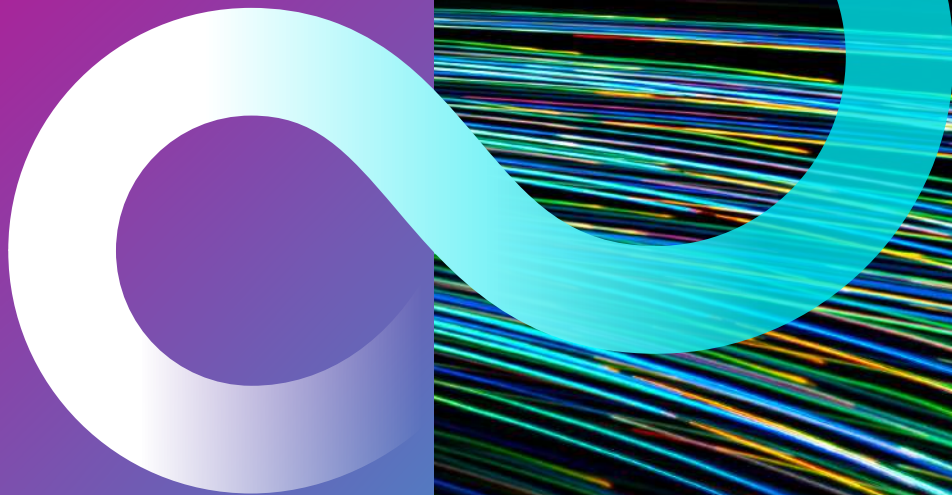




Generative AI: Use Cases as the Pathway to Value Creation

Three recommendations
for executives harnessing
generative AI



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-Three recommendations for executives harnessing generative AI-

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Generative AI: Use Cases as the Pathway to Value Creation

–Three recommendations for executives harnessing generative AI–

Introduction

ChatGPT, along with other similar applications, has demonstrated the immense potential of generative AI in creating value. This has caught the attention of not only the academia and industry, but also the public. The rapid expansion in the adoption of existing applications like ChatGPT is reshaping the traditional technology adoption curve. The belief in the potential value creation of generative AI has prompted significant investments from venture capitalists, industries, governments, and other financial backers. Concurrently, the technology's maturity, the development of regulatory frameworks, and its integration into businesses are all advancing at an exponential rate.

Generative AI holds the potential to fundamentally transform human-AI interactions by leveraging natural language as an interface. Foundational models like large language models (LLMs) dissect the intricacies of language, learning context and intent. This equips them with the innovative ability to engage in human-like dialogues, generate fresh content, and redefine work processes, thereby boosting productivity and paving the way for future insights and exploration. The capabilities of these foundational models are brought to life through applications and use cases, contributing to value creation. User-friendly generative AI applications such as ChatGPT, DALL-E, and Stable Diffusion epitomize inclusivity, making them accessible to anyone, anywhere, helping to democratize of technology.

In this scenario, the commitment to creating latent value through generative AI is demonstrated through its implementation in various use cases. End users, including companies, actively participate in the value creation process through these use cases. Consequently, the degree to which this latent value can be maximized hinges on the development of compelling use cases. Therefore, it is crucial to identify such use cases, bearing in mind that a technically feasible use case may not necessarily possess commercial or specific value for a particular company.

1. The power of generative AI: Exploring the economic impact and impact on industries and occupations

In terms of the economic implications of generative AI, McKinsey projects that the potential economic effects, confined to 63 organizational use cases, could range from \$2.6 trillion to \$4.4 trillion annually.*¹ Moreover, when considering the productivity enhancements for workers involved in over 2,100 occupations outside of these use cases, the estimated impact escalates to between \$6.1 trillion and \$7.9 trillion annually. This signifies a monumental impact, generating value equivalent to the GDP of mid-sized advanced nations within the G7.

Accenture has published a report on the influence of generative AI on industry-specific and occupation-specific jobs, using the 2021 U.S. industry as a case study and the impact on working hours as a measure.*² According to this report, language tasks constitute 62% of total working hours in the U.S. Of these, 65% (or 40% of total working hours) are likely to be automated or enhanced by LLMs. Naturally, industries with a high volume of language tasks are expected to be more significantly impacted by generative AI. Service industries such as finance, retail, and telecommunications are particularly likely to be affected. Conversely, industries that have already incorporated many mechanical tasks or those with stringent regulations and high safety requirements tend to be less affected.

Figure 1 illustrates the impact on related industries and occupations based on the data from this report. The occupational impact of generative AI is such that the more language tasks an occupation involves, the greater the impact, similar to industries.

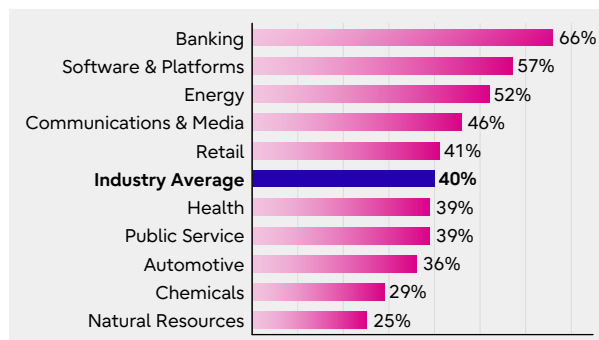
However, even within the same industry, occupations involving a higher volume of language tasks are likely to be more profoundly impacted. For instance, in the chemical industry, the overall industry impact is relatively moderate, but the administrative and back-office departments of chemical companies could be significantly affected.

As generative AI technology continues to advance and refine, its impact may extend to industries and occupations with fewer language tasks, or those that are less likely to be affected even if they involve language tasks. Moreover, in applications and use cases, consideration should be given to emerging types of AI, such as composite AI, which amalgamates generative AI models with traditional AI and other technologies.

Figure 1 Generative AI will transform work across industries and every job category

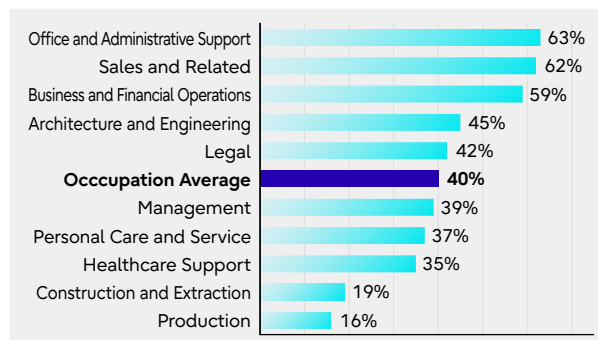
Generative AI's potential impact by related industry

(Percentage of work hours likely to be automated, in the US in 2021)



Generative AI's potential impact by related job category

(Percentage of work hours likely to be automated, in the US in 2021)



Source: Created by the author based on Accenture (2023) data

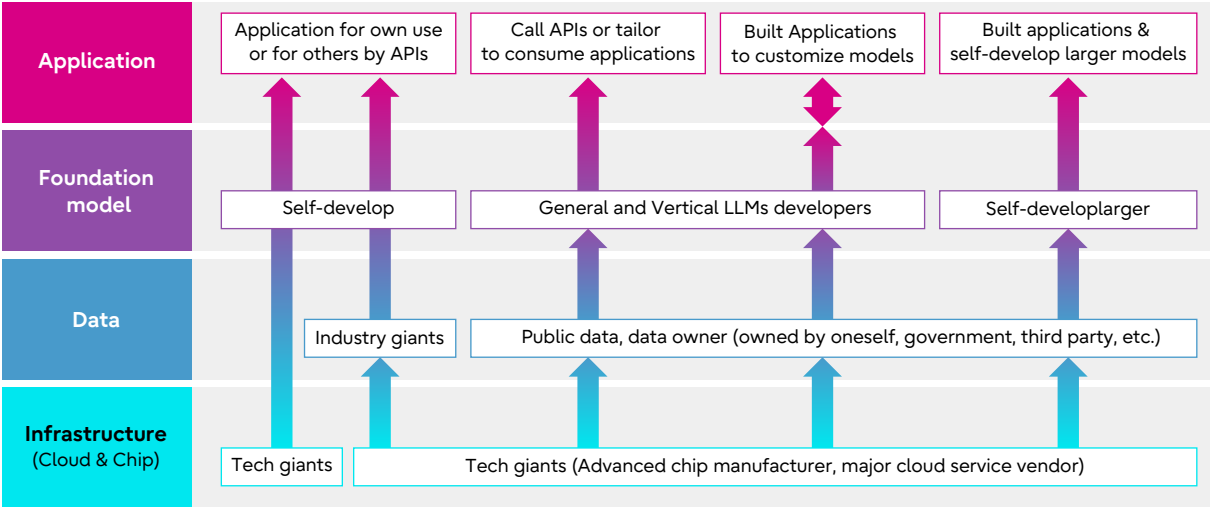
*1 McKinsey (June 2023) "[The economic potential of generative AI: The next productivity frontier](#)"

*2 Accenture (March 2023) "[A new era of generative AI for everyone](#)"

2. The value creation process and value chain of generative AI

Figure 2 offers a snapshot of the generative AI value chain. The process of value creation encompasses the development of infrastructure, the preparation of large-scale datasets for pre-training, the creation of core models that drive generative AI, and the construction of applications or use cases that leverage the potential of core learning models for tangible value creation. The form this value creation process takes can vary depending on stakeholder involvement.

Figure 2 Generative AI value chain overview



Source: Created by the author

The structure of this value chain has paved the way for the power of generative AI, catering to a diverse user base that previously struggled with or was unable to independently develop applications and services. This is attributable to the unique value chain of generative AI, which distinguishes itself from its traditional counterpart. Vendors pre-train on extensive datasets (text, images, audio, etc.) and then provide foundational models that can be customized and refined for a broad spectrum of tasks.

In fact, a multitude of pre-trained foundational models, both proprietary and open source, have been launched. While these generative AI foundational models' capabilities can be interpreted in various ways, they can be boiled down to the following four key competencies at the level of human intellectual tasks:

- (1) **Automation:** This is the most basic level, which includes data collection, organization, and straightforward computations.
- (2) **Summarization:** The next level requires the ability to condense large amounts of information and pull-out key points. This demand understanding and recontextualization of the information.
- (3) **Creation:** At a more sophisticated level, this involves the ability to generate fresh ideas and concepts. This requires creativity and insight to create new information from existing data.
- (4) **Discovery:** At the apex, this involves the ability to unearth new patterns and correlations within existing data, requiring deep understanding and analysis.

3. How to adopt a diversifying foundation model: Insights from the user's perspective

There are three ways to leverage the capabilities of the foundational model:

(1) Adopting an off-the-shelf model

From a technical perspective, the emphasis is on the capabilities and developmental progress of the core model that powers generative AI. However, from a user's viewpoint, there are numerous commercially available, general-purpose applications that integrate with the core model, such as ChatGPT, GitHub Copilot, and Adobe Firefly. These applications are ready-to-use products that require no specific interpretation or transformation work as they are directly understandable by humans. End users, including companies with some technical skills, can also utilize pre-packaged models via APIs provided by foundational model vendors. However, to integrate this output into an application or interface for specific use, it typically needs to be converted into a certain format.

This approach facilitates easy customization. Through prompt engineering techniques, which involve creating user-generated prompts for questions and instructions to obtain the desired output from the AI model, you can enhance performance for your use cases. Prompt engineering can be performed with little to no data and minimal computational resources, without the need to retrain the model or alter the number of parameters or other structures.

(2) Customized practices that integrate off-the-shelf models with your data and systems

On the other hand, enterprise users aiming to maximize the value of their own data or meet specific requirements must not only develop compelling applications but also customize the model and select the appropriate foundational model. In the process of model selection, there are numerous mature models available. Factors such as model size (number of parameters), performance, versatility, and transparency are considered to broaden the range of models you might want to utilize.

Customization also involves diverging from the original model by using your own data to fine-tune the existing model for a specific domain or task. Fine-tuning typically requires a substantial amount of data and computational resources to adjust the model's parameters. Generally, permission must be obtained from the model vendor.

To construct a high-performance 'proprietary model' by tailoring the foundational model with our own data, the development of high-quality datasets is indispensable. These superior datasets are not only crucial for customizing the foundational model, but also for harnessing generative AI to extract value from managed data. Consequently, it is vital to establish systems and governance that facilitate access to high-quality data. In order to accomplish these objectives, it is essential to enhance the maturity of the entire data lifecycle, encompassing data generation, collection, storage, analysis, and disposal.

(3) Developing a foundational model tailored to your company's objectives

Certain prominent companies, particularly those in the technology sector, have developed their own foundational models. However, constructing a foundational model necessitates substantial financial resources, extensive data, deep expertise, and a robust computing infrastructure.

Thus, the adoption strategy depends on technical capabilities, financial resources, cost-effectiveness, model diversity, and deployment speed. Generally, customers will find a practical combination of using generic, off-the-shelf models and customization to integrate them into their data and systems. Instances of in-house development methods are quite rare.

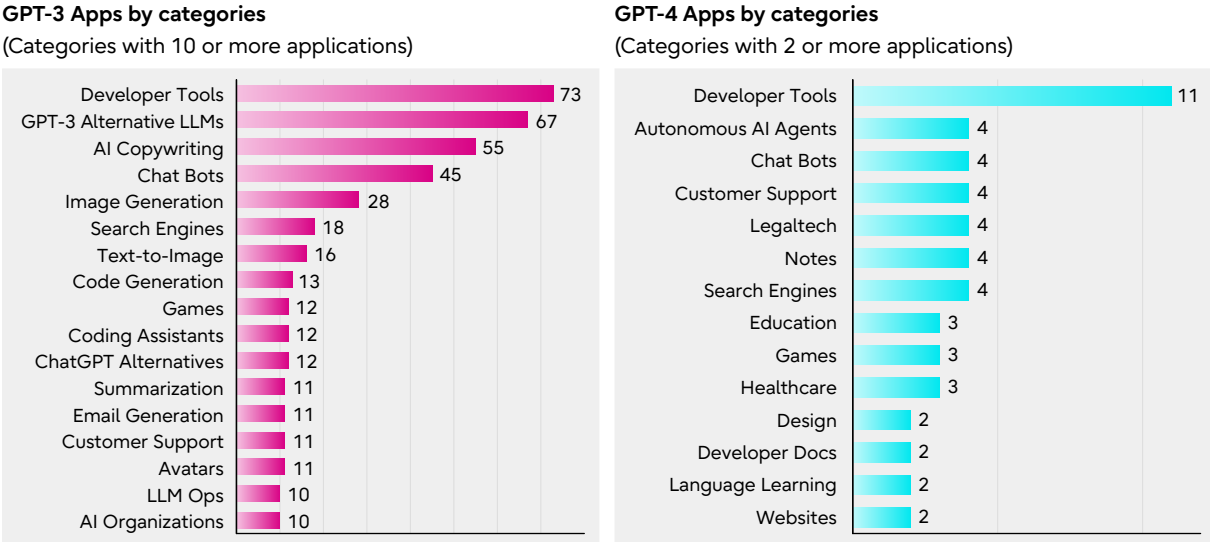
4. Unlocking the power of generative AI: Choosing and developing the right use cases

As foundational models and related technologies for generative AI rapidly evolve and diversify, there has been a surge in interest among users regarding the emergence and development of compelling use cases for business applications. A multitude of use cases for generative AI have been proposed and implemented. For instance, McKinsey analyzed 63 organizational use cases to estimate the potential economic impact of generative AI. Deloitte compiled and presented 60 of the most compelling use cases for Generative AI across six key industries.*3

Furthermore, there are already numerous applications available that demonstrate these use cases. For example, the OpenAI Playground, developed by OpenAI, showcases various pre-built AI models such as GPT-3 and GPT-4, which can perform tasks like image classification, text generation, and sentiment analysis. As illustrated in Figure 3, there are 878 applications across 206 categories related to GPT-3 and other alternative LLMs, and 86 applications across 46 categories related to GPT-4. Additionally, since the platform allows for open registration, other LLMs capable of replacing GPT-3 have also been registered. As a result, it is expected that the number of ready-to-use applications will surpass 1,000.

Consequently, there are two primary strategies for leveraging generative AI to foster value creation via business transformation. The first approach involves utilizing readily available models and applications for immediate profit. Given that value creation through generative AI requires innovation in operational and business processes, early successes can foster acceptance within the organization and generate momentum for broader innovation. The alternative strategy involves employing custom models and applications, tailored to your organization's data, to restructure your business, customer engagement, and product and service offerings. Regardless of the approach, a value-centric mindset is crucial in defining the business case and achieving success.

Figure 3 Status of Apps on GPT-3/GPT-4 demo platform by category (As of November 26, 2023)



Source: Created by the author based on data from <https://gpt3demo.com/>

*3 Deloitte (April 2023) "The Generative AI Dossier: A selection of high-impact use cases across six major industries"

In adopting these strategies, the organization will engage in experimentation during the initial stages. As it explores restructuring opportunities, it will accumulate tangible value while discerning which models and applications are best suited to specific use cases. Simultaneously, it is necessary to identify and develop priority use cases that can extract maximum value from generative AI.

Table 1 encapsulates priority use case examples across six pivotal industries, derived from Google Cloud's research into best practices among leading enterprises.^{*4} Among these use cases, "Customer Service Automation" (Retail and CPG), "Enhanced Virtual Assistants" (Financial Services), "Digital Patient Concierge" (Healthcare and Life Sciences), "Machine-Generated Events Monitoring" (Manufacturing), and "Media Content Discovery" (Media and Entertainment) have been acknowledged as highly valuable by the companies that have implemented them.

Drawing inspiration from these industry-specific use cases can significantly expedite your company's value creation process. This is crucial, as there are numerous instances where companies become overly engrossed in Generative AI use cases, leading to failure. Indeed, when companies attempt to adopt new technologies, they often generate use cases merely to experiment with the technology, without clearly identifying how the technology will contribute value to their business.

Table 1 Priority use cases for enterprise by selected industries

Industries	Priority use cases	Industries	Priority use cases
Retail and CPG	<ul style="list-style-type: none"> • Creative assistance • Conversational commerce • Customer service automation • New product development 	Manufacturing	<ul style="list-style-type: none"> • Machine-generated events monitoring • Customer service automation • Document search and synthesis • Product/content catalog discovery • Supply chain advisor
Financial services	<ul style="list-style-type: none"> • Financial document search and synthesis • Enhanced virtual assistants • Capital markets research • Regulatory and compliance assistant • Personalized financial recommendations 	Media and entertainment	<ul style="list-style-type: none"> • Media content discovery • Creative assistance • Internal document and media search • Branded consumer Interactions • Content summarization and metadata
Healthcare and life sciences	<ul style="list-style-type: none"> • Digital patient concierge • Public and private contextual search • Expedite Prior Authorization • Clinical trial report generation 	Communications Service providers	<ul style="list-style-type: none"> • Customer or employee service automation • Network planning and operations • Advertising and creative content assistance • Employee knowledge search • Test or code script generation • Contract analysis and negotiation

Source: Created by the author based on Google (July 2023)

*4 Google (July 2023) "[The executive's guide to generative AI](#)"

5. Measuring the success of generative AI: KPIs and effective approaches to prevent use case failures

As previously mentioned, it's crucial to leverage the capabilities of generative AI and demonstrate the business value generated through use cases. Fortunately, there has been extensive research on KPIs for measuring the success of Generative AI, and the proposed framework offers valuable insights for enterprises. For instance, Google Cloud has compiled a set of KPIs for generative AI, as illustrated in Figure 4.*⁵

The methods of measuring metrics and setting benchmarks are critical in evaluating the success of your KPIs. These should be based on specific business goals, industry best practices, and past performance. It's also important to regularly review and adjust KPIs as needed. As business goals and circumstances evolve, KPIs should be adjusted accordingly.

Figure 4 KPIs to Measuring the Success of Generative AI

Output KPIs	<ul style="list-style-type: none">• Business impact Identify specific business metrics that are directly impacted by the generative AI use case• Productivity Assess the impact of generative AI on the productivity of the target persona or department• Cost savings Measure the cost savings achieved through the use of generative AI• Customer satisfaction Assess how well the AI system meets customer needs and expectations
Quality KPIs	<ul style="list-style-type: none">• Turnaround time Evaluate the time taken for the generative AI model to generate outputs• Accuracy Measure the accuracy of the generative AI model in producing relevant and correct outputs• Quality of output Assess the quality of the generative AI outputs against predefined criteria• Error rate Quantify the rate at which the generative AI model produces incorrect or undesirable outputs
System KPIs	<ul style="list-style-type: none">• Training time and cost Measure the time and resources required to train and fine-tune the generative AI model• Human-in-the-loop metrics Track metrics related to the efficiency and effectiveness of human oversight• Scalability Assess how well the generative AI model scales to meet increased usage or higher demands• Regulatory compliance Monitor how well the generative AI system adheres to relevant regulatory requirements and data privacy standards, and address risks such as hallucinations

Source: Reconsidered and created by the author with reference to Google (July 2023)

*5 Google (July 2023) "[The executive's guide to generative AI](#)"

However, when companies attempt to introduce a new technology, they often create use cases solely for the purpose of testing the technology, without clearly identifying how it will add value to their business. Consequently, many of these endeavors end in failure. To prevent such use case failures, we propose the following effective steps.

(1) Clarification of Business Objectives:

Initially, it's crucial to establish clear business objectives that encapsulate your aspirations. All executives should consider the goal of implementing Generative AI to revolutionize existing business models, create new ones, and generate fresh sources of value. Essentially, criteria should be established to determine which use cases are effective for your company.

(2) Understanding the Technology:

To actualize your business objectives, it's necessary to understand the problems that the Generative AI you're deploying can solve, the value it can provide, and the issues it may not be able to address. Indeed, there may be instances where Generative AI is not the optimal choice.

(3) Use Case Selection:

Based on your business objectives and understanding of the technology, select specific 'fit for purpose' use cases. It's important to choose use cases that contribute significantly to the business objectives, taking into account the likelihood of achieving these objectives and the resources available, rather than merely testing the technology.

(4) Prototyping and Validation:

Develop prototypes for the selected use cases and verify their actual contribution towards achieving business objectives. This validation should ideally encompass the Proof of Concept (PoC), Proof of Value (PoV), and Proof of Business (PoB) stages. If any issues are identified during this step, it may be necessary to review or improve the use case.

(5) Scale-Up:

Once validation is successful, fully deploy the use case and scale it up within the same domain to augment value creation. Concurrently, work on developing new, relevant use cases from the validated ones to broaden the selection of use cases. Throughout this process, it's vital to continually ensure that you're contributing to the achievement of your business goals.

Based on the results of the above research and insights, we would like to make the following three recommendations.

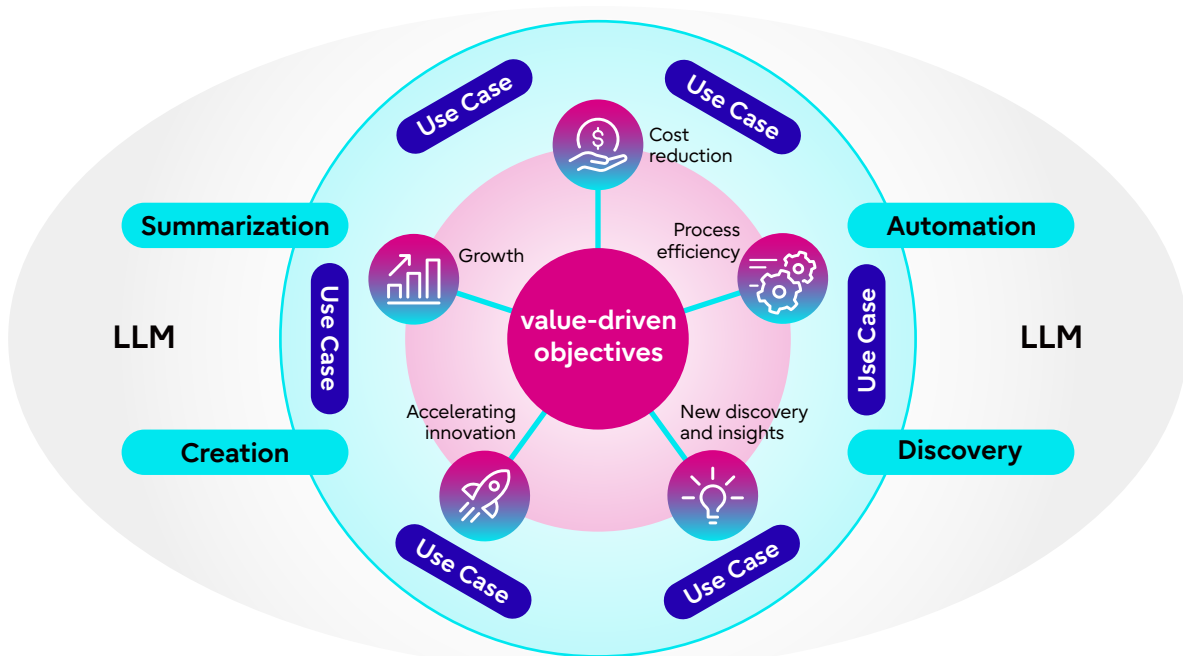
6. Exploring use cases: Three recommendations for executives harnessing generative AI

Recommendation 1

Redefining business strategy: Setting value-driven goals and upgrading DX plans in the era of generative AI

From a managerial perspective, generative AI serves as a tool for value creation, necessitating the selection of the most suitable tool for your specific purpose. To accomplish this, it is essential to first establish value-driven objectives for the entire company. Figure 5 illustrates a conceptual diagram that embodies the value creation process of generative AI.

Figure 5 A conceptual diagram that embodies the value creation process of generative AI



Source: Created by the author

Furthermore, the implementation and operation of generative AI, including foundational models and applications, are realized through use cases, enabling the actualization of value creation. Therefore, it is crucial to design a generative AI utilization model as an integral part of a business solution, such as a digital transformation (DX) solution, to achieve your management goals. Generative AI should not be regarded as a standalone plan solely focused on task automation within the enterprise, but rather positioned as a “Corporate DX + Generative AI” plan integrated into the overall enterprise DX strategy.

Recommendation 2

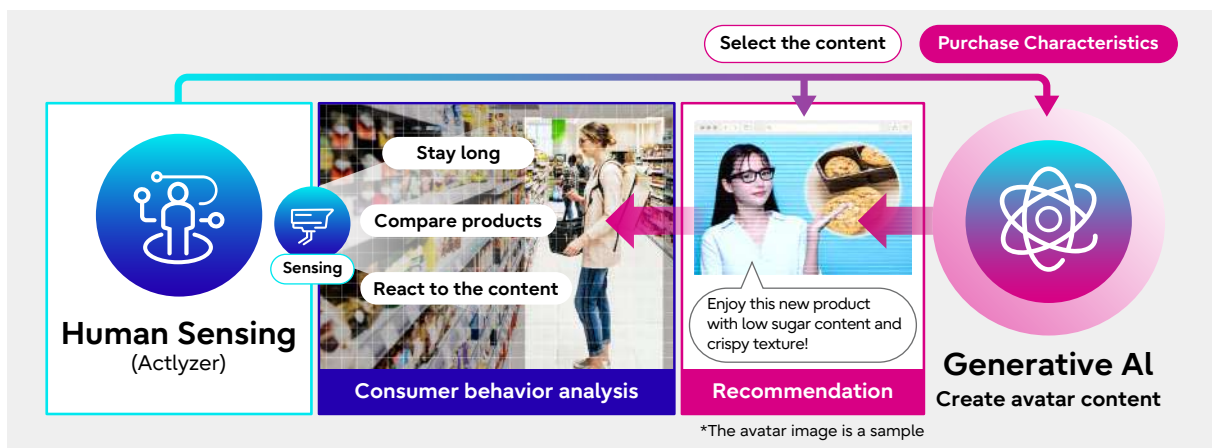
Developing hybrid use cases leveraging the synergy of generative AI and traditional AI

As we observed in the first chapter, corporate operations encompass a diverse range of tasks, including verbal, nonverbal, or mixed tasks. Generative AI appears to exert the most significant influence on language-related tasks. Moreover, with advancements in technology, such as image recognition and code generation, generative AI is becoming increasingly applicable to non-verbal tasks. However, generative AI methodologies, which are probabilistic in nature, strive for optimal performance through learning and growth, as opposed to relying on fixed software or algorithms. This can result in outputs that are not always accurate. In other words, the output of generative AI can be unpredictable and challenging to control. Consequently, companies may be hesitant to adopt generative AI due to risk aversion. Traditional AI, on the other hand, produces predictable results based on pre-established rules and algorithms, or deterministic functions, set by the developer.

In this context, to regulate the behavior of generative AI and ensure its reliability and safety, it is crucial to develop “generative AI applications” in conjunction with definitive models such as traditional AI. Essentially, hybrid use cases can be beneficial for complex applications, integrating scenarios where generative AI and traditional AI have previously been utilized separately. This means that the two types of AI can supplement each other to maximize their strengths and minimize risk.

Figure 6 illustrates that Fujitsu has already developed and implemented a hybrid use case for consumer services that integrates existing AI Actlyzer with generative AI.⁶ This balanced approach, coupled with technological progress, is anticipated to permeate the low-impact industries and occupations discussed in Chapter 1.

Figure 6 Fujitsu's AI customer service solution concept diagram



Source: Fujitsu press release

*6 Fujitsu press release: Fujitsu deploys [AI customer service solution for field trials at supermarket chain](#) in Japan

Recommendation 3**Exploring a balance between utilizing the emergence capabilities of generative AI and achieving trustworthy AI**

Beyond the conventional elements of reliable AI, we believe that 'transparency,' 'fairness,' and 'robustness' are particularly important due to the unique nature of generative AI.

Generative AI, for instance, has the capacity to 'generate' new ideas and solutions from its learned data, or emergent capabilities, offering a distinct value proposition compared to traditional AI. However, AI can also generate incorrect information or produce irrelevant responses to user input. 'Hallucination' is a particularly significant issue for generative AI. Strategies to prevent such hallucinations include careful selection of AI learning data, stringent monitoring of the AI learning process, ensuring the AI does not learn incorrect patterns, and mechanisms to detect and correct AI behavior when necessary.

Leading IT vendors are already developing such technology. For example, Fujitsu has developed a hallucination detection technology, an AI trust technology that enhances the reliability of responses from interactive generative AI, and is making it available to clients. This developed hallucination detection technique can detect hallucinations more accurately than existing methods.*7

Therefore, to regulate the behavior of generative AI and ensure its reliability and safety, certain constraints must be imposed. However, imposing such constraints can, to some extent, suppress the emergent capabilities of generative AI. This is one of the trade-offs of using generative AI. In the future, as our understanding and control of AI evolve with technological advancements, we hope that the use of generative AI with greater degrees of freedom will become possible.

*7 Fujitsu press release: Fujitsu launches [new technologies to protect conversational AI from hallucinations and adversarial attacks](#)

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Recent writings: the following Fujitsu Insight Paper, etc.

- [Transformative Quantum Computing: Striving for Greater Heights in Pursuit of Steady Progress](#) (2023, Co-author)
- [Transforming Supply Chains to Be More Productive, Resilient, and Sustainable](#) (2023)
- [Transformative Enterprise 5G: To Become an Attractive Enabler for DX](#) (2023)
- [The Composable Enterprise Emerging in the VUCA Era: From Concept to Practice](#) (2023)
- [Digital Transformation in Manufacturing: Top Challenges CxOs Face and Proven Solutions](#) (2023)

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