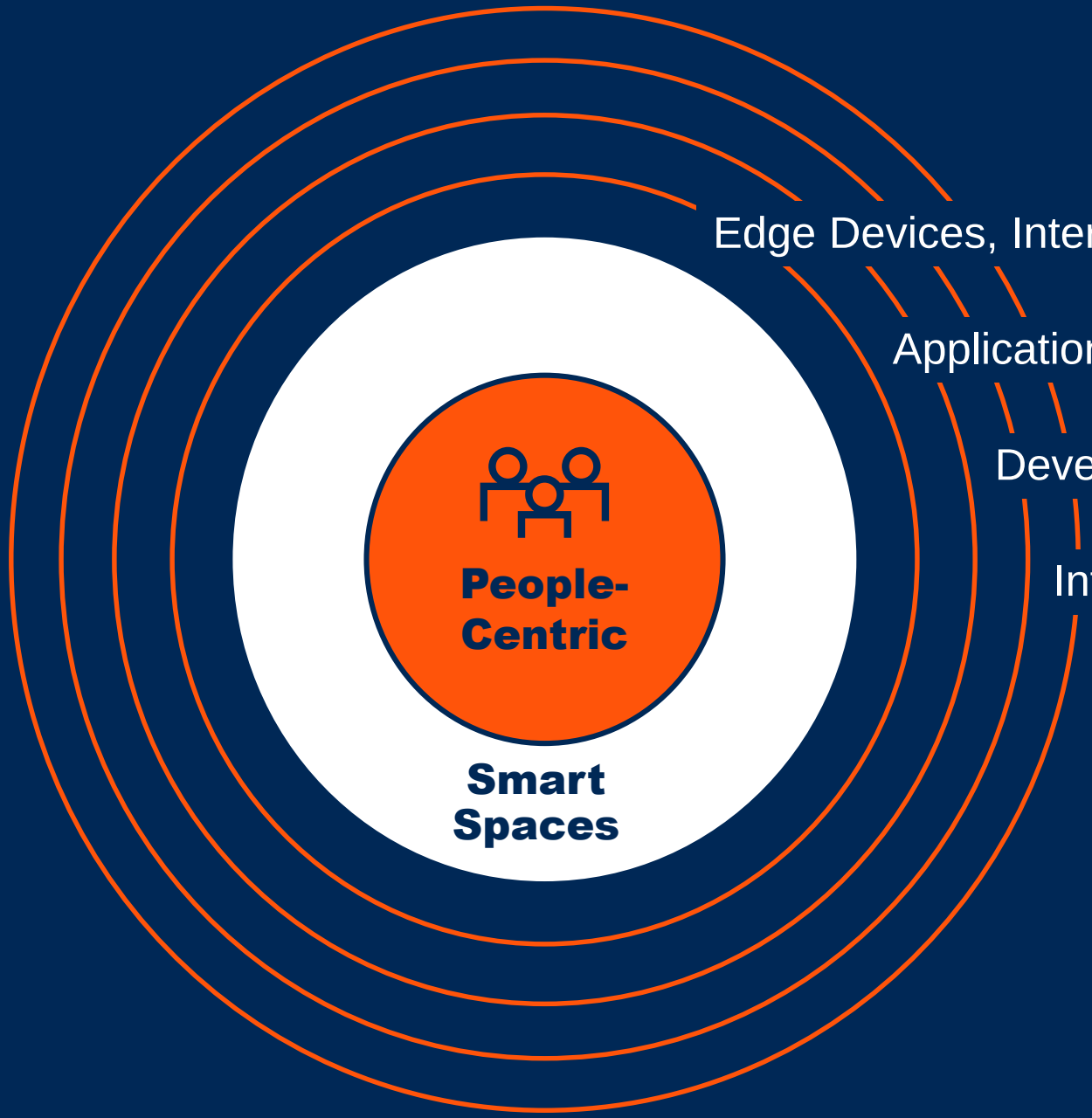
Gartner IT SYMPOSIUM | Xpo

03 – 07 November 2019 / Barcelona, Spain

The Top 10 Strategic Technology Trends for 2020

Brian Burke

Gartner



Edge Devices, Interfaces and Experiences

Applications, Services and Ecosystems

Development Tools, Platforms, Data and Integration

Infrastructure, Operations, Security and Networking

Gartner

The Top 10 Strategic Technology Trends for 2020

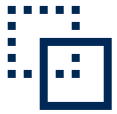
People-Centric

Hyperautomation

Multiexperience

Democratization

Human Augmentation



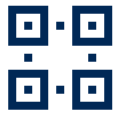
Transparency and Traceability

Smart Spaces

Empowered Edge

Distributed Cloud

Autonomous Things



Practical Blockchain

AI Security

Gartner

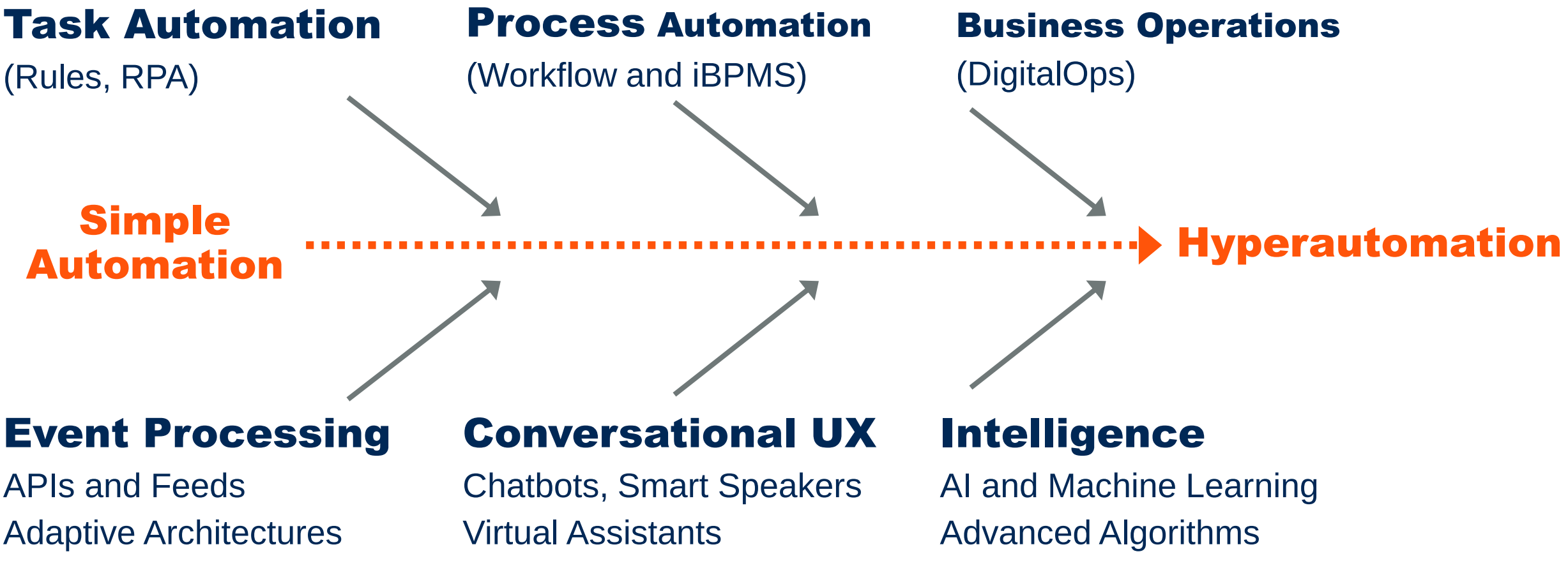
Hyperautomation

The goal of Hyperautomation is to automate anything that can be automated.

The No. 1 use case for AI is process automation.

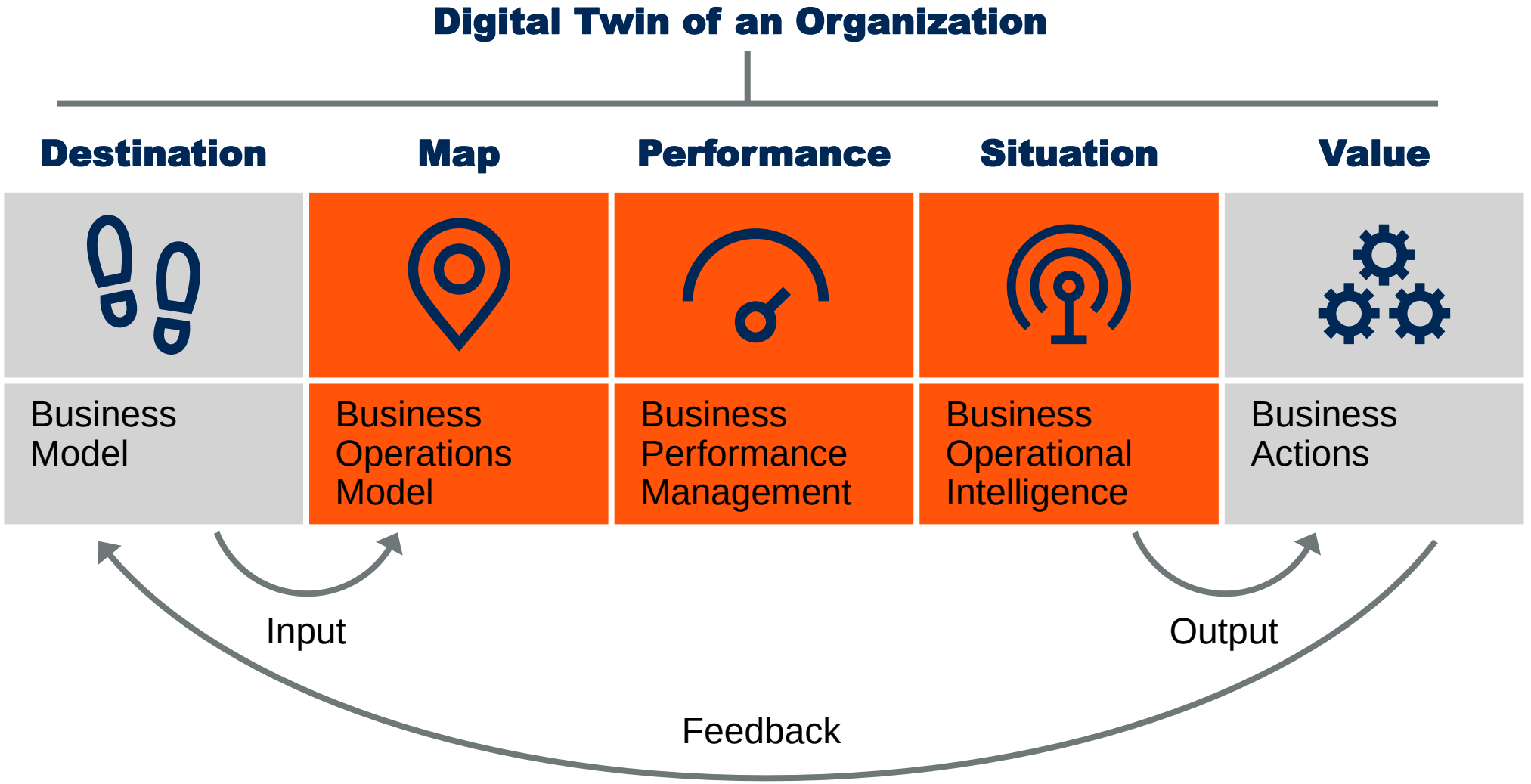
Source: “AI Use Cases, Tales From the Trenches: A Gartner Trend Insight Report” (G00373320)

The Path to Hyperautomation



Gartner

Hyperautomation Through DigitalOps

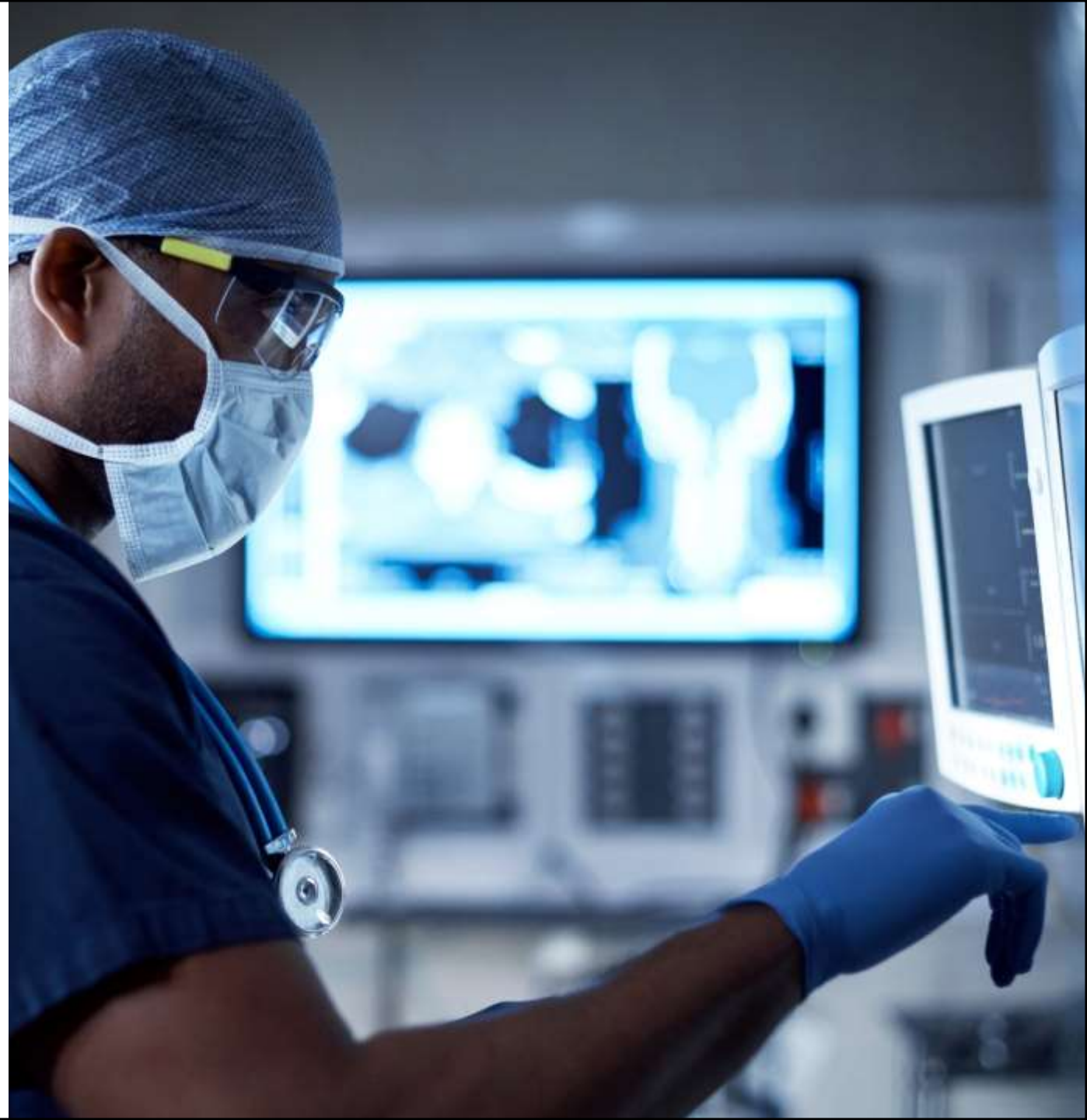


Multiexperience

By 2021, at least one-third of enterprises will have deployed a multiexperience development platform to support mobile, web, conversational and augmented reality development.

- Voice
- Eye Tracking
- Gesture
- Emotion
- Position
- Many More …

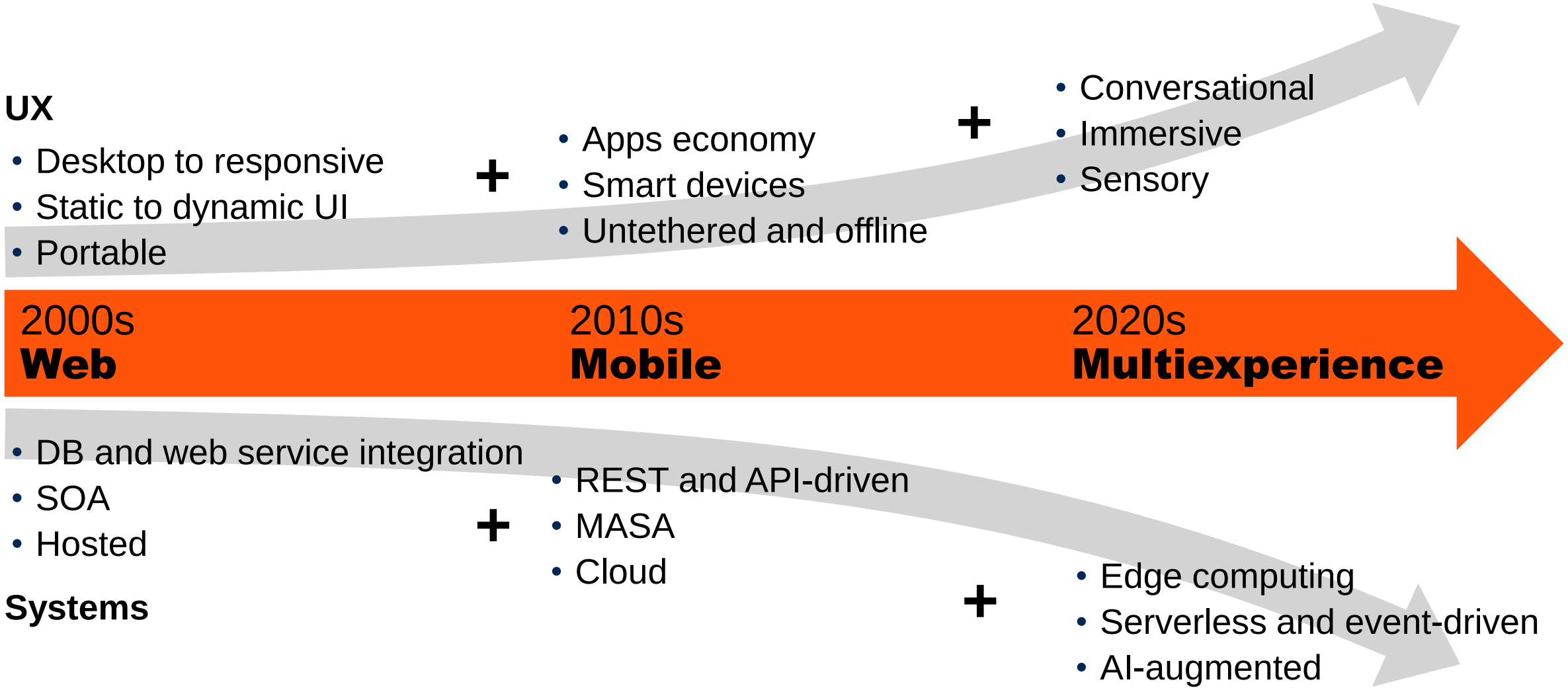
Source: "Technology Insight for Multiexperience Development Platforms" (G00351300)



Immersive Environments Will Change the Way We Perceive and Interact

Gartner

Evolving From Web to Multiexperience



The Pathway to Ambient Multiexperience

Smell — Taste — Sight — Sound — Touch — **Multisensory and Multimodal** — Radar — Humidity — Location — Emotion

Democratization

By 2022, 30% of organizations using AI for decision making will contend with shadow AI as the biggest risk to effective and ethical decisions.

Source: [“Predicts 2019: The Democratization of AI”](#) (G00376162)

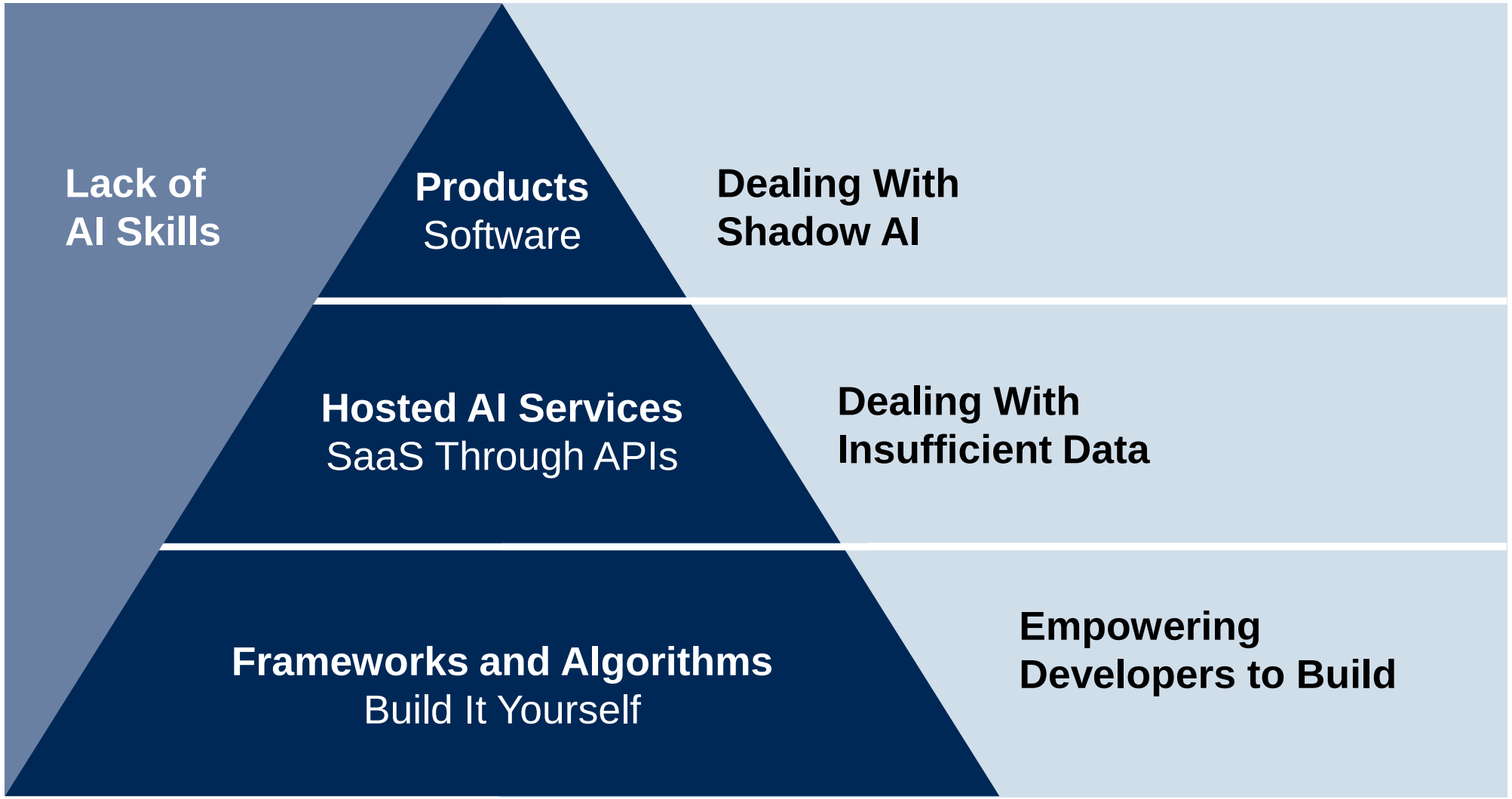
Democratization Is About Empowering Everyone

Accessible Technology

Accessible Intelligence

Gartner

Key Challenges Driving Democratization of AI



Source: "Predicts 2019: The Democratization of AI" (G00376162)

Gartner

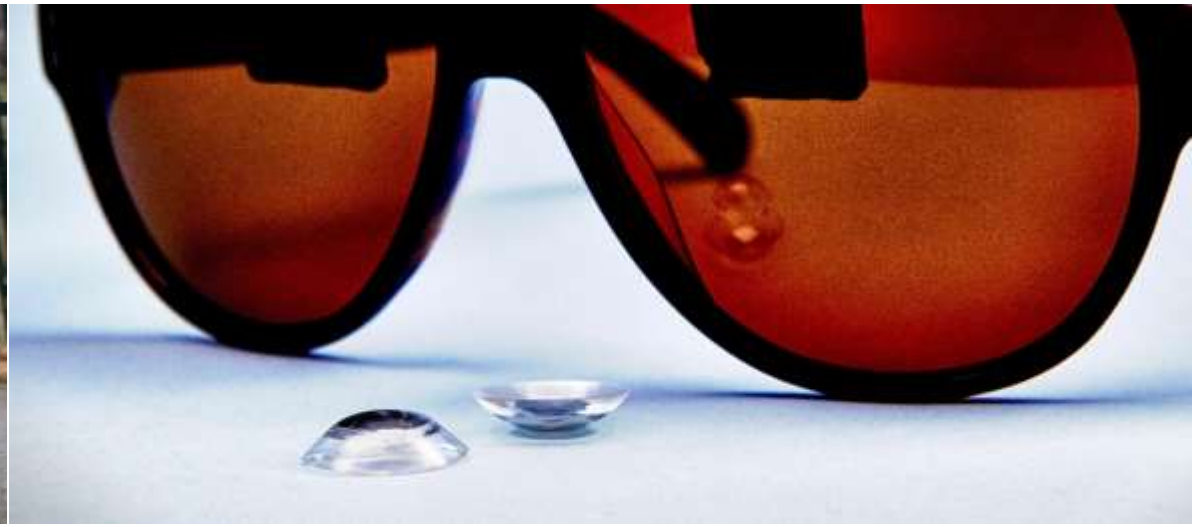
Human Augmentation

By 2025, 40% of enterprises will shift from designing for humans to architecting humans themselves by adopting human augmentation technologies and methodologies.

Source: “Maverick* Research: Architecting Humans for Digital Transformation” (G00389205)

Image Source: Ford: EksoVest is the latest example of advanced technology Ford is using to reduce the physical toll on employees during the vehicle assembly process, lessening the chance of worker fatigue, injury or discomfort

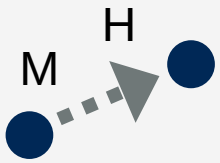
Physical Augmentation



Gartner

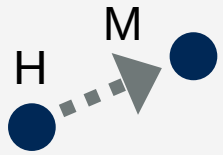
Cognitive Augmentation

Take me to the next level



Train me.
Show me the possibilities.

Go the last mile

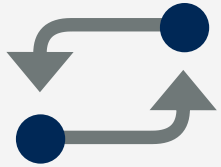


Human in the loop.

Pass the Baton

It’s your turn now.

Symbiosis

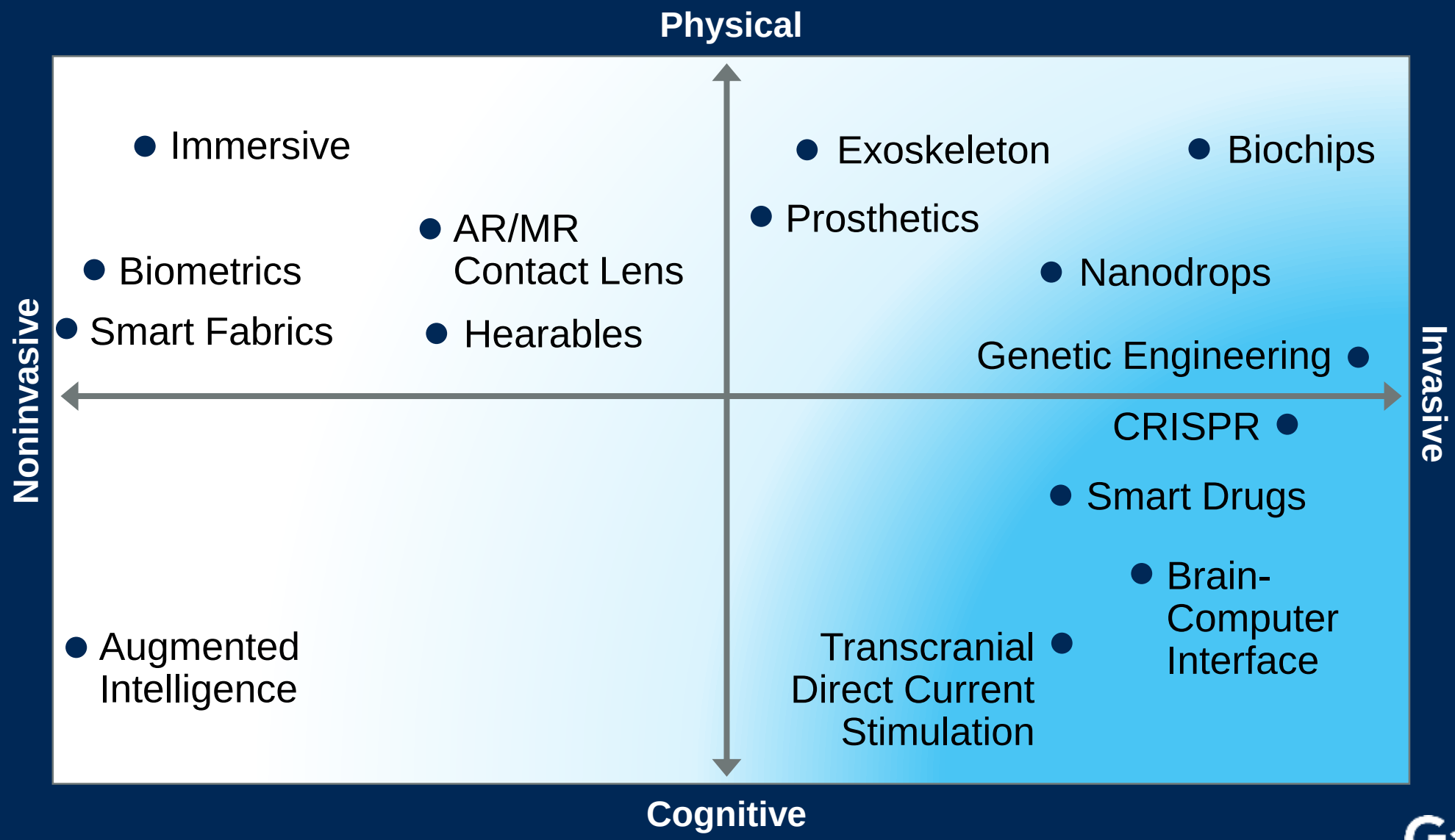


One cannot live without another.

Train Machines to Do Their Best. Train People to Be Their Best.

Gartner

Would We, Could We, Should We, Must We



Transparency and Traceability

By 2023, over 75% of large organizations will hire artificial intelligence specialists in behavior forensic, privacy and customer trust to reduce brand and reputation risk.

Source: “Top 10 Data and Analytics Technology Trends That Will Change Your Business” (G00379563)

The Trust Crisis

Counterfeit reality

Omnipresent IoT data collection

Fake news and reviews

Misuse of data

Algorithmic bias

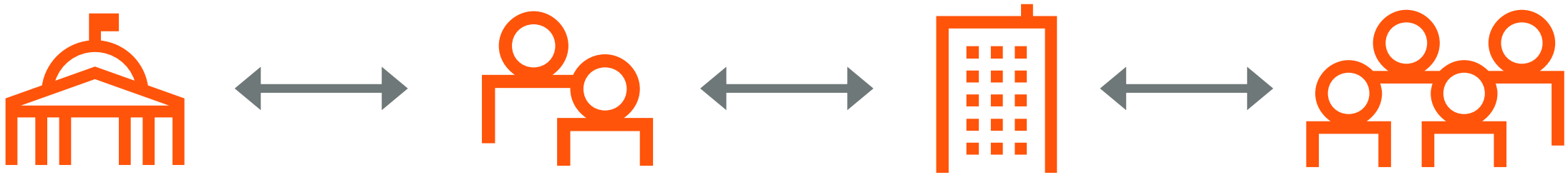
Ecosystem trust

Addictive applications

Opaque algorithms

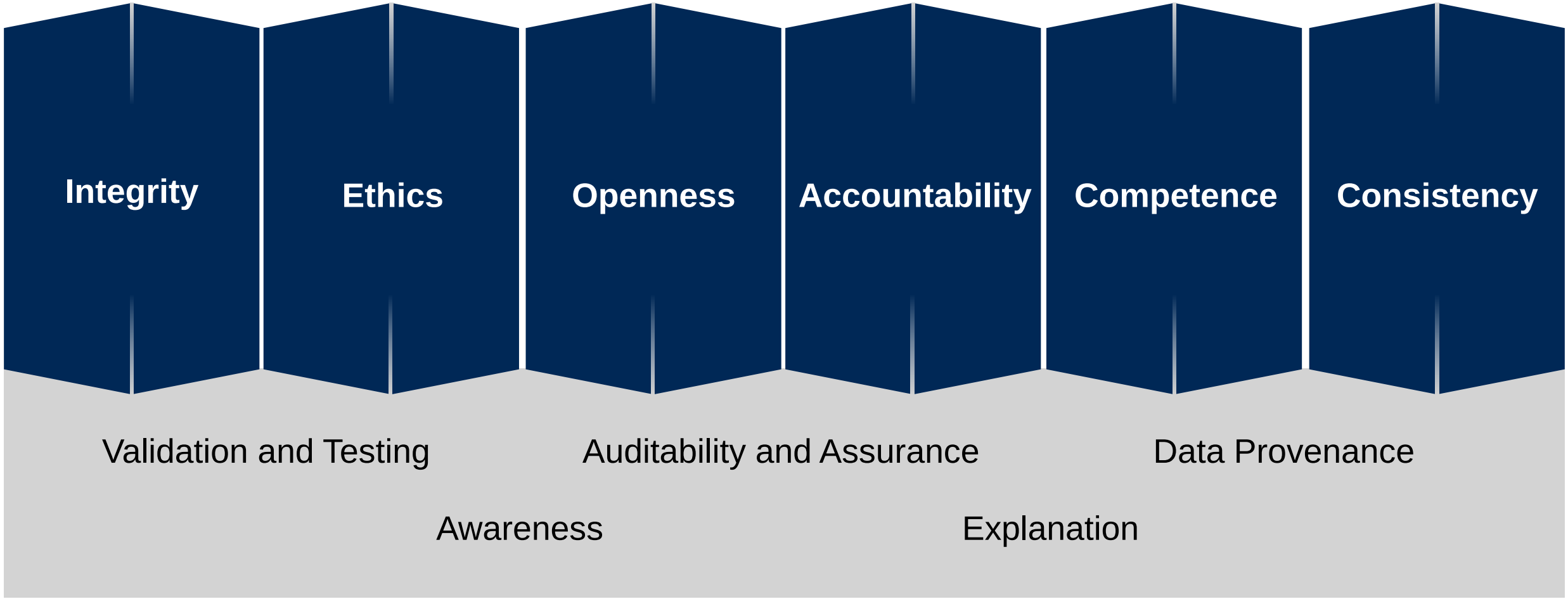
Unauditable AI

Unauthorized data harvesting



Gartner

Six Pillars of Trust



Empowered Edge

By 2023, more than 50% of enterprise-generated data will be created and processed outside the data center or cloud, up from less than 10% in 2019.

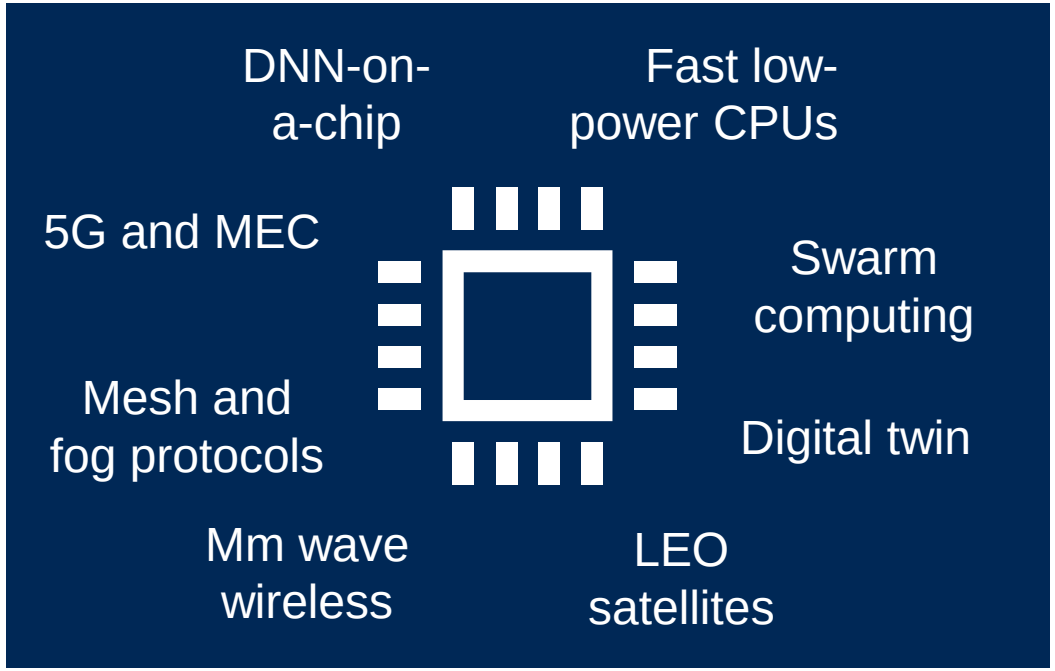
Source: "5 Questions a Tech CEO Must Address When Proposing an AI-Enabled Edge Project" (G00407161)

Technology Drives the New Business Edge

Security

Resiliency

Real-time responsive business



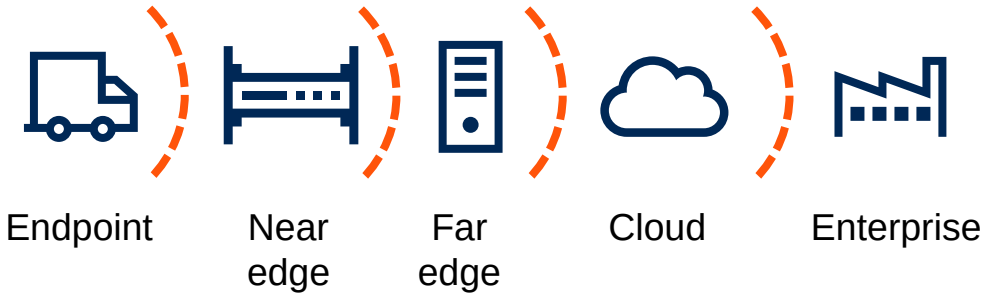
Reduced cost

New and better user experiences

Smarter, safer systems

Gartner

Toward a Smarter, Faster, More Flexible Edge



Edge 2019

Static processes

Hierarchic architectures

Static network topology

Edge and cloud

Edge 2025

Adaptive processes

Fog/Mesh architectures

Dynamic network topology

Distributed cloud to the edge

Gartner

Distributed Cloud

By 2024, the majority of cloud service platforms will provide services that execute at the point of need.

Gartner Strategic Planning Assumption

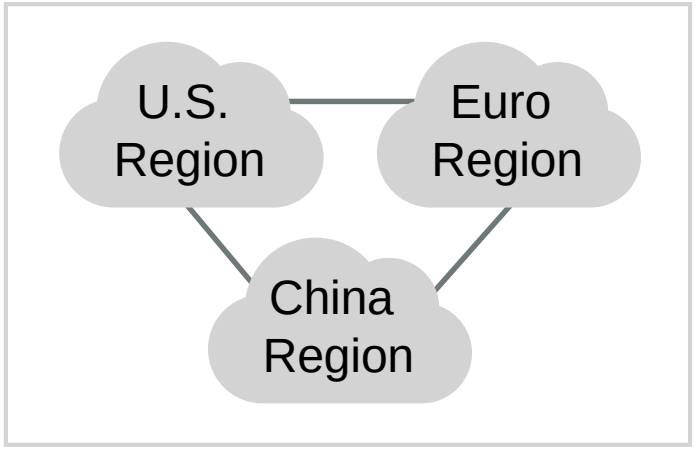
Hybrid Cloud Sets the Stage

On-Premises and Remote Locations

Enterprise Data Center

Centralized Public Cloud Architecture

Provider Data Centers



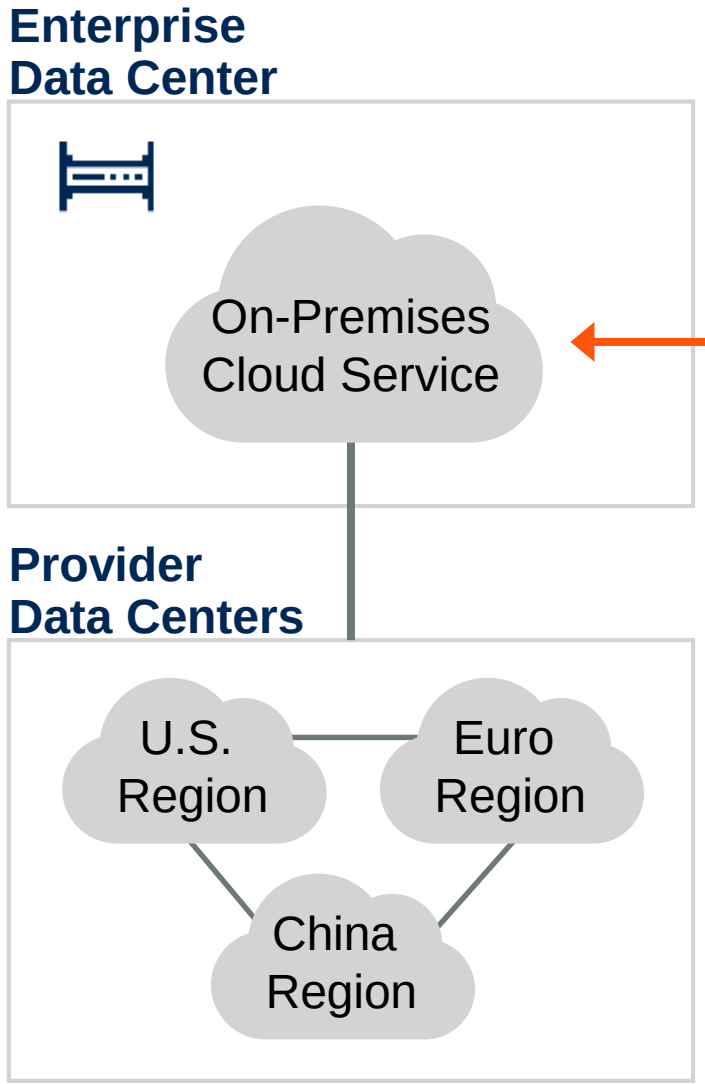
- Private cloud service architecture does not reflect the centralized cloud service.
- Enterprise owns and is responsible for design, development, deployment, governance, operations, evolution and update.

Gartner

Distributed Cloud Fixes the Hybrid Problem

On-Premises and Remote Locations

Centralized Public Cloud Architecture



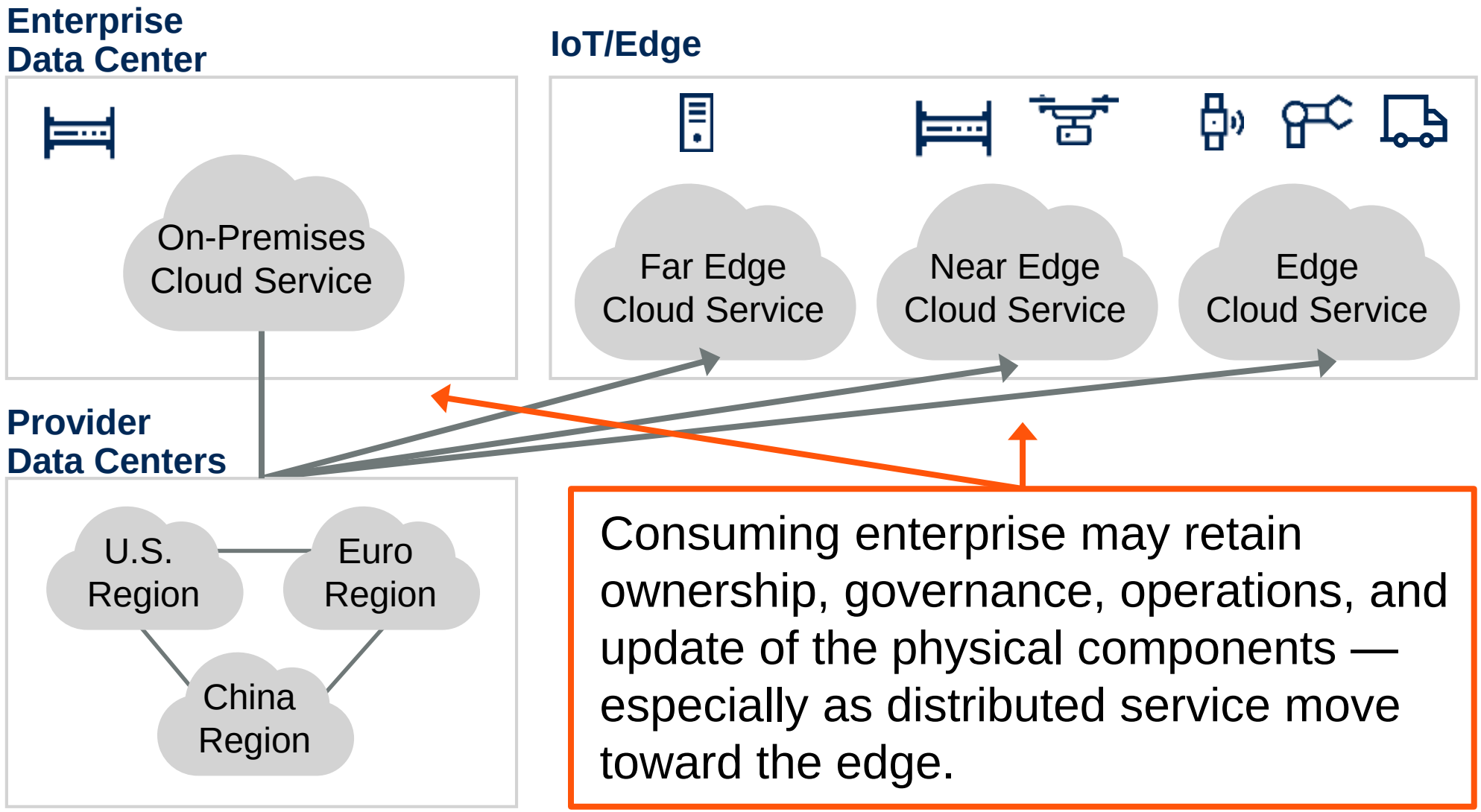
- Public cloud service architecture is replicated on-premises or is complementary to the centralized service.
- Provider owns and is responsible for architecture, development, deployment, governance, operations, evolution and update.

Gartner

Distributed Cloud Extends to the Edge

On-Premises and Remote Locations

Centralized Public Cloud Architecture



Consuming enterprise may retain ownership, governance, operations, and update of the physical components — especially as distributed service move toward the edge.

Gartner

Autonomous Things

By 2025, more than 12% of the newly produced vehicles will have Level 3 or higher autonomous driving hardware capability.

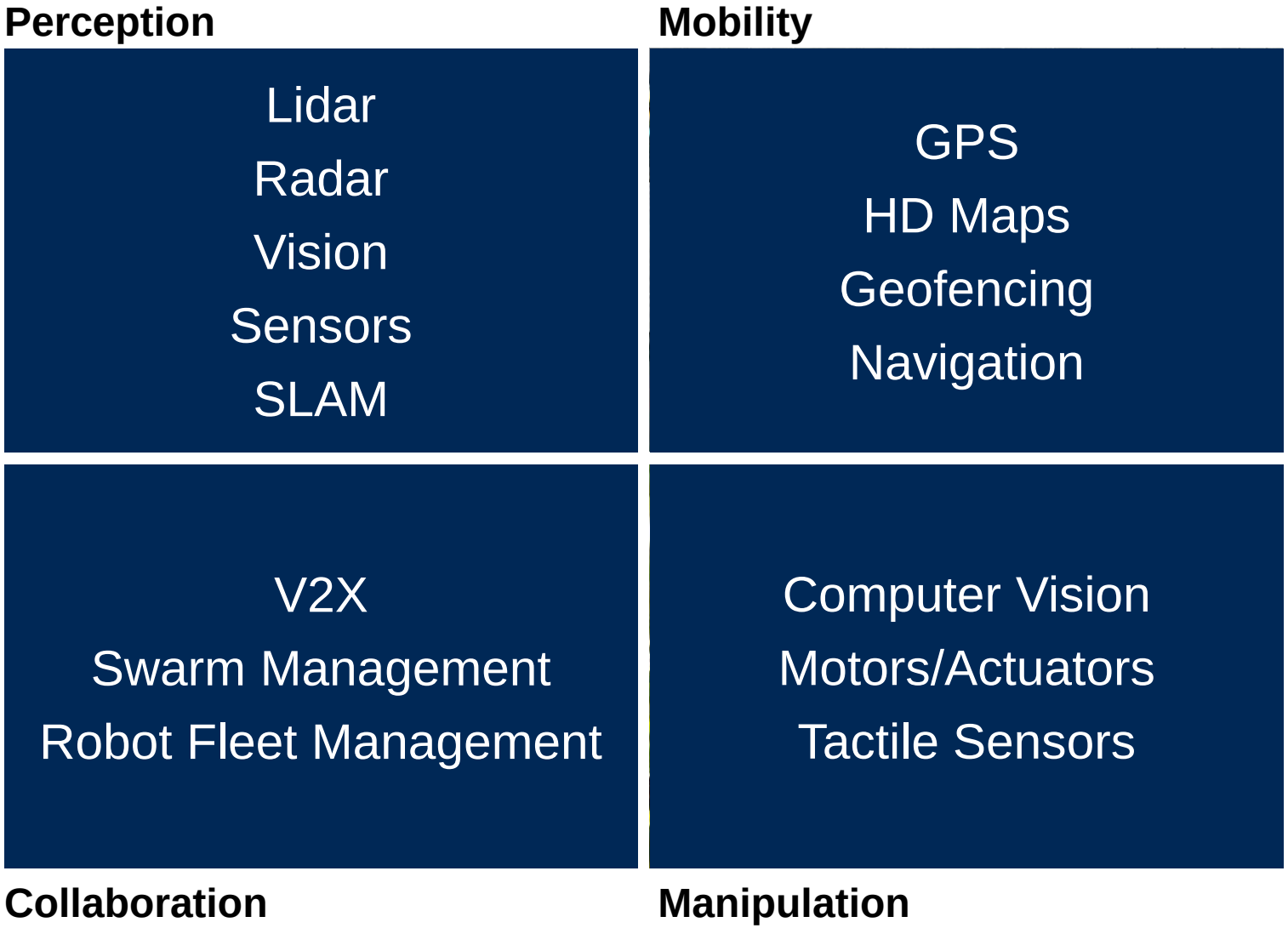
Source: "How to Assess Opportunities in Autonomous Things" (G00402843)

Image Source: NAVYA Media Kit

Autonomous Things

Gartner

Key Technical Capabilities



Form Follows Function

Autonomous Things	Environment
Robots	Sea
Drones	Land
Appliances	Air/Space
Vehicles	Controlled

Full Autonomy	No Human Control
High Automation	Human Override
Conditional Automation	Human-Directed
Partial Automation	Full Human Control
Human-Assisted	

Nonfunctional Tipping Points: Regulation and Social Acceptance

Gartner

Practical Blockchain

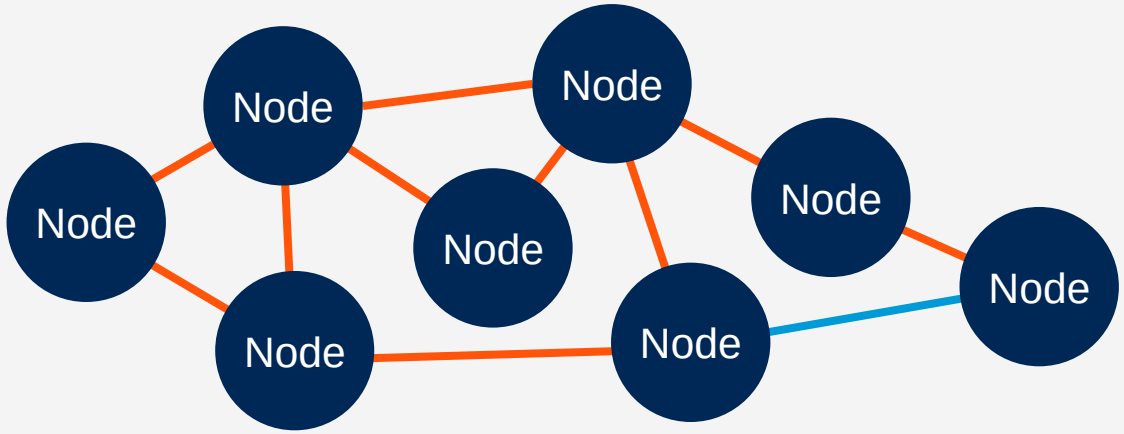
By 2023, blockchain inspired technology will support the global movement and tracking of $2 trillion of goods and services annually.

Source: “Predicts 2019: Blockchain Business” (G00374378)

What Is a Blockchain? A “Distributed Ledger”

Distributed Ledger of Bitcoin Transactions (Tx)

Ledger Replicated Across Peer-to-Peer Network



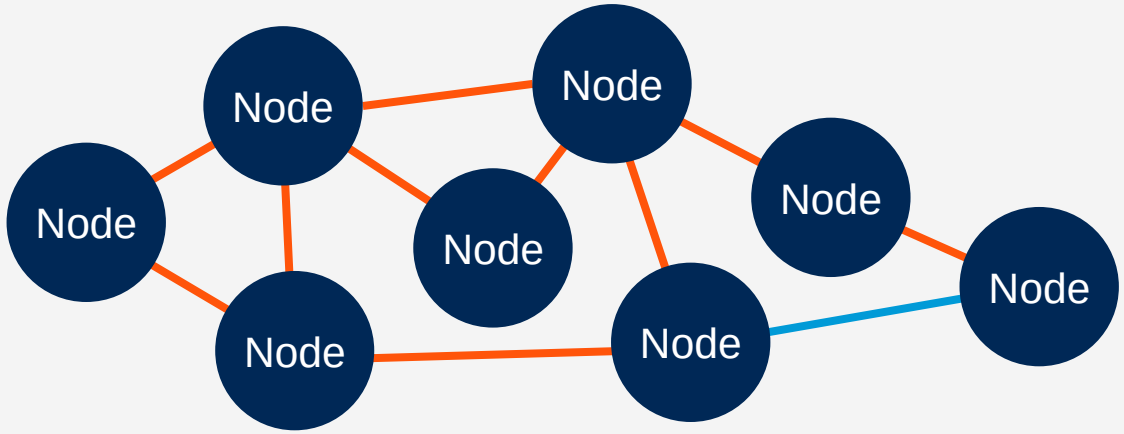
- Immutable and traceable/auditable
- Shared and distributed
- Encryption
- Public/Distributed consensus
- Tokenization

Gartner

What Is a Blockchain? A “Distributed Ledger”

Distributed Ledger of Bitcoin Transactions (Tx)

Ledger Replicated Across Peer-to-Peer Network

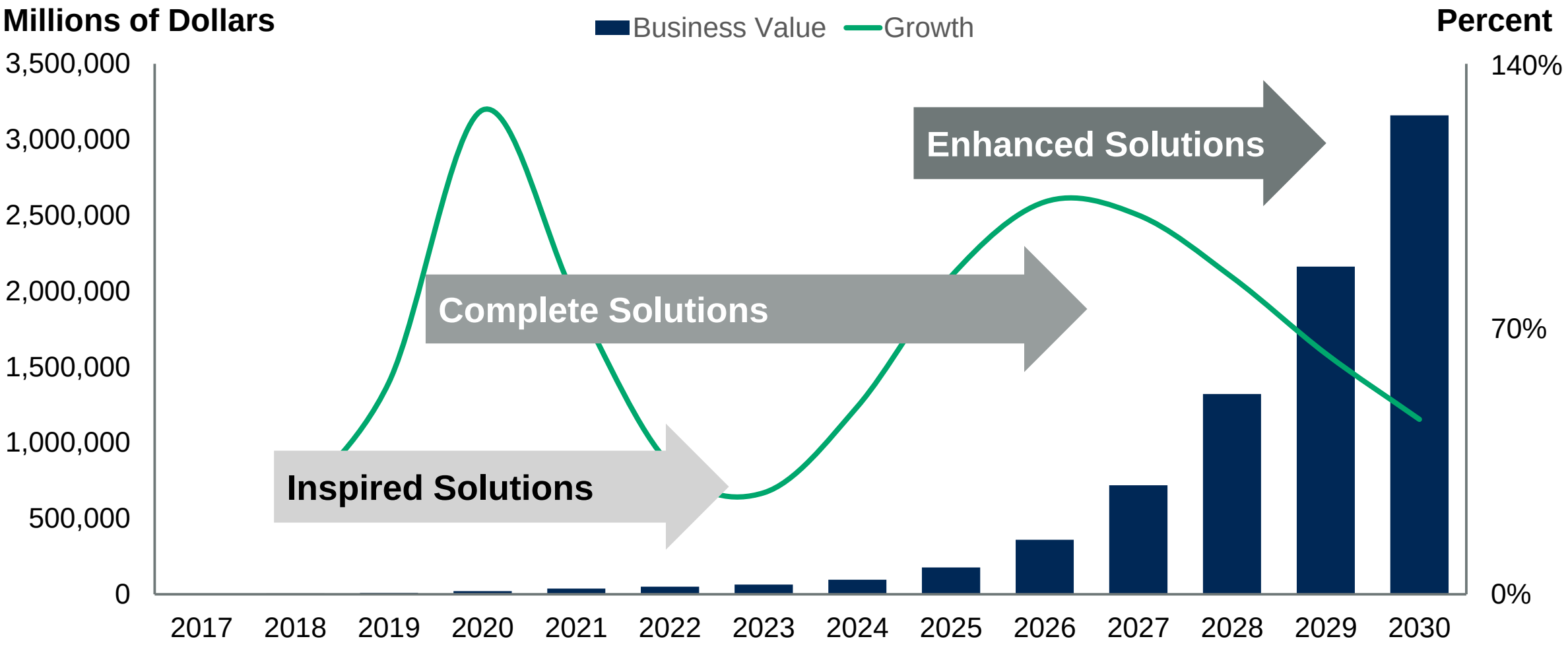


- **Immutable and traceable/auditable**
- **Shared and distributed**
- **Encryption**
- ~~**Public/Distributed consensus**~~
- ~~**Tokenization**~~

Permissioned blockchains don’t use tokens as incentives for validators participating in distributed consensus mechanisms

Gartner

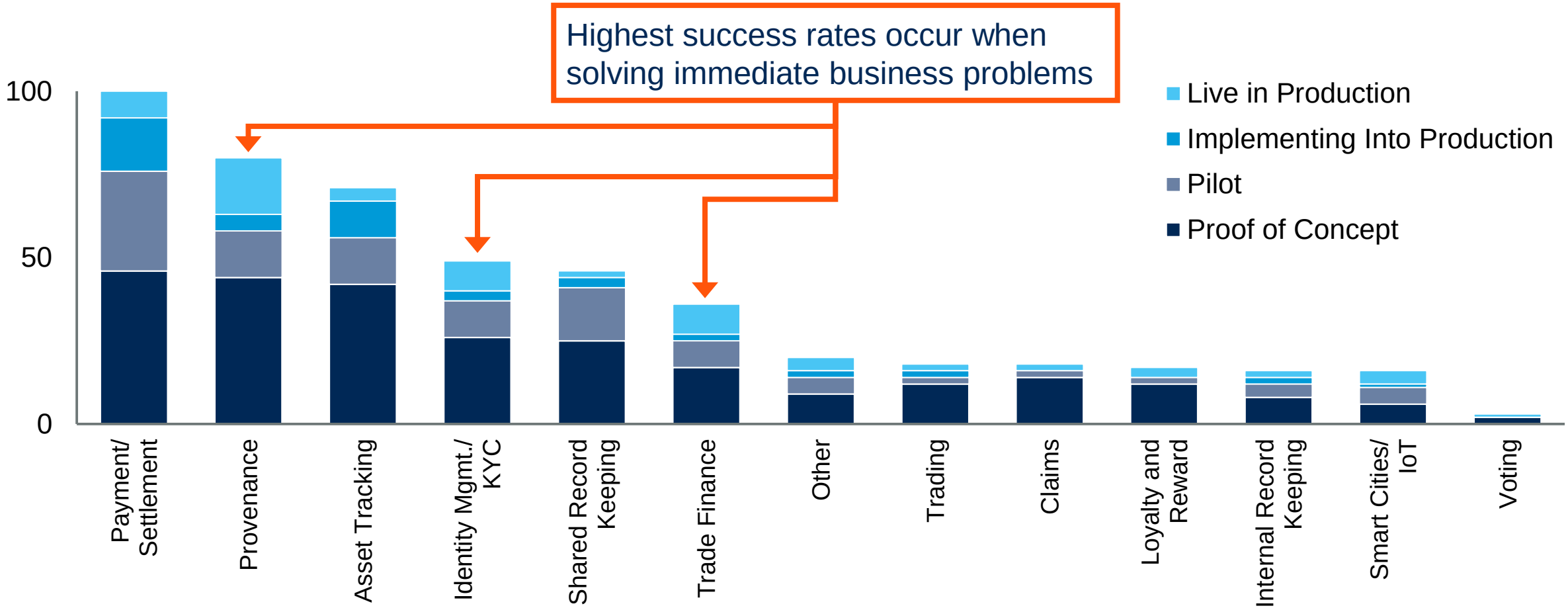
Business Value Reflects a Measured Evolution



Blockchain Business Value — "Forecast: Blockchain Business Value, Worldwide, 2017-2030" (G00325744)

Gartner

The Business Needs to Lead on Blockchain



For success, blockchain initiatives must be demand-led, not solution-led

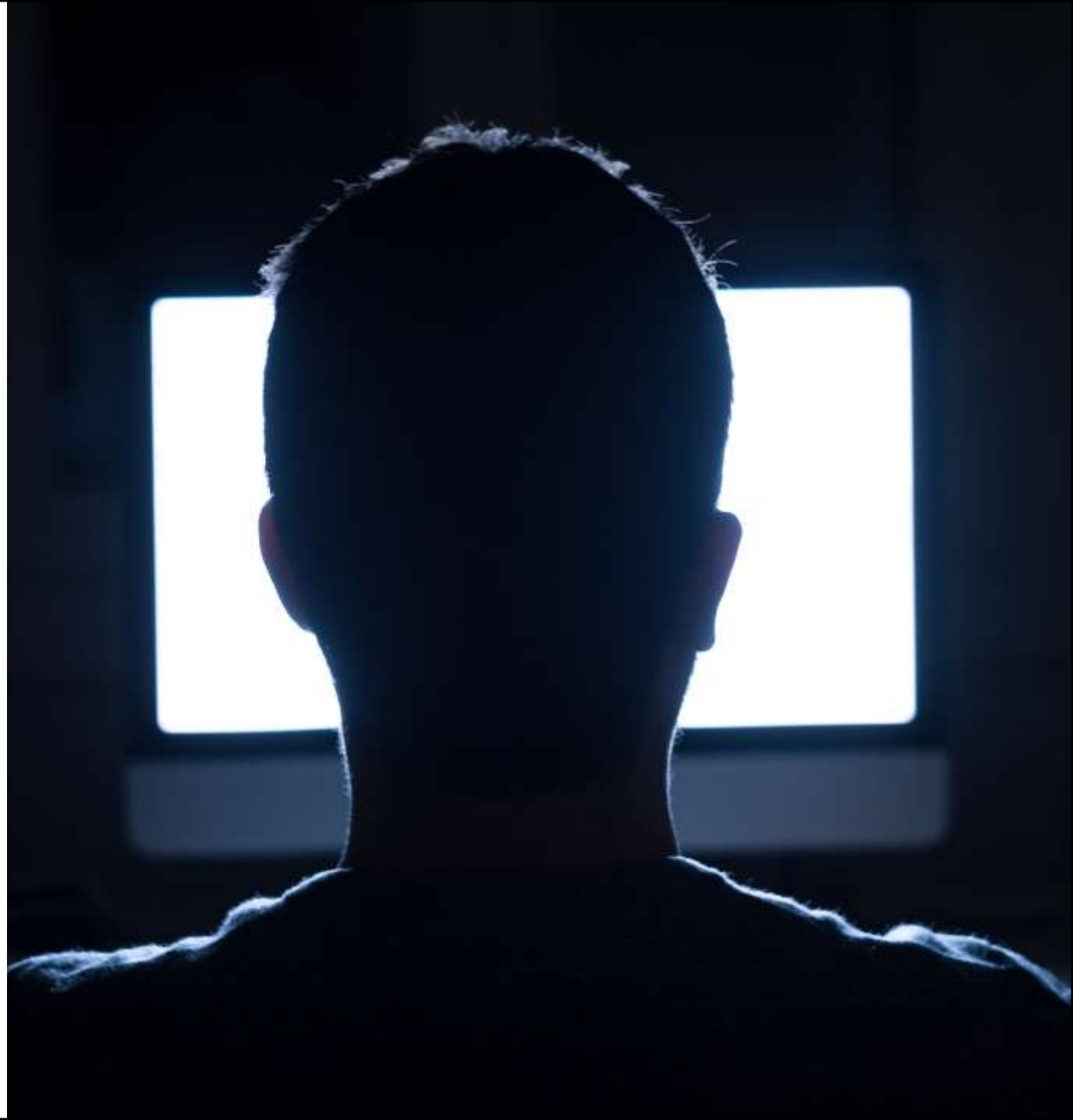
n = 490, excludes use cases with the phases of "Strategy Consulting" and of "Other,"
Blockchain Use Cases — "Blockchain Trials Show Pragmatism Emerging Across Industries" (G00387725)

Gartner

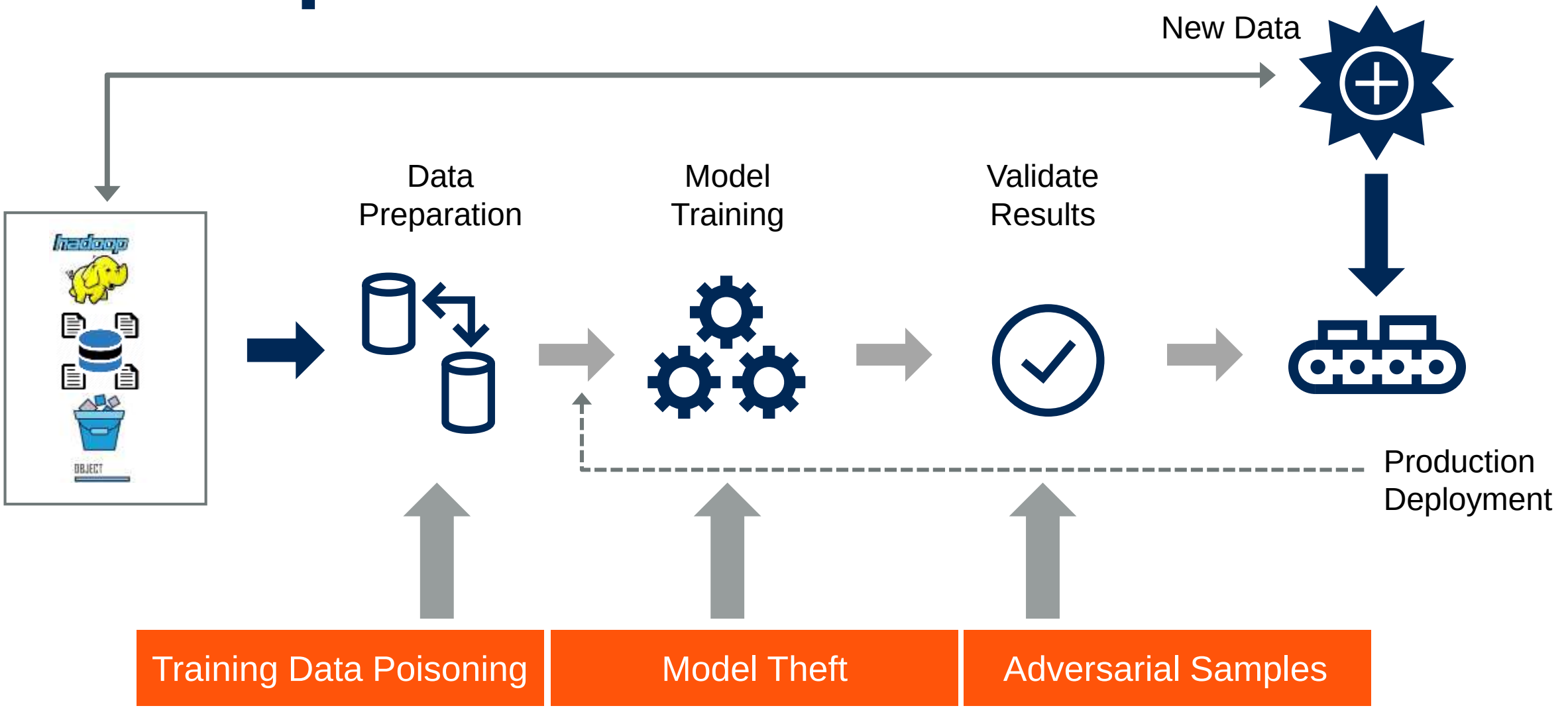
AI Security

Through 2022, 30% of all cyberattacks will leverage training data poisoning, AI model theft or adversarial samples.

Source: “Anticipate Data Manipulation Security Risks to AI Pipelines” (G00373743)



Your AI Pipelines Are at Risk



Gartner

AI Can Transform Security to Be More Effective

Security Challenges Are Increasing:

- Points of attack expand dramatically with IoT and highly connected systems
- Rate and type of attacks expand
- More sophisticated attacks and complex patterns of attacks

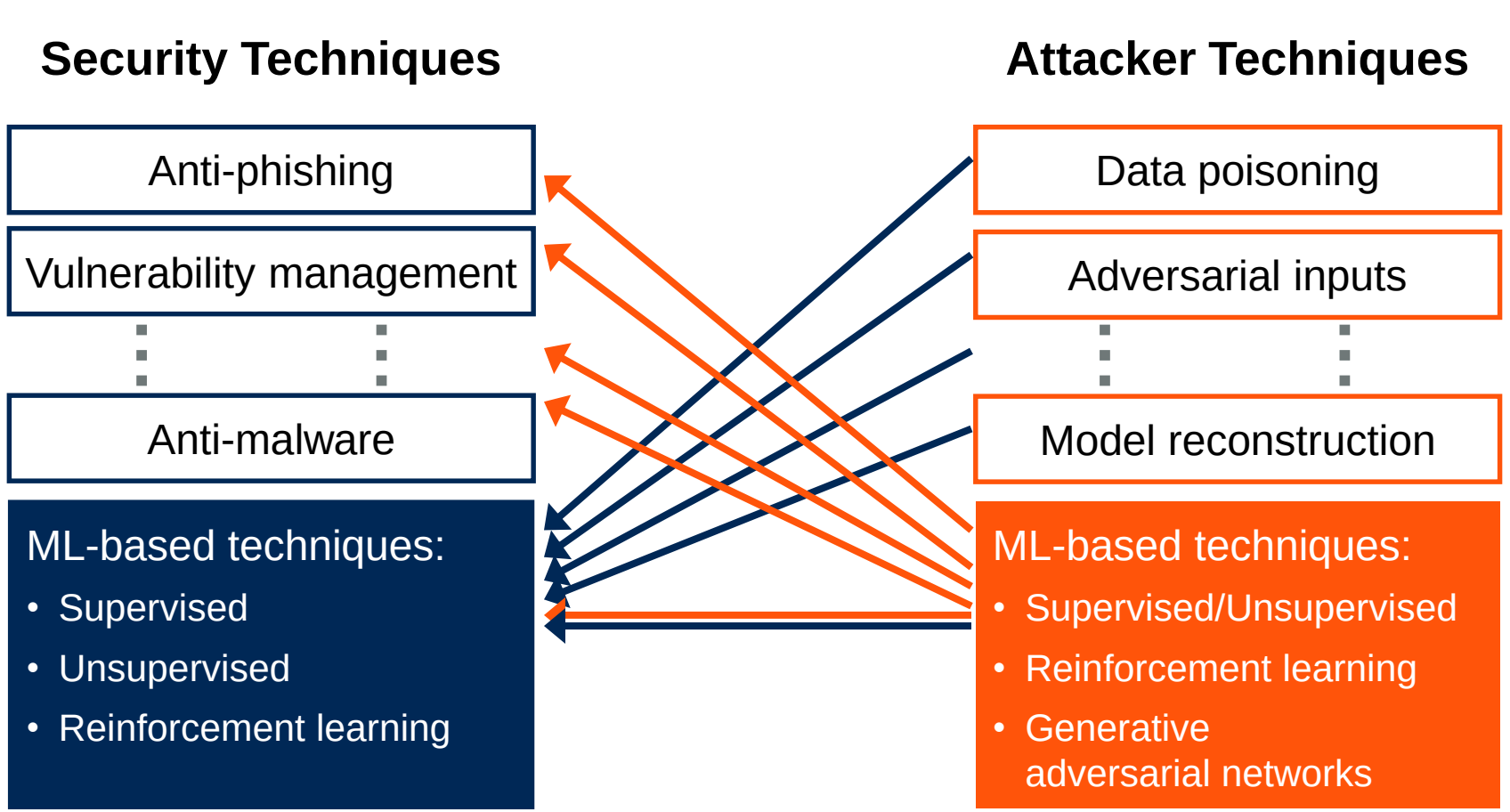
Assume ML is developed well:
- Sufficient amounts of high-quality training data
- Low bias and variance
- Low error rates

Big assumptions!

Then an ML anomaly detection or classification algorithms can have higher detection rates than any rule-based algorithm (and even humans in some areas)

Gartner

Attacker's Will Use ML for Nefarious Purposes



Adversarial ML

Attacks on ML-based techniques in security products

Nefarious ML use

Attacks leveraging ML as one of the techniques

Adversarial ML

Nefarious ML use

Gartner

The Top 10 Strategic Technology Trends for 2020

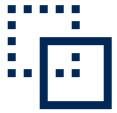
People-Centric

Hyperautomation

Multiexperience

Democratization

Human Augmentation



Transparency and Traceability

Smart Spaces

Empowered Edge

Distributed Cloud

Autonomous Things

Practical Blockchain

AI Security

Gartner