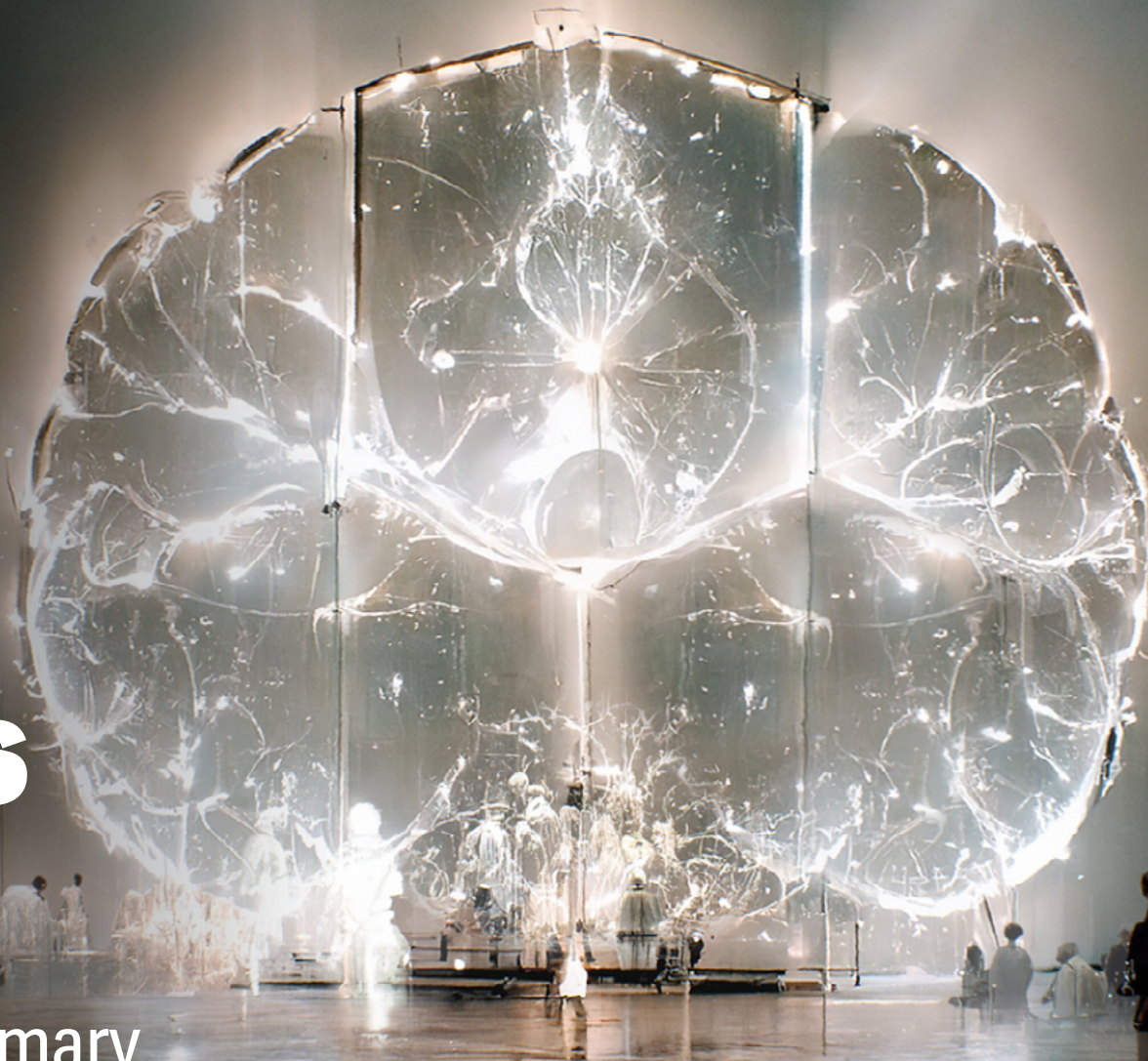**Deloitte.**
Insights

Tech
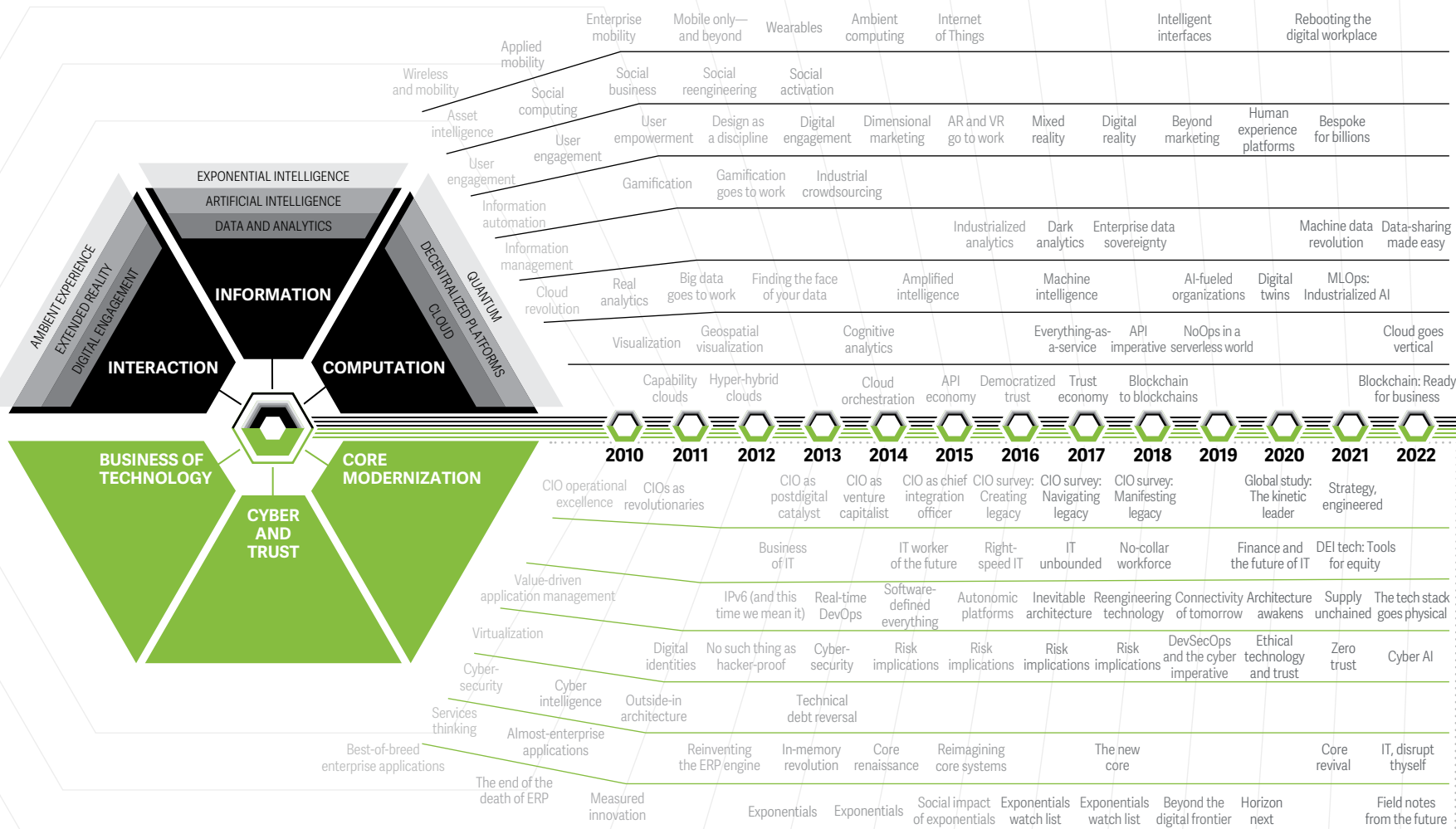# Trends
2023

Executive summary

Executive summary

Deloitte's 14th annual *Tech Trends* report explores the impact of emerging technology opportunities in the innovation areas of interaction, information, and computation, and the foundational areas of business of technology, cyber and trust, and core modernization. Through the stories of pioneering organizations, we note what's happening now across sectors and geographies, highlight new technologies and approaches that stand to become the norm within 18 to 24 months, and project where the trends could be headed next during the coming decade.

Prologue: A brief history of the future

The entire history of IT has been a steady evolution of the same three enduring eternities: interaction, information, and computation. The future of IT will continue to march along these same three tracks toward specific, convergent endgames: simplicity, intelligence, and abundance. Three additional categories—the business of technology, cyber and trust, and core modernization—acknowledge the reality that business drives technology, not the other way around, and that extant systems and investments need to play nicely with pioneering innovations so that businesses can seamlessly operate while they grow. Taken together, these six macro technology forces are the backbone of information technology.

Trending the trends: Fourteen years of research

Diagram labels (hexagon)

EXPONENTIAL INTELLIGENCE
ARTIFICIAL INTELLIGENCE
DATA AND ANALYTICS

AMBIENT EXPERIENCE
EXTENDED REALITY
DIGITAL ENGAGEMENT

DECENTRALIZED PLATFORMS
QUANTUM
CLOUD

INFORMATION
INTERACTION
COMPUTATION
BUSINESS OF TECHNOLOGY
CORE MODERNIZATION
CYBER AND TRUST

Timeline

Years: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 — 2023

INTERACTION — Through the glass

- Enterprise mobility; Mobile only—and beyond; Wearables; Ambient computing; Internet of Things; Intelligent interfaces; Rebooting the digital workplace
- Applied mobility; Wireless and mobility; Asset intelligence
- Social computing; Social business; Social reengineering; Social activation
- User engagement; User empowerment; Design as a discipline; Digital engagement; Dimensional marketing; AR and VR go to work; Mixed reality; Digital reality; Beyond marketing; Human experience platforms; Bespoke for billions
- User engagement; Gamification; Gamification goes to work; Industrial crowdsourcing

INFORMATION — Opening up to AI

- Information automation; Industrialized analytics; Dark analytics; Enterprise data sovereignty; Machine data revolution; Data-sharing made easy
- Information management; Cloud revolution; Real analytics; Big data goes to work; Finding the face of your data; Amplified intelligence; Machine intelligence; AI-fueled organizations; Digital twins; MLOps: Industrialized AI

COMPUTATION — Above the clouds

- Visualization; Geospatial visualization; Cognitive analytics; Everything-as-a-service; API imperative; NoOps in a serverless world; Cloud goes vertical
- Capability clouds; Hyper-hybrid clouds; Cloud orchestration; API economy; Democratized trust; Trust economy; Blockchain to blockchains; Blockchain: Ready for business

BUSINESS OF TECHNOLOGY — Flexibility, the best ability

- CIO operational excellence; CIOs as revolutionaries; CIO as postdigital catalyst; CIO as venture capitalist; CIO as chief integration officer; CIO survey: Creating legacy; CIO survey: Navigating legacy; CIO survey: Manifesting legacy; Global study: The kinetic leader; Strategy, engineered
- Business of IT; IT worker of the future; Right-speed IT; IT unbounded; No-collar workforce; Finance and the future of IT; DEI tech: Tools for equity
- Value-driven application management; IPv6 (and this time we mean it); Real-time DevOps; Software-defined everything; Autonomic platforms; Inevitable architecture; Reengineering technology; Connectivity of tomorrow; Architecture awakens; Supply unchained; The tech stack goes physical
- Virtualization

CYBER AND TRUST — In us we trust

- Cyber-security; Cyber intelligence; Digital identities; No such thing as hacker-proof; Cyber-security; Risk implications; Risk implications; Risk implications; Risk implications; DevSecOps and the cyber imperative; Ethical technology and trust; Zero trust; Cyber AI
- Services thinking; Outside-in architecture; Technical debt reversal

CORE MODERNIZATION — Connect and extend

- Best-of-breed enterprise applications; Almost-enterprise applications; Reinventing the ERP engine; In-memory revolution; Core renaissance; Reimagining core systems; The new core; Core revival; IT, disrupt thyself
- The end of the death of ERP

HORIZON NEXT

- Measured innovation; Exponentials; Exponentials; Social impact of exponentials; Exponentials watch list; Exponentials watch list; Beyond the digital frontier; Horizon next; Field notes from the future

Eyes to the sky:
Three enduring eternities

The history of IT has been a steady evolution of pioneering innovations in interaction, information, and computation, the three enduring eternities of modern computing.

Trend 1

Through the glass: Immersive internet for the enterprise

For a generation, the connection to the digital world has been mediated through an ever-shrinking series of rectangular screens. Now, as technologists recognize that screens can't keep shrinking forever, the paradigm is shifting again, toward interfaces that take users through the glass and into immersive virtual experiences, including the digital world known as the metaverse. Over the next few years, tangible, conversational, and virtual interfaces will likely continue to graduate from tech to toy to enterprise tool. While some companies build lucrative business models around the unique capabilities afforded by an "unlimited reality," others provide immersive environments for employees to streamline operations or collaborate and learn. As technology advances further over the next decade, organizations should be ready for reality to move online through expanded ways of interacting with mixed reality.

Trend 2

Opening up to AI: Learning to trust our AI colleagues

With AI tools increasingly standardized and commoditized, few businesses may realize true competitive gains from crafting a better algorithm. Instead, what will likely differentiate the truly AI-fueled enterprise from its competition will be how robustly it uses AI throughout its processes. The key element here, which has developed much slower than machine learning technology, is trust. As machines encroach on humanlike tasks that go beyond basic number crunching and enter the realm of discernment and decision-making via AI, the business world is having to develop a new understanding of what it means to trust machines.

Trend 3

Above the clouds: Taming multicloud chaos

To simplify multicloud management, some enterprises are beginning to turn to a layer of abstraction and automation that sits above the burgeoning multicloud. Known alternately as metacloud or supercloud, this family of tools and techniques can help cut through the complexity of multicloud environments by providing access to common services such as storage and computation, AI, data, security, operations, governance, and application development and deployment. Metacloud offers a single pane of control for organizations feeling overwhelmed by multicloud complexity.

Feet firmly on the ground: Three foundational forces

Existing systems and investments—represented by the business of technology, cyber and trust, and core modernization—should integrate well with pioneering innovations so that businesses can seamlessly operate while they grow.

Flexibility, the best ability: Reimagining the tech workforce

In the last year, many organizations have been engaged in a heated competition for a limited supply of technology talent. Yet with technical skills becoming outdated every few years, hiring for current needs is not a winning long-term strategy. Rather than competing in scarcity, savvy leaders consider an abundance frame, wherein technology talent can be curated, created, and cultivated. Companies should be prepared to eschew IT orthodoxies and prize flexibility as the best ability. By building a skills-based organization, tapping into creative sources for finding talent, and providing a compelling talent experience, companies can meet their talent goals. In the longer term, organizations should plan to brush up on their humanities, as AI technology advances enough to carry out many of the lower-order tasks that IT teams are burdened with today.

In us we trust: Decentralized architectures and ecosystems

Blockchain-powered ecosystems are becoming key not only to developing and monetizing digital assets but also to creating digital trust. As organizations begin to understand blockchain's utility, they're realizing that building stakeholder trust could be one of its primary benefits. From everyday enterprise applications to blockchain-native business models, decentralized architectures and ecosystems disintermediate trust, placing it not in a single person or organization but distributing it across the community of users. Organizations may be able to cement their credibility by helping reinvent a more decentralized internet—Web3—in which a single, immutable version of the truth is based on public blockchains. In this world, digital natives are increasingly likely to demand higher-quality proof and higher-order truth. Digital ledger technologies and decentralized business models that achieve consensus through code, cryptography, and technology protocols are demonstrating that none of us is as trustworthy as all of us.

### Connect and extend: Mainframe modernization hits its stride

Rather than rip and replace legacy core systems, enterprises are increasingly looking to bring them into the modern era by connecting and extending them to emerging technologies. Through tried-and-true approaches to legacy system modernization, businesses are leveraging mainframes—and their precious data—to drive digital transformation.
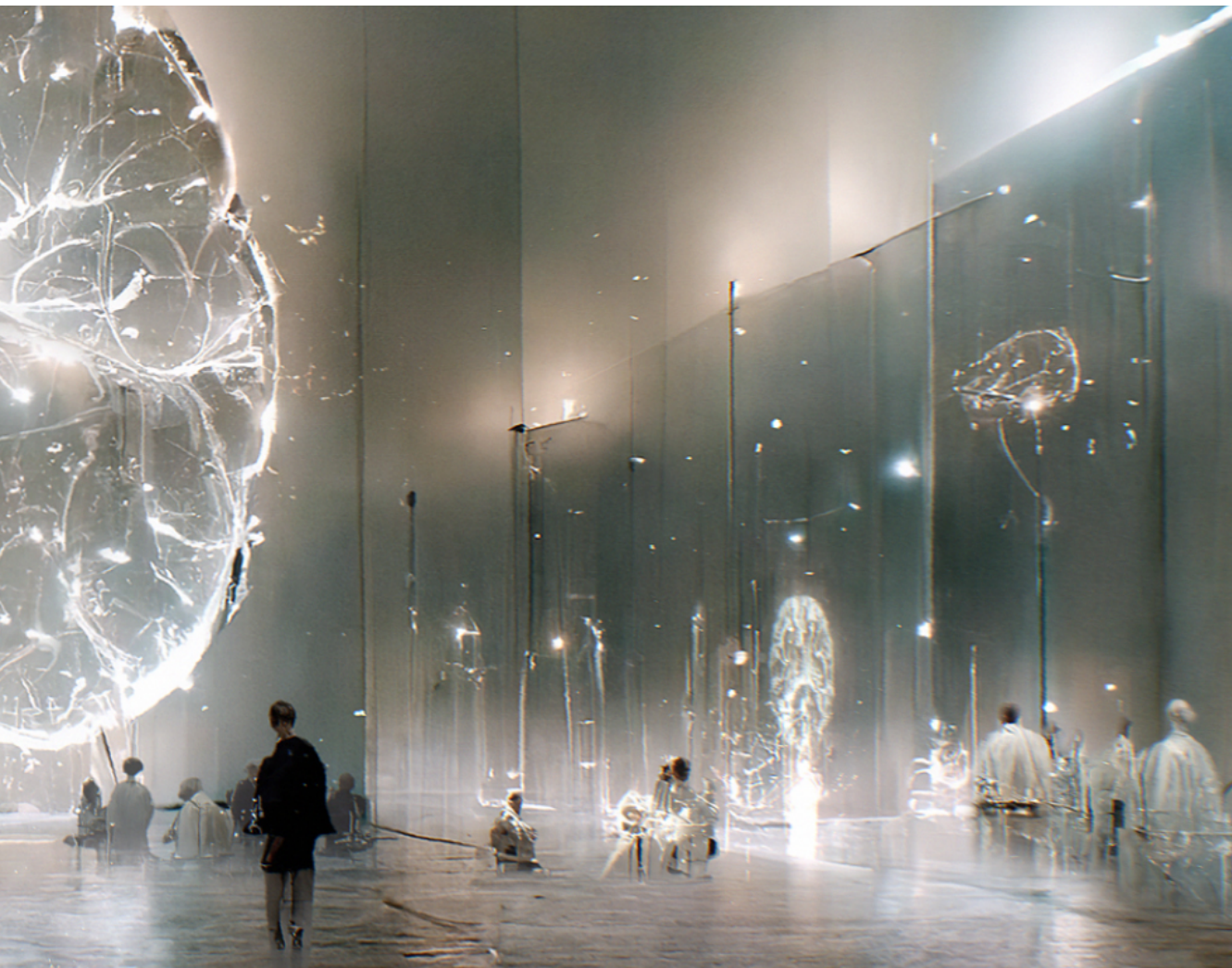
Epilogue:
Widening the aperture—
From infoTech to xTech

Historically, to enterprise audiences, "technology" has served as shorthand for *information* technology. But separate and distinct from enterprise IT, an extended set of technologies—or xTech—are on the horizon. Rooted in the formal, natural, and social sciences, these academic and research areas are brimming with patent and startup activity, technology maturity and advancements, academic and grant investments, and venture capital funding. And they're attracting the best and brightest talent. We anticipate six emerging technology disciplines to eventually rival IT in their impact on business innovation: space and aeronautical engineering; cellular and biomolecular engineering; brain and nervous systems applications and interfaces; climate, sustainability, and the environment; autonomous and precision robotics; and power, energy, and battery technologies.

Deloitte's xTech approach

BioTech: Cellular and biomolecular engineering

SpaceTech: Space and aeronautical engineering

NeuroTech: Brain and nervous system applications and Interfaces

InfoTech (IT)

ClimateTech: Climate, sustainability, and environmental technologies

RobotTech: Autonomous and precision robotics

EnergyTech: Power, energy, and battery technology
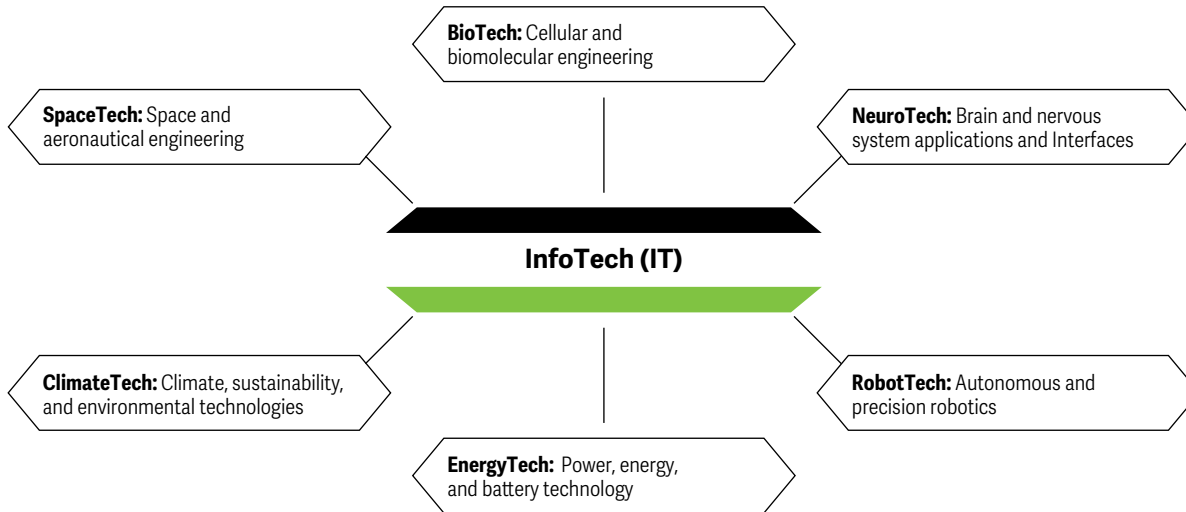
Source: Deloitte analysis.

Trend Lines

The future is already here, albeit unevenly distributed.

Our **collection** of technology case studies highlights pioneering leaders and organizations throughout the year to curate a collage of emerging technology innovations. Taken together, these varied vignettes outline the likely shape of work and life for the next 18 to 24 months, and serve as the signals that we synthesize into our annual *Tech Trends* report.

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