Generative AI use cases for the enterprise

Artificial intelligence Data and Analytics

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Remember how cool it felt when you first held a smartphone in your hand? The compact design and touch-based interactivity seemed like a leap into the future. Before long, smartphones became a way of life for organizations worldwide because of all they offer for business productivity and communication. Generative AI (artificial intelligence) promises a similar leap in productivity and the emergence of new modes of working and creating.

Tools such as Midjourney and ChatGPT are gaining attention for their capabilities in generating realistic images, video and sophisticated, human-like text, extending the limits of AI's creative potential. Generative AI represents a significant advancement in deep learning and AI development, with some suggesting it's a move towards developing " strong AI." This evolution demonstrates that computers have moved beyond mere number-crunching devices. They are now capable of natural language processing (NLP), grasping context and exhibiting elements of creativity.

For example, organizations can use generative AI to:

- Quickly turn mountains of unstructured text into specific and usable document summaries, paving the way for more informed decision-making.
- Automate tedious, repetitive tasks.
- Streamline workflows with personalized content creation, tailored product descriptions and market-ready copy.
- Design content, ad campaigns and innovative products that build better customer experiences.

Demystifying generative AI

At the heart of Generative AI lie massive databases of texts, images, code and other data types. This data is fed into generational models, and there are a few to choose from, each developed to excel at a specific task. Generative adversarial networks (GANs) or variational autoencoders (VAEs) are used for images, videos, 3D models and music. Autoregressive models or large language models (LLMs) are used for text and language.

Like diligent students, these generative models soak up information and identify patterns, structures and relationships between data points, which is how they learn the grammar of poetry, artistic brushstrokes and musical melodies.

Generative AI uses advanced machine learning algorithms and techniques to analyze patterns and build statistical models. Imagine each data point as a glowing orb placed on a vast, multi-dimensional landscape. The model meticulously maps these orbs, calculating the relative heights, valleys, smooth slopes and jagged cliffs to create a probability map, a guidebook for predicting where the next orb (i.e., the generated content) should most likely land.

Now, when the user provides a prompt—a word, a sketch, a musical snippet or a line of code—the prompt acts like a beacon, drawing the model towards a specific region on that probability map; the model then navigates this landscape, probabilistically choosing the next element, the next and the next, guided by the patterns it learned and the nudge of the users' prompt.

Each output is unique yet statistically tethered to the data the model learned from. It's not just copying and pasting; it's creatively building upon a foundation of knowledge fueled by probability and the guiding prompt. While advanced models can handle diverse data types, some excel at specific tasks, like text generation, information summary or image creation.

The quality of outputs depends heavily on training data, adjusting the model's parameters and prompt engineering, so responsible data sourcing and bias mitigation are crucial. Imagine training a generative AI model on a dataset of only romance novels. The result

will be unusable if a user prompts the model to write a factual news article.

Harnessing the value of generative AI

Generative AI is a potent tool, but how do organizations harness this power? There are two paths most businesses are traveling to realize the value of generative AI:

Ready-to-launch tools:

The “AI for everyone” option: Platforms like ChatGPT and Synthesia.io come pre-trained on vast datasets, allowing users to tap into their generative capabilities without building and training models from scratch. Organizations can fine-tune these models with specific data, nudging them towards outputs tailored to particular business needs. User-friendly interfaces and integration tools make them accessible even for non-technical folks.

These public options offer limited control, less customization of model behavior and outputs and the potential for bias inherited from the pre-trained models.

Custom-trained models:

Most organizations can’t produce or support AI without a strong partnership. Innovators who want a custom AI can pick a “foundation model” like OpenAI’s GPT-3 or BERT and feed it their data. This personalized training sculpts the model into bespoke generative AI perfectly aligned with business goals. The process demands high-level skills and resources, but the results are more likely to be compliant, custom-tailored and business-specific.

The best option for an enterprise organization depends on its specific needs, resources and technical capabilities. If speed, affordability and ease of use are priorities, ready-to-launch tools might be the best choice. Custom-trained models might improve if customization, control and bias mitigation are critical.

Adopt a use-case-driven approach to generative AI

The key to success lies in adopting a use-case-driven approach, focusing on your company’s problems and how generative AI can solve them.

Key considerations:

- Tech stack: Ensure your existing technology infrastructure can handle the demands of AI models and data processing.
- Model matchmaking: Choose a suitable generative AI model for your specific needs.
- Teamwork: Assemble a team with expertise in AI, data science and your industry. This interdisciplinary team will help to ensure your generative AI is a success.
- Data: High-quality, relevant data is the fuel that powers generative AI success. Invest in data hygiene and collection strategies to keep your engine running smoothly. Garbage in, garbage out.

Generative AI use cases

Excitement about this new technology has spread quickly throughout various industries and departments. Many marketing and sales leaders acted rapidly and are already infusing generative AI into their workflows. The speed and scale of generative AI’s ability to create new content and useful assets is difficult to pass up for any discipline that relies on producing high volumes of written or designed content. Healthcare, insurance and education are more hesitant due to the legal and compliance efforts to which they must adhere—and the lack of insight, transparency and regulation in generative AI.

- **Code generation**: Software developers and programmers use generative AI to write code. Experienced developers are leaning on generative AI to advance complex coding tasks more efficiently. Generative AI is being used to automatically update and maintain code across different platforms. It also plays a significant role in identifying and fixing bugs in the code and to automate the testing of code; helping ensure the code works as intended and meets quality standards without requiring extensive manual testing. Generative AI proves highly useful in rapidly creating various types of documentation required by coders. This includes technical documentation, user manuals and other relevant materials that accompany software development.
- **Product development**: Generative AI is increasingly utilized by product designers for optimizing design concepts on a large scale. This technology enables rapid evaluation and automatic adjustments, streamlining the design process significantly. It assists in structural optimization which ensures that products are strong, durable and use minimal material, leading to considerable cost reductions. To have the greatest impact, generative design must be integrated throughout the product development cycle, from the initial concept to manufacturing and procurement. Additionally, product managers are employing generative AI to synthesize user feedback, allowing for product improvements that are directly influenced by user needs and preferences.
- **Sales and marketing**: Generative AI is assisting marketing campaigns by enabling hyper-personalized communication with both potential and existing customers across a variety of channels, including email, social media and SMS. This technology not only streamlines campaign execution but also enhances the ability to scale up content creation without sacrificing quality. In the realm of sales, generative AI boosts team performance by providing deep analytics and insights into customer behavior. Marketing departments are harnessing this technology to sift through data, understand consumer behavior patterns and craft content that truly connects with their audience, which often involves suggesting news stories or best practices that align with audience interests. Generative AI plays a crucial role in dynamically targeting and segmenting audiences and identifying high-quality leads, significantly improving the effectiveness of marketing strategies and outreach efforts. In addition, Well-developed prompts and inputs direct generative models to output creative content for emails, blogs, social media posts and websites. Existing content can be reimagined and edited using AI tools. Organizations can also create custom generative AI language generators trained on their brand's tone and voice to match previous brand content more accurately.
- **Project management and operations**: Generative AI tools can support project managers with automation within their platforms. Benefits include automatic task and subtask generation, leveraging historical project data to forecast timelines and requirements, note taking and risk prediction. Generative AI allows project managers to search through and create instant summaries of essential business documents. This use case saves time and enables users to focus on higher-level strategy rather than daily business management.
- **Graphic design and video**: With its ability to create realistic images and streamline animation, generative AI will be the go-to tool for creating videos without needing actors, video equipment or editing expertise. AI video generators can instantly create videos in whatever languages they need to serve each region. It will be a while before generative AI-created videos can effectively replace human actors and directors, but organizations are already experimenting with the technology. Users also use image generators to edit personal photos to create professional-looking business headshots for business use on Slack or LinkedIn.
- **Business and employee management**: In customer service, generative AI can be used throughout the call center. It can make necessary documentation easy to access and search, putting case-resolving information at the fingertips of support agents. Generative AI-powered tools can significantly improve employee-manager interactions. They can structure performance reviews, offering managers and employees a more transparent framework for feedback and growth. Additionally, generative conversational AI portals can provide employees with feedback and identify areas for improvement without involving management.
- **Customer support and customer service**: While chatbots are still widely used, organizations have started merging technologies to change how chatbots work. Generative AI advancements aid the creation of more innovative chatbots that can engage in naturally flowing conversations, enabling them to understand context and nuance similar to how a human representative would. Generative AI-powered chatbots can access and process vast amounts of information to answer customer and agent queries accurately; unlike human agents, AI chatbots can handle customer inquiries around the clock to provide a seamless user experience, night or day. The shift from traditional chatbots to generative AI-powered companions is still in its early stages, but the potential is undeniable. As technology evolves, we can expect even more sophisticated and engaging AI interactions, blurring the lines between virtual and human assistance.
- **Fraud detection and risk management** Generative AI can quickly scan and summarize large amounts of data to identify patterns or anomalies. Underwriters and claims adjusters can use generative AI tools to scour policies and claims to optimize

client outcomes. Generative AI can generate custom reports and summaries tailored to specific needs and provide relevant information directly to underwriters, adjusters and risk managers, saving time and simplifying decision-making. However, human judgment and oversight are still necessary for making final decisions and ensuring fair outcomes.

- **Generating synthetic data for training and testing** Enterprises can leverage AI to generate synthetic data for training AI models, testing new products and simulating real-world scenarios. This can reduce reliance on actual data, which may be sensitive and must remain private or come from an expensive external data source. No longer bound by the limitations of gathering and preparing real-world data, development cycles can be accelerated. With readily available synthetic data sets, companies can rapidly iterate on AI models, test new features and bring solutions to market faster.

Here are key takeaways for the ethical implementation of your organization's generative AI use cases:

- Protect sensitive data: Use only depersonalized and nonsensitive data to avoid exposing vulnerable information and comply with regulations.
- Stay informed: Follow industry news to identify reliable tools and avoid unethical AI practices.
- Develop an AI policy: Create guidelines for internal AI use and investments in third-party tools, drawing from available templates.
- Invest in upskilling: Investment in reskilling and upskilling programs is crucial, empowering workers to develop skills resistant to automation.

Best practices are evolving rapidly. While the potential of generative AI is exciting for many organizations, navigating this landscape requires a balancing act between progress and prudence.

Future of generative AI

According to McKinsey,[1] generative AI will not likely outperform humans anytime this decade. However, we may see a significant leap in generative AI capabilities by 2040. McKinsey expects AI to reach a level where it can compete with the top 25% of human performers across a wide range of tasks. Meaning, AI will write high-quality creative content, solve complex scientific problems or make insightful business decisions on par with skilled professionals. Jobs that have historically been automation-proof will be further affected by generative AI. Professionals in education, law, technology and the arts will likely see generative AI touch their profession sooner.

Panelists at an MIT symposium[2] on AI tools explored various future research avenues in generative AI. One significant area of interest is the integration of perceptual systems into AI. This approach would enable AI to mimic human senses like touch and smell, moving beyond the conventional focus on language and imagery. The potential for generative AI models to surpass human capabilities was also discussed, particularly in the context of emotional recognition. These advanced models might use electromagnetic signals to interpret changes in a person's breathing and heart rate, offering a deeper understanding of their emotional state.

Experts anticipate that bias will remain a persistent aspect of most generative AI models. This challenge is expected to give rise to new marketplaces centered around ethical data sets. Moreover, a dynamic scenario will likely unfold, characterized by ongoing competition between companies and content creators using generative tools.

As these tools become more widespread in the workplace, they will inevitably bring changes to job roles and necessitate new skills. Alongside these developments invariably comes increased misuse of generative capabilities. As users gain the power to create diverse forms of content, including images, audio, text and video, the likelihood of malicious misuse is anticipated to rise. This scenario underscores the importance of developing robust mechanisms to mitigate such risks and ensuring the responsible use of generative AI technologies.

Generative AI will continue transforming enterprise operations across various industries, much like the smartphone transformed business communication and productivity. From automating mundane tasks to fostering creativity in content creation and beyond, the potential of generative AI is vast and varied.

However, navigating ethical considerations, maximizing data security and adapting to evolving best practices are paramount. For enterprises ready to explore the full spectrum of possibilities that generative AI offers, guidance and insights are just a click away. Learn more about harnessing the power of generative AI for your business by exploring IBM watsonx, the AI and data platform built for business.

Footnotes:

1https://www.mckinsey.com/featured-insights/mckinsey-explainers/whats-the-future-of-generative-ai-an-early-view-in-15-charts

2https://news.mit.edu/2023/what-does-future-hold-generative-ai-1129

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