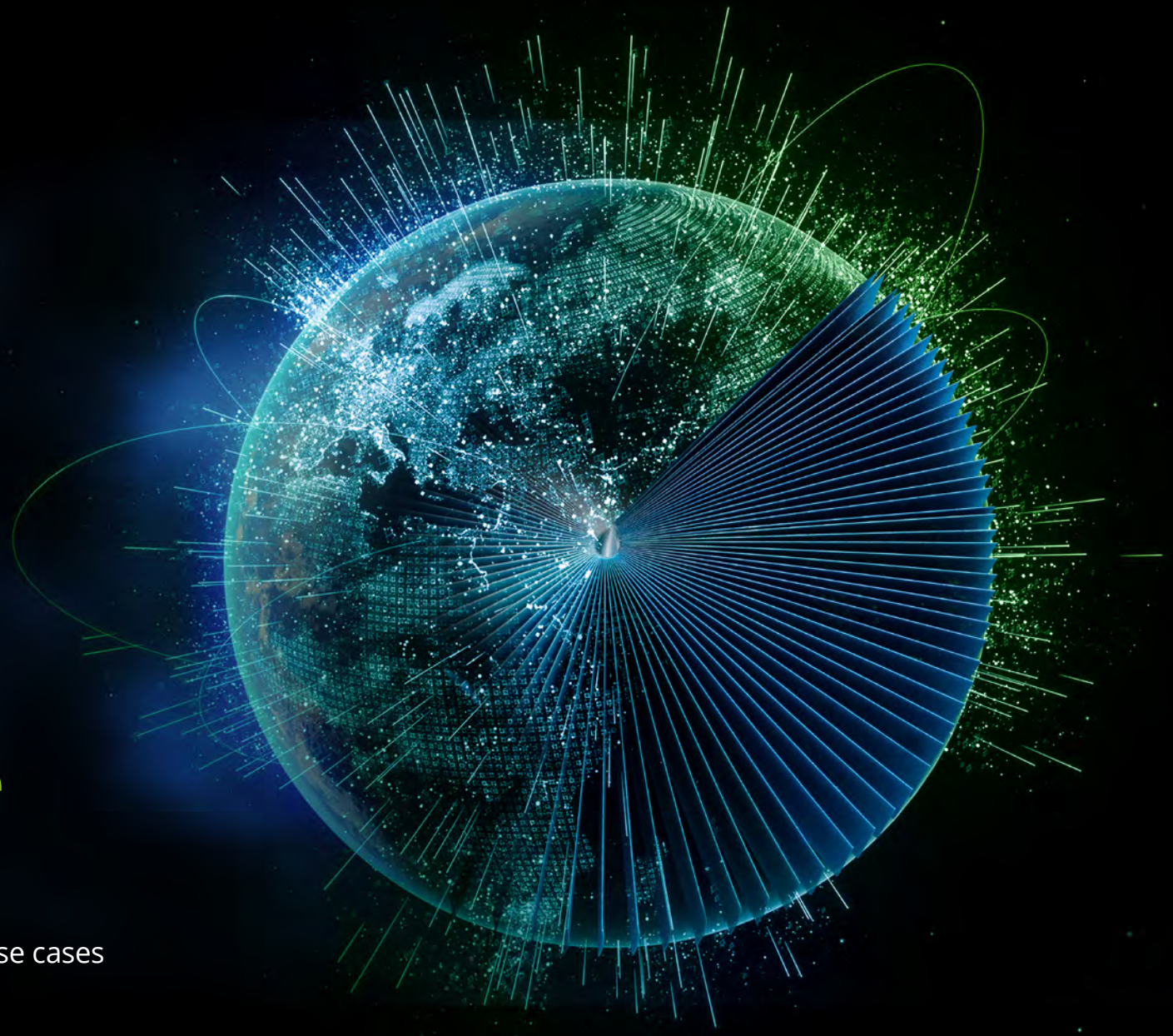
Deloitte.



The Generative AI Dossier

A selection of high-impact use cases across six major industries

By 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

Introduction

The advent of Generative AI has delighted and surprised the world, throwing open the door to AI capabilities once thought to be still far off in our future. With a remarkable capacity to consume and generate novel outputs, Generative AI is prompting excitement and stimulating ideas around how this type of AI can be used for organizational benefit. Far more than a sophisticated chatbot, Generative AI has the potential to unleash innovation, permit new ways of working, amplify other AI systems and technologies, and transform enterprises across every industry.

This compendium highlights 60 of the most compelling use cases for Generative AI across six major industries:

- **Consumer** (which includes Consumer Products, Retail, Automotive, Lodging, Restaurants, Travel, and Transportation)
- **Energy, Resources, and Industrial** (ER&I)
- **Financial Services** (FSI)
- **Government & Public Services** (GPS)
- **Life Sciences & Health Care** (LSHC)
- **Technology, Media, and Telecommunications** (TMT)

For each of these industries, we explore Generative AI use cases that can address enterprise challenges in new ways, permit more and greater capabilities across business functions, and deliver advantages in efficiency, speed, scale, and capacity.

As with any type of AI, there are potential risks. We use Deloitte's Trustworthy AI™ framework to elucidate factors that contribute to trust and ethics in Generative AI deployments, as well as some of the steps that can promote governance and risk mitigation. Trustworthy AI in this respect is: fair and impartial, robust and reliable, transparent and explainable, safe and secure, accountable and responsible, and respectful of privacy.

To be sure, this collection of use cases is just a sample among myriad other applications, some of them yet to be conceived. As Generative AI matures as a technology and organizations move forward with using it for business benefit, we will likely see even more impressive and compelling use cases. The applications highlighted here can help spark ideas, reveal value-driving deployments, and set organizations on a road to making the most valuable use of this powerful new technology.

Nitin Mittal
Global Generative AI Leader
Deloitte Consulting LLP

Beena Ammanath
Global Deloitte AI Institute Leader
Deloitte Consulting LLP

Lynne Sterrett
US Generative AI Market Activation Leader
Deloitte Consulting LLP

Jim Rowan
US Head of AI
Deloitte Consulting LLP

Six key modalities

One of the primary differences between more traditional AI and Generative AI is that the latter can create novel output that appears to be generated by humans. The coherent writing and hyper-realistic images that have captured public and business interest are examples of Generative AI models outputting data in ways once only possible with human thought, creativity, and effort. Today, Generative AI models can create outputs in six key modalities.

Text

Written language outputs presented in an accessible tone and quality, with details and complexity aligned with the user's needs.

Examples include summarizing documents, writing customer-facing materials, and explaining complex topics in natural language.

Code

Computer code in a variety of programming languages with the capacity to autonomously summarize, document, and annotate the code for human developers.

Examples include generating code from natural language descriptions and autonomously maintaining code across different platforms.

Audio

Much like textual outputs, audio outputted in natural, conversational, and even colloquial styles with the capacity to rapidly shift among languages, tone, and degrees of complexity.

Examples include Generative AI-powered call centers and troubleshooting support for technicians in the field.

Image

Textual or visual prompts lead the model to create images with varying degrees of realism, variability, and "creativity."

Examples include simulating how a product might look in a customer's home and reconstructing an accident scene to assess insurance claims and liability.

Video

Similar to imagery, Generative AI models can take user prompts and output videos, with scenes, people, and objects that are entirely fictitious and created by the model.

Examples include autonomously generating marketing videos to showcase a new product and simulating dangerous scenarios for safety training.

3D/Specialized

From text or two-dimensional inputs (e.g., images), models can extrapolate and generate data representing 3D objects.

Examples include creating virtual renderings in an omniverse environment and AI-assisted prototyping and design in a purely virtual space.

By understanding these modalities, organizations are empowered to think through and better understand the kinds of benefits Generative AI could permit. For each use case described in this dossier, there may be more than one value-driving modality. A chatbot text output could be presented as simulated audio; a generated image could be extended into a video. Ultimately, the Generative AI use case and the value the organization seeks will determine which output modalities can contribute the greatest advantages and outcomes.

Broad categories of value capture from Generative AI

The value that Generative AI use cases can enable can be conceived across six dimensions: cost reduction, process efficiency, growth, innovation, discovery and insights, and government citizen services. To be sure, a single use case can drive more than one value capture, but to help paint the vision for how Generative AI can be used to move the needle on competitive differentiators and operational excellence, the use cases described in this dossier are each associated with a primary value capture.

Cost reduction

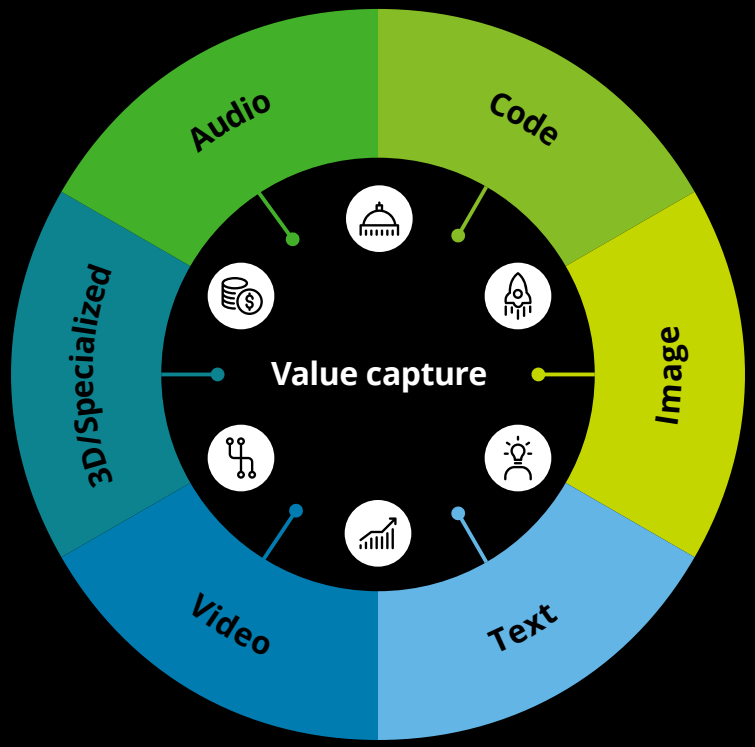
Reduce cost, typically by 30% or greater, primarily through automating job functions and then undertaking job substitutions

Process efficiency

Create process efficiencies through automating standard tasks and reducing manual interventions

Growth

Increase revenue generation through hyper-personalized marketing for target customers



Government citizen services

Increase accuracy of various federal and local programs and create easier access for at-risk populations

Accelerating innovation

Increase the pace of new product or new service development and speedier go-to-market

New discovery and insights

Uncover new ideas, insights, and questions and generally unleash creativity

What is inside

Consumer
7

Energy, Resources & Industrials
33

Financial Services
58

Government & Public Services
85

Life Sciences & Health Care
109

Technology, Media & Telecommunications
138

The Consumer Generative AI Dossier

Generative AI has already seized the imagination of the consumer. The public release of models that can convert text to images or respond coherently to user prompts captivated and even startled many. As the Generative AI marketplace grows, consumers are increasingly exposed to Generative AI-enabled search, educational tools, and a range of free and paid services. For businesses in the consumer industry, Generative AI holds vast potential for improving and enhancing interactions, from helping consumers understand and find the products they need to accessing better, more real-time support to promoting brand loyalty.

Among Generative AI's exciting capabilities for the consumer industry is the ability to automatically create compelling content on demand and at scale. With Generative AI-created text, images, marketing campaigns, product offerings, and more, businesses can hyper-personalize customer engagement across a multitude of markets and channels. There are also emerging opportunities for improving business operations and meeting enterprise goals. The rapid tempo of decision making in the consumer industry demands faster analysis of enterprise data, including structured information (e.g., sales) and unstructured information (e.g., customer feedback and design trends). Given the scale of the data, as well as the reality that data is sometimes siloed or geographically dispersed, Generative AI can help business users more rapidly and easily query datasets, find the right answers when they are needed, and understand their market at a level of granularity and speed that was previously unachievable. All of this moves toward improved decision-making that drives greater cost avoidance, labor efficiency, positive customer interactions, and measureable ROI.

Today, Generative AI is beginning to be built into the technology solutions that run consumer businesses. As it becomes more accessible, companies will continue exploring the potential use cases and deployments that can drive top-line and bottom-line benefits. Looking ahead, when Generative AI is combined with human oversight and governance, as well as other complementary technologies (e.g., traditional machine learning), it will likely sit at the core of consumer businesses.

Today, Generative AI is beginning to be built into the technology solutions that run consumer businesses.

Marketing content assistant

(Content Generation)

Generative AI can be used to enable the creation of efficient, consistent, and personalized content across a range of modalities.

Issue/opportunity

Companies face a significant challenge in managing and optimizing marketing content. With hundreds of websites for brand portfolios, each in dozens of languages, companies struggle to allocate enough time and resources to create customer group-specific product descriptions, images, video, and even audio. Enterprises also wrestle with consistency across descriptions, imagery, ads, and other media, and the materials may not always be optimized for the necessary purposes (e.g., product descriptions for search versus e-mail). Companies need a method to provide a seamless and personalized brand experience across different ecosystems and touchpoints.

How Generative AI can help

Next-gen content generation
With Generative AI, the enterprise can create product descriptions, imagery, video, and more much faster and more consistently than with existing tools and processes.

Personalization at scale
Generative AI models can draw from multimodal data (e.g., text, image, geospatial data) to create personalized and contextually relevant content. The model can be used to catalog content and adapt content and user flow based on language, region, and customer behavior trends.

Assisting compliance
Due to the consistency Generative AI enables across modes, languages, and contextual factors, the enterprise can enhance regulatory compliance for materials across different geographies, cultures, and topics.

Marketing content assistant

Managing risk and promoting trust

Reliable
While tasked with producing superior marketing materials, Generative AI systems may invent inaccuracies, which will lead to poorer customer engagement and outcomes.

Fair and impartial
Biases in the data (e.g., due to incomplete datasets) could lead to unequal quality of content in the face of different geographical or cultural factors.

Potential benefits

Catering to the customer
By tailoring content and the user experience based on language, region, and customer preferences, the enterprise can drive customer satisfaction and loyalty.

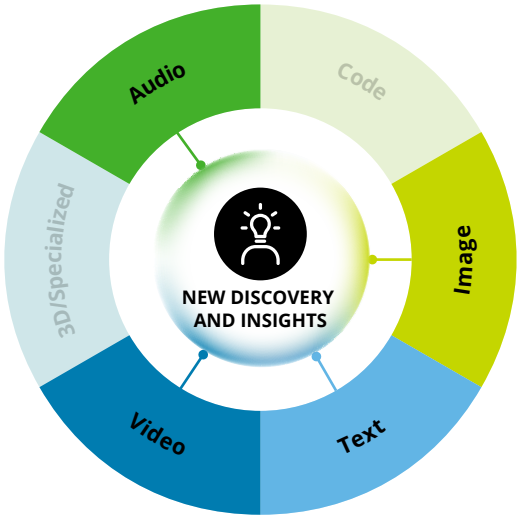
Revenue growth
Personalized content can promote higher engagement, traffic, and conversions through tailored and relevant marketing experiences.

Cost efficiency
Using Generative AI for content creation allows the enterprise to develop and maintain content at scale without the costs associated with commensurate human labor.

Planning for promotions

(Reimagined Trade Promotions)

Generative AI can be used to prepare promotion plans, negotiation materials, pre-works, and pitch-decks.



Issue/opportunity

When it comes to planning and negotiating trade promotions, Consumer Packaged Goods (CPG) organizations draw from a multitude of data sources and there is often not enough time to filter through all relevant information. What is needed is a way to more rapidly consult data sources to enhance trade pricing negotiations by predicting outcomes, customizing strategies, and tailoring selling stories. At the same time, there is also a challenge in understanding complex transactional data from retailers, which holds valuable insights for the design of successful promotion plans (i.e., what, where and how to promote).

How Generative AI can help

Supporting employees
Generative AI can be used to prepare negotiation materials by combing through older campaigns or deals, sorting the relevant information, and generating suggestions. This helps equip the human employee with materials like pre-works (e.g., consolidated material from prior years) and pitch-decks, supporting their negotiations.

Predicting outcomes
Generative AI can help optimize trade shelf spacing and investment allocation by predicting outcomes and conducting scenario building and storytelling. It can also be used to build scenarios with cultural customizations for negotiation processes with retailers.

Optimization support
With Generative AI, users can rapidly analyze EPOS data and transactional information to provide insights that help optimize the design of promotional programs, setting the right price points, promotion mechanics, and anticipating sales uplift to inform production processes of the expected demand.

Planning for promotions

Managing risk and promoting trust

Security
Because price, margin information, and negotiation strategies are consumed by the model, it must be secured to prevent the leakage of sensitive commercial data.

Fair and impartial
The data used to train and fuel the model may be dated, leaving new target groups and small-but-growing customer segments potentially underrepresented. As a result of this latent bias, the model may be challenged to provide commensurate accuracy for all groups and segments.

Potential benefits

Driving efficiency
By using Generative AI to augment preparing and sorting materials, the organization promotes efficiency in trade promotion processes.

Trade promotion effectiveness
Leveraging Generative AI can help improve allocation of resources across price, promotion, and negotiation strategies.

Data-driven decision making
Using Generative AI to create materials for trade negotiations enables human workers to access much more information and make more informed, data-driven decisions.

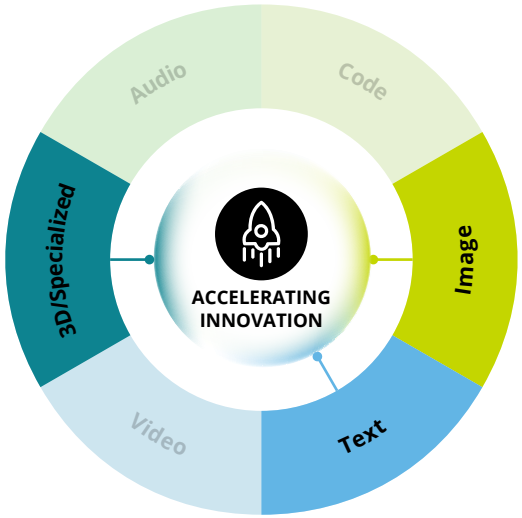
Product design assistant

(Rapid Prototyping)

Accelerate the product prototyping lifecycle by creating new concepts and high-fidelity virtual prototypes with the help of Generative AI.

Issue/opportunity

Traditionally, product development is a time-intensive process, and from hundreds of options, just one idea is commercialized. The challenge is in part overcoming human limitations in generating diverse and innovative ideas, facilitating cross-industry inspiration, and streamlining concept testing processes.



How Generative AI can help

A creative aid
Generative AI can be integrated with CAD and other software to assistant the design process of new prototypes and products. This can help creative thinking, brainstorming, and out-of-the-box thinking.

Trends for innovation
Generative AI can be a collaborative assistant by drawing from consumer trend analysis to help inform creative concepts and products.

Product design assistant

Managing risk and promoting trust

Reliable

While virtual prototyping can accelerate the iteration process, a Generative AI assistant may propose prototype designs that are sound in a virtual space but infeasible from the standpoint of real-world fabrication and regulatory compliance.

Responsible

There remain legal questions around the intellectual property rights for outputs created with Generative AI. Ownership rights, attribution, and the protection of designs can become complex when Generative AI is involved in the creative process.

Potential benefits

Cost reduction
By reducing the need for extensive market research and concept testing, the enterprise can save resources, time, and money across the prototyping process.

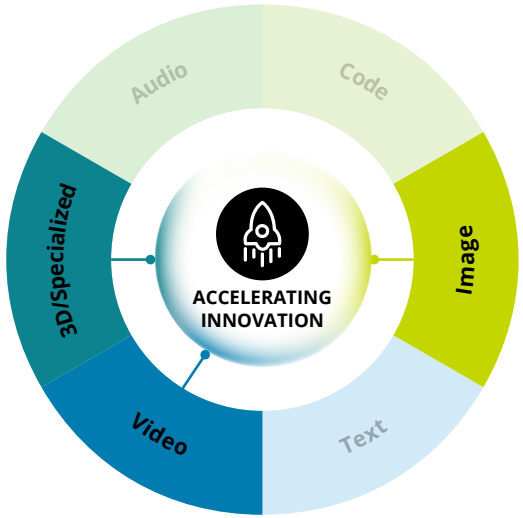
Increased innovation
More rapidly generating diverse and unconventional ideas in greater volume expands the creative possibilities for new product development.

Speed to market
Leveraging Generative AI can accelerate the ideation and concept testing phases, enabling faster product development and launch.

Strike an AI pose

(Artificial Model Agency)

Generative AI can create video and still images to more efficiently showcase products to a more diverse set of people.



Issue/opportunity

The model industry requires significant coordination among agencies, actors, photographers, and other professionals. Agencies may sometimes struggle to find models with a specific look or voice, and it may also be challenging for agencies to communicate their ideas to models and even to the audience. The overall process can suffer from inefficiency, limited capacity for customization or variation, limited diversity, high costs, and issues around intellectual property and licensing.

How Generative AI can help

Customization and realism
Generative AI can be used to create a range of artificial models, with customizable features that can promote diversity and uniqueness. These artificial models can exhibit a high degree of realism, giving consumers more immersive experiences with a greater ability to envision the products that interest them.

Time and cost efficiency
Generative AI can automate the generation of models by using pictures of one model and transferring it to many other models, reducing the need for manual creation from scratch.

Adaptability in style and aesthetics
Whether agencies require models with a specific art style, period, or cultural reference, Generative AI can be used to adapt artificial models to specific design requirements. Agencies can also provide feedback on generated models to help the Generative AI application refine and improve its outputs.

Driving diversity
By using Generative AI to create virtual models, the business has greater flexibility to create diverse and inclusive representations.

Strike an AI pose

Managing risk and promoting trust

Transparency

The enterprise should consider the ethics of portraying a digital output as authentically human. Suggest weighing the degree to which customers should understand they are not observing a real person, as that could have implications for customer trust in how the product looks in person, and ultimately, trust in the company itself.

Responsible

The Generative AI system is trained on the data and likeness of human models, which raises important ethical and intellectual property considerations regarding consent, privacy, and representation.

Potential benefits

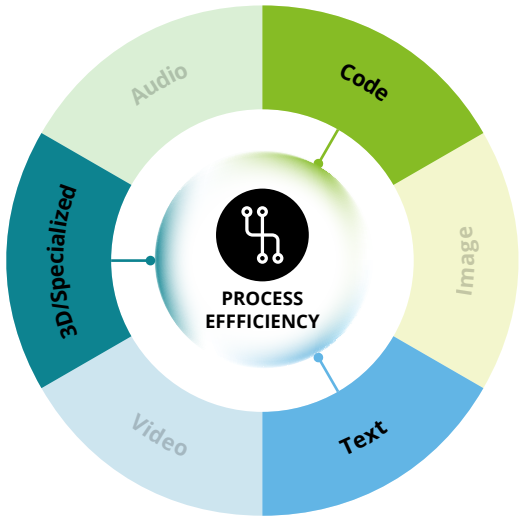
Model customization
A more tailored and diverse use of AI-generated models to showcase products may better attract customer interest and sales.

Scale on demand
Leveraging Generative AI to create artificial models allows the enterprise to quickly adapt showcasing to changing market conditions and customer needs. It can achieve this at scale, across markets and geographies, while also ensuring consistent quality and speed.

Data access for all

(Data-Empowered Business Users)

Generative AI can help guide business users to key insights in consumer behaviors by enabling them to combine data from various sources through natural language queries and summarizing issues to action without needing the help of dedicated analysts.



Issue/opportunity

Everyone in the business should be consumer-focused, but while the marketing function may have access to customer data, business stakeholders in product design, trading, retail operations, supply chain, and other functions may only encounter slices of customer information. Currently, enterprises need dedicated analysts to pull SQL queries to curate data for decision making, which creates an expertise barrier to use AI the advantages of AI. Data is held across different silos, and existing interfaces are only built to answer pre-populated questions. The result is that most business users cannot fully leverage the enterprise's models and data, and cross-functional insights are challenging to identify.

How Generative AI can help

Greater access to insights
A Generative AI system can help stakeholders across all business functions better understand the consumer by simplifying data mining and analysis with user-friendly interfaces and natural language queries. This allows users to ask questions relevant to their work and extract actionable insights without compromising functionality.

Bringing down data barriers
The system can aggregate data from various sources and domains (e.g., purchasing patterns, customer service, website and browsing data, marketing campaign response) to provide comprehensive insights into consumer behaviors. Reaching across data silos, the system can automatically identify outliers and summarize issues to guide decision-makers to areas requiring attention.

Data access for all

Managing risk and promoting trust

Security

The Generative AI model is exposed to sensitive and proprietary enterprise data, which creates a risk of potential data leakage. To mitigate this risk, the enterprise may look to restricting data access to the Generative AI provider, as well as carefully determining which consumer data should be exposed to the model.

Reliable

For business users to make confident decisions informed by Generative AI, they need to be able to trust the outputs. To this end, data inputs need to be accurate and up-to-date, and outputs should be validated and monitored.

Explainable

Business users require sufficient context to interpret consumer data, and whereas analysis conducted by a data expert inherently contains a level of "human in the loop", when using a Generative AI model, business users need the capacity to understand context and outputs.

Potential benefits

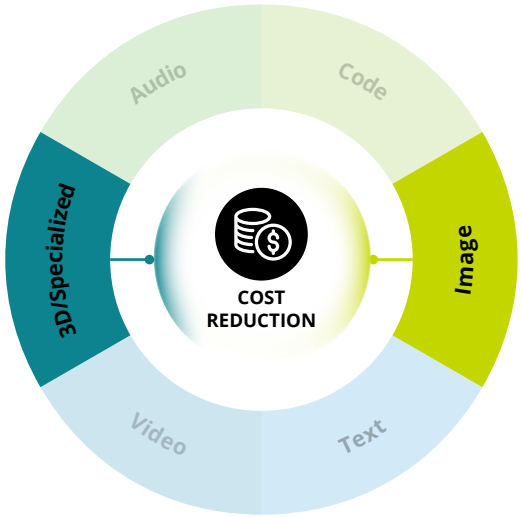
Agile decision-making
Business users are empowered to make more informed decisions about product launches, sales, and other customer-related initiatives both quickly and efficiency.

Time and resource efficiency
Simplifying data access and analysis for business users can accelerate time-to-insight without additional burdens on data analysts and the technical workforce.

Seeing is believing

(Virtual Try-On)

Generative AI can be used for style transferring, which allows consumers to see a digital rendering of clothes and other products on their own bodies, in their homes, and elsewhere.



Issue/opportunity

In the clothing and make-up industry, consumers typically try on products to determine whether they want to purchase and keep it. Yet, this traditional method of selecting products is challenged by online shopping, where the consumer relies on pictures and product descriptions to inform their decision. This can lead to high return rates and affiliated costs to the company, as well as customer dissatisfaction.

How Generative AI can help

Accurate style transferring
By analyzing images or videos of the customer and the desired style, Generative AI can create realistic representations of how the clothing or product would look in the real world.

Virtual mix-and-match
Generative AI allows customers to more easily explore a wider range of style options, clothing combinations, and accessories.

Greater personalization
By considering factors such as body shape, skin tone, and personal style, Generative AI can suggest suitable products that align with the customer's preferences.

Seeing is believing

Managing risk and promoting trust

Privacy

By working with and augmenting consumer photos and videos, the model is exposed to sensitive or personally identifiable information, which is subject to privacy regulations and standards. Leveraging Generative AI for style transferring requires the enterprise to ensure user data is safely stored, transferred, and used.

Transparency

When consumers input an image of themselves or their surroundings, they need to understand how that media is used by the enterprise, how consumer-machine interactions are tracked and recorded, and whether there are any privacy risks to the consumer when using the style transferring application.

Fair and impartial

If the training set is unbalanced and therefore biased, renderings for virtual try-ons may be more accurate or realistic for one demographic group over another, potentially impacting customer satisfaction and regulatory compliance.

Potential benefits

Customization for the customer
Catering to the customer buying experience with a simpler way to explore product offerings promotes customer satisfaction.

Reduced return rates
When customers can better see and imagine how a product looks before making a purchase, it helps reduce the likelihood of mismatched expectations, product dissatisfaction, and returns.

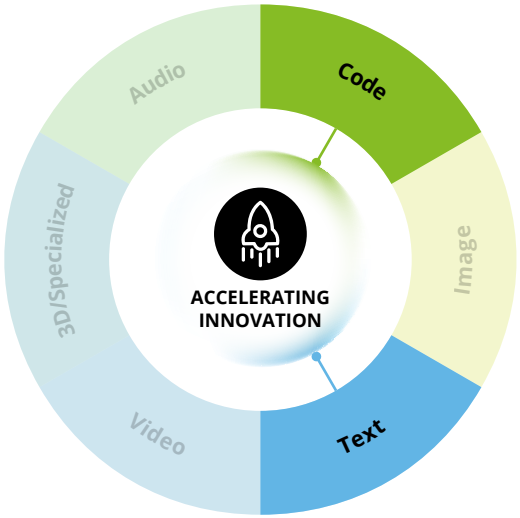
Simpler sales
Making it easier to choose which product to buy by virtue of a simpler method for exploring options can support sales growth.

Trend analysis and insights
Generative AI can be used to analyze data from virtual try-on experiences to gather insights on customer preferences, popular styles, and emerging trends.

Code assist for developers

(Augmented Developer)

Generative AI can be used to supplement the work of software developers by helping create and maintain multiple applications and platforms.



Issue/opportunity

To give customers a seamless digital experience, enterprises are challenged to develop and maintain applications across different platforms. Yet, developers and other high-skilled professionals are in high demand and short supply. To overcome the talent gap, Generative AI can be used to supplement a developer's effort by automating aspects of code creation and maintenance so the developer can focus on more complex code writing and validating Generative AI outputs.

How Generative AI can help

Offloading lower-level work
Generative AI can augment the completion of repetitive tasks, such as the deployment and maintenance of code across different platforms (e.g., iOS, Android, webapps).

A developer assistant
Generative AI can be used in the development of the code itself, serving as a assistant supporting software developers in writing and maintaining code. It can also promote consistency across platforms and applications, such as by converting functional code to different environments.

Code assist for developers

Managing risk and promoting trust

Security

Code created with Generative AI may include vulnerabilities that may be difficult to identify during development and even after deployment. Given the importance of cybersecurity, enterprises need to ensure generated code does not introduce security risks.

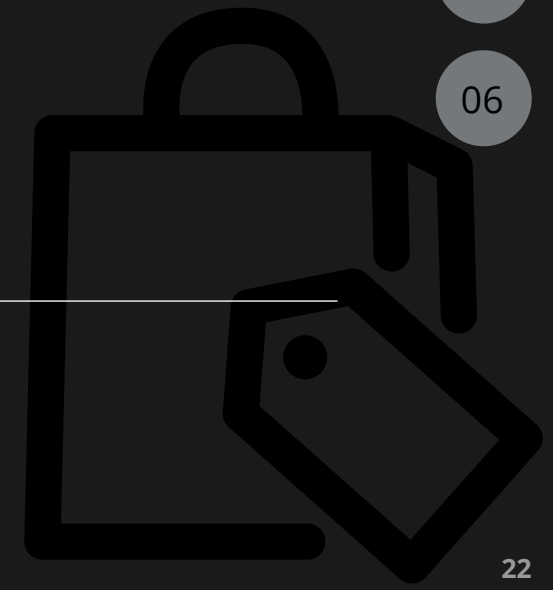
Reliable

Generative AI is susceptible to errors, and when using it for development tasks, human validation is necessary to mitigate the risk of bugs or vulnerabilities in code as it is created and maintained for multiple applications.

Potential benefits

Efficient deployments
Using Generative AI can help developers efficiently deploy and maintain code across platforms.

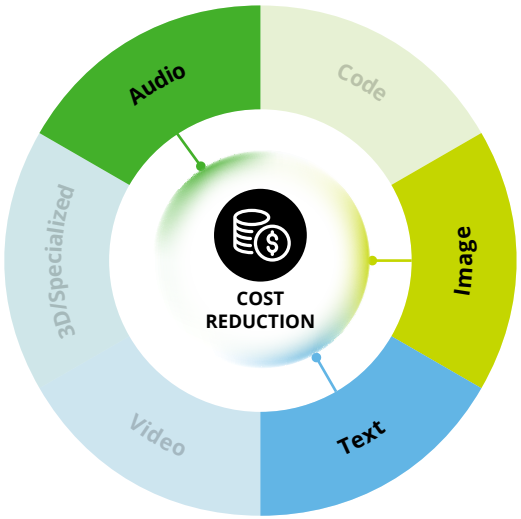
Digital consistency
Using Generative AI helps developers maintain a consistent experience across multiple platforms by ensuring each environment functions at the same level of quality, thanks to automation (e.g., code conversion) that augments developer capacity and capabilities.



Customer support on demand

(Customer Assistant)

Generative AI-enabled virtual agents can improve the customer experience by providing real-time, personalized support and creating new ways of interacting with customers.



Issue/opportunity

After purchase, customers may seek information or support around a product or service. While traditional call centers have implemented some AI capabilities to automate responses to customer inquiries, the automation is often limited in its capacity to interpret customer questions and respond in a conversational and helpful way. The need is to accurately and proactively respond to customer inquiries and online trends in an efficient and effective manner.

How Generative AI can help

A conversational agent
Generative AI can enable new ways of engaging with customers, using speech-to-text and natural language inputs to generate empathetic and personalized conversations for aftersales support and handling customer complaints.

Better use of human capital
Because Generative AI can provide instant, personalized responses to customer queries, offer relevant solutions, and engage in conversations, customers can gain faster response and resolution, and organizations can free up human agents to focus on more complex customer issues.

Customer support on demand

Managing risk and promoting trust

Reliable

The quality and accuracy of customer interactions impacts the customer experience and brand impression. If a Generative AI-enabled customer assistant fails to provide accurate and personalized advice or product instructions, it could degrade (rather than enhance) the quality of the customer interaction.

Transparency

Customers should have the opportunity to gain a clear understanding of what the model can and cannot do, and to promote transparency and positive engagements, enterprises should set customer expectations for the virtual assistant.

Potential benefits

Enhanced customer experience
Providing personalized and accurate support, guidance, and troubleshooting supports a positive brand reputation and improved customer relationships and loyalty.

Increased efficiency
By integrating Generative AI to automate aspects of customer engagement, a larger volume of customer interactions can be accomplished simultaneously, improving response times, driving customer satisfaction, and with the capacity to scale with customer demand.

A virtual shopping assistant

(Product Recommendations)

Generative AI can be used to create personalized product recommendations based on customer preferences and behavior.

Issue/opportunity

Suggesting the right products to customers can dramatically increase sales, and hyper-personalized product recommendations are often the most effective at driving a sale. Data-based product recommendations are already possible today, but they often lack a conversational, natural language tone. What is more, recommendations may lack a hyper-personalized quality as they are based on broader customer segments and purchase history, as opposed to individual customer search criteria and feedback.

How Generative AI can help

Hyper-personalized recommendations
Based on customer input and preferences, Generative AI can generate tailored recommendations, making the buying process more personalized and convenient. In addition, the interactive and iterative approach to product recommendations that Generative AI enables can yield more targeted suggestions than current search engine capabilities.

Image as input/output
Consumers can enter an image of preferred styles (e.g., a celebrity in a designer outfit), and the Generative AI model can output product identification and recommendation based on the image.

A virtual shopping assistant

Managing risk and promoting trust

Fair and impartial

Latent bias in training and testing data may lead the model to express a preference toward some products or product combinations when making recommendations. Ongoing monitoring, data updates, and human validation can contribute to continuous improvement and bias mitigation.

Privacy

The model may be exposed to customer data throughout the course of an interaction, and that personal information may be subject to regulatory protections. Important considerations include how the customer data is stored, transferred, and used, as well as how the data is consumed and used by the model itself.

Potential benefits

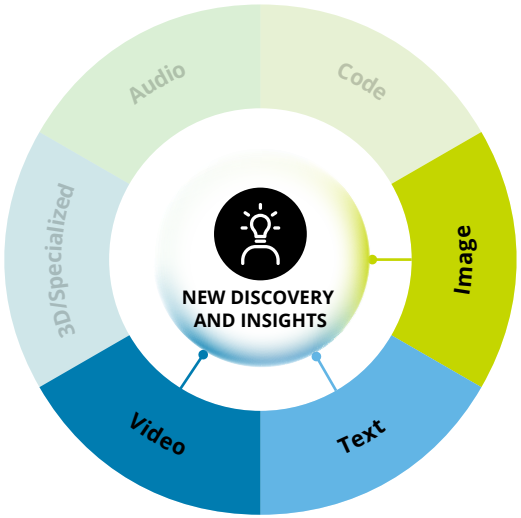
Enhanced customer experience
Providing personalized and accurate support, guidance, and troubleshooting supports a positive brand reputation and improved customer relationships and loyalty.

Increased efficiency
By integrating Generative AI to automate aspects of customer engagement, a larger volume of customer interactions can be accomplished simultaneously, improving response times, driving customer satisfaction, and with the capacity to scale with customer demand.

Next-level market intelligence

(Market Research)

By harnessing Generative AI's capacity to read and summarize vast amounts of relevant material, companies can expedite market research and gain concise insights for effective decision-making in new markets.



Issue/opportunity

When researching entry possibilities in new markets or customer groups and identifying new target segments, enterprises face a variety of challenges. Things like a lack of market data, unfamiliar customer preferences, cultural and economic differences, competitive analysis difficulties, regulatory complexities, high market entry costs, potential brand perception challenges, and uncertainties about demand and market acceptance all impact the speed and quality of market research.

How Generative AI can help

Market intelligence
Generative AI can help simulate market scenarios, generate synthetic data to fill data gaps, predict customer preferences based on existing patterns, offer cross-cultural insights, aid in competitor analysis, suggest compliance strategies, optimize market entry costs, simulate brand perception scenarios, and provide demand forecasting to reduce uncertainties.

Information synthesis
Generative AI enables rapid market research by efficiently reading and summarizing extensive volumes of pertinent material, presenting the information in a readily understandable format for market research teams.

Novel market segmentation
AI-generated data may reveal new and previously unidentified market segments within the target market. This can open up additional opportunities for niche marketing and product customization.

Richer personas
Rather than relying on basic surveys and focus groups for understanding consumer likes and dislikes, Generative AI can identify specific customer preferences and create detailed profiles. Using Generative AI, market research teams can even create fictional-yet-plausible customer personas based on the market's unique characteristics, helping the company better understand their potential customers' behavior and preferences.

Next-level market intelligence

Managing risk and promoting trust

Fair and impartial
Generative AI models may learn from biased datasets, leading to biased outputs that do not accurately represent the actual market.

Reliable
Given Generative AI's potential to hallucinate inaccurate outputs, AI-generated insights should be verified with real-world data and traditional research methods to ensure accuracy and reliability.

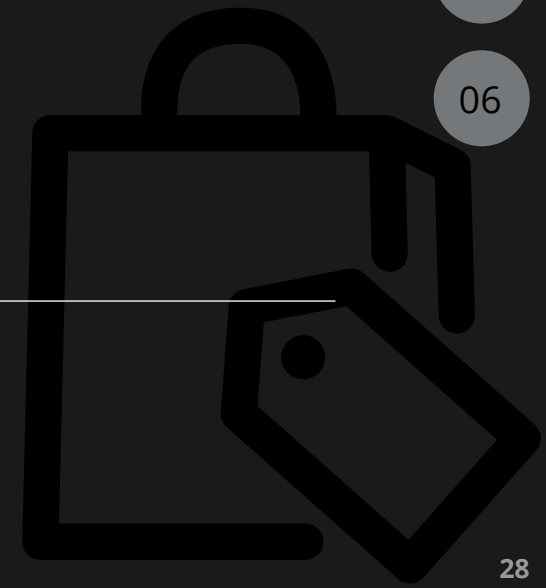
Responsible
While Generative AI can complement market research, it should not replace traditional research entirely, as it may miss qualitative nuances and human expertise.

Transparency
To trust the Generative AI outputs, users require the ability to understand which samples and research methods were used to generate recommendations and insights.

Potential benefits

Cost-effective research
Generative AI can reduce the costs associated with traditional market research methods by generating large datasets and simulating scenarios.

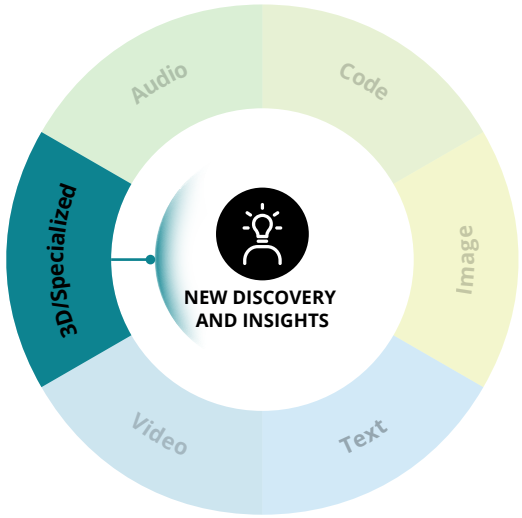
Risk mitigation
By simulating market responses, CPG companies can identify potential risks and challenges in the new market before making substantial investments. This helps reduce the chances of product failure and financial losses.



Integrated business planning

(AI consolidation of forecasting and planning across the enterprise)

AI can help an organization consolidate real-time sales, demand, and supply data across all functions, creating a single source of truth to drive faster, more strategic decisions in finance, supply chain, marketing, and sales.



Issue/opportunity

Today's companies have a wide variety of systems for planning and forecasting. However, the individual outputs from those disparate systems often conflict with each other and don't provide a unified view of what's really going on. Different teams—finance, supply chain, marketing, and sales—create their own forecasts using siloed data and inconsistent approaches. The potential results? Mismatched projections, inefficiencies, delayed decision-making, and significant operational waste.

How Generative AI can help

Real-time consolidation
Generative AI can consolidate real-time inputs from sales, inventory, marketing trends, and supply chain metrics to produce dynamic forecasts.

Sophisticated analysis
AI enables trend recognition, historical pattern analysis, and early alerting on supply-demand gaps, while also facilitating scenario planning and pricing strategy refinement—all through a unified dashboard.

Actionable insights
The system can continuously update itself as new data flows in, signaling demand shifts or regional product affinities and providing decision makers with actionable insights.

Integrated business planning

Managing risk and promoting trust

Robust and reliable

Given the system's critical business impact, resilience is key. AI models should be capable of updating in real time and integrating multiple data streams reliably and accurately. Extensive pilot testing can help fine-tune model accuracy before scaling.

Transparent and explainable

A user-facing dashboard that clearly shows inputs, trends, and recommendations can help business leaders understand how forecasts are generated, what assumptions are at play, and what real-world data is influencing outputs—reducing blind reliance on the system and promoting human-AI collaboration.

Safe and secure

To help mitigate security breaches and operational disruptions, robust security protocols should be embedded in both the technology infrastructure and data flows, with IT overseeing access controls, data encryption, and integration with existing ERP systems.

Potential benefits

Unified forecasting with less redundancy
AI can help minimize conflicting forecasts across departments, creating a single source of truth for the entire enterprise.

Improved collaboration and decision-making
Cross-functional teams are able to operate from the same real-time data set, improving alignment. Also, leaders spend less time on data consolidation and cross-checking, enabling them to make better-informed decisions more quickly.

Greater supply chain efficiency
Integrated business planning powered by AI enables better inventory and warehouse management, which can reduce supply disruptions, shortages, and waste.

Social media content generation

(Automated, multimodal content creation that is trend-aware and always on)

Generative AI is now being used to autonomously produce social media content—text, images, hashtags, and videos—that aligns with brand identity and capitalizes on viral trends in real time.

Issue/opportunity

Social media is a key channel for communicating with customers and shaping brand perceptions, and an important driver for awareness, engagement, and sales conversion. But creating personalized, high-quality content at speed and scale—while maintaining brand consistency and legal compliance—is a difficult balance.

Large enterprises often rely on global agencies to support social media content across dozens of brands and channels. This approach can be very costly, time-consuming, and limited by human working hours. Also, in a media environment where trends can shift in an instant, traditional methods likely cannot scale or respond quickly enough to keep pace with opportunities in real time.

How Generative AI can help

Detecting and analyzing trends and events
AI can help detect and analyze influencer trends and brand affinity across a wide range of social media platforms 24/7, identifying opportunities to shape consumer expectations in real time. Retrieval-augmented generation (RAG) capabilities provide real-time access to social data, such as trending hashtags, viral video clips, and current events.

Generating multimodal creative content
GenAI offers the ability to autonomously generate creative content across modalities, while remaining contextually and culturally aware. Key capabilities include: (1) LLMs for generating social media copy, product descriptions, captions, and hashtags; (2) multimodal image models for visual asset generation, including pack shots, brand imagery, and marketing visuals; and (3) short-form video generation.

Model-agnostic orchestration
Content creation tasks can be dynamically routed to the most cost-effective or best-performing GenAI models, optimizing output while reducing compute costs.

Social media content generation

Managing risk and promoting trust

Robust and reliable

Retrieval-augmented generation can reduce hallucinations and improves model performance over time. Fallback models and safety nets can mitigate failures or inappropriate content generation under unpredictable conditions.

Fair and impartial

The content generation pipeline should be evaluated regularly for potential cultural, social, or representational biases. Human oversight can ensure that outputs reflect brand values.

Respectful of privacy

No personal user data should be used in the generation process; models should be trained and tuned on anonymized or public datasets. Data residency and usage should comply with regional regulations, including the EU AI Act.

Potential benefits

Always-on, real-time responsiveness
Traditional content workflows often require long lead times for ideation, approval, and execution. With GenAI, brands can respond almost instantly to real-time events, seasonal trends, or cultural moments by generating relevant content in minutes, enabling more agile and timely brand engagement.

Scalable content production at low marginal cost
Generative AI enables brands to produce high volumes of personalized, platform-specific content—text, images, and video—without requiring a linear increase in resources. The system can support hundreds of product lines and campaigns with minimal incremental effort, greatly improving operational leverage.

Cost reduction through automation and budget reallocation
Augmenting external creative agencies and internal content teams with AI-generated outputs can reduce operational costs. It can also free up budget that can be reallocated toward more strategic initiatives, such as paid media, analytics, or customer experience improvement.

Data-driven personalization and targeting
AI systems can tailor content for audience segments based on behavior, geography, platform norms, or product affinity. This micro-personalization allows brands to deliver relevant content to niche audiences, increasing engagement and conversion potential.

Improved productivity
By automating repetitive or time-intensive content generation tasks, marketing and creative professionals can focus more on high-value work such as strategy, brand storytelling, or campaign optimization. This reallocation of effort can lead to improved job satisfaction and better use of talent.

Consistent brand voice and visual identity
With proper tuning and governance, AI-generated content can more reliably align with predefined brand guidelines, helping to ensure a unified voice across markets, languages, and touchpoints. The system can learn and reinforce tone, terminology, and aesthetic standards consistently.

The Energy, Resources & Industrials Generative AI Dossier

Companies in the Energy, Resources, & Industrials (ER&I) industry face challenges related to energy security, affordability, profitability, and the transition towards a cleaner and sustainable future. Adopting Generative AI presents an attractive opportunity to help address these critical areas. Integrating Generative AI across the industry can lead to cost avoidance, operational efficiencies and resilience, and reduced emissions.

Historically, the ER&I industry has tended to take a conservative approach in embracing novel technologies, owing to the investment required to access new benefits while mitigating new risks. Consequently, companies may be hesitant to become early adopters of Generative AI. Yet, incumbent firms (particularly in construction, mining, and energy production) may hold an inherent advantage in this domain, as they possess exclusive and proprietary data that can be used to finely calibrate Generative AI models for specific requirements and value-driving use cases. This grants them the potential to take a leading market position when leveraging Generative AI models.

There is increasing pressure on companies in this industry to transition to more sustainable and environmentally friendly practices. This pressure is exacerbated by the global shift towards renewables and the need to diversify the energy mix. Generative AI may hold transformative potential in this regard. For example, Generative AI is revolutionizing resource exploration and extraction processes. Resource-rich areas can be quickly identified by capitalizing on vast amounts of geological and geophysical data. As an example, Generative AI could be employed by Oil and Gas companies to overcome the complex logistical challenges of offshore exploration. Synthetic seismic data generation and generative modelling of hydrocarbon reservoirs can optimize

There is increasing pressure on companies in this industry to transition to more sustainable and environmentally friendly practices.

exploration efforts and increase resource extraction efficiency while limiting disturbance to the surrounding environment. By optimizing energy usage, minimizing waste, and supporting the development of eco-friendly technologies, by automating certain parts of the design process, Generative AI can contribute to a more sustainable and responsible approach to resource extraction and industrial operations.

Initiating the adoption of Generative AI at this juncture goes beyond merely gaining a competitive edge in the present. It also entails establishing a foundation for future growth by investing in the workforce. Contemplating the ER&I industry's future, Generative AI will likely assume a central role in optimizing and mitigating health and safety risks by generating worksite-specific safety training that replicates real-world settings and critical scenarios. As companies transition to the environmentally sustainable business model, Generative AI could develop real-time, bespoke training materials that support workforce transition and adoption of sustainable practices.

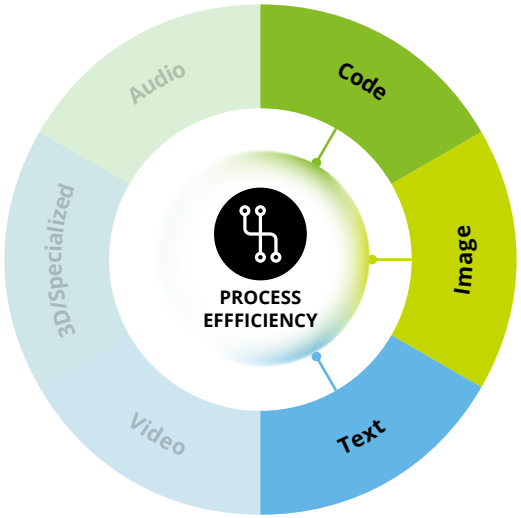
By embarking on the exploration and implementation of Generative AI now, companies can acquire valuable insights, adapt to its nuances, and evolve alongside the advancing technology. This strategic approach will position organizations to leverage the full capabilities of Generative AI as it reaches maturity.

As companies transition to the environmentally sustainable business model, Generative AI could develop real-time, bespoke training materials that support workforce transition and adoption of sustainable practices.

Keeping the equipment healthy

(Asset Maintenance Planning)

Generative AI in asset maintenance planning can improve equipment uptime, reduce maintenance costs, and enhance operational efficiency.



Issue/opportunity

In mining and oil and gas operations, maintenance planning helps prevent premature equipment failure, costly repairs and replacements, and extends the life of an asset. Facing near- and long-term constraints and factors, maintenance plans and the subsequent downstream processes can be changed to align with production, in response to resource availability, or because of unexpected events. Making maintenance plan alterations, however, can be costly and labor intensive.

How Generative AI can help

Continuous improvement
Generative AI can be used to reconcile lessons learned from prior shutdowns, identify opportunities for maintenance alignment, provide planners with the information needed to challenge assumptions on maintenance alignment, and develop strategies to minimize the impact across the system.

Optimal maintenance scheduling
Generative AI helps optimize maintenance schedules by weighing operational factors (e.g., equipment use, production requirements, and maintenance costs), recommending the most efficient and cost-effective schedules, and analyzing equipment use and performance data to minimize downtime and maximize equipment availability.

Simulation and optimization
Generative AI can simulate maintenance scenarios and evaluate the impact of maintenance strategies on equipment performance, productivity, and operational efficiency. This helps reveal the most effective maintenance approaches and optimizes resource allocation for maintenance activities.

Keeping the equipment healthy

Managing risk and promoting trust

Robust and reliable

Generative AI applications for asset maintenance planning depend on the quality of the data. Data that is incorrect, incomplete, or is not representative of the current operational environment or maintenance practices can lead to a suboptimal and potentially inappropriate maintenance plans that may even be detrimental to asset health management and future maintenance planning activities.

Accountable

There is no machine substitute for a human asset maintenance planners' knowledge, experience, and expertise. Overreliance on AI-generated outputs without critical human review may lead to important contextual factors and valuable insights being overlooked.

Safe and secure

Generative AI models may struggle to account for the uncertainties inherent in asset maintenance planning, like unexpected equipment failures or changing production requirements. Suboptimal or unrealistic Generative AI recommendations due to overfitting can lead to inaccuracies or poor performance when applied to real-world maintenance scenarios. The degree of human intervention and oversight needed must be considered in the design phase of the solution. This is especially true in intricate operational constraints which may prevent Generative AI from providing accurate and feasible solutions.

Potential benefits

Proactive cost improvements
Maintenance plans can be dynamically altered at different time scales in response to changes in upstream plans, which not only helps minimize the impact of down time but also maximize the use of available resources for asset maintenance.

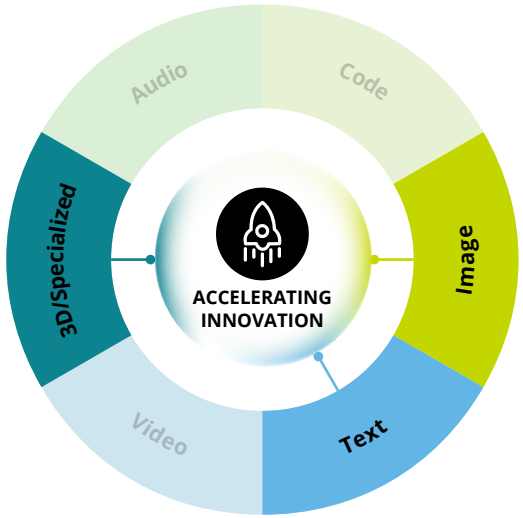
Increased volume delivery
Improved alignment of planned maintenance and production helps increase volume without compromising asset management strategies.

Greater health and safety
Optimal resource allocation, accommodation management, and shutdown duration all support occupational health and safety outcomes.

Expediting experiments and design

(Materials Design)

Generative AI empowers materials designers to explore a wider design space, optimize material properties, and expedite the discovery of new materials.



Issue/opportunity

Developing new materials is challenging, costly, and time-consuming, and one reason is that the chemical space is vast and complex while the number of chemically feasible molecules is unknown. What is more, the materials discovery, development, and optimization process attracts different complexities at each stage, increasing the time required to reach a final design.

How Generative AI can help

Streamline experimental process
Using Generative AI to determine the most efficient experimental procedures for probing or optimizing materials can streamline the experimental stages of development by removing redundant experiments and undertaking those that are cost and time optimized.

High-entropy alloy (HEA) engineering
Traditional techniques for developing HEAs with excellent physical, chemical, and mechanical properties are time-consuming and costly, making generative modelling a promising alternative development pathway.

Expediting experiments and design

Managing risk and promoting trust

Security

Intellectual property or a competitive advantage could be compromised by using Generative AI in materials design, as models trained on proprietary or sensitive data could potentially reveal valuable insights or design strategies to competitors.

Responsible

Companies should be mindful to identify and mitigate unintended negative ramifications of materials designed with the support of Generative AI, such as long-term environmental impacts from materials that cannot be manufactured in responsible and sustainable ways.

Potential benefits

Fueling innovation
Generative AI applications have the capability to rapidly generate and prioritize a wide range of virtual materials with diverse compositions and structures. This virtual screening process allows researchers to identify potential candidates for specific applications or material properties much more quickly than traditional experimental methods.

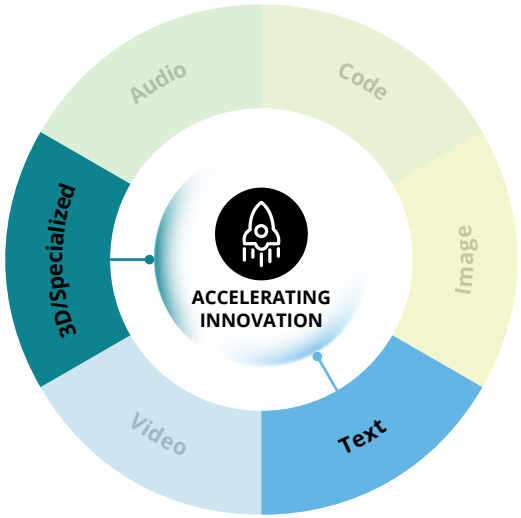
Bringing down costs
Through efficiency savings and the rationalization and/or elimination of experiment consumables, the organization can reduce development costs.

Enabling discovery
Generative AI maximizes the likelihood of discovering materials with superior properties by leveraging its ability to efficiently explore and navigate a vast design space of potential materials.

Understanding the ore

(Minerals Processing Optimization)

Generative AI can make the process of chemical separation of minerals from ore more cost- and time-efficient, safer, and more environmentally sustainable.



Issue/opportunity

In mineral processing, chemical additives must be matched to the exact contents of the ore to separate as much as possible from waste minerals without destroying them. The process is complicated due to the facts that modelling and testing each compound is time- and effort-intensive, complex mineralogy and interrelationships between minerals can hinder recovery, and environmentally hazardous chemicals are often necessary to process certain compounds.

How Generative AI can help

Ore characterization and mapping
Generative AI models can be trained on large datasets of mineral samples to generate synthetic samples that mimic the characteristics of real-world ores. Comprehensive databases can be built for mineral identification, classification, and prediction of ore properties, permitting insights into the behavior and composition of different ores without testing on known processing assays.

Process optimization
Models that simulate the physical and chemical processes involved in mineral processing can help optimize factors like grinding parameters, flotation conditions, and separation techniques. This can improve efficiency, reduce energy consumption, and enhance mineral recovery rates.

Understanding the ore

Managing risk and promoting trust

Robust

Generative AI models may struggle to generalize mineral samples and processing scenarios that are significantly different from the training data. The model might not capture the full range of variations and unique characteristics of novel ores, which could lead to suboptimal processing recommendations.

Reliable

If Generative AI models cannot interpret complicated physical and chemical qualities like particle size distribution, mineral composition, and processing conditions (typically as they are not explicit in the data), the model may generate suboptimal strategies or overlook critical factors.

Potential benefits

Accelerated exploration
The cost and time needed to characterize ore and develop a processing workflow can be significantly reduced, and cost and efficiency trade-offs can be optimized to maximize mineral recovery while minimizing operational costs.

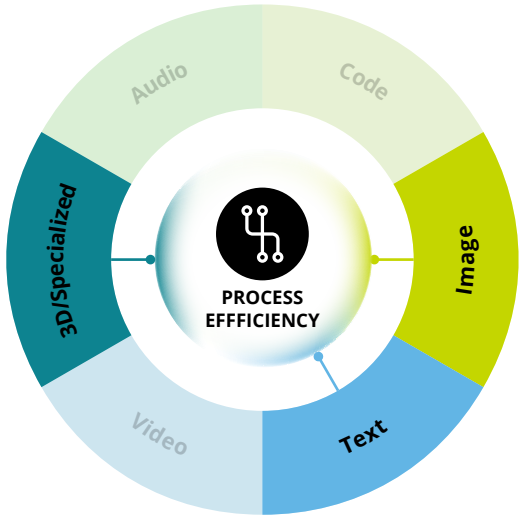
Eco-friendly operations
Keener insights into mineralogy using Generative AI can help reduce the amount of environmentally damaging additives and resources needed for processing without sacrificing production volume or efficiency.

Occupational health
Optimized processing can help reduce human exposure to toxic chemical additives and fine particle dust, which contributes to a safer work environment.

Optimize the design

(Site Design Generation)

Generative AI can support the development of site plans by automating aspects of the design process, providing designers with new possibilities and reducing the associated time and cost.



Issue/opportunity

Site planning is a multi-stage, iterative process to optimize cost, efficiency, and safety, but it is also an expensive and time-consuming exercise involving numerous stakeholders and third-party specialists. Site planning can require surveys in remote, sometimes hostile locations. Forecasting near- and long-term impacts involves assessing a multitude of factors, and site-specific activities such as topological and geological surveying can be labor intensive and expensive.

How Generative AI can help

Automated layout generation
Designers can use Generative AI to analyze site constraints, design requirements, and input from engineers to quickly generate layout options for site plans that consider factors such as zoning regulations, operational use, and user preferences.

Design optimization
Generative AI can help optimize site plans by analyzing parameters like solar orientation, traffic flow, and accessibility to suggest optimal infrastructure placements. This can help improve energy efficiency, support better space utilization, and enhance the user experience.

Efficient documentation and annotation
By analyzing design elements and structures in the generated plans, Generative AI can automatically annotate the plans with relevant information, such as dimensions, materials, and specifications. This automation could save designers considerable time and effort, allowing them to focus on higher-level design tasks.

Optimize the design

Managing risk and promoting trust

Responsible

Generative AI for design optimization may focus primarily on efficiencies, such as cost reduction or time savings, while potentially neglecting other important considerations, such as environmental sustainability, community impact, or long-term adaptability. The model should be configured to balance multiple objectives and prioritize trade-offs to achieve better overall outcomes.

Accountable

Using Generative AI for site planning raises legal considerations around intellectual property, ownership of AI-generated designs, liability for design flaws, and privacy restrictions for sensitive or proprietary data.

Potential benefits

Acceleration with automation
Using Generative AI for site planning can accelerate the completion of time-consuming processes.

Discovering new solutions
With Generative AI quickly creating a variety of site designs, the planning process can include a greater diversity of designs and the promotion of innovative planning solutions.

Reducing risk
Generative AI can simulate and analyze potential hazards and safety risks in site plans. AI-generated planning would consider factors such as weather events, traffic patterns, and emergency response routes. It could propose alternative design options to proactively minimize risks to safety and reduce potential property damages in case of unforeseen events.

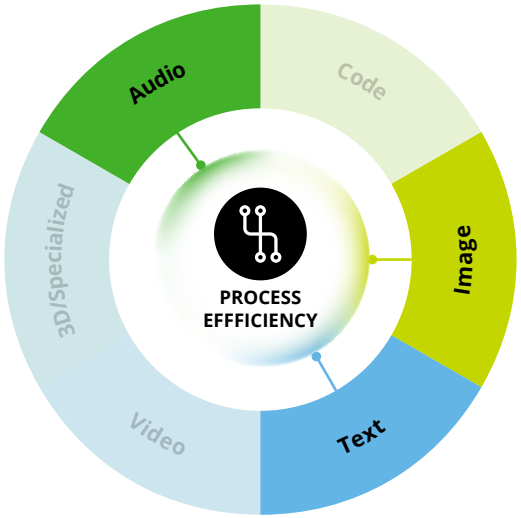
A helping hand in the field

(Virtual Field Assistant for Engineers)

A Generative AI-enabled virtual field assistant can provide engineers with on-demand access to engineering knowledge and support in problem solving, improving efficiency, productivity, and decision-making capabilities.

Issue/opportunity

Engineers sometimes work in remote or challenging environments, and they regularly experience information challenges, such as a lack of manuals or the need to localize the source of a problem. Because of this, engineers may need to seek further guidance and return to the site at a later time.



How Generative AI can help

Easily accessible technical information
A Generative-AI enabled virtual field assistant can serve as a reference tool and provide quick access to a vast amount of technical information. As well as delivering relevant information and directing engineers to appropriate resources, a virtual field assistant can help with problem solving by responding to questions about specific engineering concepts, principles, or calculations.

Troubleshooting and diagnostics
When encountering issues or challenges in the field, engineers can describe the problem to a virtual field assistant, and it will return appropriate questions to identify the cause or provide step-by-step guidance for resolution.

A helping hand in the field

Managing risk and promoting trust

Robust and reliable

A virtual assistant's accuracy depends on the quality of its training data, and if the data is inaccurate or outdated, its incorrect outputs could lead to potential harms to the engineer, damage to equipment, or operational downtime. In addition, Generative AI's potential to hallucinate outputs means the virtual assistant may make recommendations that are erroneous or contextually inappropriate.
The potential for misinterpretation or misinformation underscores the importance of engineers cross-verifying information, especially regarding safety-critical processes or decisions.

Responsible

With a typically reliable virtual assistant, engineers may become overly dependent on the assistant and fail to balance its output with their own skills and judgement. In complex situations requiring creative problem solving or critical thinking, relying solely on the assistant's responses may be insufficient.

Accountable

If incorrect information or advice from the virtual field assistant leads to an accident or operational failure, there may be complex liability issues to resolve. Clear guidelines and procedures for addressing these situations should be established as a part of model governance.

Potential benefits

Cost savings
By giving engineers an information and troubleshooting resource, the organization can improve the efficiency of its operations, with corresponding value for cost savings.

Improved effectiveness in the field
Informed problem solving and decision-making supports task completion with minimal remediation.

Occupational health
By more rapidly addressing issues with the aid of a virtual assistant, engineers may spend less time in the field exposed to potential environmental hazards.

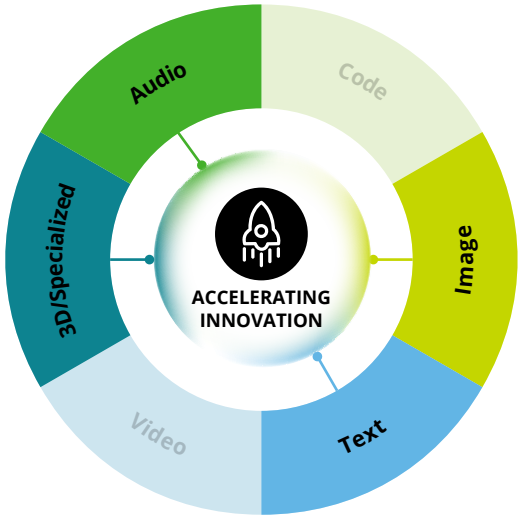
Enhancing employee safety

(Personalized OHS Training)

Generative AI can be used to develop personalized and immersive occupational health and safety (OHS) training materials that allow trainees to be safely exposed to realistic scenarios and thereby reduce or better respond to real OHS incidents.

Issue/opportunity

Traditional OHS training may only cover some potential scenarios, and it lacks practical opportunities to apply new skills and knowledge. Workers need to be prepared for emergency scenarios but cannot practice managing these scenarios in a real-world setting due to the cost and risk involved.



How Generative AI can help

Virtual reality (VR) training
Combined with VR, Generative AI can be used to develop virtual training environments that replicate operational conditions. With realistic scenarios that simulate OHS incidents, trainees can navigate hazardous situations, identify risks, and improve their OHS awareness and response capabilities in a safe setting.

Customized training content
Generative AI can be used to customize training materials based on specific job roles, site conditions, or regulatory requirements. This technology can analyze large volumes of data, such as incident reports, OHS guidelines, or compliance standards and generate tailored content, including videos, interactive modules, or quizzes.

Enhancing employee safety

Managing risk and promoting trust

Safe and secure

Real-life emergencies can be highly stressful and traumatic. Replicating these scenarios virtually could imperil the psychological safety of trainees, and the final design of simulations should be reviewed by human trainers to remove potentially harmful visualizations.

Responsible and accountable

The AI-generated training materials should be continuously monitored to identify any potential issues, inaccuracies, or outdated information. Regular updates to the training content should be made to reflect the latest safety guidelines, regulations, and best practices.

Fair and impartial

The AI-generated training materials should be designed to be inclusive and accessible to all types of learners, including individuals with disabilities. Considerations such as providing closed captions for videos, adjustable training scenarios to accommodate different skill levels, and alternative formats for content taken into account.

Potential benefits

Safety through preparedness
Increased training engagement and readiness for emergencies supports workforce safety and fewer OHS incidents.

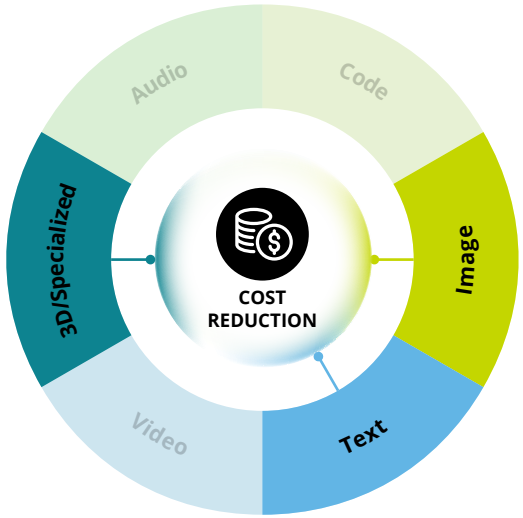
Customized training
A personalized approach to OHS training helps address the specific needs of workers, ensuring they receive relevant and targeted instruction.

Dynamic compliance
Changes in legislation, regulation, and policies can be quickly reflected in training materials by using Generative AI to make updates.

Peering below the surface

(Hydrocarbon Reservoir Exploration)

Generative AI can be used to optimize exploration success rates, reduce costs, and mitigate risks associated with hydrocarbon reservoir location and characterization.



Issue/opportunity

Oil and gas exploration involves a high degree of uncertainty and risk. Advanced technologies and extensive data analysis are needed to navigate the subsurface and accurately locate and characterize reservoirs. Extracting oil and gas from underground reservoirs requires advanced drilling techniques and technologies, and harsh environmental conditions, deep water, and complex logistics make offshore exploration difficult. As result, exploration is a capital-intensive and time-consuming process involving multiple stages of seismic surveys, analysis, drilling, and testing.

How Generative AI can help

Seismic data analysis
To overcome incomplete, low volume, or poor-quality seismic data, Generative AI can support enhanced data analysis and interpretation. Generative AI could be used to generate new data samples that resemble the patterns and characteristics of the existing seismic data, addresses missing or incomplete seismic data, improve data quality through denoising or resolution enhancement, and more effectively interpret complex data patterns.

Reservoir characterization
By analyzing data sources such as well logs, core samples, and production data, Generative AI can create models that simulate the more complete behaviors of hydrocarbon reservoirs. This enables a better understanding of the reservoir dynamics, which helps optimize production strategies and improve recovery rates.

01
02
03
04
05
06

Peering below the surface

Managing risk and promoting trust

Reliable

False positives or misinterpretations may result in costly and time-consuming drilling operations that do not yield productive reservoirs, making human expertise crucial to validating insights and decision-making.

Robust

Generative AI models may fail to consider critical factors or geological nuances that human geoscientists would recognize and so the model fails to contextualize the data when generating outputs. Without contextual understanding, the AI-generated models and interpretations may lack accuracy or fail to capture the full complexity of reservoirs.

Potential benefits

Informed investments and decisions
A deeper, more complete understanding of the characteristics of hydrocarbon reservoirs reduces the degree of uncertainty and supports investment decisions.

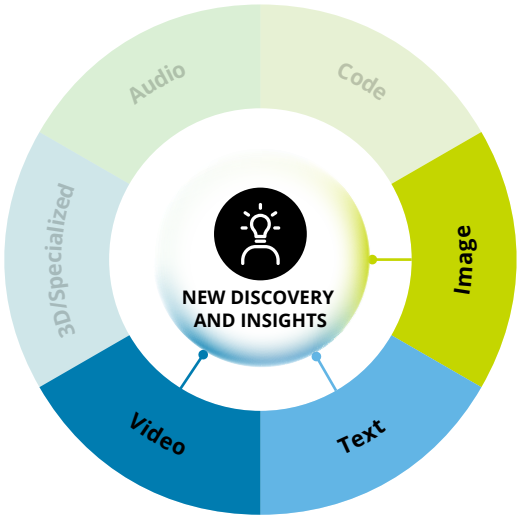
Amplifying exploration
Improved data quality supports more accurate subsurface modeling, imaging, and structure characterization, which translates to an increased ability to accurately locate hydrocarbon reservoirs.

Smarter strategy
With an earlier and more complete understanding of reservoir characteristics, less time is needed to optimize production strategies.

A smart eye in the sky

(Smart Summaries for Drone Surveying)

Generative AI can assist in summarizing large volumes of drone footage and enable querying to enhance productivity and efficiency.



Issue/opportunity

In the mining industry, drones are increasingly used for tasks such as mapping, tailings dam management, safety management, blast assessment, environmental monitoring, and haul road optimization. In the case of Optical Gas Imaging (OGI) to detect gasses and volatile organic compounds leaking from vessels (e.g., pipelines), unmanned drones mounted with OGI cameras have proven useful for surveying a variety of equipment over vast areas. Using drones in this way permits frequent scans and reduced costs associated with fugitive gases. Yet, while advanced AI solutions (e.g., volumetric monitoring) have been developed for applications using drone footage, manual inspection of drone footage is still required for environmental monitoring, security review, safety assessment, and retrospective analysis.

How Generative AI can help

Smart summaries
Combined with computer vision solutions, Generative AI can create smart assistive summaries in natural language from thousands of hours of drone footage. Assistive smart summaries can be based on a pre-determined template requested by the user, where observations are generated about elevations, topology, lighting, vegetation, and other factors. Summaries can also be queried in natural language so questions can be asked without the assessor manually reviewing all footage.

Querying the footage
When using OGI to detect leaks, there may be instances where a leak is irreparable but still must be managed. With Generative AI, specific sites can be efficiently reviewed and monitored by querying the footage of that site using natural language.

A smart eye in the sky

Managing risk and promoting trust

Reliable

Generative AI models may struggle to interpret environmental indicators, assess ecological impacts, or consider local conditions and regulations. Training data availability and quality in particular can impact the AI model's ability to generalize and handle diverse environmental scenarios. Inadequate or biased training data may result in limited or skewed analysis and summaries.

Privacy

Drone footage may contain sensitive information, including personally identifiable information, facial images, or confidential business information, and the footage may also be captured on private properties or areas with restricted access. In using Generative AI to analyze and summarize the footage, unsecure data handling and access can raise privacy concerns as well as legal and regulatory implications.

Potential benefits

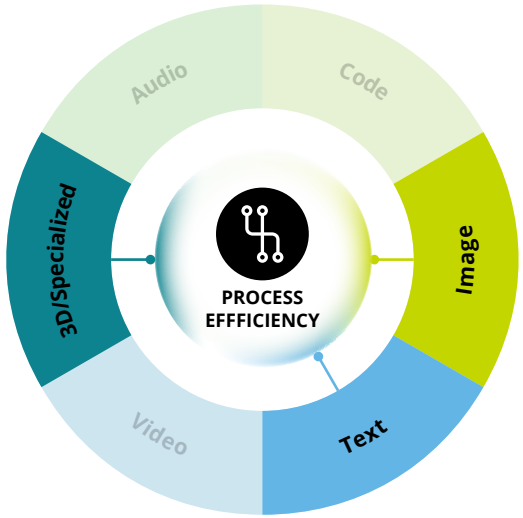
Supplementing human expertise
Querying smart assistive summaries helps keep critical observations are not missed due to human error or cost and time constraints.

Faster time to insight
Replacing manual drone footage inspection with assistive summaries saves significant time and effort.

Resilient logistics and planning

(Supply Chain Optimization)

Generative AI can support supply chain optimization by leveraging its ability to simulate, model, and generate data-driven insights.



Issue/opportunity

Global supply chains are highly interconnected with many dependencies and multiple stakeholders. The inherent complexity challenges efficiency, resilience, and cost avoidance, making supply chain intelligence a critical component of supply chain management. What is needed is a way to rapidly analyze data from internal and external sources to identify patterns and areas for improvement.

How Generative AI can help

Supply chain intelligence
Generative AI could help identify and simulate potential disruptions or risks in the supply chain. By assessing port congestions, shipment routes, and tier-n supplier mapping, Generative AI can be used to predict risks, their corresponding impact on operations, and recommend actions to mitigate those risks. This allows supply chain managers to proactively implement mitigation strategies, develop contingency plans, and improve overall resilience.

Scenario analysis and optimization
Supply chain managers could use Generative AI to run what-if scenarios in a digital twin environment that reflects the real-world supply chain. By simulating the impact of changes in demand patterns, production capacity, inventory strategies or supplier reliability, supply chain managers can improve risk assessments and proactive decision-making based on real-time conditions.

Supply chain planning
Generative AI enables supply chain professionals to use natural language to interact with advanced planning solutions. Questions concerning all supply chain areas, such as planning, inventory, supply assurance, order management, and global logistics, can be easily asked, helping even less experienced users navigate complex topics and data.

Supplier assessment
Generative AI can assist in supplier evaluation and relationship management by analyzing financial reports, performance metrics, customer feedback, and other data and then generate insights and predictions around supplier performance, risk factors, and opportunities for collaboration. This helps supply chain professionals make informed decisions when selecting, negotiating with, and managing suppliers.

Resilient logistics and planning

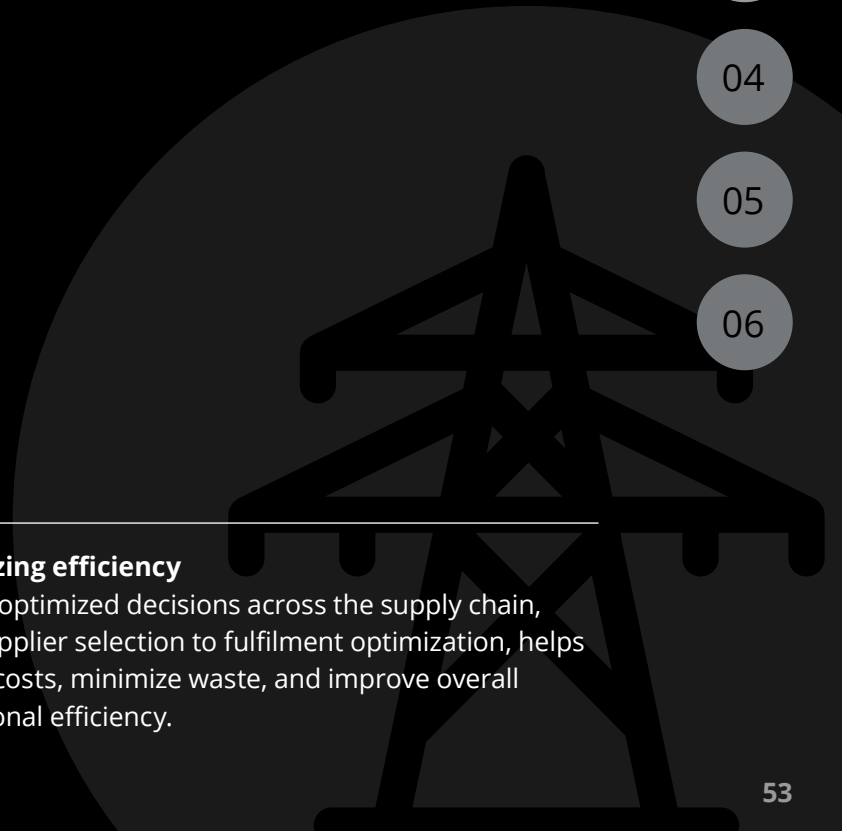
Managing risk and promoting trust

Reliable

Supply chain management involves complex trade-offs, strategic considerations, and tacit knowledge that the AI models may not fully capture. Generative AI outputs may also fail to balance ethical considerations or long-term strategic goals. As such, human judgment and validation is central to the interpretation and augmentation Generative AI outputs.

Fair and impartial

When using Generative AI for supplier evaluation, negotiating, and contracting, bias in the data or model could lead to unfair recommendations and discriminatory practices. By taking into account factors such as fair contract terms, social responsibility, and ethical sourcing practices, organizations can promote decision-making processes that are fair and transparent.



Potential benefits

Resilient supply chains
Enhancing supply chain resilience allows the organization to respond quickly to changing market dynamics and permits greater agility to take advantage of emerging opportunities based on real-time insights and recommendations.

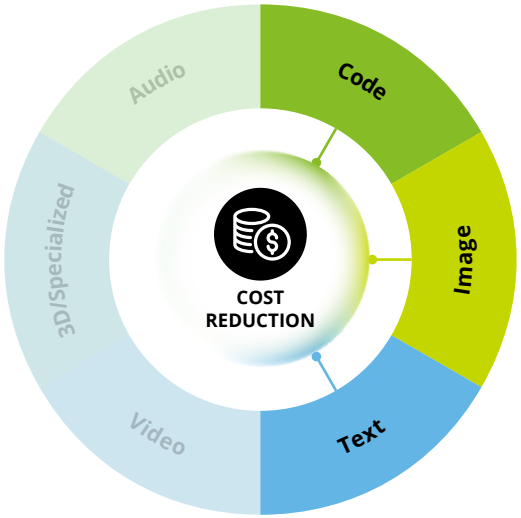
Enhanced performance
By prioritising alerts that require human intervention and differentiating between noise and disruption, the organization can drive greater efficiency in the supply chain.

Optimizing efficiency
Making optimized decisions across the supply chain, from supplier selection to fulfilment optimization, helps reduce costs, minimize waste, and improve overall operational efficiency.

Enabling a better grid

(Grid and Energy Efficiency Optimization)

Generative AI can be used to better understand the state of the grid and factors that could support more efficient energy consumption, minimizing losses and improving overall grid efficiency.



Issue/opportunity

Energy grids are massive and intricate systems with interconnected components operating in a dynamic and uncertain environment. Maintaining a balance between energy supply and demand is crucial for grid stability, but it is challenged by the difficulty in predicting and managing fluctuations in energy demand. The integration of intermittent renewable energy sources (e.g., solar) further complicates the supply-demand balancing act as these depend on weather conditions. Regulatory frameworks, policies, and market structures also constrain the ability to balance technical optimization.

How Generative AI can help

Aid conscious customer behavior
Energy companies can incentivize consumers to adjust their energy consumption based on their specific energy use patterns using conversational chatbots powered by Generative AI. AI models can analyze historical data and customer preferences to recommend personalized strategies to reduce energy usage. When there is an immediate need to reduce peak loads to improve grid stability, Generative AI applications can be used to alert customers as to what they can do specifically to help. What is more, conversational chatbots can be used as an educational tool for consumers to understand and optimize their energy usage.

Document and map digitization
Generative AI can be used to digitize documentation, infrastructure maps, records of energy use, as well as for image-to-image translation or image restoration (such as by removing noise, adjusting brightness, and enhancing contrast). This improves the quality of the documents and yields searchable documents that can be used to train existing AI classification and forecasting tools.

Grid layout and expansion
Generative AI can assist in designing the optimal configuration and expansion plans for the energy grid. AI models can generate optimized grid designs that minimize transmission losses and maximize efficiency by considering factors such as population density, existing infrastructure, and energy demand projections.

Energy trading and market analysis
Generative AI models can simulate the behavior of electricity markets under different scenarios, such as regulation changes or the introduction of new technologies. This can help energy companies optimize their trading strategies and make more informed investment decisions.

Enabling a better grid

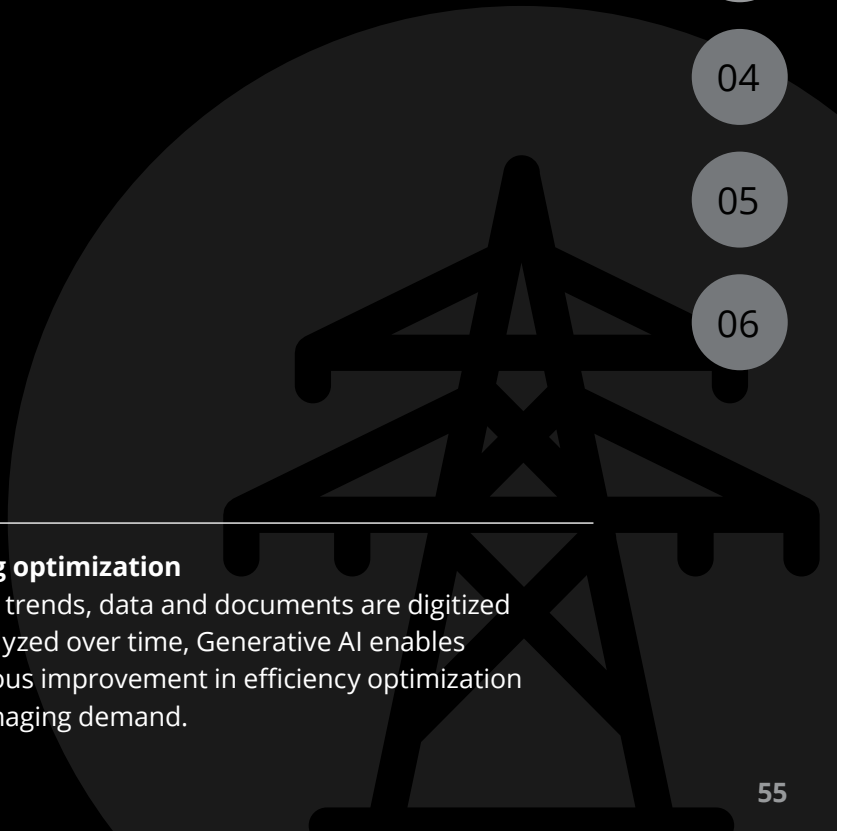
Managing risk and promoting trust

Privacy

Using Generative AI in customer behavior analysis and chatbot interaction involves handling sensitive customer data. Risks include data breaches and unauthorized access to customer information and chat logs, and risk mitigation requires robust security measures, customer data protection, and adherence to privacy regulations.

Security

Generative AI models are vulnerable to adversarial attacks, where malicious actors manipulate inputs to deceive or exploit the system, for example, to influence energy trading decisions or disrupt grid operations. Robust security measures and regular testing are necessary to mitigate such risks.



Potential benefits

Diversifying energy sources
Generative AI supports the integration of variable renewable energy sources while maintaining stability and reliability.

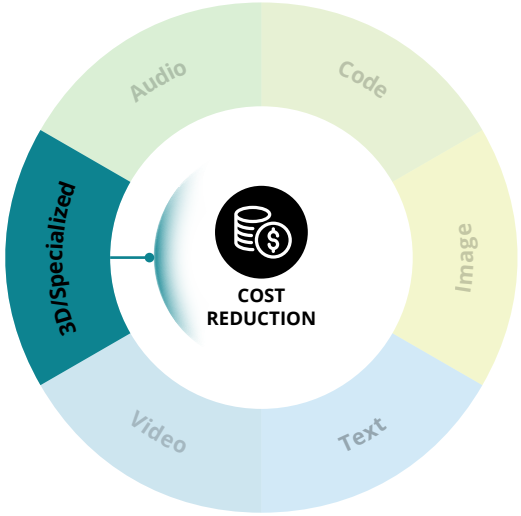
Dynamic demand response
Using Generative AI for improved visibility of the grid's current state allows companies to better respond to fluctuations in demand.

Ongoing optimization
As more trends, data and documents are digitized and analyzed over time, Generative AI enables continuous improvement in efficiency optimization and managing demand.

Predictive maintenance in Oil & Gas

(Layering GenAI on top of existing AI-powered systems to improve predictive maintenance)

Oil and gas companies are using GenAI to transform complex sensor data into targeted, actionable insights, reducing unplanned downtime and operational risk.



Issue/opportunity

Oil and gas production facilities—whether offshore platforms, drilling rigs, or onshore plants—are highly complex environments with thousands of critical equipment components. Unexpected failures in pumps, compressors, valves, or separation systems can bring production to a halt, triggering safety risks and revenue losses that quickly escalate.

Traditional predictive maintenance systems use high-volume sensor and maintenance log data to forecast potential failures using probabilistic models, categorizing equipment status as red, amber, or green depending on predicted failure risk and timing. But engineers often struggle to determine which alerts are genuinely urgent, and what actions should be taken.

How Generative AI can help

Monitoring sensors and flagging potential failures
Many companies in the industry already rely on traditional AI models to monitor sensor data and identify potential failures. However, these systems often produce an overwhelming number of alerts, many of which are false positives or lack actionable context, placing a heavy burden on engineering teams and delaying response times.

Turning data into action
GenAI can solve the human interface challenge by providing a natural language layer on top of existing predictive models. Pulling from structured AI outputs, historical feedback data, and document repositories (such as manuals, repair logs, and technical bulletins), GenAI can provide targeted, explainable responses and help prioritize response actions. It can also flag questionable predictions based on past false positives—and even suggests next steps—all in an intuitive, easy-to-consume format.

Predictive maintenance in Oil & Gas

Managing risk and promoting trust

Responsible and accountable

Given the safety-critical nature of oil and gas operations, deploying AI systems—especially those involving infrastructure or decision support—requires strong governance and alignment with regulatory expectations. A centralized governance board or cross-functional AI oversight team should ensure that every new GenAI use case is subjected to a rigorous value/risk assessment, and that accountability is maintained at the site or business unit level for all decisions.

Robust and reliable

AI-powered predictive maintenance systems continuously learn from actual maintenance outcomes. Each time a flagged issue turns out to be a false alarm—or conversely, when a missed alert leads to failure—the outcome should be fed back into both the traditional AI and GenAI layers to improve future performance.

Transparent and explainable

Engineers can see not just what the system recommends, but why. Historical trends, reliability data, and source documents should be cited to support the system's recommendations and prioritization, making the results easier to trust and audit.

Potential benefits

Less unplanned downtime
By improving how engineers interpret and act on AI-generated alerts, oil and gas companies can reduce production disruptions.

Lower operating costs
Smarter maintenance planning can reduce emergency repairs, overtime labor, and expedited parts logistics, all of which can be expensive.

Improved engineering productivity
Field teams can spend less time triaging alerts and more time addressing high-priority issues, leading to measurable productivity improvements. Also, junior engineers and less-experienced technicians can be better equipped to understand and respond to maintenance issues with GenAI's contextual guidance.

Faster scaling and adoption
Integrating GenAI into existing predictive maintenance platforms can reduce the operational overhead of adopting new tools or training programs.

The Financial Services Generative AI Dossier

The Financial Services Industry (FSI) is data-intensive, simultaneously representing an opportunity for business success and a challenge to operations and efficiency. The manual effort required to analyze data and use the resulting insights for business and customer benefit is slow and expensive. More than that, the volume and complexity of the data can prohibit the realization of a truly customer-centric approach. FSI enterprises have made some progress in leveraging AI to automate aspects of the business and use machine learning for data-driven decision making. With the advent of Generative AI, these endeavors can be dramatically enhanced, accelerated, and scaled.

The potential value in Generative AI in FSI is not merely as a downstream application. Rather, it can serve as a powerful and complementary tool that works with other machine learning models and applications. Businesses with mature AI programs are approaching Generative AI not as stand-alone silo models but as components of a constellation of models, where the insights and outputs from one are used to inform the function and direction of another.

The vision with Generative AI is multifaceted. At the grandest level, the incorporation of Generative AI could be the enabling tool that allows FSI enterprises to fully transition from a product-centric approach to one that is designed around the customer, using AI to enhance and invigorate customer lifecycle management. Generative AI paired with other AI for tasks like sentiment analysis and customer analytics can lead to hyper-personalization in product offerings and customer engagement. This can drive new and more business while also catering to customer expectations for customized products and services.

Generative AI paired with other AI for tasks like sentiment analysis and customer analytics can lead to hyper-personalization in product offerings and customer engagement.

This is the more profound value in Generative AI, not as a discrete application but as an enabling component of the broader data infrastructure and AI programs. Generative AI can be leveraged to dramatically accelerate model development and tuning, drawing from new data pipelines at a pace no human could match. It can be a powerful contribution to enterprise-wide digital transformation, reducing time, cost, and risk. And it can be used to generate complex reports and analyses, informing customers and employees, shaping executive decision making, and ferreting out fraud, waste and abuse.

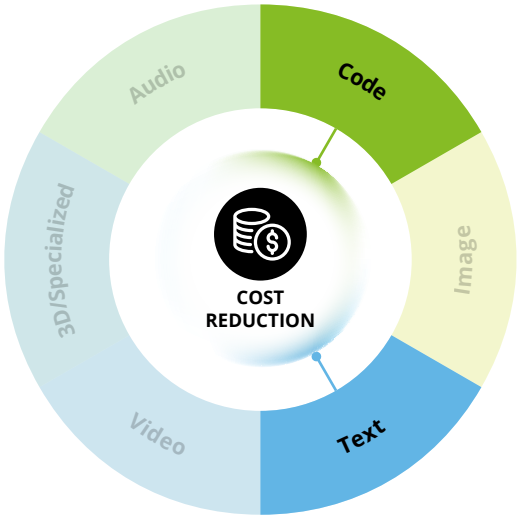
To be sure, there are risks, such as data leakage and output inaccuracies. Nevertheless, integrating Generative AI into an organization's wider technology stack and AI programs holds so much potential that it is becoming a priority in FSI. The capabilities in cost avoidance, speed to market, customer engagement, and scale can be powerful differentiators that do not just create value at the margins but contribute to a transformation of the very DNA of the company.

Generative AI can be leveraged to dramatically accelerate model development and tuning, drawing from new data pipelines at a pace no human could match.

Transformation with speed and confidence

(Code Assistant for Digital Transformation)

Generative AI can enable banks to increase digitization at a faster pace through code assistants.



Issue/opportunity

Many FSI enterprises are pursuing cloud and data transformations, which are essential steps in preparing the organization for using AI tools (of many kinds). In some cases, legacy hardware is retired as data is curated and shifted to the cloud, freeing up humans for more valuable work while bringing down the costs associated with on-premise infrastructure. Yet, these kinds of transformations are significant undertakings that can bring long lead times and high costs. There is also a risk of failure and error.

How Generative AI can help

Supercharge your human capital
Generative AI can be used as a component of cloud and data transformations to empower developers working across the enterprise on applications, data engineering, machine learning, and frontend development.

A helping hand in code development
As organizations explore new digital and cloud capabilities, development teams can accelerate and simplify their work by using Generative AI as a force multiplier when writing, debugging, and documenting code, as well as translating ideas to code.

A shorter path to software
Part of success in transformation hinges on how quickly new enabling software can be deployed. There are opportunities to use Generative AI in software development to shorten the lifecycle and more quickly reach a stable and deployable version, such as by helping rapidly write APIs, ETL, data pipelines, or even frontend code.

Transformation with speed and confidence

Managing risk and promoting trust

Reliable
Partial automation of programming-related tasks requires the system to be reliably availability and accurate. If availability cannot be guaranteed to an acceptable extent, weigh the benefits of automation against the risk of erroneous or buggy code.

Responsibility
The training data for foundation models may create legal risks related to intellectual property or copyright infringement. If the training data contains copyrighted material, the organization deploying the model needs to evaluate whether the presence of intellectual property in the training set could lead to legal challenges against the enterprise.

Security and privacy
By using a Generative AI system, proprietary code bases may be exposed to third parties, raising questions around the security of the data and controlled access to it. An inadvertent breach of confidential intellectual property could have significant enterprise impacts.

Accountable
While the use of Generative AI can accelerate the work of developers, without a human in the loop (e.g., validating and debugging code), critical failures may occur. Shoring up accountability may include documenting and communicating standards and expectations for employees using Generative AI.

Potential benefits

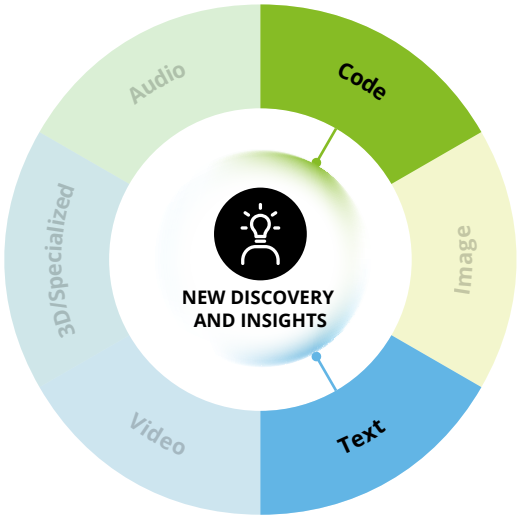
Lower transformation costs
By shortening the software development lifecycle, the organization can reduce overall costs for digital and cloud transformation.

Lower the bar to digital entry
Using Generative AI opens the door for FSI organizations of all sizes, capabilities, and technology maturities to digitize and move to the cloud in a way that was previously out of reach for many.

Business intelligence at your fingertips

(Enterprise-wide data search and access)

Make business intelligence via enterprise data search accessible to all through natural language interfaces.



Issue/opportunity

For many banking and insurance companies, data is stored in a multitude of locations, from local hardware to cloud storage solutions. This makes it difficult to effectively query different databases and retrieve relevant information in a time-efficient manner. Complicating the matter, multiple mergers and acquisitions over time may have compounded the diversity of data locations and databases, which hinders data mining for insights. FSI organizations are information-intensive enterprises, and without the capacity to easily query all data, the result is poorer or incomplete insights that can increase enterprise risk while threatening customer dissatisfaction.

How Generative AI can help

An enabling interface
Generative AI capabilities are built on top of an existing solution to facilitate the communication of queries from the user to the search layer. It serves as the interface between search layers and databases, allowing users to easily mine all enterprise data, as well as generate structured analytics reports.

Speed to insight
With the ability to query and analyze disparate data sources using Generative AI as an interface, the enterprise can move past traditional business intelligence techniques and dramatically reduce the time required to generate insights while increasing the workforce accessibility to business intelligence.

Business intelligence at your fingertips

Managing risk and promoting trust

Responsible

When it comes to governance and control, while granting more data access to a wider segment of the workforce, organizations may face a more complex challenge of restricting who in the organization is permitted to access sensitive business data.

Reliable

Given the known challenges with model reliability and the potential for hallucination, banking and financial services organizations face the risk of inaccurate or false Generative AI-derived insights influencing decision making and leading to negative ramifications even at the market level.

Privacy

When dealing with sensitive and proprietary information, the organization must contend with securing the data, remove or obscure it in training and testing sets, and evaluate the model to determine whether information could "leak" protected information, either due to faulty function or a targeted attack.

Potential benefits

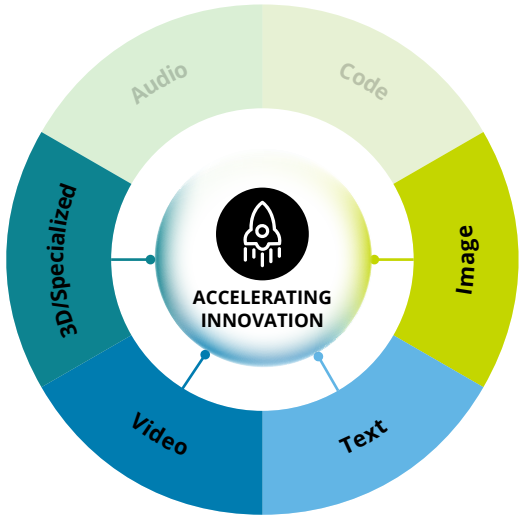
Lower technical hurdles
Generative AI as an interface between search and data enables business users to query databases and obtain tailored results without in-depth programming experience. This gives more of the workforce access to business intelligence without additional burdens on IT and data science teams.

A new level of data-driven decisions
Real-time access to all of an enterprise's data can help organizations become even more insight driven, which supports improved growth prospects through access to the right insight at the right time.

Fixing the missing data issue

(Synthetic Data Generation)

Generate synthetic data for model training, anomaly detection, and identifying cyber and deception attacks.



Issue/opportunity

Missing data is a significant challenge for FSI organizations. Datasets may be incomplete, data transfers may be restricted, and potential anomalies are underrepresented in the data. Using synthetic data can help overcome these challenges. In cloud transformation, data transferals may be delayed due to the risks associated or regulations around data governance, and using synthetic data first enables a smoother and more efficient transformation. Meanwhile, machine learning anomaly detection systems (such as for identifying fraud, waste, and abuse) are trained on data from previous events. Their rarity and the dearth of data around them can make anomalies harder to assess.

How Generative AI can help

Improve model training
Generative AI can be used to quickly create synthetic data to supplement machine learning model training data, which is then used to aid and accelerate digital and cloud transformations. In this way, Generative AI complements the enterprise's wider AI initiatives, fueling (rather than replacing) other AI deployments.

Amplify anomaly event detection
The rarity of anomaly events can make it difficult to train machine learning systems to detect instances of fraud, waste, and abuse, but by creating synthetic data with Generative AI, ML systems have a larger suite of examples that lead to a greater capacity to find patterns and anomalies in the data.

Harden the organization's cyber posture
Just as synthetic data can be used to train models to identify fraud, adversarial synthetic data can be used to train models to detect and mitigate cybersecurity risks, as well as user deception of virtual assistants.

Fixing the missing data issue

Managing risk and promoting trust

Fair and impartial

A significant risk when generating synthetic data is that historic biases can creep into the generated data, perpetuating those biases. This bias is not necessarily intentional, such as in the case of certain communities or socio-economic groups being underrepresented in the data because those groups have conducted fewer banking business in the past.

Reliable

Synthetic data created with Generative AI can be limited in its scope and scale, and it should not be presumed to be accurate or perfectly reflective of real-world data. An over-reliance on synthetic data may inject problems with data reliability, which can hamper the validity and usefulness of the outputs and model training.

Potential benefits

Faster path to the cloud
Generative AI-created synthetic data can accelerate digital and cloud transformations by making the transition smoother and more efficient.

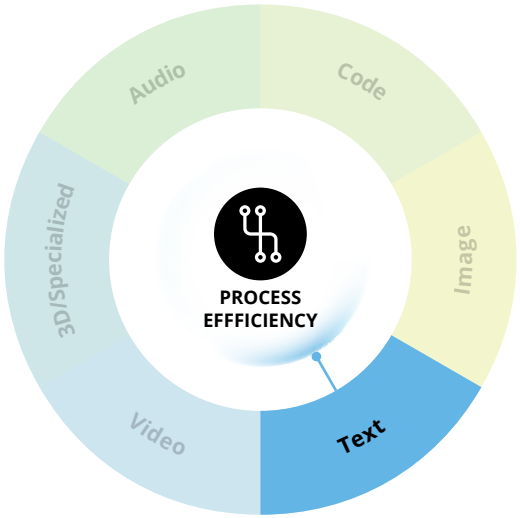
Tackling Fixed Wireless Access (FWA)
Use synthetic data to train machine learning systems on rare or unknown events, such as a novel type of fraud.

Security confidence
Adversarial synthetic data contributes to the enterprise-wide imperative to fortify digital assets against cyber threats.

Getting to know your customer

(Research-Based Report Generation)

Generate and summarize reports on new customers to inform employee decisions for customer onboarding.



Issue/opportunity

New customers are the lifeblood of a growing FSI enterprise, but onboarding customers can be a highly manual and time-consuming process. Know Your Customer (KYC) standards and rules require institutions to develop meta reports on customers based on economic outlook, equity research, adverse media, and new prospect due diligence. These are high human involvement tasks, with desk-based meta research consuming valuable time and resources.

How Generative AI can help

Condensing results for easier consumption
Generative AI can be used to summarize and filter results from existing search engines to inform meta reports, as well as summarize information for the customer relationship manager.

Research and analysis to inform reports
Generative AI, alongside other machine learning models, can be used to conduct preliminary data searches and meta analysis, potentially accelerating the KYC process.

Getting to know your customer

Managing risk and promoting trust

Reliable

When using Generative AI to perform search and analysis, there is a risk that it could skip or misconstrue highly relevant information, which could skew the conclusions in the meta analysis and hamper sound decision making. If a new customer is erroneously assessed to be higher risk and a relationship manager passes on the opportunity to engage the customer, the consequences are missed revenue and diminished customer engagement.

Privacy

When dealing with a customer's financial or personally identifiable information, the enterprise faces legal and regulatory standards for data privacy. When using Generative AI, the organization should take steps to ensure sensitive information does not inadvertently leak through model outputs, as well as govern who has access to the model, the underlying data, and the customer data it references.

Potential benefits

Timely insights
Faster and more efficient search and analysis can give decision makers more up-to-date information and insights that enable better, more timely decision making around customer onboarding.

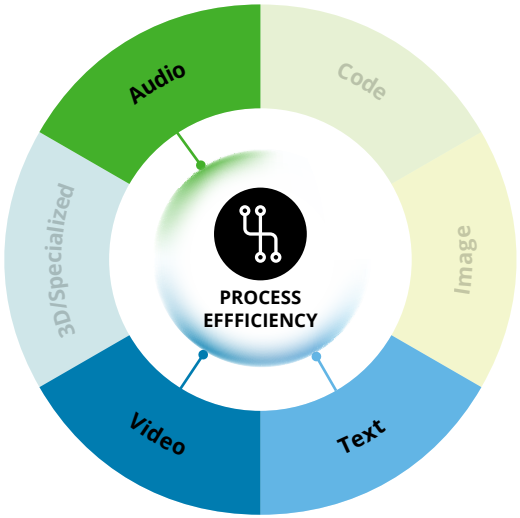
Cost reduction
By streamlining and simplifying the report generation process, costly labor hours can be redirected to more valuable work.

Efficiency
The end user saves time and effort by more easily accessing and consuming relevant information.

Enhanced AI support for customers

(Financial Guardian)

A personal virtual assistant powered by Generative AI can cater to daily needs of customers.



Issue/opportunity

Customer service and engagement is vital for FSI organizations, particularly as they transform from a product-focused to a customer-focused business. As a part of that, there is a pressing need for the enterprise to rapidly and accurately answer both common and complex customer queries and do so with the timeliness customers expect. Yet, the increase in digitization in FSI organizations has reduced access to representatives who can answer customer questions; this is at a time when FSI customers seek a hyper-personalized experience.

How Generative AI can help

An empathetic, personalized interface
Generative AI can be paired with other models to create a customer interface that delivers a hyper-personalized experience, such as by training the Generative AI model to provide answers or insights with empathy. It also overcomes some of the challenges around more traditional chatbots that can lack an empathetic tone.

A more capable digital agent
Using Generative AI can dramatically improve the usefulness and accessibility of a chatbot interface. With the capabilities of large language models (LLMs), a personal digital assistant can summarize contracts and answer nuanced questions, and the customer may enjoy a range of interface options, including text, audio, and imagery.

Enhanced AI support for customers

Managing risk and promoting trust

Responsible

While a Generative AI-enabled solution may provide valuable answers and recommendations most of the time, there is a risk that too much confidence may be placed in the validity of the outputs, both by the organization and the customer. Generative AI is not an infallible oracle, and an overreliance on the AI solution may have a detrimental impact on customer actions, which can in turn increase financial risk.

Privacy

When confidential or personally identifiable information is inputted via the digital interface by the customer, the FSI organization is obligated to follow the laws and rules that dictate how that sensitive information can be transmitted, stored, and accessed. Failing to do so could raise legal peril and potentially subject the enterprise to greater cyber risks.

Transparent

End users require a clear understanding of how their information will be processed, as well as that they are interacting with a machine. At the same time, the enterprise needs to be able to interpret outputs and understand how and why the Generative AI model created a given output.

Potential benefits

Customer satisfaction
Greater accessibility and more timely answers can lead to a more personalized and satisfying customer experience. This can drive an increase in net promoter score, reflecting increased customer retention and loyalty.

A cycle of efficiency and growth
Customer loyalty and brand reputation fuel business growth, but using Generative AI as a component of a virtual assistant also supports efficient operations. Greater reliance on Generative AI-enabled interface can service more customers at scale while the human workforce focuses on resolving the most complex issues or attracting new customers.

Financial inclusivity through hyper personalization
When customers feel that banking applications are delivering a valuable, personalized experience, it encourages greater customer engagement and interest in service offerings, supporting both the customer's financial wellbeing, as well as that of the enterprise.

Customized marketing for the individual

(Hyper-personalized Sales and Marketing Assistant)

Regulatory-compliant marketing material generation across different geographies.

Issue/opportunity

FSI marketing operations are increasingly coming under regulatory scrutiny for issues such as mis-selling and misinformation. Part of the challenge for multinational organizations is that cultural differences as well as varying customer understanding of the products may create regulatory risk for enterprises in a given geography. To overcome this, FSI organizations invest significant manual labor to maintain a compliant marketing function, which is both time consuming and costly.

How Generative AI can help

Customized materials for different audiences
Generative AI can be used to create marketing materials that contain the appropriate tone, language, and cultural references, while also supporting consumer understanding of the product so as to maintain regulatory compliance.

Personalized sales at scale
With Generative AI, FSI organizations have the ability to create marketing materials that are customized to individual customers, and it can be done at scale.

Customized marketing for the individual

Managing risk and promoting trust

Reliable

For Generative AI-derived marketing to be valuable, the organizations needs to be able to rely on the validity of the output. Generative AI can be prone to hallucinations, and once tasked with creating marketing that touts one product over another, there is a risk the model will return false statements. This injects potential regulatory violations that could incur fines and other penalties. To shore up reliability with Generative AI, ensure outputs are validated by a human with the subject matter understanding to do so.

Fairness

Datasets may contain latent bias of which the organization is unaware. This could be due to the way in which the data was acquired, recorded, and curated, and the challenge is compounded when operating in multiple geographies. Consider the datasets used to train and fuel Generative AI systems and whether unknown bias could lead to marketing materials that fall short because they fail to reflect important geographical and cultural differences.

Potential benefits

Individual-level marketing
Hyper-personalized marketing takes the enterprise to a new stage of customer engagement and enticement that is infeasible through manual effort alone.

Confident compliance
Using Generative AI for marketing development can help ensure the content remains in line with regulatory expectations across many geographies, thereby reducing regulatory risk.

Driving marketing ROI
Personalized marketing that is customized for the customer can support new sales, strengthen the customer relationship, and reduce the cost of marketing operations while also improving the timeliness of outreach and engagement.

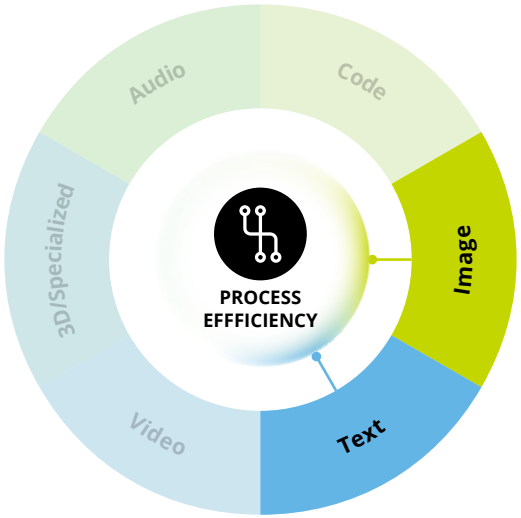
Ensuring the integrity of claims

(Automated Claims Reporting)

Generative AI can be used to automatically generate reports based on descriptions or pictures of the relevant subject.

Issue/opportunity

During claims processing for property and casualty insurance, claims agents must decide whether a destructive event was insured, and if so, the amount and cost of the damage. These processes are complex and can be time consuming, and agents have few tools to support their decision making.



How Generative AI can help

Virtual damage rendering
Generative AI can be used to help visualize the damage by replicating it virtually. The basis for the replication and visualization can be customer conversations, damage documents, photos, official reports, and other relevant media. In visualizing the data in this way, the agent is empowered to make better decisions when assessing the degree and cost of damage.

Automated claims reporting
With Generative AI, claims reports can be generated based on photographic evidence.

Ensuring the integrity of claims

Managing risk and promoting trust

Reliable

Damage visualization requires a high degree of accuracy, and erroneous Generative AI outputs could lead to claims being paid incorrectly, potentially leading to overpayment (a detriment to the organization) or underpayment (a detriment to the customer).

Explainable

If claims agents use Generative AI to automate aspects of claims processing but are unable to articulate to customers how the Generative AI model derived its outputs or contirbuted to the cost and damage assessment, customers may not accept the outcome of the claims process.

Potential benefits

Cost reduction
When claims are processed faster and damage assessments are more accurate, it can reduce costs in labor hours and claims payments.

Customer satisfaction
By processing claims faster and with less administration, customer satisfaction improves due to quicker, more streamlined adjudication and payment.

Identifying fraud
More expedient claims processing has the advantage of identifying potential fraud more quickly, helping to ensure the integrity of claims and payments.

A virtual bank experience

(VR-Enabled Retail Banking Centers)

Virtual reality customer agents powered by Generative AI can change the retail banking experience and interactions.

Issue/opportunity

Banks seek to provide customers with multiple methods of interacting with their accounts, services, and offerings. As digital services grow, customers may prefer to conduct banking transactions remotely via an edge devices. These virtual transactions still require an agent, and human employees are the most expensive cost component in customer service, particularly when there are a necessary three levels of customer support. Chatbots can help automate virtual transactions, but existing chat tools are limited to specific, pre-programmed dialogue and options. A limited volume of conversations can be handled by AI today.

How Generative AI can help

Bring the bank to the customer
With a Generative AI-enabled virtual space, customers can use a VR headset to conduct business with the financial institution and interact with a service representative from the comfort of their own home and in a way that is convenient for the customer.

Hyper-personalized service
A Generative AI agent can provide conversational, tailored responses to questions about customer accounts and financial needs. By this, the enterprise caters to the customer desire for a personalized experience while also avoiding the costs that come with adding more human customer service workers.

Speed and quality of service
In a virtual space, customer data can be accessed in real time by the conversational agent to provide faster, higher quality service and offerings.

A virtual bank experience

Managing risk and promoting trust

Transparency

Given a Generative AI-enable chatbot's capacity for conversational outputs, there is a risk that customers may not realize they are interacting with a machine. To promote trust, customers should not only be informed that the chatbot is not human, but also, they should understand how their inputs and information are stored, accessed, and use.

Fair and impartial

The datasets used to train and inform the chatbot may contain latent biases, such as underrepresented customer groups or semantic deficiencies in some languages but not others. As a result of untreated bias, the model may simply not work as well for some customers, leading a variety of negative customer impressions and complaints.

Accountable

With issues around reliability and data quality, if the chatbot outputs erroneous data or recommendations, a human stakeholder needs to be accountable for the outcome. Organizations can promote accountability by keeping a human in the loop and documenting roles and responsibilities.

Potential benefits

Customer-focused experience
A Generative AI-enabled virtual banking experience connects customers with tailored digital representatives that can converse in the customer's preferred language in a timelier manner.

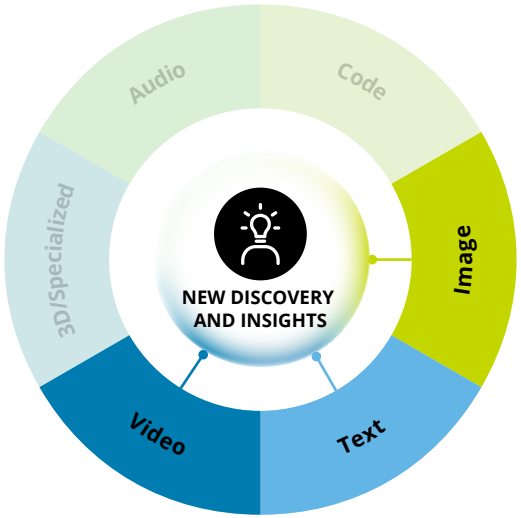
Liberated human capital
With conversational chatbots satisfying most customer inquiries, the human workforce can focus on the most complex or value-driving activities and customer service.

Cost avoidance
Virtual agents allow the bank to serve more customers without expanding the human workforce, which helps limit customer service costs.

The next era of market analysis

(Predictive Trading Algorithms)

Generative AI can be leveraged to identify a larger number of trades more quickly to support profitability.



Issue/opportunity

Identifying and capitalizing on valuable trades requires technical analysis, news and reports, and industry data, all accessed in real time. Analysts must consume these vast amounts of information to understand and predict market trajectory and make prudent buying and selling decisions. A challenge for financial firms is that market analysis is in many ways a time-consuming, manual process.

How Generative AI can help

Faster, more accurate analysis
Leveraging Generative AI in market analysis can support and supplement the human analyst, accelerating their work while also potentially delivering more accurate market predictions.

Revenue driver
By enhancing the analyst's capacity, the organization could achieve a larger number of profitable trades, generating a return for clients and the enterprise.

Real-time risk mitigation
Drawing from predictive analytics, Generative AI can help mitigate investment risk in real time by creating trade strategies to hedge positions.

Data consumption at scale
Generative AI offers a greater capacity to consume a variety of data types, which can enhance natural language processing capabilities in sentiment and news analysis at a scale and speed far greater than human analysts.

The next era of market analysis

Managing risk and promoting trust

Reliable

The Generative AI model is susceptible to erroneous outputs delivered with complete confidence, even with hallucinated data points or conclusions. Even as Generative AI may help analysts better predict the market, there is a risk that decisions made based on unreliable outputs could lead to poor outcomes, potentially even worse than a human working alone.

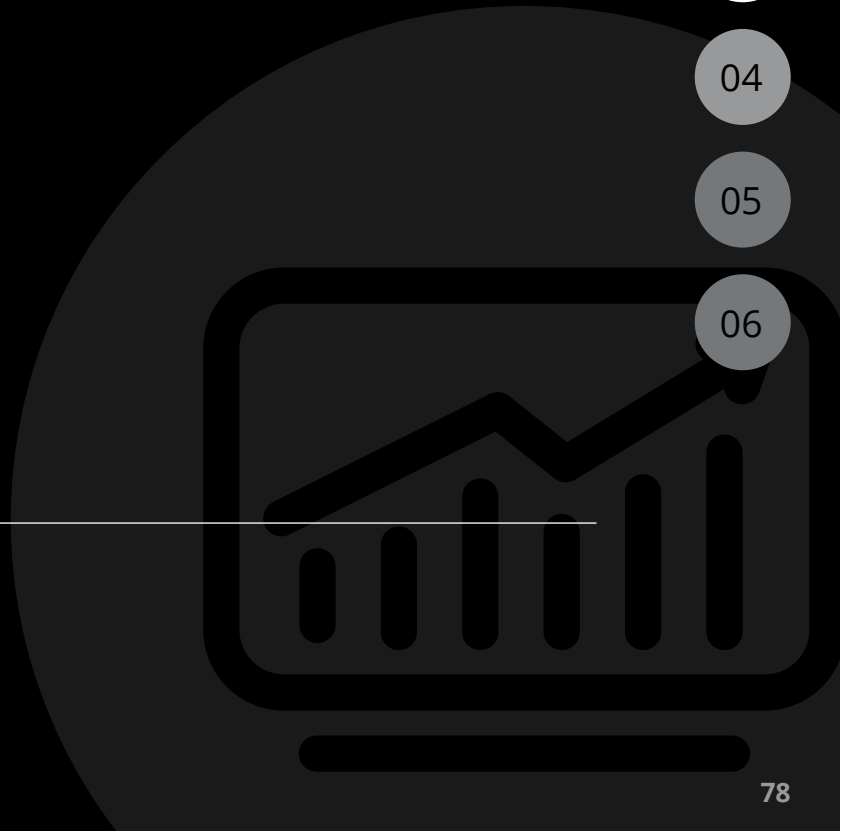
Explainable

Confidence in Generative AI outputs requires stakeholders to understand how and why the machine reached its conclusions. Human validation of Generative AI outputs remains essential, and it necessitates model explainability to a range of stakeholders at each step of the AI lifecycle.

Potential benefits

Efficiency, accuracy, and profitability
With faster, more accurate market analysis, the organization can increase trading volumes, validate analysis in real-time, and potentially drive greater profitability while mitigating risks.

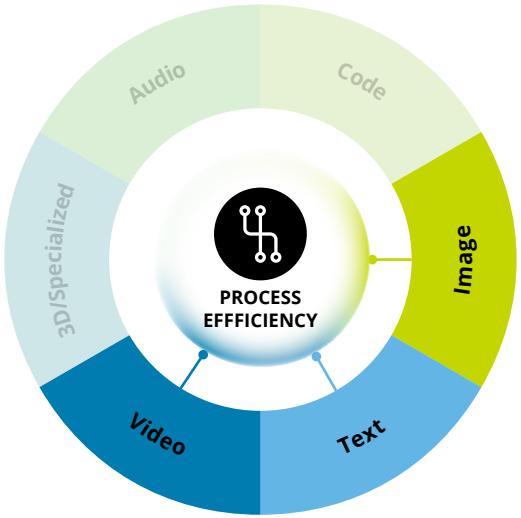
Cost reduction
By automating aspects of the market analysis process, human analysts can focus on more complex or value-driving tasks.



Mitigating risk as it arises

(Real-Time Risk Management)

Generative AI can be a powerful addition to support corporate risk management activities.



Issue/opportunity

Corporate risk management is a costly and labor-intensive process with a low tolerance for error. Regulatory and compliance requirements mandate that financial institutions assess and manage risks, including those related to credit, investment, fraud, and cybersecurity. Yet, risk assessments are made based on a variety of data sources, including identity verification, credit assessment, credit card data, mortgage data, and more. At scale, with tens of millions of customers in multiple markets, risk management becomes enormously complex, time consuming, costly, and subject to human error.

How Generative AI can help

Operational efficiency
Real-time monitoring and verification for risk and fraud identification has a direct impact on operational efficiency and cost savings.

Regulatory compliance
The ability to access relevant data and contextual information in real-time supports compliance with regulations and industry standards.

Improved accuracy
When the organization evaluates risk based on customer data, industry data, and real-time updates, the organization can conduct better risk assessments with greater accuracy and impact.

Synthetic data generation
Creating synthetic data that mirrors fraudulent transactions can help train models to better identify risky scenarios, predict fraudulent patterns, and reduce the overall fraud rate.

Mitigating risk as it arises

Managing risk and promoting trust

Fair and impartial

Biases in the data sources used for risk assessment could lead the Generative AI model to output unequal customer risk assessments, which in turn can lead to unfair decisions and unequal treatment. This is not only a concern for brand reputation and customer satisfaction. It may raise compliance issues as well.

Accountable

If risks are missed by the Generative AI system and the organization makes a poor customer decision, the machine cannot be held accountable for the repercussions. Document stakeholder roles and responsibilities and establish output validation as a part of the risk management process.

Security

Given the sensitive information involved in risk management, the model accessing data needs to be secured against leaking or unintentionally divulging customer data to unauthorized parties.

Potential benefits

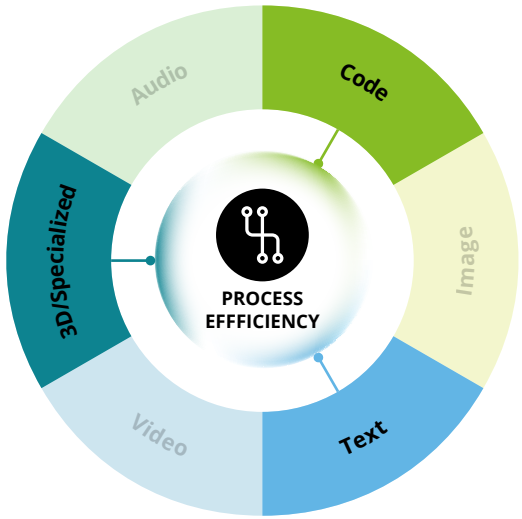
Increased profitability
Mitigating direct and indirect investment risks and reducing fraud directly impacts the organization's book value and profitability.

Promoting compliance
Robust and real-time risk assessments position the organization to more rapidly respond to emerging risks and trends, and by that, enjoy a more agile capacity to meet regulatory expectations for risk management.

Focused cyber

(AI-driven vulnerability management that focuses on real threats)

AI can help filter, analyze, and prioritize security alerts, allowing organizations to focus their resources on true vulnerabilities—which can help reduce their cybersecurity risk.



Issue/opportunity

Financial institutions and other large enterprises rely on multiple security tools that generate millions of alerts daily—many of which are false positives or non-actionable.

Security teams and developers spend time triaging and remediating vulnerabilities that pose little or no real risk. This inefficiency delays response to real threats, creates operational fatigue, and increases the likelihood of breaches—threatening business continuity and brand reputation.

How Generative AI can help

Evaluating alerts
Generative AI models can evaluate alerts by calculating breachability (likelihood the vulnerability can be tapped in a real-world scenario) and exploitability (likelihood it can be actively taken advantage of to inflict harm).

Setting priorities
An AI-driven system can use enterprise-specific context—such as workload risk profiles, application architecture, and network exposure—to separate high-risk from low-risk vulnerabilities. AI automatically identifies which threats demand attention and which can be deprioritized, ensuring a data-driven, risk-based prioritization process.

Focused cyber

Managing risk and promoting trust

Robust and reliable

The vulnerability management system should be continuously retrained and tested against live alert data and historical incidents to validate its prioritization logic. A human-in-the-loop approach confirms oversight on critical decisions, especially during early-stage deployment.

Safe and secure

The models should be hosted in secure environments (e.g., on-prem or restricted cloud instances), with strict access controls and audit trails. Systems must be designed to prevent data leakage and regularly tested for robustness.

Transparent and explainable

AI outputs should include the rationale for prioritization with traceable decision paths that help analysts understand and trust the recommendations.

Potential benefits

Less noise
Moving from thousands of daily alerts to a handful of real threats enables security and engineering teams to focus their time and effort more effectively.

Improved security and reputation
Decreasing security incidents strengthens a company's standing with customers, investors, and regulators.

Cost savings and improved efficiency
Better resource allocation allows security and engineering teams to spend less time and money protecting the organization from cyberthreats.

Enhance productivity & morale
Minimizing time spent on false positives reduces friction between the security and engineering teams, improving productivity and morale.

Automated investment management

(AI-driven portfolio management and optimization)

AI can be used to automate investment portfolio construction, rebalancing, and optimization based on client preferences, market data, and regulatory constraints—improving service quality at lower cost.

Issue/opportunity

Traditional portfolio management is resource-intensive and highly reliant on manual analysis. As client expectations shift toward personalization and cost-efficiency—driven by pressure from robo-advisors and low-cost ETFs—active asset managers are looking for ways to deliver better, more customized service at lower operational cost without compromising on regulatory compliance and fiduciary responsibility.

How Generative AI can help

Taking a broader view
AI models can integrate and analyze structured client data (e.g., risk tolerance, financial goals, life stage) along with external macroeconomic indicators, financial news, and portfolio company metrics.

Automating the process
The models can provide threshold-based rebalancing, factor-based investing, and tax-loss harvesting, enabling continuous monitoring and autonomous adjustment of portfolios. They can also identify potential portfolio risks in real time and flag anomalies for review.

Automated investment management

Managing risk and promoting trust

Robust and reliable

To responsibly deploy AI in a highly regulated, trust-sensitive industry like asset management, models should be tested in sandbox environments under various market conditions to determine resilience to volatility, black swan events, and stress scenarios. Parallel operations with human oversight helping to ensure fallback procedures are in place if AI outputs diverge from expected patterns.

Transparent and explainable

Model-driven decisions—such as rebalancing actions or investment recommendations—should be accompanied by clear rationales that can be communicated to both advisors and clients. Decision logs and audit trails are maintained for every action the AI recommends or executes, enabling accountability and regulatory review.

Respectful of privacy

Client data should be anonymized or pseudonymized where possible and only accessed on a need-to-know basis. Data flows must be tightly monitored to ensure sensitive personal or financial data doesn't leak across internal silos or into unauthorized hands.

Potential benefits

Cost efficiency and scalability
Automation of rebalancing, trade execution, and reconciliation can help reduce FTE hours, enabling long-term fee reduction without margin erosion. Portfolio managers can handle more accounts, improving productivity without sacrificing oversight.

Strategic differentiation
AI-driven portfolio management can help an investment firm maintain a premium position in a commoditized market by offering a high-touch yet affordable client experience that is difficult to achieve in other ways.

Client personalization at scale
Custom investment strategies tailored by AI to fit an individual's life stages, goals, and preferences can improve customer satisfaction and retention in a cost-effective way.

Risk reduction
Transitioning from daily to real-time rebalancing improves market responsiveness and boosts client trust. Also, using AI to flag anomalies, liquidity risks, or sector imbalances early enables proactive corrective actions.

The Government & Public Services Generative AI Dossier

In the Government and Public Service (G&PS) industry, agencies work to satisfy citizen needs and extract the greatest return on investments from a limited budget. A Generative AI-enabled chat function can be used for addressing citizen inquiries as well as for procurement functions, such as by accessing the most up-to-date information to respond to questions around contractor qualifications, existing contracts, and bids. The advent of Generative AI presents a new level of capability that can enhance and accelerate the public industry's transformation to use cutting-edge AI.

Today, Generative AI-enabled natural language processing capabilities have the potential to revolutionize the way governments interact with citizens and how the public workforce performs their duties. Public servants have a new tool for improving interactions with citizens, customizing communication, and identifying needs of beneficiaries to suggest tailored solutions. This supports a superior level of citizen services, maximizing the value of public funds by improving efficiency, personalization, and data-driven decision-making.

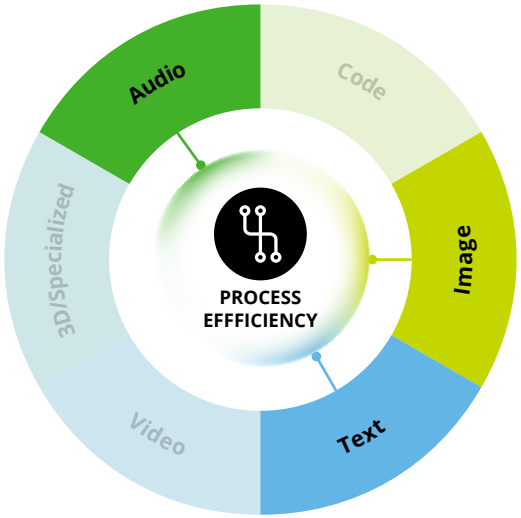
Meanwhile, Generative AI applications can also help automate administrative tasks (e.g., reporting), analyze and summarize lengthy and voluminous policy documents, and parse case notes to inform citizen services. A Generative AI-enabled chat function can be used for addressing citizen inquiries as well as for procurement functions, such as by accessing the most up-to-date information to respond to questions around contractor qualifications, existing contracts, and bids.

Government organizations are increasingly exploring how Generative AI can be used for these and other applications. Adoption of Generative AI creates important considerations for assessing security, fairness, transparency, and compliance in deployments. Model governance requires an alignment of people, processes, and technologies to mitigate risks while meeting the performance expectations of citizens and government employees. By doing so, government organizations can promote the responsible use of Generative AI while fulfilling their duty to serve their constituents.

Open-source assistant

(OSINT Reporting)

Generative AI can be used to automate open-source intelligence (OSINT) reporting, including financial affairs, technology advancements, media assessments, and security briefings on a global scale.



Issue/opportunity

OSINT reporting is conducted daily at a global scale by defense and national security organizations. This can be a labor-intensive process that requires significant time and resources. With the explosive growth in publicly available information, traditional methods of manually cataloguing and summarizing open-source content simply cannot keep pace. For example, ship and airplane tracking websites make huge volumes of data available to analysts, but it is almost impossible to summarize that data, let alone collate it with media and social media data. The result is that analysts need new tools that can look across vast troves of structured and unstructured data to pull out human-readable insights.

How Generative AI can help

Automated synthesis
Generative AI can be used to review, evaluate, and summarize information from a multitude of open-source documents, including briefings, news media, and other reports.

Mimicking report style
With countless numbers of OSINT reports previously created with traditional methods, Generative AI can use these as examples to write reports in the same style while drawing from up-to-date data sources.

Open-source assistant

Managing risk and promoting trust

Fair and impartial

Open-source information may not be unbiased, and it may even be intentionally misleading or outright fake. When a Generative AI model is used to review and evaluate information, it requires the capacity and/or human input to mitigate bias in OSINT reporting.

Security

The sensitive nature of intelligence queries means that special care must be taken to prevent adversaries from influencing the model or gathering their own intelligence from what is queried.

Reliable

Given that Generative AI is susceptible to producing inaccurate outputs, for agencies to trust OSINT reporting, human validation is necessary to identify and remedy AI hallucinations.

Potential benefits

Resource efficiency
Automating aspects of OSINT reporting helps reduce the degree of human involvement, which has benefits for operational costs and resource allocation.

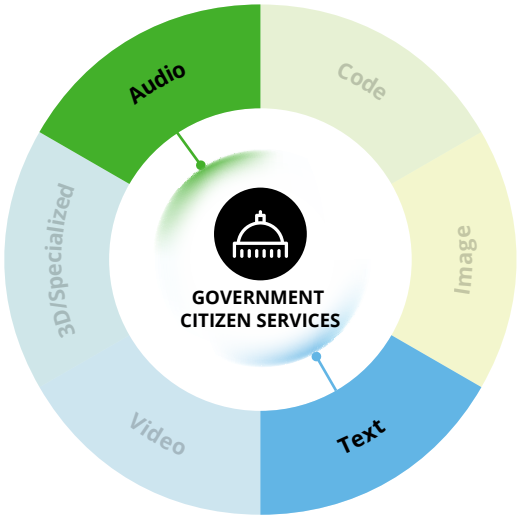
Time efficiency
Expediting OSINT reporting by leveraging Generative AI, agencies can more rapidly review large datasets and documents and create richer, more timely reports.

Human capital efficiency
By freeing analysts from time-consuming tasks like cataloging and transcription, Generative AI lets analysts spend more time on higher value tasks, such as analysis and collaboration with colleagues.

Virtual public servant

(Citizen Engagement)

Generative AI can enable virtual assistants that provide personalized responses to citizen questions about public services.



Issue/opportunity

Government organizations perform a range of functions, from supporting public health to promoting tourism. Data about government and public services, however, is often stored in a variety of formats and locations (e.g., on-prem, cloud), challenging interoperability. When citizens contact agencies to inquire about services and resources, human agents are challenged to rapidly access and summarize information to satisfy citizen questions. This is a time-consuming, labor-intensive endeavor for the organization, and it may not meet citizen expectations for fruitful engagement.

How Generative AI can help

A digital agent for engagement
A Generative AI-enabled virtual assistant can serve as the interface between citizens and government information, helping with questions and transactions via empathetic, natural language.

Reaching across datasets
The virtual assistant can distill and summarize information from myriad sources on a variety of topics to answer questions in a multitude of languages regarding service requirements and appointment options.

Virtual public servant

Managing risk and promoting trust

Responsible

While virtual assistants may be valuable for providing information, they may not be suited to providing true insight and advice. Agencies need to guard against an over-reliance on a Generative AI solution and the potential for citizens to take some action based on a faulty or improper AI output.

Security

A model tasked with providing accurate information may be a target for cyber criminals seeking to access sensitive information or manipulate the model and its underlying data. Many government agencies contend with cybersecurity regulations and standards, making model security a priority.

Reliable

Model accuracy and timeliness depends in part on the data sources it can access, and if information is outdated or incorrect, it creates a risk of erroneous outputs. Human stakeholders responsible for updating information have a direct impact on model reliability and user trust.

Potential benefits

Promoting citizen engagement
When public services are more accessible due to more efficient and robust technology, it promotes user engagement and citizen satisfaction in government offerings.

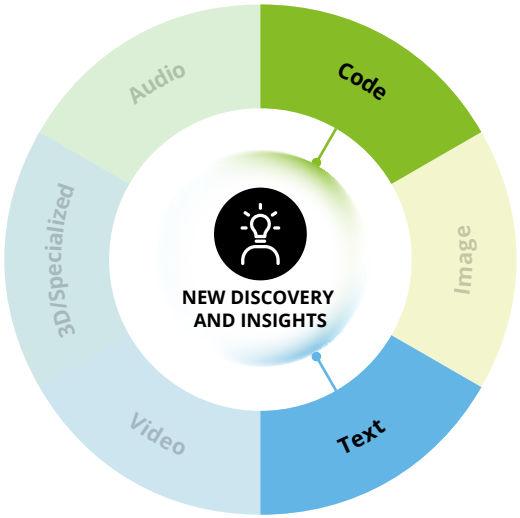
Increasing accessibility
A virtual assistant powered by Generative AI can interact with citizens in their preferred language and ultimately help bring down social barriers to engaging public services.

Citizen satisfaction
Government agencies operate in service to the public, and providing fast access to information about services promotes a positive public perception of government function.

Insights for all

(Knowledge Management)

Generative AI can serve as an interface to help the public industry become insight driven by making data more accessible.



Issue/opportunity

From census to transportation and procurement, government agencies collect and release huge amounts of open datasets. By encouraging the use, reuse, and distribution of open datasets, government organizations can promote data-driven innovation and citizen-centric services if combined with an agency's internal datasets. For public industry stakeholders to become truly insight-driven, they require the means to interrogate all relevant data, even if they lack a technical background in data science or related fields.

How Generative AI can help

Greater accessibility
Generative AI can provide a natural language interface that allows non-technical users to access and understand data that might otherwise only be accessible to technical users.

Democratizing insights
Rather than placing all of the burden for data analysis, interpretation, and visualization on a technical team, a Generative AI interface reduces that burden by allowing more stakeholders to work with the data and derive their own insights.

Insights for all

Managing risk and promoting trust

Security
A Generative AI model that is consulting a variety of datasets can make it difficult for the organization to control which data is accessed by which stakeholders in which organization, raising important considerations for model security and governance.

Privacy
When dealing with sensitive and proprietary information that is subject to varying laws and regulations across jurisdictions, organizations are called to ensure the Generative AI model does not leak, inadvertently divulge, or inappropriately access sensitive or restricted data.

Transparency
To accurately interpret data and AI outputs, the end user needs to understand which data was referenced for the output, which could not be accessed, and the potential biases in the available data.

Potential benefits

Scaling data access
A Generative AI solution that can access a variety of datasets and types allows public servants to draw conclusions from a broader set of knowledge and information.

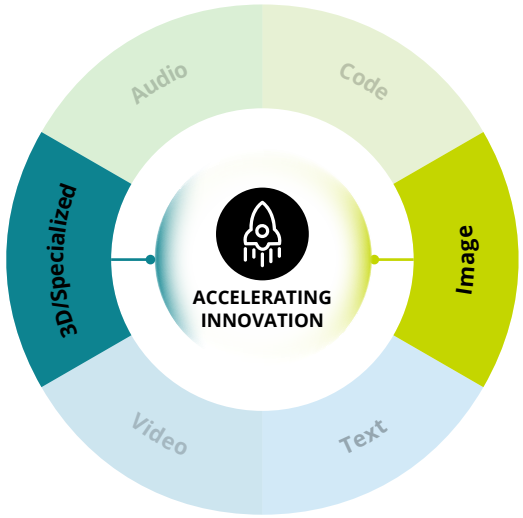
Fostering collaboration
When more public servants can access insights and knowledge, it promotes insight-driven action across agencies, helping to fuel greater collaboration between a larger set of stakeholders.

Faster insights
Generative AI can help accelerate the process of identifying and consuming relevant information, driving speed and efficiency.

Simulating urban planning scenarios

(Urban Planning/Future of Cities)

Generative AI can be used to help urban planners in the ideation and design of novel urban concepts.



Issue/opportunity

More than 56 percent of the world's population—4.4 billion people—live in cities.[1] By 2050, the urban population is likely to double, with upwards of 70 percent of people living in cities. The scale and speed of urbanization brings a host of challenges, such as lack of affordable housing, overburdened transportation systems, traffic congestion, lack of drinking water, rampant sanitization issues, and degraded environmental quality. The challenge for city officials and urban planners is to imagine the future of cities by overcoming creative hurdles and developing city designs that are resilient, sustainable, and human centric.

How Generative AI can help

Generating 3D city models
Using Generative AI, thousands of 3D images can be rapidly created to help guide and refine a city design. Such 3D images form part of the design brief for urban planners and the master city plan.

Simulate natural disasters
Generative AI can simulate natural disasters like earthquakes, floods, or hurricanes to evaluate the vulnerability of city infrastructure and plan for resilient urban infrastructure.

Planning for the future
By simulating population growth and demographic trends, Generative AI can develop scenarios for urban expansion and plan for adequate infrastructure, housing, transportation, and public services that accommodate urban growth.

Simulating urban planning scenarios

Managing risk and promoting trust

Reliable

While a Generative AI model may create interesting or attractive designs, they require human review and validation to ensure they meet urban planning requirements and can be feasibly built in the real world.

Explainable

A lack of contextual knowledge of urban planning may lead Generative AI to develop improbable scenarios, and analysts need to be able to understand how and why the model produced an output, so as to confirm and validate it.

Potential benefits

Super-charge creativity
Using Generative AI to rapidly create a plethora of designs and scenarios helps city officials imagine the future of cities and plan for upcoming challenges.

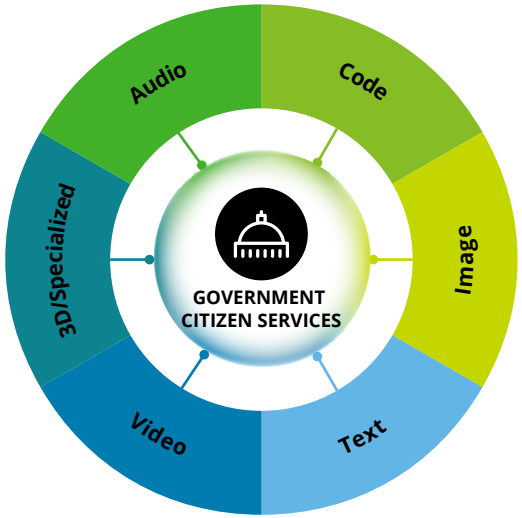
Faster ideation and iteration
With a faster method to create design iterations, urban planners can accelerate the design and decision-making processes.

Improved decision-making
Using Generative AI in city planning enables decision-makers to model various scenarios and optimize urban designs for better resource utilization, sustainability, and quality of life for residents.

Education 2.0

(Hyper-Personalized Education)

Generative AI can be used to hyper-personalize digital teachers that can adapt to student learning needs and curricula.



Issue/opportunity

The demand for schoolteachers can often exceed supply. While the available teachers contend with larger class sizes, they also need to accommodate students with different learning styles and educational needs. Yet, because of the one-to-many nature of traditional schools, teachers are challenged to deliver the kind of personalized learning support and instruction that students need to be successful.

How Generative AI can help

A digital, adaptive teacher
Generative AI can serve as a virtual instructor, drawing from resources and lesson plans to hyper-personalize the learning experience. The model can check the student's work and comprehension and adapt lessons and learning strategies according to the student's individual weaknesses, strengths, and preferences.

A force multiplier for teachers
When personalized digital teachers can work with students one-on-one to master new skills and knowledge, the human instructor can focus on higher-level planning, interacting with students, evaluation, and student support.

Education 2.0

Managing risk and promoting trust

Responsible
While digital teachers can offer valuable advantages in adaptive learning, the model should not be expected to satisfy all of the important lessons teachers impart, such as social lessons around collaboration, conflict resolution, and empathy. The human element in teaching is essential, and educational institutions need to take a responsible approach to integrating Generative AI-enabled teachers.

Reliable
Because Generative AI is susceptible to outputting inaccuracies and hallucinations, there is a risk that a virtual teacher could teach incorrect facts or produce poor learning strategies.

Privacy
Student data is subject to education regulations, making model security and data privacy a priority when deploying digital teachers.

Potential benefits

Catering to the student
Employing adaptive learning with Generative AI can promote knowledge retention and understanding by tailoring teaching approaches to the student's learning style.

Remedy the talent gap
Leveraging Generative AI helps overcome teacher shortages, allowing more students to access quality education.

Removing barriers
A Generative AI-enabled teacher is not restricted to a physical classroom. With online access, digital teachers could be accessible to students in any environment or geography, helping to bring down barriers to attending school.

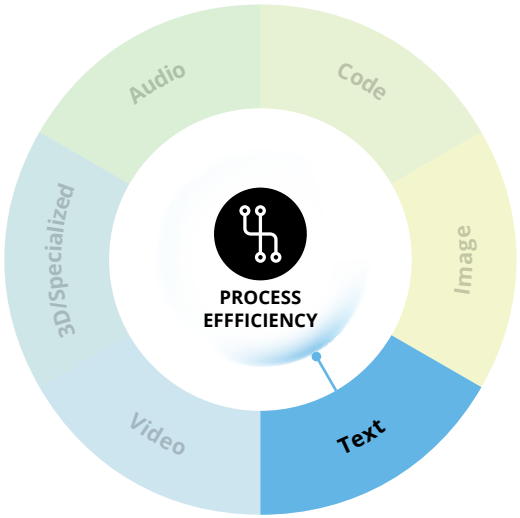
Digitizing policymaking

(Policy Creation Assistant)

Generative AI can be used to search large volumes of policy documents and output natural language responses to user queries in complex policy environments.

Issue/opportunity

Because the data that is relevant to GPS is stored in different locations and formats, it can be difficult for analysts and policymakers to effectively query datasets and retrieve relevant information in a timely manner. With nomenclature issues, it can also be challenging to identify associated data topics and types. The result is a diminished ability to digitize policymaking and discussion while also complicating interactions around policy matters.



How Generative AI can help

Generative AI assistant
Generative AI can identify data dealing with the same themes and topics and summarize that information in response to user queries, helping identify policy differences, conflicts, and gaps.

Citizen engagement in policymaking
Using Generative AI, governments can create interactive platforms and chatbots that encourage citizens to participate in policymaking discussions. The AI-driven interface can gather public opinions and feedback on policies, making it easier for citizens to voice their views.

Digitizing policymaking

Managing risk and promoting trust

Privacy

Some of the data relevant to policy issues may be sensitive or restricted, and the Generative AI model may require controls to limit which users can access which datasets.

Fair and impartial

Various stakeholders aim to influence policymaking. Generative AI might be biased in giving higher weightage to comments and input coming from one source over other. It has the potential to develop biased policies that are in favor of certain businesses or sections of the society.

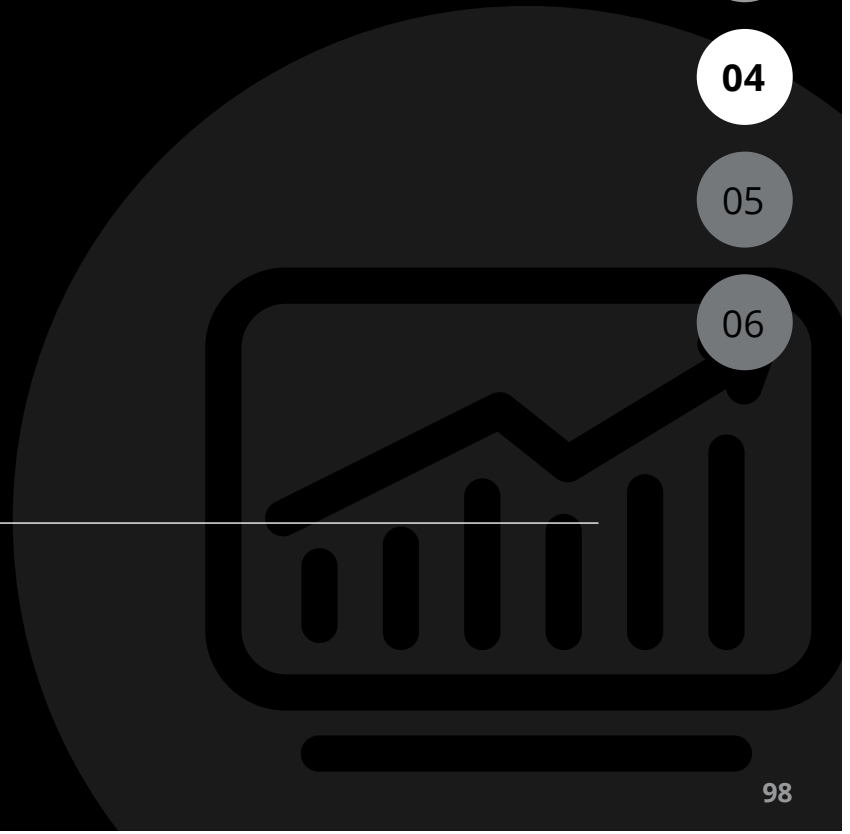
Potential benefits

Data query at scale

By reviewing large volumes of policy documents, the user can accelerate information gathering and increase their capacity and efficiency in querying disparate datasets.

Participatory policymaking

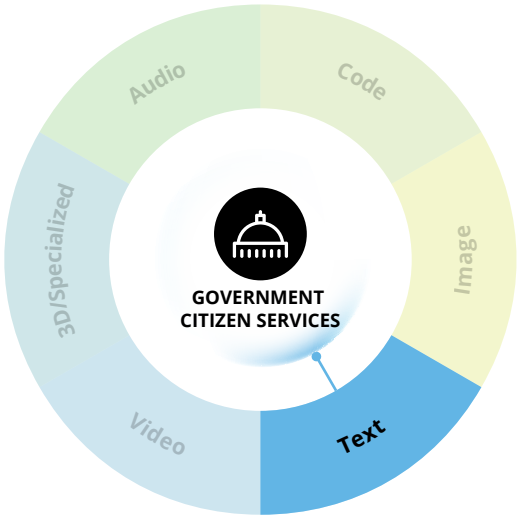
Using Generative AI to better identify and incorporate a diversity of views and stakeholders supports more robust and complete representation in policy matters.



Drafting contracts and SoWs

(Procurement)

Generative AI can analyze offerings from existing vendors, match to an organizational need, generate requests for proposals, and analyze the responses.



Issue/opportunity

Governments procure billions of dollars in goods and services annually.[2] Traditionally, government procurement requires significant volumes of paperwork, which can lead to delays. Many government procurement contracts are highly detailed and often incorporate a range of clauses and requirements from payment terms to export controls to wage and workforce requirements. Drafting requests for proposals (RFPs) and contracts and then generating statements of work (SoWs) requires significant time and resource investments.

How Generative AI can help

Automated drafting
Generative AI can automate the RFP and SoW writing process by generating the initial drafts based on templates, historical documents, or specific prompts provided by procurement officials.

Extracting information
Generative AI's advanced Natural Language Processing (NLP) capabilities can help extracting relevant clauses and requirements from existing contracts, SoWs, and legal documents. Such information can be used to either create new contracts or assess the risks posed by existing contracts.

Drafting contracts and SoWs

Managing risk and promoting trust

Explainability

Generative AI may not be able to explain why certain clauses are added to a contract while others are excluded, which is vital information for the human user validating the outputs.

Privacy

Ingesting existing and historical contract data may pose data privacy and legal hurdles. Model governance is necessary to ensure the Generative AI model, as well as the underlying data, meet privacy rules, regulations, and standards.

Potential benefits

Time savings

Creating initial document drafts with Generative AI can expedite the writing process and lead to significant time savings, compared to manually creating each contract or SoW from scratch.

Improved consistency

Generative AI can develop drafts while adhering to predefined guidelines in prompts, which supports a greater level of consistency across report writing.

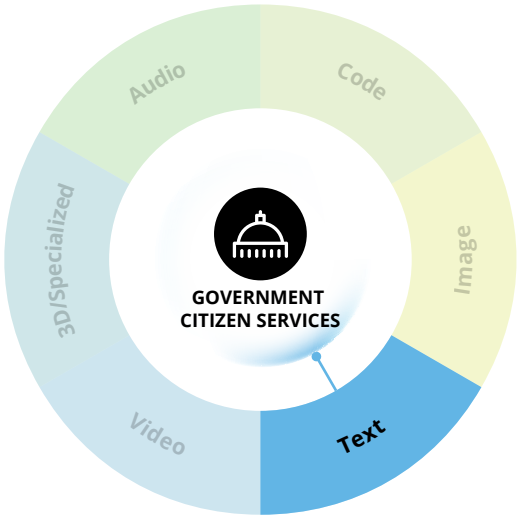
Onboarding caseworkers

(Case Management/human services)

Generative AI can help caseworkers parse notes, analyze policy documents, and assess eligibility to propose interventions.

Issue/opportunity

Health and human services agencies can face workforce challenges due to high turnover, increased caseloads, and insufficient training. When new employees are brought onboard, it can take months of training for the staff to become fully productive. This, coupled with high turnover, ultimately impedes an agency's ability to carry out its mission and serve individuals.



How Generative AI can help

Developing training manuals
Generative AI can code exit interviews of retiring and experienced caseworkers to distill important lessons for new hires. Additionally, Generative AI can automatically generate onboarding documents and training videos customized to the role of a newly hired caseworker.

Queries on program rules
When a Generative AI model is trained on policy manuals, program rules, and historical cases, it can help answer questions from new caseworkers and bring them up to speed more quickly on complex and continually changing program rules and policies.

Onboarding caseworkers

Managing risk and promoting trust

Privacy

Ingesting data from historical cases could expose the model to sensitive or protected information, creating new data privacy issues as the model may leak or accidentally divulge protected data.

Fair and impartial

As training manuals rely on decisions made in the past, as well as on the experiences of retiring caseworkers, biases in previous decisions may be encoded in training manual content created with Generative AI.

Potential benefits

Faster onboarding
When caseworkers can be more quickly and efficiently onboarded, it helps the agency begin to rapidly reduce backlogs in health and human services.

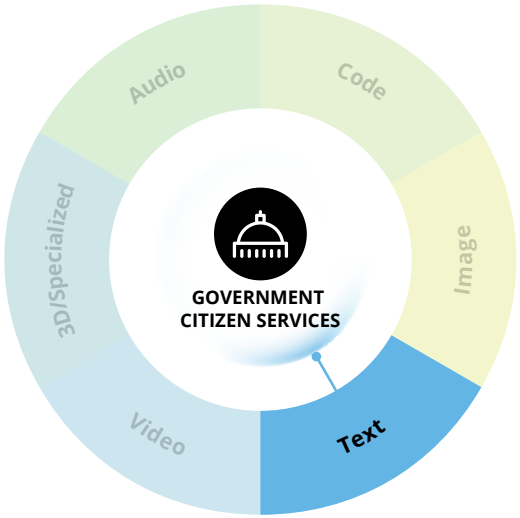
Promoting efficiency
Leveraging Generative AI to automate aspects of case management can reduce the time-consuming paperwork burdens on caseworkers.

Positive user experience
More efficient processes around case management can improve the citizen experience and support positive interactions.

Multilingual citizen services

(Service delivery)

Generative AI can help with language translation to support the delivery of more inclusive services to citizens.



Issue/opportunity

In recent years, governments have enacted laws and published policies to make government services more inclusive and equitable. Further, many governments around the world serve diverse populations with varying language proficiency and linguistic backgrounds. This challenges agencies to develop multilingual websites, translate official documents, and support frontline workers with translation tools so they can better communicate with all citizens.

How Generative AI can help

Aiding frontline workers
Generative AI can be used to create real-time audio and text messages in different languages as frontline workers interact with residents around a variety of services, such as social care, healthcare, and emergency response.

Translating official documents
Government agencies often deal with the publication of official documents, laws, regulations, and policies. Generative AI can help streamline the translation process, and produce accurate and consistent translations.

Announcement and website translation
Government websites and public information (e.g., health and travel advisories) can be translated quicky to make essential information more accessible to a diverse population.

Multilingual citizen services

Managing risk and promoting trust

Fair and impartial

The data used to train a Generative AI model for use in translation may not be consistently accurate or robust across all languages, which could in turn lead to poorer translations and access to citizen services for some language speakers than for others.

Privacy

The translating model may be exposed to sensitive information, necessitating steps to ensure the model does not mishandle or inappropriately divulge protected data and so violate data privacy regulations.

Potential benefits

Real-time translation
When audio or text can be translated into a multitude of languages in real-time, it enables more seamless and conversational interactions with a diversity of language speakers.

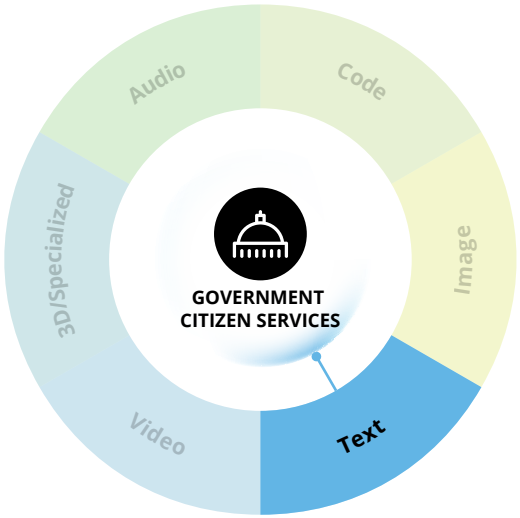
Translation at scale
Generative AI can handle large volumes of document translation, giving an agency greater capacity to ensure government information and services are accessible to a diverse audience.

Improved accessibility
Generative AI can help governments achieve their diversity, equity, and inclusion (DEI) targets by enabling inclusive service delivery through multilingual translations.

Summarizing legislative documents

(Legislative Administration)

Generative AI can help legislative staff more rapidly transcribe and summarize hearings, legislation, documents, and official announcements.



Issue/opportunity

Legislative offices are expected to hold hearings on important topics, respond to constituents, and make public announcements in the form of press releases. Manually transcribing hearings and meetings is a time-consuming task. Further, developing new legislation (where staff play a pivotal role in research) requires sifting through voluminous policy proposals and research published by experts.

How Generative AI can help

Summarizing official documents
Auto-generating transcripts of hours-long committee hearings and summarizing important bills and hearings can significantly reduce the administrative burden on staffers.

Process and summarize policy proposals and research
Legislative staff review a large volume of policy proposal and recommendations published by experts. Generative AI can quickly summarize the documents for them, so staffers can spend more time on higher level policy analysis and decision making.

Summarizing legislative documents

Managing risk and promoting trust

Fair and impartial

Generative AI may perpetuate latent biases based on its training set and generate skewed summaries that are partisan and favor certain ideologies.

Privacy

Ingesting internal policy proposals can expose sensitive information, requiring offices to take measures that protect the confidentiality of internal documents.

Potential benefits

Reducing burdens

Generating summaries of official hearings can reduce administrative burdens on legislative staff so they can focus on more complex or value-driving tasks.

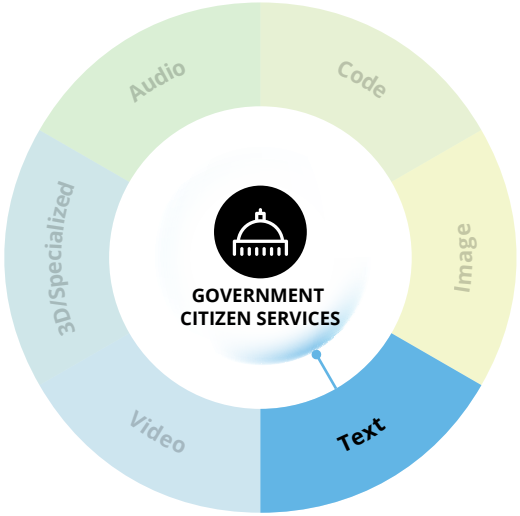
Saving time

Generative AI can quickly retrieve information and summarize it, saving legislators and staff time when reviewing lengthy, complex, or detailed documents.

AI-powered government policy tracking

(Automated tracking and analysis of public policy on a global scale)

Organizations in the public and private sector can use AI to monitor, interpret, and analyze public policy developments in real time across hundreds of countries.



Issue/opportunity

Tracking national policy developments on a global scale is a resource-intensive and highly fragmented process. Policy documents vary in language, structure, formatting, and accessibility, making it difficult for international organizations, governments, and advocacy groups to maintain a coherent and timely view of global policy trends.

How Generative AI can help

Data collection and analysis
AI can automatically gather, structure, and analyze vast volumes of policy documents from government websites and public sources. The technology performs multilingual data extraction, applies natural language processing to categorize and summarize policies, and synthesizes insights into structured outputs that can be validated by subject-matter experts.

AI-powered government policy tracking

Managing risk and promoting trust

Fair and impartial

The AI model is designed to avoid reinforcing systemic biases. Human experts from different backgrounds and regions are embedded in the feedback loop to validate model outputs, helping to ensure representation across geographies and policy contexts.

Robust and reliable

Automated systems should undergo rigorous, iterative testing to ensure the reliability of outputs. Policy insights are continuously benchmarked against human analysis and real-world policy documents to maintain a high level of accuracy and dependability, especially in politically sensitive or under-reported regions.

Potential benefits

Greater accuracy, scalability and knowledge sharing
AI can enable ongoing, real-time monitoring and analysis of thousands of policies across hundreds of countries without an exponential increase in manual effort. It can also enable local entities and other stakeholders to identify policy trends, compare regional approaches, and uncover best practices.

Improved efficiency
The solution combines data collection and policy analysis with AI-powered automation, which can save an organization significant time and resources.

Improved decision-making
Use of AI for policy tracking and analysis can provide organizations with timely, structured, and reliable data to support effective decision-making and planning.

The Life Sciences & Health Care Generative AI Dossier

The Life Sciences and Healthcare (LSHC) industry has been a vibrant testing ground for new AI capabilities. Facing large data volumes, health maladies that demand new and better treatments, an aging global population, an array of regulatory obligations, the complexity of claims processes, and the challenge of sharing patient information between organizations, LSHC enterprises seek greater efficiency, speed, connectivity, and innovation, all to drive patient care and better health outcomes. Generative AI can help transform healthcare and life sciences companies in three archetypical ways.

First, Generative AI can be used to improve operational performance through improved employee productivity. In essence, it can help organizations achieve more with less. It can be used to automate aspects of claims authorization and appeal, optimize R&D processes, and drive waste out of procurement and contracting. It can also improve and scale population health reporting and analytics to drive consistency in care, and it can boost speed to market for offerings, customer engagement, and drug commercialization. By accessing these advantages without adding new burdens to the existing workforce, the efficiency gained through these kinds of deployments can have a direct impact on the enterprise bottom line and generate long-term stakeholder value.

Second, Generative AI can be used to provide N of 1, fit-for-purpose, and hyper-personalized experiences to patients, customers, and employees. Deployments that improve experiences can optimize the customer and patient journeys, focus on health outcomes (rather than services), and enable new digital products and offerings. With Generative AI, patient and customer engagement content can be hyper-personalized at scale. Innovations such as like virtual therapy and virtual care assistants move toward differentiating services that can enhance the quality of care and health outcomes.

Innovations such as virtual therapy and virtual care assistants move toward differentiating services that can enhance the quality of care and health outcomes.

Third, Generative AI can be used to develop and enhance enterprise digital and data capabilities. As a component of the organization's technology ecosystem, Generative AI can help uncover insights by using an intuitive interface to more easily interrogate enterprise code and datasets. It can help extend asset utility by consuming unstructured data from across the enterprise systems and making predictive recommendations, and it can improve decisioning with intelligent semantic search. There are also valuable advantages for the workforce by augmenting skills and knowledge and adapting to human resource challenges, like human capital shortages and burnout.

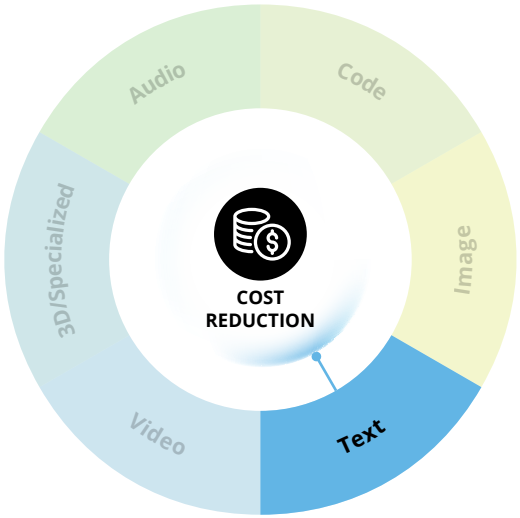
Together, these opportunity to improve efficiency, experience, and data capabilities can accelerate time to market, enhance agility, and build toward the work, workforce, and workplace of the future.

As a component of the organization's technology ecosystem, Generative AI can help uncover insights by using an intuitive interface to more easily interrogate enterprise code and datasets.

A co-writer for appeals

(Denial Appeal Letters)

Generative AI can be used to draft denial appeal letters, drawing from patient records and medical policies and guidelines in a faster, more cost-effective way than human staff.



Issue/opportunity

When a medical insurance claim is denied, hospital billing staff face a costly and lengthy process of reviewing patient records and medical policies to create an appeal letter. For US hospitals, appeals-related administrative costs are measured in billions of dollars. Part of the challenge is the amount of time required for staff to compile an appeal. While more than 60% of denied claims are recoverable, vague reasons for denial and limited hospital billing resources result in only 0.2% of in-network claims being appealed, with millions of dollars written off as uncollectable loss each year.[3]

How Generative AI can help

Retrieving policies and guidelines
A Generative AI retrieval model can reach across large volumes of medical policies and member plans to identify the necessary information for a claims appeal.

Extracting patient data
Using extractive algorithms, the organization can rapidly consult unstructured medical notes, medications, lab results, and other electronic health records.

Writing the appeal
With the necessary information gathered with AI, an LLM can be used to generate an appeal letter.

A co-writer for appeals

Managing risk and promoting trust

Accountable

When consulting highly detailed guidelines, policies, and records to appeal a claim denied for vague reasons, the Generative AI models working together to create the appeal may misinterpret the denial or the records, leading to an unsuccessful appeal. Ultimately, a human needs to be accountable for validating appeal letters.

Privacy

By drawing from electronic health records, the model is consuming health information whose protection is subject to laws and regulations. Ensure that the data ingestion and information outputted aligns with data protection and patient privacy expectations.

Potential benefits

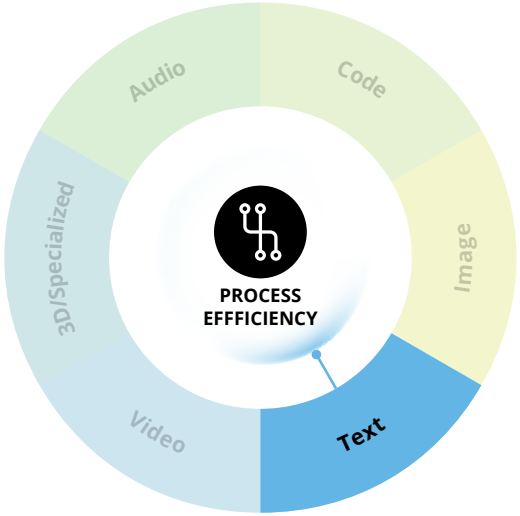
Reclaim revenue
Automating the denial appeal process can supplement hospital billing resources, leading to more denial appeals filed and potentially more revenue recovered.

Efficiency improvement
The implementation of advanced legal technologies can greatly enhance the speed and efficiency of appeals, such as drafting and substantiating, when compared to traditional manual methods. They have the potential to streamline processes across both simple and complex cases, making the legal workflow considerably more time-effective.

Faster admin for payers, providers, and patients

(Accelerated Prior Authorization)

Using Generative AI to consume medical policies, guidelines, and provider-submitted information about underlying issues, patient needs, and medical history, the organization can automate a Prior Authorization submission (Provider) or generate a Prior Authorization approval or denial (Payer).



Issue/opportunity

The Prior Authorization process is manual and labor-intensive for both healthcare payers and providers. The process requires the input of coders who understand the intent of a payer's Prior Authorization policies, as well as the need for medically necessary care management plans. The time required to consume medical records and policies to make determinations on Prior Authorization submission, approval, or denial can lead to a long administrative process between the payer and provider, which can negatively impact patient satisfaction and the customer experience.

How Generative AI can help

Supporting the provider
For providers, Generative AI can help prepare a Prior Authorization submission by analyzing submission requirements and guidelines and cross referencing with a patient's medical records to ensure necessary requirements are met. Generative AI can then aid in submission to the payer and continually learn which best practices tend to lead to Prior Authorization approvals.

Supporting the payer
For payers, Generative AI can help reduce the time required to make a Prior Authorization decision, impacting the patient experience. It also helps mitigate fraud by determining if there are anomalies in a provider's coding practices and promoting compliance by analyzing submitted Prior Authorization requests and records against the payer's policies and procedures.

More efficient operations
For both payers and providers, using Generative AI for Prior Authorization processes reduces work burdens and streamlines the ability to respond to Prior Authorizations, which can reduce costs while improving patient experiences.

Faster admin for payers, providers, and patients

Managing risk and promoting trust

Security

Prior Authorization requires the provider and payer to communicate sensitive patient data, such as protected health information (PHI) and personally identifiable information (PII), etc., which means this data is exposed to the model. Risks included unauthorized third-party access, as well as AI systems inadvertently revealing sensitive information during the generation process, thus compromising patient data confidentiality.

Bias

The process for submitting and responding to Prior Authorization involves a standard set of Prior Authorization rules and the patient's medical history, which introduces the potential for bias in Generative AI models. This bias might arise due to the historical data used to train the model (e.g., disparities in healthcare treatment or outcomes), and as a result, the Generative AI model could inadvertently perpetuate and even amplify such biases by making biased decisions or recommendations. The use of standardized authorization rules and patient-specific medical history, alongside continuous monitoring and careful evaluation, helps mitigate this risk and promotes fairer and more equitable outcomes.

Reliable

While the process for submitting and responding to Prior Authorization requires a standard set of Prior Authorization rules and the patient's own medical history, there is a risk that the model will misinterpret nuanced medical conditions of underrepresented populations that were not in the training dataset, and so falsely deny the need.

Potential benefits

Speed and efficiency
With Generative AI, providers and payers may require less time to understand policies, research patient medical records for compliance, and generate, approve, or deny a Prior Authorization request.

Continuous learning
A Generative AI feedback loop refers to the cyclical process where the AI model's output is presented to users or evaluators for feedback, which is then used to iteratively update and refine the model. This enhances the consistency and quality of outputs, enabling providers to gain a deeper understanding of payer policies, streamline decision-making processes, and ultimately allowing payers to optimize their procedures.

Improved patient experience
As the Prior Authorization process becomes more efficient, patients can receive the care management they need without needless waiting for administrative processes to conclude. This supports increased patient satisfaction by virtue of improved administrative and patient experience.

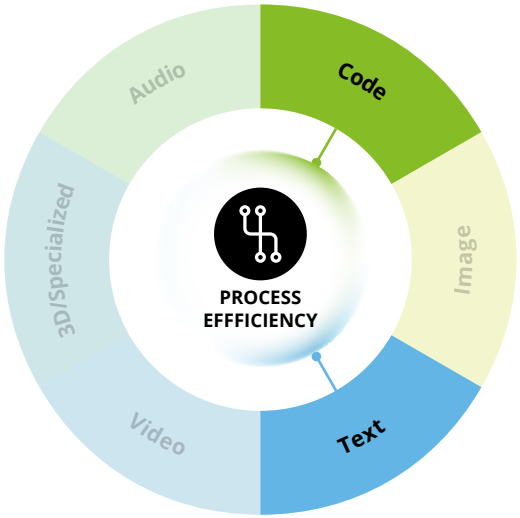
Simplifying claims submission

(Medical Coding)

Generative AI can be used to create code for a claims department to categorize incoming claims and billing for medical services and procedures, which can improve the accuracy, efficiency, and speed in the claims submission process.

Issue/opportunity

The claims submission process in the medical industry can be laborious and error-prone, involving the manual categorization of a large volume of incoming claims with complex medical codes. This time-consuming task leads to backlogs, delays, and potential payment issues for healthcare providers.



How Generative AI can help

Transformed claims processing
Using Generative AI to help categorize incoming claims and analyze and assign accurate codes can improve the overall accuracy, efficiency, and speed of claims processing. This results in faster reimbursements for providers and a streamlined experience for both the claims department and patients.

Reduced labor burden
By leveraging an LLM, the human workload in the claim's submission process can be redirected to higher value-added tasks which could result in administrative cost savings for the payer.

Simplifying claims submission

Managing risk and promoting trust

Fair and impartial

A Large Language Model (LLM) used in medical billing may be susceptible to bias owing to skewed training data, incorrect labels, and under-represented cases, potentially leading to incorrect claim categorization. To mitigate these issues, careful data collection, diverse model testing, and continuous monitoring and adjustment are vital for ensuring fair and accurate performance.

Privacy

To assess coding accuracy, the LLM compares the billed codes with the patient medical history, which exposes the patient's data to the underlying model and creates potential privacy risks that need to be mitigated.

Reliable

Medical coding is highly regulated with strict penalties for over/under coding. The accuracy and reliability of LLM outputs in this regard is essential, as mistakes could carry consequences. Reliability may be challenging in part because patient medical history may contain multiple modalities (e.g., text, images, and video).

Potential benefits

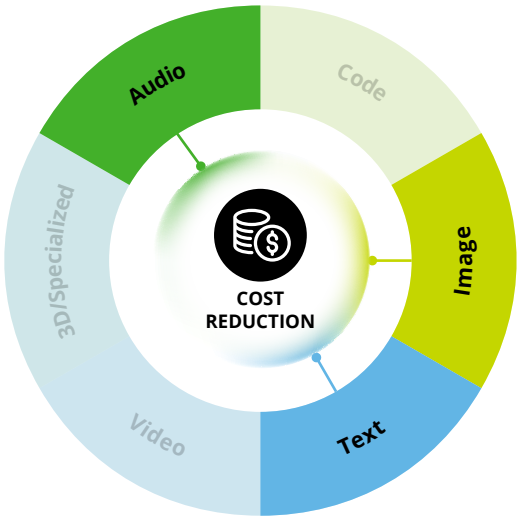
Accuracy to limit revenue loss
Leveraging an LLM can help reduce the risk of coding errors. This can help increase billing accuracy and decrease revenue loss due to errors.

Time efficiency
Automating the review of medical records can save valuable time for healthcare practitioners, enabling them to focus on more meaningful work.

Personalized service for patients

(Claims Assistant)

Generative AI can assist human staff in generating responses to customer questions about the claims process, insurance coverage, and other plan details.



Issue/opportunity

The customer service experience has a direct impact on patient perception, even without any change in charged costs or appointment wait times. This is particularly relevant in the context of payer call centers, where patients can spend significant time navigating Interactive Voice Response (IVR)-based responses. Operational inefficiencies or limited capacity in the call center can translate to decreased customer satisfaction. What is needed is a method for supporting more customers more quickly while also reducing call volumes handled by associates.

How Generative AI can help

Sorting customer archetypes
Customer claims questions often fall into archetypes, such as "claim status," "coverage status," and "explanation of benefits." A Generative AI model can be fine-tuned on these archetypes to address nuanced, customer-specific needs.

Improving the customer experience
Generative AI can support the IVR process by cross referencing the patient's medical and claims history to create a more personalized and comprehensive user experience. It can also summarize next steps on the patient's account for future follow-up.

Supporting human staff
Live agents can be supported by having the AI model summarize customer questions, compare it to past successful resolutions and remediation plans, and provide real-time recommendations for next steps. In some instances, the Generative AI model may be able to function as a live agent.

Increasing capacity
By leveraging web-based textual support in conjunction with the call center, payers can use Generative AI to respond accurately and empathetically to customer questions, simultaneously serving more customers while deflecting contact center inbound call volumes away from the associate, unlocking new operational efficiencies.

Personalized service for patients

Managing risk and promoting trust

Fair and impartial

The presence of geographic and socioeconomic bias implicit in claim or plan details may lead the system to provide less accurate responses to customers from underrepresented regions or socioeconomic backgrounds.

Reliable

Generative AI outputs may not always be accurate, and with the risk of hallucination, the AI could return responses that are misaligned with claim or plan details.

Potential benefits

Enhanced customer satisfaction
When live agents can provide real-time, personalized feedback and answers to the customer, it improves the overall customer experience when inquiring about plans and benefits.

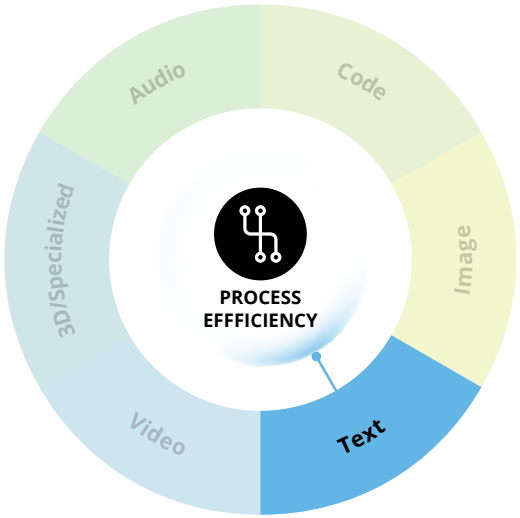
Increased efficiency
When IVR is augmented and improved with Generative AI, the model can handle simple or straightforward customer inquiries while more complex questions are directed to a live agent.

Strategic insights
Generative AI can process customer and text analysis to reveal trends and insights, such as the types of claims/visits causing the most issues, when customers are most upset, and the topics that tend to confuse customers the most. These insights can inform strategic decisions for the payer and provider.

A physician's message manager

(Provider In-Basket Management)

An LLM can be used to process messages in a healthcare provider's in-basket, accelerating responses while liberating physicians to focus on patient-facing care.



Issue/opportunity

The amount of time required for primary care providers (PCP) to accomplish both administrative and patient care responsibilities can exceed what is possible in a day. In some cases, upwards of two-thirds of time is spent on administrative, non-patient facing work. The 21st Century Cures Act encourages electronic medical records (EMR) in-basket usage, which led to a dramatic increase in in-basket messages during the COVID-19 pandemic. The result is significant burdens on PCPs, which is contributing to physician burnout.[4]

How Generative AI can help

Triaging the in-basket
Generative AI can be used to review routine messages (e.g., Rx refills, scheduling) and delegate simpler tasks to automation.

Message assistant
PCPs can leverage Generative AI to summarize complex clinical messages for review and use the model to draft replies for provider input and response. Drafts are informed by the model consulting prior in-basket replies and EHR data.

Insights at scale
By using AI-enabled in-basket message systems at scale, organizations can identify issues related to patient negativity in their messages. The insights into complaints, expressions of dissatisfaction, frustration, confusion, or concern about care can inform interventions that may improve the patient experience.

A physician's message manager

Managing risk and promoting trust

Security

Use of AI in in-basket systems involves collecting, processing, and storing large amounts of sensitive patient data, such as medical history, diagnoses, and treatment plans. This data is subject to strict privacy laws, and any unauthorized third-party access could result in legal and financial consequences for healthcare providers.

Accountable

If messages are composed or summarized with inaccurate information, it could lead the PCP to erroneous decision making or poor patient engagement, which can have significant consequences for patient health, trust in the healthcare provider, and the reputation of the organization.

Potential benefits

Physician support
By using an AI-enabled in-basket system, the PCP's time-consuming administrative tasks are reduced, permitting more patient-facing work and mitigating one cause of physician burnout.

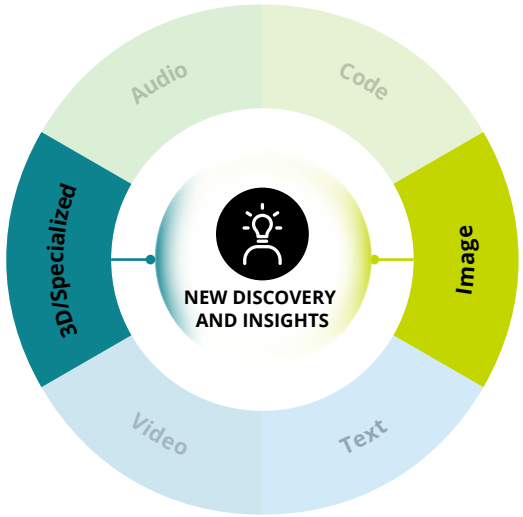
Timely responses
A more efficient process for working through in-basket messages can lead to faster responses to patient needs, contributing not only to be a better patient experience but potentially also better health outcomes.

Patient sentiment
By identifying and tracking signals of negativity at scale, healthcare providers can gain insights into common pain points in the patient experience. This could help them proactively address these issues, whether by adjusting their practices, improving communication, or implementing other interventions to enhance patient satisfaction.

Unlocking the cures

(New Drug Discovery/Generation)

Generative AI can be used to model the structure and function of proteins and biomolecules, accelerating the identification and validation of molecules and the creation of new drug candidates.



Issue/opportunity

Despite advancements in medical treatments, numerous diseases still lack effective solutions due to the complex, costly, and time-consuming process of drug discovery and verification. The challenge of drug development lies not just in discovering potential treatments but also in the rigorous verification of their effectiveness, a process that is both costly and time-consuming. Compounding these issues are the unique complexities of clinical trials, which need to account for diverse populations, varied interactions with other treatments, and potential side effects. Furthermore, the rarity of some diseases creates additional hurdles due to limited data from fewer patients, making the development even more challenging.

How Generative AI can help

Cost reduction
The use of Generative AI in the verification of drugs during clinical development could significantly reduce costs. This is due to its ability to run simulations and select the best potential candidates for further testing, thereby minimizing the need for extensive real-world iterations.

Promoting public health
Generative AI has the potential to significantly improve public health by accelerating the discovery of better treatments and cures for diseases. Its ability to analyze and learn from vast amounts of data can lead to more targeted, effective treatments, directly benefitting patients and, by extension, society at large.

Enabling collaboration
Generative AI can facilitate improved communication and knowledge sharing across research groups. It can process and make sense of data from various sources, breaking down data silos and opening new opportunities for collaboration and innovation in experimentation.

Unlocking the cures

Managing risk and promoting trust

Transparent

Generative AI can play a vital role in enhancing transparency in data collection and sharing. Using Generative AI to track and document all data processes, from sourcing to utilization, can help ensure that all stages of data collection and sharing are transparent, auditable, and compliant with established standards. This, in turn, can foster trust among stakeholders, prevent the monopolization of the domain, and accelerate innovation.

Responsible

Monitoring current and evolving regulations early in the process is crucial to gaining public trust and ensuring ethical Generative AI deployment. By demonstrating a responsible approach to AI implementation and adhering to established regulations, organizations can prevent misunderstandings and help ensure that scientific progress is not slowed by regulatory issues.

Potential benefits

Cost reduction
The use of Generative AI in the verification of drugs during clinical development could significantly reduce costs. This is due to its ability to run simulations and select the best potential candidates for further testing, thereby minimizing the need for extensive real-world iterations.

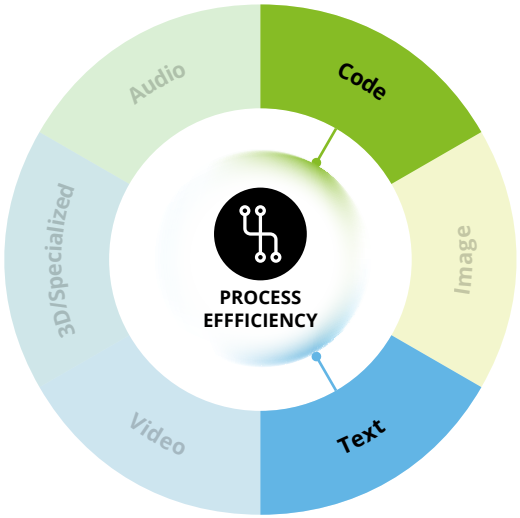
Promoting public health
Generative AI has the potential to significantly improve public health by accelerating the discovery of better treatments and cures for diseases. Its ability to analyze and learn from vast amounts of data can lead to more targeted, effective treatments, directly benefitting patients and, by extension, society at large.

Fostering collaboration
Generative AI can facilitate improved communication and knowledge sharing across research groups. It can process and make sense of data from various sources, breaking down data silos and opening new opportunities for collaboration and innovation in experimentation.

Democratizing model creation

(Knowledge Domain Model Development)

Generative AI can remove UI hurdles with reinforcement learning (RL) without need for tech staff.



Issue/opportunity

Developing novel models for LSHC continues to demand a high degree of technical proficiency to perform data exploration, feature engineering, model training, and evaluation. Frequently, the steps involved in model training lack a user-friendly interface, posing accessibility challenges for healthcare professionals and domain experts who may not possess extensive technical backgrounds. Simultaneously, the quality and relevance of model outputs hinges significantly on domain expertise and practical experience. Overcoming this divide between technical acumen and domain knowledge remains the primary obstacle in harnessing the complete capabilities of AI within the field of LSHC.

How Generative AI can help

Empowering professionals
With its capacity for learning from and adapting to iterative feedback, Generative AI can act as an enabler for professionals across various sectors. It offers the opportunity to continually refine domain-specific models by adding new training data. This iterative enhancement increases the model's accuracy, utility, and relevance to the user's specific professional needs. In this way, Generative AI can empower professionals by providing them with tailored, precision tools that evolve with their work.

Streamlining healthcare model development
Generative AI can help simplify model development in the complex and highly-regulated healthcare industry. By focusing on intuitive user interface designs and automated processes, Generative minimizes UI obstacles, making it more accessible for professionals to refine and improve their models. Consequently, this increases the effectiveness and accuracy of models in healthcare, driving more efficient outcomes.

Improving alignment
Generative AI leverages reinforcement learning (RL) techniques, a type of machine learning where an AI system learns to make decisions by trial and error, to validate and improve its outputs. This process assists in mitigating prevalent AI challenges, including hallucinations or confabulations, ambiguity, and colloquialism misuse. As a result, it bolsters the AI's reliability and furnishes professionals with more precise models and predictions, thus aligning AI capabilities more closely with user requirements.

Democratizing model creation

Managing risk and promoting trust

Reliable

Hallucinations or confabulation could lead to the execution of incorrect procedures or use of suboptimal reagents and equipment, causing inaccurate experiments and inefficient use of resources. Particularly in medical or pharmaceutical labs, inaccurate information could even lead to compliance or regulatory issues.

Transparency

The Generative AI system itself incorporates tools that offer transparency into the data engineering pipelines, including data preparation stages. This inherent transparency facilitates an understanding of the AI's functioning within the organization, fostering trust in the accuracy and reliability of the AI system's outputs. It is a crucial component of the AI use case, demonstrating the system's accountability and promoting its acceptance across the organization.

Potential benefits

Enhance institutional knowledge access
Generative AI can help reduce institutional knowledge loss due to employee exits and enable on-demand access to domain-specific knowledge across the organization.

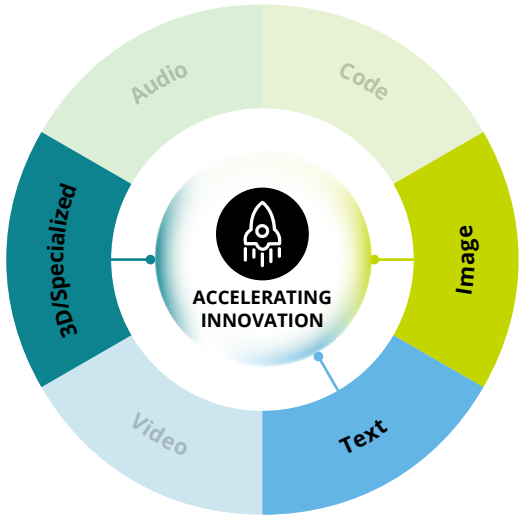
Increase development throughput
Domain area experts can drive more self-sufficient model experimentation and development by utilizing model outputs in natural language and synthesizing insights about optimal procedures, reagents, equipment, and techniques into a comprehensive and accessible format.

Cost management
This approach to model development empowers employees to take part in model experimentation, reducing costs associated with MLOps and technical specialists.

Optimizing lab procedures

(Experimental Design)

Generative AI can be used to create procedural templates and recommendations on best practices (e.g., reagents, equipment, techniques).



Issue/opportunity

Laboratory personnel, including researchers, technicians, and managers, often face challenges in maintaining up-to-date procedural templates and ensuring the consistent application of best practices, especially as scientific knowledge evolves rapidly. These challenges can lead to inefficiencies, errors, and inconsistency in experiments or analyses. Additionally, without a central source of curated recommendations, time and resources may be wasted sourcing and comparing various reagents, equipment, and techniques. These pain points present an opportunity for Generative AI to streamline and enhance laboratory processes.

How Generative AI can help

Generation of novel processes
Leveraging historical data and scientific principles, a Generative AI model could suggest novel experimental designs, more efficient processes, or alternate uses of reagents and equipment, stimulating innovation in laboratory procedures.

Data analysis and interpretation
The Generative AI uses a large language model (LLM) to analyze data from lab protocols, equipment specifications, previous experimental designs, reagent usage, and techniques, providing a holistic understanding of laboratory procedures and principles.

Optimizing lab procedures

Managing risk and promoting trust

Robust and reliable

The integration of multimodal text and images of complex structures and processes in experimental design presents complexity. This can heighten the risk of unworkable, unfeasible, or inefficient designs, as interpreting and accurately representing this diverse and intricate data can be challenging. These challenges could potentially lead to errors in the design and execution of experiments, resulting in failed or less reliable outcomes and unnecessary time and resource expenditure.

Accountable

In the event of erroneous design recommendations, accountability may be an issue. Determining who bears the responsibility for incorrect designs and their potential consequences is important. The roles of human oversight and system validation need to be clearly defined.

Explainable

With the application of AI in experimental design, there may be challenges related to explainability. If scientific or academic papers are to be published based on the results, authors need to be able to adequately explain the methodology behind the AI recommended designs, which can be inherently complex due to the black-box nature of some AI models.

Potential benefits

Efficiency
LLMs can reduce the time and effort needed for experimental design by streamlining and accelerating the data analysis, procedure consolidation and providing immediate best-practice recommendations.

Lower cost
With less time required for experimental design, organizations can reduce the overall operational costs of experiments while also increasing their throughput.

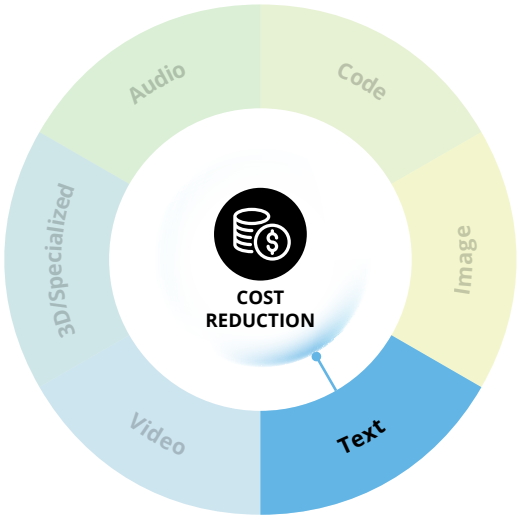
Revealing the rules

(Automated Regulatory Compliance)

Generative AI can be used to support and enhance compliance by processing large amounts of regulatory documents from multiple geographies.

Issue/opportunity

Compliance to ever-changing regulations in every geography is a costly, time-consuming process for pharmaceutical companies. Even with significant investment in legal help, regulatory compliance can be hard to achieve. Regardless of the attempt, the fines associated with non-compliance are high.



How Generative AI can help

Text processing
Generative AI can be used to extract regulations for one specific purpose from thousands of pages of regulatory texts, expediting and enabling compliance.

Transforming the legal support ecosystem
As Generative AI handles the laborious, detail-oriented process of regulatory text processing, it can also lead to a commensurate decrease in the need for third-party legal and compliance support.

Mitigating financial risk
By employing Generative AI in regulatory compliance, the potential financial risk associated with non-compliance can be significantly reduced.

Revealing the rules

Managing risk and promoting trust

Explainable
Generative AI models may produce outputs that are difficult to interpret, making it difficult to validate the outputs and explain the reasoning to regulatory authorities.

Privacy
While regulatory authorities may vary, data privacy around personal health information remains a priority, and data that is not anonymized first may leak and become inappropriately disclosed.

Reliable
A Generative AI model trained to extract compliance factors from regulatory documents may be susceptible to outputting information that looks accurate but is a hallucination, making human validation an important element for mitigating risks around reliability.

Potential benefits

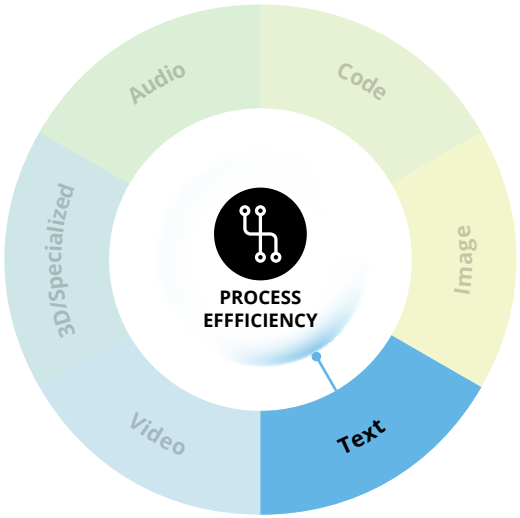
Cost reduction
Using Generative AI to process regulatory documents reduces the need for humans to perform time-consuming tasks, thus lowering the cost of compliance.

Fuel for growth
When regulatory compliance becomes tractable across geographies because of Generative AI processing capabilities, it helps the organization confidently expand business operations globally.

Toward a superior supply chain

(Demand Forecasting & Price Optimization)

Generative AI can be used to reach across datasets related to supply chain management, helping increase precision in supply and demand forecasts.



Issue/opportunity

A variety of factors frustrate pharmaceutical company efforts to optimize their supply chain and better meet market demand. A shortage of product can lead to negative health implications for patients, while transport delays or overstocking for perishables can hamper gains in the margin. Meanwhile, geographical disparities between disease prevalence are difficult to analyze and manage. All this comes in the context of traditional supply chain management issues like weather, traffic patterns, warehousing costs, and the need to discard expired medicines.

How Generative AI can help

Precision in demand forecasting
Generative AI, employing advanced machine learning algorithms, can greatly enhance supply-demand balance. By ingesting and analyzing data from diverse sources (e.g., finance, procurement), the model can generate nuanced forecasts. This cross-silo data utilization leverages deep learning capabilities to identify patterns and trends that could be missed using traditional methods, thus mitigating the risk of product shortages.

Localized forecasting
Generative AI's ability to incorporate multiple variables and local context factors takes forecasting to a new level. The model can integrate local geographical characteristics and disease prevalence data, along with socio-economic and logistical factors, to generate highly accurate, micromarket-specific demand forecasts. This is possible due to the system's contextual learning capability, which allows it to understand and learn from complex environments and situations.

Toward a superior supply chain

Managing risk and promoting trust

Reliable

Generative AI's outputs, while increasingly accurate, should be subjected to human validation to ensure risk mitigation. Despite the AI's advanced capabilities, there's a need for human oversight to avoid potential errors, ensuring that the AI's recommendations align with real-world constraints.

Explainable

To trust the model, supply chain managers need to understand how it calculated demand and supply estimates. Clear, interpretable outputs make AI-driven decisions more transparent, fostering trust and facilitating wider adoption of these advanced technologies in supply chain operations.

Potential benefits

Moving towards net-zero

The precision and efficiency brought about by Generative AI can significantly contribute to an organization's sustainability goals. It minimizes waste and reduces carbon footprint by avoiding overproduction and unnecessary transportation, which is achieved through the AI's optimization capabilities that efficiently align demand with supply.

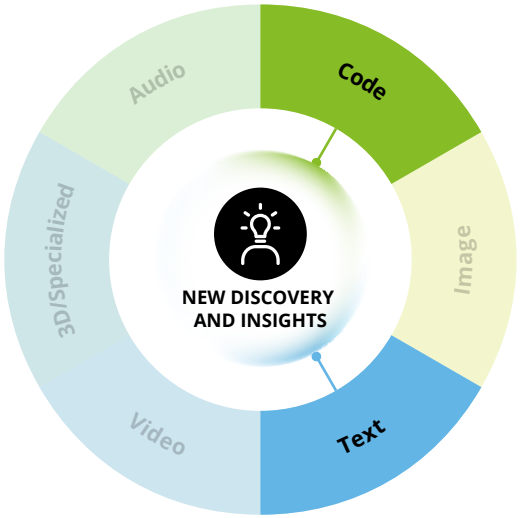
Efficiency drives gains

The implementation of Generative AI can lead to lower prices for patients, increased revenue for enterprises, and cascading financial benefits for insurers and governments. This is possible due to the AI's capability to create optimized, cost-effective supply chain strategies, which result in resource savings and enhanced profitability.

Smarter clinical trials

(Conducting clinical trials that mirror real-world populations)

AI can improve the accuracy and effectiveness of clinical trials by quickly identifying and addressing misalignments between sample patient pools and real-world patient populations.



Issue/opportunity

Clinical trials often rely on narrow patient pools that do not fully reflect the broader population's genetic, environmental, and lifestyle variations. A limited participant base can lead to incomplete and inaccurate data on how treatments work for different types of individuals. In particular, some patients might experience variations in drug efficacy and safety that go unnoticed in smaller, homogenous groups. Broader participation can help ensure treatments are applicable to as many people as possible.

How Generative AI can help

Identify sample population gaps
Generative AI can be used to analyze legacy and ongoing clinical trial data against external benchmarks (such as national census demographics) to identify underrepresented populations.

Address gaps in real time
An AI-powered dashboard can track recruitment by demographic group and provide automatic alerts when gaps emerge, along with suggestions on how to address them (e.g., outreach strategies, alternative trial sites, or digital engagement solutions).

Smarter clinical trials

Managing risk and promoting trust

Fair and impartial
AI models should be trained and validated using demographically broad datasets to avoid systemic bias in recruitment strategies. Representation audits can help ensure no population segments are inadvertently favored or excluded.

Respectful of privacy
All patient data used in training or analysis should be anonymized and managed according to HIPAA, GDPR, and local data protection regulations. AI tools can be designed to work with de-identified datasets.

Robust and reliable
Models should be stress-tested across multiple trial scenarios and geographies to ensure consistent performance. A human-in-the-loop approach can validate AI-driven recommendations.

Potential benefits

More accurate trial results
By including a broader and more demographically representative participant pool, clinical trials are more likely to produce results that reflect the real-world effectiveness of a drug across different populations.

Faster and more cost-effective trials
AI can facilitate many aspects of the clinical trial process—including patient identification, recruitment tracking, and early identification of enrollment gaps. This allows trials to proceed more quickly and efficiently, reducing the overall time and cost to bring new therapies to market.

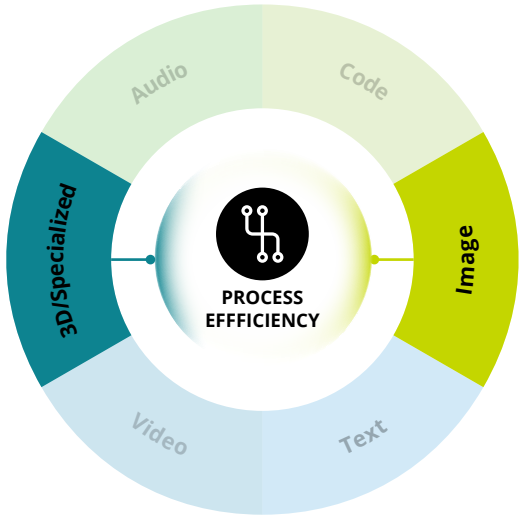
Regulatory and market readiness
Clinical trials that accurately reflect target patient populations increase the credibility and relevance of results in real-world settings, which can enable faster regulatory approval and smoother market entry.

Better commercial outcomes
Drugs that are tested and proven effective across a wide range of demographic groups are more likely to gain broad clinical adoption, which increases their commercial potential.

20/20 impurity detection

(AI-driven visual inspection for particulate matter in IV fluids)

Computer vision powered by AI can be used to detect particulate contamination in IV bags, reducing product waste and improving patient safety in life sciences manufacturing.



Issue/opportunity

Pharmaceutical manufacturers, particularly those producing IV fluids and life-saving therapies, face a persistent and costly challenge: detecting particulate matter in sterile products. Despite sterile manufacturing environments, small particles—such as plastic, dust, or other foreign materials—can still enter IV bags, posing serious health risks to patients.

This issue is not new—dating back to the 1940s—and despite ongoing improvements, a scalable, reliable, and cost-efficient solution has remained elusive. Historically, detection has relied on manual inspection, often using contingent labor, leading to inconsistent results, high labor costs, and significant product waste. Also, every incident of contamination risks brand reputation, regulatory scrutiny, and potential product recalls.

How Generative AI can help

Automated, real-time inspection
By combining AI vision capabilities with GenAI models trained on synthetic and real-world data, manufacturers can automate the inspection process at scale. High-resolution imaging and computer vision detect anomalies in fluid packaging with greater precision and consistency than the human eye. Also, unlike human inspectors, AI does not experience distractions and fatigue.

Continuous learning
GenAI enhances the system by learning from historical defect data, adapting to new defect types, and identifying potential causes through pattern recognition across vast datasets. The AI system not only flags potential contamination in real time but also enables traceability—helping identify the root cause by analyzing patterns across manufacturing lines, geographies, or specific production lots. This insight enables proactive correction and long-term process improvements.

20/20 impurity detection

Managing risk and promoting trust

Robust and reliable

AI models should undergo rigorous testing across multiple manufacturing lines and environments to ensure high accuracy and minimal false positives/negatives. Redundancy checks, human-in-the-loop validation, and performance monitoring help ensure reliable operation even under variable lighting or packaging conditions.

Transparent and explainable

AI-based contamination detection can provide clear, trackable results, allowing manufacturers to understand why a product passes or fails inspection. Detailed imaging and reporting help ensure accountability and regulatory compliance while enhancing confidence in quality control.

Potential benefits

Improved patient safety and confidence
Consistent detection of contaminants before they enter the supply chain increases patient safety, and fewer quality incidents enhance brand trust with hospitals, regulators, and patients.

Operational efficiency and scalability
Replacing manual inspection with AI reduces reliance on contingent labor and speeds up quality control processes. Also, AI-based solutions can be deployed at scale across multiple products, manufacturing lines, and facilities worldwide.

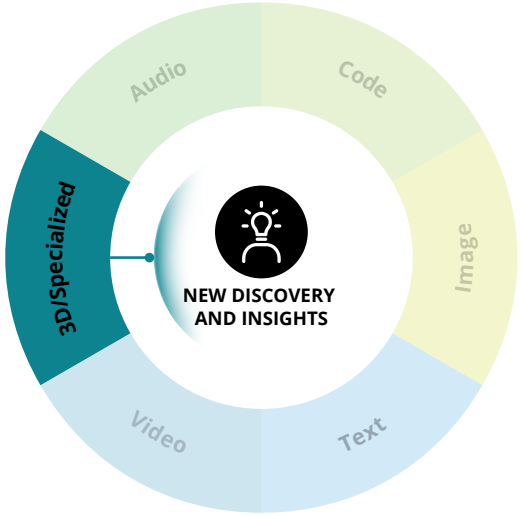
Improved ROI and reduced costs/waste
AI helps drive measurable ROI through improved efficiency, reduced labor costs, and avoidance of costly recalls. Also, fewer discarded bags due to false positives or late-stage detection leads to significant material savings.

Quality and traceability
Root cause analysis helps address upstream issues in the manufacturing line, improving overall process quality.

Accelerated drug discovery

(Creating new drugs by proposing and evaluating modifications to existing molecules)

Pharmaceutical companies are enhancing and accelerating early-stage drug development by using AI systems that can propose structural modifications to known molecules and then evaluate their therapeutic potential and feasibility.



Issue/opportunity

Drug discovery is a highly iterative, slow, and resource-intensive process. Medicinal chemists, constrained by human brainpower and timelines, can only explore a narrow slice of the chemical space when optimizing molecules for properties such as potency and safety. Also, traditional workflows lack scalability and make it difficult to consistently identify and prioritize high-quality drug candidates.

How Generative AI can help

Proposing modifications to existing molecules
AI can propose modifications to known starting molecules, mimicking how medicinal chemists work but at exponentially greater scale. These modifications are not random; they are guided by predictive models for key drug properties such as efficacy, absorption, metabolism, and synthesizability.

Prioritizing new drug candidates
An optimization layer can evaluate and prioritize candidates based on how well they satisfy various requirements and constraints. The process is automated and systematic, allowing chemists to triage and refine ideas faster, while retaining human oversight.

Accelerated drug discovery

Managing risk and promoting trust

Robust and reliable

Focusing on modifying known molecules rather than generating new molecules from scratch can help avoid hallucinations. Also, all AI models should undergo rigorous internal testing and version control before being deployed. Performance can be benchmarked against historical chemist-designed molecules, and the system should only be scaled after demonstrating consistent value across multiple projects with defined constraints and inputs.

Transparent and explainable

Rather than operating as a black box, the system can present a ranked list of AI-generated molecule suggestions accompanied by the underlying rationale and predicted property scores.

Responsible and accountable

Medicinal chemists should remain in the loop, retaining veto power over each decision, which helps build trust and limit risk.

Potential benefits

Three- to fivefold acceleration in early discovery
AI can enable rapid iteration and faster decision-making by generating and evaluating viable molecule candidates in weeks rather than months or years.

Higher-quality molecules at lower cost
Use of AI can help chemists identify and prioritize drug candidates that most effectively satisfy multiple property constraints, raising the bar for what progresses to later stages. By homing in quickly on promising candidates and flagging unviable ones early, the system can reduce aggregate drug development costs.

Improved productivity
By automatically triaging and filtering candidates, AI can enable development teams to work on more programs simultaneously.

The Technology, Media & Telecommunications Generative AI Dossier

The data-rich Technology, Media & Telecommunications (TMT) industry faces a range of opportunities for digitization, as well as a challenge in managing and analyzing vast amounts of information. TMT businesses have seen some success in leveraging AI to reduce manual effort and improve efficiency, and while some enterprises are well on their way to AI maturity, others are just getting started. Generative AI can be the enabling technology that allows TMT businesses at all levels of AI maturity to accelerate digital transformation and unleash entirely new capabilities and business outcomes.

With Generative AI, some of the greatest potential value is found in accelerating efficiencies through digitization. It can help shift the organization from being product-focused to customer-centered. Using Generative AI to access insights and correlations in structured and unstructured enterprise data helps align offerings with customer demand, drive operational agility and productivity, and transform how TMT enterprises operate, create products, and engage customers. The Generative AI use cases are already apparent: creating more effective marketing campaigns, accelerating copywriting and research, deriving new product concepts, and supporting software engineering. By integrating Generative AI with the organization's existing AI ecosystem, the business is positioned to create hyper-personalized content for customers, craft and target ads to specific users, and permit translation at scale. This can drive new and more business while also catering to customer expectations for customized products and services.

With Generative AI, some of the greatest potential value is found in accelerating efficiencies through digitization.

Generative AI can also be used as an integral tool for risk management processes. Analyzing real-time network data, models can enable simultaneous, continuous anomaly and pattern detection, catching discrepancies and providing a root cause analysis. By monitoring connectivity between critical hardware, software and data lakes, systems leveraging Generative AI could not only flag network and infrastructure irregularity but then also analyze it and automate response mechanisms.

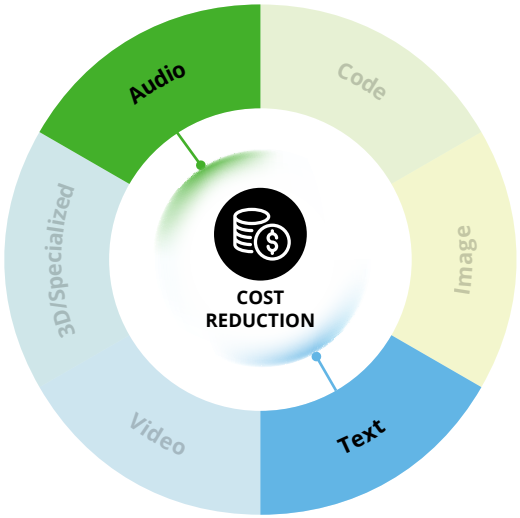
New opportunities often come with new challenges, and the risks and complexity with Generative AI can be significant. What is more, the global regulatory environment around AI is still in flux, challenging TMT enterprises to anticipate government rules and implement the governance and compliance processes that are essential for AI programs, including those using Generative AI. Still, challenges and risks notwithstanding, TMT companies face a transformative opportunity to focus on the customer, streamline and accelerate processes, free up human capital for creative, value-driving tasks, and ultimately, help companies grow, innovate, and succeed.

New opportunities often come with new challenges, and the risks and complexity with Generative AI can be significant.

Conversational chat for customer service

(Virtual Voice Customer Assistants)

With a Generative AI-enabled voice assistant, customer concerns can be remedied faster and in line with company policies and standards while maintaining or even enhancing customer satisfaction.



Issue/opportunity

When it comes to customer support, there are often high operational costs associated with customer care. This owes to customer service agents (CSAs) processing large volumes of cases, even though the resolutions may be simple and could be automated. More traditional chatbots can be limited because they rely on pre-programmed dialogue, which may not contain all of the answers a customer is likely to ask. A Virtual Voice Customer Assistant, powered by an LLM, could overcome the challenges with conversational dialogue, CSA capacity, and even contribute to continuous improvement in knowledge management.

How Generative AI can help

Personalized customer self-service
Combining an LLM with Conversational AI can deliver customer support in a local language, tailored to customer preferences. Virtual troubleshooting can personalize the customer experience, and a virtual assistant could also provide product recommendations and generate offers that increase customer satisfaction.

Interactive Q&A
Automating personalized responses to common customer inquiries during the pre- and post-sales process can reduce customer response times and increase cost savings.

Context summarization
At the end of a customer interaction, it is necessary for an agent to document the context of the interaction. While critical to the business, it is an expensive, time-consuming activity that results in increased agent handle time. With Generative AI, the process takes moments.

Conversational chat for customer service

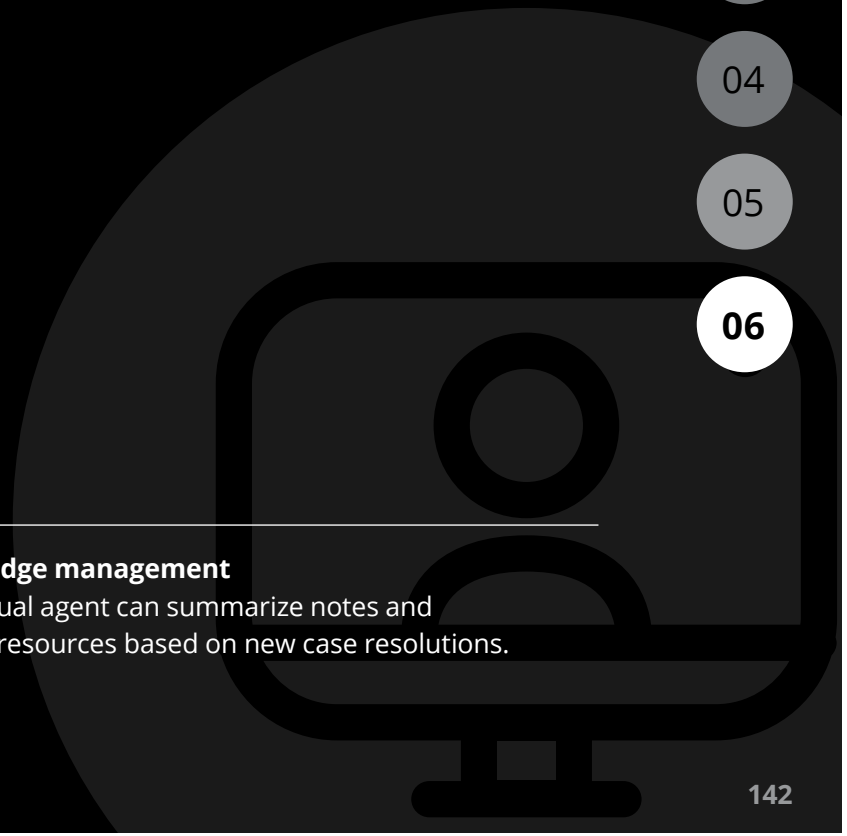
Managing risk and promoting trust

Reliable

While models can be highly accurate, they remain susceptible to outputting false or incomplete information, which could lead to a negative customer experience with the chatbot. This underscores the need for human validation and risk mitigation across the AI lifecycle to limit the potential for hallucinations.

Robust

Automating elements of customer service can increase capacity and speed, but it is important to ensure customer support quality is maintained in the process of deploying and using a Generative AI-enabled chatbot. The deployed virtual customer assistants need to be sufficiently robust to provide equally personalized and empathetic support across all customer regions.



Potential benefits

Cost reduction
A reduced case load for CSAs enables reallocation to complex cases or value-driving tasks.

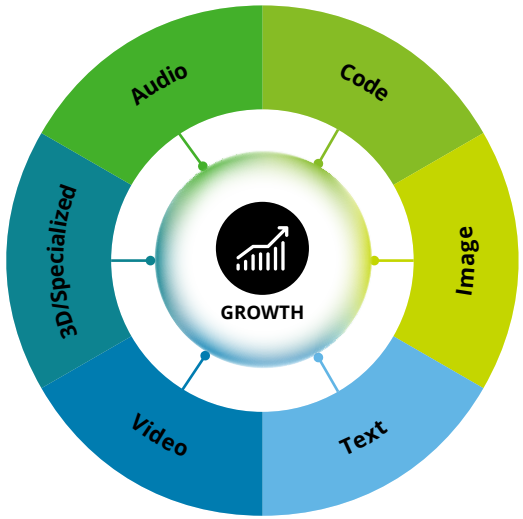
Improved real-time speech AI
Customers can engage in natural language with a chatbot that understands technical and company-specific language, as well as human intent and sentiment.

Knowledge management
The virtual agent can summarize notes and update resources based on new case resolutions.

Generative AI for gamers

(Game Content Development)

Developers can leverage Generative AI 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. Generative AI provides the gaming industry with an opportunity to bend the cost curve through enhanced development efficiency, while also simultaneously meeting player demands.

How Generative 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, weapons, and skins). Developers can use text prompts to generate new content in line with the current game and even community desires and upload those assets to the existing game.

Generative AI for gamers

Managing risk and promoting trust

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.

Security
The player's personally identifiable information could be fed into the models as they interact within the game, which raises risks around cybersecurity and regulatory compliance. The collection of PPI, 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 of the 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.

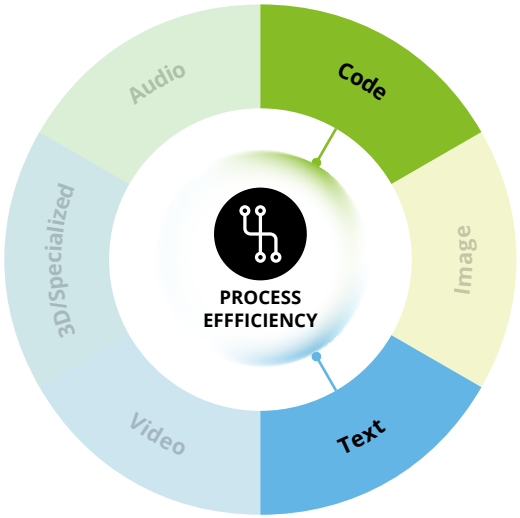
Cater to gamers
More immersive, controllable, responsive, engaging, and unique experiences for gamers (based on community requests and existing popular assets) has a direct impact on the player lifetime value.

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

Annotation with automation

(Code Summarization and Documentation)

Automating code summarization and documentation frees up developers to focus on higher-value tasks, while also enabling code explainability for technical and non-technical stakeholders.



Issue/opportunity

Traditionally, a thoroughly commented and structured codebase is difficult to maintain due to resource turnover, time constraints, and siloed knowledge. This step is often deprioritized in code development. The complexity of code and limited comments slows the process of upscaling new resources on an existing codebase. What is more, lack of communication across development teams without clear code commenting or summarization leads to silos of knowledge where each developer only knows certain portions of the code.

How Generative AI can help

Reducing code documentation efforts
Generative AI can be used to review code and create output summaries and application documentation in a concise, human-readable format. It can also automatically pick up important code blocks and add comments for explanation or summarization.

Preparing summaries for multiple audiences
Code summaries can be autonomously generated for non-technical audiences, such as business analysts, product managers, and functional stakeholders.

Generating code from natural language descriptions
Code can be created from the structured descriptions (e.g., behavior-driven development) from non-technical audiences, such as business analysts and product managers, without having to write it manually from scratch, thus reducing time-to-development while increasing efficiency and productivity.

Annotation with automation

Managing risk and promoting trust

Robust

Generated code documentation may lack business context. Generative AI can support documenting the "what" and "how" of the code, but the "why" may still need to be added by the development team. In addition, code summaries may miss nuances and interdependencies in the codebase. High-level summaries may need to be supplemented with insights or interdependencies from other relevant files.

Transparent and explainable

Domain/developer-specific variables and comments may not be interpretable and could result in inaccurate summarization or documentation. Clearly named variables and aliases used in the code will improve Generative AI's documentation.

Potential benefits

Resource efficiency
Using Generative AI returns significant time savings for developers, allowing them to focus on producing code, rather than adding commentary to existing code.

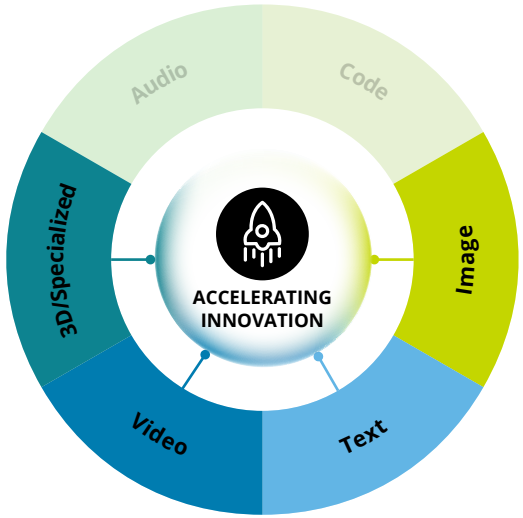
Understandable codebase
Generative AI summaries and documentation are inserted in a consistent writing style that can be understood by any development team member.

Improved onboarding
Summaries and documents help new developers rapidly understand existing code and software, expediting the onboarding process.

Content creation with AI

(Generative AI-Enabled Creative Tools)

Content creation can be facilitated and enhanced with Generative 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. There are significant time and resource investments 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. Amid this, content creators face tight deadlines that require high levels of efficiency for content management and editing.

How Generative AI can help

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

Picture editorial
Producers can automate footage management with video-to-text Generative 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
Generative 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 and civil risks for the organization.

Reliable
Noticeable changes in style and brand quality due to Generative AI content creation and editing may erode consumer trust in the brand and content.

Privacy
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.

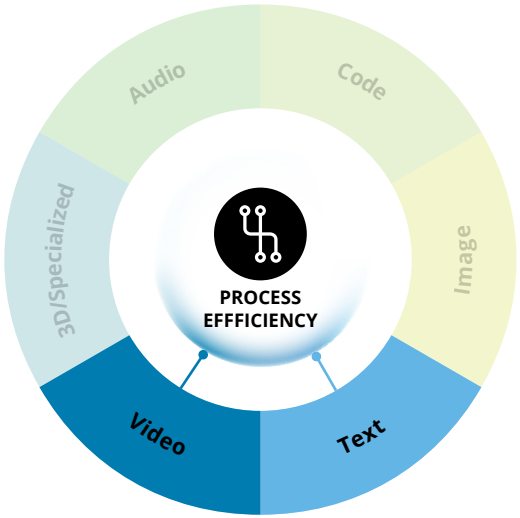
Improved content quality
Generating novel content can supplement the human creative process and potentially lead to a higher quality product.

Content tailored to the audience
With Generative AI, creators can hyper-personalize content with prompts driven by consumer trends and interests.

Translate specs for sales

(Technical Sales Knowledge Management)

Generative AI can help sales staff quickly find and translate technical specifications to customers, as well as document and summarize insights from customer interactions.



Issue/opportunity

When sales staff are promoting technology offerings (e.g., SaaS, hardware, devices, infrastructure, cloud, data, analytics, AI, and IoT), they need a technical understanding of the offering, as well as the ability to quickly find the right technical specifications. Yet, it can be challenging to translate technical specs in a way that is clear and meaningful when responding to a customer's questions.

How Generative AI can help

Technical spec summarization
Generating summaries of technical specifications for customers based on targeted text-based query entries can help the sales staff understand which products meet customer requirements. It may also help staff suggest features and integrations that align with the customer's existing technology stack and vendors.

Knowledge management update
Generative AI can be used to update sales case history to support knowledge management, such that similar technical inquiries in the future can be addressed using previous resolution steps and spec summaries.

Automated technical demos
By training a model on demonstration scripts and sample interactions, staff can generate demonstrations showcasing key features and benefits of the solution, all tailored to specific clients and use cases.

Translate specs for sales

Managing risk and promoting trust

Privacy

Customer data (e.g., sales case history, customer tech stack/vendors) needs to be processed by the model, making it necessary to continuously monitor model outputs and safeguard customer data to mitigate privacy risks.

Reliable

If the information derived from the model is inconsistently accurate or reliable, it will have a direct impact on customer interest, understanding of the offering, and trust in the organization. It's advisable to establish processes for human validation of Generative AI outputs.

Potential benefits

Efficiency with automation
Less manual effort required in responding to technical sales inquiries allows staff to focus on customer needs and opportunities.

Tailored to the customer
Greater personalization in responses and demonstrations improve the customer sales experience and increases chances for conversion.

Enabling other stakeholders
With Generative AI, staff can rapidly create content to inform sales and marketing materials, as well as specific customer or partner questions.

Marketing content multiplier

(On-Brand Publishing)

Using Generative AI, marketing content generation can be cheaper, quicker, and more 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 are often 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 or its leaders' subject matter authority. Frustratingly, the return on investment for on-brand publishing can be difficult to measure because the impact itself is complex and challenging to quantify.

How Generative AI can help

Cohesive content generation
Generative 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.

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

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

Elevate content quality
The language quality of marketing materials can be enhanced by using Generative AI to help with phrasing, grammar, company style, and adherence to company values.

Marketing content multiplier

Managing risk and promoting trust

Transparency

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, leading to potential harms to brand reputation and consumer trust in the enterprise. One way to mitigate this outcome is to ensure data collection and usage policies are transparent and communicated meaningfully to the consumer.

Responsible

Content produced by Generative 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 Generative AI systems.

Security

When brand data is used to train Generative 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 unlimited content better tailored to their brand and customers, iterating through multiple drafts as needed.

Time and cost savings
As Generative AI systems instantly generate content, human staff can shift to an editorial role, and marketing departments may be able to reassign workers to other tasks.

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

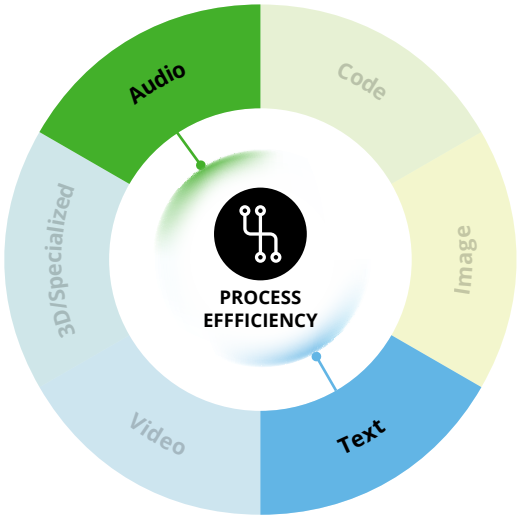
Language translation at scale

(Content Localization)

Generative 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 Generative AI can help

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

Content personalization across industries
AI-powered content personalization can supercharge localization efforts by improving engagement, building brand loyalty, and increasing conversions.

Speech recognition during translation
Generative 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.

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 significant 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 Generative 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 Generative AI promotes a high-quality user experience.

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

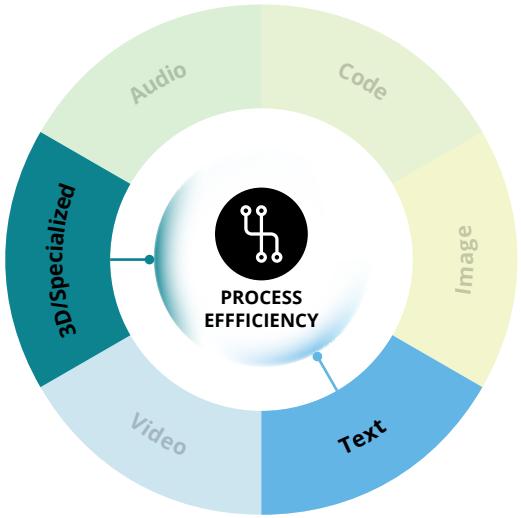
Technician support on the go

(Telco Network Maintenance)

Generative AI-enabled simulations can drive network maintenance speed and effectiveness to help field technicians quickly identify and resolve root causes of network issues.

Issue/opportunity

When working in the field, network technicians must reference thousands of documents and procedures to find guidance on resolving network problems and outages. Without access to these troves of information, remediation efforts may be delayed, hampering operations and customer satisfaction.



How Generative AI can help

Network ops and maintenance
Network technicians can leverage an LLM to power their search for solutions to customer network issues and accelerate troubleshooting. Augmented retrieval generation and summarization from internal databases and customer chat history can generate the recommended resolution steps and explanations for network engineers.

Network optimization
LLMs can help technicians understand network behaviors and create action plans to support network capacity planning and performance. This helps network planning and design, which historically has required high levels of reporting, analysis, and on-site visits.

Technician support on the go

Managing risk and promoting trust

Reliable

With the potential for an LLM to output factually incorrect information, there is a risk that network troubleshooting may be unproductive or even introduce new problems for network operations.

Responsible and accountable

Given the importance of resolving network issues in a timely manner, it is important that humans take ownership of network issues and supplement the Generative AI recommendations and optimization planning with their own judgment and domain understanding.

Potential benefits

Improved effectiveness
Using an LLM can help increase visibility into the reasons for outages and support productivity by streamlining remediation actions, all of which moves toward customer satisfaction.

Personalized support
With rapid access to customer queries, relevant documents, and previous actions, the network technician can better cater to customer needs.

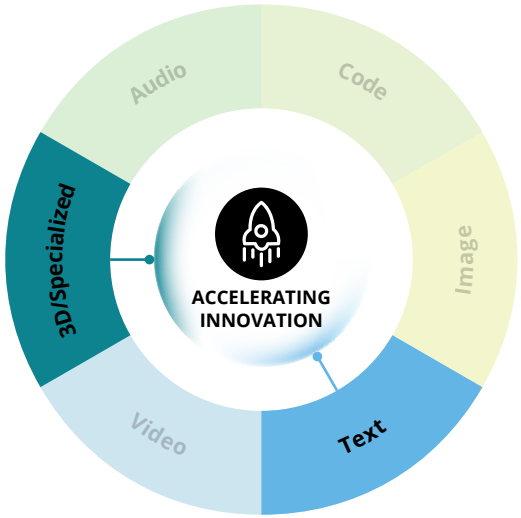
Enhancing chip innovation

(Semiconductor Chip Design & Manufacturing)

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

Issue/opportunity

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



How Generative AI can help

Iterative chip design
Generative 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

Security
With the 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.

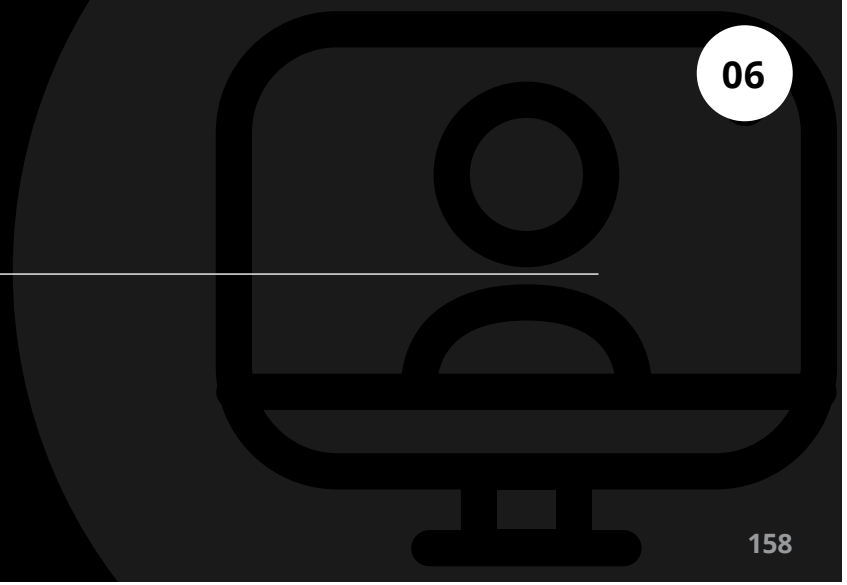
Responsible
When using Generative AI for design, the organization needs to consider how to secure copyrights or patents and protect the IP of chip designs that are moved into production.

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.

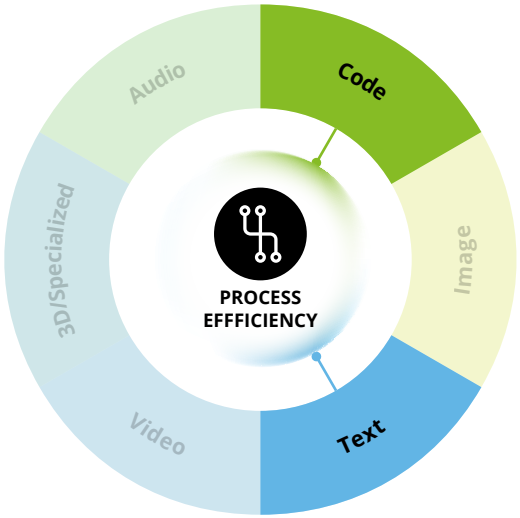
Create new ideas
Generative AI can help improve designs or discover entirely novel designs that optimize performance based on specific criteria, such as power consumption, performance, location, and manufacturability.



Tech specs on demand

(Field Sales Assistant)

Generative AI can help operations and frontline staff quickly find and translate technical specifications to enable faster knowledge retrieval.



Issue/opportunity

Technology offerings require technical depth of 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, operations and frontline staff can be challenged to translate the information and effectively communicate it to the customer. Part of the issue owes to the time-consuming and tedious process of scouring vast amounts of unstructured information and knowledge documents that contain the specifications and answers customers are seeking.

How Generative AI can help

Spec summarization and search
Generative AI can be used to create summaries of technical specifications based on targeted text-based query entries to help understand which products meet customer requirements. It can suggest features and integrations that align with 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 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
Generative 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

Privacy

Because customer data is used as a component of responding to technical inquiries, the organization needs to take steps to continuously monitor and safeguard customer data and ensure sensitive information does not leak as the Generative AI model is used by a variety of stakeholders.

Reliable

Generative AI models are susceptible to hallucinations or factual inaccuracies, making human validation essential for 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), as it can have a direct impact on answering customer questions, and by extension, sales and customer satisfaction.

Potential benefits

Faster answers for customers
When Generative AI can quickly consult and summarize technical specifications, it leads to less manual effort on the part of operations and frontline staff when responding to technical sales inquiries.

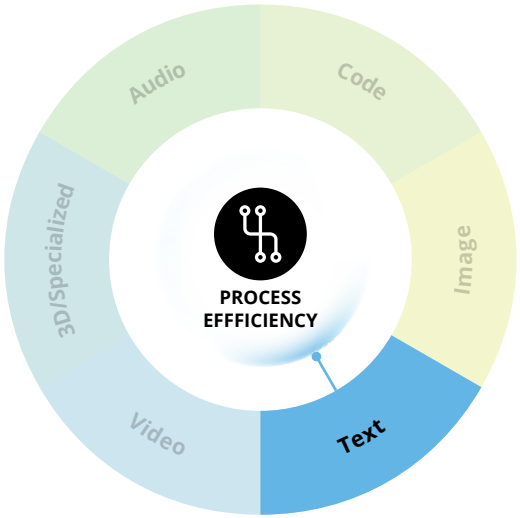
Tailored to the customer
With greater personalization of responses and demos, the enterprise can improve the customer sales experience and increase chances of conversion.

Assisting with sales
Generative AI can be used to create content that supports sales and marketing processes and addresses specific customer or partner questions.

AI-powered technical sales

(Automated RFP responses and conversational access to internal knowledge bases)

Generative 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.

How Generative AI can help

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

Automatically drafting RFPs
Generative 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 technical sales

Managing risk and promoting trust

Robust and reliable

Rigorous A/B testing has shown AI-assisted workflows can deliver higher quality outputs—in much 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 ensure traceability and compliance. Role-based access controls can ensure only authorized personnel are able to view or generate sensitive proposal content.

Respectful of privacy

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, greatly 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 improving win rates (especially for opportunities with time-sensitive budget windows).

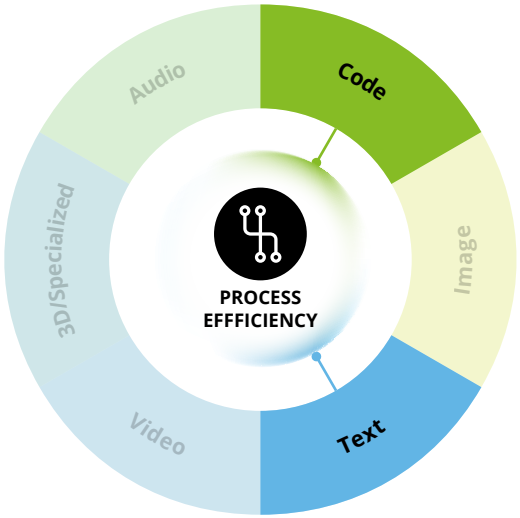
Increased sales rep productivity
Salespeople can search for materials or draft proposals more quickly, freeing them to focus on sales strategy, client relationships, and personal follow-ups. AI tools help onboard new team members more quickly by making institutional knowledge accessible in minutes rather than months.

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 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.

How Generative AI can help

Automating test creation
AI tools, including Generative AI and large language models (LLMs), 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 & 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 that humans might overlook, 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.

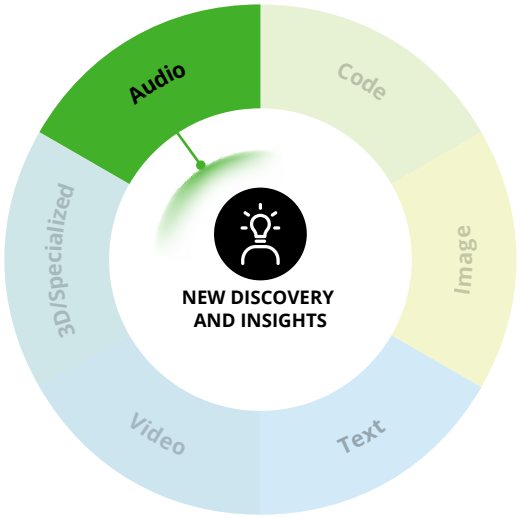
Operational efficiency & cost control
AI helps teams do more with less, reducing reliance on manual testers and mitigating the need to grow headcount to handle increasing workload.

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 GenAI)

AI can separate vocals or instruments from mixed audio tracks even when the original files are not available, opening up possibilities 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.

How Generative AI can help

Separating music into its component parts
Generative 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 rests 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—are 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 QC, increasing throughput without compromising quality.

AI-powered archive access and extraction

(Transforming historical news content into a searchable, monetizable 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.

How Generative 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
GenAI 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 equitable 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 a curated, high-quality proprietary dataset.

Improved operational efficiency

The solution can eliminate 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.

Conclusion

Getting the most value from Generative AI

These are the early days of Generative AI, but the technology is rapidly maturing. As it does, organizations in every industry will probe how this type of AI can contribute to their business and open doors to transformative opportunities. As such, an important part of understanding and working with Generative AI is shaping the vision for the future, acknowledging both the potential benefits and the risks.

In this Generative AI-enabled era, governance and risk mitigation are business imperatives. The challenges organizations face with traditional AI are amplified in this new arena. A commitment to the trustworthy development and use of Generative AI will only become more important as the capabilities grow and governing bodies shape rules for their application.

Still, there is also a risk in waiting to embrace Generative AI. The use cases described in this dossier are a starting point for exploring how this powerful technology can be used to improve the enterprise today and prepare it to lead in the future.

Beena Ammanath
Global Deloitte AI Institute Leader, Deloitte AI Institute United States, Lead
Deloitte Consulting LLP

Francisco Barroso
Global Generative AI Market Activation Leader
Deloitte Consulting LLP

Sulabh Soral
Deloitte AI Institute United Kingdom, Lead
Deloitte United Kingdom

Contact us

Kate Schmidt
US Deloitte AI Institute Leader
Deloitte Consulting LLP
kateschmidt@deloitte.com

Ivana Savic Vucenovic
Global Office of Generative AI Program Leader
Deloitte Touche Tohmatsu
ivucenovic@deloitte.com

Deloitte AI Institute

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

Yousef Barkawie
Deloitte AI Institute Middle East, Lead
Deloitte United Arab Emirates
ybarkawie@deloitte.com

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

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

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

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

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

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

Dr. Kellie Nuttall
Deloitte AI Institute Australia, Lead
Deloitte Australia
knuttall@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

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

Philipp Wendland
Deloitte AI Institute Germany, Program Manager
Deloitte Germany
pwendland@deloitte.com

Endnotes

1. "Overview," Urban Development, The World Bank, accessed September 7, 2023, https://www.worldbank.org/en/topic/urbandevelopment/overview.
2. Darrell M. West, "Reforming federal procurement and acquisitions policies," Brookings, The Brookings Institution, published April 3, 2023, https://www.brookings.edu/articles/reforming-federal-procurement-and-acquisitions-policies/#:~:text=The%20federal%20government%20purchases%20around.
3. Rick Childs, Tony Rinkenberger, and Carmen Sessoms, "The Denials Challenge: A Cross-functional Approach to Denial Prevention and Management," Change Healthcare, October 2017. www.beckershospitalreview.com/pdfs/Change%20HC_Webinar%20Slides_Nov17.pdf
4. Tai-Seale M, Olson CW, Li J, Chan AS, Morikawa C, Durbin M, Wang W, Luft HS. Electronic Health Record Logs Indicate That Physicians Split Time Evenly Between Seeing Patients And Desktop Medicine. Health Aff (Millwood). 2017 Apr 1;36(4):655-662. doi: 10.1377/hlthaff.2016.0811. PMID: 28373331; PMCID: PMC5546411. https://pubmed.ncbi.nlm.nih.gov/28373331/

Deloitte.