

GENERATIVE AI AND EMERGING BUSINESS USE CASES: A SCENARIO ANALYSIS TO ENVISION THE FUTURE

Abstract

Generative AI is at the threshold of gaining popularity among all stakeholders, particularly with enterprises. It can generate high-quality text, images, and other content. Generative AI brings both opportunities and challenges from the business point of view as its use cases are steadily increasing even though the overall area right now is in its infancy for business use. In this chapter, an attempt is made to explore the emerging business use cases of Generative AI and the potential opportunities and challenges in order to envision the future of it.

Keywords: Generative AI – Models – Pretraining - Use Case – Opportunities and Challenges.

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I. INTRODUCTION

It is the advent of Generative AI that has really accelerated the popularity of AI and its potential impacts on business and society as well. Both stakeholders are very excited about the potential applications of Generative AI in their respective domains. As Generative AIs can potentially perform like human beings, it is pertinent to envision their future in the light of opportunities and challenges it is going to bring. According to Gartner (2023)¹, “By 2025, ten percent of all data produced will be Generated by AI”. According to an IBM Research report, “Generative AI refers to deep-learning models that can generate high-quality text, images, and other content based on the data they were trained on” (Martineau, K, 2023)². In the past, AI has gone through many cycles of hype, but the advent of *ChatGPT* is a major breakthrough. LLM (Large Language Model)-powered *OpenAI* chatbots can create poems, stories, jokes, and reports just like humans, or even better than them. Today, Generative AI can learn a variety of data types which includes software code, images, molecules, etc. Houde et al. (2020)³ opined that deep fakes and media-art-related Generative AI advancement have recently caught everybody’s recognition and curiosity, but the overall domain is in its infancy for business use. Generative AI brings both opportunities and challenges from the business point of view. In this chapter, an attempt is made to explore the emerging business use cases of Generative AI and the potential opportunities and challenges that may arise in order to envision the future of it.

Some of the sample generic business use cases for Generative AI are:

1. To take the repetitive tasks away from busy executives,
2. To maintain high-quality production standards,
3. To bring speed and scale, and
4. To automate customer relationship management efforts

II. GENERATIVE AI AND EMERGING BUSINESS USE CASES: AN OVERVIEW

According to a McKinsey report⁴, “Generative AI likely to create value of \$2.6 trillion to \$4.4 trillion annually across around 60 use cases, especially in the areas of R&D, life sciences, software engineering, marketing & sales, and customer operations. Generative AI is impacting almost all stakeholders in an increasing manner. It will automate many routine activities and will enhance productivity”. According to Gartner, “Generative AI will lead to faster product development, improved labor productivity, and enhanced customer experience”. Gartner looks at Generative AI as befitting to be a foundational technology with a footprint comparable to that of the steam engine, electricity, and the internet. The influence of Generative AI will get bigger as communities and enterprises find more cutting-edge applications for the technology in day-to-day work and life. Foundation models of AI like GPT (Generative Pretrained Transformers), which are AI architecture innovations, can autonomously take care of business processes and augment both humans and machines. Complex computing power will create more advanced models in the future. Currently, the more advanced AI models are *GPT-3(OpenAI)*, *AlphaGo (Google DeepMind)*, *Watson (IBM)*, *Sophia (Hanson Robotics)*, and *Tesla Autopilot (Tesla Inc.)*. Experts in the field say that the industries that may most be impacted by Generative AI include mainly pharmaceuticals, electronics, automotive, media, energy, defense, etc. and the functions included are design, workflows, HR, marketing, communications, etc.

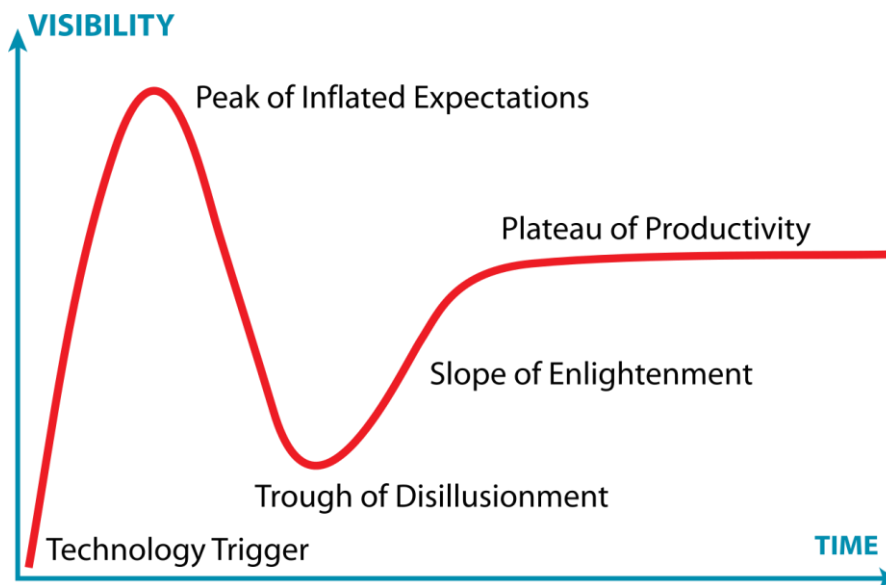
A recent *Gartner* webinar poll among 2,500 Executives reveals the following generic use case priorities for Generative AI investments:

Sl. No.	Use Case	Percentage
1.	Customer Experience and Retention	38%
2.	Revenue Growth	26%
3.	Cost Optimization	17%
4.	Business Continuity	7%
5.	Vendor, Investors, etc.	12%

Source: www.Gartner.com

III.SCOPE OF THE STUDY

This study covers the emerging generic and specific business use cases of Generative AI at its present hype cycle. According to *Gartner Hype Cycle* for Emerging Technologies, Generative AI is now (2023) in the stage of the ‘Peak of Inflated Expectations’. That means it is inviting a lot of attention and generating more enthusiasm, but at the same time, there are expectations that exceed its capabilities. The authors have mainly focused the large companies across industries. The following is the general Hype Cycle for technology:



Source: https://en.wikipedia.org/wiki/Gartner_hype_cycle

IV. OBJECTIVES OF THE STUDY

The following are the objectives of the study:

1. To understand the emerging business use cases that come from the new popular Generative AI,
2. What are the opportunities and challenges to be brought by Generative AI in the realm of business?

3. To envision the future of Generative AI in business, and
4. To recommend suggestions to sustain the use of Generative AI in business.

V. METHODS

In this study, the authors tried to understand the opportunities and challenges that come from the emerging business use cases of Generative AI from a limited literature search in Google in English. Almost all the references are from the year 2023 only. We used mainly the search character strings “Generative AI and Business Use Cases” and “Review of Literature on Generative AI and Business Use Cases” to capture applicable studies related to our research questions. And used simple scenario analysis to envision the future. According to Kishita et al. (2016)⁵, scenario analysis is an approach for forecasting the available results of a context, assuming that a trend will persist hereafter.

Table 1: Some Top Generative AI Tools, Industries that Use Generative AI the Most, and Leading Generative AI Firms

Top Generative AI Tools	Industries that Use Generative AI the Most	Leading Generative AI Firms
• Scribe,	• Manufacturing industries	• OpenAI
• Jasper,	• E-commerce	• Hugging Face
• ChatGPT,	• Banking and Finance	• Alphabet
• Dall-E2,	• Education	• Microsoft
• Autodesk's Generative Design,	• Pharmaceuticals	• Grammarly, Inc.
• Wordtune,	• Media	• Glean
• Notion,	• Gaming	• Synthesis AI
• GitHub Copilot,	• Graphic Design	• Anthropic
• VEED, and	• Coding	• Cohere AI
• Speechify.	• Law	• Jasper AI

VI. SOME BIG COMPANIES USING GENERATIVE AI

1. *Amazon* is giving very high importance to Generative AI. All divisions of Amazon have multiple Generative AI projects in the works. Every Amazon team is working on building Generative AI applications (Holt, 2023)⁶.
2. *Microsoft* also used Generative AI to create *Copilot*. It acts as a pair programmer. Microsoft is steadily integrating Generative AI into its portfolios.
3. *DHL Express* has automated its FAQs (Frequently Asked Questions) process. Other services where Generative AI is used are customs clearance, delivery schedules, payment of taxes and duties, parcel tracking, etc.
4. By investing \$200 million in upgrading the IT system and related processes, *Air India* is heading for a planned use of Generative AI.
5. *Reliance Jio's* AI platform *Haptik* has integrated *OpenAI's* tool *ChatGPT* with its own products. It is used for analyzing user sentiment, generating contextual and conversational responses, and other use cases.

VII. REVIEW OF LITERATURE

Generative AI has become a prominent field of study (Bandi et al., 2023)⁷. Generative AI is growing in both its consumer and business use cases (Hiter, 2023)⁸. Dipankar et al. (2023)⁹ say that Generative AI is showing significant success in many applications, of course, on pre-trained AI models which need very large data and huge computing power for training. So, these models need fine-tuning for customized tasks, to avoid bias, retention of long-term memory, interpretability, etc. Generative AI is praised and criticized for its profound implications and it is forcing researchers to evolve reliable and dependable Generative AI applications. Dipankar et al. further say that the ongoing success of Generative AI can be attributed not only to algorithmic evolution but also to the surged computational potential. Executives expect Generative AI to have an enormous impact on business, but most of them are unprepared for immediate adoption of the same (KPMG U.S., 2023)¹⁰. Also, it says that, apart from restraints of cost, talent, and governance issues, the main issue is determining the business case uses of Generative AI. It suggests that the enterprises lack awareness about where the Generative AI fits into their operations. The market size of Generative AI going to be to the tune of \$1.3 trillion over the next 10 years from a mere \$40 billion in 2022(Bloomberg,2023)¹¹. Generative AI can pave the way for new business models and applications. There will be Generative AI systems designed exclusively for specific verticals and datasets. Many start-ups are rushing to build foundational AI models (J.P. Morgan, 2023)¹². Most enterprises believe the benefits of generative AI outnumber the risks (Capgemini, 2023)¹³. It further says that strategies and operations can be integrated with Generative AI. Generative AI is not only a technological advancement, but also a collaborative tool (HighWire, 2023)¹⁴. Noy and Zhang (2023)¹⁵ found that *ChatGPT* has raised the output quality by 18% and decreased the time taken by 40%. Generative AI is neither inherently good nor bad, and its socio-economic impacts will largely depend on how its diffusion is managed (ILO, 2023)¹⁶. Jack Clark, the Co-founder, of Anthropic, said at the United Nations on 18 July 2023, “The Governments have to come together, develop State capacity, and make the development of powerful AI systems a shared endeavor across all parts of society, rather than one dictated solely by a small number of private firms which are competing with one another in the marketplace.”(United Nations, 2023)¹⁷. Bandi et al. again note that “there are several avenues for future research in the field of generative AI”. To understand the nuances of the impact of Generative AI, we need an interdisciplinary approach covering cultural, social, legal, economic, algorithmic, technological, and creative domains (Epstein and Hertzmann, 2023)¹⁸.

VIII. RESEARCH QUESTIONS

Based on the above literature review, the scope and objectives of the study, the following research questions are posited:

- RQ1:** What are the emerging business use cases that are being offered by Generative AI?
- RQ2:** Whether the Generative AI be able to follow the path of the *Gartner Hype Cycle* for a technology?
- RQ3:** To what extent large enterprises are showing enthusiasm for adopting Generative AI?
- RQ4:** What are the key drivers of Generative AI in business use cases?
- RQ5:** What are the key uncertainties of Generative AI in business use cases?

RQ6: What are the scenarios emerging to envision the future of Generative AI from the perspective of business use cases?

RQ7: What are the suitable measures that can be recommended for sustainable Generative AI adoption in business use cases?

IX. EMERGING GENERIC BUSINESS USE CASES OF GENERATIVE AI

The business use cases of Generative AI can be classified broadly into five categories:

1. Product Side,
2. Process Side,
3. Human Side,
4. IT Side, and
5. Risk Side

1. Product Side

- Generative AI can help develop new products quickly
- Will boost the creativity of the people
- It may help to identify the consumer behavior pattern
- Marketing communication can be automated
- It can create personalized customer experiences
- Virtual assistant to interact with customers
- Product recommendations
- Repurposing of the original product
- Cost reduction efforts

2. Process Side

- It will bring breakthrough changes in the workflow
- Optimizing the operations and reducing the cost
- Product discovery process
- Project management
- Generative AI will incorporate sustainability norms in making decisions, particularly with regard to product design and processes. Sustainability initiatives will surely get a boost.
- Predictive maintenance
- Quality control

3. Human Side: Generative AI is going to be the next productivity frontier.

- New hire training
- Will augment the employees' abilities and performance in terms of accuracy, reliability, speed, and scale.
- Generative AI will be leveraged for optimum talent management.
- To promote distributed enterprise (Remote and hybrid workplaces)
- To promote total experience (TX)

4. IT Side

- Code development (Generation, translation, verification, and documentation)
- Content creation
- Generation of synthetic data for training
- Generation of imagery, audio, videos, and texts
- Data augmentation
- Data analytics and metrics
- Knowledge management
- Creating simulation
- Art creation
- Friendly SEO
- Cyber security
- Data integration through data fabric
- Privacy solutions
- Data protection

5. Risk Side

- Risk prediction is easily possible through Generative AI with accurate data and patterns.
- Risk mitigation efforts
- Fraud detection and prevention
- To investigate suspicious incidents
- To avoid identity theft
- To catch the red flags that signal a potential crime
- To arrest the reputation-threatening errors

X. GENERATIVE AI IN BUSINESS: THE KEY DRIVERS

1. **Cloud Data:** Innovation in cloud storage is enabling easy access to data.
2. **Growth of LLM:** LLM is growing in size and sophistication which will facilitate the Generative AI to autonomously generate content.
3. **Quickness:** Generative AI helps the users to quickly generate new content/report/output through a given input.
4. **Inspiration:** Generative AI inspires employees and augments workplace creativity. New ideas and designs are generated.
5. **Wide-range Possibilities:** Generative AI is going to bring a lot of disruptive trends in the business. Even the foundation models of AI perform multiple and open-ended tasks. The applications of Generative AI have wide-ranging possibilities. Many applications/use cases are yet to be discovered. Generative AI has applications across language, visual, auditory, and synthetic data.

6. **Manufacturing Impact:** Generative AI can streamline the production processes. Akash Takyar, CEO of LeewayHertz, says that Generative AI will impact manufacturing activities like product design & development, quality control, SCM, machine automation and optimization, customer interaction and support, etc.
7. **Time Saver:** Tedious and mundane tasks can be assigned to Generative AI. One of the most powerful roles Generative AI can take is time-saver. It can help even in creative jobs to avoid tediousness and time consumption. Bill Gates says that AI-driven productivity benefits society because citizens are freed up to do other things in the workplace and at home (Gates, 2023)¹⁹.
8. **Model Evolution:** Generative AI uses a number of models that are continuously evolving. The foundational models of AI are getting fine-tuned for better applications and use cases.
9. **Ready Availability:** Unlike human employees, Generative AI is always available, ready to help, and doesn't care how you utilize its potential (Dykes, 2023)²⁰.
10. **No Threat to Humans:** Literature says that Generative AI has not yet significantly reduced employment. No mass firing reported yet due to Generative AI. Experts opine that no industry will demise due to Generative AI. The London-based law firm Allen & Overy employing 3000 lawyers all over the world says that their Generative AI has not replaced even a single person (Kantrowitz and Gorman, 2023)²¹. From this, we can understand that Generative AI is supporting and facilitating humans and not replacing them. Jobs like teaching, caring for patients, and supporting the elderly can never be replaced by AI (Gates, 2023)²². That is, people who help other people can never be replaced.
11. **No Fundamental Limitations:** Though there are problems with Generative AI, there are no fundamental limitations. Researchers are working on the problems. Experts feel that all the problems can be fixed within two years or so.

XI. GENERATIVE AI IN BUSINESS: THE KEY UNCERTAINTIES

Though Generative AI has a lot of positive sides and enthusiasm among potential users, there are a lot of caveats as it will have to face a lot of challenges with regard to aspects like fine-tuning, accuracy, cost, ethics, and explainability. The following are some of the key challenges and uncertainties:

1. **Technical Complexity:** Generative AI technology can be a complex technology to understand as it is becoming more and more advanced. This complexity may undo the advantages of it.
2. **Heavy Investment:** Generative AI implementation needs heavy investment. The hardware and software needed are highly sophisticated and specialized. Highly skilled people are needed to operate and maintain the Generative AI. This is not an issue for large companies, but it is certainly a big barrier for small and medium-sized firms. Many of these companies have only a limited budgetary provision for it.

- 3. Lack of Quality Data:** For Generative AI to make accurate predictions we need high-quality data. Lack of quality data from any angle will lead to unreliable results. So, it is mandatory to have clean and up-to-date data, which is not always possible. Moreover, fact-checking reports prepared by Generative AI always need humans. As of now, Generative AI models are less accurate than Discriminative AI models, especially in precise classification and prediction. That is why the latter (Discriminative AI) dominates the enterprise AI adoption (Mahurkar, 2023)²³.
- 4. Ethical Concerns:** No information technology is ethics-proof. Generative AI too may have many potential ethical issues. It can make many biased and unfair decisions. As far as possible we need to take steps that the AI models chosen are ethical and unbiased. As of now, Generative AI models are mostly trained using the inputs from the internet. In that case, the biased and prejudiced (on the basis of race, religion, gender, language, etc.) information present on the internet also gets ingrained in the Generative AI models leading to reinforcement of the same (biased and prejudiced information). Many copyrights and IP issues occur when texts and images from other people are taken without prior permission to pertain to the Generative AI models. Some more potential misuse of Generative AI may include deep faking, mispropoganda, and misinformation.
- 5. Lack of Explainability:** Decisions or predictions made by Generative AI models can't be explainable. It may be difficult to understand why they made a particular decision or prediction or conclusion. This becomes a serious business issue as the stakeholders need an explanation for the decision they have been informed of. So, human validation of decisions of Generative AI is inevitable.
- 6. Public Data:** When we train Generative AI with a large amount of publicly available data, there is no guarantee for the protection of data of the general public. There are possibilities for proprietary information being fed into public Generative AI tools. There are instances where companies discovered that their employees uploaded confidential and strategic information into Generative AIs. Currently, there are no data governance and protection assurances. This is the foremost issue.
- 7. Sustainability Problem:** AI computing system consumes a lot of power and has a heftier carbon footprint. Integrating Generative AI tools with other platforms requires more computing power which needs more energy. The more compute-intensive, the more carbon emission. It is not good news in the midst of a climate crisis. The hidden environmental costs and other negative impacts of Generative AI are yet to be studied well.
- 8. Lack of Emotion:** Integrating Generative AI may not be going to be a smooth affair for all firms in all situations. Effective organizational communication and emotional understanding are key to success. AIs have inherent limitations in interpreting the language and emotional signals which may hinder the widespread adoption.

XII. IMPLICATIONS OF THE KEY DRIVERS AND UNCERTAINTIES

Large companies have started leveraging Generative AI. Explainable AI is the future expectation. Fine-tuning of foundational models is happening. The 'Peak Inflated

Expectations' Hype Cycle stage is really experienced in the business use cases of Generative AI including in India. At this rate, Generative AI is likely to follow the Gartner Hype Cycle for technology. There are indications that Generative AI will drive the economy. 'Technology aids the economy' may be proved once again with the caveat that it (Generative AI) needs huge investments, talents, and addressing ethical concerns. We need AI Governance, and AI also needs governance.

XIII. SCENARIOS AND THE ENVISIONED FUTURE

Though Generative AI is now not a new animal in the forest, common people still do not know what exactly this new technology is. However, enterprises have started exploring it for use. Any company may be in any one of the following five stages as far as the use of Generative AI:

1. Advanced use of Generative AI, or
2. Basic level of use of Generative AI, or
3. Exploring to use of Generative AI, or
4. Trying to understand the Generative AI to use, or
5. Unaware of the use of Generative AI.

It is very clear that enterprises are making an effort to understand, apply, and expand Generative AI. According to a NASSCOM report in June 2023, more than 60 Generative AI start-ups are dedicated to offering solutions and services to their clients across various industry verticals. The fund flow into this space is more than \$590 million. NASSCOM further says that the space is evolving. NASSCOM has given many recommendations to various ecosystem players requesting them to promote the large-scale Generative AI. It is a good sign. A study by *Salesforce* says that 57% of senior IT leaders believe Generative AI is a 'game changer.' Most of them (IT leaders) opined that Generative AI could help them better serve their customers. Goldman Sachs Research predicts the following for the Generative AI globally:

- Seven percent (\$7 trillion) increase in global GDP
- Lifting the productivity growth by 1.5 percent points over a period of 10 years
- May displace some workers
- Will fundamentally transform how most employees generate content with regard to routine, mundane, and repetitive works

ARK Big Ideas 2023 predicted that by 2030 Generative AI tools will enhance the productivity of K-workers by more than fourfold. *Bill Gates* says that AI is the second biggest innovation in his lifetime after the Graphical User Interface in 1980. It is believed that the power of Generative AI will be democratized not only to the enterprises but also to the common people. Despite the fact that Discriminative AI is dominating the space now, the Generative AI landscape is rapidly changing and it is likely to be adopted for wider use in the near future. Accuracy, reliability, and affordability will make it still more suitable for content generation, product design, drug discovery processes, etc. It may not be an exaggeration to say that Generative AI is on the way to its primetime though it has the following concerns:

- Lack of transparency
- Lack of built-in security safeguards
- Lack of ethical use policies

It is safe to envision a scenario where the advancements in Generative AI may be outperforming its limitations. Many limitations will be subsumed as more and more advancements take place. The melioristic view is that Generative AI has a lot of risks, but is still manageable just like we managed the risks of other technologies in the past.

XIV. RECOMMENDATIONS

- 1. Quality Data:** Complete, accurate, and up-to-date data should be ensured. Adequate investment can be made to ensure quality data for error-free predictions.
- 2. Policy Need:** Gartner says organizations need a framework to check biased outputs and handle them according to company policy and law. Some industries like insurance, education, healthcare, etc. are encircled by many legal compliances that really prevent them from leveraging the full potential of Generative AI.
- 3. Responsible Use:** Any technology can be used for good purposes or bad ones. Enough measures can be there for social and cultural norms compliance in the use of Generative AI to reduce the irresponsible use of it and the subsequent consequences that follow it. Adequate provisions for taking action against individual members who may violate the above norms must be in place. Singapore and China are already having new regulations for the use of Generative AI. Italy has ad hoc regulations. India, the EU, the U.K., Canada, and the U.S. are in the process of shaping their regulations. Any responsible use must ensure inclusion, transparency, and accountability. On 27 August 2023, Prime Minister of India Narendra Modi called for a global framework for the ethical use of Artificial Intelligence (AI) to avoid bias in this modern technology and its impact on society (PTI, 2023)²⁴. Bill Gates suggests that government and private have to work together to ensure responsible use.
- 4. Model Customisation:** Enterprises can fine-tune an existing AI model to fit into their own customized needs. It will be a less energy-intensive process. They can refresh the data regularly for accuracy and energy efficiency. Also, it will avoid the huge cost of training a new Generative AI model. The models can be available in large cloud providers such as Microsoft, Google, and Amazon.
- 5. ESG:** Firms can integrate Generative AI into their ESG to achieve healthy ESG parameters. Integrating Generative AI into the ESG landscape will help make it easier to track and measure ESG performance, documentation, filing, compliance, and stakeholder engagement. It will certainly help to develop the next cycle of products with sustainability goals and ensure continuous improvement.

6. **Mitigation-ready:** Generative AI is likely to bring many unintended consequences and negative implications. So, organizations need to have a grip on these potential implications and consequences and be prepared to mitigate any worst eventualities.
7. **Balance the Fears:** Efforts must be taken to balance the fears of the negative sides of Generative AI.
8. **Equity:** Government, NGOs, and Philanthropic organizations have to come forward to ensure Generative AI inclusion for the benefit of MSMEs, rural, and poor people.

XV. CONCLUSION

Generative AI is a powerful tool for enterprises, businesses, and marketers, of course, with a lot of caveats. The drawbacks can be mitigated by taking a slew of measures. Generative AI is no longer a new animal in the forest. It is a very impressive technology, but yet to become good enough to take care of all the jobs. It may add value to the firm, but may not replace the people. Generative AI bots are useful in getting things done, but still, they need human supervision to avoid things going wrong. Academic institutions have to support research activities in basic and applied areas, nurture human capital, and enhance and expand the state of the art in this most happening field. For example, *Yardi School of AI, IIT Delhi*, is doing an exemplary job in this regard. There is no doubt Generative AI is potentially transformative and future-promising technology for the world of business.

Understanding the dynamic and agile capabilities, potential opportunities and unintended challenges, and ethical concerns of Generative AI, businesses can make empowered decisions to adopt and adapt this disruptive technology to drive business growth and innovation. The future of generative AI is promising, and enterprises that adopt this accelerating technology will surely reap the intended rewards. With the arrival of Generative AI, we have graduated from content creators to content editors to drive the following:

1. To generate more revenue.
2. To stay more competitive
3. To achieve consistency and compliance

XVI. LIMITATIONS

1. The business use cases taken for the analysis are random, and not exhaustive,
2. The scope of the period is limited to 2023 only,
3. The insights are only about large organizations and small and medium organizations were not included,
4. Strengths and Weaknesses of the Generative AI with regard to business use cases were not included in the analysis, and
5. It is only a preliminary effort, and more in-depth evidence-based studies are needed for better insights.

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