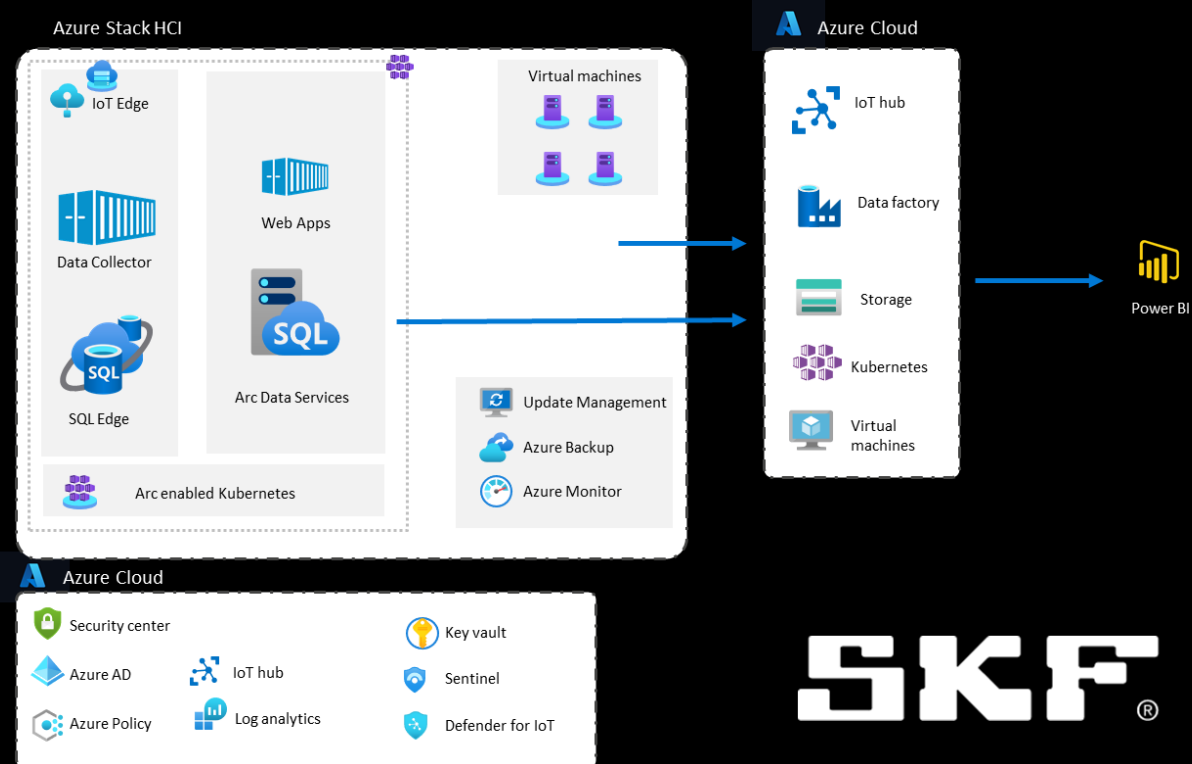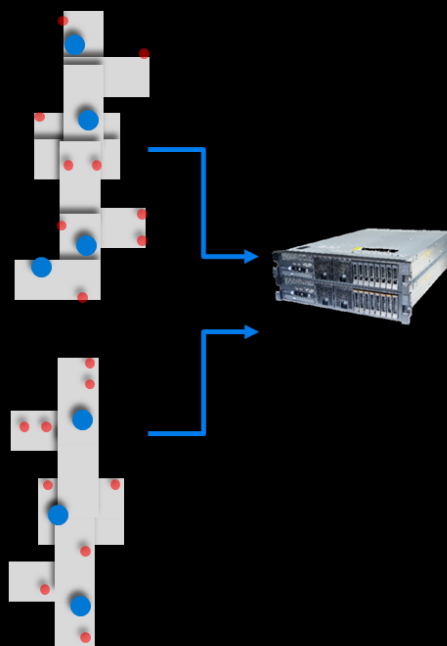![Microsoft](Microsoft logo)

Manufacturing
How to accelerate with the Edge?

Christophe Le Roux , Modern Infra Solution Lead – DPSS EMEA

SKF Digital Manufacturing
"Cloud managed, locally executed"

- Production of Bearings

- 106 factories in 28 countries
- Data Driven Manufacturing
- React before deviation appears
- Production start just in time

- Cloud Operating Model , centrally managed platform
- Automation

- 40% of savings on Hardware
- 30% reduction of OT downtime

Azure Stack HCI

- IoT Edge
- Data Collector
- Web Apps
- SQL Edge
- Arc Data Services
- SQL
- Arc enabled Kubernetes
- Virtual machines
- Update Management
- Azure Backup
- Azure Monitor

Azure Cloud

- IoT hub
- Data factory
- Storage
- Kubernetes
- Virtual machines

Power BI

Azure Cloud

- Security center
- Azure AD
- Azure Policy
- IoT hub
- Log analytics
- Key vault
- Sentinel
- Defender for IoT

SKF®

(2) Digital transformation at SKF: An AKS on Azure Stack HCI use case - YouTube

Microsoft Customer Story-SKF builds factories of the future with Azure hybrid cloud solutions managed with Azure Arc

Picanol Group finds flexibility and faster time to market with Azure Stack

The Context

- Picanol Group Produces and sells high-tech weaving machines
- Factory 4.0 strategy
- Production facilities in Belgium, Romania, and China

The Use Case

"Our robotics produce a lot of data, which we can use to make smarter decisions about how our machines should work and how to better manage storage and shipping. We always want to know where we can automate or do something better, faster, and with fewer errors, and that's where IT and the business go hand in hand. We're trying to do as much as possible driven by IT to make the new Factory 4.0."

The Challenge

1. Compliance
2. Connectivity & Latency
   - Decisive factor
   - The production systems in the factory are controlled from a local ICT
3. Lack of capacity on the current 3-tier environment
   - Could no longer sustain the increasing amount of data

The Solution

- Fujitsu PRIMEFLEX
- Azure Stack HCI OS
- Azure Arc
- SQL Server

"We wanted to manage our whole environment with a single solution. That's what we got with Azure Stack HCI—the flexibility to run workloads in the cloud or on-premises"

"We've improved our flexibility, time to market, and costs."

Microsoft Customer Story-Picanol Group finds flexibility and faster time to market with Azure Stack

Agenda

01

Challenges and Solutions for Manufacturing Industry

02

The Value Proposition of Modernized Infrastructure

03

The IT/OT Convergence

04

The Microsoft Platform

Agenda

Challenges and Solution for Manufacturing Industry

Context , Challenges and Solution

Challenges
- Obsolete IT/OT infrastructure
- Increasing Security threats
- Complex administration at scale
- Compliance constraints
- Need to on-board new smart use cases

Solution:
- Modernize the IT/OT infrastructure to
1. Host the legacy applications
2. Be ready for the next use cases

Optimize

Infrastructure standardization and modernization

Simplified Administration at scale

Reinforced Security

Data modernization

Innovate

Quality Management

Predictive Maintenance

Digital Twin
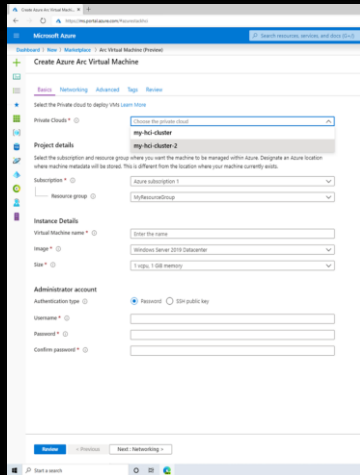
Manufacturing Platform

Agenda

The Value Proposition of Modernized Infrastructure

The Value Proposition : Doing more with Less

① Optimize the administration
of the IT/OT solution

- Manage the solution from a central portal

- Patch and Update the solution at scale

- Automate using process templates

- Secure by design

② Innovate with
smart use cases

- Manage your energy consumption

- Factory Lines Monitoring

- Predictive Maintenance

- Improved Product Quality

- ...

Agenda

The IT/OT Convergence

Closing the gap between IT/OT

1.IT/OT Convergence:

2. IT/OT convergence integrates the tools used for data collection (IT) with the tools used to control processes (OT).

3. By combining these systems, organizations achieve real-time data exchange, enhancing efficiency and effectiveness.

4. Benefits include improved decision-making, operational processes, and accurate, timely data[12]
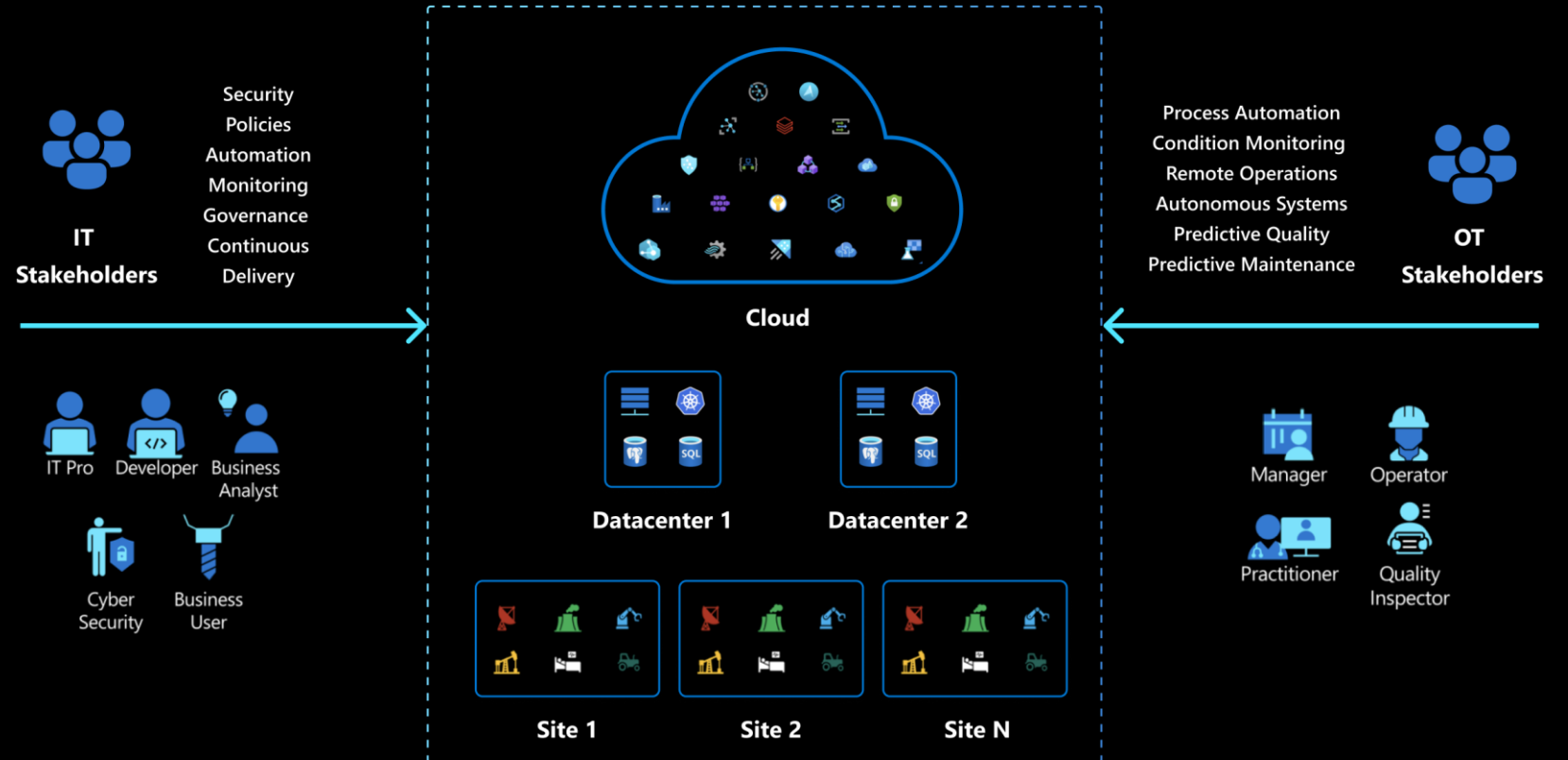
Infrastructure and hosting.
- Manufacturing operations has traditionally been an **isolated business function**, creating and interpreting data locally to inform day-to-day operations
- Organizations must now ensure that this **data can be available to aggregate more broadly for meta-analysis and best practice sharing**
- Infrastructure enables the **power of the cloud for remote access** into operations for high compute power advanced analytics like artificial intelligence (AI) and machine learning (ML)
- Deploy **edge computing technologies that can support new and existing workloads** locally

Data and analytics.
- To achieve the conflicting principles of repeatability and flexibility, **OT data must be combined and analyzed in new ways** at the plant, enterprise, and supply chain levels.
- The sources exist across multiple systems and environments **with inconsistent database structures**, labeling formats, and access protocols.
- Data must be ingested and contextualized into a **common environment using data engineering and management practices** to ensure usefulness in analytics initiatives.

Organization and collaboration.
- To achieve ROI and scale in the integration of infrastructure and connectivity as well as data and analytics, **IT and OT teams must be integrated organizationally**.
- New technologies are becoming so embedded into every manufacturing business process that IT skills and resources must be permanently integrated with manufacturing to ensure both up-front success and maintainability over time.

FIGURE 1

Business Pressures Facing Manufacturers

Q.   *What are the three main reasons your organization is investing in IT/OT integration?*
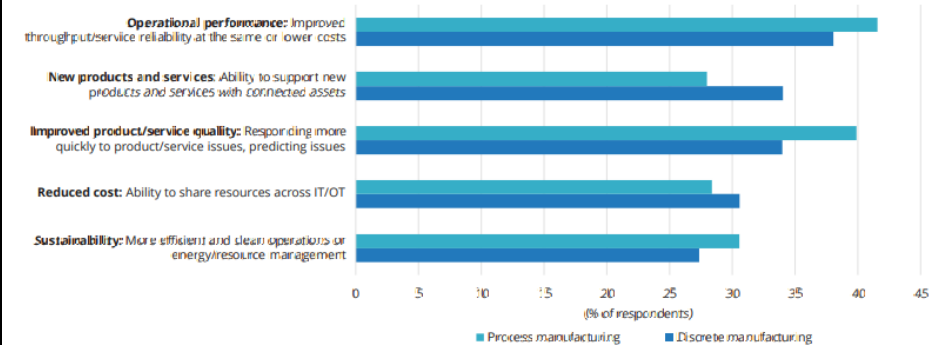
n = 336

Source: IDC's *Worldwide IT/OT Convergence Survey*, July 2022

The IT/OT Convergence Journey

IT Team	OT Team

IT Solutions	OT Solutions

IT Solutions
- Apps
- Data
- Infra

OT Solutions
- Apps
- Data
- Infra

IT Team	OT Team

Control Plane — Infra Mgmt

IT Solutions
- Apps
- Data
- Infra

OT Solutions
- Apps
- Data
- Infra

IT Team	OT Team

COE

Data Plane — Data Platform

Control Plane — Infra Mgmt

IT Solutions
- Apps
- Data
- Infra

OT Solutions
- Apps
- Data
- Infra
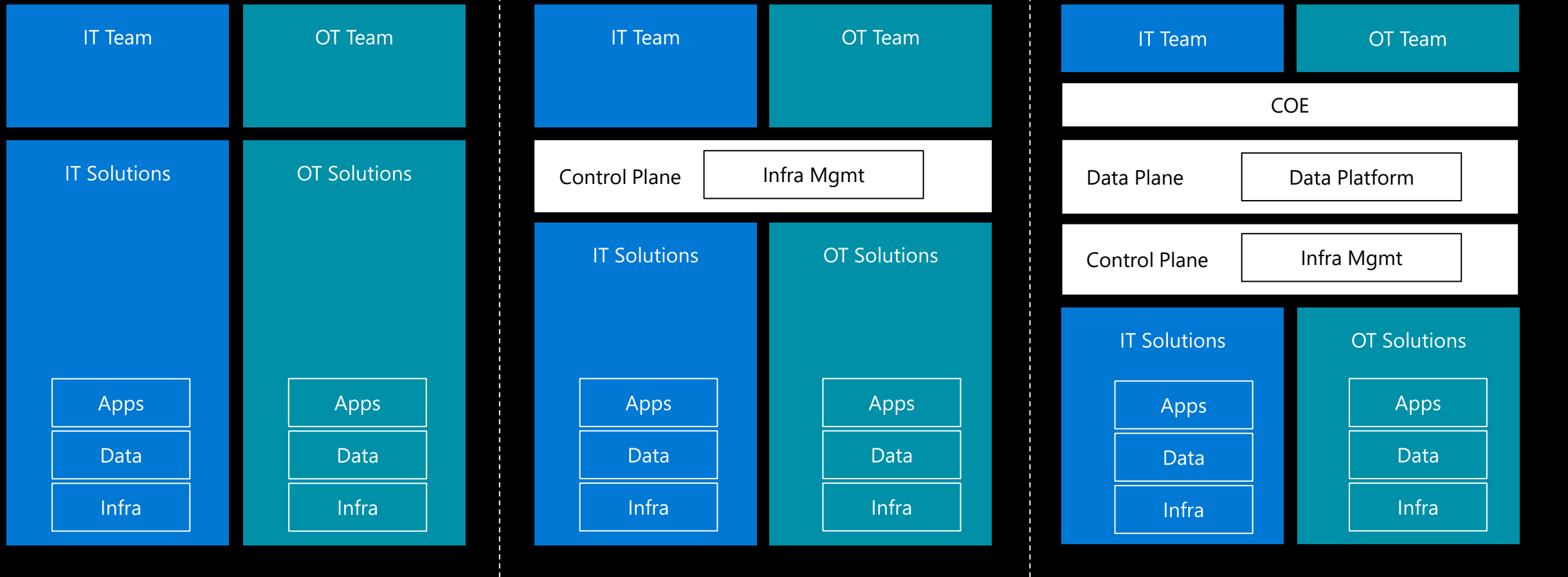
Siloed organisation and platforms → Converged organisation and platforms

Agenda

The Microsoft Platform
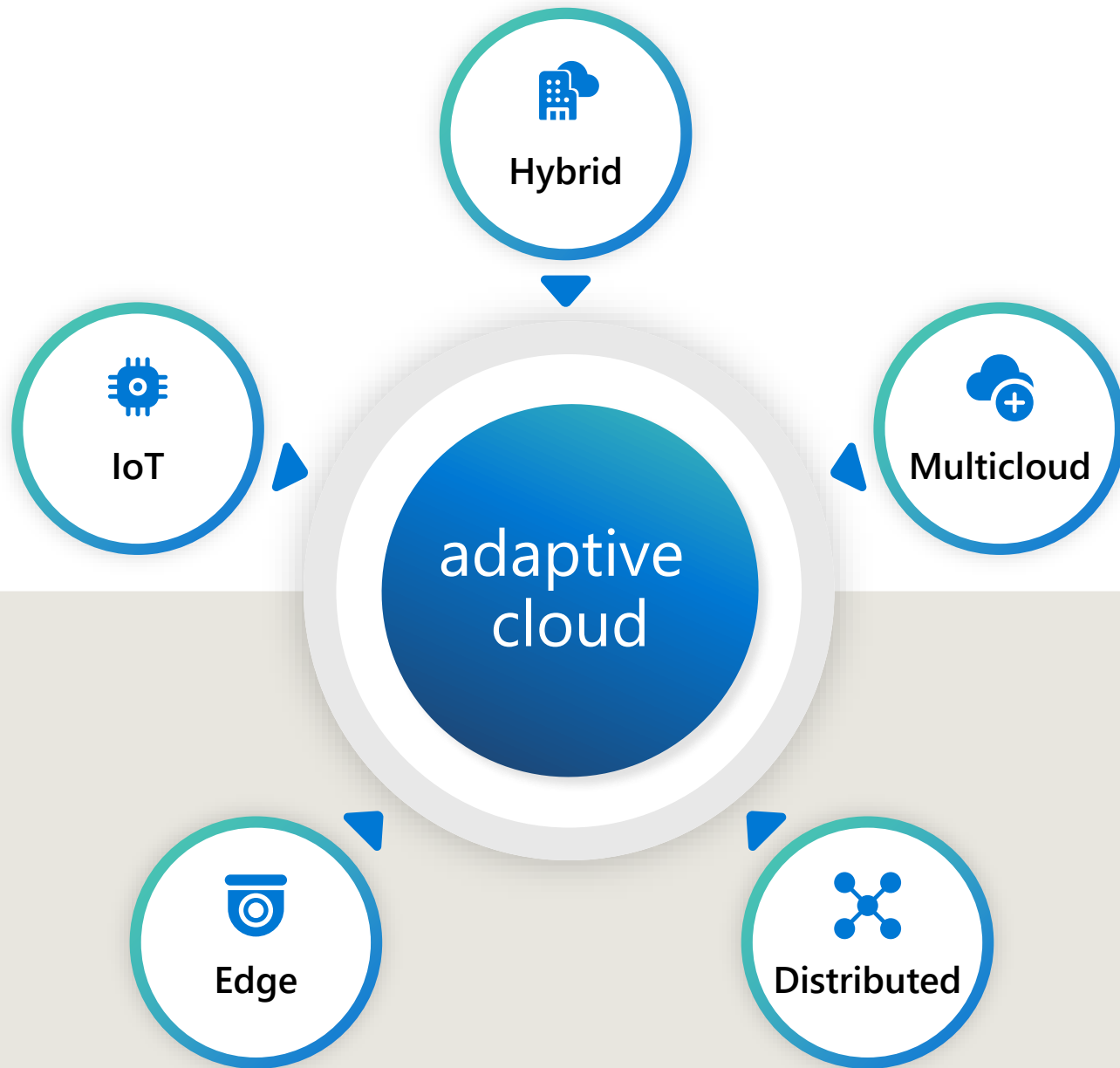
Advancing hybrid cloud to adaptive cloud

Thrive in dynamic environments by unifying teams, sites, and systems across hybrid, multicloud, edge, and IoT.

adaptive cloud

Operate with AI-enhanced central management & security

Rapidly develop and scale applications across boundaries

Cultivate data and insights across physical operations

Enabling adaptive cloud with Azure Arc

Operate with AI-enhanced central management & security

Portal	Resource Manager	Monitor	Policy	Microsoft Defender for Cloud

	Microsoft Copilot for Azure	Key Vault	Automation	Microsoft Sentinel

Rapidly develop and scale applications across boundaries

Azure CLI and PowerShell	Visual Studio	GitHub	Azure Kubernetes Service

App Service	API Management	*Functions*	CNCF Kubernetes

Cultivate data and insights across physical operations

IoT *Operations*	SQL	Microsoft Fabric	Machine Learning

Microsoft Azure

Windows Server

Azure Stack HCI

Enabled by Azure Arc

*Preview

Adaptive Cloud has unmatched capabilities to address customer challenges anywhere

| Azure Control Plane | | | | | | |

| Applications | .NET | Python | node JS | C++ | Java | GO |

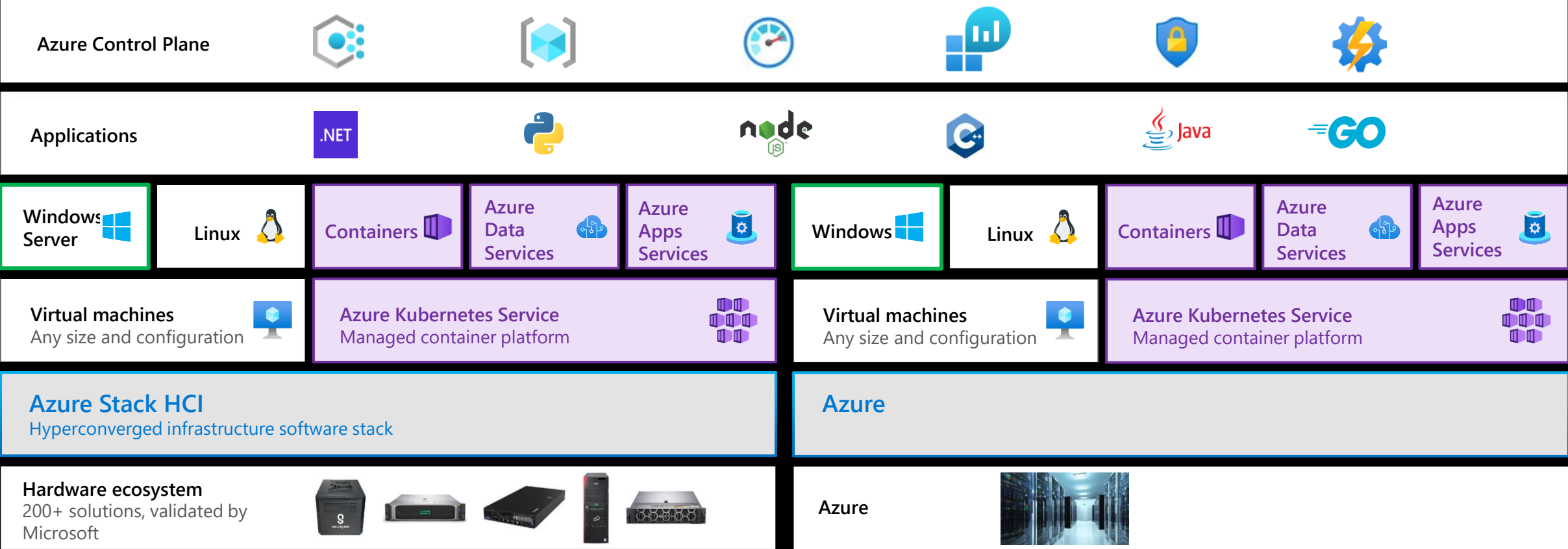| Windows Server | Linux | Containers | Azure Data Services | Azure Apps Services | Windows | Linux | Containers | Azure Data Services | Azure Apps Services |

| **Virtual machines** Any size and configuration | **Azure Kubernetes Service** Managed container platform | **Virtual machines** Any size and configuration | **Azure Kubernetes Service** Managed container platform |

Azure Stack HCI
Hyperconverged infrastructure software stack

Azure

Hardware ecosystem
200+ solutions, validated by Microsoft

Azure

Appendix

Becoming the Transformation Agent of our customers

Tangible

Money coming in → ← Money going out

Test in the Cloud / Deploy locally Train in the Cloud / Execute locally Azure ML

Azure Arc Azure Stack HCI Azure Hybrid Benefits Energy Management Quality Management Employee Safety

Increase Revenue

- **Improve product quality**
- Accelerate Time to Market
- Develop new data driven business models
- Allocate resources according to the demand

Reduce Costs

- **Reduce effort to deploy and administrate the solution**
- **Reduce solution price**
- Reduce energy consumption
- Optimize resources per Factory

Accelerate Digital Transformation

- **Use of Single pane of glass for solution administration at scale**
- Get accurate and actionable insights
- Equip front line workers with more intelligent tools

Reduce Business Risk

- **Reduce solution downtime**
- **Reduce IT security risks**
- Make workflows more predictive

Azure Arc Digital Twin Azure ML Real Time Data Analytics PowerBI

Stretch Cluster Patch and Update Layered Security Real time data analytics

Intangible

Azure Stack HCI Detailed Value Proposition

Reduction of administration effort
- One click Patch and update for Hardware Firmware, BIOS , Azure Stack HCI OS
- Centralization of administration in the Azure portal (WAC in Azure portal, cluster HW in the portal)
- Use of policies to automatically detect variation from baseline (from hardware to software)
- "IT teams can work more efficiently and strategically"

Optimization of OT uptime
- Reduction of maintenance window by one click P&U
- Cluster aware updating (no downtime)
- Hot patching (no reboot with Windows Server Azure Edition)
- Stretch Cluster
- "SKF has seen a reduction by **30% of OT downtime**"

Increased security
- Security approach inherited from Azure : Zero Trust
- Layered security from workload (Defender) to Silicon (Secured Core)
- Workload isolation (SDN)
- Encryption

More Flexible and Secure workplace
- Azure Virtual Desktop only available on Azure and Azure Stack HCI

Simple contract management
- Included in Azure contract (MACC, CSP , EA…)
- Consumption model (no oversubscription of licences)
- Evergreen (Always up to date , no need to buy or migrate to a new version)
- Included in Azure support contract (Incidents open from the Azure portal directed to dedicated expert Team)

Improved Return on Investment
- Azure Hybrid Benefits , charging $0 for:
    - Azure Stack HCI (networking , management , storage , compute)
    - Azure Kubernetes Service
    - Windows Server CALs
- Extended Security Update for Windows Server 2012 for $0
- Extended Security Update for SQL Server 2012 for $0
- Azure Policies for $0
- Reduction of administration effort
- Switchless architecture up to 4 nodes reducing equipment and energy consumption
- Witness in the cloud removing need for dedicated VM
- "SKF has also seen roughly **40 percent lower costs** "

Customer feedback

"SKF is rolling out this new platform across its approximately 100 factories. In addition to the much-needed consistency that comes from standardizing its operations, SKF has also seen roughly **40 percent lower costs and a 30-percent reduction** in machinery-related IT/OT downtime."
Microsoft Customer Story-Longtime innovator SKF unveils the factory of the future on Azure hybrid cloud

"We were able to install Windows updates on 23 separate servers simultaneously **in just two minutes. If we had done that manually, it would have taken two weeks.**"
Microsoft Customer Story-Transportation, driven by data: Transport for Greater Manchester keeps its millions of residents on the go

"By combining storage and compute in a single solution with Azure Stack HCI, we've reduced our footprint **from two full 19-inch racks to just one-half rack per datacenter**," says Cobben. Running Azure Stack HCI on-premises is also **more cost-effective** than running its environment completely in the cloud.
Microsoft Customer Story-Royal Mosa reduces carbon footprint and enhances performance with centralized, cloud-native management through Azure Arc–enabled Azure Stack HCI

"None of this could be done without Azure Stack HCI," says Westaedt. "Having to build every piece of infrastructure can be a major limitation on innovation. **We're able to do things now we weren't able to do six months ago**"
"Azure Stack HCI helped us quickly and easily integrate the cloud into our current environment."
Microsoft Customer Story-Van Havermaet scales up innovation to deliver superior accounting advice with Azure Stack HCI

"We really benefit from the **ability to just go to the Azure portal and get a clear idea of what's going on** in our cluster at any moment, like checking for security alerts and available updates."
Microsoft Customer Story-Picanol Group finds flexibility and faster time to market with Azure Stack

Customer Feedback #2

"We've **reduced processing times by 50 percent**, and we **no longer receive tickets relating to poor performance of our VDI environments**. " Francisco Castillo: Head of Infrastructure

"When compared with our three-tier infrastructure, our **Azure Stack HCI platform provides at least three times more storage bandwidth** with less than 1 millisecond latency in every given test scenario," states Castillo

"Our **migration to Azure Stack HCI was completely hidden from our users**, but they're coming to us now and saying, 'I don't know what you did, but our application is running so much faster than before.'"

"We crunched the numbers after migrating to Azure Stack HCI and realized that year-on-year, we'll be **saving more than 100,000 kilowatt hours**," says Bevan"

"Another tremendous benefit is that the company's **IT teams can work more efficiently and strategically**. Having one central management platform means that IT resources can stretch further with less effort and skills required to monitor, manage, and troubleshoot incidents."

Microsoft Customer Story-SSP unifies its hybrid infrastructure with Azure Stack HCI and saves more than 100,000 kilowatt hours