

Impact of AI and Gen-AI on Business Models

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ABSTRACT

Artificial Intelligence (AI) is changing businesses and business models. AI is revolutionizing business models by automating processes, enhancing decision-making, and enabling innovation. From being a technology enabler, AI is becoming a business driver. AI has become a new potent dimension for growth, collaboration, and profitability. The use of AI is no longer a strategic option. Instead, it has become the core of the business strategy and often the strategy for technology-driven companies. AI can help businesses scale both horizontally and vertically. AI-driven analytics provide real-time, data-driven insights, allowing businesses to predict trends and personalize customer experiences at scale. Generative AI further disrupts industries by creating new products, designs, and content, fostering rapid innovation.

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1 INTRODUCTION

Artificial Intelligence (AI) and Generative AI (Gen-AI) are rapidly changing the business models across many businesses. The growth and evolution of neural networks and AI's generative capabilities, which can create content and data, have impacted the way businesses create and capture value. It is no longer a question of whether AI will affect business models; it is now a question of how much and how soon this impact will be seen.

Gen-AI creates novel outputs like images, videos, text, and voice, surpassing the regular tasks of non-Gen-AI applications. This kind of capability fundamentally changes the foundation of traditional business models, wherein it was previously assumed that "creation" was mainly a human domain. This assumption no longer holds. AI can think, create, and generate meaningful business results. With this ability, Gen-AI can reshape the core principles of business and operating models. This creates unprecedented opportunities. Companies can now use AI to optimize operations, innovate design processes, and personalize the customer experience in real time. However, they must do so while protecting user privacy and maintaining ethical standards. Gen AI's multifaceted impact on business models, its potential to disrupt, and its role in fostering new isunprecedented, and this has an overall impact on the global economy (Abbas et al., 2024). This paper examines the opportunities and challenges of using AI and Gen-AI from ethical, technological, and transformational perspectives.

2 THEORETICAL FRAMEWORK

2.1 Definition and Key Concepts of Generative AI

A new class of Gen-AI algorithms powers AI applications. Some of these new-age algorithms are Generative Pre-trained Transformers (GPT), Variational Autoencoders (VAEs), and Generative Adversarial Networks (GANs). Fresh perspectives on GANs were introduced by Goodfellow et al. (2014). The

architecture of a GAN has not one but two neural networks; this model contains a generator and a discriminator. These two models compete in a zero-sum game: the generator creates data, and the discriminator evaluates its authenticity and applicability. This is one way Gen-AI creates realistic data. Kingma and Welling (2013) proposed VAEs; here, the input data is encoded in a latent space and then decoded with variations to produce new data. Here, data is interpolated and extrapolated in a controlled manner, allowing granular manipulation.

Now, coming to the transformer models, these models are built on the doctrine of "Self-Attention". These algorithms have revolutionized natural language processing. OpenAI's GPT models (Radford et al., 2018) can generate meaningful, contextual, and coherent responses to queries. This has driven advances in customer and end-user applications. Today, AI-based voice and chat applications are common. One of the pressing challenges is data privacy; while mature businesses exclude data fields that contain personal and sensitive information while training the Gen-AI application, it is challenging to apply the same level of restriction in the LIVE and production environment, given that, fundamentally, the underlying algorithms are taught to self-learn by paying attention, and when this is coupled with the human need for higher accuracy, these algorithms develop complex data relationships and find out means to make sense of orthogonal data that is usually challenging to classify as personal or sensitive information. This concerns industries like healthcare, advertising, and related industries. This is another area of frontier research.

2.2 Historical Context and Evolution of AI Technologies

Through machine learning, humans have taught machines how to learn, not exactly what to learn. This is one of humankind's most significant creations. Early information systems were primarily based on rules and symbolic learning. We defined

these rules, thereby limiting the scope of knowledge and the scope of the application. Using statistical methods, these early machine learning models could predict and prescribe solutions and options. The advent of deep learning models marked a significant shift. This led to a major leap in AI systems and their ability to learn complex patterns from vast amounts of data, producing outputs humans could not previously understand or create (LeCun, Bengio, & Hinton, 2015). This has profound implications for all industries. It will not be limited to new Gen-AI-generated content, because Gen-AI will be used to create new designs and solutions through its creative power. Gen-AI will power future innovation at a foundational level. This is forcing businesses to rethink their strategies and business models.

2.3 Theoretical Models of Business Transformation

Several theoretical frameworks explain how businesses can integrate generative AI into their models. One such framework is the disruptive innovation theory, which explains how new technologies can displace established businesses by offering more accessible or affordable alternatives (Prakash, G. et al., 2024). Generative AI, with its ability to automate and enhance creative processes, exemplifies this type of disruption, particularly in industries where traditional methods are labor-intensive and costly.

Another relevant model is the concept of digital transformation, which refers to adopting digital technologies to fundamentally change how businesses operate and deliver value to customers (Vial, 2019). Generative AI is a key driver of digital transformation, enabling enterprises to innovate at scale, personalize customer experiences, and optimize operations. Adopting generative AI often requires changes to organizational structure, culture, and strategy as companies seek to leverage AI's full potential

IMPACT ON TRADITIONAL BUSINESS MODELS

3.1 Disruption in Traditional Industries

The industries most prone to disruption from Gen-AI are those that rely heavily on content creation, design, and even customer interaction. One industry that is seeing disruption is media and entertainment. AI-generated content is beginning to challenge conventional content and design production methods. AI can create new content, morph existing content, and combine new creations with existing ones. This applies to images, animations, scripts, and even music. These AI tools can also produce many different variations with a user-selected amount of moderation. This can significantly reduce the production costs (Khan, M. H., 2023).

Retain, fashion, and textile industries that primarily depended on human design and creation now have the option of leveraging the assistance and use of these technologies on a mass and unprecedented scale, allowing them to respond to consumer demands quickly (Mohiuddin Babu et al., 2024)

Brick-and-mortar and manufacturing companies, such as aerospace and automobile companies, are also being impacted. New-gen AI tools help them develop solutions that were once too expensive or impossible. These include real-time calibration and optimization of machine input

parameters to meet specific requirements (Buchmeister et al., 2019).

3.2 Automation and Efficiency Improvements

In the last 30 years, the IT industry has pioneered business process efficiency, effectiveness, and automation. While traditional IT automated business processes, new-age AI has fundamentally transformed businesses. In the field of marketing, AI is taking the world by storm. AI can now understand micro-moments when end users make decisions and make recommendations suited to that moment. This takes personalization to the next level because it uses past and changing behaviors of the user that are usually dynamic (Chui et al., 2018).

Large organizations' customer service and support functions will feel the full impact of Gen-AI. Customer service user journeys can now be fully or significantly automated. Affordable, high computing power addresses the latency challenge in answering customer queries. LLMs provide a high level of sophistication and can now handle complex queries and personalized support 24x7x365 days. This has increased efficiency and expanded businesses' reach.

3.3 Case Studies of Businesses Adapting or Failing to Adapt

Gen-AI will see the rise of early adopters who use this technology to transform their businesses, and those who do not adopt it will be left behind or fade out (Marr, 2019). Netflix gave away a significant amount of money to the winners, who increased viewership by just a fraction by using AI and developing algorithms that curate specific content for users. However, traditional media companies that have been slow to adopt AI struggle to compete with AI-driven platforms. The music industry shows a similar trend, with companies embracing AI-generated music pulling ahead. At the same time, those sticking to old production methods risk falling behind as consumers increasingly demand personalized, on-demand content (Amatriain & Basilico, 2015).

3.4 Uber Case Study

3.4.1 Business model

Uber's business model is built almost entirely on a digital platform and supports different business models like UberX, UberBlack, and UberPool. Uber's ecosystem thrives on data, complicated algorithms, and real-time response capabilities. While it takes a commission on each ride, Uber manages logistics once it enters the region. Advanced neural networks power dynamic pricing models. This has increased their profitability and growth. Uber's ecosystem is much bigger than that of a standalone digital platform. This ecosystem links end users, telecom providers, and payment gateways, and operates across different countries, among others. This ecosystem helped the company grow into other sectors, such as Uber Eats. Later, Uber also entered the freight market. Uber is a classic example of one ecosystem giving rise to another.

3.4.2 Technology Stack

The technology stack is the bedrock of any digital platform. Uber's technology stack is massive and complex. Over the years, it has become robust and stable. Uber's technology stack covers most of the latest technologies, such as cloud computing, AI, analytics, and mobile applications. They have a lightweight mobile app that connects passengers and ride seekers. They have

integrated capabilities like digital payments, credit cards, and other local payment methods to support a smooth journey. Cloud architecture helps Uber to scale during peak load and addresses the scalability problems of standalone systems.

The brain behind the logic that runs the Uber platform is AI. It pretty much manages the entire operation (Ojanperä, T., 2021). Receiving requests involves allocating rides, predicting demand, optimizing the routes, ensuring driver availability, and managing passenger safety. AI makes all of this possible. One of the many algorithms that they use is reinforcement learning. Uber's fraud detection system is also powered by its AI.

3.4.3 Competitive Advantage:

Uber's core strategy is to understand customers' unmet needs, leverage new technologies, and be a first mover. (Baron, D. P., 2018) This strategy has yielded many advantages. Uber's understanding of the business problem was groundbreaking; it focused on building human networks and connections, not just artificial neural networks, and brought customers and service providers together in one app. To do so, they boldly used the best technologies available and then scaled their operations. They optimized daily operations using AI while creating a human network effect that attracted more customers and drivers.

They used dynamic pricing to increase their profitability. While this has been criticized, they still use it. This is one of their key differentiators. They also invested heavily in their brand worldwide. The company's marketing campaigns have successfully positioned Uber as a convenient and reliable transportation option.

3.4.4 Regulatory Challenges

Despite its extraordinary success, one of Uber's most significant challenges has been adhering to local laws and regulations (Rauch, D. et al, 2015). This is often because it can disrupt the market it enters almost immediately. This has been the intrinsic nature of their business model. Their model impacts other business models and the livelihood of traditional taxi service providers. Under Uber's original business model, drivers were individual contractors, not Uber employees, which has been a contentious issue. While Uber pays employee-like benefits in some countries, including health insurance and paid leave, these benefits are not uniform across all countries (Harris, S. D. 2018). For example, in California, local laws require Uber to classify drivers as Uber employees.

3.4.5 Future Outlook

Uber's future depends on how it manages ever-changing regulations across regions worldwide and adheres to them continuously in a transparent, auditable way. The key is Uber's vision of moving from a "logistics platform" to a "Mobility Platform." Other players running similar trucking businesses have successfully replicated Uber's digital platform and ecosystem.

Uber's digital platform has fundamentally changed how people move in cities, offering a convenient and cost-effective alternative to traditional transportation options. However, the company's journey has been fraught with challenges, from regulatory hurdles to public criticism of its labor practices. As Uber continues to evolve, its ability to innovate, diversify, and navigate complex regulatory

landscapes will determine its future trajectory. Uber's case highlights the broader dynamics of platform-based businesses in the digital economy, where success often depends on a delicate balance between growth, regulation, and social responsibility.

4. EMERGING BUSINESS MODELS DRIVEN BY GENERATIVE AI

4.1 AI as a Service (AIaaS)

IT companies have created complex and sophisticated products and services as SaaS offerings. Companies now offer AI as a service (AIaaS), which has not only transformed business processes but is also beginning to transform companies' business models. Gen-AI will transform businesses of all sizes. LLMs have significantly reduced the upfront investment in AIaaS offerings. AIaaS offerings can be customized to specific businesses based on the local and global market conditions and customer choices. For example, a company might use AIaaS to generate marketing content, automate customer interactions, or analyze large datasets to uncover insights that drive strategic decisions (van der Staay, A et al, 2025).

4.2 Personalized Marketing and Customer Experiences

Before using Gen-AI for personalization, marketers relied more on statistical models to predict what customers wanted. The creative element was somewhat restricted. Gen-AI capabilities have enhanced the user experience. Now, users can have creative personalization, not just statistical personalization (Dimitrieska, S. 2024). Gen-AI powered platforms are now replacing E-commerce platforms (Shevchyk, 2024).. These new-age platforms provide users with creative, personal content. Similarly, AI-generated marketing content, such as personalized emails and social media ads, can drive engagement and sales by resonating more deeply with individual consumers.

4.3 Content Creation and Media Industries

A surge of Gen-AI companies now focuses specifically on media and entertainment content. LLMs like Llama, GPT-4o, Gemini, and others have been trained on billions of parameters and can create content similar to human-written work. This has become an asset for these companies (Floridi & Chiriatti, 2020). Streaming platforms also use AI to personalize content. For example, AI can generate personalized playlists, movie recommendations, and custom video content based on user preferences, leading to higher retention rates (Amatriain & Basilico, 2015).

5. CHALLENGES & ETHICAL CONSIDERATIONS

5.1 Intellectual Property and Content Ownership

With the extensive use of neural networks in Gen-AI applications and the need for greater prediction accuracy, Gen-AI-based applications challenge existing laws and regulations on intellectual property and content ownership. As AI systems generate new content, questions arise about who owns the rights to that content: the AI's creator, the user who inputs the data, or the AI itself. This issue is particularly complex in creative

industries, where copyright and intellectual property rights are critical (Lim, D. 2018).

Current frameworks like GDPR and California Consumer Protection laws can address some, but not all, challenges about the use of Gen-AI applications. However, the same cannot be said about local country-specific laws and regulations in other regions. In many countries, if a Gen-AI generates content, art, or music, it is unclear who holds the copyright and how royalties should be distributed. As AI continues to play a more prominent role in content creation, developing new legal standards and frameworks to address these challenges will be essential (Akpobome, O. 2024).

5.2 Bias and Fairness in AI-Generated Content

Another significant challenge is bias in AI-generated content. AI models are trained on large datasets that can contain biases, which are then reflected in the AI's outputs. This can create biased or unfair content, perpetuating stereotypes and reinforcing existing inequalities (Buolamwini & Gebru, 2018).

Ensuring fairness in AI-generated content requires careful consideration of the data used to train models and implementing techniques to mitigate bias. Businesses must also be aware of the ethical implications of using AI-generated content and take steps to ensure that their AI systems are transparent and accountable.

5.3 Regulatory Challenges

Advancements in Gen-AI have outpaced efforts to create regulatory frameworks to govern its use. This has raised concerns about the potential misuse of Gen-AI, particularly in areas such as deepfakes, misinformation, and privacy violations. Governments and regulatory bodies are grappling with how to balance the benefits of AI with the need to protect consumers and ensure fair competition (Cath et al., 2018).

Compliance with local laws and regulations like GDPR is one of the biggest challenges to using Gen-AI on ecosystem-based digital platforms because they tend to store and use personal and sensitive information. Since data is the lifeblood of neural networks in digital platforms, this raises significant data privacy and security concerns. Neural networks often need large amounts of data, including sensitive user information, to make predictions and decisions. Hence, ensuring this data is collected, stored, and processed securely in line with laws and regulations is vital (Voigt, P., et al, 2017). The low interpretability of complex neural networks makes their extensive use challenging.

Companies must navigate an increasingly complex regulatory landscape as AI becomes more integrated into business operations. This may involve complying with data protection laws, ethical guidelines, and industry standards initiatives. Businesses that fail to address these regulatory challenges risk legal repercussions and damage their reputation.

5.4 Impact on Employment and Workforce Dynamics

The rise of Gen-AI and the widespread use of Gen-AI applications will affect employment across industries. Growing concern about job displacement is increasing. The deeper problem is that Gen-AI creates jobs at a slower rate than it displaces them (Brynjolfsson, E., & McAfee, A., 2014).

Companies must reskill and upskill their workforce to address these challenges and prepare employees for new roles that require human creativity, critical thinking, and emotional intelligence. Additionally, companies must consider the ethical implications of replacing human workers with AI and strive to create a balanced approach that leverages AI's capabilities while preserving human jobs (West, C. et al, 2018).

6. Future Trends and Predictions

6.1 The Future of Generative AI in Business

Gen-AI is here to stay, and it is here to change. Gen-AI can potentially change the purpose of human life. Businesses willingly or otherwise embrace Gen-AI applications (Haenlein & Kaplan, 2019). On one hand, AI models will become increasingly sophisticated. On the other hand, more regulations will be passed and implemented to govern and limit AI applications. Many companies are starting initiatives like AIOps to improve their operations.

Gen-AI applications will become an affordable commodity for the masses. Future AI models may generate entire business strategies, design products tailored to individual customer preferences, or even create new markets and business models. This will require businesses to stay at the forefront of AI research and development and continually adapt their strategies to leverage the latest advancements (Ransbotham et al., 2018).

6.2 Emerging Trends in AI-Driven Innovation

Predicting the technical advancements that will drive Gen-AI capabilities is difficult. It will draw on advanced mathematical concepts, as well as ethical and fairness principles. This field of human-centric technology, grounded in legal compliance, will grow. AI will make more decisions in dynamic, complex, real-time situations. This will involve collaboration between businesses, governments, and academia to create ethical guidelines and standards for AI use (Jobin, Ienca, & Vayena, 2019).

6.3 Long-Term Potential Impacts on Global Economies

The long-term impact of generative AI on global economies could be profound. AI could drive significant economic growth by increasing productivity, creating new industries, and enabling more efficient use of resources. However, this growth will not be evenly distributed, and AI could exacerbate existing inequalities within and between countries (Korinek & Stiglitz, 2017).

Governments and international organizations must implement policies that promote inclusive growth to ensure that AI's benefits are shared broadly. This may include investments in education and training, support for small and medium-sized enterprises, and measures to ensure that AI-driven innovation benefits all segments of society (Acemoglu & Restrepo, 2018).

7. CONCLUSION

Generative AI is indeed next-generation technology. It is helping us solve problems that just a few years ago were unimaginable. Gen-AI technology has demonstrated that AI can think creatively, act independently, observe silently with attention, and respond instantaneously. Now we must ensure it is ethical, fair, and able to address legal challenges, given that no universally accepted definitions exist for ethics, fairness, and trustworthiness

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