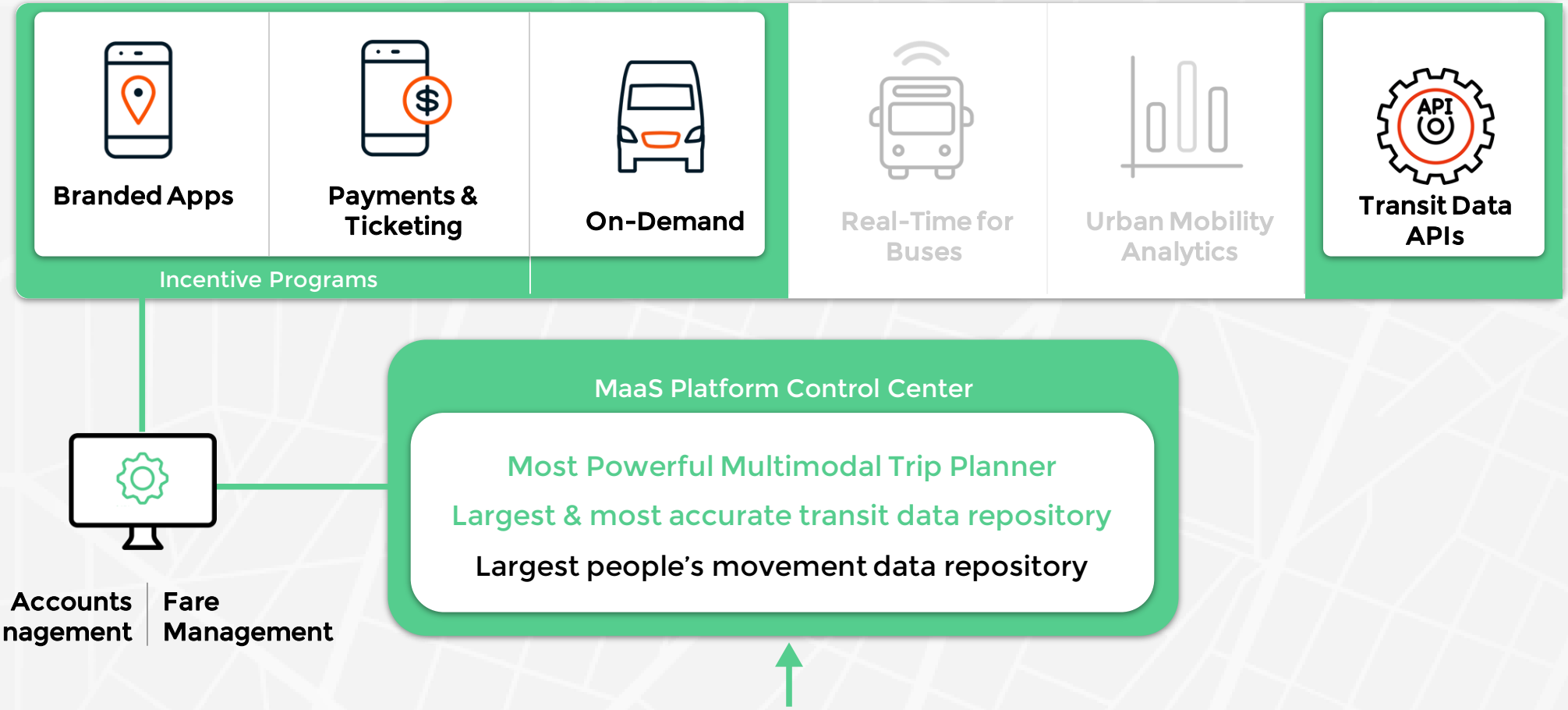


Plan Pay Ride

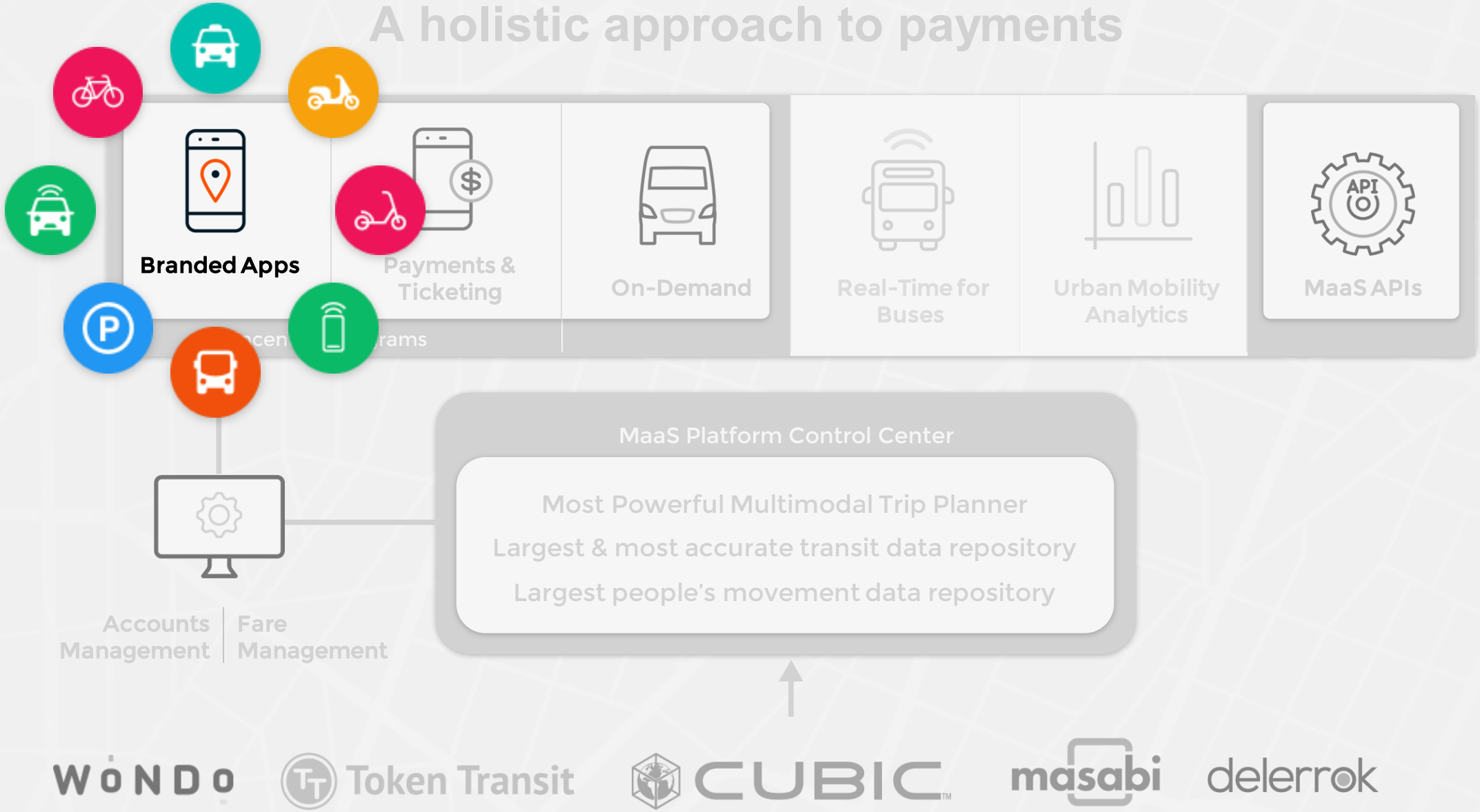
Holistic Transit Experience of a Complete MaaS Platform

moovit

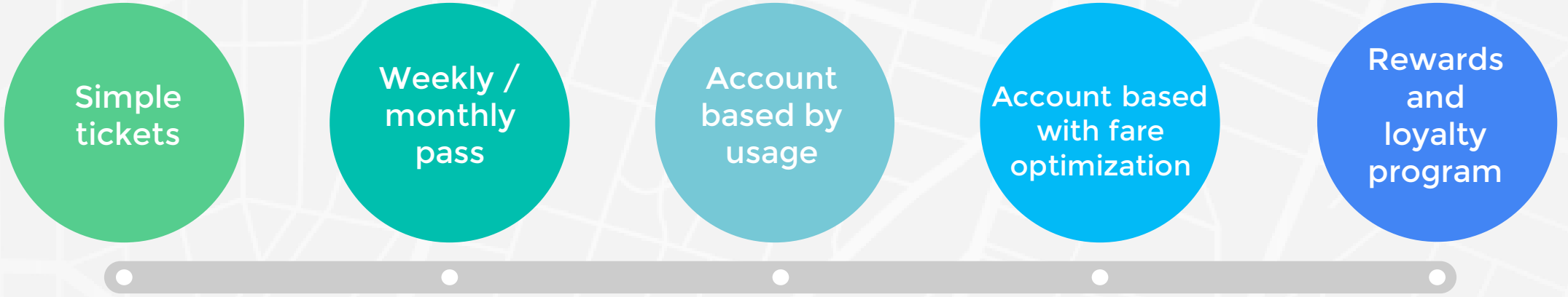
A holistic approach to payments



A holistic approach to payments



A Range of Payment Models



Powering MaaS for

Transit Agencies & Operators

Cities & Municipalities

Department of Transportation, Regional/country level

Campus

Private Sector

Employers, Business Districts, MaaS providers

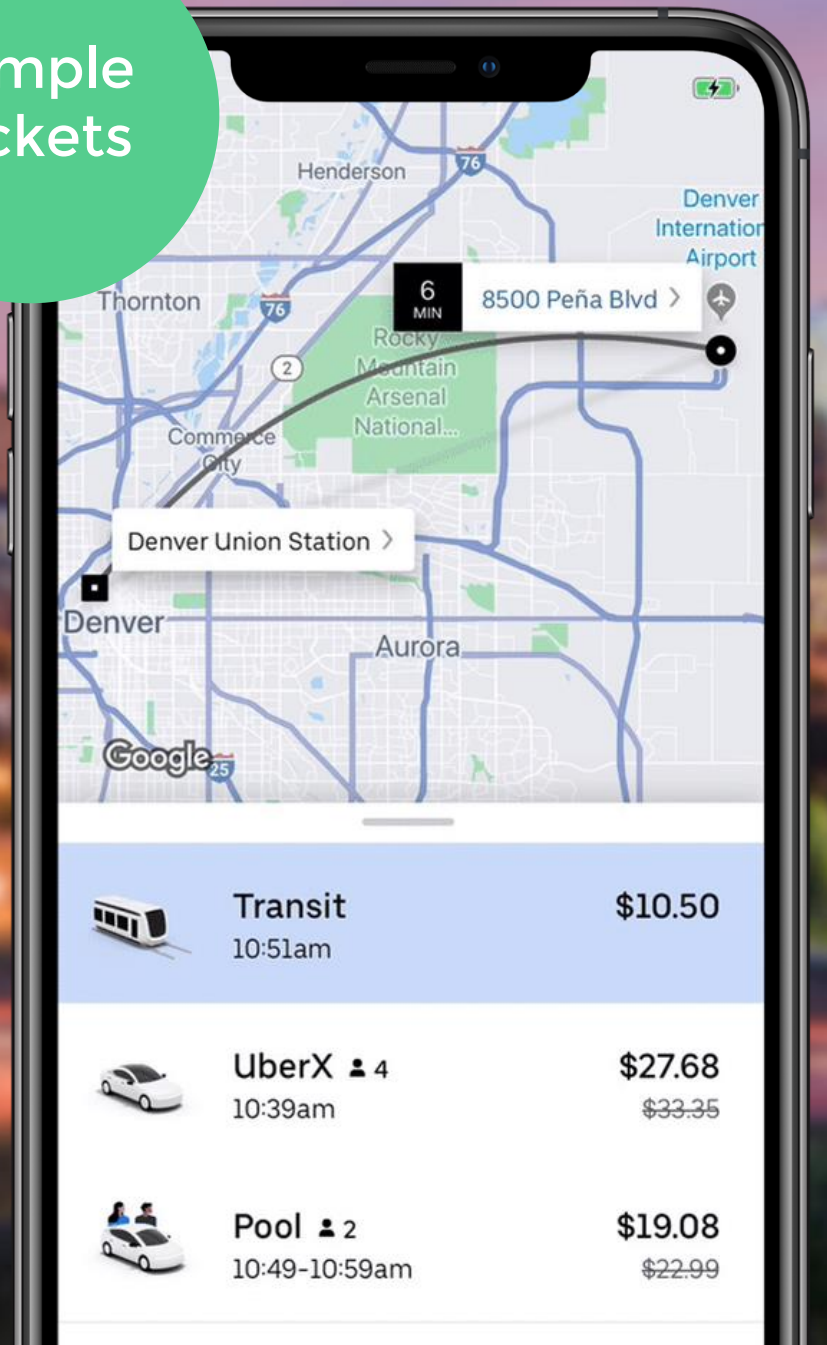
Case Study

Uber

Currently live in Las Vegas, San Francisco, Boston, Chicago & Denver - USA, London - UK, Sydney - Australia, Paris - France, and Ciudad de Mexico - Mexico

Branded Apps	**Payments & Ticketing**	Urban Mobility Analytics	On-Demand	Real-Time for Buses	**APIs**

Simple tickets



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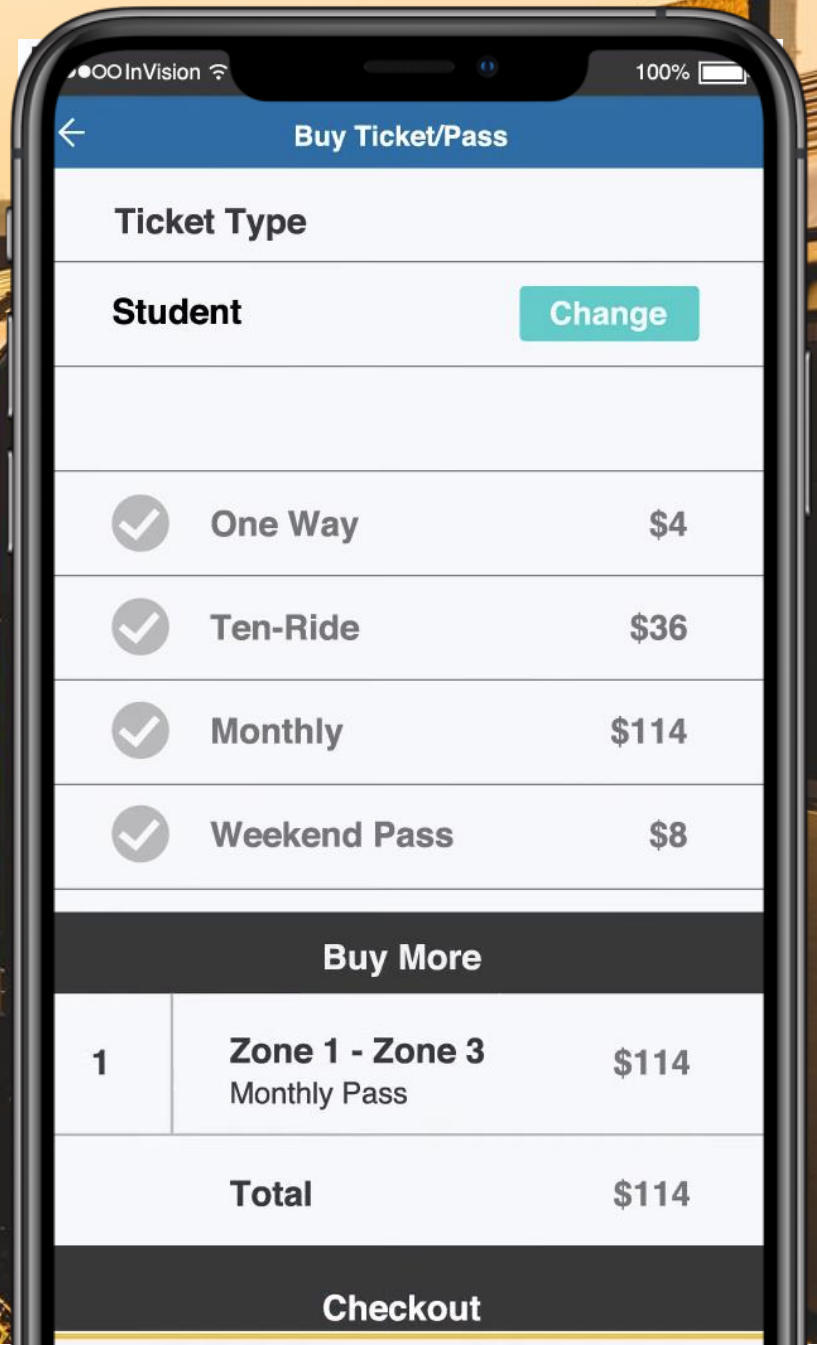
Case Study

CUBIC™

USA, UK, Australia, Canada

- Branded Apps
- Payments & Ticketing
- Urban Mobility Analytics
- On-Demand
- Real-Time for Buses
- APIs



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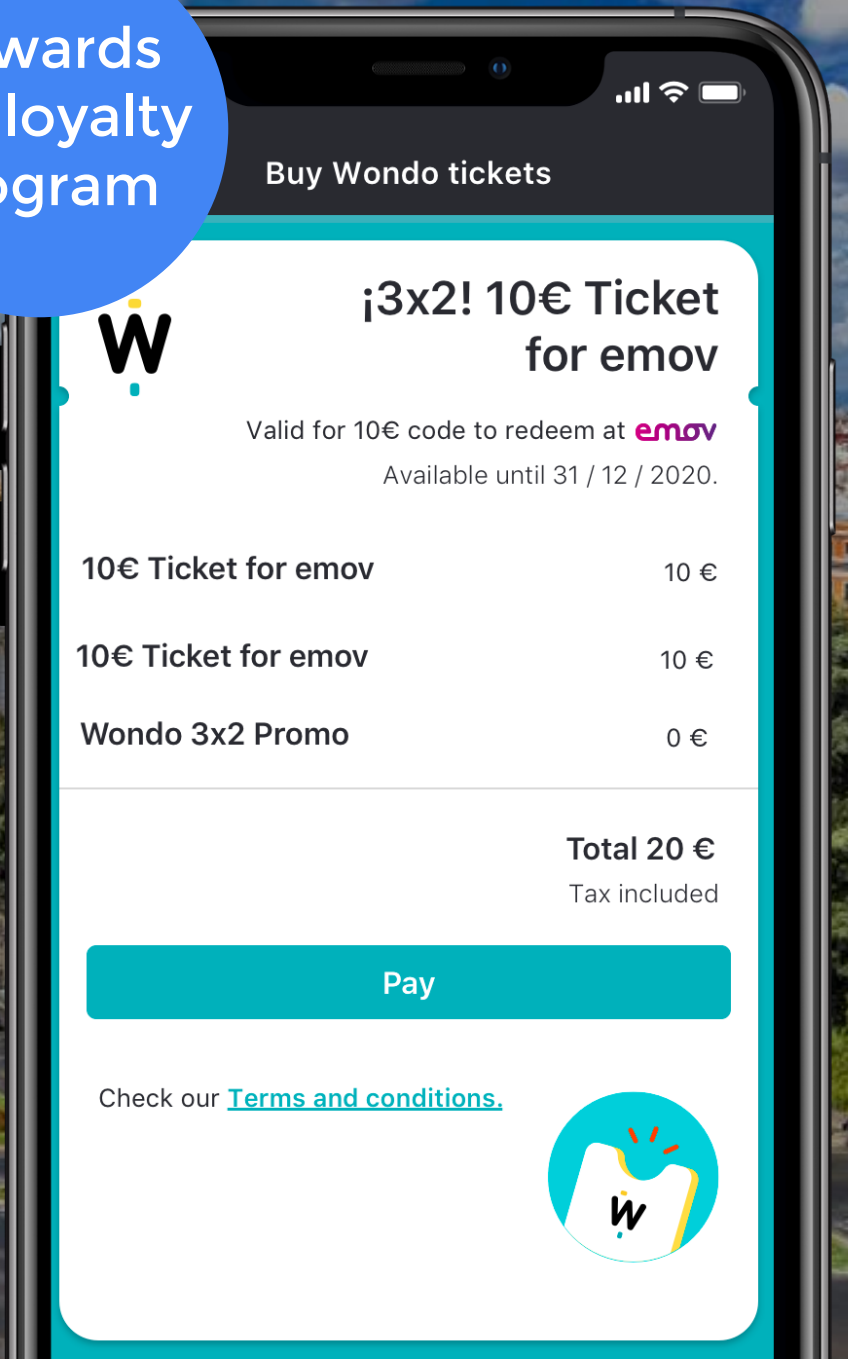
Case Study

WONDO

Madrid, Barcelona & more

- Branded Apps
- Payments & Ticketing
- Urban Mobility Analytics
- On-Demand
- Real-Time for Buses
- APIs

Rewards and loyalty program



moovit

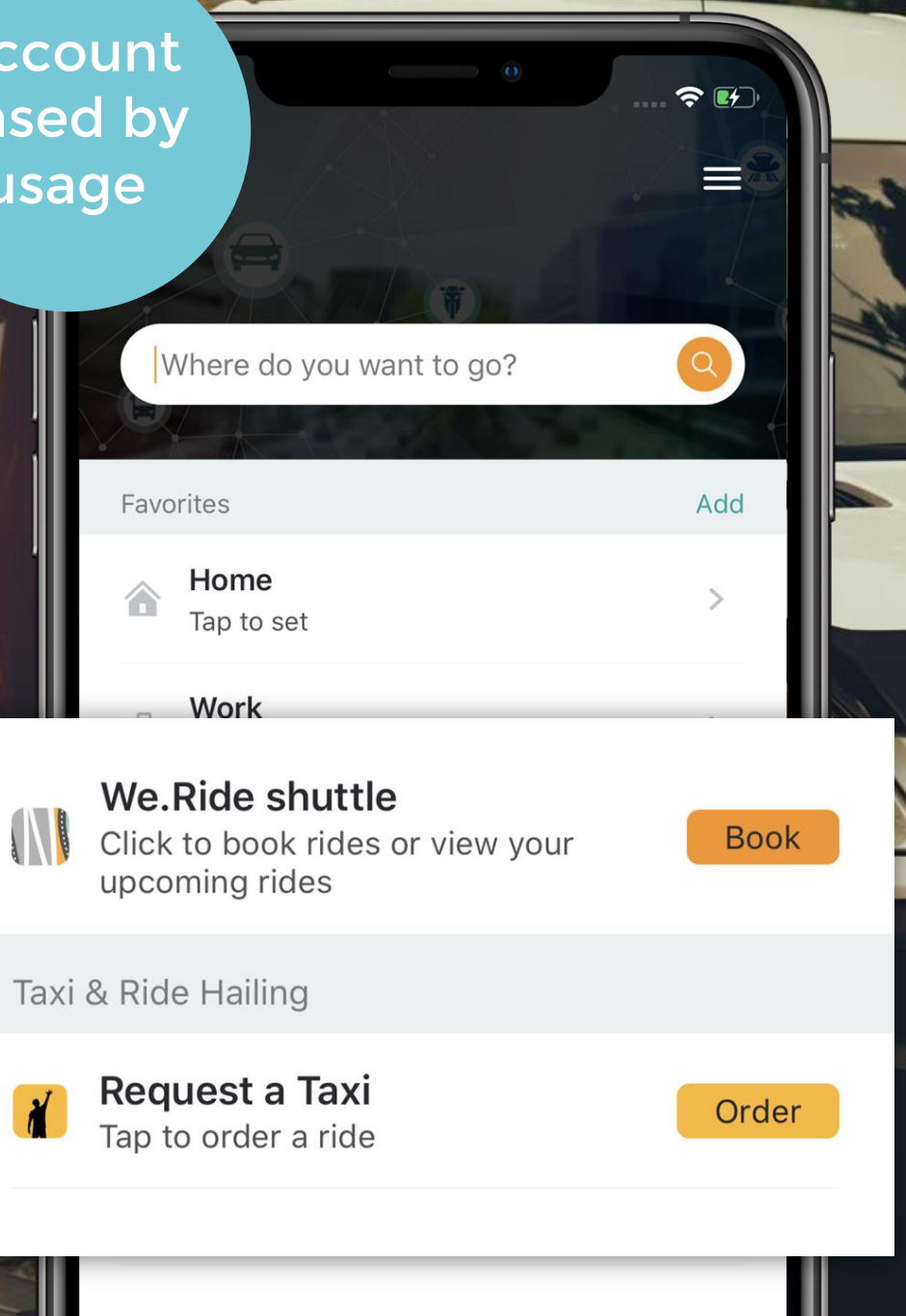
Account based by usage

Case Study

Western Digital® | We.Ride Mobility made simple

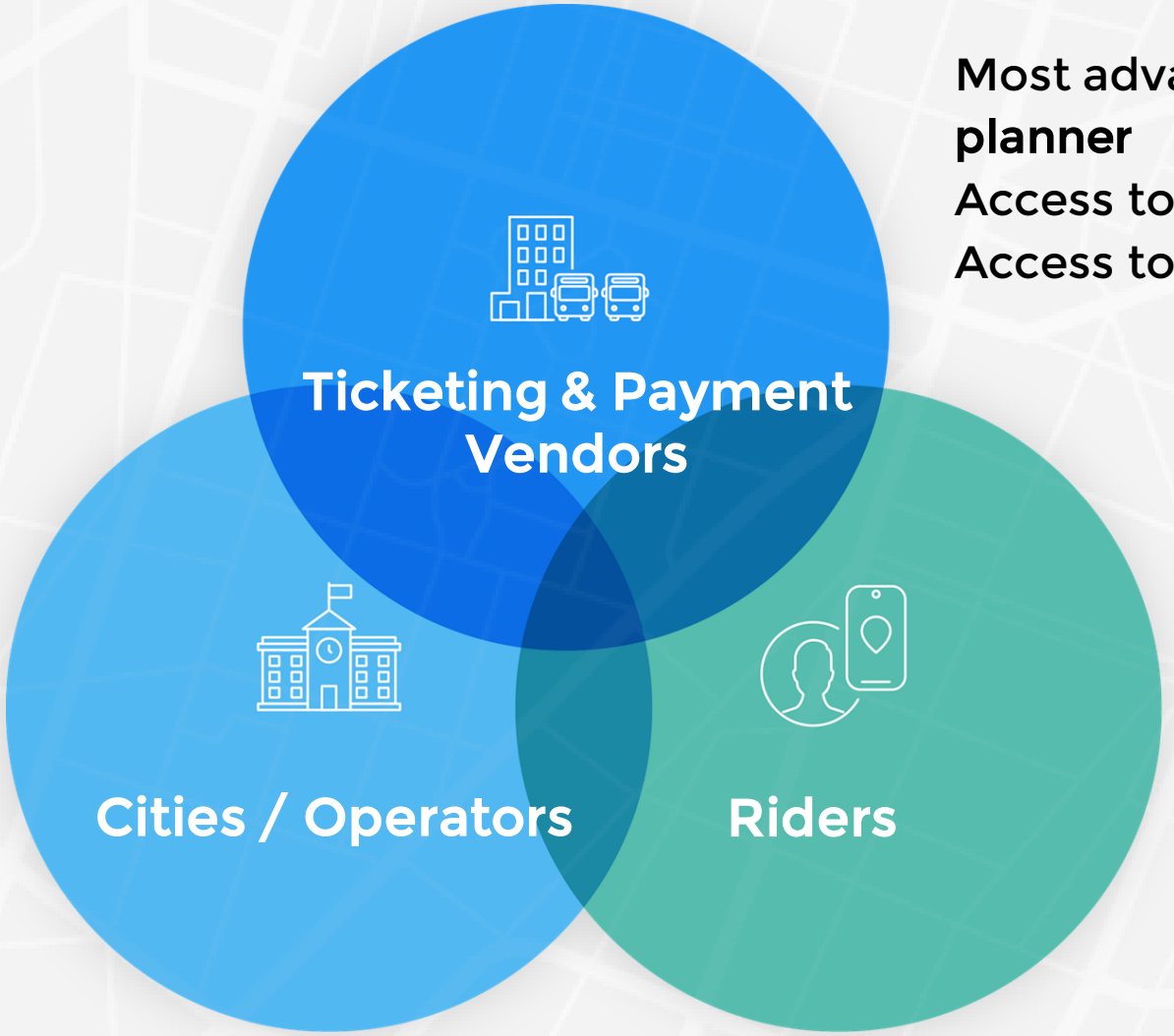
Israel

Branded Apps	Payments & Ticketing	Urban Mobility Analytics	On-Demand	Real-Time for Buses	APIs



moovit

Benefits for all



Most advanced **Multimodal trip planner**
Access to over **680M** users
Access to over **3000** cities

One MaaS platform with one mobility app
Offer **variety** of payment models and vendors

One mobility app
Seamless experience - **plan>pay>ride**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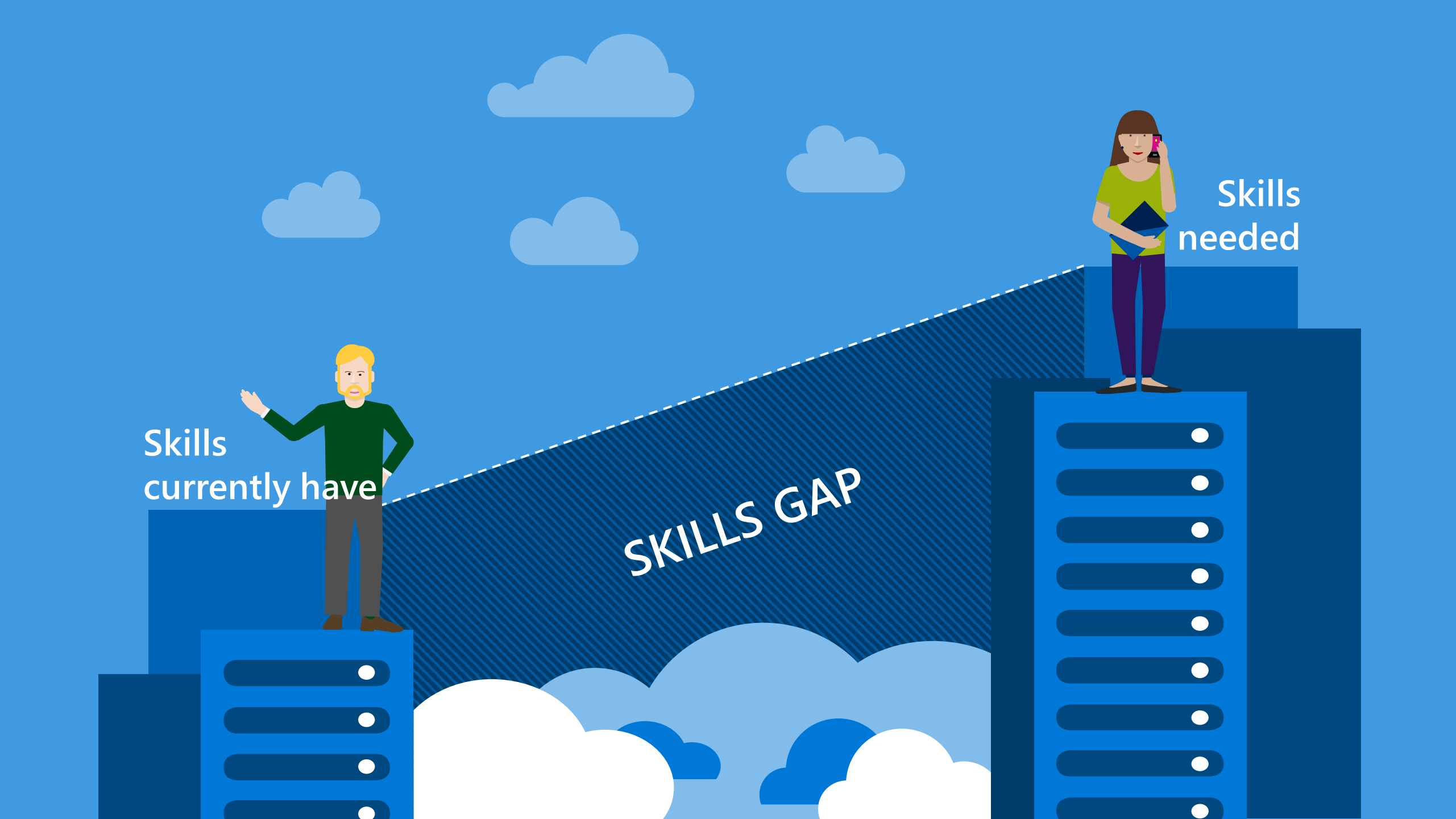
yovav@moovit.com


Skills needed
Skills currently have
SKILLS GAP

Welcome to Microsoft Learn

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Time investment expectation

Microsoft.com/learn

12300 XP

Azure fundamentals

8 hr 17 min remaining • Learning Path • 1 of 12 modules completed

Beginner | Developer | Solution Architect | Administrator | AI Engineer | Business Analyst | Business User | Data Engineer | Data Scientist | Azure | Azure Portal | Azure Resource Manager | Storage | Virtual Machines

Interested in the cloud, but aren't quite sure what it can do for you? This path is the place to start.

In this learning path, you will:

- Learn cloud concepts such as High Availability, Scalability, Elasticity, Agility, Fault Tolerance, and Disaster Recovery
- Understand the benefits of cloud computing in Azure and how it can save you time and money
- Compare and contrast basic strategies for transitioning to the Azure cloud
- Explore the breadth of services available in Azure including compute, network, storage and security

Once you complete this learning path, you will have the necessary knowledge to take the AZ900 Microsoft Azure Fundamentals Exam.

Prerequisites
None

Modules in this learning path

Cloud Concepts - Principles of cloud computing

1100 XP

1 hr 2 min • Module • 10 Units

★★★★★ 4.8 (23350)

Explore the core concepts of cloud computing and how it can help your business.

Overview

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Total XP= 12,300

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Module XP= 1,100

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Top Challenges

Complexity
- IoT PnP, IoT Central

Knowledge
- MS Learn

Security
- Confidential Computing

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