BOREL SIGMA

WORLD ECONOMIC FORUM

Digital Communications

STRATEGIC INTELLIGENCE BRIEFING

Curated with Nanyang Technological University (NTU)

Generated for Raja Ram Mohan Roy on 02 March 2025

Contents

Executive summary

Explore the interactive version online

The digital communications industry is sustaining record levels of global internet use, online social interaction, and financial inclusion. As the industry is transformed, effective policy and regulation that support businesses while also ensuring the rights of users can ultimately boost productivity - though an openness to new models of collaboration and governance is required, in order to best address challenges like data privacy and mounting infrastructure demands.

This briefing is based on the views of a wide range of experts from the World Economic Forum's Expert Network and is curated in partnership with A S Madhukumar, Associate Professor at Nanyang Technological University's School of Computer Engineering in Singapore. The content does not necessarily reflect the views of the Forum.

The key issues shaping and influencing Digital Communications are as follows:

ConnectivityandCoverage
Moreseamlessconnectivityamongcellular networks,vehicles,satellitesanddronescouldhelp erase the digital divide

PolicyUncertainty
Shiftsinthedigitalcommunicationssectorare outpacing existing regulation

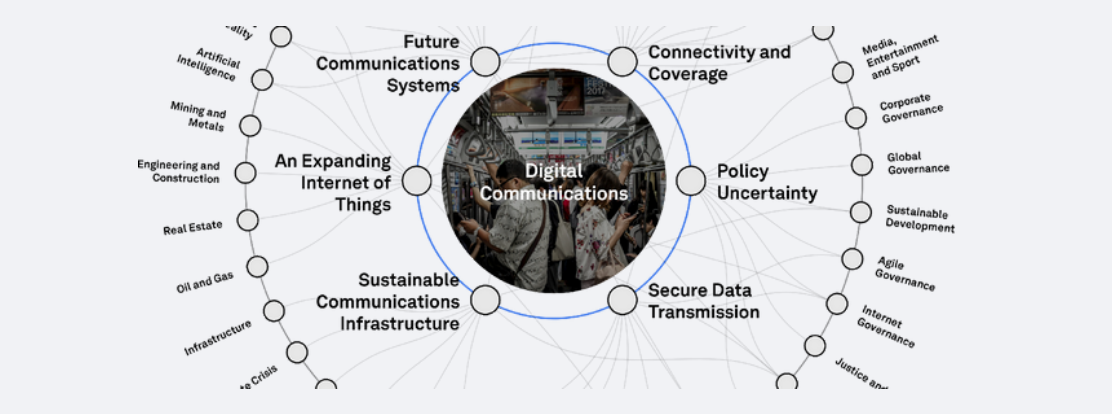
SecureDataTransmission
Increasingcomputingpowermaymakedigital communication more vulnerable to hacking

SustainableCommunicationsInfrastructure
Technologieslikeblockchainandsoftware-defined networkingcancutbothcostsandenergyuse

An Expanding Internet of Things
Wavesofconnecteddevicesareblurringthe boundarybetweenthephysicalanddigitalworlds

Future Communications Systems
Systemsthatareself-aware,self-optimizingand self-healingareonthehorizon

Below is an excerpt from the transformation map for Digital Communications, with key issues shown at the centre and related topics around the perimeter. You can find the full map later in this briefing.



In the following sections, we give a comprehensive summary of the latest Insights and Trends shaping the topic, a look at potential Forecasts and Scenarios based on current and emerging trends, and an overview of the Strategic Context.

1 Insights and trends

A synthesis of the most recent expert analysis.

1.1 Currentperspectives

Australian Strategic Policy Institute

Meta's Waterworth cable project is about geopolitics and geoeconomics

27 February 2025

Meta's Project Waterworth, announced on February 14, aims to create the world's longest submarine cable, connecting five continents. This initiative enhances Australia's collaboration with regional partners, particularly India and Pacific nations, while allowing Meta to capitalize on international data flows. The cable's route strategically avoids areas with potential malign influence and prioritizes security against cyber threats. It underscores India's growing digital prominence and serves to strengthen Meta's standing among US tech giants amid geopolitical tensions, particularly concerning China. The project also presents opportunities for improved regional regulatory cooperation and cyber resilience in submarine cable operations.

War on the Rocks

The Rise of the Fake Tech Workforce: State-Sponsored Infiltration of U.S. Technical Supply Chains - War on the Rocks

27 February 2025

North Korean nationals have perpetrated a fake IT worker scheme impacting hundreds of U.S. firms, funneling millions toward the country's ballistic missile program. This scheme exploits identity fraud to gain access to sensitive systems, posing a significant national security threat. The FBI warns that North Korea has trained thousands to execute such fraud, aided by Chinese and Russian firms. The ongoing shortage of cybersecurity expertise in the U.S. increases vulnerability, allowing adversaries to leverage this infiltration for potential sabotage or data theft. Enhanced integration between the defense industrial base and the broader technology sector is crucial for mitigating these risks.

SpringerOpen

Secure ISAC MIMO systems: exploiting interference with Bayesian Cramér–Rao bound optimization

27 February 2025

A signaling design is proposed for secure integrated sensing and communication (ISAC) systems utilizing a dual-functional multi-input multi-output base station. The design enhances sensing performance by optimizing the Bayesian Cramér–Rao bound while ensuring quality of service for communication. By exploiting constructive interference, signals aimed at eavesdroppers are directed into a destructive region, reducing their decoding probability and bolstering physical layer security. A tailored successive convex approximation method is introduced to effectively solve the nonconvex optimization, with numerical results demonstrating its superiority over traditional block-level precoding techniques.

Electronic Frontier Foundation

The Senate Passed The TAKE IT DOWN Act, Threatening Free Expression and Due Process

25 February 2025

The Senate passed the TAKE IT DOWN Act (S. 146), aimed at expediting the removal of non-consensual intimate imagery (NCII), including deepfakes. While protecting victims is important, the bill threatens free expression, privacy, and due process through its notice-and-takedown requirements. It potentially encompasses a broad range of intimate content without proper safeguards against misuse, risking the wrongful censorship of

lawful speech, such as satire and journalism. The act may force platforms to abandon encryption to comply with rapid takedown demands, leading to increased surveillance of private conversations. Congress is urged to focus on enhancing existing laws rather than adopting this bill.

Nature

Sharing benefits of research is key to effective science communication

25 February 2025

Effective science communication hinges on sharing the benefits of research with the public. Highlighting the positive impacts of scientific findings fosters understanding and engagement, ultimately enhancing the relationship between scientists and society.

GovLab - Living Library

California Governor Launches New Digital Democracy Tool

24 February 2025

California Governor Gavin Newsom announced the launch of Engaged California, a digital democracy initiative aimed at connecting residents directly with government officials, particularly during disasters. The initiative will start by assisting victims of recent wildfires in Pacific Palisades and Altadena, allowing them to voice their concerns on issues like insurance and building standards. Newsom described the program as a modern town hall, emphasizing community involvement in recovery efforts. Modeled after a successful Taiwanese program, Engaged California aims to strengthen public engagement and combat misinformation.

W ired

Samsung's Affordable Galaxy A36 and Galaxy A26 Will Get 6 Years of Software Updates

01 March 2025

Samsung is launching the Galaxy A36 and A26, priced at $400 and $300 respectively, with 6 years of software updates, surpassing previous offerings. Both models feature a 6.7-inch AMOLED display with a 120 Hz refresh rate, a 5,000 mAh battery, and water resistance (IP67). The cameras include a 50-MP main sensor and varying ultrawide and macro configurations. The Galaxy A36 utilizes a Qualcomm Snapdragon processor, while the A26 and upcoming Galaxy A56 use Samsung's Exynos chips. Pre-orders begin March 26 for the A36 and March 28 for the A26.

World Economic Forum

How do Early Warning Systems work – and how can we improve them?

28 February 2025

Early Warning Systems (EWS) monitor and predict extreme weather events, providing crucial alerts to protect communities from natural disasters like floods and tsunamis. Advancements in AI, remote-sensing, and partnerships among governments, businesses, and communities are enhancing these systems. The UN's Early Warnings for All initiative aims to ensure that everyone receives adequate warnings by 2027. Despite progress, challenges remain, including funding gaps and the need for better collaboration. A World Economic Forum white paper emphasizes the importance of open data, business engagement, and public-private partnerships in improving EWS effectiveness.

The Quantum Insider

Caltech Demonstrates Multiplexed Entanglement to Advance Scalable Quantum Networks

27 February 2025

Caltech researchers demonstrated multiplexed entanglement using ytterbium ions in nanophotonic cavities to enhance entanglement rates by utilizing multiple qubits per node. This method employs frequency-multiplexed photons and a quantum feed-forward correction system to stabilize entanglement distribution despite frequency mismatches. The multiplexing technique allows simultaneous entanglement across multiple qubits, significantly improving quantum communication bandwidth and resilience. This advancement is a crucial step toward scalable quantum networks and the future of a quantum internet, though further technologies like quantum repeaters will be necessary for long-distance applications.

International Telecommunication Union

Strengthening the world's digital backbone

26 February 2025

Digital technologies have become integral to global social and economic life, with two-thirds of the world's population now online, an increase from less than half in 2015. The International Telecommunication Union (ITU) is dedicated to ensuring sustainable digital access for all, addressing a $1.6 trillion investment gap through initiatives like the Digital Infrastructure Investment Initiative. ITU manages crucial submarine cable systems and promotes resilient connectivity while working on sustainable satellite use and green digitalization strategies. It also focuses on leveraging AI for socio-economic progress and preparing for challenges posed by quantum technologies.

Science Daily

Study shows primary care and telehealth can deliver life-changing diabetes care

24 February 2025

Research from the University of Colorado Anschutz Medical Campus indicates that individuals with Type 1 diabetes can achieve similar positive outcomes using advanced insulin technology when trained by primary care providers (PCPs) or via telehealth, compared to traditional in-person consultations with specialists. In the study, 97% of participants reached healthy blood sugar levels, with 64% surpassing other benchmarks. The findings advocate for broader access to diabetes care, particularly in areas lacking endocrinologists, showcasing the potential of telehealth in providing effective management for millions with diabetes. A follow-up study is set to investigate longer-term effects.

W ired

Gear News of the Week: Skype Will Close for Good in May

01 March 2025

Skype will permanently close on May 5, 2023, following a significant decline in users from 300 million in 2016 to 36 million currently, largely due to competition from platforms like Zoom and Teams. Users have 10 weeks to transfer chats and contacts to Microsoft Teams, with ongoing messaging support during the transition. Meanwhile, Adobe launched a full-featured Photoshop app for iPhone, offering layer-based editing and AI tools, although some features require a subscription. Google's Pixel Watch 3 gained FDA clearance for its Loss of Pulse feature, which alerts emergency services when no pulse is detected. Oura is also conducting a large-scale pregnancy study.

LSE Business Review

The US reciprocal tariff plan is anything but reciprocal

27 February 2025

The Trump administration's Reciprocal Trade and Tariffs memorandum is characterized as a unilateral approach that threatens to harm international trade more than previous tariffs. The plan aims to establish tariffs based on purported unfair practices of trading partners, contrasting the longstanding principles of reciprocity and non-discrimination upheld by the World Trade Organization (WTO). This initiative could undermine previous agreements and alter the regulatory landscape by unilaterally defining what constitutes fairness. As a result, the US would impose tariffs or threats thereof to coerce changes in trading partners' regulations, impacting the global trade system established over the past 70 years.

GovLab - Living Library

Data Sovereignty and Open Sharing: Reconceiving Benefit-Sharing and Governance of Digital Sequence Information

24 February 2025

Ethical, legal, and governance challenges surround digital sequence information (DSI) on genetic resources. The paper discusses the international framework shift regarding benefit-sharing from DSI, emphasizing data sovereignty in the context of AI and synthetic biology. It highlights tensions between open science principles and data control, particularly during the COVID-19 pandemic. The need for inclusive and equitable data sharing frameworks that respect privacy and sovereign rights is underscored, advocating for international cooperation to reduce global inequalities in scientific and technological advancement.

The Tokenist

American Tower Beats Expectations with $2.55 Billion Revenue in Q4

25 February 2025

American Tower Corporation reported fourth-quarter 2024 revenue of $2.55 billion, exceeding expectations and marking a 3.7% increase. Key growth drivers included a 2.0% rise in property revenue and a remarkable surge in net income by 9,151.9% to $1.23 billion, due to effective cost management and globalization efforts. Adjusted EBITDA increased 5.1% to $1.69 billion. The company anticipates continued growth, projecting a net income range of $2.93 billion to $3.02 billion for 2025, alongside an expected 1.1% rise in adjusted EBITDA.

World Economic Forum

3 trends shaping the future of cyber leadership

27 February 2025

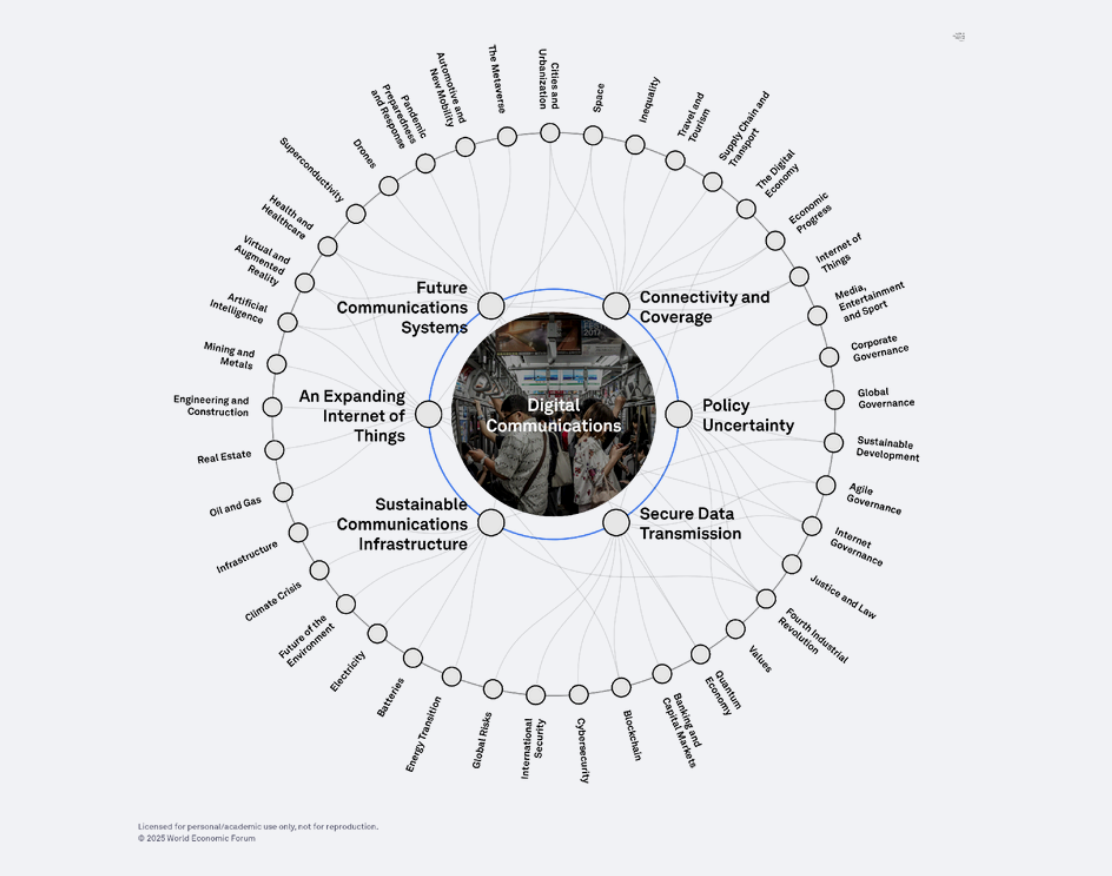
Ongoing geopolitical shifts are undermining international cooperation in cybersecurity, presenting challenges for cyber leaders. The rapid adoption of artificial intelligence and transformative technologies is altering the cybersecurity landscape, introducing new vulnerabilities. As millennials and Generation Z dominate the workforce, cyber threats are increasingly targeting decentralized platforms and cryptocurrency exchanges. Increasing geopolitical tensions are leading to reduced cooperation and funding for cybersecurity initiatives and creating uncertainty in the global cyber landscape. Cyber leaders must adapt to evolving threats, emphasizing the need for new security practices and addressing the complexities of global supply chains.

2 Strategic context

The key issues shaping Digital Communications.

The following key issues represent the most strategic trends shaping the topic of Digital Communications. These key issues are also influenced by the other topics depicted on the outer ring of the transformation map.

FIGURE 1 Transformation map for Digital Communications



2.1 ConnectivityandCoverage

More seamless connectivity among cellular networks, vehicles, satellites and drones could help erase the digital divide

Electronic communications infrastructure could ultimately provide connectivity anywhere, anytime with uniform quality - regardless of region or socio-economic status. More efficient infrastructure can address a persistent digital divide separating those able to access computers and the internet from those who must do without. The number of global internet users increased to approximately 5.4 billion in 2023, or some 67% of the population, according to the International Telecommunication Union - up 45% from 2018, as an estimated 1.7 billion people gained internet access during the period. Yet, a not-insignificant 2.6 billion people remain

without online connectivity. That is despite the fact that over the past 65 years or so, both wireline and wireless networks have radically evolved. A multitude of technologies have emerged in parallel, helping connect people via fibre broadband networks, undersea cables, cellular mobile networks, and satellites. Even more significantly, advances in chip design and ever-increasing computing power have supercharged mobile devices. By 2023, there were roughly 8.5 billion mobile connections worldwide, projected to grow to 9.5 billion by 2030, according to the GSMA. In a recent five year-span alone, mobile-broadband subscriptions grew by 27% - nearly four times higher than the growth rate for mobile-cellular subscriptions.

Such exponential growth has made wireless connectivity increasingly affordable. The foundation for future innovation and services will be 5G; the advanced networks are expected to reach the equivalent of 5.3 billion connections, and contribute nearly $1 trillion to the global economy, by 2030. The proliferation of 5G has already significantly expanded the connectivity of devices to cellular networks, and more growth is expected due to the emergence of private networks and the Industrial Internet of Things. The increasingly substantial data generated by smart devices, coupled with the integration of artificial intelligence and machine learning, should provide even more profound insights for sustainability-related applications. 5G will continue to evolve as a standard, similar to LTE - which has evolved through a series of ongoing updates. While some elements of even more cutting-edge 6G networks will no doubt be constructed anew, and thereby take advantage of the opportunities inherent in starting afresh, certain aspects of incumbent 5G networks will persist - not least by serving as the groundwork for their successors when it comes to matters including the ongoing evolution of AI and machine learning networks within the 5G framework.

Related topics: Cities and Urbanization, Space, Inequality, Travel and Tourism, Supply Chain and Transport, The Digital Economy, Economic Progress, Internet of Things

2.2 PolicyUncertainty

Shifts in the digital communications sector are outpacing existing regulation

The global playing field for the digital communications industry has changed significantly due to advancing digitalization. The time when the focus for regulators was simply on competitive dynamics has long since passed; now, they must understand a complicated field of ageing incumbents and younger, digitally-focused players providing unprecedented access to services. By 2030, the number of smartphone connections is projected to reach 9 billion, or 92% of the total connections worldwide. This substantial growth in smartphone data traffic can be attributed to things like video streaming and online gaming (video alone may constitute roughly 70% of all mobile data traffic). 5G is also a catalyst - forecasts indicate that it will surpass 4G by 2029 and become the predominant mobile technology - as is the explosive growth of social media use. A fundamental resource needed to meet this growing demand is spectrum, which is however relatively scarce and subject to the significant influence of policy-makers. According to the GSMA, already by 2022 mobile technologies and services accounted for 5% of global GDP, contributing a total of $5.2 trillion to economic value added. The main benefits stemmed from productivity effects, totalling $3.5 trillion, and mobile operators, at $650 billion.

Projections indicate that by 2030, mobile's contribution to the global economy will surpass $6 trillion. The anticipated global economic impact of 5G alone by 2030 is estimated at over $950 billion. While conventional spectrum management is based on so-called static allocation, where spectrum is licensed in discrete portions according to a radio standard, in recent years developments in digital signal processing and semiconductor technologies, as well as the advent of artificial intelligence-based networks, have enabled more agile, cooperative, and cognitive wireless platforms. The trade-offs involved in deploying these innovations must be carefully evaluated, however - and policies that enable the ad-hoc utilization of spectrum, rather than letting it sit unused in rigid structures, must be formulated. As standards evolve, they should also better accommodate the changing technological landscape - to eliminate the fragmentation of development, and to help reduce capacity bottlenecks. Policy-makers must incentivize incumbent telecom industry players to enable the faster adoption of new technologies. They need to tread carefully, however, in order to ensure fair play. The ultimate performance indicator is sustainability - regulators should play a proactive role in promoting energy-efficient, sustainable technologies so that industry transformation can have a broad, positive impact.

Related topics: Media, Entertainment and Sport, Corporate Governance, Global Governance, Sustainable Development, Agile Governance, Internet Governance, Justice and Law, Fourth Industrial Revolution, Values

2.3 SecureDataTransmission

Increasing computing power may make digital communication more vulnerable to hacking
Next-generation digital networks are expected to make broadband connectivity a reality anywhere, anytime. Every facet of life is going to be digitalized and networked, amid increasingly prevalent self-driving vehicles, environmental monitoring, and online payments. This will increase the exchange of sensitive data, and the networking of critical assets - and the protection of data integrity and data privacy will be essential. Since World War II, increasingly robust and diverse cryptographic techniques for transmitting sensitive information have been deployed. State-of-the-art techniques are based on the exchange of widely available public keys, and undisclosed private keys, both of which function like passwords and are related through complex mathematical expressions. Due to ever-increasing computing power, however, these keys may become vulnerable to so-called brute-force attacks - which involve testing all possible combinations of characters in a key through trial and error. Traditionally, a dedicated security layer within a network's protocol stack, or the software that sets the rules for a network's interconnectivity, is used to provide secrecy - while the physical layer of networking equipment is limited to signal processing and transmission. However, it is now understood that the physical layer can also be used to provide security.

Emerging cryptographic techniques like quantum cryptography, which relies on physics rather than math in order to encode information using elements such as light particles, deserve greater attention. The first quantum transaction, in 2004, used entangled photons to transfer money into a bank account. Blockchain is another networking paradigm gaining prominence as a distributed, cryptography-based service enabler. Blockchain and quantum cryptography are each emerging as pivotal components in shaping the future of secure digital transactions. While blockchain provides a decentralized and tamper-resistant ledger, potentially ensuring transparency and integrity in data transactions, quantum cryptography addresses the serious threats posed by powerful quantum computers to traditional cryptographic methods. As quantum computers gain prominence, their ability to break widely-used cryptographic protocols will only become more of a data security concern. Quantum cryptography leverages the principles of quantum mechanics, enabling a new paradigm for secure communication. Unlike classical cryptographic algorithms vulnerable to quantum attacks, quantum cryptography leverages quantum key distribution to ensure secure key exchange. Integrating quantum-resistant cryptographic techniques with blockchain technology could help fortify security systems against the evolving hazards posed by quantum computing advances, and ensure the continued integrity and confidentiality of digital transactions and information.

Related topics: Quantum Economy, Internet Governance, Agile Governance, Banking and Capital Markets, Blockchain, Cybersecurity, The Digital Economy, International Security, Global Risks

2.4 SustainableCommunicationsInfrastructure

Technologies like blockchain and software-defined networking can cut both costs and energy use
Wireless systems consume substantial resources. In 2020, China's mobile networks and data centres consumed about 201 terawatt-hours of energy, and a Greenpeace study has predicted a 289% increase in energy use by wireless networks in that country between 2020 and 2035 - due to 5G deployment and growing consumer demand. The radio access network (RAN) component of these systems may be key for improving energy efficiency. According to the GSMA, a RAN consumes 73% of the energy used by network operators (data centres also contribute significantly to energy consumption). However, initiatives like Open RAN are expected to shift processing to software-based, decentralized units. More energy-efficient infrastructure can directly reduce carbon emissions; this is a particularly pressing need amid the Fourth Industrial Revolution, which is underpinned by emerging technologies related to digital communications like cloud computing, data analytics, and artificial intelligence. This mix of technologies may lead to a mix of standards - and to a fragmentation of valuable resources and capacity. Greater adaptability of infrastructure, in a world of diverse wireless standards, is essential. Yet, current state-of-the-art communications networks including 5G and Long Term Evolution Advanced (LTE-A) are based on rigid, centralized architecture.

Efforts to reduce power consumption are underway; roughly 46% of the electricity used globally by mobile networks now comes from renewables, though achieving net-zero goals requires further progress. Efforts have been made to enhance 5G base station efficiency, and 6G promises intensified measures. Machine learning is a promising means of optimization, and blockchain-style distributed networking, where users communicate through peer-to-peer links, could improve service quality by reducing latency while cutting energy costs. Software-defined networking, which enables the manipulation of traffic and services

independent of hardware, and virtualization, where things like intrusion detection can be done through software rather than having to rely on hardware, are being touted as the future of networks. Another way to cut energy consumption and increase sustainability is to replace telecom networks powered by the electricity grid and batteries. While renewable energy can be problematic due to intermittency of the energy supply, the evolution of advanced power storage technologies means sustainable power generation is expected to become a reliable alternative to fossil fuels. For Internet of Things networks, for example, energy-harvesting sensors can provide a sustainable alternative to battery-powered versions - and the digital communications industry should make efforts to optimize accordingly.

Related topics: Cities and Urbanization, Sustainable Development, Energy Transition, Batteries, Electricity, Future of the Environment, Climate Crisis, Fourth Industrial Revolution, Infrastructure

2.5 AnExpandingInternetofThings

Waves of connected devices are blurring the boundary between the physical and digital worlds

The Internet of Things (IoT) facilitates a flow of information among smart devices, cars, and home appliances. Global IoT connections increased by 17% in 2022, according to Statista, reaching 13.1 billion active endpoints (an additional 15% increase was projected for 2023). By 2030, the total number of IoT device connections should reach 29.4 billion, which will have an inevitable impact on peoples' daily lives. It is already possible to cut travel time by optimizing routes, for example, and remote health monitoring for elderly patients is now more feasible. The spread of connected devices in combination with increased online activity has also enabled new marketing techniques and customization. However, greater numbers of connected devices may make it difficult for wireless service providers to guarantee quality (one way to reduce cost and latency might be to deploy decentralizing blockchain technology). Another growing areas is "Industrial" IoT (IIoT), comprised of devices, sensors, applications, and networking equipment collaborating to collect and analyse data from industrial operations - to increase visibility, troubleshoot, provide maintenance, reduce costs, and increase efficiency and safety in industries like manufacturing, transportation, oil and gas, and mining.

"Industry 5.0," enabled by advancements in IoT, goes beyond efficiency to emphasize human collaboration with advanced technology like artificial intelligence, in addition to resilience and sustainability. It is intended to foster a broader perspective than Industry 4.0, as a major shift in the interaction between machines and humans has been triggered by technology advances. Intelligent human-machine interfaces could be deployed in connected devices, as could virtual reality and augmented reality technologies to enhance efficiency. The potential to blend these technologies is tremendous - examples of areas where this could be applied include real estate (visiting a property virtually), architecture (inspecting a building before construction), and healthcare (remote monitoring of patients). However, there are challenges that need to be addressed before mass adoption is possible. The cost of devices needs to come down, for example, and data privacy and protection must be addressed. Human-machine interface advances could also be hampered by the bulk and cost of typical virtual- and artificial reality devices. Still, progress in image processing, machine learning, pattern matching, and deep learning techniques has markedly enhanced human-machine interaction, enabling a greater ability to operate smartphones and other devices through hand gestures and voice commands, for example.

Related topics: Fourth Industrial Revolution, Oil and Gas, Internet of Things, Real Estate, Internet Governance, Engineering and Construction, Blockchain, Mining and Metals, Artificial Intelligence, Space, Virtual and Augmented Reality, Health and Healthcare

2.6 FutureCommunicationsSystems

Systems that are self-aware, self-optimizing and self-healing are on the horizon

The advent of smarter devices and services has exponentially increased demand for wireless data. Yet spectrum, a key resource, is already scarce and may become more so due to the proliferation of the Internet of Things, drones, in-car connectivity, and underwater cables. Still, the implementation of 5G and investigation into technologies beyond 5G should further boost data speeds and minimize latency - while integrating artificial intelligence and machine learning enables more efficient network management. Future communication systems will not only redefine how we connect, but also pave the way for transformative applications in different industries, from healthcare to smart cities. Both machine learning (which uses AI to help computers gather information without programming) and deep learning, where computers learn

algorithms in the same way a human brain absorbs information, have become increasingly important; researchers are trying to extend deep learning capabilities to communications infrastructure. 5G has already resulted in better speed and quality for mobile broadband networks, and there is growing demand for ultra-reliable low rates and extensive machine-type communication to facilitate time-sensitive connections among devices. The distinct use cases within a modern network present challenges that are compelling engineers to further integrate AI technologies.

In the face of growing competition among devices for network resources, traditional, linear design guided by human-based rules are no longer adequate. AI techniques tend to excel at addressing non-linear problems - by efficiently extracting patterns that human-based approaches cannot. The technology is crucial for recognizing patterns in communication channels between devices and people, and optimizing resource allocation. As global deployment of 5G progresses, the development of 6G is underway. While 6G has not been fully defined as a standard, stakeholders are outlining their wish lists for features. Unlike 5G's focus on enhanced mobile broadband, low-latency communications, and machine-type communication, 6G aims for a more holistic, immersive communication fabric with scalable network flexibility. Key performance indicators should include significantly higher data rates, global coverage, and adaptability to diverse environments with cost-effective infrastructure or non-terrestrial networks. COVID-19 underlined the importance of meaningful digital interaction, and the evolution towards 3D holographic telepresence is being driven by advancements in camera technology and graphics processing units. 6G may support the high-data-rate demands of holographic telepresence; while low latency is crucial for virtual reality applications based on holographic telepresence, augmented reality requires high uplink and downlink speeds for seamless coverage.

Related topics: Economic Progress, Health and Healthcare, Quantum Economy, Superconductivity, Virtual and Augmented Reality, Drones, Artificial Intelligence, Pandemic Preparedness and Response, Automotive and New Mobility, Internet of Things, The Metaverse, Fourth Industrial Revolution

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About Strategic Intelligence

Our approach

In today's world, it can be difficult to keep up with the latest trends or to make sense of the countless transformations taking place. How can you decipher the potential impact of rapidly unfolding changes when you're flooded with information - some of it misleading or unreliable? How do you continuously adapt your vision and strategy within a fast-evolving global context? We need new tools to help us make better strategic decisions in an increasingly complex and uncertain environment.

This live briefing on Digital Communications, harnesses the World Economic Forum's Strategic Intelligence platform to bring you the very latest knowledge, data and context from our 300+ high quality knowledge sources. Its aim is to help you understand the global forces at play in relation to Digital Communications and make more informed decisions in the future.

Each day, our Strategic Intelligence platform aggregates, distills and synthesizes thousands of articles from around the world. We blend the best of human curation with the power of machine learning to surface high-quality content on over two hundred global issues to our one million users globally. Our hand-picked network of content partners from around the world means that we automatically exclude much of the noisy clickbait, fake news, and poor quality content that plague the Internet at large. We work with hundreds of think tanks, universities, research institutions and independent publishers in all major regions of the world to provide a truly global perspective and we are confident that our data are well positioned when it comes to the intrinsic biases inherent to open text analysis on uncurated content from the Internet. For further context on our approach, you may be interested to read Strategic trend forecasting: anticipating the future with artificial intelligence and These Are The 3 Ways Knowledge Can Provide Strategic Advantage.

↓ A leading expert presenting a transformation map at our Davos Annual Meeting

Overview of methodology

Our Transformation Maps are dynamic knowledge visualisations. They help users to explore and make sense of the complex and interlinked forces that are transforming economies, industries and global issues. The maps present insights written by experts along with machine-curated content. Together, this allows users to visualise and understand more than 250 topics and the connections and inter-dependencies between them, helping in turn to support more informed decision-making by leaders.

The maps harness the Forum network's collective intelligence as well as the knowledge and insights generated through our activities, communities and events. And because the Transformation Maps are interlinked, they provide a single place for users to understand each topic from multiple perspectives. Each of the maps has a feed with the latest research and analysis drawn from leading research institutions and media outlets around the world.

At the centre of each map is the topic itself. This is surrounded by its "key issues", the forces which are driving transformation in relation to the topic. Surrounding the key issues are the related topics which are also affected by them. By surfacing these connections, the map facilitates exploration of the topic and the landscape within which it sits.
The framework extends beyond mapping current trends by incorporating forecasts and scenarios to project potential future states of the system. Forecasts are based on observable patterns, while scenarios explore broader possibilities, including low-probability but high-impact events. These elements contextualize key issues and related topics within potential future trajectories, enhancing strategic thinking and decision-making.

Harnessing collective intelligence from the Forum network and leading research institutions, the maps synthesize diverse insights into a cohesive view. By integrating these insights with the latest research and analysis, the framework provides a comprehensive understanding of how transformations unfold and interrelate, empowering users to navigate the evolving landscape effectively.

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Our Pro membership allows you to create unlimited custom transformation maps and the ability to collaborate on them with your colleagues. You also get the ability to export transformation maps images and Powerpoint presentations. As a Pro user, you also gain access to a range of hypothetical scenarios that have the potential to impact developments in the near future; enabling you to think through and anticipate potential opportunities and risks.

To learn more, visit our membership site.

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