

# Inventing the Future With Continuous Foresight

## Industry 4.0

Paweł Białka – GARTNER Executive Partner

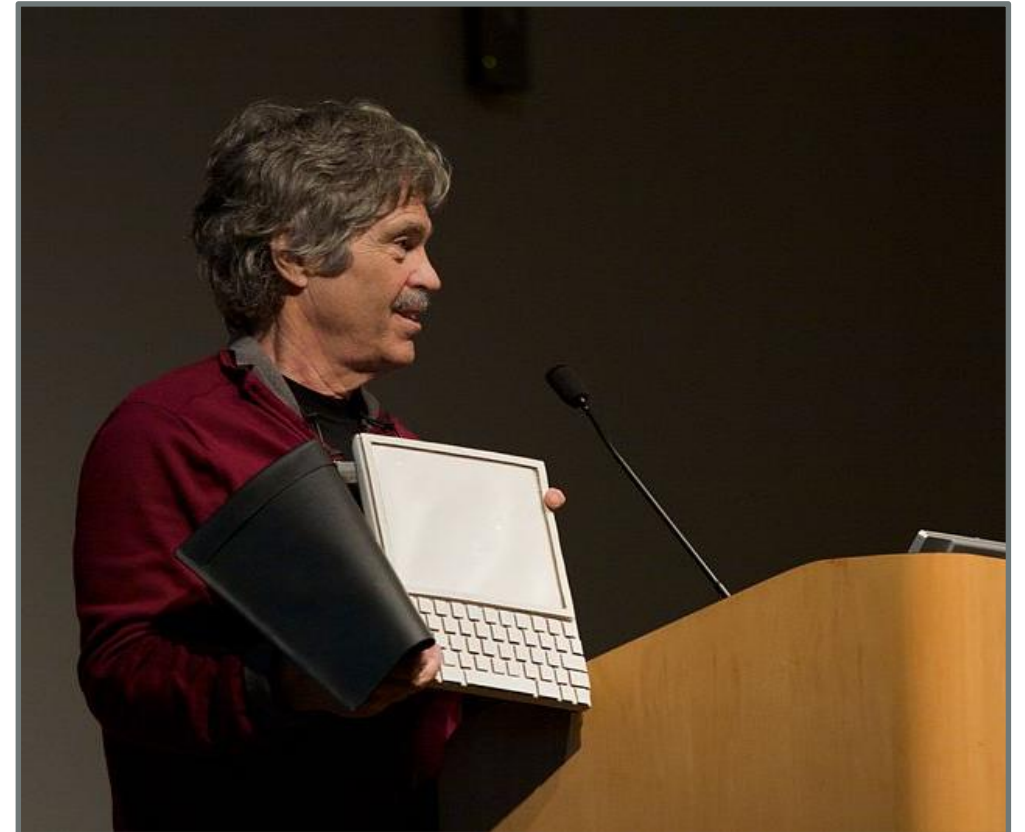
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**Gartner**®



**“Best way to  
predict the future  
is to invent it”**

Alan Kay — at a 1971 meeting of PARC



# What is a Disruption?

## Definition of Digital Disruptions

Trends That Cause a Fundamental Shift in Technology Along With One or More of the Other Elements of Disruption



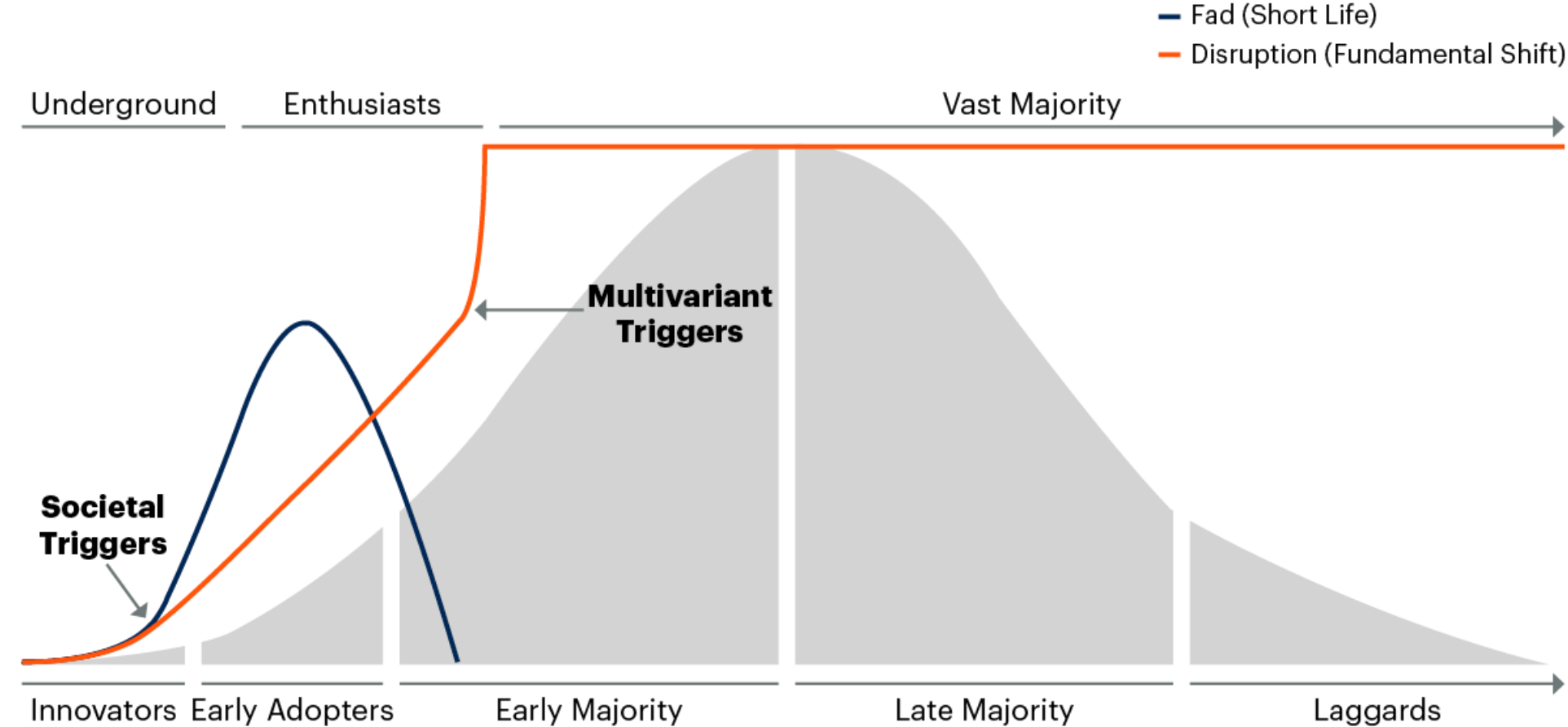
Source: Gartner

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# Fads vs Disruptions

## Difference Between Fads and Disruptions

The Life Cycle of Fads and Disruptions



Source: Gartner

# We Live in VUCA Times ...

# V

Volatile

**The world can change overnight:**

- Consumer preference
- Political landscape
- Technology innovation

# U

Uncertain

**Best practices are yesterday's solutions:**

- New business models
- Fashion
- Competition

# C

Complex

**Competing stakeholder requirements:**

- Regulatory compliance
- Shareholder returns
- Customer value

# A

Ambiguous

**Ethical questions arise:**

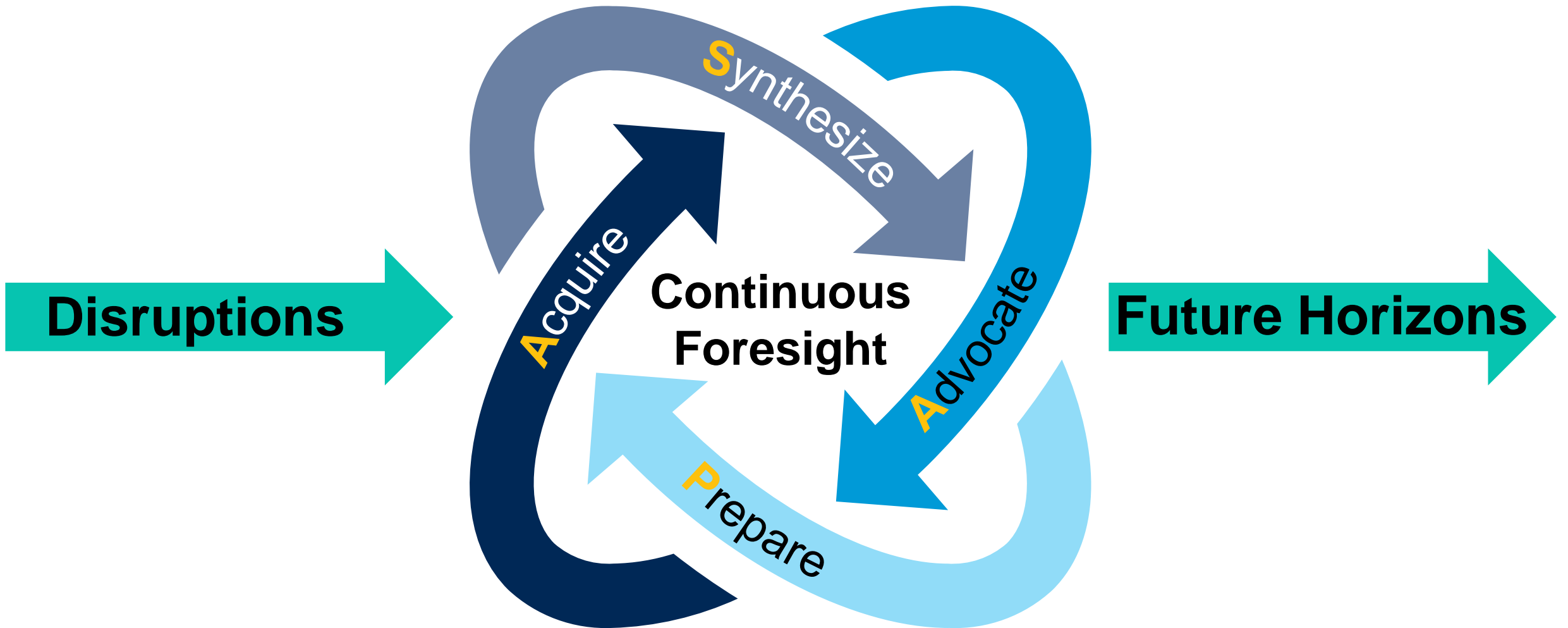
- What is cool?
- What is creepy?



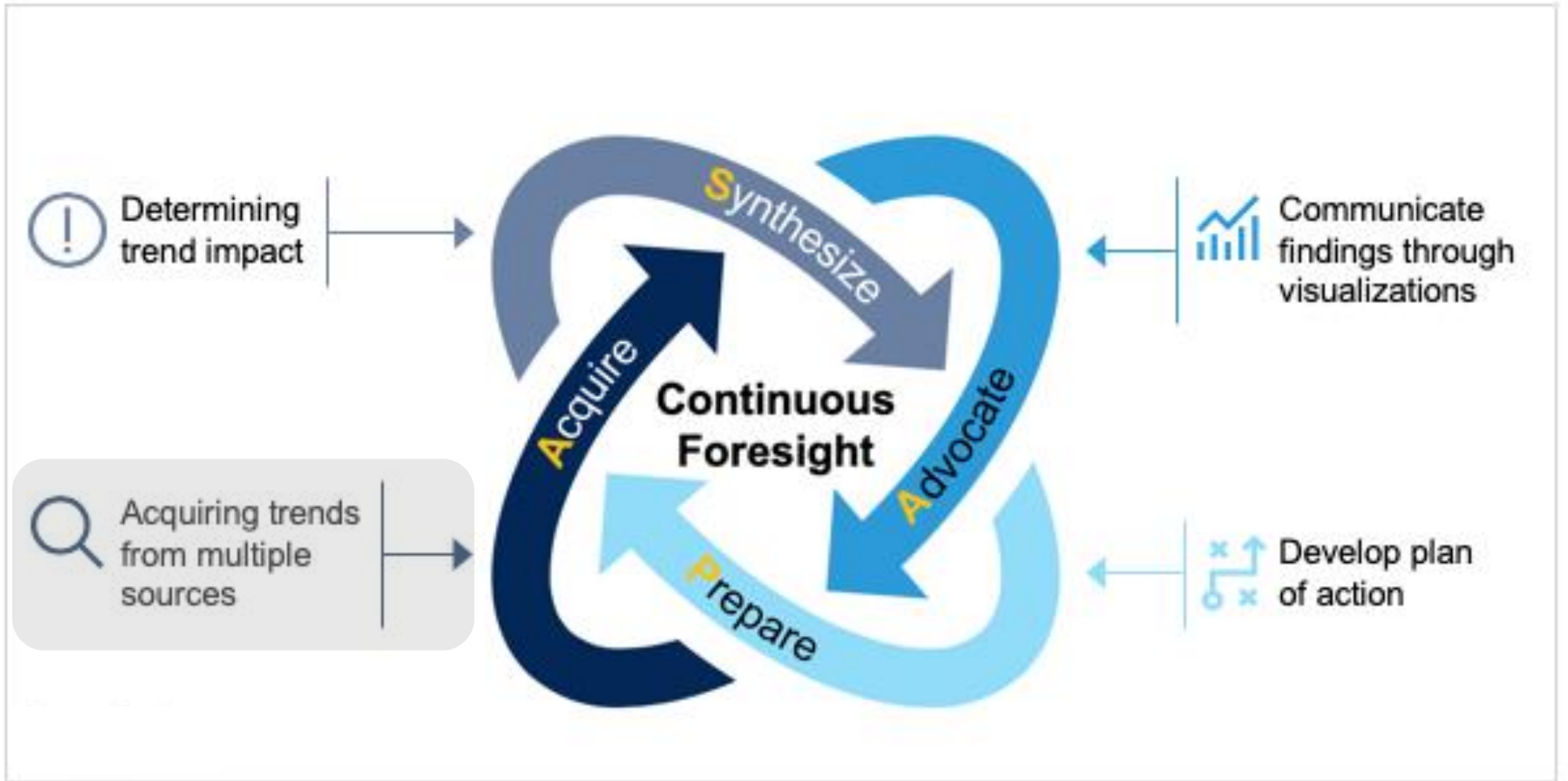
**Continuous Foresight is used to identify and assess probable disruptions and develop strategic responses to successfully bring the organization into the future.**



# Continuous Foresight







# Recruit Trend Scouts



- Dedicated Trend Scouts
- Part-Time Trend Scouts
- Volunteer Trend Scouts
- Contracted/Hired Trend Scouts
- Partner/Ecosystem Trend Scouts
- Academic Trend Scouts



# Compile Disruptions and Trends Using Tapestry

	Examples	Assumption	Opposite
<b>Technological</b>	Digital literacy of customers Cybercrime Pace of innovation of AI Innovation lead	Low — Uncomfortable Institutionalized High Megavendors	High — Driving innovation Rogue Slowing Startups
<b>Political</b>	Borders Entrepreneurial spirit	Globalization Friendly	Nationalism Restrictive
<b>Economical</b>	Growth in consumer spending Transparency Emerging economies Competitive forces Price of oil	Moderate High Growing Traditional market Going up	High or low Low Stalling New adjacent entrants Going down
<b>Social/Cultural</b>	Mode of action Time orientation Type of communication Privacy needs	Individualistic Long term, patient Empathic Not very sensitive	Collectivist Short term, impatient Confrontational Highly sensitive
<b>Trust/Ethics</b>	Trust in business/government Ethical system	High Consequentialist	Low Universalist
<b>Regulatory</b>	Pressure Type	Going up Principles-based	Going down Rule-based
<b>Environmental</b>	Global warming Renewable energy	No impact No use	Impact Heavy use

Source: Gartner

# Sample Trends – Technology



Trend Name	Trend Description
<b>Internet of Things</b>	Uses software and sensors to connect physical objects to the Internet to help organizations gather data on how the object is being used.
<b>Machine Learning</b>	Uses algorithms to enable computers to continuously learn from patterns in data without being explicitly programmed to do so.
<b>Advanced Robotics</b>	Includes physical devices that automate manual tasks or augment human activity.
<b>Artificial Intelligence</b>	Software's capability to constantly learn and accomplish tasks that would usually require human intelligence.
<b>Immersive Technology</b>	Technology that attempts to emulate a physical world through the means of a digital or simulated world, thereby creating a sense of immersion, e.g., augmented reality and virtual reality.
<b>Big Data and Big Data Visualization</b>	Collection and analysis of large volumes of both unstructured and structured data, which can be attained from an extremely diverse and rapidly changing range of sources. Big data visualization relates to technologies that convey complex datasets in simple and intuitive formats to help employees and customers make more effective decisions.
<b>Blockchain</b>	A set of distributed databases that develop a chronological overview of digital transactions that is usually shared through a public ledger.
<b>Digitization/Digital Strategy</b>	How companies exploit all sources of data and technology to create and enhance products and services; boost employee productivity through collaboration and insight from data; enable new and more efficient operations, processes, channels and business models.
<b>Hybrid Cloud</b>	Includes both public and private clouds that operate as separate entities but are integrated in an automated environment to allow for seamless transfer of data and applications.
<b>Robotic Process Automation</b>	A rules-based software application that can interact with multiple systems.

# Identifying Candidate Trends



## Trend Scouts

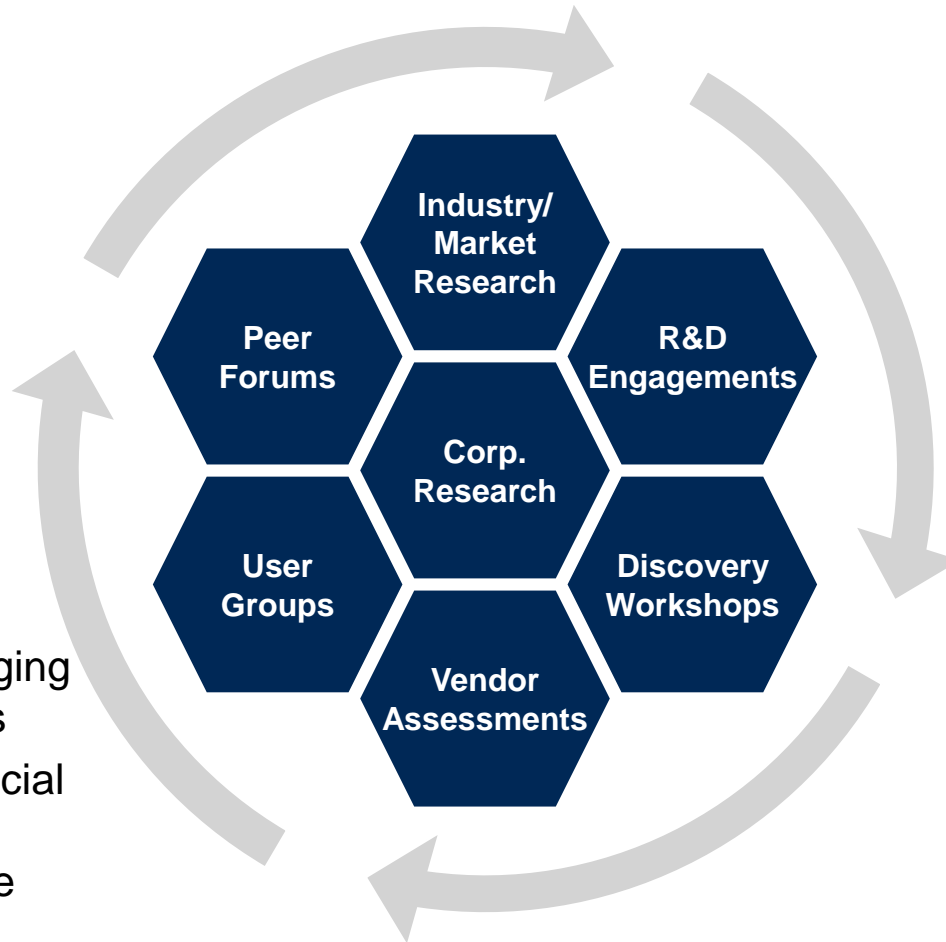


- Define Activity Scope
- Tailor Approach
- Engage Sources

## Curate Portfolio



- Identify Candidate Emerging Technologies and Trends
- Associate trends with Social Impacts, Vendor Innovations, Industry Use Cases and Independent Market Research



**Investigate, Identify and Triage Market Landscape**



**Recommendations and Candidate Trend Profiles**

# Leverage Gartner Trend Profile Research



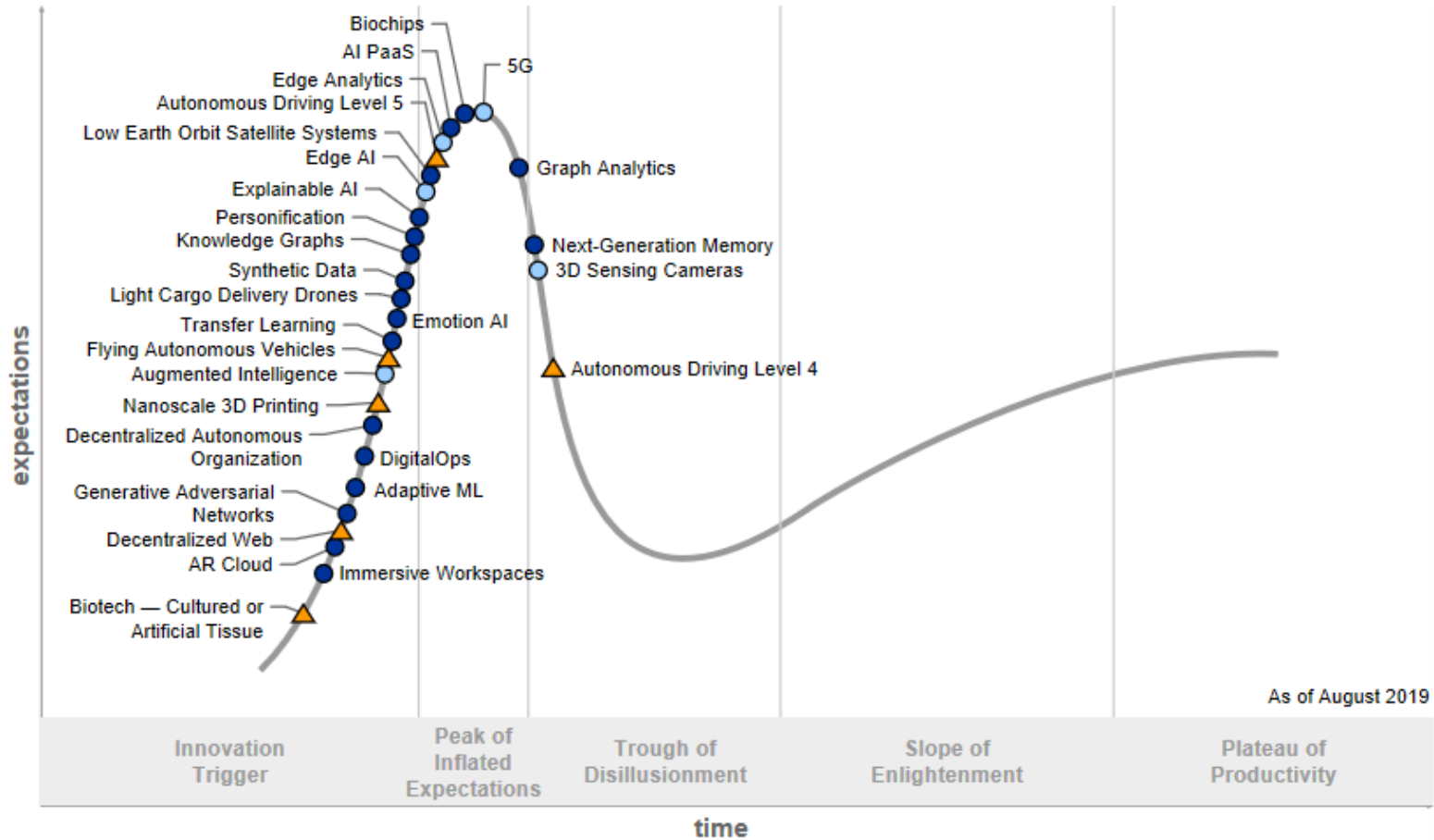
Technology Name	Market Context	Definition	Position	Time to Plateau	Position and Adoption Speed Justification
Connected Home	All Inclusive	A connected home is networked to enable	3.peak	3.Five to 10 years	The connected home is a concept that overarches several technologies,
Connected Personal Hearing Devices	All Inclusive	Connected personal hearing devices	5c.post-trough 15%	3.Five to 10 years	PHDs amplify sound, making speech intelligible for the wearer. Hearing-aid-
Connected TVs	All Inclusive	Connected TVs, also known as smart TVs,	6f.pre-plateau 20%	1.Less than two years	Almost 70% of TVs produced worldwide in 2016 were smart TVs, an upward
Consensus Mechanisms	All Inclusive	A consensus mechanism is a	2c.pre-peak 35%	2.Two to five years	The PoW (Proof of Work) was the consensus mechanism used by the first
Constrained Application Protocol	All Inclusive	The Constrained Application Protocol	2f.pre-peak 20%	2.Two to five years	CoAP uses an interaction model similar to the client/server model of HTTP, but
Consumer 3D Printing	Retail	Consumer 3D printing is the	3h.post-peak 40%	3.Five to 10 years	3D printing by consumers is an emerging market, but every home will
Consumer Energy Storage	All Inclusive	Consumer energy storage (as opposed	4.peak-trough midpoint	4.More than 10 years	The need to integrate consumer-owned renewable generation into delivery



# Leverage Gartner Hype Cycles



## Hype Cycle for Emerging Technologies 2019



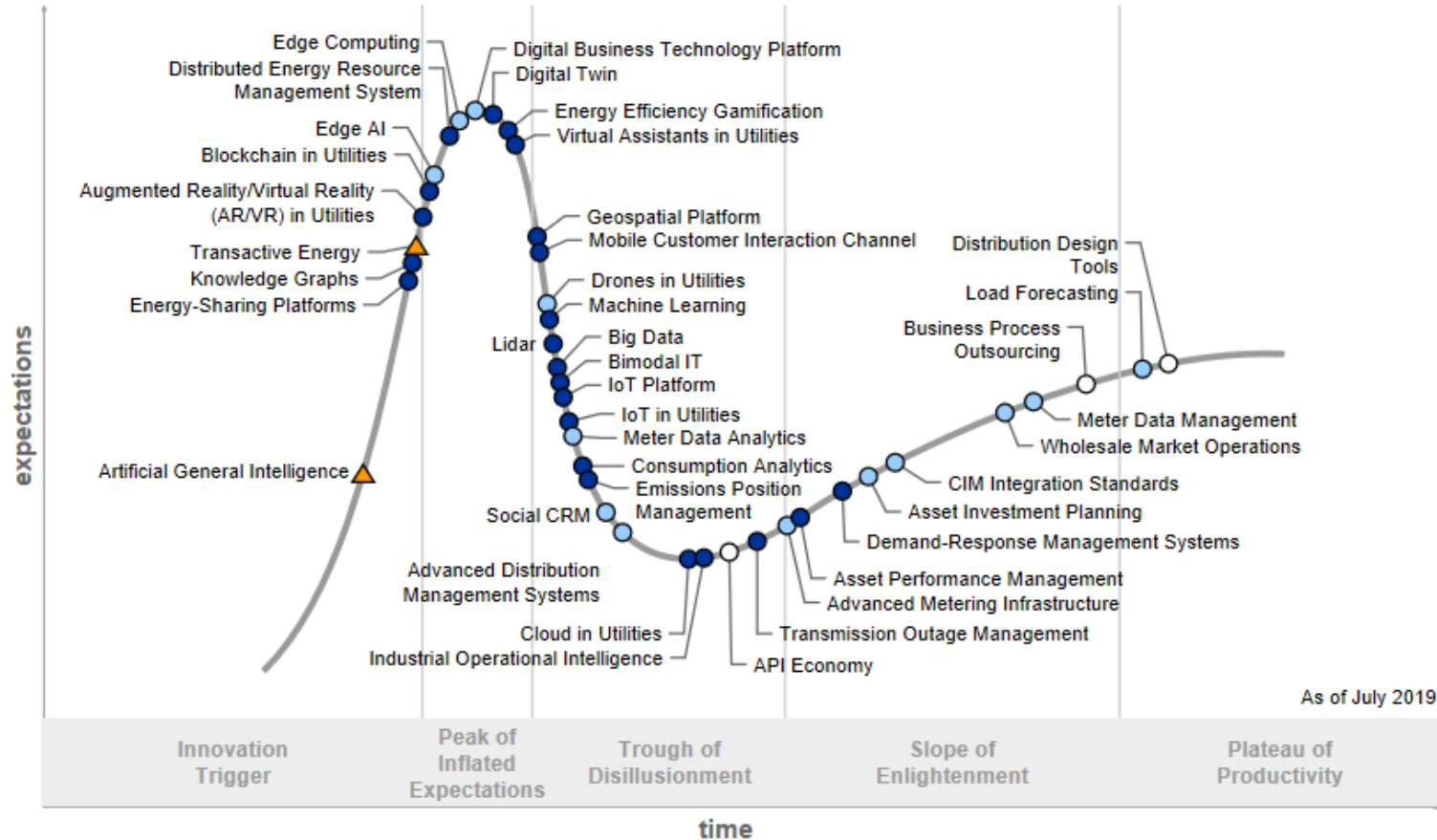
Plateau will be reached:

- less than 2 years
- 2 to 5 years
- 5 to 10 years
- ▲ more than 10 years
- ⊗ obsolete before plateau

# Leverage Gartner Hype Cycles

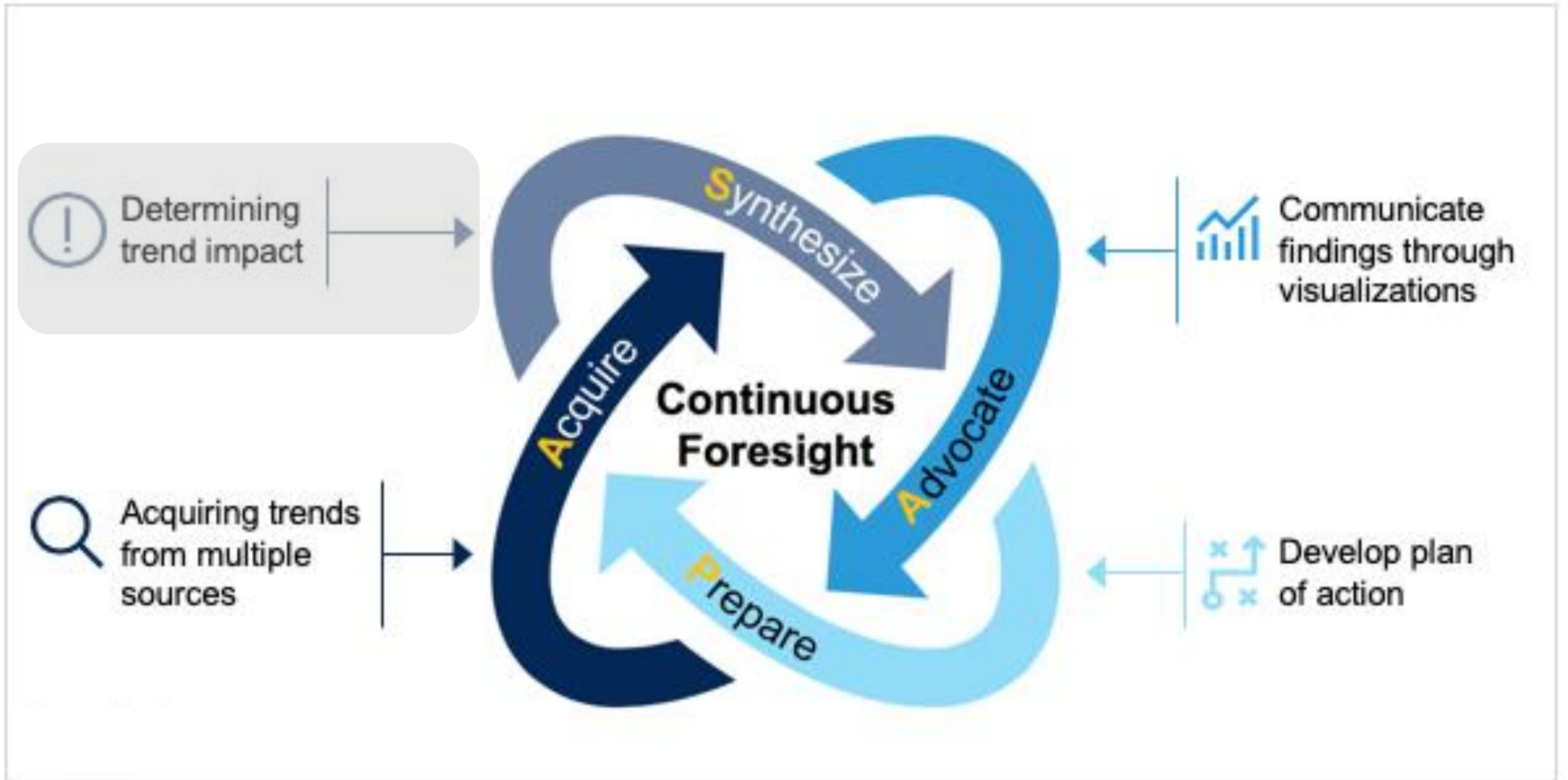


## Hype Cycle for Energy&Utility Industry 2019

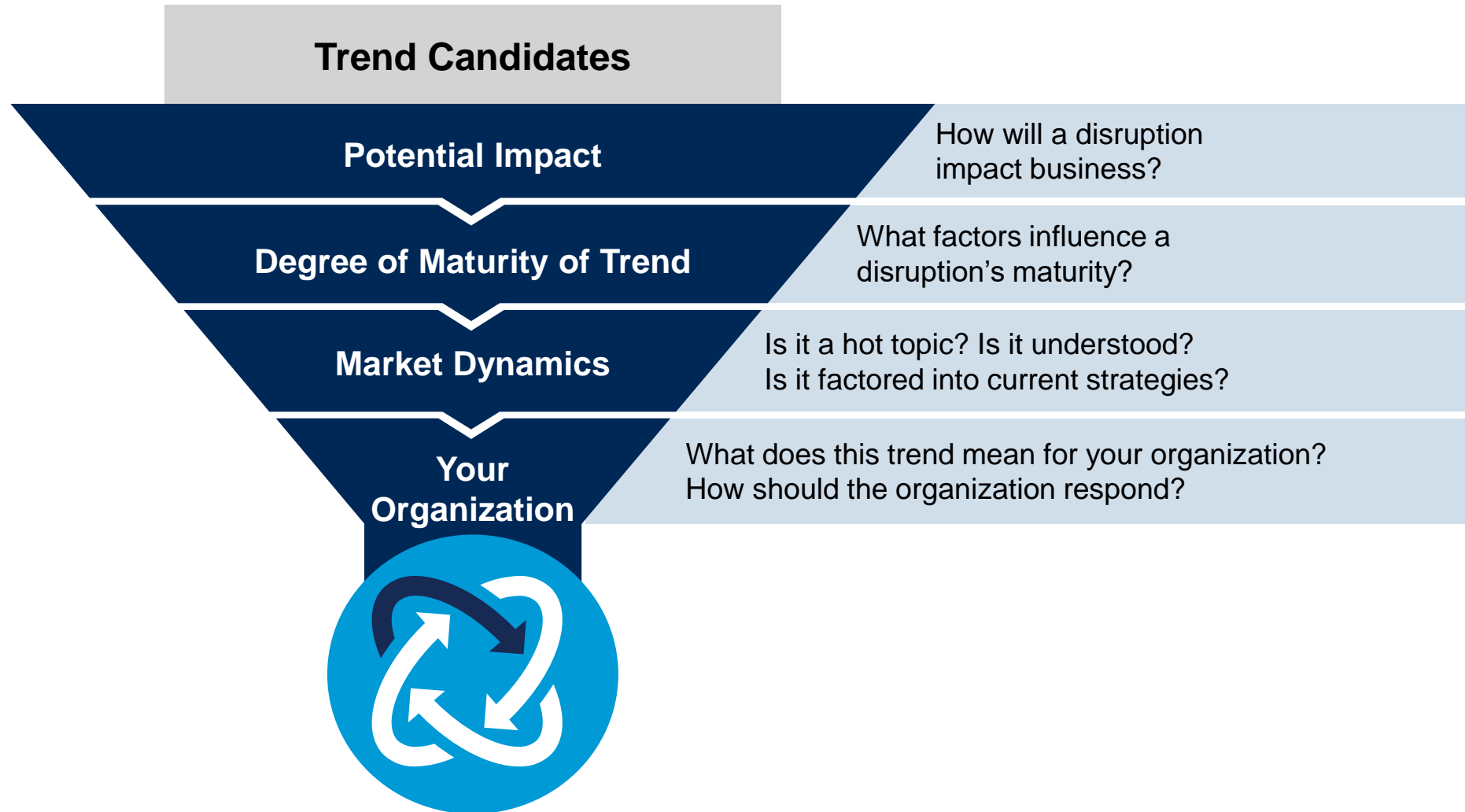


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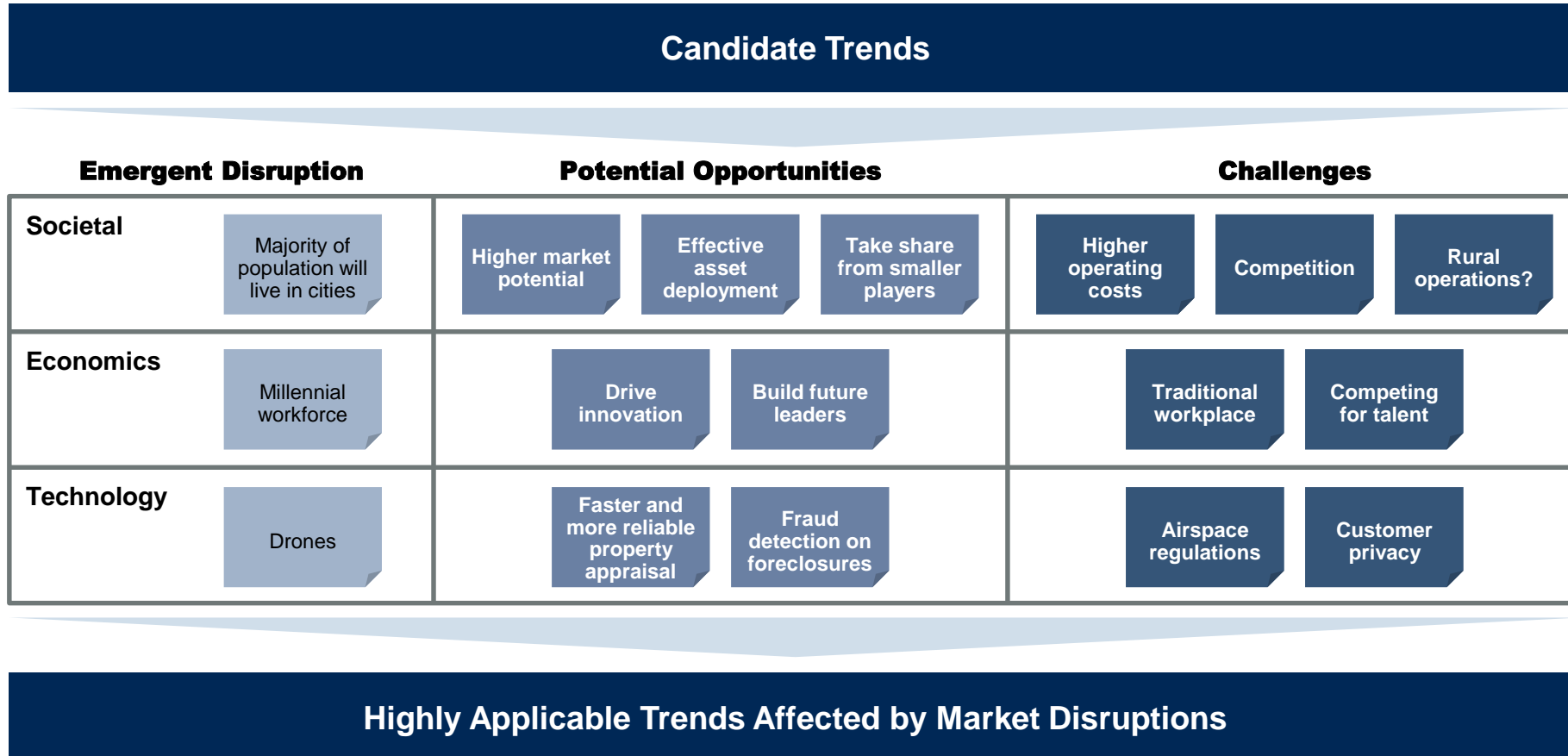
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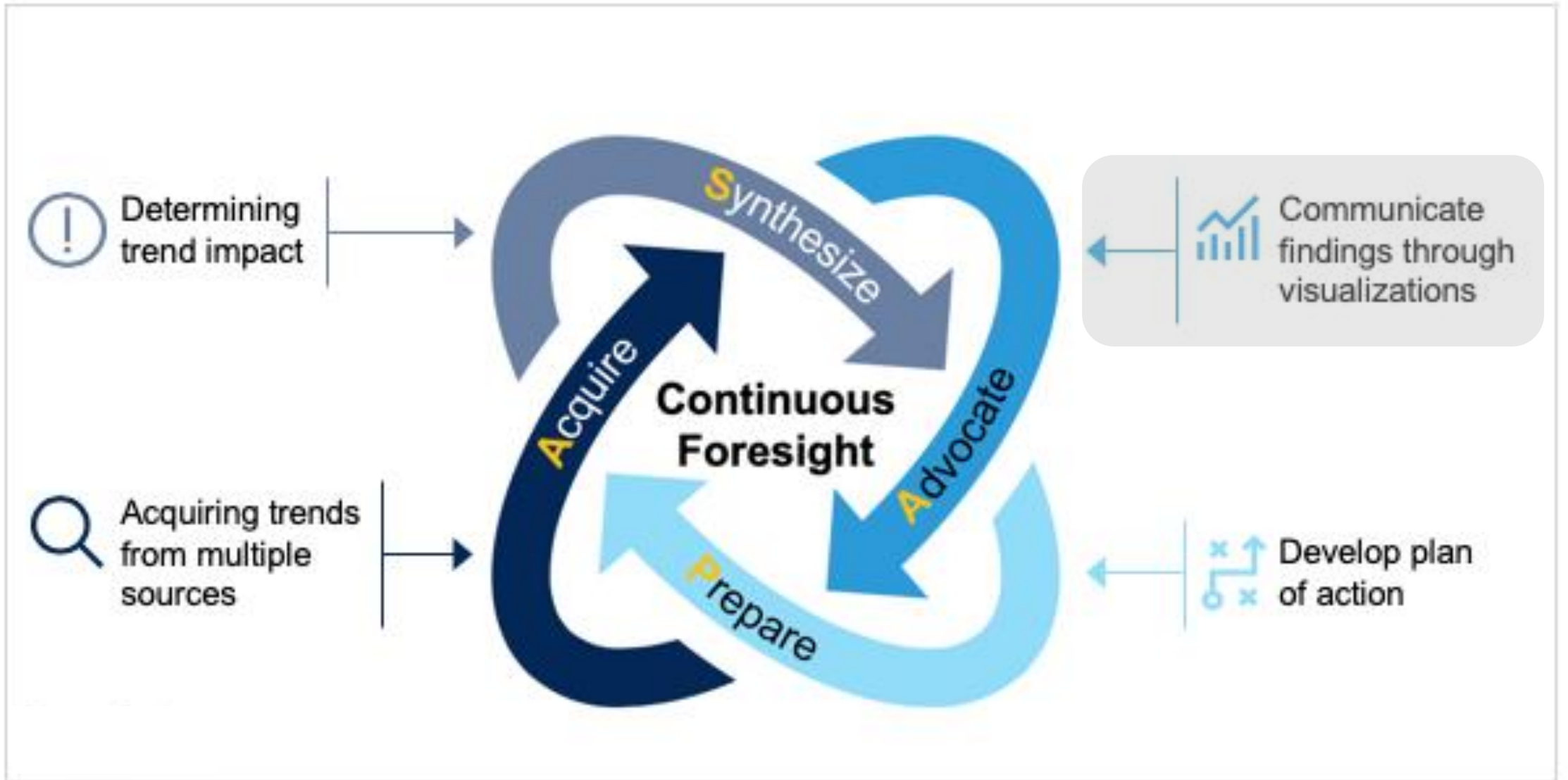


# Organize Trends Based on Impact



# Qualify Trends by Assessing Their Opportunities and Threats







# Create Emerging Trend Radar



 **Candidate  
Trend  
Profiles**



**Select Technologies  
and Trends**

 **Market Business  
Scenarios**



**Emerging Technology  
Radar**

**Analyze Market Findings**

**Communications and Education**

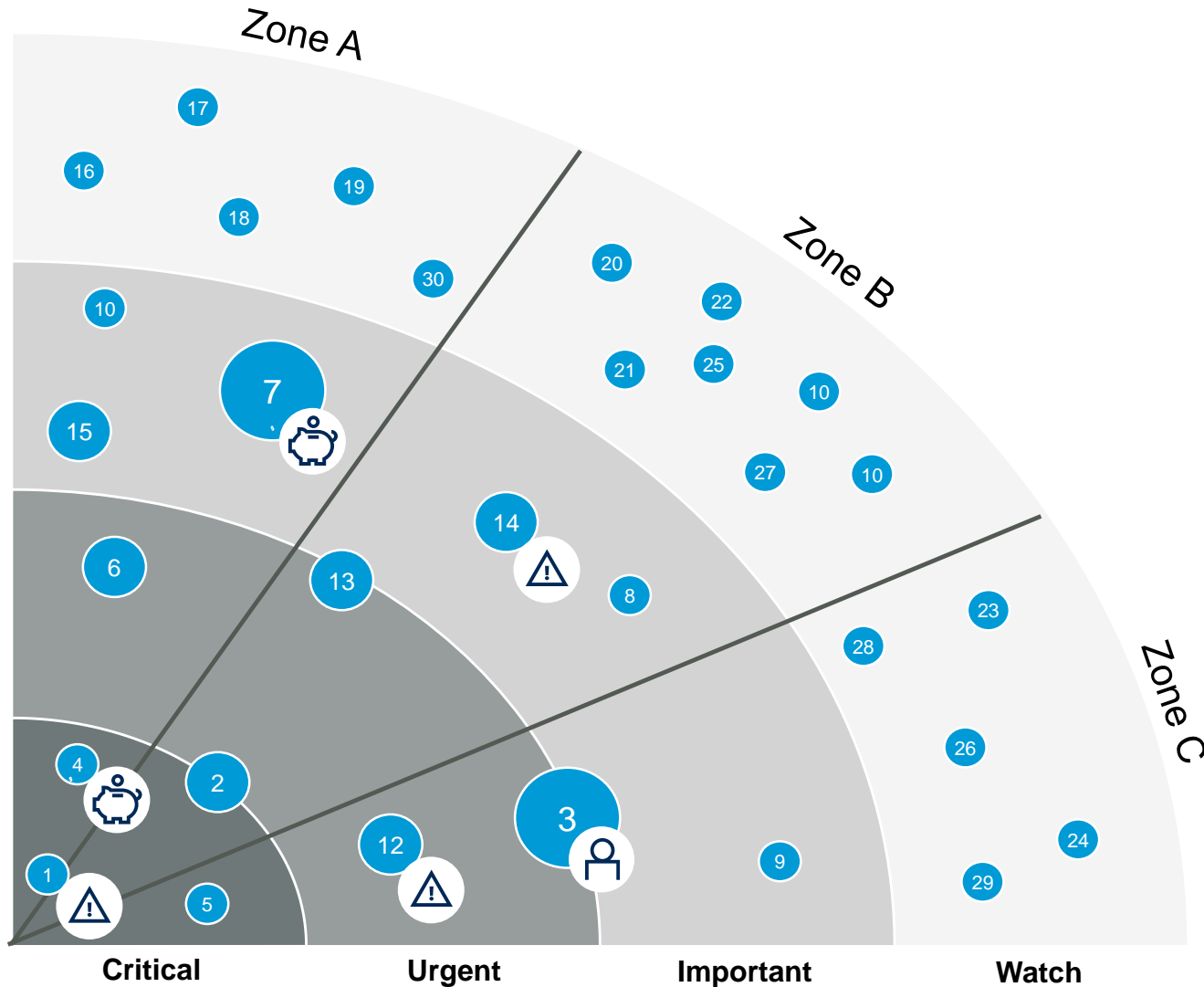
 **Trendspotting  
Newsletter**



**Quarterly Emerging  
Technologies Radar Publication**



# Sample Radar



## Must-Watch Technologies

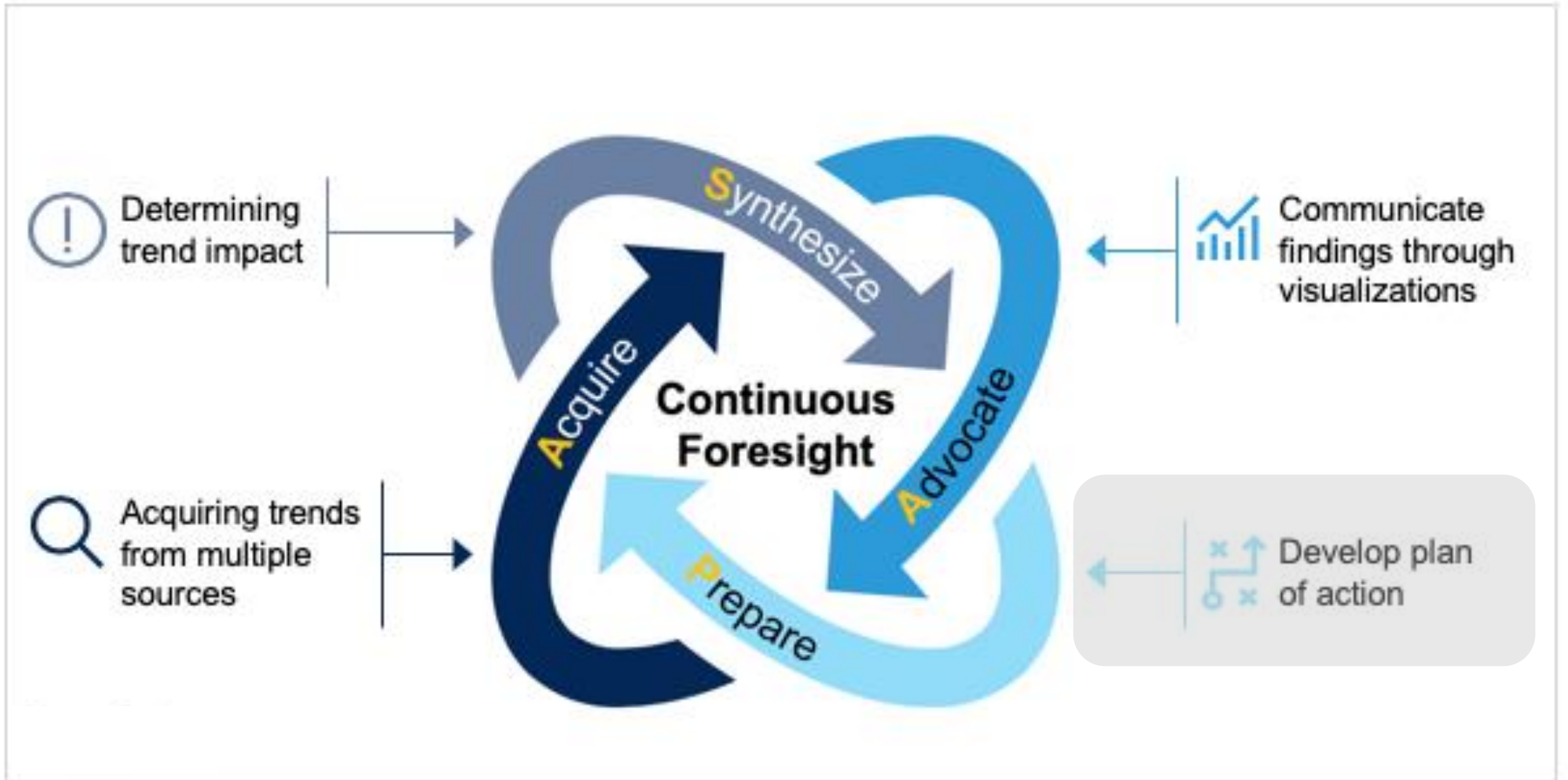
- |   |                                |
|---|--------------------------------|
| 1 Human Augmentation                    | 16 Brain-Computer Interface    |
| 2 4D Printing                           | 17 Commercial UAVs (Drones)    |
| 3 Virtual Assistants                    | 18 Volumetric Displays         |
| 4 Autonomous Vehicles                   | 19 Nanotube Electronics        |
| 5 Cognitive Expert Advisors             | 20 5G                          |
| 6 Smart Dust                            | 21 Neuromorphic Hardware       |
| 7 Commercial UAVs (Drones)              | 22 IoT Platform                |
| 8 Blockchain                            | 23 Digital Twin                |
| 9 Neuromorphic Hardware                 | 24 Quantum Computing           |
| 10 General-Purpose Machine Intelligence | 25 Software-Defined Security   |
| 11 Deep Reinforcement Learning          | 26 Edge Computing              |
| 12 Deep Learning                        | 27 Serverless PaaS             |
| 13 Augmented Reality                    | 28 Machine Learning            |
| 14 Virtual Reality                      | 29 Natural Language Processing |
| 15 Wearable Technology                  | 30 Cognitive Computing         |

### Impact Potential

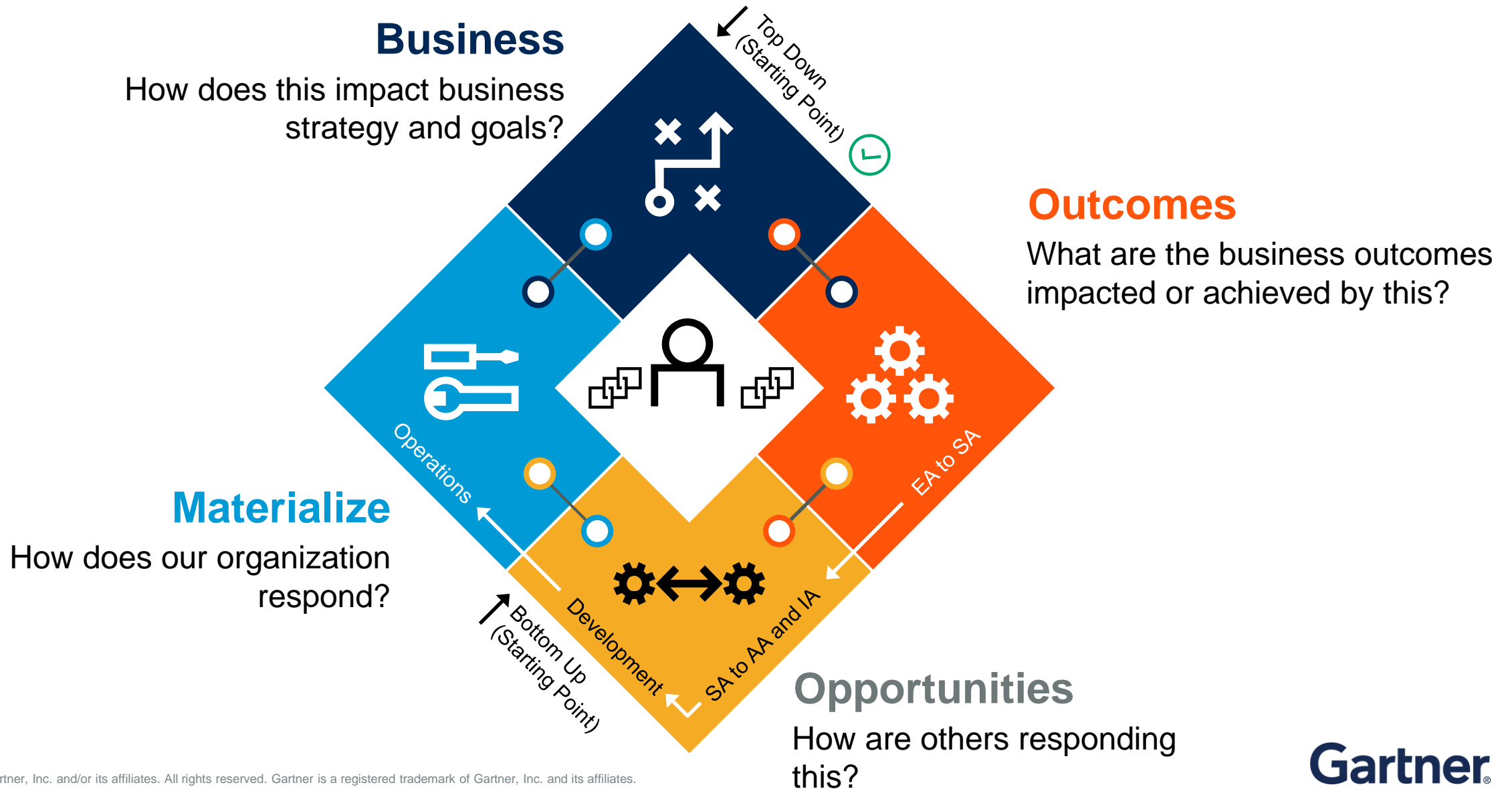
- Transformational
- High
- Moderate

### Risk Factors

- ⚠ High Regulatory Impact
- 👤 Ethical/Social/Readiness
- 💰 Competitive/Monetary



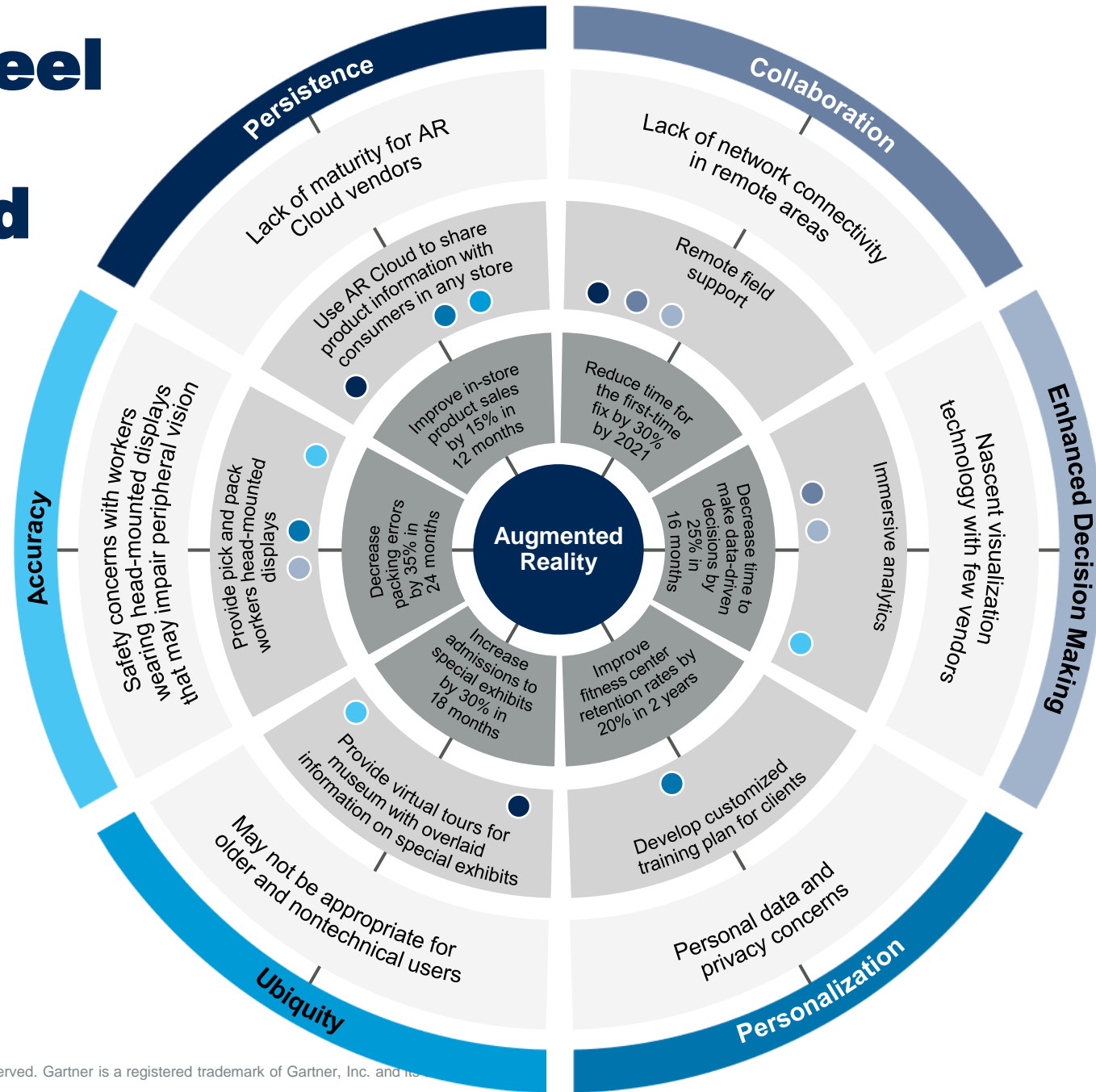
# Answer the Following Questions



# Future Wheel for Augmented Reality



Obstacles
Opportunities
Outcomes



# BuySmart – Gartner methodology for Cost Optimization

BuySmart Supports Multiple Client Roles and Helps Gartner “Capture the Org”

## Client Roles Supported



### Determine What You Really Need To Meet Business Outcomes:

Assess your strategic, financial and technical requirements

■ CIO  
■ Functional Leader



### Pick the Right Provider:

Understand the market, evaluate and select the right partners

■ CIO  
■ Functional Leader  
■ Procurement



### Align Deal Structures With Business Needs:

Pick the optimal delivery model, contracting vehicles and pricing models

■ CIO  
■ Functional Leader  
■ Procurement



### Optimize Spend:

Avoid unnecessary charges, rightsize support & service levels, assess pricing (where available)

■ Procurement



### Reduce Complexity & Risk:

Review T&C's to protect against future price increases, unanticipated costs and provide risk mitigation

■ Procurement



# Recommended Gartner Research

- ▶ [Inventing the Future With Continuous Foresight](#)  
Marty Resnick, Jackie Fenn, et. al (G00466739)
- ▶ [Toolkit: How to Build an Emerging Technology Radar](#)  
Marty Resnick (G00387948)
- ▶ [Unleash Your Inner Futurist to Survive Digital Transformation](#)  
Frank Buytendijk and Kristin Moyer (G00377797)
- ▶ [Use a Trendspotting Method to Identify the Technology Trends You Need to Track](#)  
Samantha Searle and David Cearley (G00372734)
- ▶ [Digital Disruption and the New Disruptors: Recognize, Prioritize and Respond — A Gartner Trend Insight Report](#)  
David Smith and David Cearley (G00327544)
- ▶ [Toolkit: How to Create an Emerging Technology Wheel](#)  
Marty Resnick (G00464956)
- ▶ [Ignition Guide to Identifying and Responding to Digital Disruptions](#)  
Enterprise Architecture Research Team(G00712019)

For information, please contact your Gartner representative.