



Microsoft における Smart Buildingへの取り組みのご紹介

日本マイクロソフト株式会社
運輸・サービス営業本部
建設・不動産専任営業部長
藤永 聖子



The UN Sustainable Development Goals



2015年9月の国連サミットで採択された、国連加盟193か国が
2016年～2030年の15年間で達成するために掲げた目標



SUSTAINABLE DEVELOPMENT GOALS

2030年に向けて
世界が合意した
「持続可能な開発目標」です

マイクロソフトは、3, 4, 5, 8, 9, 11, 13, 16（8領域）を優先

Microsoft and the UN Sustainable Development Goals

2015年9月の国連サミットで採択された、国連加盟193か国が2016年～2030年の15年間で達成するために掲げた目標



AI for Earth

Open Data Initiative

Open Source

DEMOCRATIZING AI

Security

Microsoft Azure / Dynamics365 / Office365 / Devices / Visual Studio

環境問題の解決にAIを活用する新しいプログラム

Microsoft invests \$50 million in AI for Earth

Microsoft President Brad Smith makes announcement in Paris

[Read more >](#)



- 「[AI for Earth](#)」を発表（2017年7月12日）
- マイクロソフトは、**人工知能を研究者や組織に提供**することで、水資源、農業、気候変動に関連した重要課題の解決を支援

<https://www.microsoft.com/en-us/aiforearth/>



Kesennuma, Japan

マイクロソフトオープンクラウドのアプローチ

- 自社のライセンス販売を主眼においていたビジネスから、技術の選択肢と柔軟性を大切にし、サービスによってお客様を支援へ

The diagram illustrates Microsoft's open source strategy across four main pillars:

- そのまま利用可能 (Direct Use):** Linux based ISV & open source use cases in the cloud. Includes logos for Linux, Java, DataStax, node.js, PHP, and Docker.
- プラスαインテグレーション (Alpha Integration):** open source technologies in our platform. Includes logos for Kubernetes, Hadoop, fluentd, DC/OS, and Redis.
- リリース (Release):** innovative technologies as open source. Includes logos for Draft R Server, .NET Core, CNTK, Roslyn, TypeScript, F#, PowerShell, ACS Engine, Graph Engine, PowerBI Visuals, Office UI Fabric, and MSR projects.
- コミュニティへの貢献 (Contribution):** to the open source ecosystem. Includes logos for OpenJDK, docker, Python, and Hadoop.

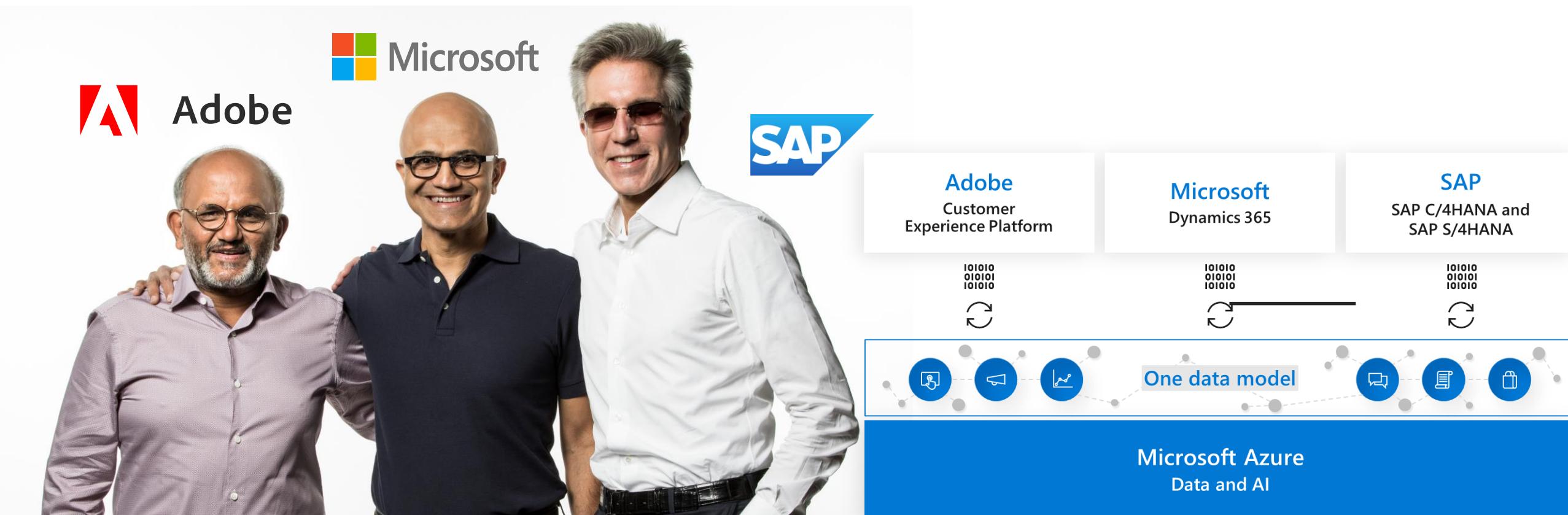
At the bottom, it highlights the "OPEN SOURCE エコシステム" (Open Source Ecosystem) with logos for THE LINUX FOUNDATION, CLOUD FOUNDRY FOUNDATION, OPEN COMPUTE PROJECT, TODO, eclipse, CORE INFRASTRUCTURE INITIATIVE, and Software Heritage.

- 「マイクロソフト、GitHub買収」を発表
(2018年6月4日)



オープンデータへの取り組み

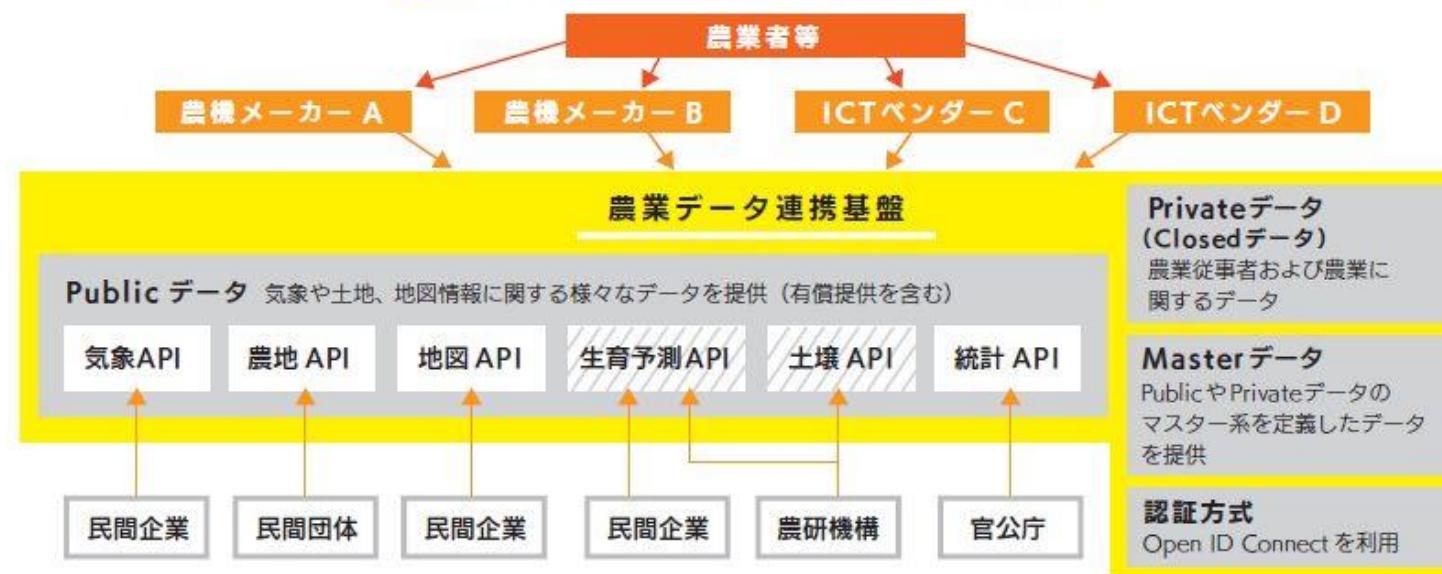
- 企業で提供している主要なサービスのデータモデルを統一する
[「Open Data Initiative」](#) を発表 (2018年9月24日)
- 共通のデータモデルを持ち、それぞれのサービスやソフトウェアに分散されていた顧客データを Microsoft Azure で統合し、より良い顧客体験を提供。



農業データ連携基盤協議会 (WAGRI)

- ・日本マイクロソフトなど24団体が設立（2017年8月22日）
- ・農産物に関するベンダーやメーカーが互いの壁を超えて、様々な農業ICT、農機やセンサーなどのデータを連携する。
- ・土壤や気象、市況など様々な公的データや企業の様々な有償データなども蓄積して、農業生産者にとって役立つ情報を提供。

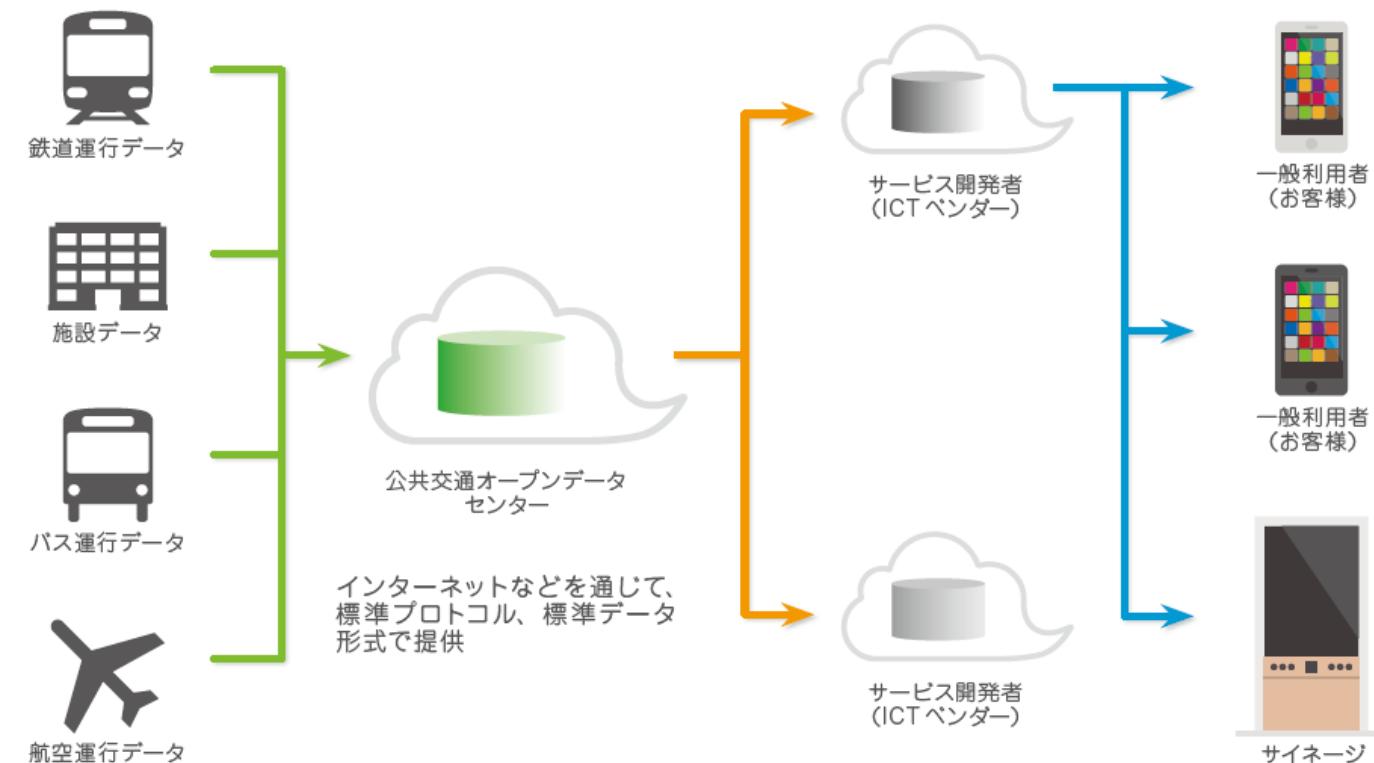
02 農業データ連携基盤の構造



出所：農業データ連携基盤協議会

公共交通オープンデータ協議会

- ・**公共性の高いデータ**に対して、アクセスするための API などを公開。
- ・データ提供を行うセンターを協議会にて運営。会員から提供されるデータをサービス開発者に提供します。
- ・2020 年の東京オリンピック・パラリンピックにおける円滑な公共交通提供に資する、オープンデータ方式による情報サービスを担います。



危機管理型水位計

- 日本アンテナは、JSOLが始める「JSOL IoT Digital Service」を「危機管理型水位計」の基盤に採用
 - JSOL IoT Digital Serviceは、「Microsoft Azure」上に構築
 - IoT端末からのデータ収集から、データの蓄積、分析、視覚化までの機能を提供する

危機管理型水位計の概要

国土交通省

【目的】
洪水時の水位観測に特化した低コストな水位計を開発することで、これまで水位計の無かった河川や地先レベルでのきめ細やかな水位把握が必要な河川への水位計の普及を促進し、水位観測網の充実を図る。

【特徴】

- 長期間メンテナンスフリー（無給電で5年以上稼働）
- 省スペース（小型化）（橋梁等へ容易に設置が可能）
- 初期コストの低減
 - （洪水時のみの水位観測により、機器の小型化や電池及び通信機器等の技術開発によるコスト低減）
 - （水位計本体費用は、100万円/台以下）
- 維持管理コストの低減
 - （洪水時のみに特化した水位観測によりデータ量を低減し、IoT技術とあわせ通信コストを縮減）

開発された水位計の例

堤防に設置するタイプ
(ケーブル(計測器)を河川に入れて計測)

橋梁に設置するタイプ
(電波や超音波で河川に触れずに計測)

【水位観測方法】

一定の水位を超過した時に観測モードを切り替え、10分以内毎に水位データを送信。水位データはクラウドで閲覧可能。

観測開始水位	9/1 0:00	9/2 0:00	9/3 0:00	9/4 0:00
2時間ごとのデータ送信 (死活監視)	●	●	●	●
10分以内ごとの計測 & データ送信	●	●	●	●
10分以内ごとの水位計測	●	●	●	●
水位監視	10分以内に1回	10分以内に1回	10分以内に1回	10分以内に1回
データ送信	なし	10分以内に1回	なし	なし
死活監視	1日に1回 ※該当時刻データのみ			1日に1回 ※該当時刻データのみ

出所：国土交通省 水防災意識社会 再構築ビジョン

マイクロソフトにおける Smart Cityへの取り組み

Microsoft CityNext



Microsoft CityNext – デジタルシティ

Putting PEOPLE FIRST

The digital revolution is underway. By 2020, 75 percent of the world's population will be connected via smart devices and broadband Internet. Also, more than 60 percent of the world's population will live cities.

Yet as cities across the globe become more digital, government leaders face many challenges, including increased pressure on resources, budget cuts, and often outdated infrastructure—plus an increasing urban population.

Microsoft CityNext Digital Cities solutions can address these challenges. With Microsoft CityNext and our partners' solutions, governments can quickly and easily deliver new solutions for citizen services on top of their existing technology infrastructure, at their own pace.

Our solutions can provide better and more citizen-centric services at lower costs. They can also improve cities' administrative processes so city workers can be more productive and effective.

- Microsoft CityNext Government and Tourism Solutions

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Microsoft CityNext ENHANCED CITIZENS Services Solutions

Citizen trust is key to a successful government. City governments today are working to gain that trust with transparency, open communication, and 24x7 access to services.

Microsoft is teaming up with city officials around the world to help them transform their operations and become digital cities. Our solutions help governments respond faster to citizens, track requests, and gain insights from data collected.

Even with fewer resources, city governments can provide effective access for citizens with help from Microsoft CityNext and our partners' Citizen Services solutions.

- Microsoft CityNext Enhanced Citizens Services Solutions

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Boosting CITIZEN Services in London

Newham Borough Council wanted to improve its service delivery and digital engagement while reducing costs. For those reasons, Newham and Havering Councils considered turning to Microsoft Dynamics CRM, SharePoint Server, and BizTalk Server.

With Microsoft solutions, the two councils gave 693,000 London residents eGovernment services and greater access to their local council members. The two councils now receive better service but also reduced costs. Contacting a council member online costs £6.0 compared to £4.60 to speak with them.

The Newham and Havering's solutions for citizen delivery service and digital engagement is considered by many in the UK's government to be a good example of how to achieve lean government. Today, switching 30 percent of Newham and Havering's contact center to Microsoft cost less than £1.3 billion. And with Microsoft's reusable technology, the platform will contribute to Newham and Havering's target of more than £11 million comparable savings between them, without cutting front-line staff.

- Learn more

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Microsoft CityNext OPEN DATA Solutions

Increasingly, city governments need to provide citizens with round-the-clock access to public information.

The open data movement provides governments with the opportunity to work with businesses and citizens to connect and share information globally. Microsoft CityNext Open Data Solutions can take advantage of technologies like cloud, big data, social, and mobile to help city leaders access new data and drive internal efficiencies, all while delivering better service to citizens.

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Bring More TOURISTS to Your City

Tourism Ireland advertised to people all over the world to bring more visitors to their country. They used traditional media, email, digital advertising, and more. The main challenge they had was gaining insight and learning about potential tourists.

Tourism Ireland decided to merge Microsoft Dynamics CRM with social media to build a quickly accessible database on followers and customers. Tourism Ireland's marketing department consolidates the information gathered and creates targeted marketing campaigns to increase the number of visitors.

- Learn more

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Microsoft CityNext SOCIAL ANALYTICS Solutions

Citizens are no longer exclusively reached by traditional channels like TV and radio. Instead, they are increasingly using social media to connect and engage with friends, government officials, and community leaders. Microsoft CityNext uses these same tools to interact with their government.

Additionally, governments can gain more insights into their citizens by using social media. Microsoft CityNext and our partners' Social Analytics solutions can help governments understand what is important to them. City leaders can use this information to improve emergency response, customer service, and more.

- Microsoft CityNext Social Analytics Solutions

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Empower Employees to INNOVATE

Northwards Housing has 340 employees and volunteers, both in the field and in the office, who needed a better way to communicate with one another and the citizens they serve.

The nonprofit deployed Yammer, a Microsoft CityNext social media solution. Yammer offers a dynamic approach to communication that allows employees, volunteers, and citizens to connect and collaborate. Northwards Housing's leadership team uses Yammer to gain insights on what is happening in the community, empowering them to adapt to changing demands and needs.

So far, more than 85 percent of employees are actively engaged in the network, and Northwards Housing now has a process to drive innovation. The results are greater efficiency, increased productivity, and improved customer service.

- Learn more

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Microsoft CityNext DOCUMENT & Records Management Solutions

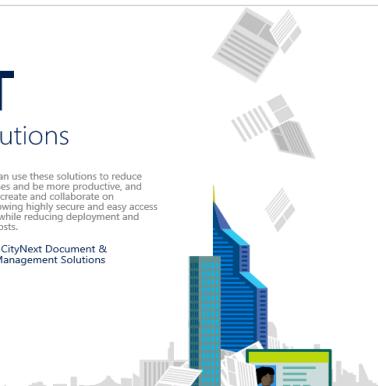
As budgets continue to be put under increasing pressure, governments need more effective ways to deliver services to their citizens.

Microsoft CityNext and our partners offer Document and Records Management solutions that deliver well-managed information for staff to easily find, share, and use.

Governments can use these solutions to reduce manual processes and be more productive, and employees can create and collaborate on documents using highly secure and easy access to information while reducing deployment and management costs.

- Microsoft CityNext Document & Records Management Solutions

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Digital Processes BOOST Productivity & Decrease Risk

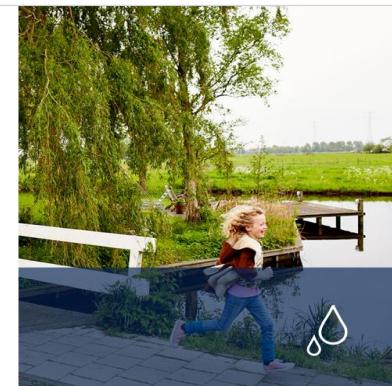
The Eagle River Water and Sanitation District relied on manual, paper-based processes to enter and store water and sanitation records for 10 years. When employees wanted to retrieve the data, they had to unpack boxes and search through binders by hand.

The district worked with Microsoft CityNext partner ECS Team to save time, space, and money by deploying an organization-wide records management system that is search-capable and automates business processes.

By moving to the new digital document retrieval system, the Eagle River Water and Sanitation District improved productivity, created a clear audit trail, and significantly decreased the risk of losing data.

- Learn more

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Microsoft CityNext – 安全 · 安心

RAISING THE BAR for City Safety

Microsoft CityNext Public Safety and Justice solutions can help civic officials effectively mitigate and deal with a host of natural and human threats to the public's safety. These include natural disasters, accidents, crime, and terrorist attacks. And with growing urban populations, their frequency can only increase.

Our solutions help make it easier for law enforcement agencies, emergency service providers, and rescue squads to respond to those threats. By taking advantage of technology, they can react faster as well as better detect threats and avert them.

When crimes happen, authorities can investigate them more quickly and share intelligence with other agencies that might be involved. Ultimately, governments can ensure greater safety for citizens.

Microsoft CityNext Public Safety & Justice Solutions

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INTELLIGENCE & Analysis Solutions

By analyzing vast amounts of data gathered from all kinds of digital and social media sources, public safety officials can take steps to prevent crime and terrorist acts. But sifting through this information and trying to make sense of it can be difficult, especially if there is a time limit when it comes to safety, there's no time to lose.

Microsoft and our partners team up with law enforcement officials to help them tap into data from a large number of sources, including mobile devices, internal records, geographic information systems, secured unified communications, and cyber-patrolling search capabilities.

Microsoft CityNext Intelligence & Analysis Solutions

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Mitigating SAFETY Threats in New York

The New York Police Department (NYPD) had to be up-to-date with the latest crime prevention and counterterrorism technology capabilities. They worked with Microsoft to develop the Domain Awareness System. This system aggregates and analyzes public safety data in real time, providing investigators and analysts with a comprehensive view of potential threats and criminal activity. The Domain Awareness System has helped the NYPD improve its response time and even prevent crimes.

Learn more

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VIDEO SYSTEMS Solutions

Ideally, law enforcement and intelligence agencies should be able to monitor in real time all areas of the cities where they operate.

Microsoft CityNext safety solutions help make this possible by giving agencies quick and easy access to a visual stream of data from around the city. This video data can be then analyzed for actionable intelligence and response, as well as shared with other agencies.

Agencies can now get a shared, dynamic operational picture of urban environments. For example, by integrating CCTV and sensor systems into one solution, they can monitor thousands of cameras, scan license plates, and keep particular watch on trouble spots.

We can also increase operational efficiency by providing monitoring and reporting capabilities, security-enhanced analytics systems, and automated workflow and assignments. We even enable agencies to collaborate with citizens through social media, websites, and web.

Microsoft CityNext Video Systems Solutions



SAFE CITY Project - Surat, India

The city authorities in Surat, Gujarat, India, wanted a state-of-the-art command and control center (COC) with a giant video wall, to monitor the city's traffic and emergency situations. Microsoft built a citywide camera network spanning critical public spots, traffic junctions, and the city's entry and exit points are all monitored at the COC.

The solution was deployed using Microsoft technologies, integrating with those of other major vendors. The project ensures constant surveillance to help secure the public from crime and terror.

View video

DEV IT Simplified

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NEIGHBORHOOD Management Solutions

To make cities safer, citizens are pitching in to help law enforcement agencies monitor and prevent antisocial behavior such as littering or graffiti painting. They can also help mitigate the risks against vulnerable groups like children and older citizens. Residents can report a crime even as it is happening, via social media, web applications, or mobile applications. They can also make non-emergency complaints, find information on police services, pay fines and license charges, and join neighborhood watch groups.

Microsoft CityNext Neighborhood Management Solutions

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Domestic Violence SUPPORT Programs

In addition, concerned citizens can use technology to report antisocial behavior such as littering or graffiti painting. They can also help mitigate the risks against vulnerable groups like children and older citizens by reporting mistreatment. City authorities can use social media and mobile solutions to issue public alerts and emergency warnings.

Learn more

women health & family services



EMERGENCY Management Solutions

In many cities, emergency service providers like fire departments and paramedics are part of overburdened departments that must handle multiple crises with declining budgets, limited resources, and smaller teams. Microsoft tools help them respond while helping them do more with less.

Microsoft CityNext Emergency Management Solutions are based on technologies that include cloud, big data, mobile, and social

technologies. With these tools, first-response agencies can access data sources, visualize and analyze that data, and then communicate it to teams and other agencies, in real time, so they can coordinate and make decisions based on shared information.

Microsoft CityNext Emergency Management Solutions



FASTER to Emergency Situations

In Madrid, Spain, SUMMA 112—the city's emergency services—was using an obsolete technology platform that couldn't classify different types of emergency calls or scale to track emergency vehicles.

In its place, the city implemented the GEMMA emergency management system by Atos, a Microsoft CityNext Gold Partner. The new system integrates data from 15 different emergency response infrastructures and provides interoperability across its various response agencies.

The solution supports 472,000 dispatches a year and provides real-time data to ambulances and hospitals. It has helped reduce response times and enabled first responders to better prioritize life-threatening emergencies.

Learn more

Atos

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COURT & JUDICIAL Management Solutions

To make cities safer, citizens are pitching in to help law enforcement agencies monitor and prevent criminal activity—and report concerns about antisocial behavior. This has helped reduce crime and brought greater order to urban areas.

Microsoft CityNext Neighborhood Management solutions help people take advantage of technology to make their communities more safe and secure. Residents can now report a crime even as it is happening, via social media, web applications, or mobile applications. They can also make non-emergency complaints, find information on police services, pay fines and license charges, and join neighborhood watch groups.

Microsoft CityNext Court & Judicial Management Solutions

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Automating Case MANAGEMENT in Harrisburg, Pennsylvania

Disparate case management systems in the justice system at the department and county government levels of Harrisburg, Pennsylvania, required redundant data entry that made it difficult to share information among departments.

To address this issue, officials deployed a unified case management system developed by CCAPI. It provides a common platform and enables information exchange between several departments in the criminal justice system.

With this new solution, officials now have better insight into all the various activities going on in the criminal justice system via the application's many dashboards and reporting features. These insights have led to improved public safety and greater efficiency.

Learn more

CCAP Commonwealth Criminal Justice Agency



Microsoft CityNext – ヘルスケア

Improving the  **QUALITY OF CARE** and Empowering Communities

As aging populations increase, the demand on city services is becoming more pressing—especially healthcare and social services. In addition, cities are seeing sharp increases in citizens with chronic ailments and are increasingly concerned about potential health outcomes.

In these cities, it's critical to offer easier access to timely, affordable, and high-quality health and social services so that their citizens can lead productive, fulfilling lives and contribute more to the well-being of their community.

Microsoft CityNext Healthcare solutions from our partners can help healthcare professionals reduce costs, and faster diagnosis and treatment personalized to each citizen. These solutions also support more cost-effective home treatment options. And our solutions use data securely so city leaders can make informed healthcare decisions that ultimately improve the quality of care while reducing costs.

 Microsoft CityNext Healthcare Solutions

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Microsoft CityNext **POPULATION HEALTH Management Solutions**

To create tailored healthcare services, local governments need to analyze factors such as environment, resource distribution, social structure, and education.

With Population Health Management solutions, Microsoft CityNext and our partners help government and healthcare organizations quickly gather data and analyze trends to target care programs. As a result, cities can provide better healthcare coverage, educate citizens on disease prevention, and reduce the incidence and severity of chronic health conditions.

 Microsoft CityNext Population Health Management Solutions

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Deeper Data **BETTER Results**

Every day, nearly 10 percent of the world's population struggles to breathe because of asthma. It's a disease with no cure, which means patients must adhere to properly prescribed doses of medicine—or risk dying from an asthma attack.

That's where Aerocrine comes in. The Swedish medical-device company provides instruments to better manage airway inflammation. But the company faces challenges. Environmental factors, such as humidity and dry air, caused monitoring issues and reporting downtime. The company recently found that transmitting data was difficult, causing a backlog in resources.

Aerocrine deployed a test application on Microsoft Azure, which the organization uses to capture and manage real-time data about its devices. Aerocrine's team can now monitor the device's performance metrics for the first time and removes environmental complications. This allows them to gain a much clearer view of devices in the field. Aerocrine hopes to use the solution to help healthcare providers better guide physicians diagnose asthma and assisting patients in managing their symptoms.

 Learn more  Aerocrine

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Microsoft CityNext **REMOTE-CARE Solutions**

Patients increasingly expect to receive personalized care at the point of need, no matter the time or the place. Mobile healthcare solutions not only can meet their expectations, but also can reduce costs. According to a recent report, mobile health can reduce overall elderly care expenses by 25 percent, and up to 50 percent—60 percent of costs related to hospital nights and re-hospitalizations.

With Microsoft CityNext solutions for remote care and case management, local governments worldwide can provide better medical services more efficiently and affordably. And mobile healthcare solutions can also provide multiple channels for civic leaders and health providers to communicate and engage directly with citizens via services ranging from preventive care to disease management.

 View full report

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Improving Citizens' Health Through **MOBILE Access to Patient Data**

Transforming health services through mobile solutions can help improve the quality of life for people with disabilities or chronic conditions, so aging citizens can live at longer.

For 10 years, Bornholm Regional Municipality in Bornholm (Sjælland, Denmark) has used a mobile solution to help public healthcare workers manage in-home visits. But that solution was beginning to show its age. As a result, social workers, nurses, and healthcare workers did not have field access to all the information they needed.

Bornholm worked to expand its MOID SmartCare app for Windows Phone, providing staff members with the flexibility to work on the go. Workers can access and submit patient data during in-home visits, share knowledge, and file reports and documentation from the field. Bornholm keeps patient data secure with extra encryption and password-protected access.

Now, Bornholm Island's citizens receive better care, which improves their health and well-being.

 Learn more 

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Microsoft CityNext **PRIMARY CARE Solutions**

Primary care providers play an important role in citizens' health because they are the principal point of contact for general care and for obtaining referrals to specialists.

Microsoft CityNext Primary Care solutions can transform patients' and caregivers' experience by streamlining services and seamlessly sharing information between healthcare providers. Our solutions help cities provide end-to-end services, centralize patient care, improve patient follow-up, and deliver better insights through Microsoft business intelligence and data analytics technologies.

 Microsoft CityNext Primary Care Solutions

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Streamlining Data Collection **HELPS NURSES Save Time & Do More**

France's Clermont-Ferrand University Hospital, which provides healthcare services to 1.3 million people, wanted to enhance patient care by streamlining data collection.

To do that, the hospital implemented a system from Capsule Technologies that automatically collects vital signs from medical facilities that converts the data to a standard format, sends it directly to the hospital's electronic medical record (EMR) system, and provides a single, secure interface for monitoring patient records.

By avoiding having to manually collect and transcribe data into the EMR system, the general medicine unit at Clermont-Ferrand saves more than 164 hours annually, and the hospital increases the quality of care. In addition, the system allows nurses to easily record information without changing screens, systems, or even location, which save time and reduces the risk for error. Most importantly, nurses now have more time to spend with patients.

 Learn more 

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Microsoft CityNext – 教育

EMPOWERING

Schools to Innovate and Prepare for the Future

Prosperous cities need educated citizens to fuel their economy. Microsoft CityNext offers tools that are operationally efficient, provide healthy learning environments, and have the ability to measure performance to ensure positive outcomes.

However, schools around the world are confronting higher operating costs, dwindling resources, increased student numbers, and rapidly evolving technology as their infrastructure ages.

Microsoft CityNext Education solutions can address these challenges by empowering administrators and educators. Microsoft CityNext and our partners help cities improve education with solutions that span education, K-12, research, learning systems, smart classrooms, and school and campus administration. Our solutions result in more innovative schools with better learning outcomes.

Microsoft CityNext Education Solutions

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SCHOOL & CAMPUS Administration Solutions

Administrators around the world are using Microsoft CityNext and partner solutions to gain insight into administrative, academic, and relationship-building programs.

Innovative administrators can use our education solutions to quickly assess to identify and engage at-risk students to increase graduation rates from 55 percent to 78 percent.

Microsoft CityNext School and Campus Administration Solutions

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Research Institution Saves \$1 Million, IMPROVES Productivity with Cloud Solution

Faced with an aging communication and collaboration system, Georgia State University decided to move to Microsoft Office 365 to improve functionality and simultaneously decrease costs. As a result, the university's students and faculty gained technical support across multiple platforms and devices, and the university saved \$1 million in its first year. Additionally, the university is saving the equivalent of 2.5 employees annually and is increasing personnel productivity.

Learn more

Georgia State University

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EDUCATION ANALYTICS & Research Solutions

A vast amount of data is already being collected by many schools, but educators and administrators need better ways to combine, process, and visualize this data to derive insights and make informed decisions.

Microsoft CityNext analytic solutions help students understand their progress and ways to improve their rankings. Included are tools that give administrators a 360-degree view of their school's performance. Educators can also use reporting tools to simplify access to data and to share information with parents and stakeholders.

Microsoft CityNext Education Analytics and Research solutions deliver actionable insights

Microsoft CityNext Education Analytics & Research Solutions

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UK Schools Gain New Insights with CLOUD-BASED Data-Tracking Solution

Essex County Council, among the largest local authorities in the United Kingdom, plays a vital role in raising children's academic success. More than 2,000 schools in the UK have adopted the council's Primary Target Tracker solution, which measures how and when children learn.

The Primary Target Tracker was originally a spreadsheet, but the Essex County Council wanted the data to be shared across multiple schools. To solve the challenge, the council redeveloped the solution on the Microsoft Azure cloud.

Today, more than 11 percent of primary schools in the UK use the cloud-based tracker with more than 300 new subscribers each year. Administrators and educators can easily upload new data and gain insights on how to improve their classes and internal systems.

Essex County Council

Microsoft CityNext

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LEARNING SYSTEMS Solutions

Students today are more digitally connected than any generation before. Increasingly, they expect to use e-learning systems to learn at their own pace, and through their classroom—throughout dedicated spaces equipped with mobile, connected devices—to enable students to work efficiently and flexibly in groups or individually.

Administrators and educators can meet these expectations with Learning Systems Solutions. Schools strengthen curriculums to enable students to accomplish and learn more. Plus, schools can add skills development coursework to prepare new students for an increasingly competitive workforce.

Our solutions save schools money while providing more value to students and educators.

Microsoft CityNext Learning Systems Solutions

@MSFTCityNex Microsoft.com/CityNext



Extending Learning Beyond the CLASSROOM with Online Productivity Tools

School District 23 in Central Okanagan is one of only a few school districts in Canada to offer email service and online collaboration sites for students. However, the district's email system was aging and unreliable, and many students had trouble accessing email on their mobile devices.

School District 23 replaced the aging service with Microsoft Office 365, providing students with cloud-based email and instant messaging. Now, students can use their phones or computers to access their email and collaborate online, connect with peers on projects, contact educators, and work on assignments in the first three months, 35 percent of the school district's students signed up—more than in the entire previous year. The district's email solution has reduced email costs by 90 percent, or \$500,000, over five years and vastly improved communication between students and educators.

Learn more

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DEVICES, MOBILITY, & APPS for Learning Solutions

Training educators to use technology in order to keep up with digitally connected students is a top priority for 47 percent of school districts worldwide. This is because the promise of anytime, anywhere learning has become a reality, as more and more students use devices to be productive and engaged both in and away from the classroom.

Microsoft CityNext and our partners provide Devices, Mobility, and Applications solutions to enhance both teaching and learning. As a result, students can access information while on the go; educators can support students through technologies that make learning more inspiring, and students can collaborate with peers, parents, and educators.

Microsoft CityNext Devices, Mobility, & Apps for Learning Solutions

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Transforming Learning & Driving CREATIVITY with Interactive Student Laptops

In Melbourne, Australia, Brighton Grammar School had deployed an educational technology platform that consisted of tablets running the Android operating system and Google Apps for Education. However, within the first year, educators, parents, and students were expressing concern about the suitability of the devices.

In response, the school switched from tablets to laptops running the Windows operating system, which empowered classes with the ability to learn anywhere, anywhere. Students are now more engaged as they enjoy interactive learning programs like Mathletics. Also, the district has received feedback from parents who are considering the school specifically because of its technology program.

Learn more

Brighton Grammar School

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Microsoft CityNext – 公共交通

Taking **TRANSPORTATION**

To the Next Level

Microsoft CityNext Transportation solutions will pave the way for civic leaders to solve an ever-growing list of transportation-related problems.

Poor roads, decaying infrastructure, and a lack of traffic management systems negatively impact the quality of life and health of citizens, while hindering economic growth.

Our intelligent solutions optimize transportation to combat these issues. They reduce traffic congestion, shorten commute times, save costs, facilitate trade, and even reduce mortality rates.

Microsoft CityNext Transportation Solutions

@MSFTCityNext Microsoft.com/CityNext

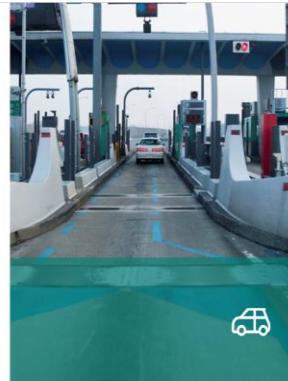
Microsoft CityNext **TRANSPORTATION** Solutions

Successful implementation of an **AUTOMATED Tolling System in China**

In China, the Tanjin Expressway Group Company wanted to improve traffic flows on its expressways—tolling more than 70 kilometers—in and around the city of Tianjin. The company replaced its manual toll collection system with an automated solution based on a Microsoft platform. As a result, tolls are collected in less than one second, improving the flow of traffic. The company has also cut costs, thanks to zero downtime and easy maintenance.

Microsoft CityNext Transportation Solutions

@MSFTCityNext Microsoft.com/CityNext



Microsoft CityNext **INTELLIGENT Asset & Fleet Management Solutions**

An efficient public transportation system makes it easy to commute and carry goods within a city. When transportation comes to a halt in a city, it can affect public transit routes and schedules. To help increase the efficiency of their public transport fleets, while lowering costs and conserving fuel, applications to help improve transport scheduling and ensure compliance with service level agreements and government regulations. Overall, Microsoft CityNext helps operators increase the efficiency of their public transport fleets, while lowering costs and conserving fuel.

Microsoft CityNext Intelligent Asset & Fleet Management Solutions

@MSFTCityNext Microsoft.com/CityNext

Improving **OPERATIONS** for Helsinki's Transportation System

The City of Helsinki bus company, Helli, wanted to lower costs and operate more efficiently. Helli worked with Microsoft and its partners to analyze data generated by sensors installed on all their buses. As a result, fuel consumption has dropped 5 percent, customer satisfaction has increased by 7 percent, driver performance has improved, and mechanical maintenance has become proactive.

View customer story

@MSFTCityNext Microsoft.com/CityNext

Microsoft CityNext **MODERN PARKING** Management Solutions

Overcoming **PARKING** Challenges in Serbia

For example, drivers can use their smartphones to find a parking spot in a particular locality and get directions to it. They can even pay parking fees via their mobile phones.

Microsoft and our partners work with city authorities to tackle this problem effectively. Our intelligent Modern Parking Management solutions take advantage of cloud, big data, and mobile and social technologies to simplify parking.

View customer story
 PSC

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Microsoft CityNext **ADVANCED** Transportation Solutions

Optimizing a city's transportation infrastructure and managing it more efficiently can make travel safer and create a better on-road experience for everyone. Microsoft CityNext Advanced Transportation solutions leverage the power of the cloud, big data, social, and mobile to help authorities overcome transportation challenges and improve their operational effectiveness. By integrating and analyzing data from multiple sources, officials can gain insights that enable them to monitor and better maintain their transportation infrastructure.

Citizens can also use Microsoft CityNext transportation solutions to manage their travel routes and plan trips more efficiently. For example, they can request a ride from the nearest car or a carpool via a smartphone. Or they can log into an online application and get real-time information about bus and tram schedules, parking spots, and other transportation options.

Microsoft CityNext Advanced Transportation Solutions

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Mobile-Device **APPLICATIONS** for Greater Manchester, England

Transport for Greater Manchester wanted to improve its transportation services by creating mobile-device applications to help travelers plan and manage their trips. To accomplish this, they made their data publicly available and used Microsoft Azure to create and run a real-time transportation platform. Their app developers are using this platform to create a wide range of apps that help citizens and visitors travel around the city faster and more easily, plan trips in real time, check transportation schedules, and even locate parking spots.

Learn more

@MSFTCityNext Microsoft.com/CityNext

Microsoft CityNext **AIRPORT, RAILWAY, & PORT** Management Solutions

Leveraging **TECHNOLOGY** at the Bangalore International Airport

In today's fast-paced world, busy individuals have little time to spare when it comes to traveling from one place to another. And because their people and goods to arrive at their destinations as quickly and safely as possible.

That's why governments are using technology to modernize their operations at airports, train stations, bus depots, and shipping ports.

Microsoft and our partners use advanced technologies to build a range of solutions that keep passengers and cargo moving. These solutions can automatically deliver notifications of flight schedules and delays directly to a traveler's smartphone. Port and airport workers can also use mobile devices to identify workers and assets so goods to their destination quickly and reliably—thus improving the supply chain of goods.

Learn more
 GVK

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Microsoft CityNext – 環境

Using Technology to  **CONSERVE**
Critical Resources

Microsoft CityNext Smart Energy and Water Management solutions help governments worldwide resolve the challenges of excess energy consumption and water shortages. The former can increase our carbon footprint and negatively impact the environment; the latter can undermine population health management.

By empowering city authorities with access to data via Microsoft Smart Energy solutions, they can make more informed decisions to better monitor and control energy consumption – with savings of up to 30 percent a year.

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Microsoft CityNext
SMART-GRID
Solutions

Conserving energy is a vital part of a city's effort to grow its economy while maintaining rapidly dwindling natural resources. Authorities can optimize energy distribution by monitoring power usage and then analyzing the data to get insights. Smart grids can help them get the usage data for all buildings, which can reduce costs, improve forecasting, and meet customer demands. Ultimately, this will help them meet their environmental and sustainability goals.

 Microsoft CityNext Smart-Grid Solutions

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Trimming Energy use in
ISSYGRID
Paris

In the town of Issy-les-Moulineaux, near Paris, a smart-grid project called IssyGrid gives home and building owners access to real-time data on their energy usage.

The project uses Microsoft public cloud resources for data storage and Microsoft data management software to analyze the information for better insights. As a result, the town reduced its energy consumption and brought down its energy bills by 10 to 20 percent.


Learn more  @MSFTCityNex Microsoft.com/CityNext



Microsoft CityNext
WATER & WASTEWATER
Management Solutions

Fast-expanding cities increase demands for limited and life-sustaining water. This can strain a city's budget, because citizens expect officials to supply clean, high-quality water. Cities also need to manage waste and energy in wastewater management.

CityNext Water Management solutions help municipalities collect and analyze real-time and historic data from sources such as watersheds, aquifer systems, sewer systems,

water treatment facilities, flood control systems, and end-user consumers and businesses.

Insights from this data can help them control costs and optimize infrastructure management. Data can also enable proactive maintenance, so that repairs are made before something breaks down and disruptions occur.

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Detecting Wasteful
WATER LEAKS
in England and Wales

Anglian Water Services Ltd., the largest water and wastewater company in England and Wales, wanted to improve operational efficiency and minimize water loss. The company implemented the suite of tools in Microsoft partner Telvent's Smart Water Network solution to gain meaningful operational data insights. For example, it uses telent's Internet of Things, Leakage and Pressure Management system to monitor water network data to detect leaks faster, so repairs can be made sooner.

With this solution, Anglian Water will lower operational costs by reducing water loss and optimizing key processes. At the same time, it can better ensure regulatory compliance and improve customer service by reducing the number of service disruptions it might otherwise suffer.

 Learn more  loveeverydrop anglianwater

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Microsoft CityNext
ENERGY MANAGEMENT
& Analytics Solutions

Cities worldwide are working hard to reduce energy consumption. This not only helps to save valuable resources, which can help protect natural resources. Conservation is critical because wasting energy increases greenhouse gas emissions and undermines city budgets.

The first step in controlling energy use is to gather and analyze all relevant data to find out where it's being wasted. To help, Microsoft offers a range of highly scalable energy management solutions that can involve cloud computing, big data, mobile, and social technologies. These solutions enable users to collect and analyze data from virtually any data source, including renewable energy systems, sensors, and

 @MSFTCityNex Microsoft.com/CityNext



Building Energy
MANAGEMENT
System Saves Money

When Arlington (Massachusetts) Public Schools consolidated its summer-school operations into one building and purchased a new chiller for the facility they needed to mitigate the potential increase in energy consumption.

Using a Microsoft cloud-based solution from CityNext partner iCOMICS, every aspect of the buildings' energy use and cooling operations were monitored. The system sped problem detection by 15 percent, reduced energy consumption, and cut outside contractor costs.

 Learn more 

 @MSFTCityNex Microsoft.com/CityNext



Microsoft CityNext
CARBON
Management Solutions

Carbon management strategies for cities can lower greenhouse gas emissions. This will reduce their carbon footprint, green their environment, improve air quality, reduce pollution, and help slow global warming. But to implement the right strategies, civic authorities must first learn how and where energy is being wasted.

Our innovative and highly scalable CityNext Carbon Management solutions can help governments tap into data sources in order to analyze energy use, consumption and emission patterns.

To create an "Internet of Things", we connect infrastructure like sensors and video cameras as well as applications such as weather reporting sites, social media, and cloud services. This interconnected digital network can offer accurate insights into a city's carbon footprint. For example, our solution can pull data in real time from air quality sensors in the city to measure emissions from cars, planes, trains, buildings, and streetlights. Specialists can analyze this data to find and eliminate wasted energy.

 Microsoft CityNext Carbon Management Solutions

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Keeping Trees
HEALTHY
in Madrid

In Madrid, Spain, our partner TECNIGRAL developed a web-based solution to enable citizens to send requests to the city council, alerting officials to trees within the city that need maintenance.

Tecnigral used the Microsoft cloud platform to build a highly secure and scalable cloud-based application to deliver a compelling user experience.

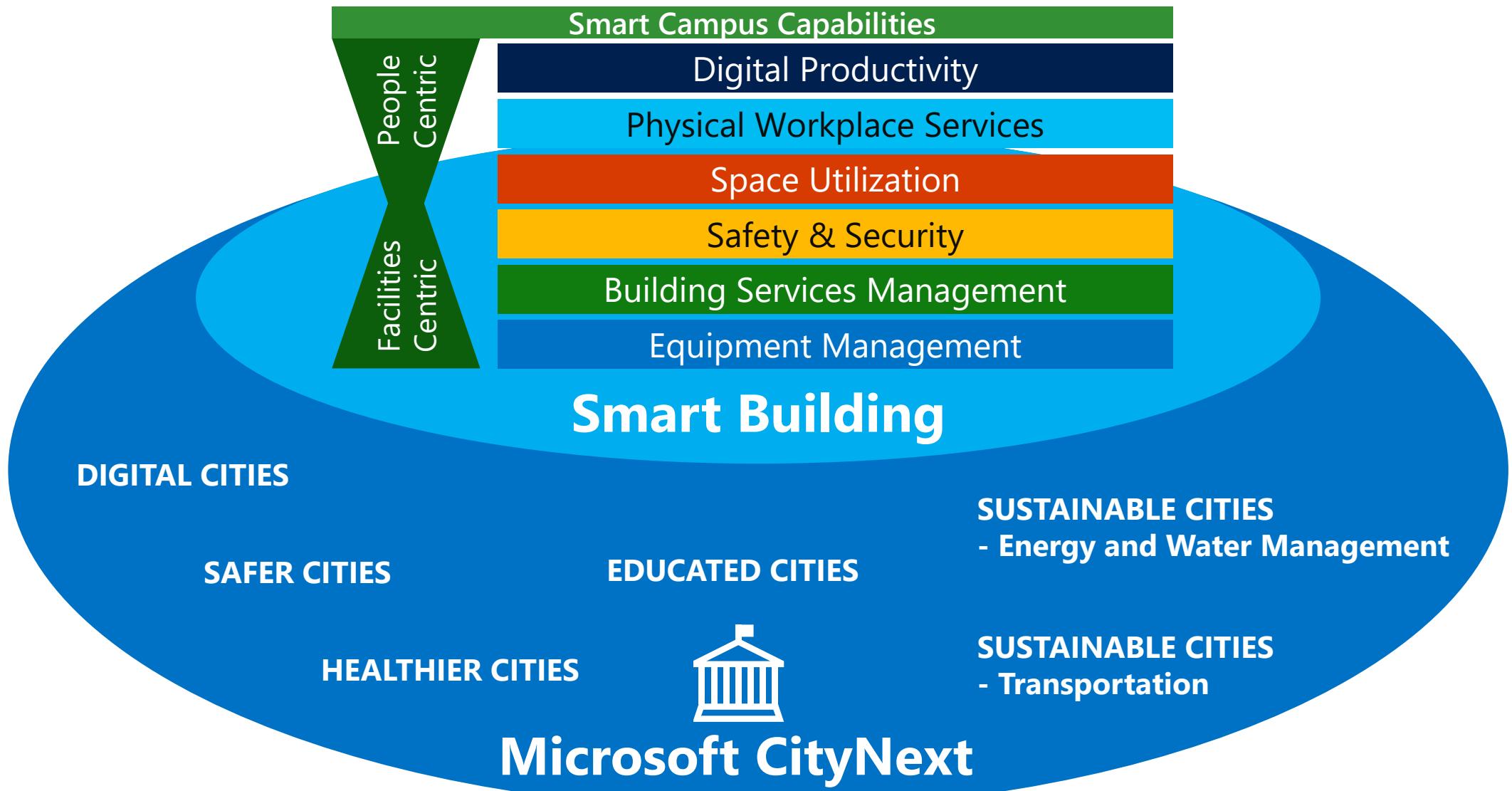
Today, the city's 16 tree inspectors can count on the many citizens who use the application to help them learn sooner about trees that are in need of help.

 Learn more 

 @MSFTCityNex Microsoft.com/CityNext



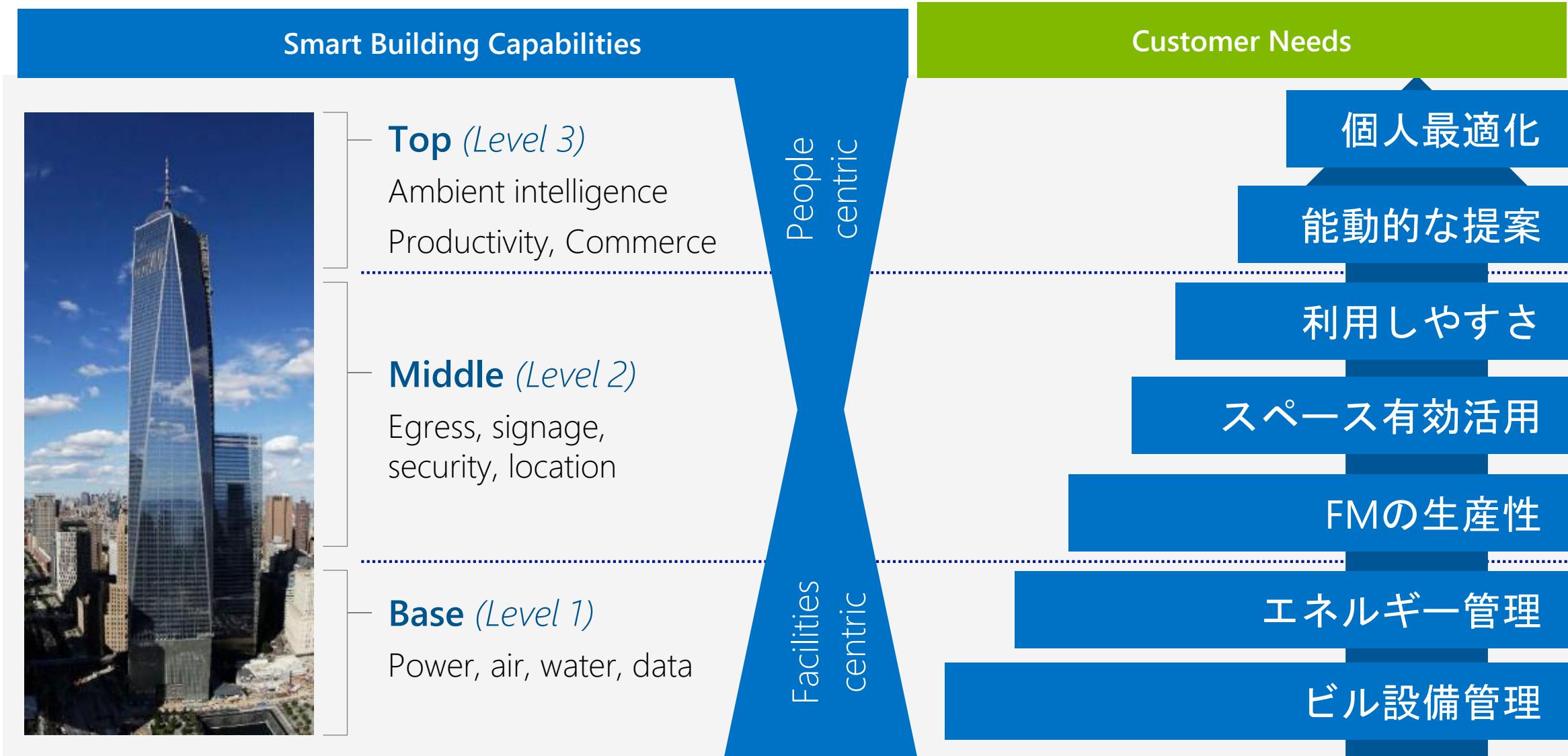
Microsoft Smart Building Solution



マイクロソフトにおける Smart Buildingの取り組み



Microsoft Smart Building Vision



Smart Building Vision Video



Reimagining Smart Buildings Productive People – Microsoft Smart Buildings

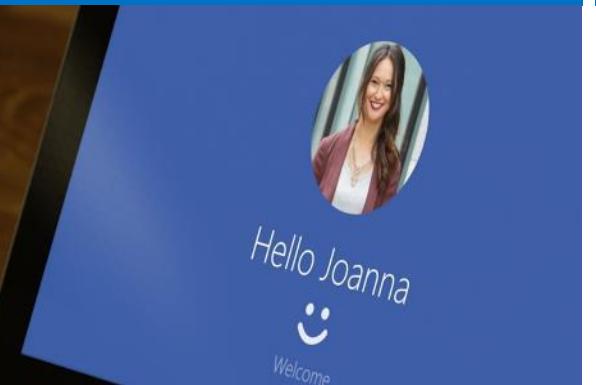
<https://www.youtube.com/watch?v=uhfjeVNI9b0>

Smart Building Vision Video

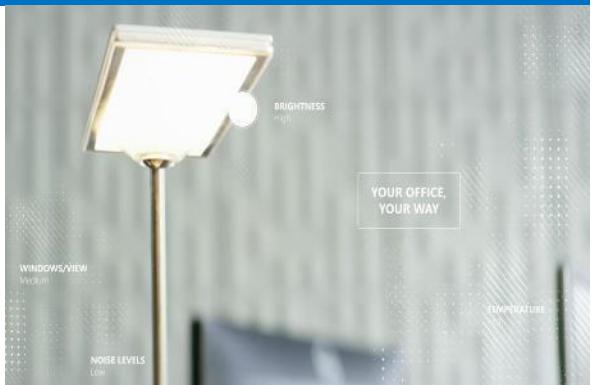
Facial Recognition



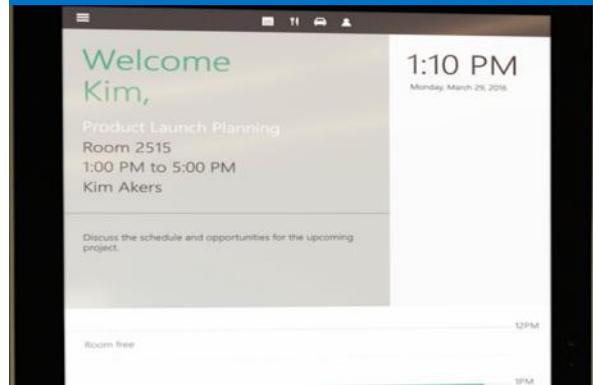
Smart Lobbies



Space Customization



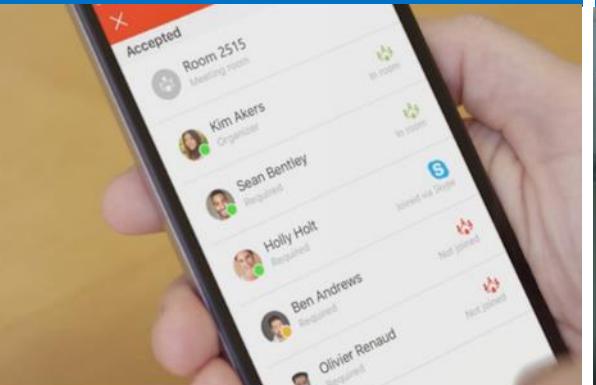
Smart Signage



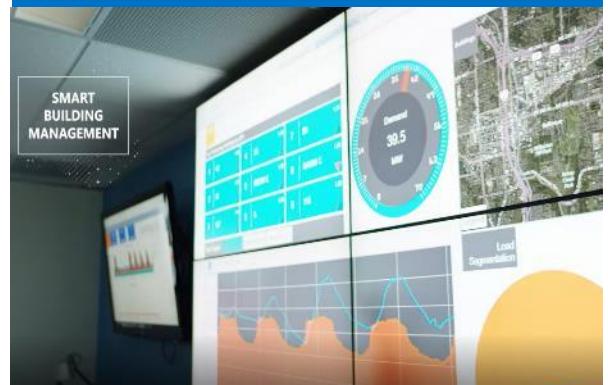
Smart Meetings



People Finder



Energy Efficiencies



Virtual Concierge



Microsoft Smart Building/Office Solution



Smart Buildingsの価値



利用者：

- ・魅力的なスペース
- ・パーソナライズされて、便利な体験が得られる
- ・気が散らない、高い生産性



オーナー：

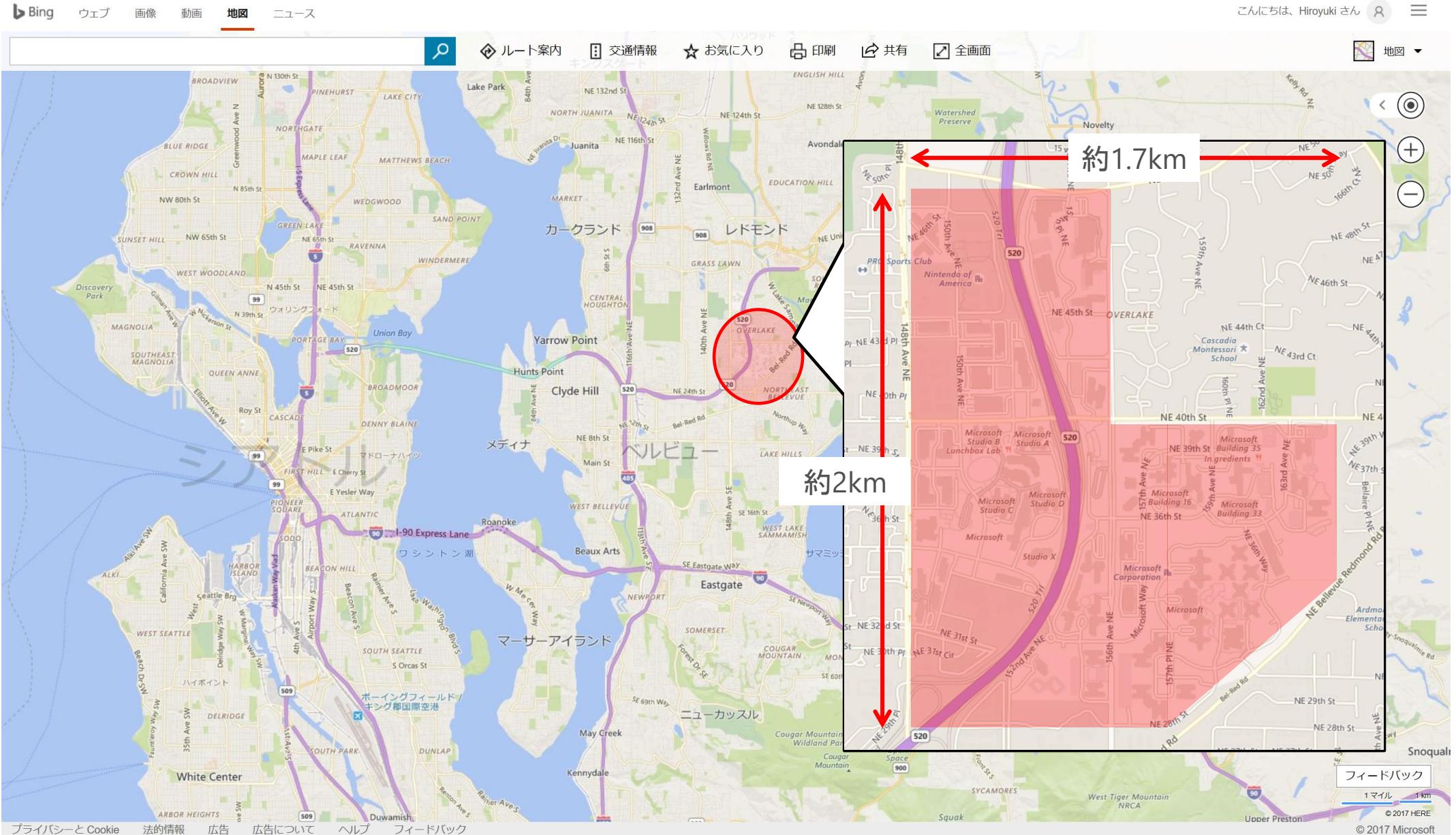
- ・建物の運用と状態の視認性（見える化）の向上
- ・高い利用者満足度による資産価値向上
- ・設備コストの削減



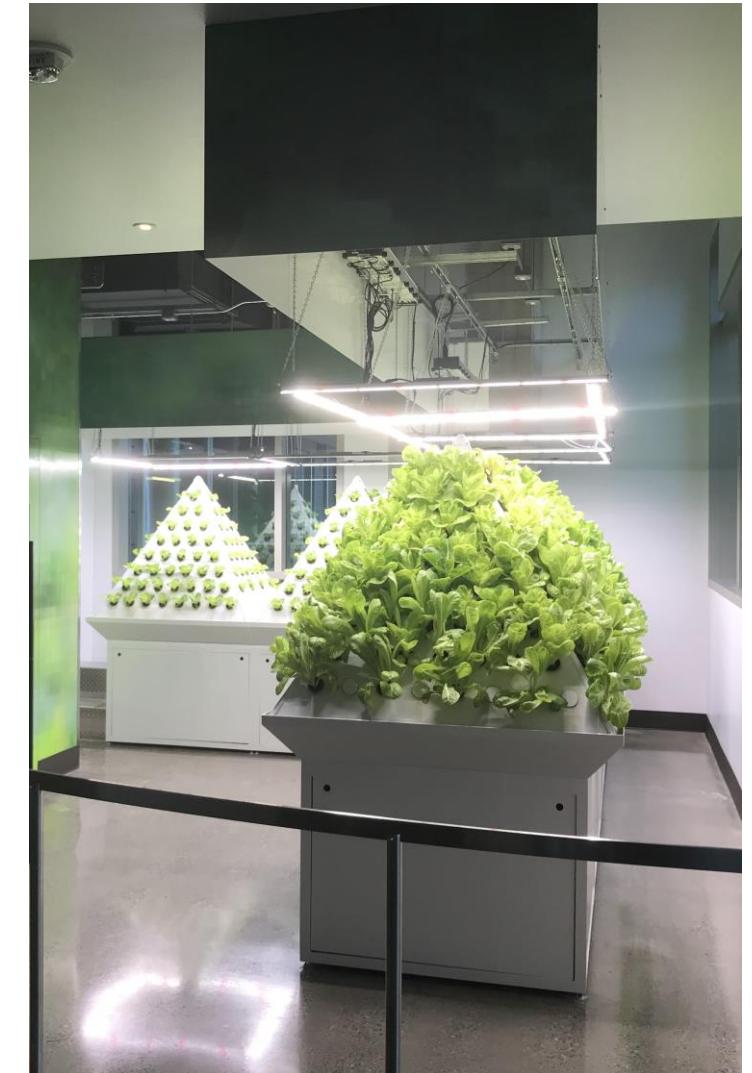
保守作業者：

- ・積極的かつ予測的な建物のメンテナンスが可能に
- ・管理コストを低減
- ・より効率的な作業プロセスに

Microsoftキャンパス



Microsoftキャンパス

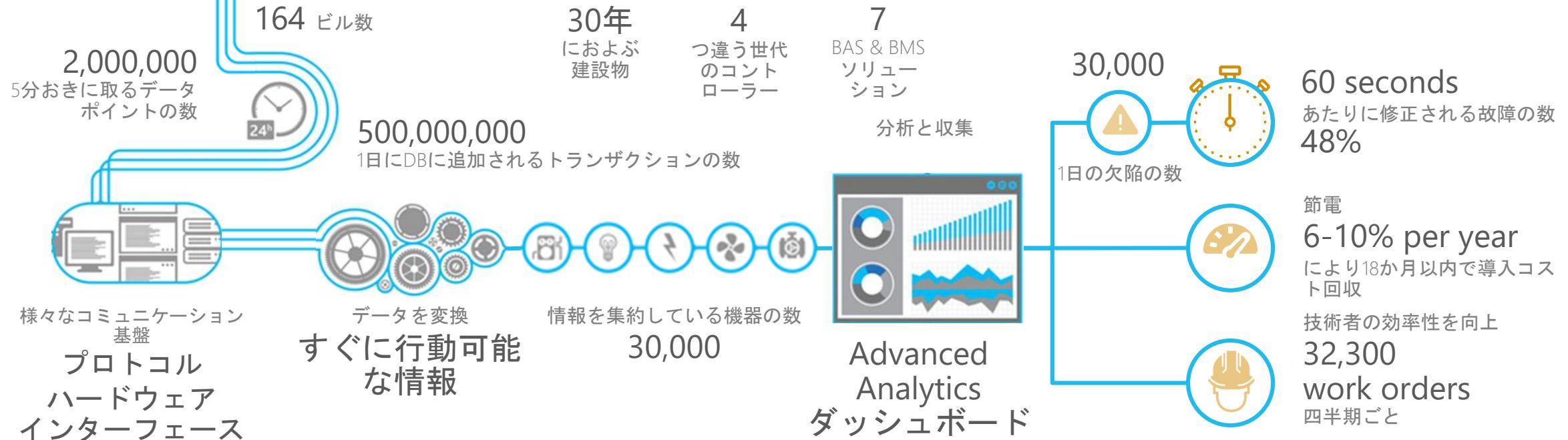
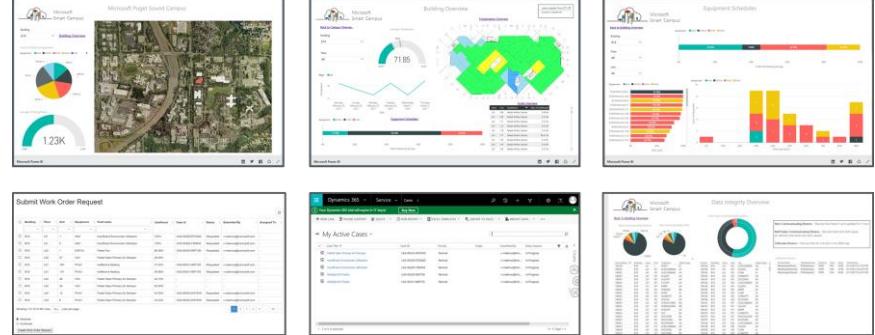


Microsoft Real Estate & Facilities

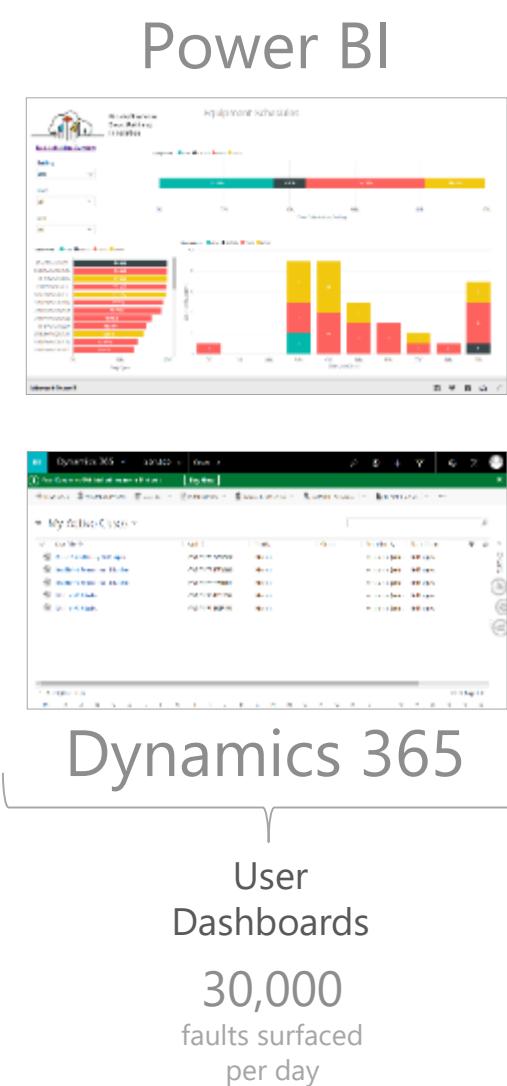
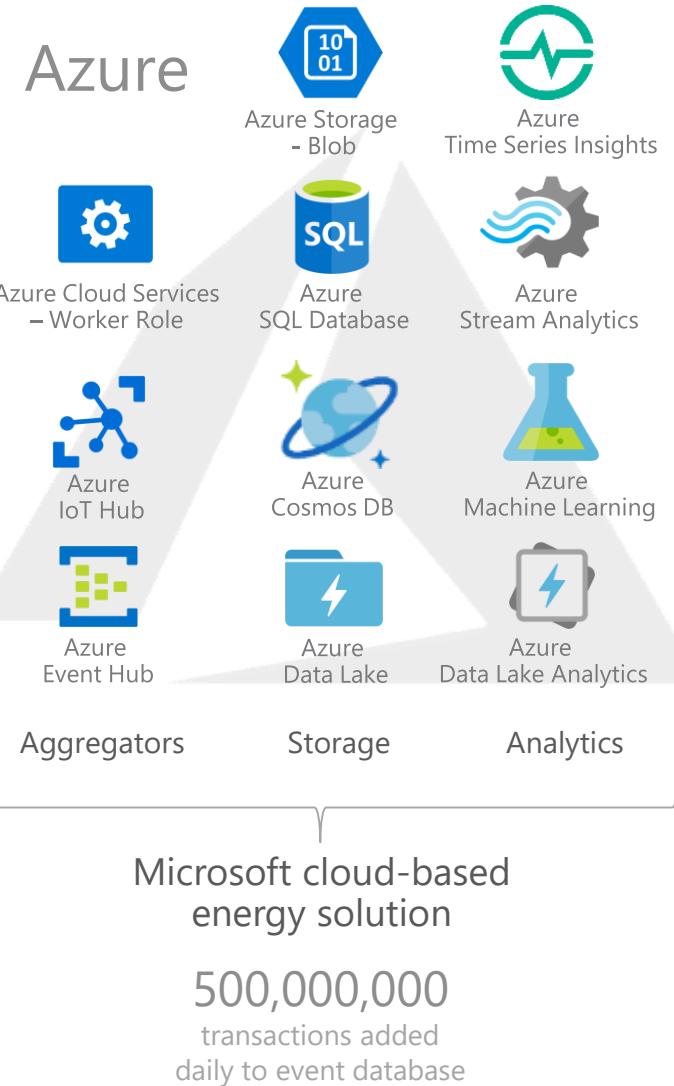
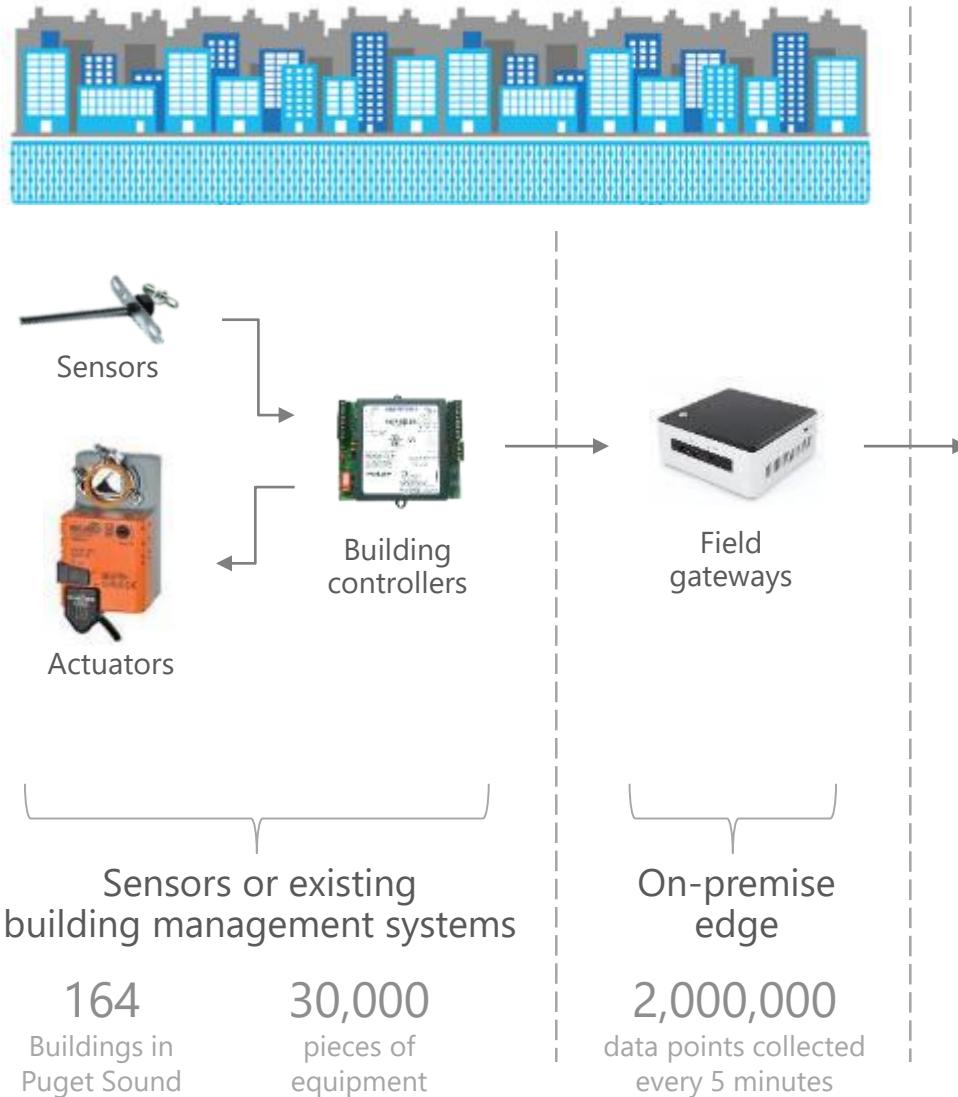
- ・500エーカー、2300万平方フィートに160以上の建物を持つマイクロソフト本社キャンパスの施設管理を行っている
- ・空調制御、空調機械、電気、一般的なメンテナンス、デジタル機器、ケーブル類、配管サービスを提供している
- ・敷地管理、用務、エレベーター、発電機、塗装、施錠と鍵管理、生活安全機器の管理を行っている



Case Study - 88 ACRES



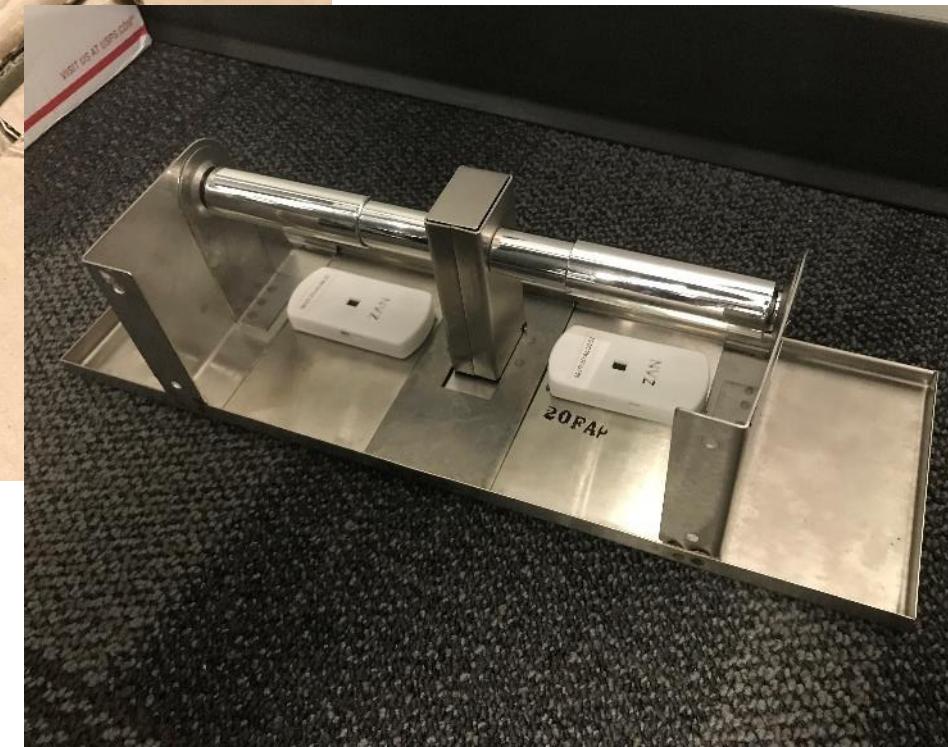
Case Study - 88 ACRES : 構成



Microsoft Real Estate & Facilities



Microsoft Real Estate & Facilities

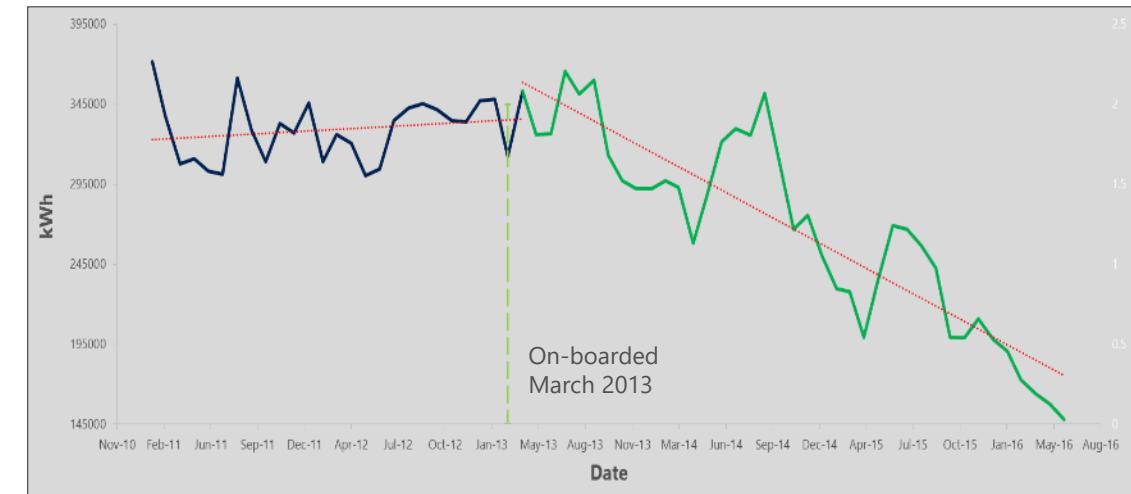


Case Study - 88 ACRES : エネルギー管理

	2012	2013	2014	2015	2016
TOTAL PUGET SOUND CAMPUS BUILDINGS AND OTHER STRUCTURES					
Number of buildings	118				
Number of other structures (garages, etc)	61				
Annual energy consumption (kWh)	655M	641M	603M	576M	513M (estimate)
Energy consumption savings, cumulative	Baseline	2.2%	8.0%	12.0%	21.7% (estimate)
Annual energy cost	\$53.4M	\$51.2M	\$48.8M	\$48.2M	\$43.7M (estimate)
Energy cost savings, cumulative	Baseline	4.1%	8.6%	9.7%	18.2% (estimate)
PUGET SOUND CAMPUS ON-BOARDED STRUCTURES					
Number of onboarded structures	12 (7%)	67 (37%)	144 (80%)	144 (80%)	145 (81%)
Average real-time energy demand (MW)					22.7



Energy consumption – Advanta C, Puget Sound campus



マイクロソフトのスマートビルディングプロジェクト事例

デジタルプラット
フォームによる
スマートネーション



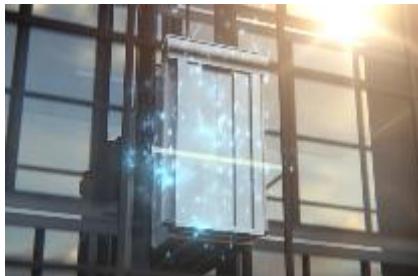
デザインと
デジタルによるス
マートライフの融合



デジタルでインフラ
をスマートに



ビル内の設備も
スマートに管理



シンガポール JURONG TOWN CORPORATION(JTC)

シンガポール政府の推進するスマートネーションの一環として、グリー
ンシティを目指し、IoTを活用したエネルギー効率化、環境配慮のオ
フィスビル、設備管理の予兆保全サービスを提供

イタリア Chorus Life

ベルガモにある製造業のお客様が保有する「Chorus Life」という都市
開発プロジェクト。住居、ホテルや社屋までを備える敷地内を、デジタル
の力で、新しいライフスタイルやイノベーションを提供するプラット
フォームサービス

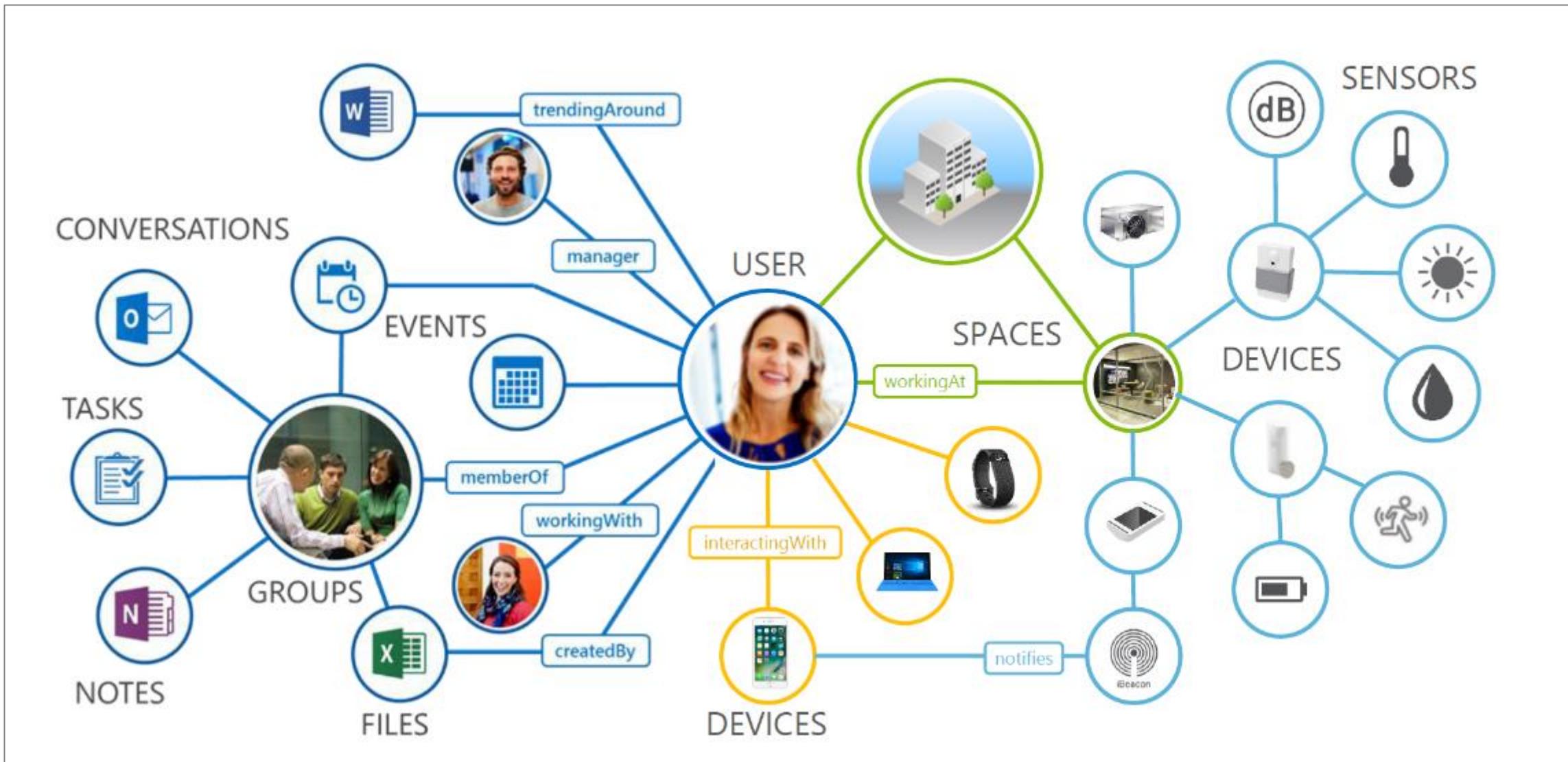
マレーシア UEM Edgenta

社会インフラを支えるUEM。スマートビルディングソリューションに
よるエネルギー効率化、設備の予防保全によるビル入居者へのサービス
を向上。ビル管理のプラットフォームを開発し展開するビジネスモデル
へと変革

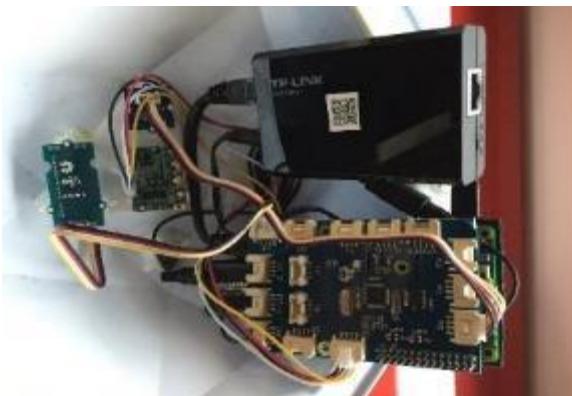
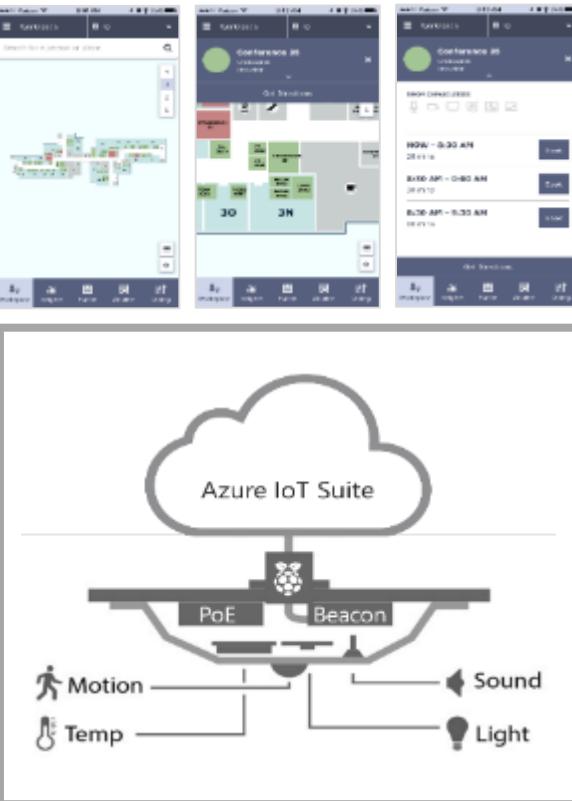
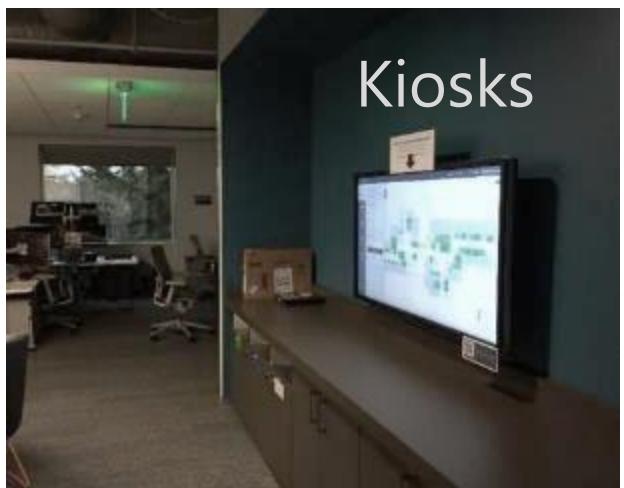
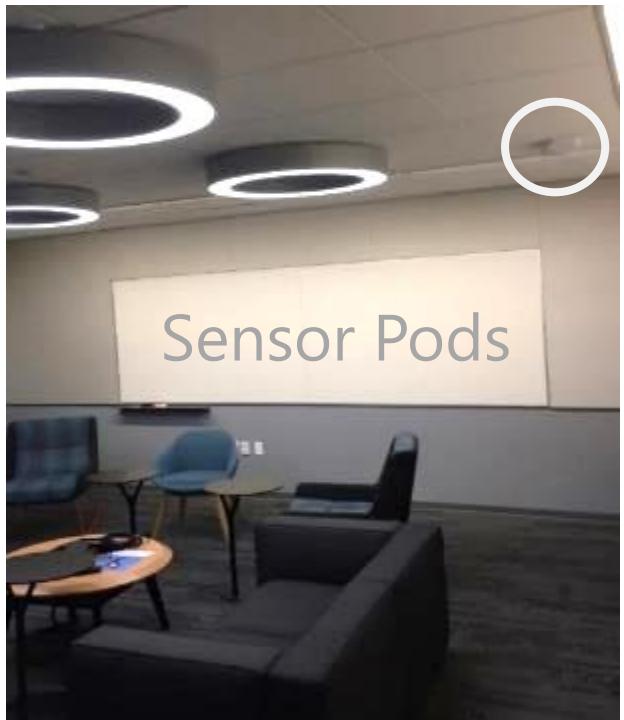
ドイツ thyssenkrupp

予防保全の業界標準を超えを目指し、数千のセキュアなセンサーとモニ
タをエレベータに搭載することで、あらゆるもの監視・管理し、事前
検知によるメンテナンスによって、利用者の満足度を向上を実現。

Smart Space



Smart Space



Smart Space

Occupancy & Utilization Analytics & Insights

<https://smartbuilding.microsoft.com>

Heatmaps

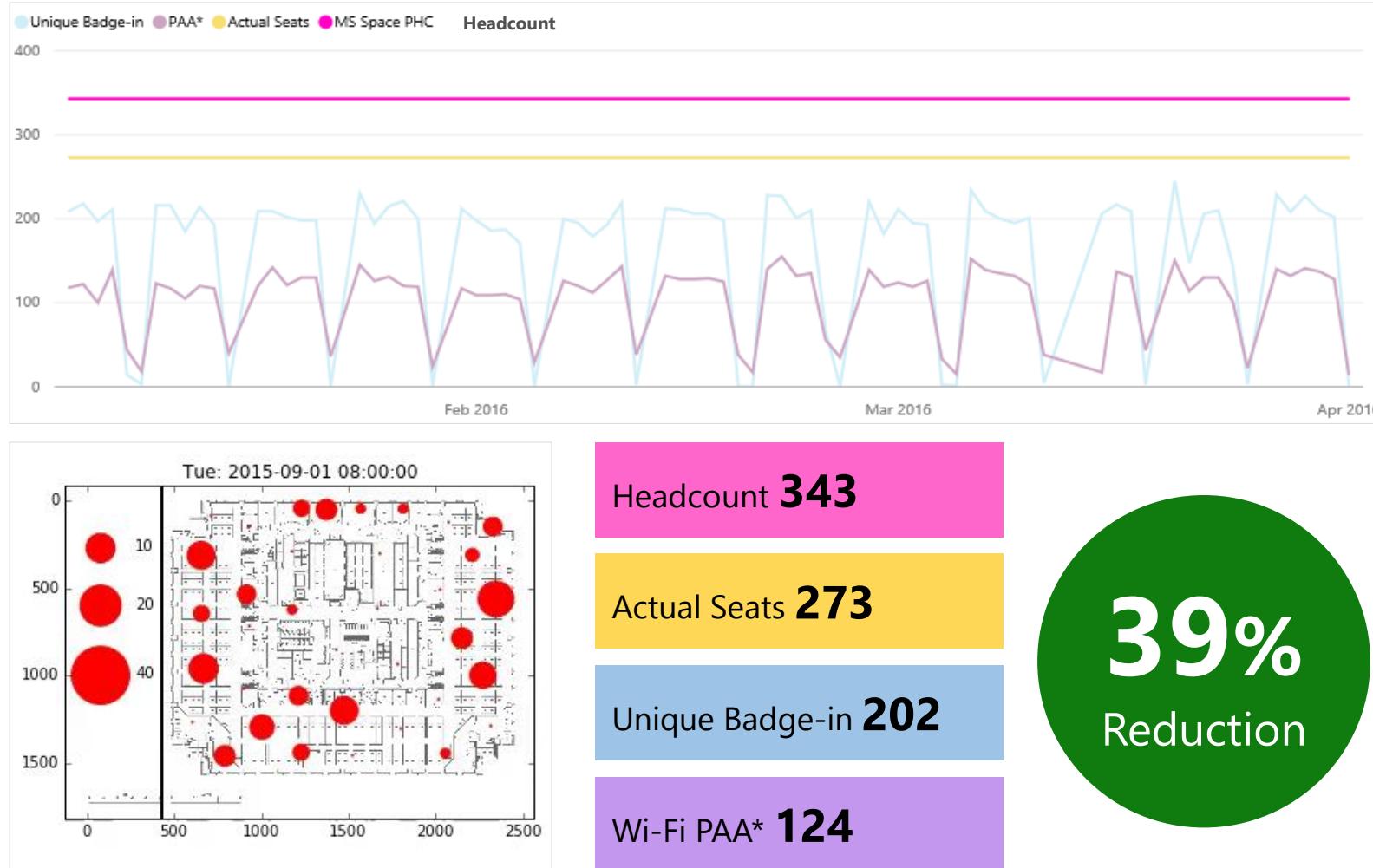


Power BI Reports



Smart Space

Attendance data: Site 2



Solution

- Multiple data sources integrated
- Dynamic modeling shows space usage

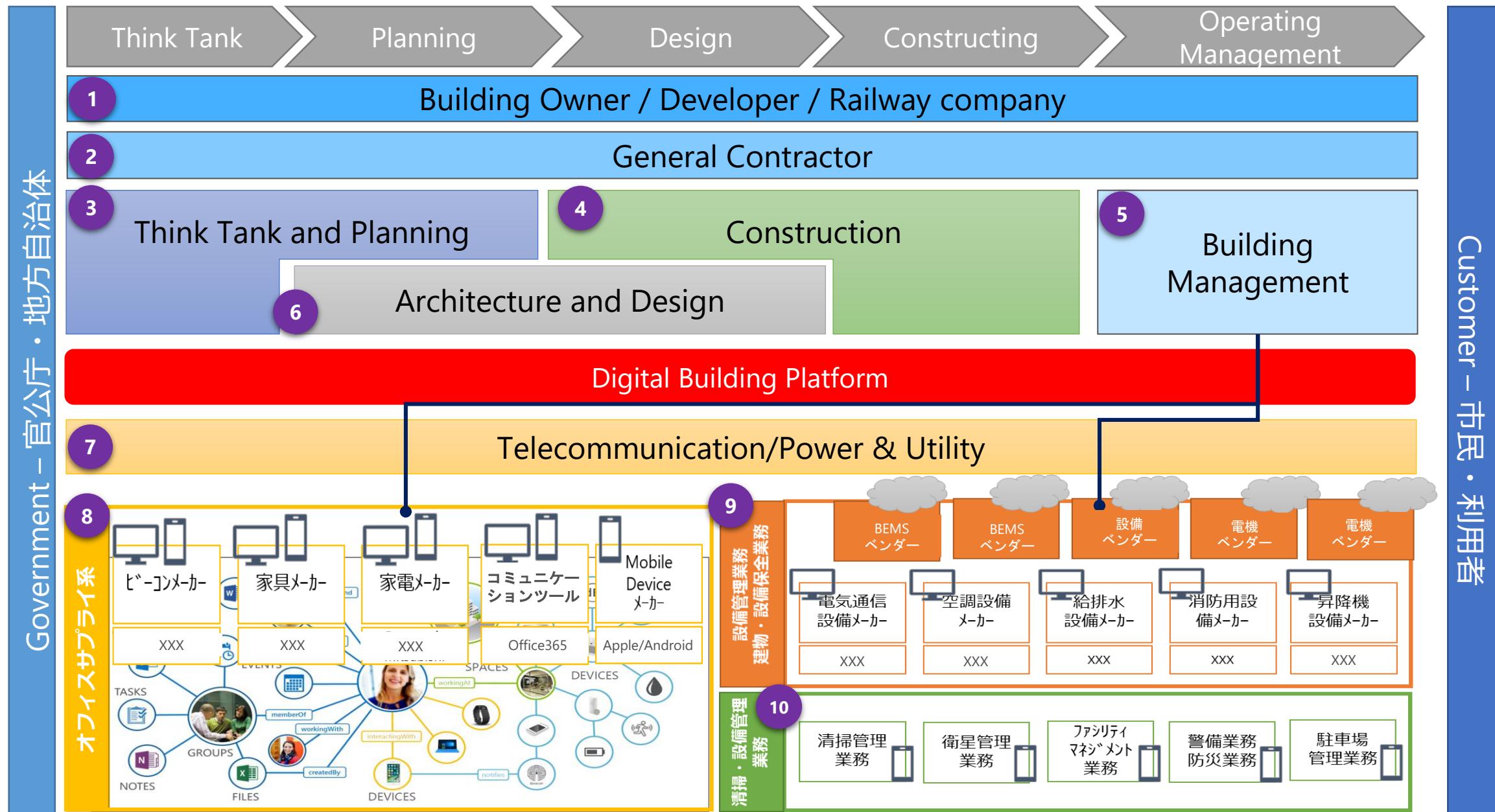


Benefits

- *Space optimization*
- *Reduced servicing costs*
- *Reduced capital costs*
- *Improved lease management*



Smart Building全体概要



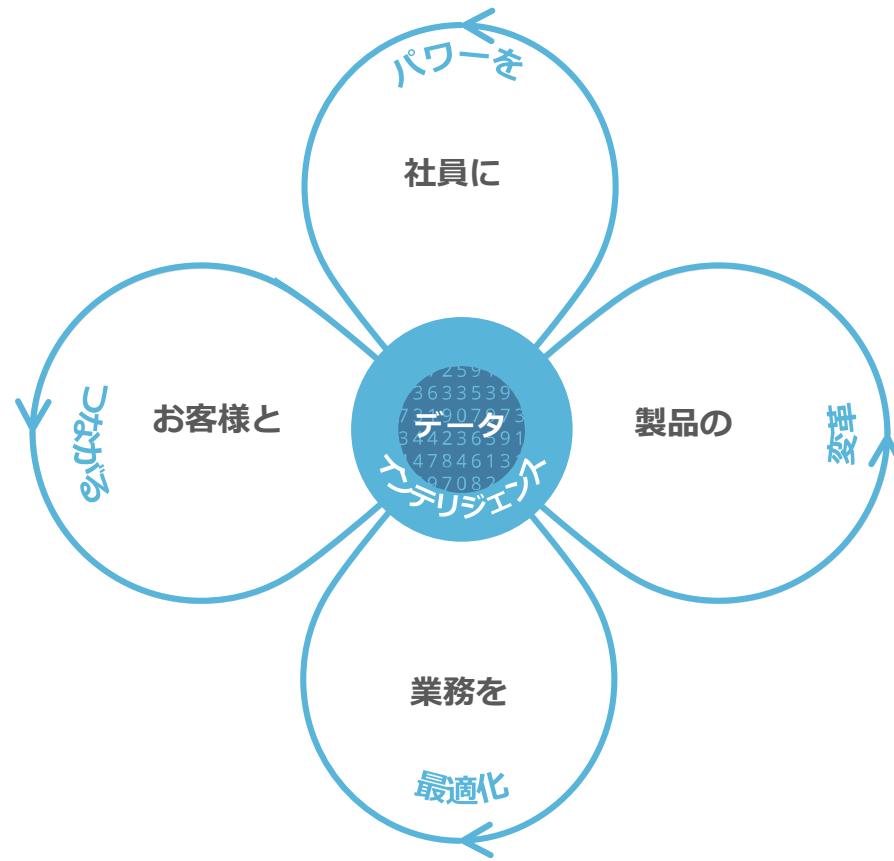


Azure Digital Twins

クラウド、IoT、AI による空間の変革

デジタルフィードバックループ

マイクロソフトのビジョン: すべての組織がビジネスのあらゆる側面においてデジタルフィードバックループを作成できることになること



製品と運用を含む包括的なデジタル モデル

- 人、場所、モノ、プロセスを含む
- 追跡、最適化、シミュレーション、未来予測の機能



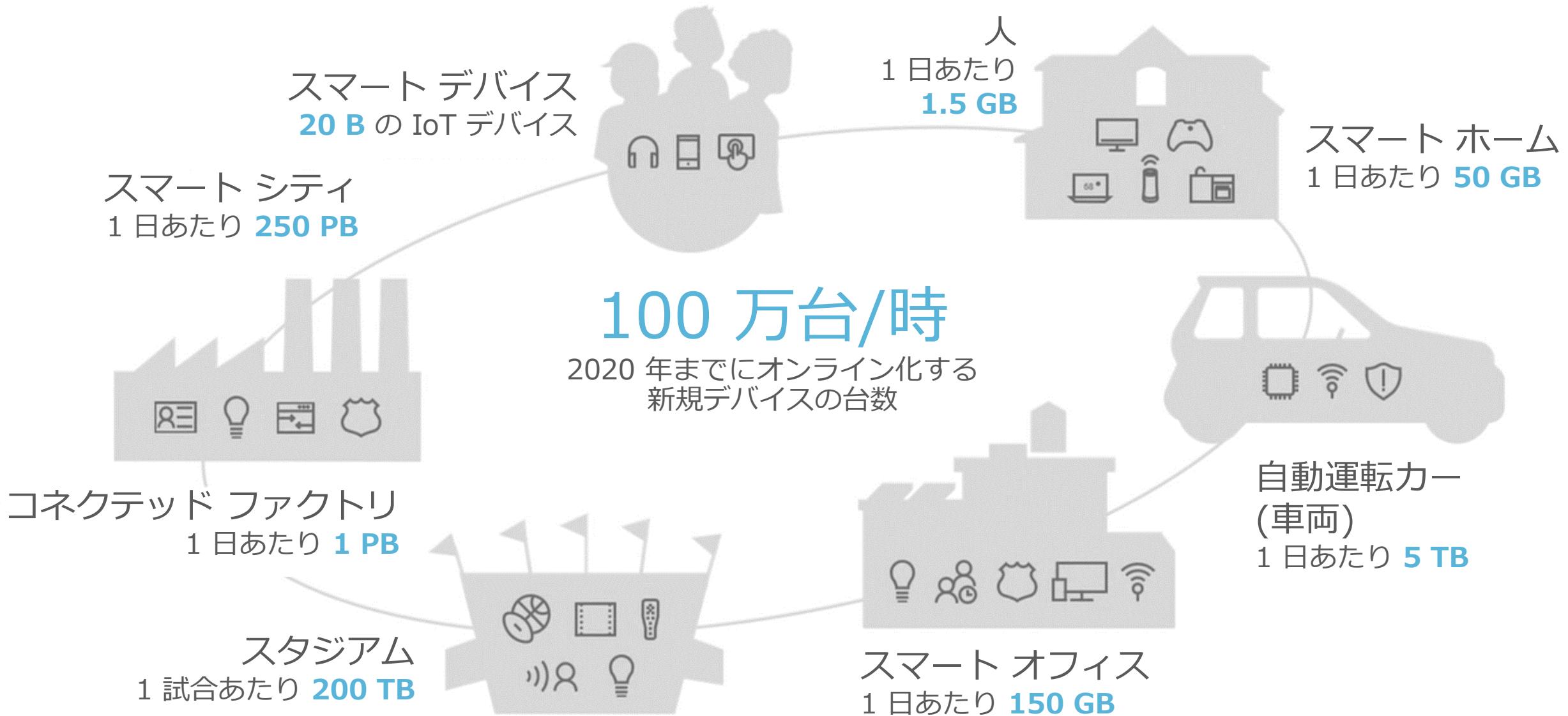
マイクロソフトは IoT に 5 億ドルを投資



マイクロソフトの目標は、**コネクテッドソリューション**によって、すべてのお客様、ひいては世界全体が**ビジネスを変革**できるようにすることです。

<https://blogs.microsoft.com/iot/2018/04/04/microsoft-will-invest-5-billion-in-iot-heres-why>

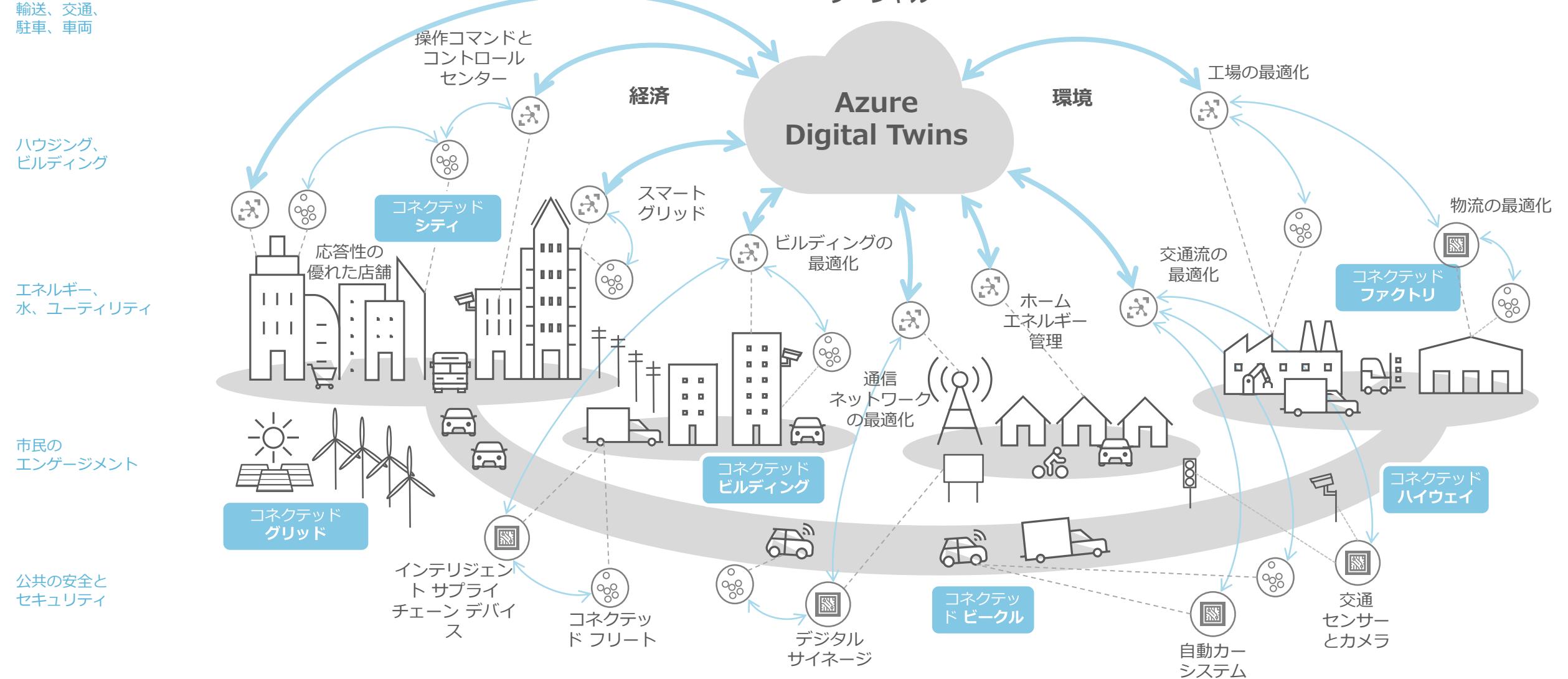
デジタル化



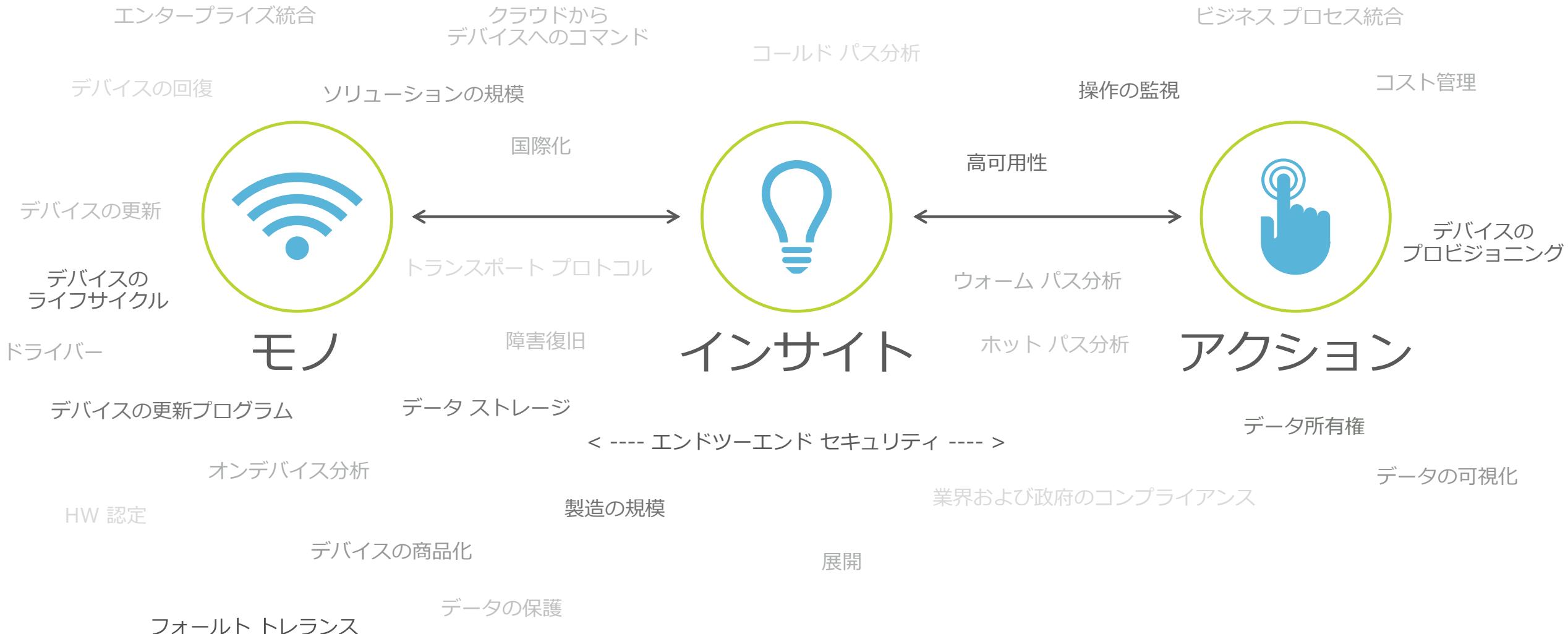
IoT ▶ デジタル変革 ◀ AI



IoT とインテリジェントインフラストラクチャ

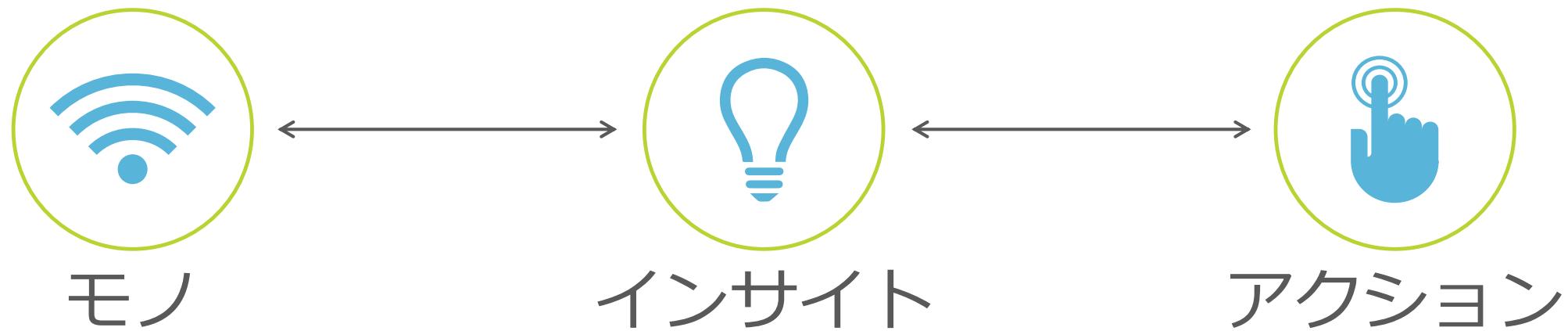


現実に即して見ると…

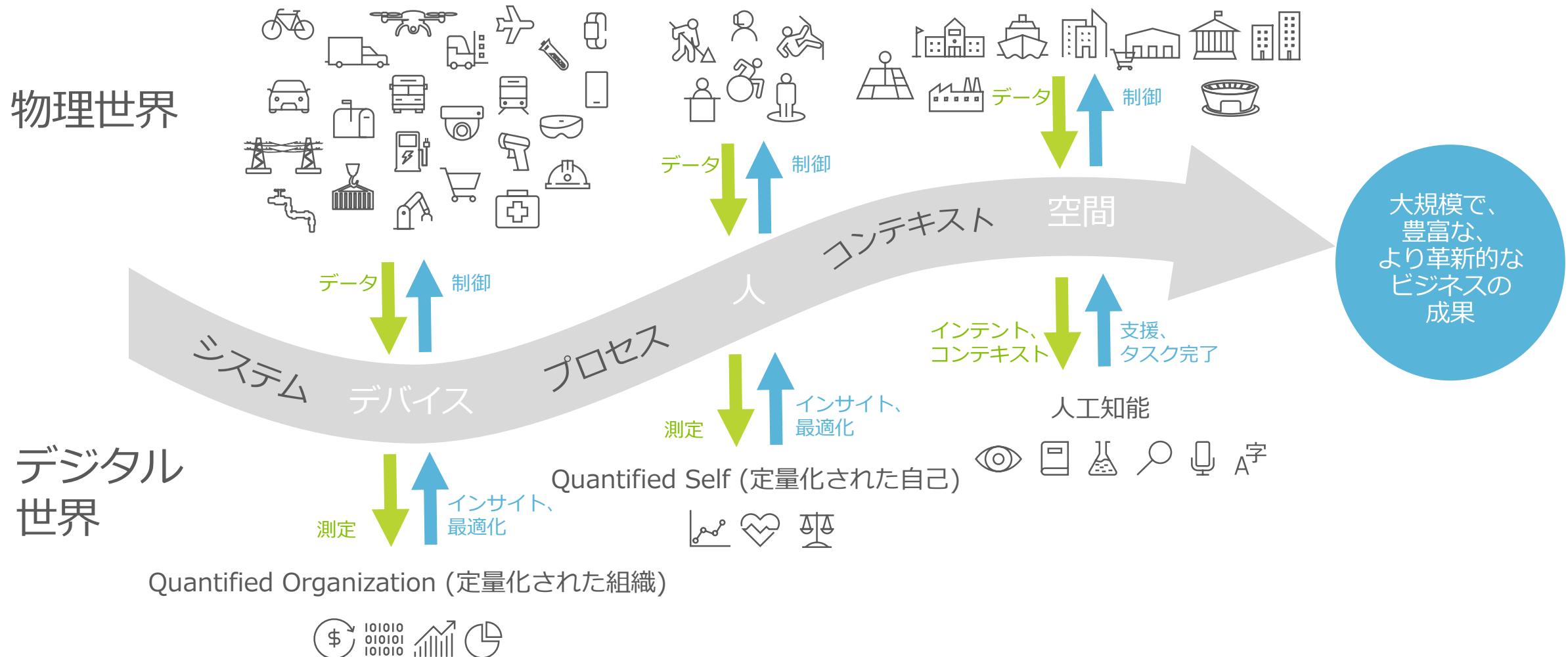


...そして IoT のシンプル化が必要な理由

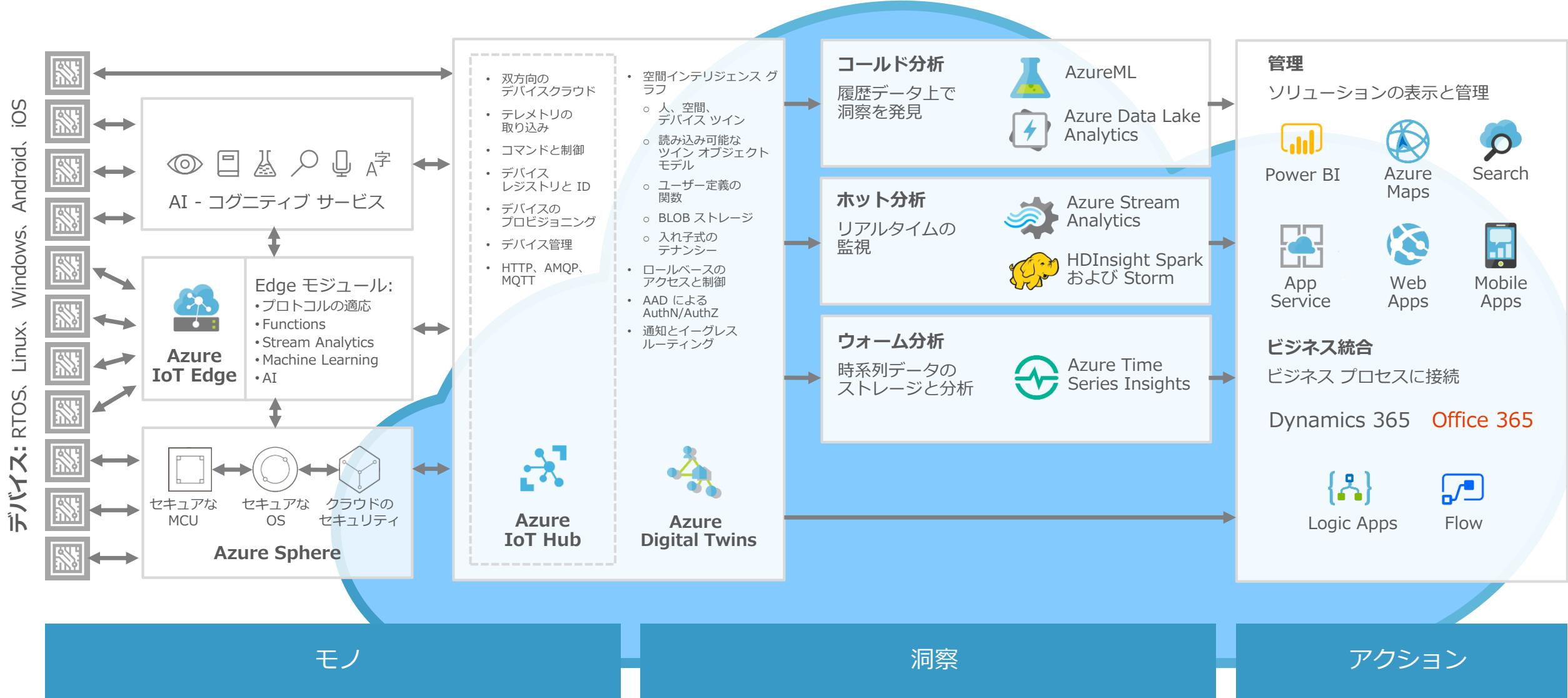
シンプルな IoT ソリューションの図



デジタル ツイン: 物理とデジタルの融合



実世界をモデル化してやりとりする





スマート空間のための
デジタルレッイン

スマート空間への関心の高まり

マーケット要因



持続可能性イニシアチブ



ワークプレースのトレンド



更なるコスト削減へ



リース会計基準の見直し

対象者

所有者

オペレーター

占有者

シナリオ

エネルギー

空間

生産性

パートナー

インフラストラクチャの構築

施設管理

ワークプレース エクスペリエンス

ワークプレース → 機能する空間

単位面積 (平方フィート)あたりの年間コスト (\$):

300

空間内の従業員数

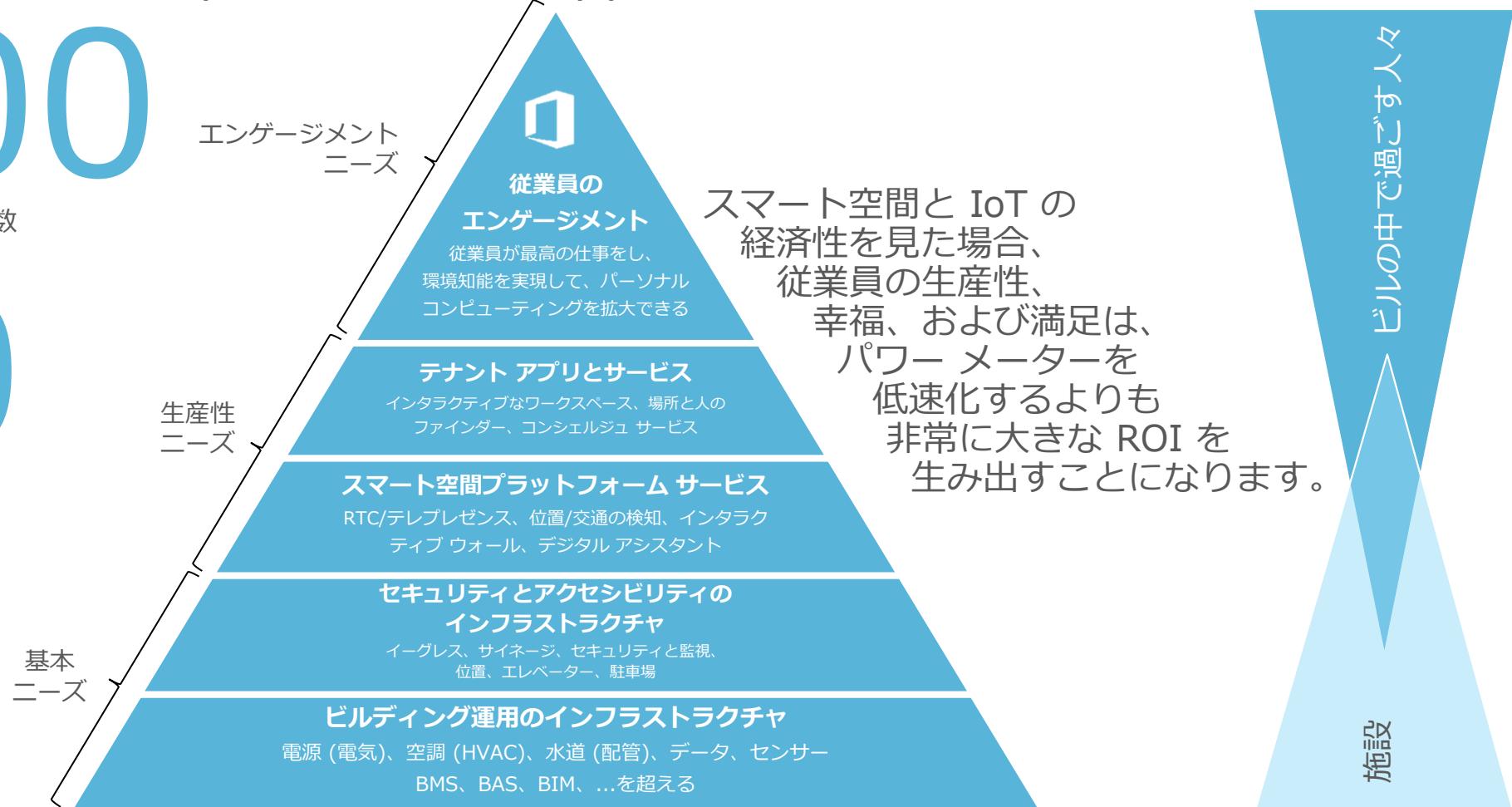
30

リース空間

3

エネルギー

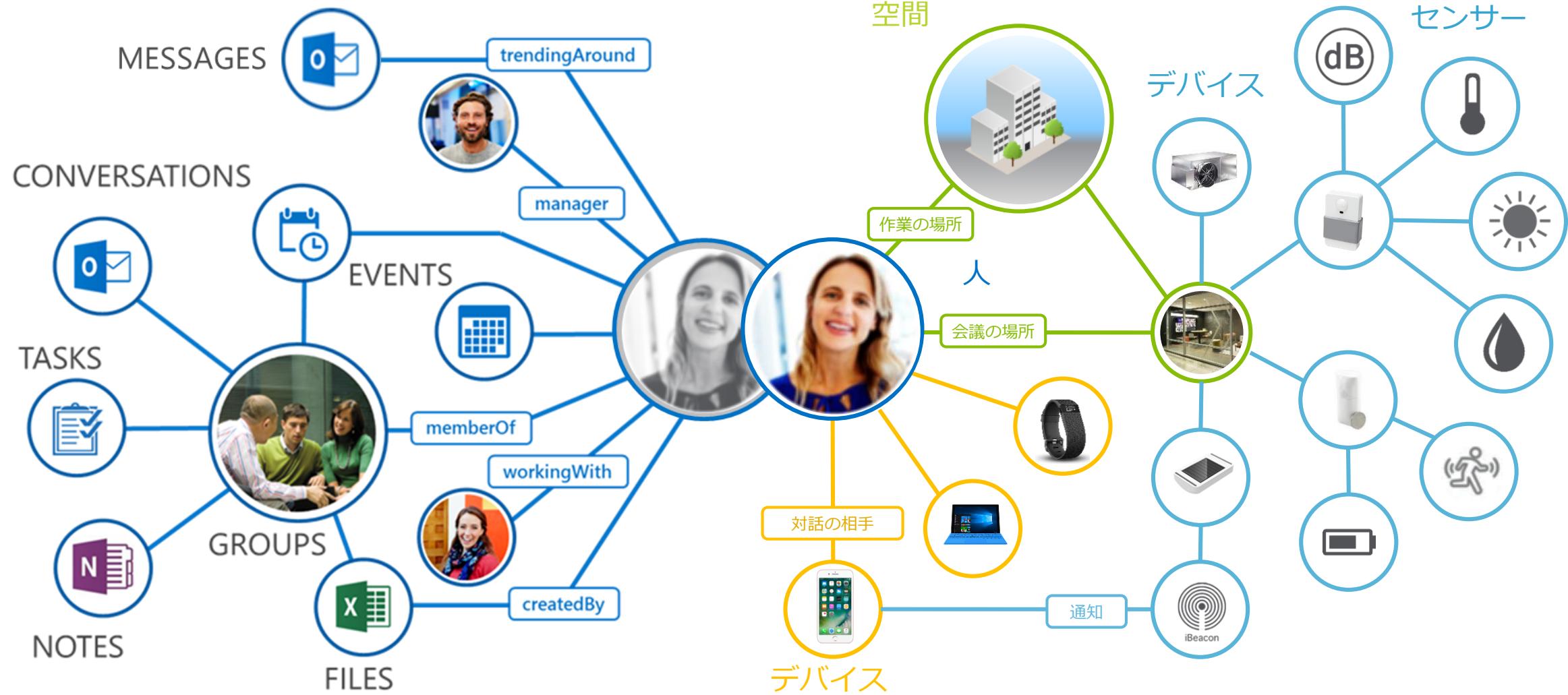
ニーズごとの価値



オフィス インテリジェンス



空間インテリジェンス



Azure Digital Twins

空間インテリジェンス グラフ

- 人、場所、デバイス ツインの関係をモデル化
- BLOB ストレージを人、場所、デバイス ツインに接続 (マップ、写真、マニュアルなど)
- トポロジベースのデバイス プロビジョニングと管理
- 入れ子式のテナント: 顧客、地域、施設など別のデータ処理とストレージ分離

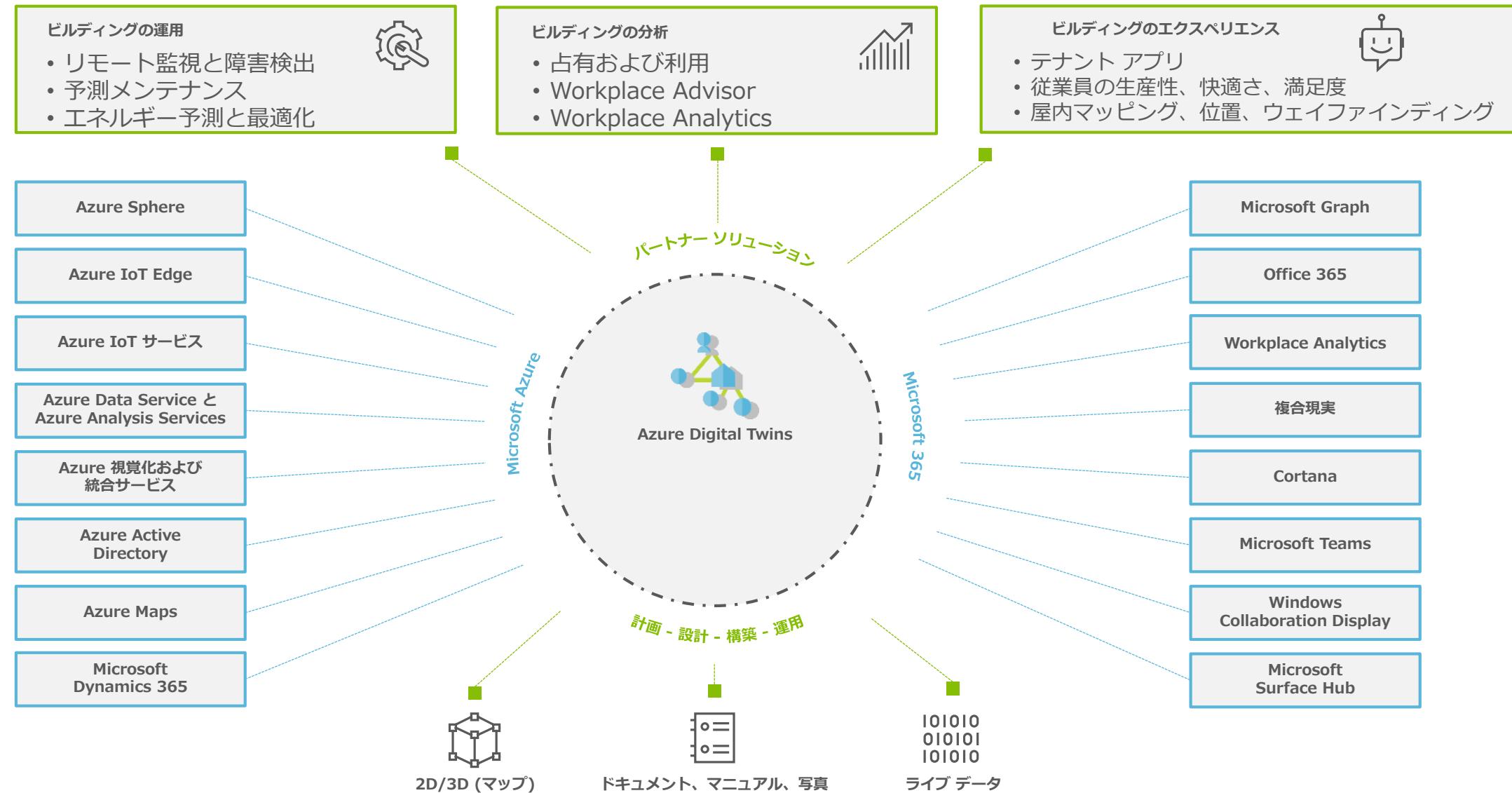
読み込み可能なツイン オブジェクト モデル

- オントロジ: 事前定義されたドメイン固有の概念定義、カテゴリ、セマンティクス
- プロパティ、およびプロパティ間の関係

高度な処理と制御

- ロールベースのアクセスと制御 (RBAC)
- AAD による認証/承認
- カスタマイズ可能なセンサー処理 (関数)
- イーグレス: 通知とルーティング (Service Bus、Event Hub、Event Grid)

スマート空間のためのデジタルツイン



革新的で多様性のあるパートナー

Steelcase

家具およびインテリア空間

convene™

オフィス ホスピタリティ



CBRE

施設管理

 **RIGADO**

IoT デバイスおよびセンサー

Honeywell

コネクテッド ビルディング



CONSTRUCTION

建設



グローバル システム インテグレーター



BeSense



ビルディングのデジタル ツイン



 **essity**

クリーニング



yanzi

IoT デバイスおよびセンサー

 **CSU**

クリーニング

heijmans

建設

パートナー アプリケーションの多様性

Steelcase
Workplace Advisor、FIND

convene
Elevate

 **RIGADO**
IoT デバイスおよびセンサー


essity
Tork Easycube

CBRE
CBRE 360

Honeywell
Honeywell Vector


PCL
CONSTRUCTION
Job Insights



Smart Campus、Smart Cities


Willow Twin


BeSense
Smart Office

yanzi
IoT デバイスおよびセンサー

 
CSU **heijmans**

スマート空間... 人の生産性を上げる

ユーザー向け

パーソナルな支援

スマートでコネクテッドな空間がオーケストレーションの負担を取り除き、物理環境でのエクスペリエンスを最適化して人間らしいものにする

選択者向け

信頼できるアドバイザー

スマートでコネクテッドな空間により、組織は今日の空間に関連する課題に取り組むための必要なデータを収集できる

個人

自分は十分に集中し、積極的に関与しているか?

フォーカス、移行、社会参加
空間のヒューマナイズ

グループ

グループは効果的に対話しているか?

存在の格差、対話と流れ、コラボレーションと
共同創作、コンテキストの想起

組織

資産を効果的に利用しているか?

不動産コスト、リソースコスト、
組織の業績

自分を見つける

自分はだれなのか?
どこにいるのか?

自分を知る

自分のスケジュール、
自分のニーズと習慣、
自分のお気に入り、
自分のグループとチーム

空間を知る

フロアプラン、
ルームスケジュール、
機能、温度、
照明とノイズのレベル、
トラフィックパターン

ヘルプ

ユーザーをガイド、
調整の情報提供、
オプションの提案、
組織の進化を手助け、
ニーズに合わせて空間を調整

ICONICS が Azure Digital Twins で スマート ビルディングを さらにスマートに

運用効率化のためにビルの点検や調整をエンジニアが手動で行う必要はありません。ICONICS のスマート ビルディング ソフトウェアは、ビル管理システムから IoT センサー データを収集して分析します。

これにより、所有者が建物の状態について可視性を得られると共に、エネルギー効率が向上し、コストが削減されます。マサチューセッツ州のフォックスボロに本社を置く ICONICS は、マイクロソフトの Azure Digital Twins を活用して、ソフトウェアのスケーラビリティを向上させ、占有分析や空間分析などの革新的な機能を顧客へ迅速に提供しています。



製品とサービス

Azure Digital Twins
Azure Machine Learning

業種

スマートスペース

国

米国



PCL Construction は Microsoft Azure の IoTのテクノロジを活用して 建設業を変革

カナダのエドモントに本社をおく PCL Construction は、何十世紀にもわたる建設業界のデジタルテクノロジーやクラウドサービスに Microsoft Azure の IoT テクノロジーを使うことで、建設に関するすべての要素を単一のビューで見ることができるモバイルに対応した Job Site Insights アプリケーションを開発しました。IoT データを集め分析することにより、安全性と効率性と生産性を向上させることができます。



Products and Services
Microsoft Azure
Azure IoT Edge
Azure IoT Hub
Azure Time Series Insights
Microsoft Power BI

Organization Size
4,000 employees

Industry
Professional services

Country
Canada



参考情報

詳細情報

- マイクロソフトのブログ:

<https://blogs.microsoft.com/iot/2018/06/05/smart-buildings-are-built-on-azure-iot/>

ロードマップ

- 限定レビュー
 - 本日、限定パートナーによるレビューを発表
 - お問い合わせ smartspacepreview@microsoft.com
- パブリック プレビュー
 - 発表: Microsoft Ignite (2018 年 9 月 24 日)
 - 開発者向けイベント: IoT Solutions World Congress、バルセロナ (2018 年 10 月 16 日)
- 一般提供開始 (予定)
 - 発表: Microsoft Build (2019 年 5 月)



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