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Gartner's Top 10 Strategic Technology Trends for 2020

Gartner's list of the most comprehensive lists of the trends that CIOs and other senior executives should be paying attention to this year includes "people-centric" technologies and "smart spaces." Here's what's on tap for 2020.

By [Michael J. Miller](#)

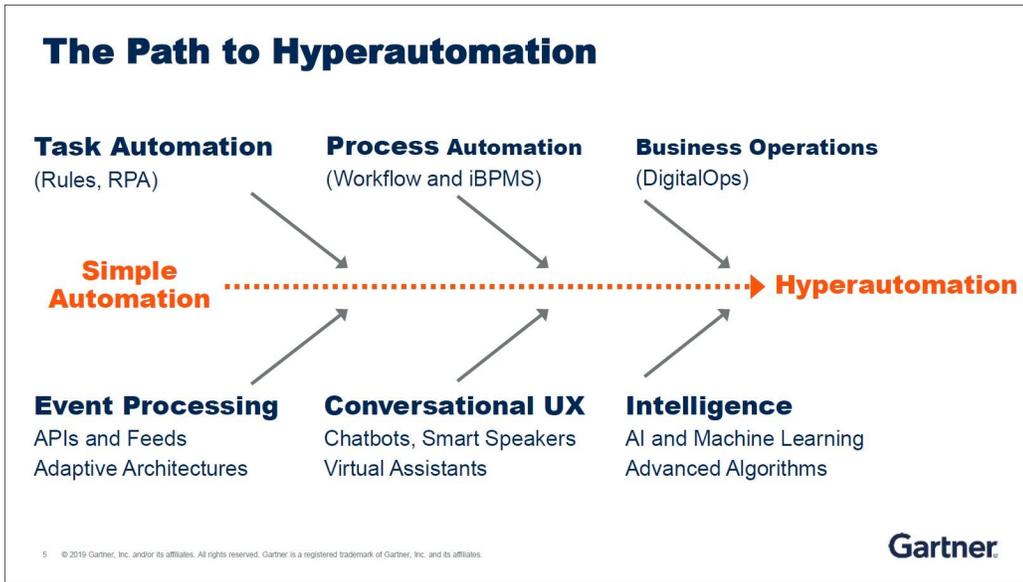
October 23, 2019



Every year Gartner produces one of the most comprehensive lists of the trends that CIOs and other senior executives should be paying attention to. This year, Gartner vice president Brian Burke presented the Top 10 strategic technology trends for 2020, grouping the trends into "people-centric" ideas and "smart spaces," a departure from the "Intelligent Digital Mesh" rubric the firm used the [last few years](#).

Here is this year's list, divided into the two groups.

People-Centric Trends



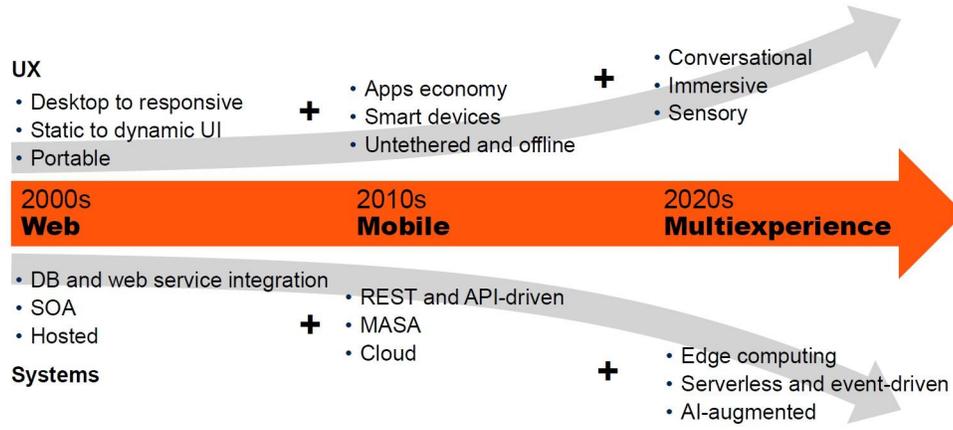
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1. Hyperautomation

This involves automating anything that can be automated, starting with process automation. Burke said that today most organizations are doing simple task automation, but that we're moving toward process automation, and will eventually end up with "DigitalOps" in which an entire organization is automated. As part of this, he talked about creating a "digital twin" of an organization, that takes into account the operations model, business process model, and operational intelligence.

Evolving From Web to Multiexperience



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2. Multiexperience

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This phrase, which was a big part of the keynote at the conference describes how we're shifting to a multi-modal interface rule, including voice, eye tracking, motion control, and other technologies

Gartner says that by 2021, at least one-third of enterprises will have deployed a multiexperience development platform to support mobile, web, conversational, and augmented reality development. As part of that, he talked about immersive environments in areas such as field service, retail, training, and design. But Burke said this includes a lot of other experiences, including apps on various devices, from smart speakers to your car. This will be supported by a lot of the new technologies, but the goal is to build "consistent ambient experience over time."

Democratization Is About Empowering Everyone



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3. Democratization

This was really focused on the democratization of AI, and how advanced technology that is very complex, including AI and machine learning, is becoming available to end users.

Burke said this is about "empowering anything" from RPA to "citizen data science" using tools to access the data and "citizen development" using low code development tools. He said we will see "virtual employee assistant" to help employees do their job more effectively, predictive analytics, such as salespeople finding high-value leads; and increased process and application automation. But there are challenges such as dealing with Shadow AI, dealing with insufficient data, and a lack of skilled developers.

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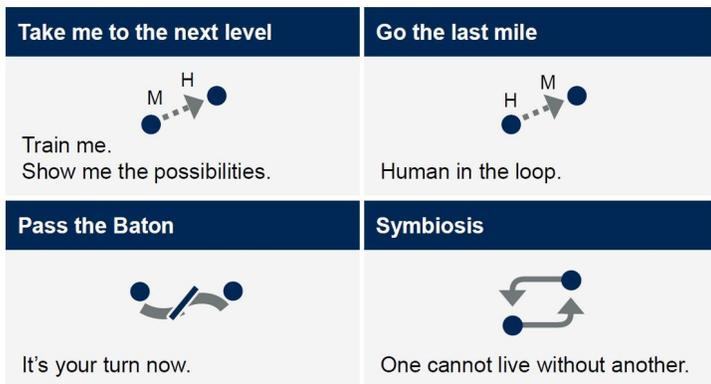
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Gartner predicts that by 2022, 30 percent of organizations using AI for decision making will contend with shadow IT as the biggest risk to effective and ethical decisions.

Cognitive Augmentation



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

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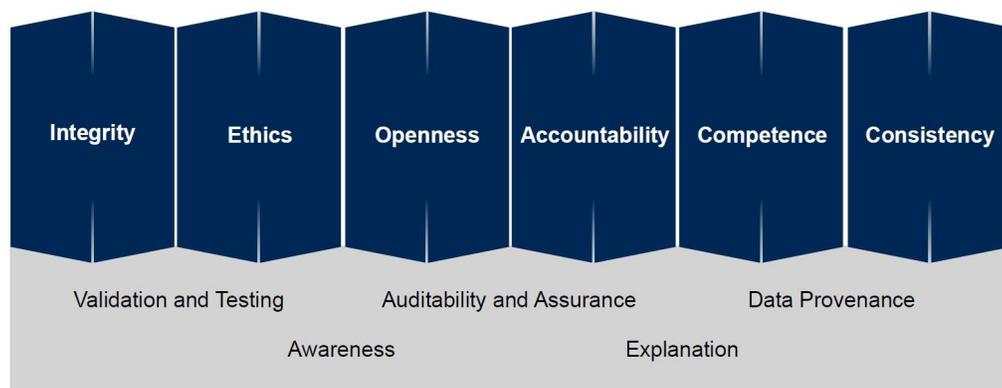


4. Human Augmentation

Burke said this trend includes things such as physical augmentation, from prosthetics to AR glasses and RFID tags implanted within people. It also includes cognitive augmentation, including using machine learning to help train people, or to do a lot of the task, but need a human to make the final decision. In the long run it will help us do things we otherwise can't. But he noted there were ethical challenges in talking about what we should and should not do.

Gartner predicts that by 2025, 40 percent of enterprises will shift from designing for humans to architecting humans themselves by adopting human augmentation technologies and methodologies.

Six Pillars of Trust



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5. Transparency and Traceability

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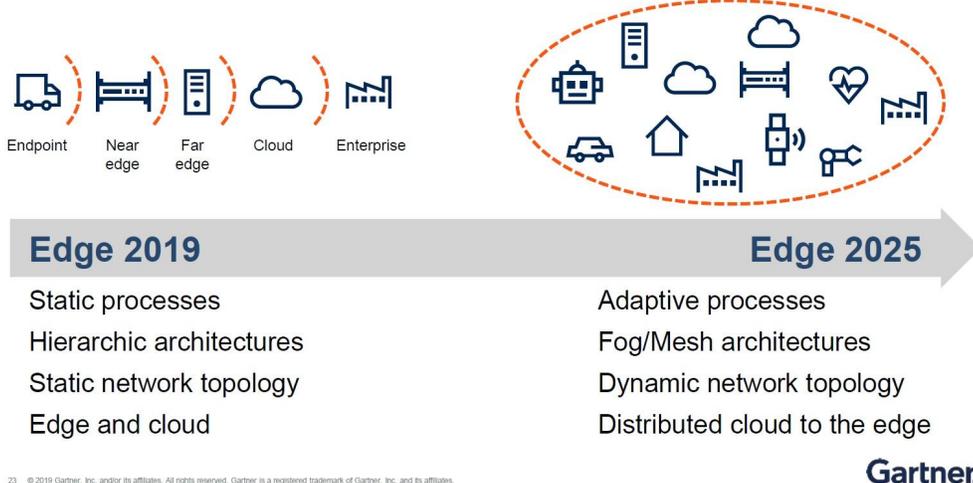
There is a lack of trust in technology, both internal to our organizations and in society at large, Burke said. For instance, when AI is used, it can be hard to explain why a loan was denied. Other issues include omnipresent IOT data collection, fake news and reviews, and algorithmic bias.

To deal with this, he discussed six pillars of trust, applying integrity and ethics, openness, accountability, competence, and consistency. This has big implications for IT, in areas such validating code.

Gartner predicts that by 2023, over 75 percent of large organizations will hire artificial intelligence specialists in behavior forensic, privacy, and customer trust to reduce brand and reputation risk.

Smart Spaces

Toward a Smarter, Faster, More Flexible Edge

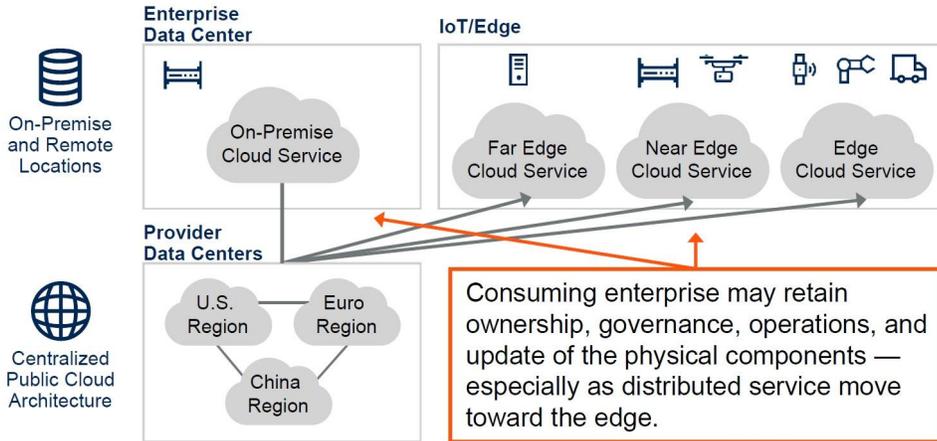


6. Empowered Edge

Burke said we are seeing a shift of computing power to "edge devices," allowing us to reduce latency and provide for autonomy on those devices. Lots of technologies are driving this, from neural networks on chip to 5G to low earth orbit (LEO) satellites. In addition, we will move from a hierarchical architecture to a fog or "mesh" architecture.

Gartner predicts that by 2023, more than 50 percent of enterprise-generated data will be created and processed outside the data center or cloud, up from less than 10 percent in 2019.

Distributed Cloud Extends to the Edge



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7. Distributed Cloud

Burke said that the physical location of where data is located is becoming more important, both because of latency concerns and regulation. As a result we will see more of a push for the distributed cloud. He said that the current push for "hybrid cloud" sets the stage for this but that "true private cloud is hard to do." Instead, he thinks we will move from private cloud to a public cloud architecture, with cloud services residing sometimes in our data centers, to deal with issues such as data residency and low latency.

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

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



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8. Autonomous Things

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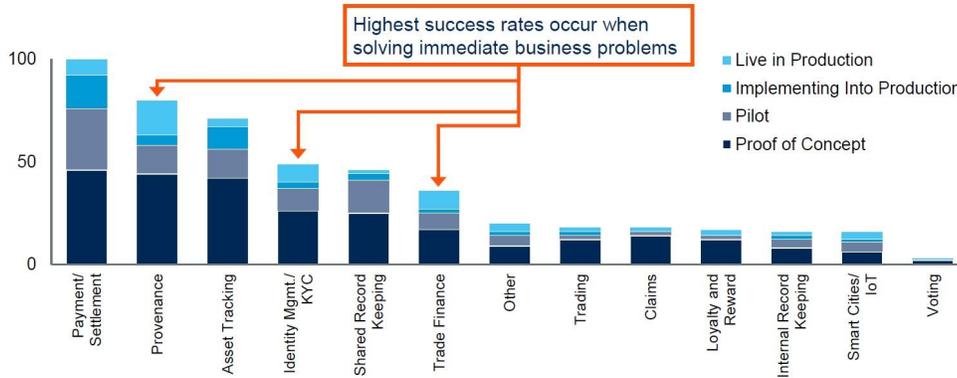
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More things are becoming autonomous, Burke said, and this goes beyond "self-driving cars" to include things such as robots, drones, and aircraft. To make this work, the devices need to have "perception and interaction" to understand the world around them. Over time these devices will be able to collaborate and work together, such as autonomous drone swarms used by the military. To enable all of this, we need improved technological capabilities, from computer vision to robot fleet management; but we will also need changes in regulation and in how society views such devices.

Today, he said, autonomous things make sense in a controlled environment, but regulation and social acceptance will determine how these can get deployed in public environments.

Gartner predicts that by 2025, 12 percent of newly produced vehicles will have Level 3 or higher autonomous driving hardware capability. (I thought it was interesting that this did not specify level 4, which provides for self-driving in most situations, but rather level 3, where a human driver is supposed to be continuously monitoring what is going on.)

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)
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9. Practical Blockchain

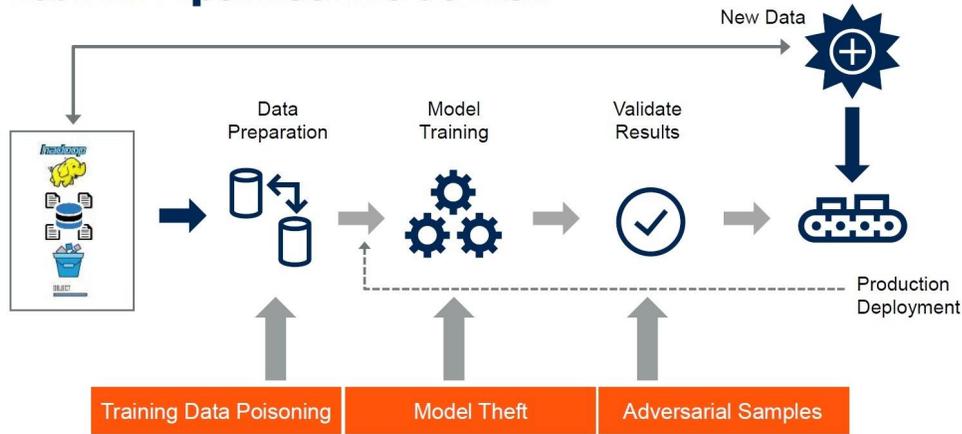
By 2023, Gartner predicts that blockchain-inspired technology will support the global movement and tracking of \$2 trillion of goods and services annually.

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But Burke said the key word in that prediction is "inspired," as most of these solutions won't support the full blockchain technology. He said these solutions will likely have an immutable traceable data structure that is shared and distributed, but will not have the tokenization or consensus that is a full blockchain solution would require. Such "permissioned blockchains" or simply distributed ledgers (which may be run by a single organization or a group of organizations) will be more important in the next few years.

By 2023, we should start to see blockchain complete solutions, including the consensus and tokenization features, and by 2025, will have "smart contracts." He said it was important to find applications where there is a real business need today, and said the applications most ready for deployment now include applications provenance, identity management/ know your customer, and trade finance (including work in the supply chain).

Your AI Pipelines Are at Risk



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Gartner

10. AI Security

Burke talked about how AI is both being infused into security to hurt the bad guys but is also an opportunity for the bad guys to do nefarious deeds. Machine learning can help security to be more effective, assuming it is developed well with sufficient amounts of high-quality training data, low bias and variance, and low error rates. But these are big assumptions, he said. As a result, he expects that we will see more adversarial machine learning, attacking the machine learning techniques in security software.

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Other opportunities for the bad guys, including things like poisoning the training data (such as how Microsoft's Tay AI bot learned inappropriate responses), adversarial samples (such as how some machine learning vision systems see things that aren't in the photos), or simple model theft.

Gartner predicts that through 2022, 30 percent of all cyberattacks will leverage training data poisoning, AI model theft, or adversarial samples.

Further Reading

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About Michael J. Miller



Michael J. Miller is chief information officer at Ziff Brothers Investments, a private investment firm. From 1991 to 2005, Miller was editor-in-chief of *CQ/ IBI*, responsible for the editorial direction, quality, and presentation of the world's largest computer publication. No investment advice is offered in this column. All duties are disclaimed. Miller works separately for a private investment firm which may at any time invest in companies whose products are discussed, and no disclosure of securities transactions will be made.

Until late 2006, Miller was the Chief Content Officer for Ziff Davis Media, responsible for overseeing the editorial positions of Ziff Davis's magazines, websites, and events. As Editorial Director for Ziff Davis Publishing since 1997, Miller took an active role in helping to identify new editorial needs in the marketplace and in shaping the editorial positioning of every Ziff Davis title. Under Miller's supervision, *PCMag* grew to have the largest readership of any technology publication in the world. *PCMag* evolved from its successful PCMagNet service on CompuServe to become one of the earliest and most successful web sites.

As an accomplished journalist, well versed in product testing and evaluating and writing about software issues, and as an experienced public speaker, Miller has become a leading commentator on the computer industry. He has participated as a speaker and panelist in industry conferences, has appeared on numerous business television and radio programs discussing technology issues, and is frequently quoted in major newspapers. His areas of special expertise include the Internet and its applications, desktop productivity tools, and the use of PCs in business applications. Prior to joining *PCMag*, Miller was editor-in-chief of *InfoWorld*, which he joined as executive editor in 1985. At *InfoWorld*, he was responsible for development of the magazine's comparative reviews and oversaw the establishment of the InfoWorld Test Center. Previously, he was the west coast bureau chief for *Computerworld*, and senior editor for *Macworld*. Miller earned a BS in computer science from Rensselaer Polytechnic Institute in Troy, New York and an MS in journalism from the Medill School of Journalism at Northwestern University in Evanston, Illinois. He has received several awards for his writing and editing, including being named to Medill's Alumni Hall of Achievement.

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