Use-Case Prism: Generative AI for Manufacturing

Ellen Eichhorn, Sohard Aggarwal

13 July 2023

Gartner

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Published 13 July 2023 - ID G00797407 - 24 min read

By Analyst(s): Ellen Eichhorn, Sohard Aggarwal

Initiatives: Manufacturing General IT Initiatives; Generative AI Resource Center

This Prism plots 21 prominent use cases for GenAI in manufacturing against value and feasibility. CIOs in manufacturing can use this to start a strategic conversation to help guide investment decisions in this technology.

Additional Perspectives

- Summary Translation: Use-Case Prism: Generative AI for Manufacturing (26 September 2023)

More on This Topic

This is part of an in-depth collection of research. See the collection:

- Research Roundup for Generative AI

Overview

Generative AI will enable business process change in manufacturing to a level previously not available by providing new insights and recommendations based on data and actionable information. The speed and level of specific insights that generative AI (GenAI) promises to offer are as significant as the introduction of the web to research and inquiry.

However, CIOs must thoroughly validate and verify the integrity of the recommendations from GenAI. Manufacturing leaders must start by evaluating which use cases bear acceptable risk compared with their value generation.

This Use-Case Prism plots use cases against value and feasibility axes, laying the groundwork for strategic conversations, and driving investment decisions among manufacturing leaders (see Figure 1).

Figure 1: GenAI Use-Case Prism for Manufacturing

GenAI Use-Case Prism for Manufacturing
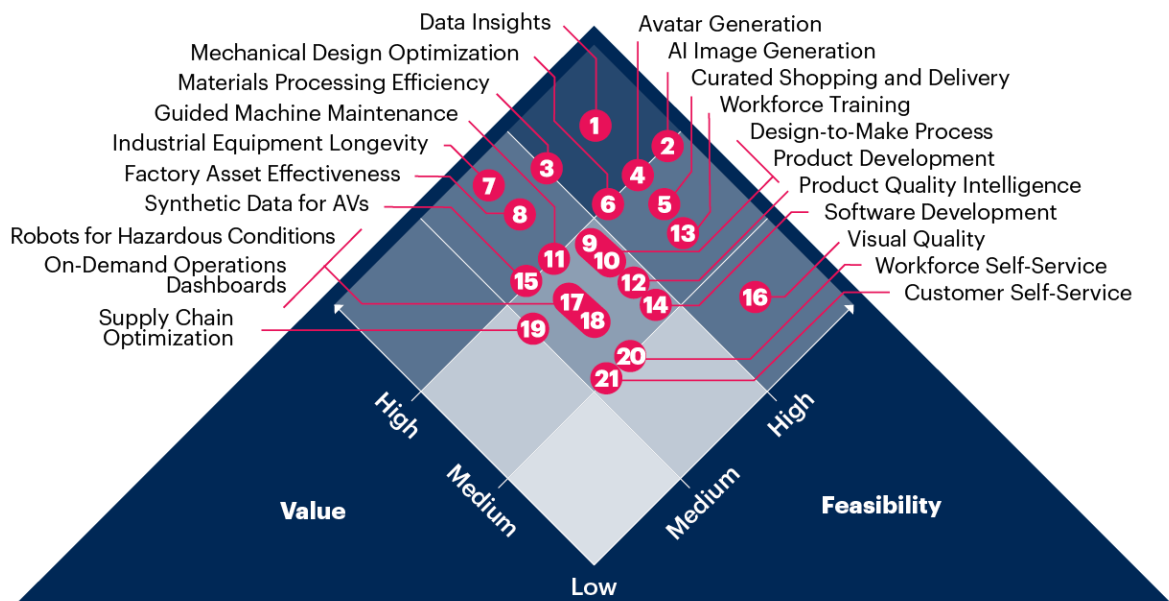
Source: Gartner
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How to Use

Review the GenAI-enabled use cases plotted on the Prism, comparing them with the maturity, risk appetite and requirements of your own manufacturing organization. To assist with this task, we have a presentation summary of this research and a Toolkit.

Presentation

Download a summary presentation of this research here:

Toolkit

A companion Toolkit allows you to tailor the Use-Case Prism for your organization's needs. Navigate to the Toolkit and download the Excel file to customize the use cases, value and feasibility dimensions, relative weightings, and use-case scores.

Scoring Breakdown

Figure 2 shows how each use case was scored against each business value and feasibility dimension. See Table 1 just below for explanations of each dimension.

Figure 2: GenAI Use-Case Scorecard for Manufacturing

GenAI Use-Case Scorecard for Manufacturing

		Value				Feasibility		
		Increased Revenue	Increased Efficiency	Managed Risk	Nonfinancial Value	Technical Feasibility	Internal Readiness	External Readiness
1	Data Insights	3.5	3.5	3.5	N/A	3.5	3.5	3.5
2	AI Image Generation	3	3.5	3.5	2	4	4	3.5
3	Materials Processing Efficiency	N/A	4	3	4	2.5	3.5	3
4	Avatar Generation	2.5	N/A	3.5	N/A	3.5	3	4
5	Curated Shopping and Delivery	2.5	2.5	3.5	N/A	3.5	3	4
6	Mechanical Design Optimization	3.5	3	2.5	3	3	2.5	4
7	Industrial Equipment Longevity	N/A	4	3	4	2	2.5	3
8	Factory Asset Effectiveness	N/A	4	3	3	2	2.5	3
9	Design-to-Make Process	3	2	2.5	3.5	3	2.5	3
10	Product Development	2.5	3	2.5	3	2.5	3	3
11	Guided Machine Maintenance	N/A	4	2	3	2	2.5	3
12	Product Quality Intelligence	2.5	3	2.5	3	2.5	3	3
13	Workforce Training	N/A	2	2.5	2	3	2.5	4
14	Software Development	N/A	3	2.5	2	3	2.5	3
15	Synthetic Data for AVs	3	3	2	4	3	2	2
16	Visual Quality	N/A	2	2.5	2	3.5	3.5	4
17	Robots for Hazardous Conditions	N/A	2	2.5	3	2.5	2	3
18	On-Demand Operations Dashboards	N/A	2	2	3	2	2.5	3
19	Supply Chain Optimization	N/A	3.5	1.5	3	2	2	2
20	Workforce Self-Service	N/A	2	3	1	3	2.5	2
21	Customer Self-Service	2	2.5	2.5	1	2.5	2.5	2

Scale: 0 1 2 3 4

Source: Gartner
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Figure 2 shows how each use case was scored against a total of seven value and feasibility dimensions. Gartner evaluated use cases based on analysts' aggregate analysis of the industry segment and their regular interactions with technology leaders from that industry. We evaluated "value" realization within three to five years and "feasibility" of implementation in the next 18 months.

While these ratings can accelerate overall appraisal of the market, the positioning for an individual organization will vary, in some cases, dramatically, based on region, technical readiness or risk appetite. See Table 1 for explanations of each dimension.

Table 1: Use-Case Dimension Explanations

(Enlarged table in Appendix)

Dimension	Explanation
Value	
Increased revenue	The ability of the use case to deliver additional financial sources to the organization through sales of products and services, government allocations, or grant funding that will result in top-line growth.
Increased efficiency	The ability of the use case to meet or exceed current performance goals with equal or fewer resources, resulting in reduced costs.
Managed risk	The ability of the use case to remove uncertainty from the organization's future performance by reducing potential reputational, security or operational risks or creating agility to respond to future market disruptions.
Nonfinancial value	The ability of the use case to assist the organization in meeting its nonfinancial or mission-related goals. These goals can include the nonfinancial value of innovation; diversity, equity and inclusion (DEI); sustainability; or community development.
Feasibility	
Technical feasibility	The ability of an organization to meet the technical requirements of a use case. Considerations include the core capabilities of the GenAI technology itself, the availability of vendor support, the current state of the organization's technology infrastructure, and the technical talent required by the use case.
Internal readiness	The organization's ability and openness to use and incorporate the use case. This includes the willingness of internal stakeholders to understand, trust and effectively execute the use case.
External readiness	The extent to which the environment outside of the organization is conducive to successful execution of the use case. This includes consideration of the legal and regulatory environment; public opinion of the use case; and the digital access, literacy and engagement required by the use case.

Source: Gartner (July 2023)

Scoring Breakdown by Category

Figure 3 shows the Prism overlaid with the four categories we've split the use cases into. The sections that follow summarize the rationale for each use-case score.

Figure 3: Use-Case Prism Categories

Use-Case Prism Categories
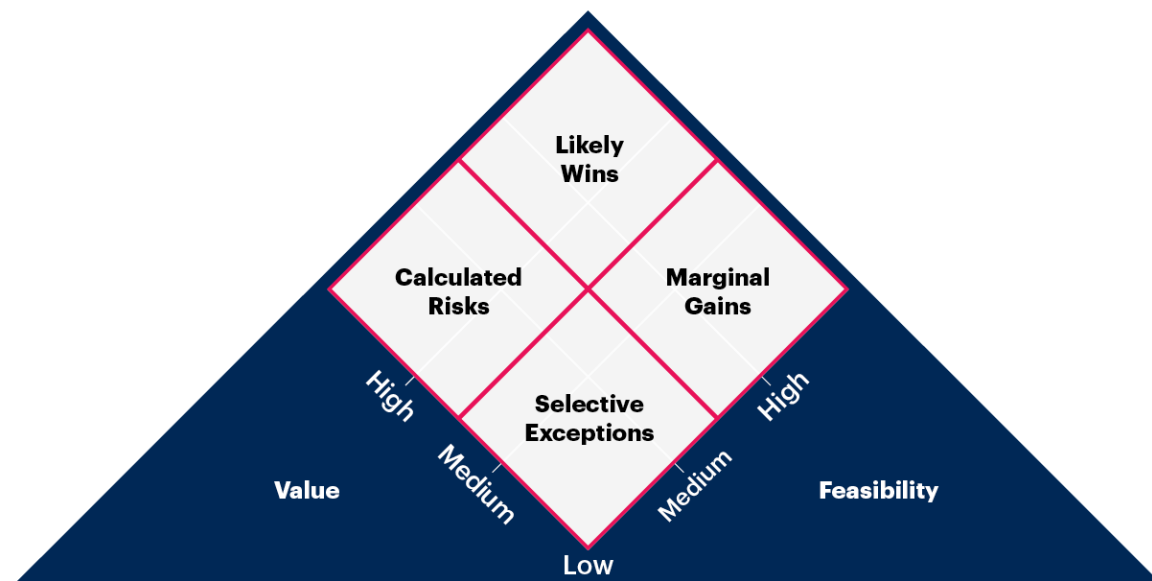
Source: Gartner
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Use-Case Prism Categories

Each use case is placed into one of four categories, based on its position on the Prism. Click on the category name to jump to a section summarizing the rationale for each use-case score in that category:

- **Likely Wins**: Use cases at the top of the Prism combine high feasibility and high value, making them wins in most circumstances.

- **Calculated Risks**: Use cases on the left side of the Prism offer high value but low feasibility, meaning they represent riskier options.

- **Marginal Gains**: Use cases on the right side of the Prism are highly feasible but offer low value, making them low-risk but for marginal gains.

- **Selective Exceptions**: Use cases at the bottom of the Prism offer low value and low feasibility, making them lower-priority unless in select circumstances.

Likely Wins

Use cases at the top of the Prism combine high feasibility and high value, making them wins in most circumstances.

Table 2: Scoring Breakdown: High-Value, High-Feasibility Use Cases

(Enlarged table in Appendix)

Source: Gartner (July 2023)

Calculated Risks

Use cases on the left side of the Prism offer high value but low feasibility, meaning they represent riskier options.

Table 3: Scoring Breakdown: High-Value, Low-Feasibility Use Cases

(Enlarged table in Appendix)

Use Case ↓	Value ↓	Feasibility ↓
15. Synthetic Data for AVs *Utilizing LLM, GenAI can produce the volume and types of synthetic data for robust simulation. To date, a subset of scenarios is often use-case-based, because it isn't feasible to generate the volume needed to test all variables.*	**Increased revenue (3):** Synthetic data for autonomous vehicles (AVs) enables machine learning (ML) algorithms to accelerate the market spread of AV technology. **Increased efficiency (3):** The efficiency gain is due to the ability to accelerate AV model training. **Managed risk (2):** Enabling vehicles to drive autonomously in all conditions is still a long stretch, which entails several different risks. **Nonfinancial value (4):** Enabling AV technology brings many nonfinancial benefits, as it should make mobility more accessible to individuals.	**Technical feasibility (3):** Using GenAI to generate synthetic data for ML training is clearly a possible use case from the technical feasibility standpoint. **Internal readiness (2):** Many manufacturers may not yet be ready internally to adopt this technology, being somewhat attached to the traditional ML approach. **External readiness (2):** Gartner sees no external obstacles to the adoption of this use case. However, regulations and consumer preference are still major showstoppers to the adoption of AVs, which consequently, represent obstacles to what this use case can actually achieve.
19. Supply Chain Optimization *This introduces a broad perspective of how things done manually today can be optimized. GenAI creates a collaboration with humans to exponentially open up efficiency opportunities. Examples include specialty pallet configuration, fuel and route configuration for trailer trucks, and product and packaging design alternatives.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (3.5):** It will take a while to get there, but it should significantly add efficiency. **Managed risk (1.5):** It will be difficult for everyone to "get along" — especially outside their companies. **Nonfinancial value (3):** This should be appealing to those seeking to reduce their carbon footprint.	**Technical feasibility (2):** This is dependent on the organization's digital maturity. **Internal readiness (2):** Determining where to start and changing over to new processes and partnerships will require strong change management. **External readiness (2):** Gartner sees a concern over the legality of partnerships.
Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.		

Source: Gartner (July 2023)

Marginal Gains

Use cases on the right side of the Prism are highly feasible but offer low value, making them low-risk but for marginal gains.

Table 4: Scoring Breakdown: Low-Value, High-Feasibility Use Cases

(Enlarged table in Appendix)

Use Case ↓	Value ↓	Feasibility ↓
13. Workforce Training *Frontline workers receive input and direction on process efficiency and machine maintenance. This takes into account both environmental and specific task requirements. GenAI can assess factors and make specific recommendations beyond traditional AI to derive recommendations at an individual worker level.*	**Increased revenue (N/A):** There is no to low opportunity for revenue. **Increased efficiency (2):** This will increase efficiency. **Managed risk (2.5):** Careful oversight is needed to avoid introducing bias into career planning. **Nonfinancial value (2):** It is difficult to say where this will fall. Some workers want the coaching and emotional support, and some want to get a list of duties and not have someone give coaching.	**Technical feasibility (3):** If scripts or success criteria for roles are documented, creating an interactive algorithm should be straightforward. **Internal readiness (2.5):** Change management will be difficult for the designated workers who have the needed skills. This might require union or workers' council approval. **External readiness (4):** Many instances are already in place using machine learning. GenAI can elevate this to a much more dynamic decision and inspection process.
16. Visual Quality *This delivers innovation throughout the product life cycle. Manufacturers using Azure OpenAI Service assistant for GenAI can augment the creation, optimization and debugging of code for factory automation, using the same capabilities that GenAI brings to software development. The difference is using visual quality inspection from the shop floor as the input.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (2):** It is likely to have a low impact on efficiency. **Managed risk (2.5):** The technology will require extensive testing to validate results. Leadership must evaluate the risk of errors, along with the type of product (for example, food for human consumption vs. a sweatshirt). **Nonfinancial value (2):** It is another form of quality control, with nothing unique to contribute to sustainability, DEI and so on.	**Technical feasibility (3.5):** In an open or accessible production environment, this is a 4. In a closed environment, this is a 3. **Internal readiness (3.5):** This level of factory inspection is often not possible for the human eye to catch. Manufacturers should consider this a new and increased capability. **External readiness (4):** Many instances are already in place, using machine learning. GenAI can elevate this to a much more dynamic decision and inspection process.

Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.

Source: Gartner (July 2023)

Selective Exceptions

Use cases at the bottom of the Prism offer low value and low feasibility, making them lower-priority unless in select circumstances.

Table 5: Scoring Breakdown: Low-Value, Low-Feasibility Use Cases

(Enlarged table in Appendix)

Use Case	Value	Feasibility
18. On-Demand Operations Dashboards *GenAI can generate a new operations dashboard or augment available operations dashboards for on-demand analysis by integrating unstructured and semistructured data sources in role-defined and context-defined views.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (2):** Until real-time adjustments and associated controls are enabled to respond in real time, ROI is limited. **Managed risk (2):** Leadership must evaluate the risk of errors, along with the type of product. **Nonfinancial value (3):** This enables any person with reasonable qualifications vs. an engineer to maintain operations. This opens up worker training to more candidates and removes language translation from worker qualifications.	**Technical feasibility (2):** This depends on the current level of digitalization. Data timing and comprehensive data collection are two variables that could significantly influence usefulness. **Internal readiness (2.5):** Change management will be difficult for the few workers who have the operations dashboard skills today. This might require union or workers' council approval. **External readiness (3):** Proving the recommendations are correct will take time. Unions and workers' councils might consider new negotiations if a new "skill" is added to a job that doesn't involve adjusting a machine.
20. Workforce Self-Service *This assists with administrative employee tasks by summarizing accomplishments toward performance reviews, aligning with workers' council and union agreements, and advising during open enrollment or counseling for new opportunities.*	**Increased revenue (N/A):** The primary value of this use case is an improved workforce experience. **Increased efficiency (2):** This is unlikely to have a significant impact on revenue or savings. **Managed risk (3):** Careful oversight is needed to avoid introducing bias into career planning. **Nonfinancial value (1):** Generally speaking, open access to advancement is welcome. It will likely be more accepted by a younger workforce.	**Technical feasibility (3):** The summarization should be straightforward. The challenge will be in building paths that match worker strengths. Today, evaluations are often subjective, and workers may be at the mercy of their bosses. **Internal readiness (2.5):** Change management will be difficult for workers who cover roles today. This might require union or workers' council approval. **External readiness (2):** There could be legal challenges and questions of equal opportunity. Strong governance will be needed.
21. Customer Self-Service *GenAI delivers significant improvements in multilanguage customer self-service through dynamic natural-language-based translations.*	**Increased revenue (2):** This could result in higher sales at check-out on direct-to-customer transactions. **Increased efficiency (2.5):** Gartner sees the most compelling benefit is to consumer experience and retention. **Managed risk (2.5):** There are concerns if the customer has a negative experience. **Nonfinancial value (1):** There is little to no significant contribution to nonfinancial value.	**Technical feasibility (2.5):** This depends on the organization's digital position. If the organization is far behind, this will be closer to 2. **Internal readiness (2.5):** If it addresses unusual problems and thus makes jobs more fulfilling, it's a win. If this replaces jobs, there will be negative impacts. Also, GenAI could impact unions or workers' councils and privacy. **External readiness (2):** Requirements could vary widely, based on region. Digital access literacy shouldn't be an issue.

Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.

Source: Gartner (July 2023)

Evidence

These use cases have been selected, positioned and averaged out, based on an assessment by Gartner analysts and customer feedback. Their applicability may vary across organizations and industries. For detailed customization, use Gartner's Prism Toolkit.

Note 1: Definitions of the Scoring Scale

Table 6: Definitions of the Value Ratings

Rating ↓	Definition ↓
N/A	Not applicable. The use case is not intended to create value in any way.
0	**Negligible.** It offers promise for value in the market, but it is doubtful that enterprises gain any real value.
1	**Low**. It offers a slight process improvement. It is difficult to translate into increased revenue or cost savings.
2	**Moderate**. It offers incremental, but significant, improvements to existing processes. These improvements will result in increased revenue or cost savings for an enterprise.
3	**High**. It enables new ways of performing horizontal or vertical applications, resulting in significantly increased revenue or cost savings for an enterprise.
4	**Transformational.** It enables new ways of doing business within and across industries. This will result in major shifts in industry dynamics.

Source: Gartner (July 2023)

Table 7: Definitions of the Feasibility Ratings

Rating	Definition
0	**Impossible.** There is a very low chance of enterprises feasibly implementing the use case.
1	**Challenging.** It is possible to implement the use case, but enterprises must overcome barriers with significant efforts.
2	**Complicated.** Enterprises can implement the use case, but will face moderate obstacles.
3	**Doable.** Enterprises can implement the use case with minor obstacles.
4	**Easy.** The use case is within the capabilities of most enterprises to adapt.

Source: Gartner (July 2023)

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Toolkit: Discover and Prioritize Your Best AI Use Cases With a Gartner Prism

Uncovering Artificial Intelligence Business Opportunities in Over 20 Industries and Business Domains

Understanding Use Case Prisms for Prioritizing Artificial Intelligence Investments

Table 1: Use-Case Dimension Explanations

Dimension	Explanation
Value	
Increased revenue	The ability of the use case to deliver additional financial sources to the organization through sales of products and services, government allocations, or grant funding that will result in top-line growth.
Increased efficiency	The ability of the use case to meet or exceed current performance goals with equal or fewer resources, resulting in reduced costs.
Managed risk	The ability of the use case to remove uncertainty from the organization's future performance by reducing potential reputational, security or operational risks or creating agility to respond to future market disruptions.
Nonfinancial value	The ability of the use case to assist the organization in meeting its nonfinancial or mission-related goals. These goals can include the nonfinancial value of innovation; diversity, equity and inclusion (DEI); sustainability; or community development.
Feasibility	
Technical feasibility	The ability of an organization to meet the technical requirements of a use case. Considerations include the core capabilities of the GenAI technology itself, the availability of vendor support, the current state of the organization's technology infrastructure, and the technical talent required by the use case.

Dimension ↓	Explanation ↓
Internal readiness	The organization's ability and openness to use and incorporate the use case. This includes the willingness of internal stakeholders to understand, trust and effectively execute the use case.
External readiness	The extent to which the environment outside of the organization is conducive to successful execution of the use case. This includes consideration of the legal and regulatory environment; public opinion of the use case; and the digital access, literacy and engagement required by the use case.

Source: Gartner (July 2023)

Table 2: Scoring Breakdown: High-Value, High-Feasibility Use Cases

Use Case ↓	Value ↓	Feasibility ↓
1. Data Insights *Large language models (LLMs) access and scale insights from internal and external data, especially unstructured data, enhancing advanced analytics with foundation-model-generated insights.*	**Increased revenue (3.5):** It has the potential to enhance existing revenue opportunities or deliver new ones. **Increased efficiency (3.5):** It could result in efficiency gains across the board. **Managed risk (3.5):** It will significantly improve risk management capability. **Nonfinancial value (N/A).**	**Technical feasibility (3.5):** Gartner has seen technical solutions as part of vendor briefings. **Internal readiness (3.5):** Gartner analysts answer many inquiries on how to set up data teams and realize new capabilities. **External readiness (3.5):** Gartner sees potential consternation that big companies will have an unfair advantage.
2. AI Image Generation *Whether for new product and package design or other content management, GenAI (specifically DALL-E) can absorb much of the burden of creating unique and appealing images.*	**Increased revenue (3):** It would be highly impactful for customer engagement. **Increased efficiency (3.5):** Organizations can leverage tools they don't currently have access to. **Managed risk (3.5):** There is concern over authenticity in some use cases and endorsements. **Nonfinancial value (2):** There is concern over authenticity in some use cases and endorsements.	**Technical feasibility (4):** It is in use today. **Internal readiness (4):** It is in use today. **External readiness (3.5):** Solution providers will need to add capabilities to address concerns over authenticity and endorsements in some use cases.

Use Case ↓	Value ↓	Feasibility ↓
3. Materials Processing Efficiency *Organizations can supplement current programmable logic controller (PLC) inputs with additional factors, such as vibration, exterior temperature and humidity, utilizing Internet of Things (IoT) sensors. As a result, organizations can let GenAI use this information to identify areas for improvement.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (4):** This will deliver significant efficiency gains, like speed, overall equipment effectiveness (OEE) and yield. **Managed risk (3):** Suggested improvements are highly likely to improve agility, as long as they are closely monitored. **Nonfinancial value (4):** By optimizing process parameters, it can make production processes more environmentally sustainable.	**Technical feasibility (2.5):** This varies widely, depending on the organization's operational technology (OT) landscape, level of digitalization and process automation. **Internal readiness (3.5):** Oversight on the output generated is required for validation. **External readiness (3):** Gartner sees few issues as long as sustainable measures are followed.
4. Avatar Generation *An avatar is a computer representation of a real person, a digital being or physical entity to represent the brand or support interactions in the digital world. For the food and beverage industry especially, avatars and participation (meaning visibility) in all the "verses" of the world are critical. GenAI enables more creativity and ideas for a medium that is foreign to most marketing individuals.*	**Increased revenue (2.5):** The direct to avatar model (digital business model where products are sold directly to avatars) has great potential. However, it remains to be seen whether or not it becomes mainstream. **Increased efficiency (N/A):** Because avatar creation is already new for most manufacturers, there is nothing to make more efficient. **Managed risk (3.5):** There is a risk of copyright violation and damage to brand image. **Nonfinancial value (N/A):** There are no issues anticipated. However, manufacturers should remain diligent in monitoring their brands so others don't abuse it.	**Technical feasibility (3.5):** This is being done today. **Internal readiness (3):** Because avatar creation is new for the majority of manufacturers, adoption readiness is unclear. **External readiness (4):** It is already publicly available.

Use Case ↓	Value ↓	Feasibility ↓
5. Curated Shopping and Delivery *Manufacturers combine ChatGPT plugins with their AI technology to let users shop for food and recipes based on conversations with ChatGPT. Manufacturers can gain insights into sentiment analysis and promotion opportunities.*	**Increased revenue (2.5):** This is highly dependent on the customer engagement model. **Increased efficiency (2.5):** This is great for the consumer, but has limitations on the delivery side. **Managed risk (3.5):** There are no issues anticipated. **Nonfinancial value (N/A).**	**Technical feasibility (3.5):** This is live at Instacart, and adoption from others may be limited only by digital channels' availability. **Internal readiness (3):** This is functioning for digital commerce models, such as Instacart, but it may not be replicable for other providers and manufacturers. **External readiness (4):** This is happening today.
6. Mechanical Design Optimization *Manufacturers use GenAI to quickly arrive at an optimized component design in terms of weight, cost or mechanical properties.*	**Increased revenue (3.5):** Arriving more quickly at the best optimization for mechanical design opens vast opportunities to deliver the best product to customers. **Increased efficiency (3):** Mechanical design is one of the most cumbersome parts of product development, and this use case provides ways to shorten it. **Managed risk (2.5):** There is the risk that GenAI may not deliver consistently great outcomes for all types of component design. **Nonfinancial value (3):** This use case allows for speed and reduction of resources.	**Technical feasibility (3):** This use case is absolutely feasible and is already put into practice. However, it may show limitations depending on the level of complexity. **Internal readiness (2.5):** There may be roadblocks of corporate culture, hindering the willingness to accept and trust such a solution. **External readiness (4):** Gartner sees no external obstacles to user adoption.

Use Case ↓	Value ↓	Feasibility ↓
7. Industrial Equipment Longevity *Using information from programmable logic controller (PLC) inputs and additional environmental and usage variables, manufacturers utilize GenAI to identify areas for improvement.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (4):** There are no issues anticipated. **Managed risk (3):** The technology will require extensive testing to validate results. Leadership must evaluate the risk of errors, along with the type of product (for example, food for human consumption vs. a sweatshirt). **Nonfinancial value (4):** Equipment longevity contributes toward sustainable use of resources, which is a high value.	**Technical feasibility (2):** This will require extensive testing to validate results. **Internal readiness (2.5):** Implementation could eliminate the need for some positions, causing labor resistance or union issues. **External readiness (3):** Gartner sees few issues, as long as regulatory standards are followed.
8. Factory Asset Effectiveness *Manufacturers establish a process mining system, and use AI to identify anomalies in the production flow. As a result, manufacturers let GenAI use this information to identify areas for improvement.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (4):** Manufacturers can streamline production flow and reduce waste and non-value-added activities. **Managed risk (3):** Leadership must evaluate the risk of errors, along with the type of product. **Nonfinancial value (3):** There is no issue anticipated.	**Technical feasibility (2):** This will require extensive testing to validate results. **Internal readiness (2.5):** There may be union or workers' council negotiations over job classifications. **External readiness (3):** There are no issues anticipated as long as regulatory standards are met.

Use Case ↓	Value ↓	Feasibility ↓
9. Design-to-Make Process *Manufacturers improve time to market by using GenAI to explore manufacturing-ready outcomes earlier as part of the development process and design, optimized for cost, materials and manufacturing technique.*	**Increased revenue (3):** GenAI introduces personalization to a new level. **Increased efficiency (2):** GenAI must be a configurable design to maintain efficiency and, ideally, modularity. **Managed risk (2.5):** There could be potential risks in ensuring product quality and safety. **Nonfinancial value (3.5).**	**Technical feasibility (3):** This will have a wide range, depending on the product and configuration choices. **Internal readiness (2.5):** Gartner sees change management for materials readiness, marketing campaigns and category management to remain diligent. **External readiness (3):** The biggest challenge here will be product safety. At what point are companies responsible for keeping people safe from themselves?
10. Product Development *Manufacturers enable product development with GenAI design and proposals, possibly by leveraging archives of products in the market to generate novel designs or optimize changes based on prompts.*	**Increased revenue (2.5):** If the technology can enable a shorter innovation cycle, this has great potential. **Increased efficiency (3):** If a shorter innovation cycle can be realized, this has great potential. **Managed risk (2.5):** Product formulation use wouldn't have much risk as all testing will find issues. **Nonfinancial value (3):** This could influence sustainable choices of materials and processes.	**Technical feasibility (2.5):** This depends on the leeway given within specifications. **Internal readiness (3):** Resources and sales should realize benefits. **External readiness (3):** Gartner anticipates no issues, except perhaps intellectual property (IP) conflict if privacy is not addressed.

Use Case ↓	Value ↓	Feasibility ↓
11. Guided Machine Maintenance *GenAI offers the capability to create, analyze and maintain multilanguage and context-specific work instructions for nonengineering or maintenance members of the workforce.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (4):** There are no issues anticipated. **Managed risk (2):** Leadership must evaluate the risk of errors, along with the type of product. **Nonfinancial value (3):** This enables any person with reasonable qualifications vs. an engineer to maintain operations. This opens up worker training to more candidates and removes language translation from worker qualifications.	**Technical feasibility (2):** This varies widely, depending on the type of materials and product longevity. **Internal readiness (2.5):** It will take time to prove the accuracy of the recommendations. **External readiness (3):** There may be union or workers' council negotiations over job classifications and descriptions.
12. Product Quality Intelligence *Manufacturers use GenAI for product quality intelligence to diagnose and recommend changes, based on the collection and analysis of multiple data points throughout the production process.*	**Increased revenue (2.5):** If a shorter innovation cycle can be realized, this has great potential. **Increased efficiency (3):** Detection and analysis of quality-related parameters will reduce waste and increase throughput. **Managed risk (2.5):** Product formulation wouldn't have much risk, as all testing will find issues. **Nonfinancial value (3):** This could influence sustainable choices of materials and processes.	**Technical feasibility (2.5):** This depends on the leeway given within specifications. **Internal readiness (3):** Gartner anticipates no issues. However, it may be challenging to incorporate older digital R&D files. **External readiness (3):** Gartner does not anticipate issues. Conflicts could arise if IP and privacy issues are not addressed.

Use Case ↓	Value ↓	Feasibility ↓
14. Software Development *Manufacturers augment software developers by generating supplementary or new software code and commenting suggestions, either for the factory or the back office.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (3):** The contribution to efficiency is directly related to the level of digitalization. Product and consumer safety issues will also mandate stricter rules for those products. **Managed risk (2.5):** Gartner recognizes certain risks related to code used in areas like IT cybersecurity, financial transactions and OT security. **Nonfinancial value (2):** Gartner sees a potential concern over jobs.	**Technical feasibility (3):** This depends on the current level of digitalization. Product and consumer safety issues will also mandate stricter rules for those products. **Internal readiness (2.5):** The readiness will depend on how risk-averse the company is. Programmers will want it, but risk officers will have more concerns. **External readiness (3):** Gartner sees no issue if the organization's IP or data privacy is respected.

Use Case ↓	Value ↓	Feasibility ↓
17. Robots for Hazardous Conditions *Manufacturers use guided or autonomous robots to inspect factory conditions, materials holding areas, or any location where human inspection could result in serious harm or death. GenAI introduces the capability to diagnose and address environmental dangers and safety hazards without the robot being told what to do, possibly by comparing existing practices to examples of best practices.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (2):** While it is likely to take as much effort to monitor the robot as preparing a human worker, speed and frequency of execution will be higher with robots. **Managed risk (2.5):** Personal injury, loss or workers' compensation claims are a detriment to everyone in the organization. Having a robotic workforce will enable more inspections of hazardous conditions scenarios. **Nonfinancial value (3):** While it's a form of quality control, it does validate an organization's commitment to the workforce's safety and does mitigate potential risks to human life and, in some cases, the environment.	**Technical feasibility (2.5):** It's already happening at some factories. The challenge is creating a configurable device to check different conditions. Alternatively, there could be custom robots for specific scenarios or organizations. **Internal readiness (2):** Proving the outcomes will require extensive testing over time. Unions could say there are concerns that robots endanger workers, because workers rely on robots for safety. **External readiness (3):** Gartner sees no reason this wouldn't be accepted by external parties, provided that there is adequate testing.

Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.

Source: Gartner (July 2023)

Table 3: Scoring Breakdown: High-Value, Low-Feasibility Use Cases

Use Case	Value	Feasibility
15. Synthetic Data for AVs *Utilizing LLM, GenAI can produce the volume and types of synthetic data for robust simulation. To date, a subset of scenarios is often use-case-based, because it isn't feasible to generate the volume needed to test all variables.*	**Increased revenue (3):** Synthetic data for autonomous vehicles (AVs) enables machine learning (ML) algorithms to accelerate the market spread of AV technology. **Increased efficiency (3):** The efficiency gain is due to the ability to accelerate AV model training. **Managed risk (2):** Enabling vehicles to drive autonomously in all conditions is still a long stretch, which entails several different risks. **Nonfinancial value (4):** Enabling AV technology brings many nonfinancial benefits, as it should make mobility more accessible to individuals.	**Technical feasibility (3):** Using GenAI to generate synthetic data for ML training is clearly a possible use case from the technical feasibility standpoint. **Internal readiness (2):** Many manufacturers may not yet be ready internally to adopt this technology, being somewhat attached to the traditional ML approach. **External readiness (2):** Gartner sees no external obstacles to the adoption of this use case. However, regulations and consumer preference are still major showstoppers to the adoption of AVs, which consequently, represent obstacles to what this use case can actually achieve.
19. Supply Chain Optimization *This introduces a broad perspective of how things done manually today can be optimized. GenAI creates a collaboration with humans to exponentially open up efficiency opportunities. Examples include specialty pallet configuration, fuel and route configuration for trailer trucks, and product and packaging design alternatives.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (3.5):** It will take a while to get there, but it should significantly add efficiency. **Managed risk (1.5):** It will be difficult for everyone to "get along" — especially outside their companies. **Nonfinancial value (3):** This should be appealing to those seeking to reduce their carbon footprint.	**Technical feasibility (2):** This is dependent on the organization's digital maturity. **Internal readiness (2):** Determining where to start and changing over to new processes and partnerships will require strong change management. **External readiness (2):** Gartner sees a concern over the legality of partnerships.

Use Case ↓	Value ↓	Feasibility ↓
Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.		

Source: Gartner (July 2023)

Table 4: Scoring Breakdown: Low-Value, High-Feasibility Use Cases

Use Case ↓	Value ↓	Feasibility ↓
13. Workforce Training *Frontline workers receive input and direction on process efficiency and machine maintenance. This takes into account both environmental and specific task requirements. GenAI can assess factors and make specific recommendations beyond traditional AI to derive recommendations at an individual worker level.*	**Increased revenue (N/A):** There is no to low opportunity for revenue. **Increased efficiency (2):** This will increase efficiency. **Managed risk (2.5):** Careful oversight is needed to avoid introducing bias into career planning. **Nonfinancial value (2):** It is difficult to say where this will fall. Some workers want the coaching and emotional support, and some want to get a list of duties and not have someone give coaching.	**Technical feasibility (3):** If scripts or success criteria for roles are documented, creating an interactive algorithm should be straightforward. **Internal readiness (2.5):** Change management will be difficult for the designated workers who have the needed skills. This might require union or workers' council approval. **External readiness (4):** Many instances are already in place using machine learning. GenAI can elevate this to a much more dynamic decision and inspection process.

Use Case ↓	Value ↓	Feasibility ↓
16. Visual Quality *This delivers innovation throughout the product life cycle. Manufacturers using Azure OpenAI Service assistant for GenAI can augment the creation, optimization and debugging of code for factory automation, using the same capabilities that GenAI brings to software development. The difference is using visual quality inspection from the shop floor as the input.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (2):** It is likely to have a low impact on efficiency. **Managed risk (2.5):** The technology will require extensive testing to validate results. Leadership must evaluate the risk of errors, along with the type of product (for example, food for human consumption vs. a sweatshirt). **Nonfinancial value (2):** It is another form of quality control, with nothing unique to contribute to sustainability, DEI and so on.	**Technical feasibility (3.5):** In an open or accessible production environment, this is a 4. In a closed environment, this is a 3. **Internal readiness (3.5):** This level of factory inspection is often not possible for the human eye to catch. Manufacturers should consider this a new and increased capability. **External readiness (4):** Many instances are already in place, using machine learning. GenAI can elevate this to a much more dynamic decision and inspection process.
Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.		

Source: Gartner (July 2023)

Table 5: Scoring Breakdown: Low-Value, Low-Feasibility Use Cases

Use Case ↓	Value ↓	Feasibility ↓
18. On-Demand Operations Dashboards *GenAI can generate a new operations dashboard or augment available operations dashboards for on-demand analysis by integrating unstructured and semistructured data sources in role-defined and context-defined views.*	**Increased revenue (N/A):** This is about quality, efficiency and reduced waste. **Increased efficiency (2):** Until real-time adjustments and associated controls are enabled to respond in real time, ROI is limited. **Managed risk (2):** Leadership must evaluate the risk of errors, along with the type of product. **Nonfinancial value (3):** This enables any person with reasonable qualifications vs. an engineer to maintain operations. This opens up worker training to more candidates and removes language translation from worker qualifications.	**Technical feasibility (2):** This depends on the current level of digitalization. Data timing and comprehensive data collection are two variables that could significantly influence usefulness. **Internal readiness (2.5):** Change management will be difficult for the few workers who have the operations dashboard skills today. This might require union or workers' council approval. **External readiness (3):** Proving the recommendations are correct will take time. Unions and workers' councils might consider new negotiations if a new "skill" is added to a job that doesn't involve adjusting a machine.

Use Case ↓	Value ↓	Feasibility ↓
20. Workforce Self-Service *This assists with administrative employee tasks by summarizing accomplishments toward performance reviews, aligning with workers' council and union agreements, and advising during open enrollment or counseling for new opportunities.*	**Increased revenue (N/A):** The primary value of this use case is an improved workforce experience. **Increased efficiency (2):** This is unlikely to have a significant impact on revenue or savings. **Managed risk (3):** Careful oversight is needed to avoid introducing bias into career planning. **Nonfinancial value (1):** Generally speaking, open access to advancement is welcome. It will likely be more accepted by a younger workforce.	**Technical feasibility (3):** The summarization should be straightforward. The challenge will be in building paths that match worker strengths. Today, evaluations are often subjective, and workers may be at the mercy of their bosses. **Internal readiness (2.5):** Change management will be difficult for workers who cover roles today. This might require union or workers' council approval. **External readiness (2):** There could be legal challenges and questions of equal opportunity. Strong governance will be needed.
21. Customer Self-Service *GenAI delivers significant improvements in multilanguage customer self-service through dynamic natural-language-based translations.*	**Increased revenue (2):** This could result in higher sales at check-out on direct-to-customer transactions. **Increased efficiency (2.5):** Gartner sees the most compelling benefit is to consumer experience and retention. **Managed risk (2.5):** There are concerns if the customer has a negative experience. **Nonfinancial value (1):** There is little to no significant contribution to nonfinancial value.	**Technical feasibility (2.5):** This depends on the organization's digital position. If the organization is far behind, this will be closer to 2. **Internal readiness (2.5):** If it addresses unusual problems and thus makes jobs more fulfilling, it's a win. If this replaces jobs, there will be negative impacts. Also, GenAI could impact unions or workers' councils and privacy. **External readiness (2):** Requirements could vary widely, based on region. Digital access literacy shouldn't be an issue.

Use cases are scored on a 0 to 4 scale for each dimension, with 0 being the lowest and 4 being the highest. See Tables 6 and 7 for definitions of the scoring scale.

Table 6: Definitions of the Value Ratings

Rating	Definition
N/A	Not applicable. The use case is not intended to create value in any way.
0	**Negligible.** It offers promise for value in the market, but it is doubtful that enterprises gain any real value.
1	**Low.** It offers a slight process improvement. It is difficult to translate into increased revenue or cost savings.
2	**Moderate.** It offers incremental, but significant, improvements to existing processes. These improvements will result in increased revenue or cost savings for an enterprise.
3	**High.** It enables new ways of performing horizontal or vertical applications, resulting in significantly increased revenue or cost savings for an enterprise.
4	**Transformational.** It enables new ways of doing business within and across industries. This will result in major shifts in industry dynamics.

Table 7: Definitions of the Feasibility Ratings

Rating ↓	Definition ↓
0	**Impossible.** There is a very low chance of enterprises feasibly implementing the use case.
1	**Challenging.** It is possible to implement the use case, but enterprises must overcome barriers with significant efforts.
2	**Complicated.** Enterprises can implement the use case, but will face moderate obstacles.
3	**Doable.** Enterprises can implement the use case with minor obstacles.
4	**Easy.** The use case is within the capabilities of most enterprises to adapt.

Source: Gartner (July 2023)

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