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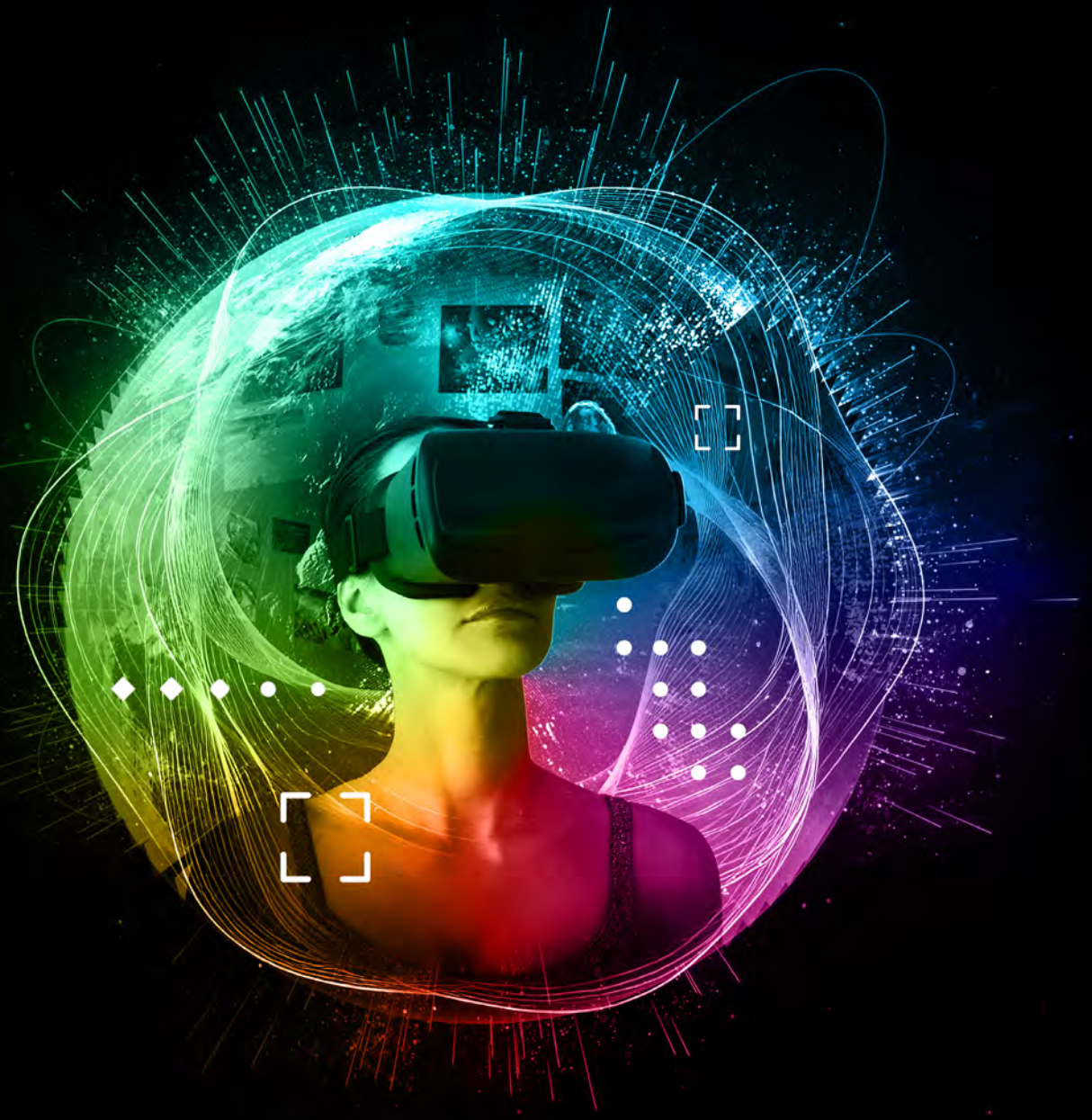
The Technology, Media & Telecommunications AI Dossier

A selection of high-impact use cases



The Deloitte AI Institute™

About the Deloitte AI Institute

The Deloitte AI Institute™ helps organizations connect all the different dimensions of the robust, highly dynamic, and rapidly evolving Artificial Intelligence ecosystem. The AI Institute leads conversations on applied AI innovation across industries, with cutting-edge insights, to promote human-machine collaboration in the "Age of With™."

The Deloitte AI Institute aims to promote the dialogue and development of AI, stimulate innovation, and examine challenges to AI implementation and ways to address them. The AI Institute collaborates with an ecosystem composed of academic research groups, start-ups, entrepreneurs, innovators, mature AI product leaders, and AI visionaries to explore key areas of artificial intelligence including risks, policies, ethics, the future of work and talent, and applied AI use cases. Combined with Deloitte's deep knowledge and experience in artificial intelligence applications, the Institute helps make sense of this complex ecosystem, and as a result, delivers impactful perspectives to help organizations succeed by making informed AI decisions.

No matter what stage of the AI journey you are in: whether you are a board member or a C-Suite leader driving strategy for your organization—or a hands-on data scientist bringing an AI strategy to life—the Deloitte AI Institute can help you learn more about how enterprises across the world are leveraging AI for a competitive advantage. Visit us at the Deloitte AI Institute for a full body of our work, subscribe to our podcasts and newsletter, and join us at our meet-ups and live events. Let's explore the future of AI together.

www.deloitte.com/us/AIInstitute

Foreword

Artificial intelligence (AI) continues to advance by leaps and bounds, delivering breathtaking capabilities once thought to be far off in the future. With a remarkable capacity to understand complex inputs and generate valuable outputs—and the rapidly emerging ability to execute real-world actions through intelligent agents and physical AI—AI is opening the door to innovations and new ways of working that were almost unthinkable just a few years ago.

As the AI landscape evolves, so does this compendium. Our latest edition features 130 of the most compelling use cases for AI across six major industries:

- **Consumer**
- **Energy, Resources & Industrials**
- **Financial Services**
- **Government & Public Services**
- **Life Sciences & Health Care**
- **Technology, Media & Telecommunications**

For each of these industries, we explore innovative uses for AI that can address enterprise challenges in new ways, expand and improve capabilities in every business function, and deliver advantages in efficiency, speed, scale, and capacity. To further provide context and clarity, each case specifies the primary business function it supports and whether agentic and/or physical AI is used. These labels are presented for informational purposes, helping you quickly grasp the intention and scope of each case.

Of course, every powerful tool presents potential risks, and AI is no exception. To help you better understand and manage the risks associated with AI, we use Deloitte's Trustworthy AI™ framework throughout this compendium to illuminate factors that contribute to trust and ethics in AI deployments, and to offer practical steps for strengthening governance and risk mitigation. The specific objective of our Trustworthy AI™ framework is to help organizations create AI systems that are (1) fair and impartial, (2) robust and reliable, (3) transparent and explainable, (4) safe and secure, (5) responsible and accountable, and (6) private.

Given AI's rapidly expanding scope and reach, this compendium offers just a glimpse of what the technology can do. Our goal is to convey what AI is currently capable of, and even more important, to inspire the next wave of AI-driven innovation. As AI technology continues to improve and organizations increasingly embrace it, we anticipate even more impressive and compelling use cases in the future—including those that have yet to be imagined.

We hope the use cases highlighted here will spark new ideas, provide a foundation for successful deployments, and set organizations on a path to harness the maximum value from this powerful new technology.

Nitin Mittal
Global Head of Generative AI
Deloitte Consulting LLP

Beena Ammanath
Global Deloitte AI Institute Leader
Deloitte Consulting LLP

Jim Rowan
US Head of AI
Deloitte Consulting LLP

The Technology, Media & Telecommunications AI Dossier

AI is reshaping the technology, media, and telecommunications sectors from the inside out. For businesses providing the digital foundation of the modern economy, AI technologies—including generative AI, AI agents, and physical AI—are driving both product innovation and operational reinvention. From code generation and content creation to network optimization and audience analytics, AI is accelerating time to market, enhancing user engagement, and unlocking new revenue models.

In the technology sector, AI is transforming how software is designed, built, and maintained. Developers are using AI-powered tools to write, test, document and debug code faster, while IT operations teams are deploying intelligent agents to monitor systems, predict outages, and automate resolution. In hardware, AI is enabling smarter design of chips and devices, shortening development cycles and improving performance.

Media organizations are leveraging generative AI to create hyper-personalized content, automate editorial workflows, and synthesize massive volumes of user data into actionable insights. Increasingly, agentic AI systems are moving beyond task automation—autonomously managing workflows, supporting technical sales, and orchestrating elements of content management across the industry landscape. Meanwhile, synthetic voice, image, and video capabilities are opening new formats for storytelling and user interaction.

In telecommunications, AI is enhancing technician support, streamlining network maintenance, and optimizing operations—helping providers deliver more reliable service and respond faster to customer needs. As 5G expands, AI will be critical to orchestrating complex, distributed infrastructure while enabling real-time services—from autonomous vehicles to immersive media.

Yet as AI becomes embedded in core platforms and content, the stakes rise around governance, transparency, and responsible use. Issues such as IP ownership, misinformation, algorithmic bias, and deep fakes present real risks. To stay competitive and credible, companies must balance speed of innovation with safeguards that build trust.

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Note: *The tags below each use case indicate its primary business function and whether Agentic AI is used.*

Tags | Primary business function | Agentic AI | Physical AI

AI-powered technical sales

Streamlining the end-to-end sales process with role-based AI agents

Agentic AI systems can augment sales teams by using specialized agents that mirror traditional sales roles, automate research and CRM tasks, and provide real-time support to boost sales performance and efficiency.

ISSUE/OPPORTUNITY

Technology sales are increasingly complex, requiring teams to manage long sales cycles, multiple stakeholders, and extensive product knowledge. Sales representatives often spend large amounts of time on administrative work—researching prospects, updating CRM systems, and preparing materials—leaving less time for relationship building and deal closure. These inefficiencies can reduce responsiveness to customers, lead to inconsistent engagement, and limit organizations' ability to scale sales operations effectively.

Tags: Sales | Agentic AI

HOW AI CAN HELP

Prospecting and research support
An AI-based business development representative (BDR) agent can research prospects, prepare initial pitch materials, and draft outreach communications, helping to provide consistent and timely engagement.

Lead qualification and CRM automation
Specialized AI agents can automatically update CRM systems, validate customer data, and handle routine record-keeping, reducing errors and freeing sales staff for higher-value activities.

Account executive (AE) enablement
An account executive AI agent can support the next stage of the sales process by preparing detailed materials, assisting with live customer inquiries, and coordinating documents to support the close of the deal.

Workflow integration
The AI agents can connect with sector-specific sales tools and platforms, align processes with industry best practices, and collaborate to provide seamless workflows across the sales organization.

AI-powered technical sales

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	Incorrect data entry or poor workflow execution could result in errors that undermine credibility and damage customer relationships. To minimize such problems, AI agents should be continuously monitored, validated, and tested against live sales processes.
Private	Because sales processes involve handling sensitive customer information, agents should comply with all relevant data protection regulations (such as GDPR and CCPA), minimize unnecessary data exposure, and use encryption to secure communications and CRM updates.
Responsible and accountable	While AI can support sales teams with research and recommendations, ultimate responsibility for customer relationships, pricing decisions, and contractual commitments should remain with human sales professionals and business leaders.
Safe and secure	Sales platforms and CRM systems are prime targets for cyberattack. AI agents should be integrated with enterprise-grade cybersecurity safeguards to prevent breaches, account takeovers, or data leaks that could damage trust with customers.

POTENTIAL BENEFITS

Increased sales productivity and lower costs

Automating research, CRM updates, and other sales support tasks can reduce costs while enabling human sales teams to spend more time engaging customers and closing deals.

Improved customer experience

Faster responses and more consistent communications improve customer satisfaction and help strengthen relationships and trust throughout the buying journey.

Scalable sales operations

AI agents can increase sales capacity without proportional increases in headcount, enabling organizations to expand their business in new and existing markets.

AI agents for customer success

Using agentic AI to improve post-sale support and customer success

Agentic AI systems can improve customer success and maximize long-term customer value by using AI to handle numerous post-sale support activities, allowing humans to focus on relationship building.

ISSUE/OPPORTUNITY

For technology companies, post-sale customer success is increasingly central to revenue growth, with a customer's long-term value to the business hinging on renewals, upsells, and cross-sells. However, customer success managers (CSMs) are often stretched thin, spending significant time on administrative work such as preparing success plans, drafting strategic review materials, and managing renewals in CRM systems. This leaves less capacity for relationship building and strategic conversations that secure customer loyalty.

As organizations scale and expand their account portfolios, they have a critical need to automate routine post-sales activities while delivering high-quality, personalized support. Agentic AI offers a way to maintain high-touch engagement—even for down-market or high-volume accounts—without proportional increases in staffing.

Tags: **Customer Service** | **Agentic AI**

HOW AI CAN HELP

Customer success planning
An overarching customer success agent reviews CRM and sales data to draft initial success plans and then continuously updates them with new inputs about usage, deployments, and engagement.

Ongoing monitoring and insights
Specialized agents analyze customer health scores, product usage, and support interactions, identifying risks and opportunities for proactive intervention by CSMs.

Strategic review preparation
Another AI agent prepares first drafts of materials for quarterly or strategic business reviews, providing customer-facing teams with timely, relevant insights.

Renewal and upsell support
A renewal agent drafts a renewal playbook, updates the CRM system, prepares quotes, and recommends product or pricing mixes, then cycles information back to the customer success agent for onboarding or cross-sell support.

Conversational support
Agentic AI-powered virtual assistants orchestrate advanced language models to deliver natural, adaptive conversations—handling a wide range of customer queries in real time and multiple languages. By combining orchestration with generative AI capabilities, these agents provide fast, accurate, and consistent responses, while automatically documenting interactions for future reference. This enables scalable, personalized support at lower cost.

AI agents for customer success

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	Since inaccurate data or flawed insights could undermine customer trust and loyalty, AI agents should be validated against actual customer usage patterns and regularly updated with new business rules.
Transparent and explainable	For customer-facing teams to trust and act on AI-driven recommendations, agents need to provide clear rationales for their outputs and highlight supporting data.
Responsible and accountable	Strong customer relationships are built on personal empathy and trust. As such, humans will always be a critical part of the sales and support process (pre- and post-sale) and have ultimate responsibility for building and maintaining relationships that last.

POTENTIAL BENEFITS

Higher customer retention

By proactively monitoring customer health and addressing problems early, AI agents can help organizations maintain strong relationships and reduce churn.

Increased sales growth

Agents can identify upsell and cross-sell opportunities that drive account expansion and long-term revenue growth.

Lower costs and improved productivity

Automation of routine planning, reporting, and CRM updates reduces costs and frees CSMs to focus on relationship building and other high-impact activities that boost customer satisfaction and value.

AI agents for software engineering

Automating the software lifecycle with multi-agent collaboration

Agentic AI systems can accelerate and improve software development by using specialized agents that generate, test, debug, and deploy code, enabling faster delivery of higher-quality applications at lower cost.

ISSUE/OPPORTUNITY

Software engineering is an increasingly complex challenge, with organizations under pressure to quickly deliver new features and products while maintaining high levels of reliability, security, and compliance. Traditional development approaches require large teams of software engineers to execute repetitive tasks such as writing boilerplate code, testing, debugging, and managing deployments. These activities are time-consuming and costly. Also, they can impair innovation and development by diverting skilled engineers away from strategic design and problem-solving.

Tags: R&D/Product Development | Agentic AI

HOW AI CAN HELP

Specialized coding agents
AI agents can generate code from natural language requirements, translating business or product needs directly into executable code.

Automated testing agents
Testing agents can validate functionality, identify defects, and ensure that new code integrates seamlessly with existing systems.

Debugging and troubleshooting agents
When errors are found, agents can automatically propose fixes or apply patches, quickly resolving problems and accelerating development timelines.

Deployment and operations agents
Specialized agents can handle integration, deployment, and monitoring, facilitating smoother releases and more resilient production environments.

Code summarization and documentation
Agentic AI can automatically generate clear, human-readable documentation alongside code, improving maintainability and accelerating future development—without burdening engineers with manual write-ups.

AI agents for software engineering

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

In software development, code quality and integrity are paramount. AI agents should be validated against test suites, subjected to rigorous regression testing, and monitored in production to help ensure reliability at scale.

Transparent and explainable

Since developers must understand, maintain, and extend AI-written code, agents should provide clear documentation and traceability of their logic and coding decisions. This includes explaining why specific code structures, libraries, or fixes were chosen.

Private

Agents must avoid exposing sensitive business logic, proprietary algorithms, or customer data during development and deployment. Data privacy protections and secure handling of intellectual property are essential, particularly when using shared or cloud-based training data.

Responsible and accountable

Although AI agents can perform coding tasks well, ultimate responsibility for design decisions, compliance, and final code deployment should rest with human engineers and engineering managers. Clear governance frameworks should ensure that accountability is not abdicated to autonomous systems.

POTENTIAL BENEFITS

Faster development cycles

Automation of coding, testing, and debugging shortens release timelines, enabling quicker delivery of features and products.

Improved code quality

Continuous AI-driven testing and refinement can reduce defects and lead to more reliable, secure software.

Greater productivity and efficiency

By offloading repetitive software development tasks, engineers can focus on higher-value activities such as strategic design, innovation, and problem-solving.

AI agents for service lifecycle management

Automating technology and telecom service activities

Agentic AI can manage key service lifecycle functions—including customer support, network operations, and billing—operating with minimal human intervention to improve efficiency and scalability.

ISSUE/OPPORTUNITY

Telecom and technology providers face rising demand for responsive, always-on service delivery. Traditional service lifecycle processes—such as handling customer inquiries, managing network performance, and processing billing—often rely on large teams performing repetitive tasks across multiple systems. These manual approaches can create delays, inconsistencies, and higher operating costs, while limiting the ability to scale operations effectively.

Tags: **Operations** | **Agentic AI**

HOW AI CAN HELP

Specialized functional agents
AI agents can be tailored for specific functions such as customer service, network monitoring, billing management, and field support, each handling tasks autonomously with high speed and consistency.

Customer support automation
In support environments, AI agents can triage tickets, resolve common issues, and escalate complex cases as needed, whether through voice or text-based channels.

Operational integration
Integrated into existing enterprise platforms, agents can update records, monitor systems, and provide real-time recommendations, seamlessly aligning with current workflows.

Scalable orchestration
Multi-agent systems can coordinate activities across service lifecycle stages, enabling efficient end-to-end management with minimal human oversight.

On-site troubleshooting support
AI-powered tools equip field technicians with access to troubleshooting guides and generate clear, step-by-step resolution plans, improving on-site problem solving and network performance.

AI agents for service lifecycle management

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	Maintaining data integrity and ensuring accurate ticket resolution are critical, especially when agents operate autonomously. AI agents should be continuously validated for accuracy and stability.
Safe and secure	Given the risks of cyberattacks targeting critical telecom and technology infrastructure, agent systems should be hardened against intrusion and designed with robust cybersecurity measures to protect networks from sophisticated attacks.
Private	Since agents often handle sensitive customer and operational data, strong security protocols and strict compliance with privacy regulations are essential.
Responsible and accountable	Agentic AI can make mistakes or overlook nuances in complex service cases. Human supervisors need to closely monitor AI agents and retain final responsibility for actions and decisions, intervening whenever necessary—especially in situations that involve sensitive customer information or regulatory compliance.

POTENTIAL BENEFITS

Greater efficiency and lower costs

Automating routine service tasks can improve the productivity of support and operations teams, reducing both the time and cost required to address customer inquiries and technical issues.

Improved customer satisfaction

AI-driven service that is faster, more consistent, and more reliable enhances customer satisfaction and loyalty.

Scalable operations

Organizations can expand support capacity and manage higher service volumes without proportional increases in headcount. Also, existing service staff can shift their focus to activities that are more complex and strategic.

Efficient marketing spend

Using AI agents to improve the efficiency of marketing spend

Agentic AI systems can help media and entertainment companies get more value from their marketing spend by forecasting financial outcomes, evaluating ROI, and running budget scenarios to optimize growth, retention, and profitability.

ISSUE/OPPORTUNITY

Media and entertainment companies invest heavily in marketing to drive subscriptions, viewership, and engagement; however, measuring and optimizing financial impact remains a complex challenge. Marketers must balance budgets across multiple channels, predict outcomes such as customer acquisition and retention, and spend their money as efficiently and effectively as possible—particularly during high-profile events, which have outsized financial implications.

Traditional forecasting and ROI analysis often rely on manual processes and disconnected tools, making it difficult to produce timely, accurate insights. Without more adaptive, data-driven approaches, marketers risk overspending, missing revenue opportunities, or failing to adjust strategies quickly enough to reflect changing consumer behavior and market conditions.

Tags: **Marketing** | **Agentic AI**

HOW AI CAN HELP

Financial forecasting
Marketers need tools that can continuously analyze performance, forecast outcomes, and support decision-making on where best to invest their resources. A financial forecasting agent can analyze marketing budget inputs and business assumptions to generate full-year projections for revenue, spend, and profitability.

Marketing effectiveness analysis
A marketing effectiveness agent can analyze historical and current performance data to provide recurring insights on ROI, ROAS, and customer lifetime value.

Scenario planning
A scenario planning agent can run simulations of different budget strategies to model impacts on subscription starts, retention, and overall profitability.

Coordinated decision support
By sharing insights across forecasting, effectiveness, and scenario planning, AI agents can collaborate to provide a comprehensive view of marketing's financial contribution.

Efficient marketing spend

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	Inaccurate forecasts and simulations can lead to poor budget decisions. To improve reliability, AI agents should be continuously tested and refined to reflect real-world market conditions.
Private	Because customer-level data is used to measure marketing effectiveness, strong data governance and compliance with privacy regulations are essential.
Responsible and accountable	AI agents are fallible and cannot perfectly anticipate all external factors or sudden market shifts. Also, AI hallucinations remain a concern. Ultimately, humans need to be responsible and accountable for all decisions and actions.

POTENTIAL BENEFITS

Higher revenue

By automating forecasting and scenario planning, agentic AI helps drive higher revenue through more accurate bundle sign-up predictions and targeted marketing efforts.

Improved efficiency and conversion rates

Greater efficiency in owned and paid channels—including both traditional linear TV and connected TV (CTV)—can lead to better conversion rates for subscriptions.

Faster, more agile decisions

Agentic AI enables a business to respond more quickly to market changes and optimize marketing spend during high-impact events.

AI-supported budget allocation

Using AI agents to optimize how marketing budgets are allocated

Agentic AI systems can inform and optimize global, regional, and national marketing budget allocations across cost centers, brands, content types, and performance channels.

ISSUE/OPPORTUNITY

Global media and entertainment companies operate across multiple regions, products, and channels, with significant marketing investments needed to drive subscriptions and engagement. Traditional budgeting processes often rely on static planning cycles and siloed data, making it difficult to dynamically reallocate spend across cost centers, brands, content types, and performance channels.

Without better budgeting tools, organizations risk under-investing in high-performing areas, overspending in less effective channels, and creating global and regional strategies that are out of line with local market realities.

Tags: Finance | Agentic AI

HOW AI CAN HELP

Cost center analysis
AI agents analyze marketing spend across cost centers and recommend reallocations that optimize key performance indicators (KPIs) such as sign-ups, churn, and viewership.

Product, channel, and vendor optimization
Other agents assess product, channel, and vendor mix within each market, using predictive models to maximize subscription starts and profitability.

Regional and country-level scenarios
Scenario planning agents run simulations of budget allocations at regional and country levels, evaluating the impact of incremental or cost-saving changes on subscriptions, retention, and profitability.

Coordinated recommendations
Agents collaborate to provide a unified view of marketing performance and deliver actionable recommendations for smarter, more flexible budget allocation.

AI-supported budget allocation

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	Bad marketing budget decisions can have serious consequences for the broader business. Agents should be validated regularly against historical budgets and real-world outcomes, using continuous performance tracking to help ensure accuracy and minimize the risk of misallocation.
Transparent and explainable	Agents should be able to provide clear explanations of their reasoning—e.g., how reallocating $X from channel A to channel B affects ROI—so marketing leaders can understand and trust their recommendations.
Responsible and accountable	AI agents should be used as decision-support tools, with final responsibility reserved for marketing and finance leaders who understand strategic business contexts.
Safe and secure	Given the sensitivity of financial plans, systems must be built with enterprise-grade security to help ensure budget forecasts and proprietary data are protected from breaches or misuse.

POTENTIAL BENEFITS

Improved financial outcomes

Optimizing the product, channel, and vendor mix within each country can maximize subscription starts, customer retention, and overall profitability.

Greater spend efficiency

Efficiency improvements in both CTV and owned marketing channels can drive higher conversion rates and reduce wasted marketing spend.

More flexible decision-making

Real-time scenario planning enables marketing teams to adjust budgets dynamically, aligning strategies with rapidly changing market conditions.

AI for gamers

Game content development

Developers can leverage AI—including generative models— to maintain and update their game with new assets and content in line with user community requests and interests.

ISSUE/OPPORTUNITY

Game development requires a massive up-front investment in time, resources, and capital. AAA games can cost tens of millions of dollars to develop and take years to complete. These costs will only rise as players increasingly demand more complex games, more post-release support, and more frequent content updates. AI provides the gaming industry with an opportunity to bend the cost curve through enhanced development efficiency, while also simultaneously meeting player demands.

Tags | R&D/Product Development

HOW AI CAN HELP

Ongoing content development

Post release, developers can rapidly generate and deploy new gaming assets as expansions or microtransactions, such as seasonal or downloadable content (e.g., new characters and skins). Developers can use text prompts to generate new content in line with the existing game and requests from the community, then upload those assets to the game.

AI for gamers

MANAGING RISK AND PROMOTING TRUST

Responsible and accountable	Generated content resulting from a model trained with proprietary third-party data may lead to copyright claims if it is deemed to be too similar (without substantial variation).
Safe and secure	Players' personally identifiable information (PII) could be fed into the models as they interact within the game, which raises risks around cybersecurity and regulatory compliance. The collection of PII, even inadvertently, places an obligation on the organization to secure the data as it is accessed, transferred, and stored.
Fair and impartial	Generated assets may over-index on player segments providing feedback or residing in specific regions. This uneven sampling of the input data could lead to bias in what assets are generated, and it may lead to missed opportunity and revenue as some customers are ignored.

POTENTIAL BENEFITS

Greater efficiency for greater creativity

By automating the process of creating game content, developers have more capacity to work on creative game designs and explore new, innovative ideas.

Cater to gamers

More immersive, controllable, responsive, engaging, and unique experiences for gamers (based on community requests and existing popular assets) has a direct impact on player lifetime value.

Drive new revenue

When add-on content can be generated with minimal human involvement, it creates new revenue streams with minimal investment.

Content creation with AI

AI-enabled creative tools

Content creation can be facilitated and enhanced with AI tools that minimize the need for manual editing and time-consuming content management.

ISSUE/OPPORTUNITY

Content creators and managers are faced with large volumes of data that require considerable time to generate, edit, and oversee. Creators also face tight deadlines that require high levels of efficiency for content management and editing.

Significant time and resource investments are needed for video and image editing, and the volume of content creates challenges around data management and finding the right content at the right time.

Tags | R&D/Product Development

HOW AI CAN HELP

Creative assistant tool
AI can be used to create imagery and apply edits using descriptive commands. Features like conversational editing, text-to-template, and text-to-image allow users to expedite the editing phase of the content creation process.

Picture editorial
Producers can automate footage management with video-to-text AI to evaluate and create tags for scenes and content. Text-to-video commands (e.g., "add more rain to this scene") can be used to enhance and accelerate the editing process.

AI "reshoots"
Content creators can use scripts and 3D scans of actors to generate new content, alter footage to create more realistic special effects, and allow studios to make edits without the need for reshoots.

Content creation with AI

MANAGING RISK AND PROMOTING TRUST

Responsible and accountable	AI tools may be trained with large databases of media and content, some of which may be copyright protected. As a result, the model outputs may include aspects of a creator's or studio's work or style that are not attributed to them, which raises legal risks.
Robust and reliable	Noticeable changes in style and brand quality due to AI content creation and editing may erode consumer trust in the brand and content.
Private	If bad actors access the underlying models or applications, it could contribute to the spread of fake content on behalf of the organization, leading to misinformation. Model owners should ensure strong privacy and access controls to mitigate this risk.

POTENTIAL BENEFITS

Greater efficiency

Content management stakeholders can gain efficiencies by leveraging creative tools to facilitate work and even create net-new content across the production lifecycle.

Improved content quality

Generating novel content can supplement the human creative process and potentially lead to a highe-quality product.

Content tailored to the audience

With AI, creators can hyper-personalize content with prompts driven by consumer trends and interests.

Marketing content multiplier

On-brand publishing

Using AI, marketing content generation can be quicker and more cost effective, while still preserving the company's brand identity.

ISSUE/OPPORTUNITY

When multiple authors are contributing to a piece of marketing or business content, there can be quality and consistency issues with tone and brand values. Authors are challenged to consistently balance product promotion with thought leadership and insight. As such, on-brand publishing is a significant time and cost investment that requires a long-term commitment to generating content that establishes the organization's (or its leaders') subject matter authority. However, the return on investment for on-brand publishing can be difficult to measure because the impact itself is complex and challenging to quantify.

Tags **Marketing**

HOW AI CAN HELP

Cohesive content generation
AI systems can be trained with on-brand content to mimic the style of company marketing materials and generate new, high-quality content rapidly and on demand.

Tailored, personalized messaging
With AI, organizations can easily create multiple versions of the same on-brand marketing tailored to different customers and audiences.

Ideation with generation
Marketing departments can leverage AI to quickly create multiple versions of content in various styles to identify the most compelling and persuasive option.

Marketing content multiplier

MANAGING RISK AND PROMOTING TRUST

Transparent and explainable

Personalized advertisements may be customized based on data collected or purchased from individuals. This may be off-putting to consumers who realize the organization has such broad access to their data, potentially harming the enterprise's brand reputation and undermining consumer trust. One way to mitigate this outcome is to ensure data collection and usage policies are transparent and communicated meaningfully to the consumer.

Responsible and accountable

Content produced by AI systems may not be subject to the same protections as human-generated content. Companies need to be wary of infringing on copyrighted material used to train AI systems.

Safe and secure

When brand data is used to train AI, there is a risk of data leaks that could result in sensitive information or IP being divulged to competitors. Companies need to ensure that their proprietary information is safely stored, transferred, and used, as well as monitor model outputs to validate that protected information is not being revealed.

POTENTIAL BENEFITS

Instant marketing

Companies can create content better tailored to their brand and customers, iterating through multiple drafts as needed.

Time savings

As AI systems instantly generate content, human staff can shift to an editorial role.

Broader marketing range

With the ability to easily create content across various formats, styles, and topics, companies enjoy greater flexibility in how they reach their customers. This also allows companies to more rapidly adapt to marketing trends.

Language translation at scale

Content localization

AI can be used to quickly and easily scale content across regions by translating and converting text and audio into regional languages.

ISSUE/OPPORTUNITY

The ability to create and translate content at scale can be a competitive differentiator for multinational enterprises, but it can also command significant time and resources, and rapid, on-demand translation may be difficult to achieve.

HOW AI CAN HELP

Tools for custom localization and quality assurance
AI can be used to help organize and manage complex file type, analyze content before translation to optimize localization, and integrate glossaries, term bases, and language tools into workflows.

Content personalization across industries
AI-powered content personalization can supercharge localization efforts by helping to improve engagement, build brand loyalty, and increase conversions.

Speech recognition during translation
AI can be leveraged to enable voice user interfaces (VUI), transcribe video and audio content into text, and simultaneously translate spoken content into the target language.

Tags: **Operations**

Language translation at scale

MANAGING RISK AND PROMOTING TRUST

Fair and impartial

Bias in the data used for content personalization could lead to unequal and unfair recommendations for certain groups of customers. In addition, AI applications are often trained on datasets from major languages, which means LLMs may have lower accuracy rates for less common languages and alternative dialects.

Transparent and explainable

Messaging and tone may change with language translation, which may negatively impact the text or audio being generated and the overall quality of the content. Localization should be audited to make sure that the messaging remains consistent with the original intent.

POTENTIAL BENEFITS

Enhancing translation

Translation processes using AI can lead to improved speed, accuracy, and scalability.

Improving the customer experience

A wider availability of language resources with the quality and speed enabled by AI promotes a higher-quality user experience.

Ensuring quality

Organizations can leverage AI to automate quality assurance for the localization of digital assets by providing more accurate natural language processing.

Enhancing chip innovation

Semiconductor chip design & manufacturing

AI can be used to iterate chip designs by having designs "compete" across a set of performance dimensions.

ISSUE/OPPORTUNITY

With demand for ever more powerful semiconductor chips, design complexity is rising. As semiconductor sizes continue to shrink, density scaling becomes a challenge, since upgraded features are required to fit on perpetually smaller chips.

Tags | R&D/Product Development

HOW AI CAN HELP

Iterative chip design

AI can generate and iterate chip designs and improve the outputs by having chip designs "compete" across a set of performance dimensions. At each new iteration, chip parameters are tweaked based on learnings from the best-performing designs in past iterations. These models are trained on existing layouts to learn patterns and constraints and generate new layouts that meet specific design requirements.

Enhancing chip innovation

MANAGING RISK AND PROMOTING TRUST

Safe and secure

With each new generation of novel designs, there is a risk of IP leakage and data breaches for proprietary chip designs and technical specifications generated by the LLM that could severely damage the organization's competitive advantage. There should be rigorous security protocols in place to protect against this.

Responsible and accountable

When using AI for design, the organization needs to consider how to secure copyrights or patents and protect the IP of chip designs that are moved into production.

Transparent and explainable

For complex simulation processes, the organization needs the capacity to understand how and why the model determined a scenario or design to be optimal. Design validation requires users and stakeholders to be able to understand the reason for the outputs.

POTENTIAL BENEFITS

Cost and time

By shortening the development lifecycle, the enterprise can reduce total development costs.

Create new ideas

AI can help improve designs or discover entirely novel designs that optimize performance based on specific criteria, such as power consumption, performance, location, and manufacturability.

Tech specs on demand

Technical sales, operations, and field staff knowledge management

AI can help sales, operations, and field staff quickly find and translate technical specifications to enable faster knowledge retrieval.

ISSUE/OPPORTUNITY

Technology offerings require deep technical understanding and the ability to find the right technical specifications in a timely manner. When it comes to translating technical specs and responding to customer technical questions, sales, operations, and field staff can be challenged to translate the information and effectively communicate it to the customer.

A big part of the problem is the time-consuming process of scouring through vast amounts of unstructured information and knowledge documents that contain the specifications and answers customers are seeking.

Tags: **Sales**

HOW AI CAN HELP

Spec summarization and search
AI can be used to create summaries of technical specifications based on targeted text-based queries to help understand which products meet customer requirements. It can suggest features and integrations that align with the customer's existing technology stack and vendors, as well as provide links to articles or an internal knowledge base for future reference.

Knowledge management update
Sales case histories and other current documents can be used to update knowledge management so similar technical inquiries in the future can be rapidly addressed with previous resolution steps and summarizations.

Automated technical demos
AI can be used to automate the creation of software demonstrations tailored to specific clients and use cases. This is achieved by training on demo scripts and sample interactions to generate demonstrations showcasing a solution's key features and benefits.

Tech specs on demand

MANAGING RISK AND PROMOTING TRUST

Private	Customer data (e.g., sales case history, customer tech stack/ vendors) must be processed by the model, making it necessary to continuously monitor model outputs and safeguard customer data to mitigate privacy risks.
Robust and reliable	AI models are susceptible to hallucinations, or factual inaccuracies, making human validation essential to establishing trust in the outputs and the decisions they inform. What is needed is a verification process to ensure the accuracy and reliability of information derived from the model (e.g., spec summarization, demos). This has a direct impact on answering customer questions, and by extension, customer satisfaction and sales.

POTENTIAL BENEFITS

Efficiency with automation

AI's ability to quickly consult and summarize technical specifications greatly reduces manual effort for sales, operations, and frontline staff when responding to technical sales inquiries.

Tailored to the customer

Greater personalization in responses and demonstrations improves the customer sales experience and increases the chances for conversion.

Supporting sales staff and other stakeholders

With AI, staff can rapidly create content to support the sales and marketing process, and to address specific questions from customers and partners.

AI-powered RFP and knowledge assistant

Automated proposal generation and sales knowledge management

AI can produce RFP responses automatically and help sales teams prepare for pitches by providing easy access to internal knowledge resources through smart chatbots.

ISSUE/OPPORTUNITY

Sales processes are often constrained by how quickly teams can access institutional knowledge and respond to Requests for Proposals (RFPs). Many sales teams have only days to coordinate across multiple departments and deliver detailed technical and commercial responses. Their ability to respond can be slowed by manual processes, fragmented internal documentation (e.g., playbooks and product briefs), inconsistent proposal quality and knowledge reuse across teams, and limited tools to extract and synthesize key information.

AI-powered tools can accelerate sales professionals' ability to retrieve, understand, and reframe information for client needs— without requiring technical expertise or deep coordination across departments.

Tags: **Sales**

HOW AI CAN HELP

Providing easy access to internal knowledge through chatbots
Salespeople can converse with AI-powered chatbots to quickly and easily retrieve sales playbooks, technical specs, competitive positioning, and customer references directly from internal documentation repositories.

Automatically drafting RFPs
AI models can produce high-quality, tailored RFP responses by finding and summarizing relevant content from existing sales documents, aligning answers with internal knowledge bases, and incorporating reusable proposal components.

Providing individualized sales support with little or no coding
Non-technical users, including sales reps and subject matter experts, can generate summaries, extract insights, and draft proposals through a simple user interface—no prompts or coding required.

Enabling customized sales processes and tools
Technical users can integrate AI tools directly into other internal systems, workflows, or dashboards to build more personalized applications.

AI-powered RFP and knowledge assistant

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

AI-assisted workflows can deliver higher-quality outputs—in less time— than traditional approaches. Users can flag incorrect responses or incomplete information; these are logged and reviewed in recurring QA cycles. Also, fallback mechanisms should exist to ensure consistent availability if problems arise with the AI models.

Transparent and explainable

Documentation should be provided for both business users and developers to explain how the system processes inputs and generates outputs. The chatbot interface includes citation tracing, where users can see which source documents were utilized to generate responses. Proposal-generation tools can allow users to edit and review outputs before submission, promoting human-in-the-loop oversight and transparency.

Safe and secure

All data and model interactions should occur within a secured internal environment, with no calls to third-party APIs unless vetted and approved. Systems should support audit logging for all user interactions to help ensure traceability and compliance. Role-based access controls can ensure only authorized personnel are able to view or generate sensitive proposal content.

Private

The system should not log personally identifiable information (PII) unless required by specific business rules and protected under internal data governance protocols. Feedback mechanisms should be anonymized where appropriate, helping to ensure user privacy while supporting continuous improvement. RFPs and customer documents processed in the system should be stored temporarily and purged according to data retention policies.

POTENTIAL BENEFITS

Faster deal cycles

Sales teams can respond to RFPs and prepare sales pitches/collateral much more quickly than before, accelerating the sales cycle.

Higher win rates

With centralized, AI-assisted knowledge access, sales teams can produce responses that are more consistent and comprehensive—reducing errors and potentially improving win rates (especially for opportunities with time-sensitive budget windows).

Increased sales rep productivity

Salespeople can search for materials or draft proposals more quickly, freeing them to focus on sales strategy, client relationships, and personal follow-ups.

Path to commercialization

Once validated internally, AI-powered sales tools have the potential to be offered to external customers, turning an internal efficiency driver into a revenue-generating product.

Automated test case generation

AI-powered test case generation and automation in chip development

As chip designs become more complex and product cycles accelerate, engineering teams are leveraging AI to automate test case generation and validation.

ISSUE/OPPORTUNITY

Chip development demands exhaustive testing and validation due to increasing functional complexity and the high cost of post-release defects. Human testers may struggle to keep pace with the volume and sophistication of required test cases, leading to potential quality issues, slower development cycles, and growing verification costs. Yet, security vulnerabilities or missed bugs can result in major product delays, public backlash, and brand damage, prompting chip manufacturers to add even more layers of testing.

Tags | R&D/Product Development

HOW AI CAN HELP

Automating test creation
AI tools can be used to create new test cases from product requirement documents, bug histories, and structured datasets. These tools can assist engineers by proposing a wider set of test scenarios including ones not previously considered and by automating portions of test implementation through code generation.

Identifying test gaps
AI systems can also help identify gaps in testing coverage and can prioritize high-risk areas based on historical failure data, although integration with structured data and internal governance systems remains an ongoing challenge.

Automated test case generation

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

Generated test cases can be validated against known test results and manually vetted to help ensure they hold up under real-world complexity. Also, systems can be stress-tested with increasingly complex product requirement documents to assess scalability and robustness across chip generations.

Transparent and explainable

AI-generated test cases can be accompanied by natural language summaries or rationales explaining why certain logic or edge conditions were selected. Engineers can trace outputs back to source inputs (e.g., PRD sections, bug databases), enabling better understanding and debugging of the AI system itself.

Safe and secure

The development and inference processes can occur in sandboxed environments with strict access controls to prevent accidental leakage of proprietary information. Integration with external AI services should be carefully managed to ensure no sensitive IP or design data is exposed to third-party systems.

POTENTIAL BENEFITS

Increased test coverage and enhanced product quality

AI can enable the generation of more comprehensive test cases than previously possible with human effort alone, allowing for earlier defect detection. Also, by identifying edge cases and potential failure modes, AI can reduce the risk of catastrophic bugs slipping into production.

Faster time-to-market

Automation accelerates the validation process, allowing development teams to keep up with faster chip release timelines and feature rollouts.

Operational efficiency and cost control

AI helps teams do more with less, reducing reliance on manual testers and mitigating the need to grow headcount to handle increasing workloads.

Improved development process

As the test tools mature, there is potential for deeper integration with the design and verification phases, improving end-to-end development flow across decentralized teams.

AI-powered source separation for music remastering

Separating mixed audio tracks into their component parts using AI

AI can separate vocals or instruments from mixed audio tracks even when the original files are not available, opening up new opportunities for licensing, remixing, archival restoration, and monetization.

ISSUE/OPPORTUNITY

Many recordings in music labels' back catalogs were produced at a time when multitrack preservation practices were inconsistent, and, in many cases, the original recordings have been lost, damaged, or never existed in isolated formats. This limits the ability to fulfill requests for custom edits—such as instrumentals, a cappella songs, or remixes— thereby stalling lucrative licensing deals, particularly for synchronization (music in film, television, and advertising) and derivative content creation. Manual audio reconstruction is costly, time-consuming, and often technically infeasible at scale. Yet demand for high-quality, tailored audio continues to grow, especially with the global expansion of streaming and sync opportunities.

Tags | R&D/Product Development

HOW AI CAN HELP

Separating music into its component parts

AI, particularly deep learning-based source separation models, can analyze a fully mixed audio file and isolate its constituent elements— vocals, guitar, bass, drums, ambient noise, etc.—into discrete audio tracks with high fidelity. These models have matured significantly in recent years and can now perform at a level sufficient for commercial use in many scenarios. Rather than depending on traditional DSP (digital signal processing) or manual studio methods, the AI learns from large datasets of music to "de-mix" the sound using learned patterns of frequency and structure. .

Leveraging Software-as-a-Service

Most deployments today use AI-powered SaaS platforms that allow internal teams to process catalog tracks quickly and securely. Internal quality control—along with artist or management approval—is then layered on to ensure that the extracted stems meet the creative and technical expectations of the project.

AI-powered source separation for music remastering

MANAGING RISK AND PROMOTING TRUST

Robust and reliable	All outputs from AI models are subject to expert human review. Because source separation can introduce artifacts, tracks should be assessed case-by-case to determine if the fidelity is suitable for commercial or creative use. Teams should be trained to identify when alternative methods or manual interventions may be more appropriate.
Transparent and explainable	Processes for using AI in audio separation should be clearly defined internally and communicated externally as needed. Stakeholders—including sync partners, artists, and producers—should be informed when AI-generated stems are used, and how those stems were derived from the source material.
Responsible and accountable	All source separation use should be logged, and responsibility for approving commercial use should rest with both label- and artist-facing teams. If stems are to be reused, remixed, or publicly released, the appropriate clearance workflows—including licensing and revenue-sharing— must be followed.

POTENTIAL BENEFITS

Commercial monetization of back catalogs

AI-powered source separation can make more recordings available for synchronization deals, remixing projects, or global reissues in alternate formats.

Accelerated time-to-license

The speed and efficiency of AI can minimize delays associated with locating or recreating stems, enabling a faster turnaround for time-sensitive media productions. .

Cost-efficient alternative to studio sessions

AI offers a high-quality yet faster and less expensive alternative to manual isolation or re-recording, which are both time-consuming and expensive.

Artist-led remix and reimagination projects

Using AI to extract source elements, artists can revisit and reinterpret their own work or collaborate across genres. Even in less creative scenarios, artists and labels can maintain full control over what gets extracted and used, ensuring all usage aligns with legal, creative, and ethical standards.

Operational scalability

AI can systematically process large volumes of tracks, with human review reserved for final quality control, increasing throughput without compromising quality.

AI-powered archive access and extraction

Transforming historical news content into a valuable asset

AI enables news organizations to recover legacy content lost to system or format issues—turning dormant information into a usable, searchable, and monetizable asset.

ISSUE/OPPORTUNITY

News archives hold cultural, journalistic, and commercial potential. But over time, many of the most significant stories—especially interactive long-form journalism, investigative pieces, and special coverage—have become inaccessible due to technological evolution, changes in content management systems (CMS), format obsolescence, and a lack of centralized archives.

Reporters and editors often cannot locate stories they know exist, especially from the early digital era (late 1990s to early 2010s). Multimedia components such as photos, graphics, and maps have not always been retained or migrated, rendering even recovered content incomplete.

Tags: **Operations**

HOW AI CAN HELP

Document extraction and digitization
AI models can process and extract structured information from legacy formats such as PDFs, microfilm scans, and outdated HTML, even when metadata is missing or inconsistent.

Content reconstruction
AI tools can intelligently identify article structure (headlines, subheads, body text, captions, bylines), reconstruct layout context, and reassemble fragmented articles into coherent, readable documents.

Semantic indexing and search
Large Language Models (LLMs) enable content to be semantically tagged and categorized, improving discoverability across themes, time periods, people, and places—even when specific keywords are not used.

Metadata enrichment and linking of multimodal assets
AI can supplement missing or corrupted metadata (e.g., publication date, author, topic) by analyzing linguistic and contextual clues. Also, the technology can cross-reference and re-link associated images, graphics, or videos from various archives where files may have been separated during prior migrations.

Improved access
AI can provide improved interfaces—such as chat-style queries or timeline exploration—to help users engage intuitively with the archive.

AI-powered archive access and extraction

MANAGING RISK AND PROMOTING TRUST

Fair and impartial	Systems are designed to ensure access to historical content across different eras and communities. Bias mitigation strategies are incorporated into model training and metadata tagging to avoid skewed representation of topics, regions, or individuals.
Robust and reliable	Extraction and structuring workflows are tested across various content types and legacy formats to help ensure consistent quality. Human oversight is embedded throughout the process to validate the accuracy and fidelity of reconstructed articles.
Transparent and explainable	A clear audit trail should be maintained for all AI-processed content, including logs of when and how specific items were extracted, tagged, and categorized. Explanatory overlays and metadata annotations help end-users understand the origin and limitations of AI-reconstructed documents.

POTENTIAL BENEFITS

Editorial improvements

Journalists can rediscover and repurpose historic reporting, improving storytelling quality and institutional memory. The AI-powered solution speeds up research for retrospective or investigative reporting by eliminating the need to manually dig through archives.

Monetization

AI can enable news organizations to expand their relationships with libraries, educational institutions, and content platforms while providing the foundation for new archive-based products, such as nostalgia-based newsletters and historical collections. What's more, it positions news organizations to negotiate more effectively with AI companies looking for premium training data by presenting them with a curated, high-quality proprietary dataset.

Improved operational efficiency

The solution can reduce ad-hoc archive retrieval and reduces the need for internal technical support to help recover content. Also, it strengthens the organization's institutional capabilities for structured knowledge management.

Network sensing, assurance and autonomous recovery

AI-supported reliability for national networks

Machine learning and agentic AI systems analyze telemetry from network assets—such as switches, routers, radio units, antennas, and fiber—to detect faults, localize root causes, and assess severity. This is complemented by drone based inspections that capture visual and sensor data from hard to reach infrastructure, with AI correlating physical observations and network signals to improve diagnosis. Human operators validate insights and execute remediation actions, ensuring control and compliance.

ISSUE/OPPORTUNITY

Telecommunications networks are large, complex physical systems where localized faults can quickly cascade into widespread service disruption. Manual monitoring struggles to keep pace with the scale and velocity of telemetry data, resulting in delayed detection and prolonged outages—conditions made less tolerable by strict regulatory requirements and high customer expectations for uptime. Network operations centers receive thousands of alerts daily from distributed infrastructure spanning cell towers, fiber nodes, data centers, and customer premises equipment. Operators must distinguish genuine failures from routine fluctuations and trace root causes amid cascading alarms, where a single physical issue—such as damaged fiber or a failing router—can trigger hundreds of downstream alerts. Drone based inspections are used to survey towers, antennas, and fiber routes, capturing visual and sensor data from hard to reach assets. Physical AI correlates this drone inspection data with network telemetry to identify incidents earlier, pinpoint root causes more clearly, and support faster resolution—while keeping humans in control and ensuring regulatory compliance.

Tags: **Information Technology** | **Physical AI**

HOW PHYSICAL AI CAN HELP

Telemetry-based fault detection

AI systems continuously monitor telemetry from physical network equipment to detect abnormal behavior indicating faults before they cause widespread service impact.

Severity and impact assessment

AI helps classify incidents based on scale and potential customer impact, enabling operators to prioritize responses to the most critical failures first.

Cross-network correlation

Signals from multiple network components are analyzed together to identify where issues originate, filtering out cascading alarms that merely reflect downstream effects.

Remediation recommendation

AI proposes corrective actions for operator review such as rerouting traffic, restarting equipment, or dispatching field technicians to specific locations.

Human-in-the-loop execution

All actions are validated and executed by operations teams, maintaining accountability and compliance with regulatory requirements for network changes.

Root-cause identification support

Likely causes are suggested based on observed network behavior and correlated with drone based visual inspections of physical assets, accelerating diagnosis by highlighting probable failure points for targeted operator investigation.

Network sensing, assurance and autonomous recovery

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

AI fault detection systems must distinguish genuine failures from routine fluctuations reliably. False positives waste operator attention, while false negatives allow faults to cascade into widespread outages. Reliable operation across a diverse set of network equipment, traffic patterns, and failure modes is essential.

Safe and secure

Telecommunications networks are critical national infrastructure, and AI systems that recommend traffic rerouting or equipment interventions are a high-value adversarial target. A compromised detection system could suppress genuine alerts or trigger unnecessary interventions, causing service disruption at scale. Security protections must reflect the critical infrastructure context and the public consequences of system compromise.

Responsible and accountable

All remediation actions require human validation and execution—maintaining accountability and regulatory compliance for network changes. This demands clear documentation of what the AI detected, what was recommended, who approved execution, and what outcome occurred, creating an audit trail supporting regulatory reporting, SLA dispute resolution, and post-incident investigation.

POTENTIAL BENEFITS

Reduced outage duration

Earlier detection and diagnosis shorten incidents by enabling faster operator response and reducing time spent on manual root cause analysis.

Operational focus

Teams spend less time triaging alerts and correlating symptoms, as AI combines network telemetry with drone based inspection data from physical assets, allowing network engineers to focus on resolution rather than diagnosis.

Faster fault isolation

Operators can identify and localize issues more quickly, reducing mean time to repair and minimizing the duration of service outages when failures do occur.

SLA protection

Improved compliance lowers penalty risk by preventing service level agreement violations through proactive incident management and faster restoration.

Lower field maintenance costs

Proactive maintenance reduces emergency repair visits by preventing urgent failures, reducing overtime labor and expedited parts shipments.

AMR-enabled physical AI for predictive quality control

Predictive maintenance insights for operators

Physical AI systems analyze trends across the end-to-end infrastructure value chain—from component quality and deployment conditions to network and equipment performance—in manufacturing facilities, to predict and prevent service-impacting issues before they occur. Autonomous Mobile Robots (AMRs) act as mobile inspection and sensing platforms within data centers and network operations environments, capturing high-frequency visual, environmental, and asset-health data, reasoning over in-process signals in real time, and triggering corrective actions before defects propagate downstream.

ISSUE/OPPORTUNITY

Quality control today is largely reactive, identifying defects only after materials, machine time, and labor have already been consumed—driving scrap, rework, delays, and margin erosion. The core limitation is the lack of real time visibility into upstream indicators such as material variation, equipment drift, and environmental change. Physical AI addresses this by continuously analyzing patterns across materials, processes, equipment, and environment, with Autonomous Mobile Robots serving as mobile, in line sensing and inspection platforms across the factory floor. Equipped with vision systems, sensors, and edge AI, AMRs capture high frequency, in process quality and equipment data that is fused with production and material telemetry, enabling closed loop AI systems to predict quality risks early and stabilize production before defects occur.

Tags: **Manufacturing & Quality** | **Physical AI**

HOW PHYSICAL AI CAN HELP

Predictive analytics across supply chain

AI systems continuously monitor material quality at intake, tracking variations and correlating them with downstream production outcomes to predict potential defects before materials enter production.

Real-time process optimization

Machine-learning models analyze equipment performance data, environmental conditions, and production parameters to detect early signs of process drift and automatically trigger corrective adjustments.

Automated robot reprogramming

Based on predictive insights, AI systems autonomously adjust robot parameters, tooling settings, or process flows to compensate for predicted variations, eliminating manual intervention cycles.

AMR-enabled physical AI for predictive quality control

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

Predictive quality systems must perform reliably across continuous production variability. A system that misses early drift indicators allows defects to propagate through downstream processes, while a system that generates excessive false alerts disrupts production unnecessarily. Both failure modes erode the operational trust on which closed-loop automation depends.

Responsible and accountable

If AI can autonomously adjust robot parameters and process flows, organizations must define clear governance boundaries specifying which adjustments can be made autonomously and which require human validation before execution. This helps prevent unreviewed AI decisions from affecting product quality at scale.

Transparent and explainable

To validate the model's reasoning and detect drift, process engineers need to understand what upstream signals drove a quality risk prediction and what corrective adjustment was applied. Closed-loop systems that adjust processes without explainable reasoning make it difficult to identify systematic errors before they affect product quality or propagate downstream.

POTENTIAL BENEFITS

Defect prevention and scrap reduction

Predictive AI, supported by AMR-based in-line inspection, detects quality issues early in TMT manufacturing lines, preventing defects from spreading and reducing scrap, rework, and wasted materials.

Optimized production efficiency

Automated process adjustments eliminate production interruptions for manual corrections, maintaining continuous flow and maximizing throughput while ensuring consistent quality standards.

Supply chain intelligence integration

End-to-end visibility enables manufacturers to provide feedback to suppliers about material quality trends, improving upstream quality and creating closed-loop optimization across the entire supply chain.

Sustainable network operations

Energy-aware control of physical networks

Physical AI systems sense real-time conditions across distributed physical assets—radios, power units, cooling systems, and edge equipment—and autonomously adjust their operating states at the edge. Decisions are executed locally within safety bounds, enabling energy-efficient operation of large-scale physical networks without compromising reliability.

ISSUE/OPPORTUNITY

Telecom networks consume significant energy, driving both operating costs and carbon exposure. Static energy management wastes power during periods of low demand, as cellular base stations, data centers, and network equipment often run at full capacity regardless of real time traffic. Edge-deployed IoT sensors, vision-enabled monitoring systems, and wearable devices used by field technicians provide granular visibility into equipment utilization, environmental conditions, and on-site activity. Network operators face growing pressure to meet regulatory sustainability targets while controlling energy costs that represent a major share of operational spend. Physical AI leverages data from edge devices, IoT sensors, and vision-based systems to dynamically adjust network operations in real time—scaling power usage up or down based on actual demand patterns—while maintaining service quality and regulatory compliance.

Tags: **Operations** | **Physical AI**

HOW PHYSICAL AI CAN HELP

Edge-level physical arbitration
Physical AI resolves conflicts between competing objectives (energy, performance, safety) locally—e.g., deciding whether to throttle, sleep, or reroute power when conditions degrade.

Physical degradation-aware control
AI adapts energy behavior based on equipment age, wear, and thermal stress, reducing long-term physical damage—not just short-term energy use.

Sensor-driven micro-actuation
Continuous feedback from temperature, vibration, and load sensors enables fine-grained physical adjustments (fan speeds, power draw, cooling flow) rather than coarse system-wide controls.

Human supervision
Operations remain controlled by network engineers who set policies, review AI recommendations, and maintain override authority to ensure service commitments are met.

Sustainable network operations

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

Physical AI that autonomously adjusts power states, cooling flows, and operating parameters across distributed network infrastructure must perform reliably under all conditions—including equipment aging, unexpected load spikes, and sensor degradation. Incorrect energy adjustments can compromise service quality or accelerate physical wear on the very assets the system is designed to protect.

Responsible and accountable

Network engineers theoretically retain policy-setting and override authority; however, as AI handles increasing volumes of continuous adjustments, the practical ability to review individual decisions is diminished. Organizations must define clear boundaries between autonomous edge actions and decisions requiring engineer review, maintaining clear audit trails to support accountability when service or equipment outcomes are disputed.

Transparent and explainable

Network engineers setting energy policies need to understand how physical AI balances competing objectives—energy efficiency, service quality, and equipment protection—and why specific adjustments were made. Without this visibility, engineers cannot calibrate policies effectively, identify misconfigured optimization objectives, or maintain true oversight of systems making continuous physical changes.

POTENTIAL BENEFITS

Extended asset lifespan

Energy decisions informed by physical stress signals reduce premature component failure across equipment fleets.

Reduced human intervention in physical tuning

Engineers shift from manual parameter tuning to policy-level oversight as AI handles continuous physical adjustments.

Reputational protection

Environmental risk is mitigated as operators demonstrate measurable progress on sustainability goals, protecting brand reputation among environmentally conscious customers and stakeholders.

Scalable cross-site consistency

The same physical control logic applies across factories, networks, data centers, or plants—despite different layouts and equipment mixes.

Data center operations

Anticipatory control of data center environments

Physical AI systems sense real-time conditions across distributed physical assets—Physical AI systems may forecast hardware degradation and thermal stress in data centers and coordinate maintenance actions with workload migration to reduce failure risk.

ISSUE/OPPORTUNITY

In the TMT sector, data centers are complex physical systems where localized issues can quickly cascade across compute, power, and cooling infrastructure. Traditional planning and monitoring struggle to capture the dynamic interplay between workload intensity, thermal behavior, and hardware aging, often reacting only after hotspots, performance degradation, or failures impact service availability. Static thresholds frequently miss early stress signals as servers age, cooling systems lag demand, and power components experience uneven loads.

Data center digital twins overlay facilities design, power and cooling systems, and network architecture to simulate "what if" scenarios, enabling operators to anticipate thermal, capacity, and performance impacts of build out or configuration changes before making physical interventions.

Physical AI enables a shift to predictive, infrastructure aware operations by continuously analyzing physical signals to anticipate risk earlier. This helps enable allows operators to proactively migrate workloads, rebalance thermal loads, or schedule targeted maintenance—under strict governance models that keep humans in control—improving resilience, uptime, and energy efficiency at scale.

Tags | Information Technology | Physical AI

HOW PHYSICAL AI CAN HELP

Thermal and stress prediction

AI models forecast temperature and load conditions that increase failure risk by analyzing patterns in cooling system performance, compute workload distribution, and environmental factors that create thermal stress on physical infrastructure.

Maintenance coordination support

AI assists in aligning physical interventions with operational constraints, helping planners schedule hardware replacement, cooling system maintenance, and infrastructure upgrades during periods that minimize business impact.

Human escalation pathways

Important decisions remain with data-center operators, helping to ensure that knowledge and accountability stay with qualified personnel who understand business context and can assess trade-offs that AI systems cannot fully evaluate.

Hardware degradation forecasting

Signals from physical components are used to anticipate end-of-life events, identifying at-risk servers, storage devices, and network equipment. AI assists operators rather than acting autonomously, providing recommendations and analysis while humans retain authority over all actions that could affect availability, performance, or risk exposure.

Guardrailed decision support

AI assists operators rather than acting autonomously.

Scenario evaluation

Potential actions are evaluated for risk and impact before execution, modeling the consequences of workload shifts, maintenance windows, or equipment changes to not create new problems while addressing identified risks.

Data center operations

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

Physical AI that forecasts hardware degradation and thermal stress must perform reliably across the dynamic interplay of workload intensity, cooling behavior, and equipment aging. A system that misses early stress signals may allow conditions to develop until failures force emergency shutdowns, negating the predictive value that justified deployment.

Safe and secure

Data centers are critical infrastructure whose AI-assisted operations span compute, power, and cooling systems—a broad attack surface where compromised control logic could trigger cascading failures. Manipulated thermal predictions or maintenance scheduling could cause outages affecting dependent services. Security protections must match the operational criticality and customer service obligations of these facilities.

Responsible and accountable

Humans retain control of all consequential actions—workload migrations, maintenance scheduling, and infrastructure changes—with AI providing recommendations for operator review. However, this human-in-the-loop approach must be adhered to in practice. Consistent documentation of AI recommendations, human decisions, and outcomes is essential when service disruptions or equipment failures require investigation.

POTENTIAL BENEFITS

Reduced unplanned outages

Higher availability through earlier identification and proactive intervention before hardware failures or thermal events force emergency shutdowns or trigger cascading failures across interconnected infrastructure.

Asset longevity

Improved lifecycle management by reducing exposure to stress conditions that accelerate hardware degradation, extending useful equipment life and reducing premature replacement costs.

Operational resilience

Better preparedness for incidents through predictive analysis that helps enable advance planning, resource staging, and coordinated response strategies rather than reactive crisis management when failures occur.

Semiconductor manufacturing orchestration

Fleet-level coordination of fab robots

Physical AI systems coordinate collaborative robot fleets across semiconductor fabrication facilities and adjacent downstream operations (e.g. testing, packing, and quality inspection), dynamically assigning tasks such as transport, inspection, and handling based on production needs.

ISSUE/OPPORTUNITY

Semiconductor fabrication facilities operate with hundreds of robots performing important tasks, yet traditional systems assign each robot to fixed functions regardless of real-time production needs. Transport robots move wafers between processing stations, inspection robots check for defects, and handling robots load and unload equipment, each following predetermined routes and schedules. When production priorities shift or equipment becomes available ahead of schedule, fixed robot assignments create bottlenecks as idle robots in one area cannot assist with backlogs elsewhere. Facilities purchase additional robots to help enable sufficient capacity for peak demands in each function, driving capital costs higher than necessary if robots could be reassigned dynamically.

Quality requirements demand strict contamination control and precise handling, constraining how robots can be redeployed without risking yield loss. In downstream test/pack areas, throughput can fluctuate with shift coverage and attendance, creating avoidable output dips even when equipment capacity exists. Robots and humans work side-by-side at 50/50 ratios during training phases. Humans teach procedures during day shifts; robots maintain operations independently during night shifts and workforce gaps.

The opportunity is fleet-level orchestration that dynamically assigns robots to the highest-priority tasks while respecting cleanroom constraints and quality standards, maximizing throughput with fewer total robots.

Tags: **Manufacturing & Quality** | **Physical AI**

HOW PHYSICAL AI CAN HELP

Fleet-level reasoning
AI assigns tasks dynamically across the robot fleet, directing available robots to the highest-priority activities based on current production status and bottleneck locations.

Reduced fixed roles
Robots are not task-locked, enabling transport robots to assist with inspection or handling when those functions become bottlenecks, increasing overall fleet utilization.

Throughput-aware coordination
Actions align with production goals, prioritizing movements that accelerate wafers through rate-limiting process steps rather than following rigid predetermined schedules.

Quality preservation
AI respects fab constraints including contamination zones, handling protocols, and equipment compatibility requirements that protect semiconductor yield and reliability.

Human governance
Engineers supervise orchestration, setting production priorities, defining quality constraints, and maintaining oversight of robot assignments to help enable fab safety and yield targets.

Remote enablement
AR-based assistants deliver step-by-step, hands-free fab tool maintenance guidance, enable real-time multilingual troubleshooting using live equipment context, and connect engineers to remote experts.

Semiconductor manufacturing orchestration

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

Fleet-level AI orchestration of robots must perform reliably under real-world production conditions, including equipment changes, yield excursions, and unpredictable robot availability. Orchestration failures that send robots to incorrect zones, create handling conflicts, or violate contamination protocols can directly affect wafer yield in a manufacturing environment where quality failures are extremely costly.

Safe and secure

Integration of AI robot orchestration into semiconductor production and contamination control systems creates a large attack surface where compromised logic could direct robots to violate contamination zones or bypass quality checks. Security protections must reflect the yield and commercial consequences of fabrication integrity being compromised through unauthorized access or manipulation.

Responsible and accountable

Engineers supervise orchestration by setting priorities and defining constraints. However, dynamic fleet orchestration generates too many individual assignment decisions for engineers to review each one. Organizations must clearly define which assignment decisions can be executed autonomously within pre-approved boundaries and which require human validation before execution to maintain meaningful oversight.

POTENTIAL BENEFITS

Lower capital intensity

Fewer robots required as dynamic assignment enables smaller fleets to handle the same production volumes by eliminating idle capacity in underutilized functional areas.

Operational efficiency

Resources are better utilized as robots spend more time performing value-adding activities and less time idle, increasing return on expensive automation investments.

Quality protection

Standards are maintained through AI enforcement of contamination protocols, handling procedures, and equipment compatibility rules that prevent quality excursions from dynamic reassignments.

Higher throughput

Bottlenecks are reduced through intelligent resource allocation that concentrates robot capacity where production flow is currently constrained, improving wafer cycle times.

Ultra-low-latency network protection

Enabling safety-critical instant response through device intelligence

In telecom networks, next generation physical AI embeds GPU based intelligence directly at the edge—within base stations, network equipment, cameras, and sensors—enabling real time threat detection without relying on centralized processing. By analyzing signals locally in milliseconds, these systems can identify physical and network threats such as site tampering, unauthorized access, equipment anomalies, or service impacting attacks, and autonomously take immediate protective actions—isolating affected assets, triggering failover, or adjusting operating parameters—before issues propagate across the network, while keeping human operators in the oversight loop.

ISSUE/OPPORTUNITY

In telecom environments, critical safety and security decisions must be made in milliseconds to prevent physical damage, service disruption, or harm to personnel. For example, AI enabled wearables worn by field technicians at cell sites can continuously monitor proximity to live equipment, restricted zones, or hazardous conditions and trigger immediate alerts or automatic equipment shutdowns if unsafe behavior is detected—without relying on network connectivity. Extending this model to the network itself, Physical AI embedded directly into base stations, edge devices, and security sensors can autonomously detect threats such as site tampering, unauthorized access, or abnormal signal behavior and take instant protective actions, including isolating affected network elements, denying access, or activating failover paths. By eliminating transmission latency and enabling on device decision making, telecom operators can contain threats at the edge before they cascade across interconnected networks, while retaining human oversight for escalation and compliance.

Tags | Information Technology

HOW PHYSICAL AI CAN HELP

On-camera AI processing
Lightweight AI models run directly on smart cameras, processing video streams locally and making threat detection or safety decisions without any network transmission, achieving response times under 10 milliseconds—enabling intervention that is essentially instantaneous.

Device-embedded threat recognition
In telecom networks, AI embedded in edge devices such as site cameras, base stations, and access sensors detects physical and network threats in real time. By processing data locally, these systems can autonomously isolate affected assets, deny access, or trigger failover—containing threats instantly without waiting for centralized analysis, while retaining human oversight.

Instantaneous alert and action systems
On-device processing enables immediate triggering of alerts, alarms, or automated safety responses (e.g., crane shutdowns, access denials) at machine-speed rather than network-limited speeds, ensuring protective actions occur fast enough to prevent incidents.

Ultra-low-latency network protection

MANAGING RISK AND PROMOTING TRUST

Robust and reliable

AI making autonomous protective decisions within milliseconds must perform with extremely high reliability. A false positive that shuts down a cell site or denies access to a field technician creates operational disruption; a false negative that misses a genuine threat allows the incident it was designed to prevent. Both failure modes carry immediate operational consequences.

Responsible and accountable

Autonomous protective actions executed at machine speed leave no time for human review before execution, making pre-deployment governance critical. Organizations must define precisely which actions the system can take autonomously, under what conditions, and with what constraints—with human operators retaining authority over escalation, investigation, and recovery following an autonomous intervention.

Transparent and explaianable

Human operators in the oversight loop must understand what triggered an autonomous protective action—what threat was detected, what evidence supported it, and what the system did—to assess appropriateness, investigate false positives, and refine detection policies. Systems acting without explainable reasoning cannot be meaningfully supervised even when humans nominally retain oversight authority.

POTENTIAL BENEFITS

Life-saving response times

Eliminating transmission latency enables AI systems to detect and respond to threats or safety violations fast enough to prevent incidents, potentially saving lives in security and industrial safety applications where milliseconds matter.

Scalable safety infrastructure

Distributed intelligence on individual devices avoids the bandwidth and processing bottlenecks of centralized systems, enabling organizations to deploy comprehensive safety monitoring across large facilities without infrastructure constraints or centralized processing limitations.

Network-independent operation

On-device processing ensures critical safety systems function even during network outages or connectivity issues, maintaining protection under all conditions without dependence on network infrastructure availability.

Robotic quadrupeds for stadium operations and sports broadcasting

Agile, AI-driven mobility for live events and complex venues

Physical AI-powered robotic quadrupeds are being deployed in sports venues to support stadium operations and live broadcasting. These mobile robots combine sensors, cameras, and remote-control capabilities to navigate physical environments, assist security teams with monitoring, and capture stable, dynamic visual content for live sports coverage without disrupting on-ground activities.

ISSUE/OPPORTUNITY

Large sports venues face operational challenges related to real-time monitoring, safety oversight, and immersive fan engagement. Security teams often need early visibility into crowded or hard-to-access areas without increasing human risk.

Simultaneously, broadcasters seek innovative ways to capture engaging visuals while maintaining stability and reliability in dynamic environments.

Physical AI systems present an opportunity to extend human capabilities through mobile robotic platforms that operate on the ground, interact safely with surroundings, and deliver real-time visual intelligence and coverage.

Tags: **Operations** | **Physical AI**

HOW PHYSICAL AI CAN HELP

Intelligent mobile surveillance
AI-enabled perception allows robotic quadrupeds to navigate venue perimeters, monitor movement patterns, and provide continuous visual feedback, supporting preventive monitoring and operational awareness across large physical spaces.

Computer vision–based situational detection
Computer vision models process live video feeds to identify unusual activity or objects, enabling faster alerts and informed decision-making while maintaining human oversight of critical actions.

Remote operation and assisted autonomy
On-device processing enables AI-supported control systems to help operators guide robots through complex terrain, relay audio-visual information, and perform initial assessments before human teams intervene.

Edge based execution for reliability
Core perception and mobility decisions run locally on the robot, enabling continued operation even under network congestion or partial connectivity loss.

Robotic quadrupeds for stadium operations and sports broadcasting

MANAGING RISK AND PROMOTING TRUST

Private

Quadrupeds with cameras and sensors in public sports venues continuously capture video covering large numbers of spectators who have not consented to robotic surveillance. Organizations must define clear policies on what is recorded, how long footage is retained, what prevents repurposing for individual tracking, and how this monitoring is disclosed to event attendees.

Safe and secure

Quadruped robots navigating densely crowded stadium environments alongside spectators, staff, and athletes must operate safely at all times. Navigation failures or loss of control in a crowd could cause serious injury. Safety boundaries and emergency stop capabilities must be validated under live event conditions, including post-match crowd surges and unexpected human-robot contact.

Fair and partial

Computer vision models trained on specific crowd types or venue configurations may perform less accurately in different circumstances—generating disproportionate false positives for individuals whose appearance differs from training data norms. In security monitoring applications, biased detections create reputational risk for venues and event operators.

POTENTIAL BENEFITS

Enhanced operational visibility

Mobile robots extend monitoring reach across stadium environments without increasing direct human exposure.

Richer audience experience

Dynamic, ground-level visuals add engaging perspectives while maintaining broadcast stability and reliability.

Improved safety support

Early situational awareness enables informed responses before deploying personnel into uncertain conditions.

Contacts

Beena Ammanath
Global Deloitte AI Institute Leader, Deloitte AI Institute United States, Lead
Deloitte Consulting LLP
bammanath@deloitte.com

Audrey Ancion
Deloitte AI Institute Canada, Lead
Deloitte Canada
knuttall@deloitte.com

Naser Bakhshi
Deloitte AI Institute Netherlands, Lead
Deloitte Netherlands
nbakhshi@deloitte.nl

Dr. Bjoern Bringmann
Deloitte AI Institute Germany, Lead
Deloitte Germany
bbringmann@deloitte.com

Martin Cabrera
Deloitte AI Institute Chile, Lead
Deloitte
mcabreraa@deloitte.com

Jefferson Denti
Deloitte AI Institute Brazil, Lead
Deloitte Brazil
jdenti@deloitte.com

Tiago Durao
Deloitte AI Institute Portugal, Lead
Deloitte Portugal
tdurao@deloitte.com

Richard Eudes
Deloitte AI Institute France, Lead
Deloitte France
reudes@deloitte.fr

Roman Fan
Deloitte AI Institute China, Lead
Deloitte China
rfan@deloitte.com

Tomas Meca Figueres
Deloitte AI Institute Spain, Lead
Deloitte Spain
tomecafigueras@deloitte.es

Alfredo Maria Garibaldi
Deloitte AI Institute Italy, Lead
Deloitte Italy
agaribaldi@deloitte.it

Nicolas Griedlich
Deloitte AI Institute Luxembourg, Lead
Deloitte Luxembourg
ngriedlich@deloitte.lu

Geert Hallemeesch
Deloitte AI Institute Belgium, Lead
Deloitte Belguim
ghallemeesch@deloitte.com

Jan Hejtmanek
Deloitte AI Institute Central Europe, Lead
Deloitte Central Europe
jhejtmanek@deloitte.com

Prashanth Kaddi
Deloitte AI Institute India, Lead
Deloitte India
pkaddi@deloitte.com

Sultanbek Khunkaev
Deloitte AI Institute Middle East, Lead
Deloitte United Arab Emirates
sukhunkaev@deloitte.com

Tomotake Kozu
Deloitte AI Institute Japan, Lead
Deloitte Japan
tomotake.kozu@tohmatsu.co.jp

Carlos Labanda
Deloitte AI Institute South-Latin America, Lead
Deloitte Colombia
clabanda@deloitte.com

Chris Lewin
Deloitte AI Institute Asia Pacific Lead
Deloitte Singapore
chrislewin@deloitte.com

Wessel Oosthuizen
Deloitte AI Institute Africa, Lead
Deloitte Africa
woosthuizen@deloitte.com

Sulabh Soral
Deloitte AI Institute United Kingdom, Lead
Deloitte United Kingdom
ssoral@deloitte.com

Dr. Elea Wurth
Deloitte AI Institute Australia, Lead
Deloitte Australia
ewurth@deloitte.com.au

www.deloitte.com/us/AIInstitute

Deloitte.