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Tech Trends 2023

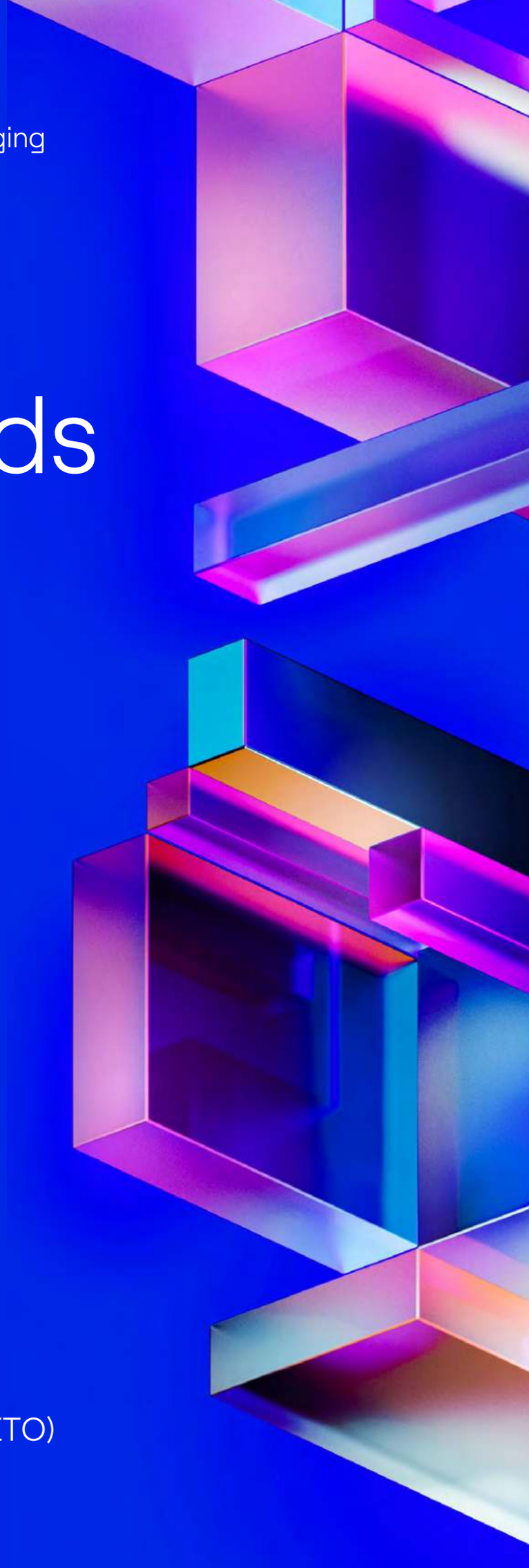

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Table of **Contents**

1. Foreword 02
2. Executive summary 03
3. A note from the editor's desk 04
4. Key areas covered 05
5. Top 10 technology trends for 2023 and beyond 06
6. Top 10 strategic trends for 2023 and beyond 09
   A. Deep Dive #1 - Traversing the AI journey - From software to silicon 10
   B. Deep Dive #2 - House of clouds has new entrants 11
   C. Deep Dive #3 - Backing up cybersecurity with quantum-secure communications and quantum machine learning 12
   D. Deep Dive #4 - Low-code, no-code platforms accelerating super app development 13
   E. Deep Dive #5 - Experiencing the 'verse' 14
   F. Deep Dive #6 - Pushing the boundaries of 5G applications 15
   G. Deep Dive #7 - Blockchain at the center of the decentralized economy 16
   H. Deep Dive #8 - Sustainable practices seeping into grassroots 17
   I. Deep Dive #9 - Redefining heuristics of employee experience via tech advancements 18
   J. Deep Dive #10 - Improved humanoid robot collaboration backed by computational empathy 19
7. Update on the tech radar for the next decade 20
8. History 22
   A. From 2022 to 2023: Where are we today? 23
   B. Mapping from 2022 to 2023 24
9. 5-year trend realization table and analysis 27
10. About Tech Trends 2023 29
11. About the HCLTech ETO 30
12. References 31

Foreword

In order to shape or rather reshape the future of work, it is important to open one's mind and opt for lifelong learning methodologies – to learn, unlearn and relearn."

A little over two years ago, as we stood on the threshold of a new decade, the world that was already in the throes of disruption was struck hard by the pandemic. While it felt like sliding down a slippery slope, the collective effort enabled us to stand firm on the ground. And here we are, trying to navigate the new normal together.

With change taking place at breakneck speed, technology continues to be the mainstay across businesses. The cloud has become a business imperative. Connectivity is seeing a significant boost with the 5G rollout. There is an increased focus on AI use cases while enhancing experience, security and accessibility. And why not? Digitally savvy customers expect unique experiences, employees expect efficient working spaces and your competitors are in the race to stay ahead of the curve.

It's about time to push the envelope! This makes it critical to understand the massive paradigm shift across technology trends. HCLTech has been committed to propelling the digital transformation journeys for customers and expanding the strategic ecosystem of partners who enable competitive differentiators for us across new and emerging technologies. While it's hard to say how a trend will play out, we've worked closely with our internal and external partners to deliver valuable, strategic and relevant insights on emerging technologies and how they will affect innovation and adoption across industries.

We've put together the top 10 technology trends to watch out for in 2023 that can help your organization prioritize future undertakings of technology adoption. This will help you be future-ready and build resilience within your organization to thrive in any new normal.

Kalyan Kumar
Global CTO & Head – Ecosystems at HCLTech

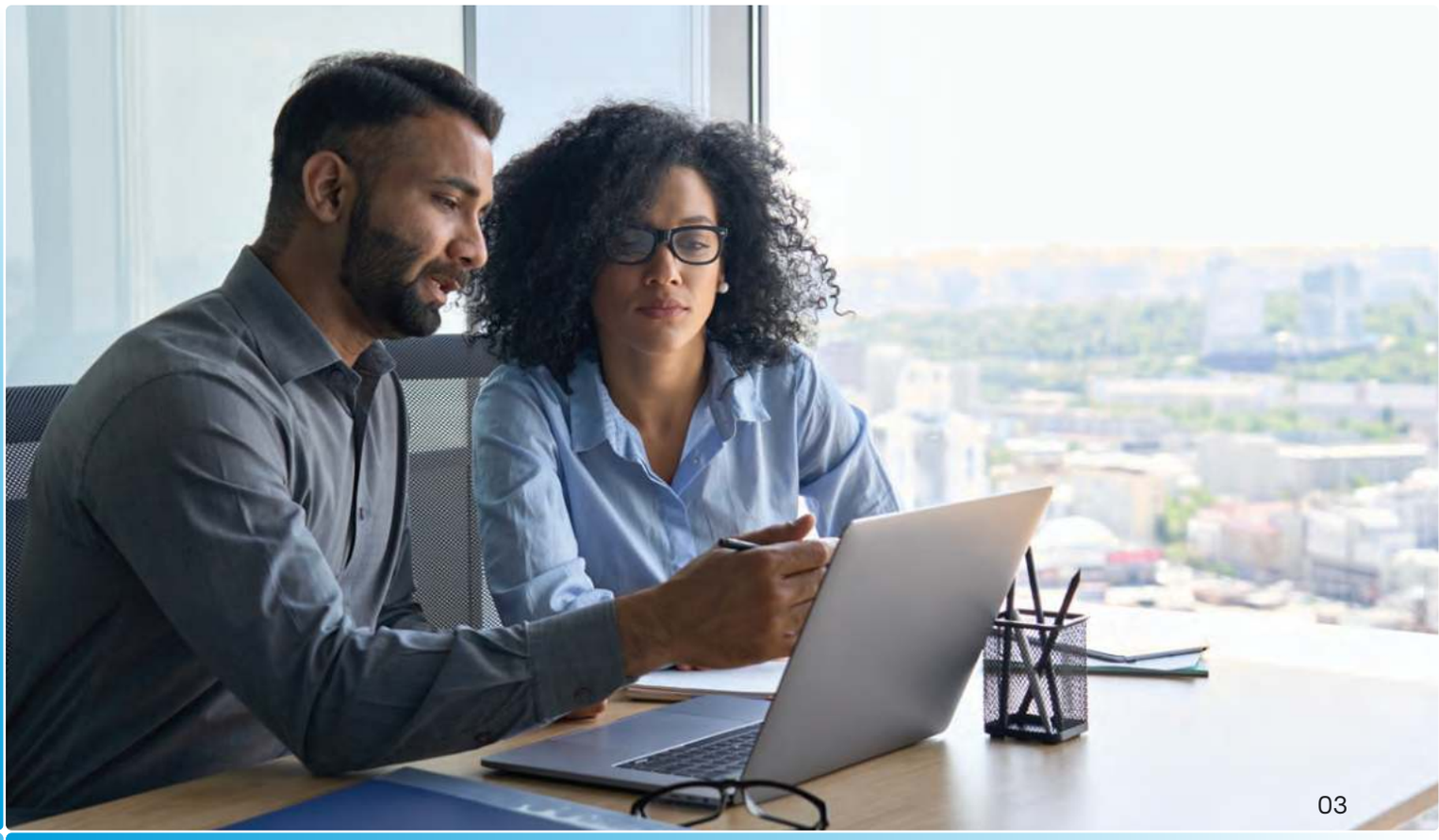
Executive **summary**

When everything is a priority, nothing is certain. As business leaders worldwide struggled to comprehend the scope and scale of the post-pandemic technology landscape, many found themselves in a phase of indecision.

How can your business ensure it is future-ready? Which technologies are gaining traction today? What key market trends should enterprises be prepared for in the coming year? These are some of the burning questions in the minds of CXOs and ITDMs as they prepare to enter a new digital era, potentially filled with complex business challenges.

Understanding emerging technologies is paramount to understanding the answers to these questions. Technology continues to propel ground-breaking changes in the world. Technological advancements offer organizations the opportunity to enhance productivity, reduce costs, reimagine products and services and ultimately improve lives. Predicting technology trends and how they are going to evolve is often a difficult task. However, CXOs can still try to augment business strategies by keeping tabs on emerging technologies, understanding their benefits and identifying how the industry plans to leverage them in the near future.

The HCLTech ETO has always been interested in what the future holds. Being one of the primary movers of value creation in the organization, the ETO strives to achieve sustainable competitive advantage through thought leadership. After thorough research, we are putting the spotlight on some significant trends and concepts that modern enterprises will look to tackle in 2023. This report builds on the trends we shared with you last year, with new data and analysis to give an in-depth, granular assessment of trends. From traversing the AI journey to the era of multi-cloud, the potential of quantum machine learning, the 5G opportunity and decentralization through Blockchain, here are 10 worthy pursuits for the year ahead.



From the editor's **desk**

Welcome to the seventh edition of HCLTech's Tech Trends report, brought to you by the Enterprise Technology Office (ETO), an electronic journal dedicated to serving CXOs, ITDMs and other business leaders in an evolving technology landscape.

The ETO's constant endeavor over the past decade has been to deliver valuable, strategic and relevant insights on the importance of emerging technologies across industries and help understand the factors that affect innovation and adoption.

The technology trends highlighted in this report will play a crucial role in accelerating three key characteristics of the post-pandemic digital era: flexibility, speed and scale. Each trend has been identified after thorough research, taking factors such as adoption, investment and impact into account. The trends have been structured into an overview, business value, market size, analyst insights and relevant news to help you gauge the momentum of each.

For enterprises to build, sustain and retain resilience in uncertain times, it becomes imperative for them to shift focus onto the three-fold strategy for technology innovation viz-a-viz (1) Adopt (2) Adapt and (3) Adept. Enterprises of the future should adopt technologies that are new, path-breaking and a potential game-changer for the next 3-4 years. They should adapt to technologies that can prove to be transformational in the next 2-3 years and finally, they should be adept in what is scalable and productive to attain operational efficiency in 0-1 years.

This report will act as a guide to help businesses navigate strategic choices when complexities arise and how organizations can approach technology priorities in their future undertakings.

Key areas covered

Top 10 technology trends for 2023 and beyond

- Overview of top 10 technology trends for 2023
- Tech deep dive on each trend

Update on the tech radar for the **next decade**

- Understanding how the technology landscape has evolved over the last five years

From 2022 to 2023: **The differentiators**

- Development of technologies over the previous year
- Underlying reasons for the changes over the year

5-year trend realization

- Showcases the top technologies and how they have moved to the adoption cycle
- Four levels of technology innovation : Hype, Disruption, Adoption and Standardization
- Observations on the evolution of technologies over the last half-a-decade

Top 10 Technology Trends for 2023 and beyond

Overview of trends

Top 10 Technology Trends – 2023

01

Traversing the AI journey –
From software to silicon

2023 will witness wide-scale **democratization of AI** – from enabling chatbots to integrating into the chip industry for developing AI-ready hardware.

02

House of clouds has new entrants

Progression to multi-cloud will be accelerated. Sovereign and industry clouds will be more widely accepted, with more than half of the enterprises using industry cloud solutions by 2027.

03

Backing up cybersecurity with quantum-secure communications and quantum machine learning

Industrial applications of quantum technologies will be realized in **quantum-secure communications** and optimizing machine learning models with the help of quantum machine learning.

04

Low-code, no-code platforms accelerating **super-app development**

Low-code/no-code technology has accelerated the pace of digital transformation. By 2024, low-code development will account for more than 65 percent of application development activities.

05

Experiencing the **'verse'**

With technologies like 5G, AI and extended reality, organizations will continue to distinguish themselves by **creating immersive experiences** in the coming years.

06

Pushing the boundaries of **5G applications**

5G will become the de facto standard in the coming years, with increased collaborations between telecom companies and enterprises leading to **innovative 5G applications** growing manifold.

07

Blockchain at the center of the decentralized economy

The shift in the status quo toward web 3.0 is getting fueled by blockchain and NFTs. As a result, 2023 will focus on **tightening regulations in the crypto world** to curb its volatile nature.

08

Sustainable practices seeping into grassroots

The coming years will focus on increased sensitization toward green practices and how technology can be at the intersection to achieve **sustainability-centric performance metrics** and ESG goals.

09

Redefining heuristics of **employee experience** via tech advancements

For nearly 50% of HR leaders globally, **employee experience has become a top priority.** Cutting-edge technology fuels better experiences - from hiring and onboarding to upskilling and employee engagement.

10

Improved humanoid robot collaboration backed by **computational empathy**

Cobots or **collaborative robots with safe behavior** around people will gather pace in the coming few years. Computational empathy will support this trend by detecting emotions and responding aptly.

Top 10 strategic trends for 2023 and beyond

Technology deep dive

01

Traversing the AI journey – From software to silicon

Overview

In 2023, we will see continued innovation and adoption of AI technologies across industries. **The amalgamation of powerful new classes of AI, like generative AI, sustainable AI and responsible/ethical AI, will lead to its democratization – enabling businesses and organizations to overcome the challenges posed by the AI skills gap.** Semiconductor companies are also integrating AI into manufacturing workflows to optimize operations and improve product quality.

Business Value

AI's democratization will enable it to reach a more extensive employee base, making it a tool not just limited to data scientists and AI software engineers. This has resulted in businesses being even better prepared for the unpredictable future.

- Generative AI will enable machines to mimic one of the most uniquely human skill sets – creativity.
- Sustainable AI will help companies build products, services and infrastructure in a more energy-efficient manner.
- Ethical AI will be central to eliminating bias and unfairness from automated decision-making systems.
- Chip making and AI.

Market Size

The global AI* market size is projected to reach

USD 1394.30 Bn

in 2029, at a CAGR of

20.1%

Analyst Insights and News

- Easy and more affordable AI implementation with rapidly growing innovation is the key trend in AI adoption.
- A recent McKinsey report suggested that leaders adopting AI exhibit more robust financial performance – marking an increase in revenue and a decrease in cost across different functions in an enterprise.

*Includes sustainable AI, generative AI, ethical AI etc.

02

House of clouds has new entrants

Overview

Cloud at the edge, AI in cloud, industry cloud, sovereign cloud, digital experience cloud and multi-cloud are some new entrants in the cloud trends shaping up in 2023 and beyond. By 2025, enterprises will spend more on public cloud services than traditional IT solutions, according to Gartner. New reports suggest that almost 84% of large or mid-size companies will adopt multi-cloud by 2023.

The current geopolitical situation and the need to meet a growing list of data privacy requirements will drive the development and adoption of sovereign cloud solutions and industry-specific clouds in the coming years.

Business Value

In 2023, we can expect continued innovation in this field as hyperscale cloud service providers like Amazon, Google and Microsoft continue applying their own AI technology to create more efficient and cost-effective cloud services for their customers. The increased adoption of a hybrid cloud in 2022 also enables opportunities for the cloud AI market, with a multi-cloud approach offering several advantages, including flexibility and security.

Market Size

The global cloud computing market size was valued at

USD

368.97 Bn

in 2021 and is expected to expand by

15.7%.

Analyst Insights and News

- By 2025, 80% of enterprises will adopt a strategy to unify web, cloud services and private application access from a single vendor's SSE platform.
- New research reveals that value in the cloud goes beyond adoption: Cloud adoption could generate $3 trillion in EBITDA value by 2030.

03

Backing up cybersecurity with quantum-secure communications and quantum machine learning

Overview

Quantum computing (QC) is expected to bring a revolution in cybersecurity. The potential risk of implementing QC has driven scientists to create quantum-safe encryption, like quantum key distribution and post-quantum cryptography.

Quantum machine learning algorithms may be made tenfold quicker, more time and energy-efficient for developing techniques for spotting and resisting fraudulent transactions by cutting-edge cyber-attacks. Experimentation of quantum computing to build more powerful machine learning models is expected to grow in 2023.

Business Value

The global IT sector is expected to witness the emergence of quantum computing in fault tolerance, cybersecurity, quantum machine learning, QC application and quantum random number generation.

APAC is projected to grow at the highest rate in the quantum computing market. An increasing number of startups worldwide are investing in R&D activities related to quantum computing technology leading to increased market size in the services segment.

Market Size

The global quantum cryptography market is expected to reach

USD

476.83 Bn

by 2030, growing at

18.67%

CAGR.

Analyst Insights and News

- Organizations are increasingly implementing quantum cryptography solutions to boost network and application security.
- The increasing shift of banking institutions toward online platforms and the surge in transactions has created a pressing need for organizations to ensure secure and authenticated transactions, poised to bolster the demand for quantum cryptography solutions.

04

Low-code no-code platforms accelerating **super-app development**

Overview

Factors influencing a rapid rise in this trend include a confluence of digital disruptions, hyperautomation and the rise of a composable business. The primary aim of both low-code (LC) and no-code (NC) application platforms is to reduce complexity and increase flexibility, reducing the overall time taken and cost associated with any software development approach.

These **LC and NC platforms enable the democratization of programming and technology. They thus are seen as a crucial factor enabling super-apps** – a platform to deliver an ecosystem of mini apps.

Business Value

- Holistic acceleration in the pace of digital transformation and process automation
- Time-efficient and plug-and-play approach
- Reduced testing time

Market Size

The low-code development platform market is expected to grow at a CAGR of

25.26%

from 2022-2027 to reach a cap of

USD 64.56 Bn

by 2026.

Analyst Insights and News

- By 2027, more than 50% of the global population will be daily active users of multiple super-apps, according to Gartner.
- A recent McKinsey report says that establishing an active LC/NC community of practice for business and IT is essential to evolve the model.

05

Experiencing the **'verse'**

Overview

The definition of the metaverse has now been expanded to "the next level of interaction in the virtual and physical worlds." As the focus on immersive experiences gets increasingly unraveled in 2023, it will become crucial that applications become interoperable, implying the creation of device-agnostic apps.

Technologies like 5G, AI and extended reality will make the metaverse futuristic from a business intelligence standpoint.

Business Value

Lucrative opportunities will emerge in every sector, with enterprises creating their immersive worlds for better customer engagement and creating an entirely new ecosystem demand. Areas that metaverse technologies will impact in the near term include – gaming, digital humans, shared spaces/experiences and NFT assets.

Market Size

Bloomberg Intelligence expects the market opportunity for the metaverse to reach

USD 800 Bn

by 2024, while crypto giant Grayscale estimates a

USD 1 Tn

metaverse opportunity across e-commerce, hardware, digital events and advertising.

Analyst Insights and News

- As 2023 hits, we may see more sophisticated metaverse avatars and more live events in the metaverse. This, in turn, will increase the advertisement market.
- Gartner says that about 30% of the world's organizations will have metaverse products and services by 2026.

06

Pushing the boundaries of **5G applications**

Overview

Deploying 5G on a mammoth scale in the next few years is based on its:
(1) High speeds,
(2) Ultra-low latency and
(3) The increased number of IoT connections.
It can be a game changer for enterprises needing high security and reliability.

The years following 2023 will focus on how enterprises can deploy and communicate the value of 5G to their customers. Furthermore, 6G will primarily be the subject of research and experimentation in 2023 on how it can be taken up for mainstream adoption in the next five years.

Business Value

With its high throughput and ultralow latency, 5G can tap into various high-value areas such as 3D robotic control, digital twin, remote medical control and so on that previous mobile communication technologies could not leverage, hence opening an entirely new market potential.

In the last year, we've seen various applications that use 5G's capabilities and mix it with AR/VR to unleash applications in the gaming, education and manufacturing industries. In addition, 5G C-V2X (vehicle to everything) is also developing fast, with several countries announcing C-V2X as the leading standard for future autonomy.

Market Size

5G network subscriptions are expected to reach **4.4 Bn** by the end of 2027.

The ultra-low-power microcontroller market is projected to grow from **USD 4.9 Bn** in 2022 to **USD 7.9 Bn** by 2027.

It is expected to grow at a CAGR of **10.3%** from 2022 to 2027.

Analyst Insights and News

- By 2025, 50% of enterprise wireless endpoints will use networking services that deliver additional capabilities beyond communication, up from less than 15%.
- Networks will go beyond pure connectivity to become a source of direct business value. Wireless is moving from a communications technology to a broader digital innovation platform.

07

Blockchain at the center of the decentralized economy

Overview

With the potential to be categorized as the next megatrend, web 3.0 includes many technologies like AI, machine learning, low-code and cloud. At its backbone lies blockchain and NFTs that give power back to the users in the form of ownership.

In 2023, we can expect the emergence of a more web 3.0-focused blockchain that will feature cohesive interoperability, automation through smart contracts and seamless integration. With increased movement in this sector, enterprises should also be prepared for the regulations of cryptocurrencies to impact their operations.

Business Value

Offering enhanced security and financial decentralization is one of the core values businesses can derive from web 3.0.

It will also limit the interference from 3rd party data mining companies and, as a result, will offer better data privacy by allowing users to keep their data stored in their digital wallets. This new iteration of the internet has also enabled brands to increase their awareness and experiment with new product ownership models.

Market Size

The global web 3.0 market size is expected to reach

USD

81 Bn

by 2030 as branding and marketing needs increase.

Analyst Insights and News

"If history is any guide, companies large and small, as well as the public and social sectors, may want to take note of the inroads Web3 is already making and start thinking about responsible ways to interact with it. Incumbents that fail to do so may suddenly find themselves overtaken by a fast-moving set of new technologies, new assets and new ways of doing business."

~McKinsey, 2022

08

Sustainable practices seeping into grassroots

Overview

Traceability, analytics and renewable energy are the three pillars for achieving sustainable goals. Businesses in emerging markets have made quick strides in sustainability by rapidly adopting mainstream practices and even pushing the envelope in this critical area.

The coming years will focus on increased sensitization toward green practices and how technology can be at the intersection to achieve sustainability-centric performance metrics and further one's ESG goals.

Business Value

Enterprises are prioritizing their ESG goals and taking the initiative to achieve them. Businesses are adopting sustainable technology in critical areas like internal IT, enterprise and customer operations. Adoption of solutions to offset carbon will help to move from net zero to positive climate actions. Enterprises have made considerable investments to achieve their sustainability charter.

Market Size

The global green technology and sustainability market is expected to grow from

USD 17.8 Bn in 2022 to **USD 60.7 Bn** by 2027.

Analyst Insights and News

- By 2025, 50% of CIOs will have performance metrics tied to the sustainability of the IT organization.
- Enhanced Carbon Management and Science Based Targets initiative (SBTi) will guide and certify corporates to achieve net-zero targets.

09

Redefining heuristics of **employee experience** via tech advancements

Overview

For nearly 50% of HR leaders globally, holistic employee experience and engagement have become a top priority in a pandemic-transformed world. According to World Economic Forum (WEF), 50% of employees worldwide need to upskill or reskill by 2025 to embrace new responsibilities driven by automation and new technologies.

Enterprises have realized the need to upskill employees in diverse domains, from technical and data-driven skills to soft skills like emotional intelligence and leadership. As more employees seek versatility and experience in their roles, upskilling and reskilling will be vital in tackling upcoming and unknown strategic hurdles. This will brace enterprises to be better prepared for the future of work.

Business Value

As per recent reports, employees can expect an increase in productivity of

18%

and an increase in work quality of

14%

after upskilling or reskilling employees. This increase comes from various places - newfound efficiency, increased motivation and improved collaboration.

Market Size

The global learning and development industry is expected to touch

USD

402 **Bn**

mark by 2025.

Analyst Insights and News

Recent research shows that when employees are satisfied with their IT services and technology experience, they are 158% more engaged at work and have 61% higher intent to stay.~McKinsey, 2022

"How employees communicate, collaborate and connect are fundamental qualities of the employee experience and it's critical that employers get it right when it comes to how they facilitate these interactions with technology."

~McKinsey, 2022

10

Improved humanoid robot collaboration backed by **computational empathy**

Overview

We are venturing into a world where robots and humans will mutually complement each other to complete tasks more quickly and accurately than we could.

While humanoid and assistive robots reduce the physical dependence of individuals, robotics as a field is expanding quickly by changing how humans will work and interact in the future. For robots to become inherently human while limiting threats around humans, robots now contain advanced sensors and algorithms to ensure safe behavior around people.

Business Value

The collaboration has increased productivity and optimization along with the capability to perform complex and dangerous tasks that face humans.

Market Size

The global humanoid robot market value is expected to reach

USD

17.32 **Bn**

by 2028, at a CAGR of

42.1%

over the forecast period (2022-2028).

Analyst Insights and News

"In 2023, robots will become even more like humans — in appearance and capability. These types of robots will be used in the real world as event greeters, bartenders, concierges and companions for older adults. They'll also perform complex tasks in warehouses and factories as they work alongside humans in manufacturing and logistics."

Forbes, 2022

Update on the tech radar for the next decade

How have we moved from last year?

Trends defining the next decade

What's waiting for you?

SpaceTech

Space economy to go leaps and bounds in the coming decade

The ongoing tech advancements in the space industry will lead to a shift from government-owned structures to commercially-owned and operated structures. From commercial satellite constellations to space tourism, we will witness insurmountable growth across segments.

Limitless experience

Defining the next-gen wave of immersive experiences

Traversing toward the phygital model of existence, immersive technologies like AR/VR/XR are finding increasing relevance not just in gaming industries but across sectors. Integrations with blockchain will also be key to making things more and more "real" in the virtual world.

Ubiquitous and distributed Industrial cloud and sovereign cloud leading the charter

Multiple segments of the cloud are emerging with an increasing focus on dedicated cloud for specific regions and industries. Moreover, the cloud will be the backbone of technologies like spatial computing and simulation, unraveling use cases that are not limited by physical constraints.

The omnipresence of green tech

Sustainable solutions for all enterprise-wide functions

Continuous growth in the number of start-ups and VCs operating in the green tech field is on the constant rise with no signs of slowing down in the coming decade.

Unlocking qubits

Accelerating safe-secure communication

Hyper-connected economy with secure quantum communications will become a de facto standard and an important differentiating criterion for companies who choose to innovate today.

The road to CyberSec 2030

With rapid tech adoption, securing against data breaches will be key

New-age cyber-attacks will require novel and unconventional approaches to mitigate and fight modern threats. The upcoming decade will require enterprises to focus on creating security fighter bots that will pre-empt, predict and identify vulnerabilities.

Connectivity at scale

The continuum of 5G and 6G

Faster speeds, lower latency and more bandwidth in networks will increase productivity and create new opportunities by instantaneously delivering huge amounts of data across decentralized networks.

History

Evolution of technologies over different ages

01
16th century to 18th century

Mercantile Age

Identified as the pre-mechanical age, where writing and alphabets were the identified modes of communication.

Key technologies:

Farming tools, like a scratch plow, animal-led power generation

Key drivers of growth:

Territorial expansion

02
Mid-18th century to about 1830

Industrial Age

Characterized by a shift from an agrarian economy to a manufacturing economy where products were no longer made solely by hand but by machines.

Key technologies:

Spinning jenny, spinning mule, power loom, steam engine, locomotive, etc.

Key drivers of growth:

Automation

03
Mid-to-late 20th century

Information Age

Characterized by a rapid epochal shift from a traditional industry established by the Industrial Revolution to an economy primarily based upon information technology.

Key technologies:

Computer, mobile, internet, satellite, TV, newspaper, radio

Key drivers of growth:

Connectivity

04
Present Day

Digital Age

Characterized by the wide-scale availability of information widely available to many people. It marks the advancement from analogue and mechanical to technological.

Key technologies:

AI, automation, IoT, cloud etc.

Key drivers of growth:

Efficiency, experience and security

05
Future

Tech Decade 2030

Identified by how technology and society advance beyond digital limitations to achieve a totally fluid multi-mediated reality.

Trends of the next decade:

- 6G
- Green IT
- SpaceTech
- Quantum technologies
- Immersive tech
- Industry/ Sovereign cloud

Challenges that are defining the Tech Decade 2030

- The rising influx of data-driven economy
- Lack of track monitoring and traceability in sustainability initiatives
- Risk of ransom and data theft as we move toward hybrid working models
- The need to ease movement, operations and communications between earth and space
- Unsecure emerging technology explorations
- Need for faster compute in limited timeframes and large data sets

From 2022 to 2023

Where are we today?

Mapping from 2022 to 2023 (1/3)

How has the **technology landscape evolved** in the last year?

2022	2023	Tracing the evolution
Progressing toward responsible AI	The continuum of responsible AI	Looking at the trends of the last six months, startups with responsible AI offerings have received more funding than other AI startups and leading enterprises are initiating dedicated BUs for using AI responsibly.
Hyperautomation driving digital transformation	Hyperautomation continues to drive digital transformation	With hyperautomation going mainstream, RPA will witness rising commoditization, thus improving access for smaller enterprises. However, adopting instant digital transformation through hyperautomation calls for a careful deployment, now more than ever.
Quantum computing and cloud at the crossroads	Convergence of hybrid cloud, AI and quantum computing for 10X faster development	With increased interest and research, many cloud companies are launching initiatives such as quantum-as-a-service (QaaS) to gather market access and utilize the potential of quantum through the cloud. Also, with AI coming into the equation, cloud computing and quantum computing can work with AI-processed computational power to ensure effective usage on cloud servers.

Mapping from 2022 to 2023 (2/3)

How has the **technology landscape evolved** in the last year?

2022	2023	Tracing the evolution
Experience-first strategy at the core	Metaverse at the forefront of fueling the experiential economy	Industries such as BFSI, retail and CPG are beginning to tap into the potential of metaverse by carrying out initial PoCs. In the first five months of 2022, more than USD 120 Bn was invested in building metaverse technology and infrastructure. That's more than double the USD 57 Bn invested in all of 2021.
Cybersecurity defining grounds for hybrid work models	Cybersecurity mesh for advanced level security in hybrid work environment	As an advancement in cloud security, cybersecurity mesh comprises multi-layers of security controls that pave the way for reliable, flexible and scalable mesh architecture. Instant login and hybrid work models have propagated cybersecurity mesh. By 2024, organizations adopting a cybersecurity mesh architecture will reduce the financial impact of security incidents by an average of 90%.
IoT device usage accelerating with complementing tech	IoT growth rate to maintain at the predicted levels	IoT usage has been accelerated due to technologies like digital twins, AR/VR, holograms, LiDAR etc., which require dedicated hardware integration.
Push towards 5G adoption	5G bolstering business resilience but mass adoption yet to be witnessed	We will witness pragmatic ways to ensure simplified 5G rollouts while leveraging existing infrastructure.

Mapping
from 2022 to 2023 (3/3)

How has the **technology landscape evolved** in the last year?

2022	2023	Tracing the evolution
Generative AI and 3D printing will complement	Shifting paradigms of 3D printing – decline on the enterprise side	We have witnessed a decline in the number of newly founded 3D printing startups in the last five years. Challenges and failures associated with 3D printing, such as slow speeds, bed adhesion, under and over-extrusion, stringing, overheating and limited build volume, are contributing to its downfall and, in turn, promoting other tools and technologies capable of achieving better outcomes.
Blockchain: A push towards consumerization	Blockchain tracing its path toward decentralized economy	While consumers are moving away, more countries are joining the crypto bandwagon to ensure financial stability. Blockchain will help achieve decentralized data storage and foster faith in the virtual world.
Eyeing for a sustainable future – Green IT leading the way	Sustainability and green IT becoming an enabler for continued business growth	Cloud sustainability and reduction in harmful gases/heat from data centers have taken center stage. Private as well as government sectors are taking initiatives towards achieving ESGs. Early-stage startups are also developing key decarbonization technologies, including clean hydrogen, carbon-to-value, long-duration energy storage, etc.

5-year trend realization table

Tracing the journey so far

Technology	2018	2019	2020	2021	2022	2023
Low-code/No-code platforms	Disruption	Disruption	Adoption	Adoption	Adoption	Standardization
5G at scale	Hype	Disruption	Disruption	Adoption	Adoption	Adoption
House of clouds	Hype	Hype	Disruption	Disruption	Adoption	Adoption
Humanoid robotics	Hype	Hype	Disruption	Disruption	Disruption	Disruption
Sustainable IT	Hype	Hype	Hype	Disruption	Disruption	Disruption
Metaverse	Not featured	Not featured	Hype	Disruption	Disruption	Disruption
Blockchain for web 3.0	Not featured	Not featured	Hype	Disruption	Disruption	Disruption
AI in the chip industry	Not featured	Not featured	Hype	Disruption	Disruption	Disruption
Quantum communication	Not featured	Not featured	Not featured	Hype	Hype	Disruption

Not featured

Hype
- Beta stage
- Birth of new advancements
- Early stages of proof of concepts

Disruption
- Launch stage
- Demonstration of feasibilities
- Competitive advantage gets established

Adoption
- Scale stage
- Maturity and mass implementation
- Competitors catch up and USPs get dissolved

Standardization
- Commoditization stage
- Saturation point of technology
- Emergence of replacement technology

Analysis of the trend realization table

What did we deduce from the table above?

Low-code/ No-code platforms

Witnessing wide-scale adoption post-Covid, low-code and no-code platforms gathered pace and 2023 will mark the starting of standardization phase, leading to super-app developments.

5G at scale

With the rising influx of investments in the 5G sector, the year-on-year adoption rate is on a constant rise, progressing toward the standardization phase.

House of clouds

Cloud computing technology has been omnipresent for quite some time now, but the rapid emergence of its new types is opening new avenues and is now in the adoption phase.

Metaverse

One of the fastest technologies to traverse from hype to disruption, the metaverse is all set to find industrial use cases.

Sustainable IT

With enterprises becoming increasingly sensitized toward adopting greener ways of operating business, sustainability will become mainstream in the coming few years.

Humanoid robotics

Artificial empathy is making robots more and more human. Hence humanoid robotics is on the cusp of entering the adoption phase, finding use cases outside factories as well.

AI in the chip industry

From using AI in manufacturing the chips to integrating AI in the chips for enhanced designing, this segment is in the disruption phase for 2023.

Blockchain for web 3.0

The emphasized need for a decentralized economy has led blockchain to come to the epicenter of massive disruption, paving the way for adoption.

Quantum communication

With the hype bubble gradually subsiding, enterprises are beginning to realize the value of safe-secure communication in a world where 463 ZB of data will be created every day by 2025.

About
Tech Trends 2023

These trends are based on reflections formed from market research and ecosystem sentiments. They are liable to change based on market dynamics and may only cover a part of the technology landscape. Our goal is to draw upon the research and experience from our ecosystem of start-ups, VCs, academia, customers, innovation forums and government trade commissions to advance the conversation on a broad spectrum of topics of interest to CXOs.

Primary Research

The trends have been endorsed by leading technologists and market leaders. The responses act as primary inputs for the statistical analysis of the observed trends.

Secondary Research

Extensive secondary research has been done by analyzing various technology reports, analyst reports, news mentions and podcasts from venture capitals. Post the observations, a statistical weighted average method has been used to evaluate these trends.

Statistical Analysis

A weighted average score benchmarking has been created to evaluate and prioritize the technology trends. Parameters taken into consideration for creating this trend analysis include:

Benchmarking the technologies, metrics created by ETO*

- News mentions
- IT budgets
- Funding from VCs
- Trend realization
- Customers
- Market size
- Analyst mentions

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About **the HCLTech Enterprise Technology Office (ETO)**

Accelerating future tech in HCLTech

Responsible for driving innovation and thought leadership across the HCLTech horizons, the ETO team has incubated various emerging technologies that have a potential future and brings HCLTech to the forefront as a thought leader.

Business units and initiatives:

HCLTech eSTiP™

ETO' s flagship open innovation platform and program

HCLTech Tech Trends

ETO's annual exercise of evaluating the global technology market landscape

HCLTech Office of CTO and CPO

Strategic initiatives like WEF, ETO Marketing, Corp Dev support, etc.

HCLTech SportsTech

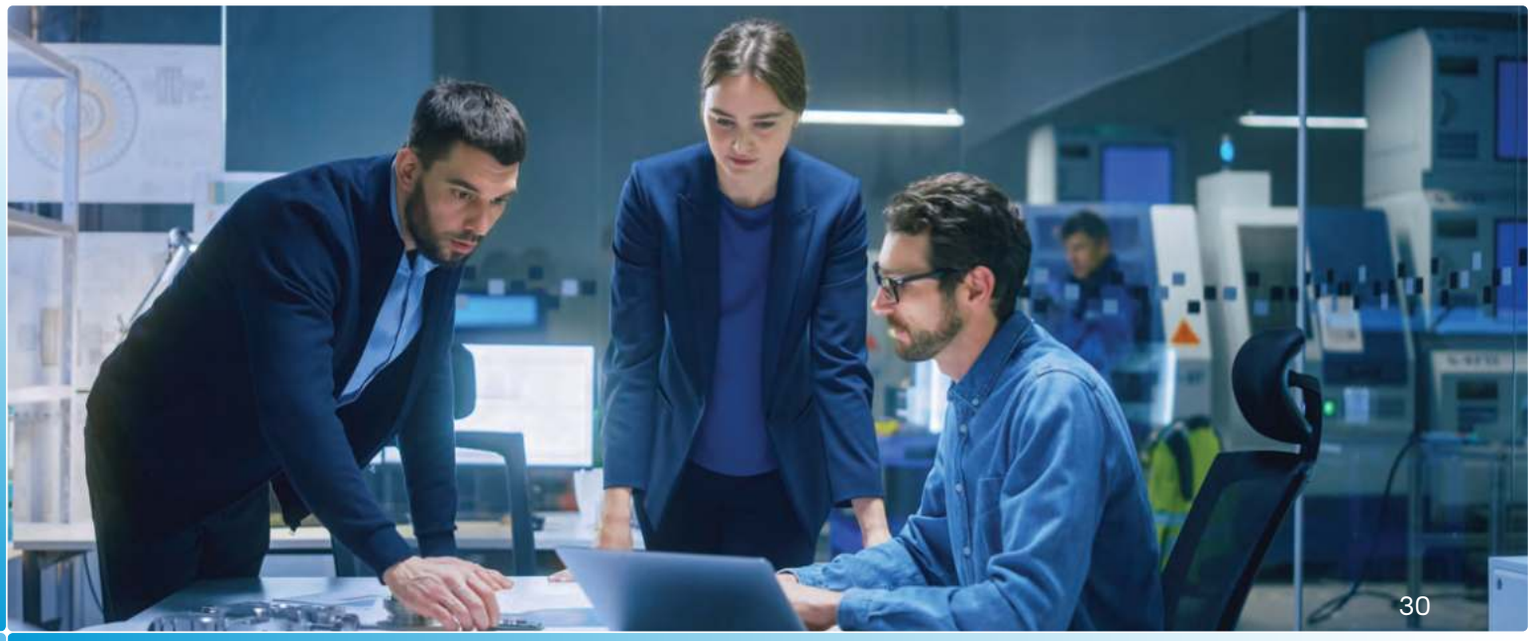
Strategic open innovation ecosystem dedicated to the field of SportsTech

HCLTech MetaLabs

HCLTech MetaLabs is a place where you will find 40+ HCLTech industry creator zones in the world of virtual reality, powered by 550+ Ideapreneurs and 300+ startup creator partners

HCLTech Q-Labs

HCLTech Q-Labs is the flagship quantum business unit stationed on four strategic pillars: viz. academy, R&D, industry offerings and ecosystem



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