Hyperautomation, blockchain, AI security, distributed cloud and autonomous things drive disruption and create opportunities in this year's strategic technology trends.

Human augmentation conjures up visions of futuristic cyborgs, but humans have been augmenting parts of the body for hundreds of years. Glasses, hearing aids and prosthetics evolved into cochlear implants and wearables. Even laser eye surgery has become commonplace.

But what if scientists could augment the brain to increase memory storage, or implant a chip to decode neural patterns? What if exoskeletons became a standard uniform for autoworkers, enabling them to lift superhuman weights? What if doctors could implant sensors to track how drugs travel inside a body?

Technology is now on the cusp of moving beyond augmentation that replaces a human capability and into augmentation that creates superhuman capabilities.

How these changes will impact the world and business makes human augmentation one of Gartner's top 10 strategic technology trends that will drive significant disruption and opportunity over the next five to 10 years.

The trends are structured around the idea of "people-centric smart spaces," which means considering how these technologies will affect people (i.e., customers, employees) and the places that they live in (i.e., home, office, car).

"These trends have a profound impact on the people and the spaces they inhabit," says David Cearley, Gartner Distinguished VP Analyst, Gartner. "Rather than building a technology stack and then exploring the potential applications, organizations must consider the business and human context first."

These trends don't exist in isolation; IT leaders must decide what combination of the trends will drive the most innovation and strategy.

For example, artificial intelligence (AI) in the form of machine learning (ML) with hyperautomation and edge computing can be combined to enable highly integrated smart buildings and city spaces. In turn, these technology combinations enable further democratization of the technology.

Trend No 1. Hyperautomation

Automation uses technology to automate tasks that once required humans.

Hyperautomation deals with the application of advanced technologies, including artificial intelligence (AI) and machine learning (ML), to increasingly automate processes and augment humans. Hyperautomation extends across a range of tools that can be automated, but also refers to the sophistication of the automation (i.e., discover, analyze, design, automate, measure, monitor, reassess.)

Hyperautomation often results in the creation of a digital twin of the organization

As no single tool can replace humans, hyperautomation today involves a combination of tools, including robotic process automation (RPA), intelligent business management software (iBPMS) and AI, with a goal of increasingly AI-driven decision making.

Although not the main goal, hyperautomation often results in the creation of a digital twin of the organization (DTO), allowing organizations to visualize how functions, processes and key performance indicators interact to drive value. The DTO then becomes an integral part of the hyperautomation process, providing real-time, continuous intelligence about the organization and driving significant business opportunities.

Trend No. 2: Multiexperience

Multiexperience replaces technology-literate people with people-literate technology. In this trend, the traditional idea of a computer evolves from a single point of interaction to include multisensory and multitouchpoint interfaces like wearables and advanced computer sensors.

For example, Domino's Pizza created an experience beyond app-based ordering that includes autonomous vehicles, a pizza tracker and smart speaker communications.

In the future, this trend will become what's called an ambient experience, but currently multiexperience focuses on immersive experiences that use augmented reality (AR), virtual (VR), mixed reality, multichannel human-machine interfaces and sensing technologies. The combination of these technologies can be used for a simple AR overlay or a fully immersive VR experience.

Trend No. 3: Democratization

Democratization of technology means providing people with easy access to technical or business expertise without extensive (and costly) training. It focuses on four key areas — application development, data and analytics, design and knowledge — and is often referred to as "citizen access," which has led to the rise of citizen data scientists, citizen programmers and more.

For example, democratization would enable developers to generate data models without having the skills of a data scientist. They would instead rely on AI-driven development to generate code and automate testing.

Trend No. 4: Human augmentation

Human augmentation is the use of technology to enhance a person's cognitive and physical experiences.

Physical augmentation changes an inherent physical capability by implanting or hosting a technology within or on the body. For example, the automotive or mining industries use

wearables to improve worker safety. In other industries, such as retail and travel, wearables are used to increase worker productivity.

Physical augmentation falls into four main categories: Sensory augmentation (hearing, vision, perception), appendage and biological function augmentation (exoskeletons, prosthetics), brain augmentation (implants to treat seizures) and genetic augmentation (somatic gene and cell therapy).

AI and ML are increasingly used to make decisions in place of humans

Cognitive augmentation enhances a human's ability to think and make better decisions, for example, exploiting information and applications to enhance learning or new experiences. Cognitive augmentation also includes some technology in the brain augmentation category as they are physical implants that deal with cognitive reasoning.

Human augmentation carries a range of cultural and ethical implications. For example, using CRISPR technologies to augment genes has significant ethical implications.

Trend No. 5: Transparency and traceability

The evolution of technology is creating a trust crisis. As consumers become more aware of how [their data](#) is being collected and used, organizations are also recognizing the increasing liability of storing and gathering the data.

Additionally, AI and ML are increasingly used to make decisions in place of humans, evolving the trust crisis and driving the need for ideas like explainable AI and AI governance.

This trend requires a focus on six key elements of trust: Ethics, integrity, openness, accountability, competence and consistency.

Legislation, like the European Union's General Data Protection Regulation (GDPR), is being enacted around the world, driving evolution and laying the ground rules for organizations.

Trend No. 6: The empowered edge

Edge computing is a topology where information processing and content collection and delivery are placed closer to the sources of the information, with the idea that keeping traffic local and distributed will reduce latency. This includes all the technology on the Internet of Things (IoT). Empowered edge looks at how these devices are increasing and forming the foundations for smart spaces, and moves key applications and services closer to the people and devices that use them.

By 2023, there could be more than 20 times as many smart devices at the edge of the network as in conventional IT roles.

Trend No. 7: The distributed cloud

Distributed cloud refers to the distribution of public cloud services to locations outside the cloud provider's physical data centers, but which are still controlled by the provider. In distributed cloud, the cloud provider is responsible for all aspects of cloud service architecture, delivery, operations, governance and updates. The evolution from centralized public cloud to distributed public cloud ushers in a new era of cloud computing.

Distributed cloud allows data centers to be located anywhere. This solves both technical issues like latency and also regulatory challenges like data sovereignty. It also offers the benefits of a public cloud service alongside the benefits of a private, local cloud.

Trend No. 8: Autonomous things

Autonomous things, which include drones, robots, ships and appliances, exploit AI to perform tasks usually done by humans. This technology operates on a spectrum of intelligence ranging from semiautonomous to fully autonomous and across a variety of environments including air, sea and land.

While currently autonomous things mainly exist in controlled environments, like in a mine or warehouse, they will eventually evolve to include open public spaces. Autonomous things will also move from stand-alone to collaborative swarms, such as the drone swarms used during the Winter Olympic Games in 2018.

However, autonomous things cannot replace the human brain and operate most effectively with a narrowly defined, well-scoped purpose.

Read more: [Human Beings, AI and Robotics Represent the New Workforce in 2028](#)

Trend No. 9: Practical blockchain

[Blockchain](#) is a type of distributed ledger, an expanding chronologically ordered list of cryptographically signed, irrevocable transactional records shared by all participants in a network.

Blockchain also allows parties to trace assets back to their origin, which is beneficial for traditional assets, but also paves the way for other uses such as tracing food-borne illnesses back to the original supplier. It also allows two or more parties who don't know each other to safely interact in a digital environment and exchange value without the need for a centralized authority.

The complete blockchain model includes five elements: A shared and distributed ledger, immutable and traceable ledger, encryption, tokenization and a distributed public consensus mechanism. However, blockchain remains immature for enterprise deployments due to a range of technical issues including poor scalability and interoperability.

Blockchain, which is already appearing in experimental and small-scope projects, will be fully scalable by 2023

Enterprise blockchains today take a practical approach and implement only some of the elements of a complete blockchain by making the ledger independent of individual applications and participants and replicating the ledger across a distributed network to

create an authoritative record of significant events. Everyone with permissioned access sees the same information, and integration is simplified by having a single shared blockchain. Consensus is handled through more traditional private models.