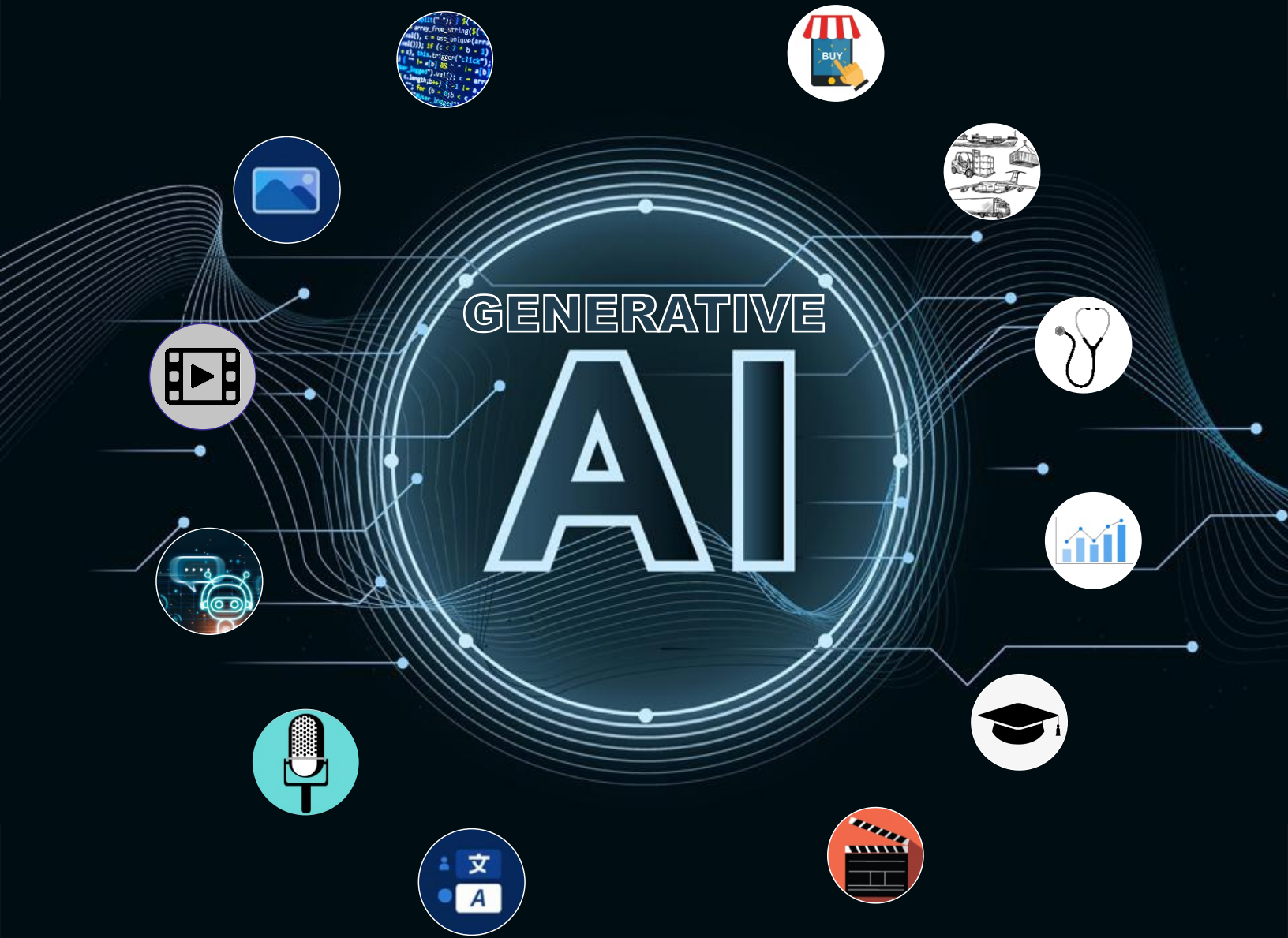


Generative AI: Machines turning creative



Enables content creation in response to natural language prompts

Potential to enhance workforce productivity along with customer experience

Challenges galore but future looks replete with opportunities

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Generative AI has emerged as a disruptive technology that can potentially help corporates improve productivity while vastly improving customer experience as well. As of now, major use cases and financial benefits of Gen AI fall in sales, marketing and customer support with software engineering expected to rise sharply. We expect sustained adoption of the technology across industry verticals under manual supervision in the short-term and independently later as trust on the technology rises. More use cases will be explored over time as training data accessibility and the cost of computation move favourably.

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Generative AI: Machines turning creative

Generative Artificial Intelligence (Gen AI) has gained worldwide attention all of a sudden but the technology has been in the works since 1940s when first mathematical model of a neural network was published. The large language models (LLMs) at the core of gen AI expansion are a concoction of natural language processing, neural networks and deep learning and have gained traction as cloud computing and graphics processing units (GPUs) become more practical. In comparison to earlier advances in AI that focused on automating physical work, Gen AI is likely to ramp up automation in knowledge work due to its capabilities with language (both human and computer). In layman terms, Gen AI enables reproduction of content in text, audio, video or software code format in response to a prompt in natural language or image. Some of the initial work is led by native Gen AI companies such as OpenAI, Anthropic and Cohere but 'big-tech' has caught up rapidly either through their in-house initiatives or through stake acquisition in some of these companies.

In comparison to the other two recent disruptive technologies (cryptocurrencies and metaverse) that have gained massive public attention, we believe Gen AI is the one that is likely to see the highest adoption due to the quantifiable productivity enhancement it enables. Recent surveys indicate that business leaders across the globe are evaluating ways to prepare their organisations for Gen AI with sales, marketing and customer support departments likely to see the maximum impact. While there are genuine concerns with regards to data privacy, bias and potential job losses, we believe that global governments will need to instil the right guardrails to ensure that the technology is used for the right purposes. Concurrently, private sector should play its part in retraining and upskilling the workforce. An MIT study estimated 50% increase in productivity from Gen AI compared to 35-40% during 1900-1940 due to electricity and 10-15% due to internet during 1995-2005. On page 23, we have shared our views on how each of the listed internet businesses in India can deploy Gen AI as an effective tool.

Slowly at first, then all at once

With research on creating human-like artificial intelligence going on since Turing test in 1950, this has been a long journey with years of comprehensive pause. However, since the launch of ChatGPT in Nov'22, we have seen rapid developments globally as major companies such as Google, Microsoft, Facebook etc. have launched their own LLMs and NVIDIA stock surged ~250% YTD due to expectations of massive demand for GPUs. Next stage of this evolution involves corporates creating domain-specific LLMs by fine-tuning with internal data on top of already trained base LLMs. Simultaneously, India has seen rise of native Gen AI startups that are working on application layer for end consumers.

Ethical and social implications to be considered

As Gen AI responses are determined by data it is trained on and the technology is not capable of deliberate reasoning yet, there remain substantive chances of bias and discrimination. Furthermore, the technology in wrong hands can also result in misuse such as deepfakes and phishing attacks. Some industry leaders have even compared AI to nuclear weapons considering the broad scope and urged for regulation. Such implications entail the need for global governments to come together in preparing safeguards, disclosures and prohibition of use cases that can result in mass scale manipulation. Businesses would also be required to innovate at scale and create solutions that protect against the harmful usage of Gen AI, similar to how antivirus software was created to protect against computer hacks.

Expected to drive automation in knowledge work

In comparison to applied AI attempting to automate the work of lower income employees through computer vision and robotics, Generative AI can use its creativity to automate standard tasks across knowledge work in fields such as law, healthcare, education, software code, marketing and even art. While the hallucinations seen in Gen AI imply that manual supervision would be needed but there has emerged an increasing acceptance of higher automation and quicker human-like capability development in the near future. These advances can potentially endanger jobs for certain sections of the workforce but the simultaneous productivity improvement can generate more fulfilling opportunities with retraining and upskilling.

Challenges galore but future is full of opportunities

As is expected with any new disruptive technology, there remain multiple challenges for Gen AI growth such as data privacy, mistrust, societal impact and lack of computing power. However, we are at the cusp of a significant change similar to graphical user interface that enabled us to interact with machines through icons, buttons and machines instead of writing a code. As computation costs decline, Gen AI is expected to not just improve workforce productivity by becoming a copilot but also help find solutions such as drug discovery and remote healthcare/education. Further, if and when Artificial General Intelligence is achieved, the software would become capable of deliberate reasoning and learn itself with self-generated prompts without any manual supervision. This technology is just coming up and ubiquitous use cases would emerge overtime.

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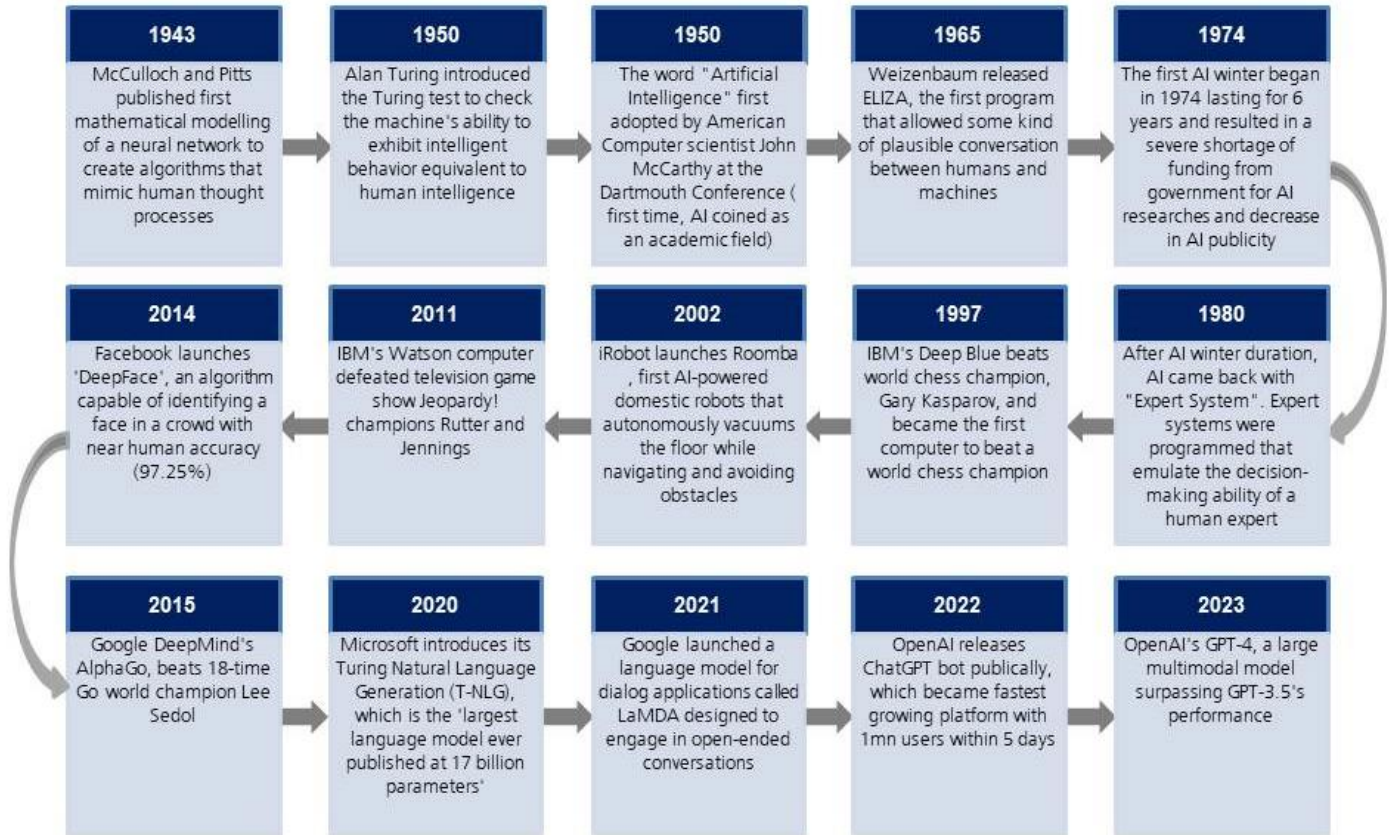
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Please see Appendix I at the end of this report for Important Disclosures and Disclaimers and Research Analyst Certification.

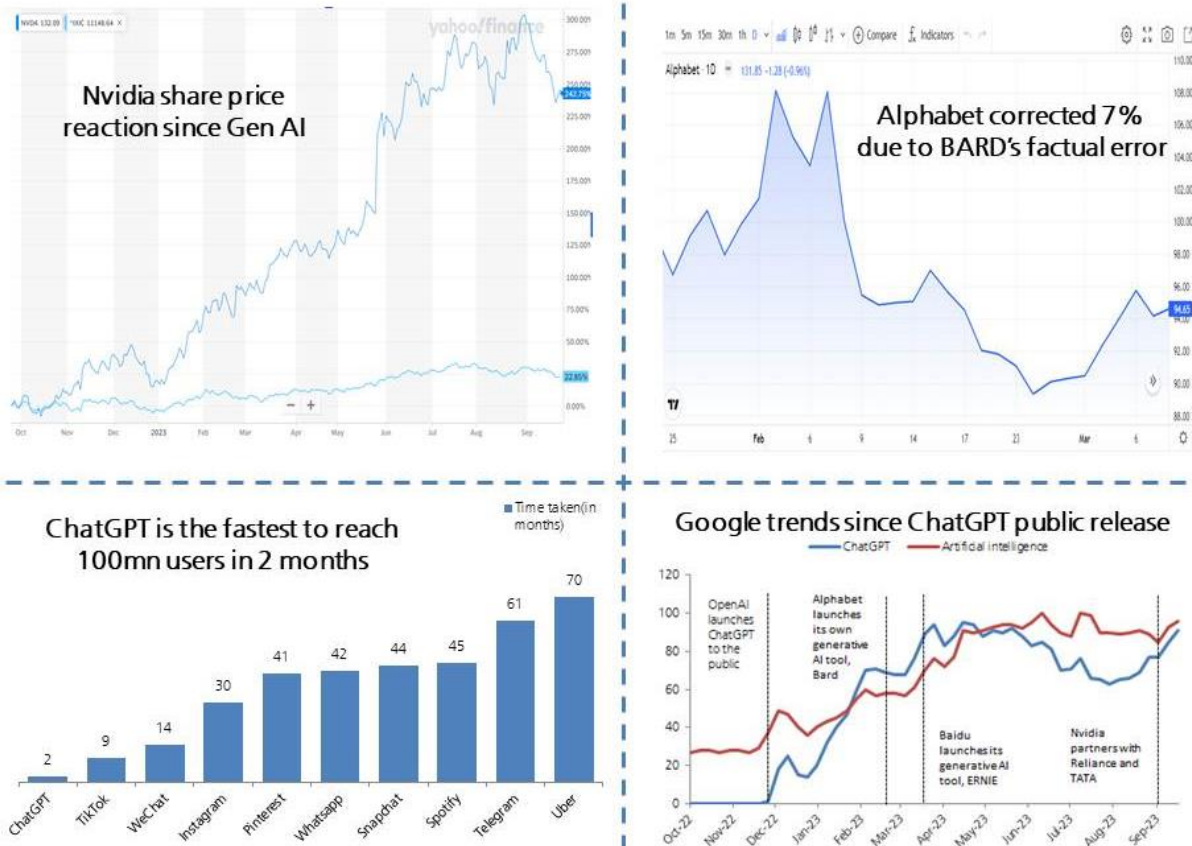
Key Exhibits

Exhibit 1. Though most attention has come in the past year, Generative AI has been half a century in making



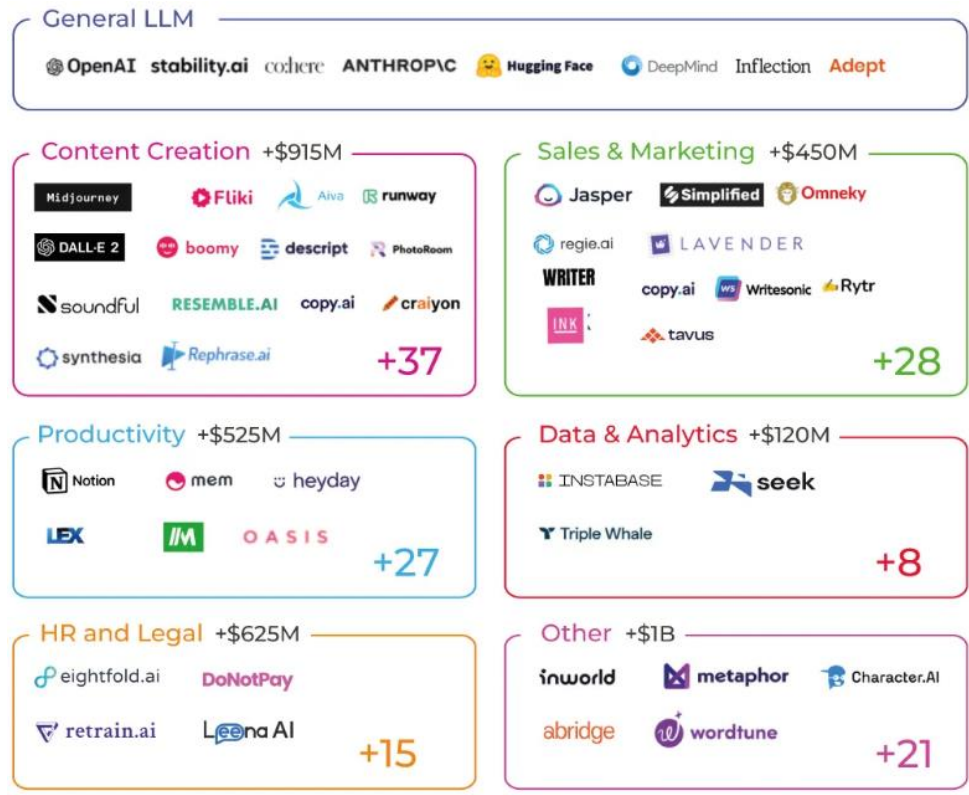
Source: Industry, JM Financial

Exhibit 2. Though less than a year since gaining market attention, Generative AI has been making its mark



Source: Industry, JM Financial

Exhibit 3. Generative AI ecosystem applications for end-users



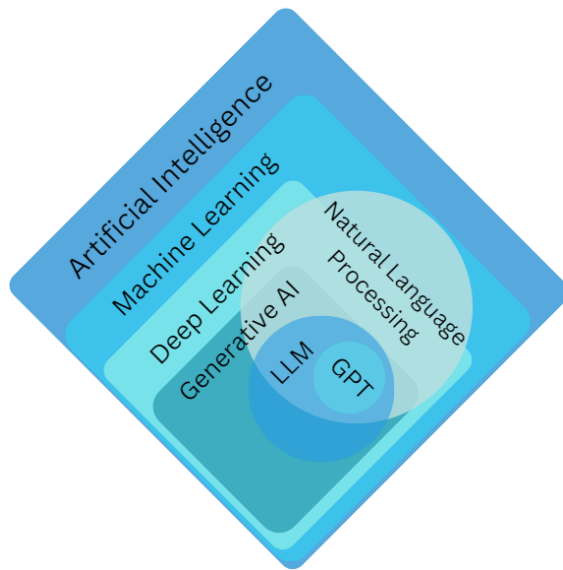
Source: SokoSolutions and Unigram Labs

Exhibit 4. Business leaders' survey on estimated impact of Gen AI (%)



Source: McKinsey Analysis

Exhibit 5. Gen AI LLMs are a fusion of neural networks, NLP and deep learning



Source: Industry, JM Financial

Exhibit 6. Challenges for generative AI startups in India

Capital Requirements	Inability to secure adequate funding for cost-intensive research and development
Data Availability	Insufficient high-quality data at a substantial scale for training models
Computational Resources	Significant computational power required for running complex generative models, which is a costly affair
Regulatory Compliance	Adherence to rapidly evolving regulations and standards pertaining to AI technology
Workforce	On-boarding and retaining AI researchers and engineers from a limited talent pool
Monetization	Lack of clarity around a revenue-generating business model

Source: JM Financial

Exhibit 7. Likely impact on industries will depend on a variety of factors

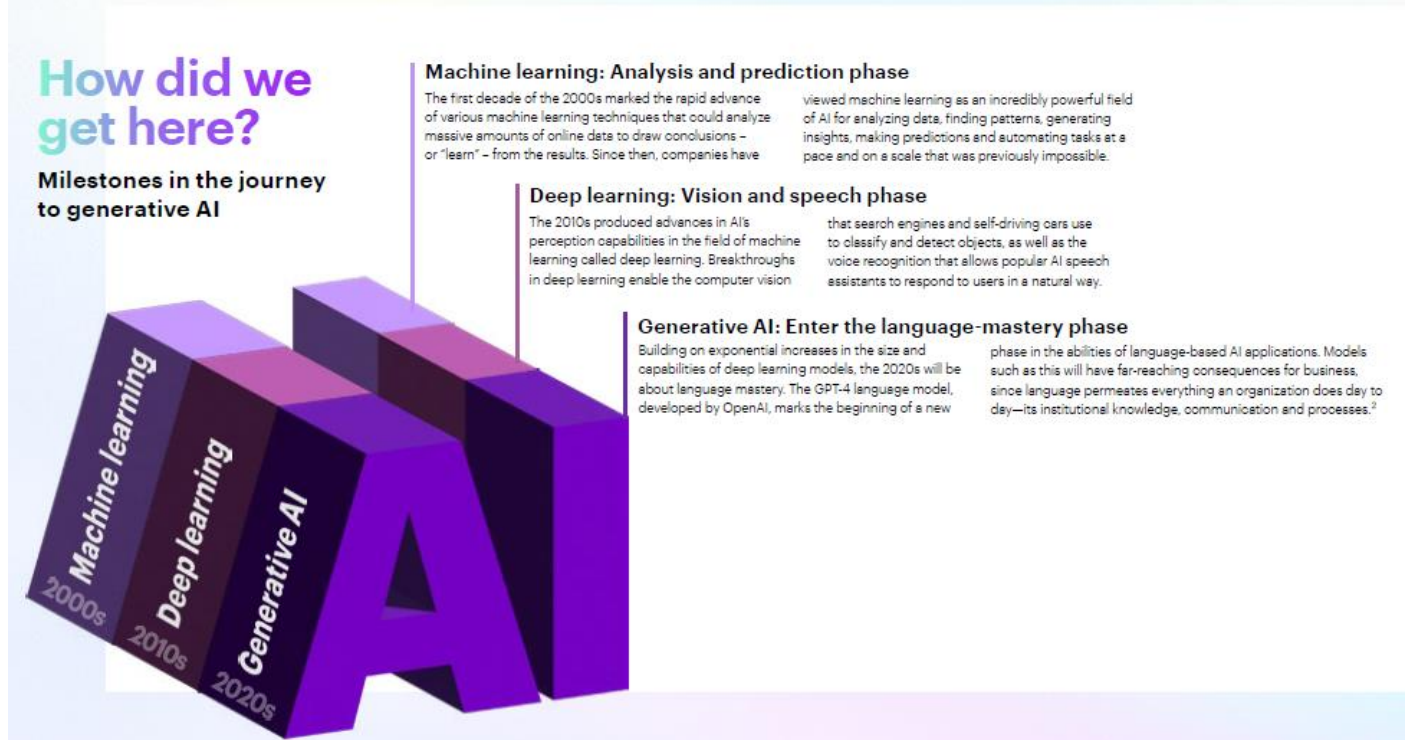
	Law firms	IT services	Consulting	Financial Services	Manufacturing	Healthcare
Share of digital products / services	Low	High	Low	Low	Medium	Medium
Share of knowledge work	Low	Low	Low	Low	Medium	High
Share of repetitive work	Low	Medium	Medium	Low	High	Medium
Commodity nature of products?	Medium	Low	High	Low	Low	Low
Regulatory freedom	High	Low	Low	Medium	Low	High
AI surprise factor	Low	Medium	Medium	High	High	High
Overall impact of Generative AI	Low	High	High	Low	Medium	Medium
		High	Medium	Low		

Source: JM Financial

What is Generative Artificial Intelligence (Gen AI)?

Artificial Intelligence (AI) has been ramping up its presence around us slowly and steadily, starting with machine learning (ML) to interpret and analyse data followed by breakthrough in speech and vision-enabled technologies (think of Siri, Alexa and autonomous driving) in the 2010s. **Generative AI refers to a category of AI algorithms that uses techniques such as deep learning and artificial neural networks to create original outputs by learning from the data during the training process.** It has caught its fair share of attention as ChatGPT (by OpenAI) has sparked a wave of curiosity due to its ability to understand language complexity, including context and intent, and has also become independently generative and creative. OpenAI is not alone as Google, Facebook, Alibaba and others are all training their own versions. In comparison to language processing by artificial neural networks earlier, which were capable of learning from raw data but forgot the start point by the time they ended the sentence, GPTs (generative pre-trained transformers) are a notch above as the attention mechanism learns patterns and structures from existing data to produce stories, music, images, videos, 3D rendering and even computer code.

Exhibit 8. Gen AI milestones



Source: Accenture - A New Era of Generative AI for Everyone

Understanding Building Blocks of Gen AI

Machine Learning uses algorithms to parse data, learn from the patterns in it and perform a defined task (narrow AI).

Artificial Neural Networks (ANNs) refers to a deep web of layers, with directions of data propagation, of digital calculators known as “neurons” than can absorb pools of unstructured data.

Graphical Processing Units (GPUs) are chipsets that help create computer graphics in gaming but have found rapid adoption in deep learning due to their ability of fast and cheap parallel processing. ANNs were almost unfeasible and impractical until GPUs were used.

Deep Learning is an advancement of machine learning that uses ANNs with parameters that can be trained to make sense of unstructured data and learn from it.

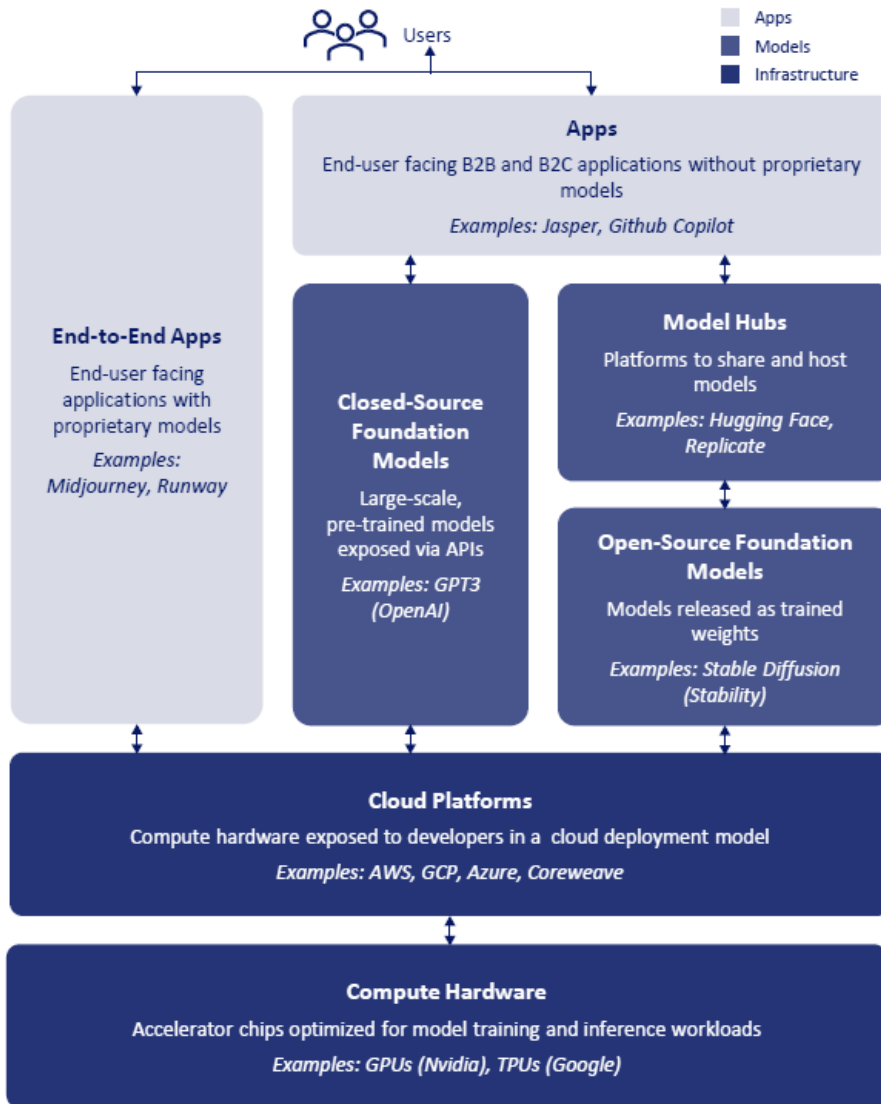
Foundation Models are deep learning models capable of delivering a wide array of responses basis their training on extensive unstructured, unlabelled data.

Large Language Models are transformer-based foundation models that can process vast amounts of unstructured text and learn the context between words or portions of words (tokens) and hence generate natural-language content.

Generative Adversarial Network (GAN) is a deep learning architecture that consists of two neural networks competing against each other to create realistic results and is able to analyse, capture and copy the variations in a dataset.

Data centres are large groups of networked computer servers for remote storage, processing and distribution of large amounts of data.

Exhibit 9. Generative AI tech stack



Source: Nasscom

How can Generative AI help?

Generative AI has gained rapid adoption across industries as it helps companies in:

1. **Cost reduction** by automating repetitive job functions and hence requiring lesser manpower.
2. **Efficiency enhancement** as the executives have an assistant on call that automates the standard tasks and saves time.
3. **Revenue growth** as it enables effective targeting and hyper-personalisation with AI trained on huge sets of captive data.
4. **Heightened innovation** as it can rapidly iterate content to suggest initial drafts for marketing campaigns, computer code and even 3D models.
5. **Rapid scaling** as the technology can analyse a large volume of data rapidly and deliver results across dispersed geographies.

Companies leading the charge

- **OpenAI:** Microsoft-backed OpenAI disrupted the tech industry with the launch of ChatGPT in Nov'22. Within the first 2 months, ChatGPT gained over 100mn users, significantly faster than Tiktok in 9 months. OpenAI has also developed text-to-image models such as DALL-E and is currently working on integrating these Gen AI tools effectively. It hasn't been a smooth ride for OpenAI as recently it has been sued for copyright infringement by many well known authors for using their books to train AI models. Also, GPTbot, a web crawler designed to collect data to improve AI models has been blocked by 15% of the "Top 100" websites including Reuters, Amazon, Quora, and NYTimes to name a few. The company has still continued to drive innovation and has recently enabled multimodal and web browsing capabilities in GPT4 while also launching Dall-E 3.

Exhibit 10. DALL-E generated image using a prompt generated with help of ChatGPT



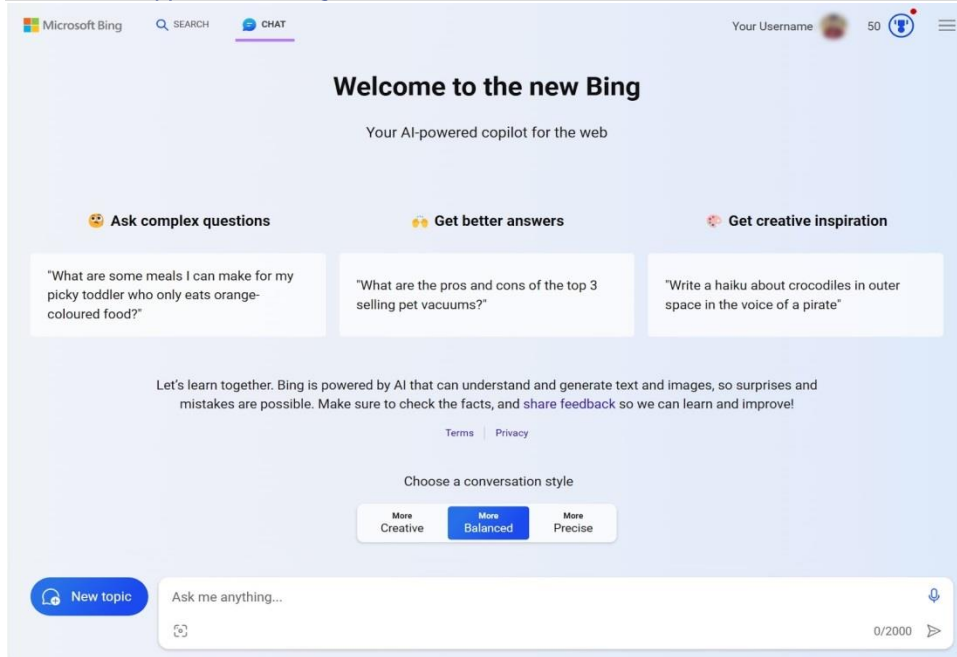
Source: arSTECHNICA

- **Google:** Google launched its own Gen AI tool 'Bard' in Mar'23 to compete with ChatGPT. The key difference between ChatGPT and Bard is that Bard has access to Google images, which enables it to incorporate images into responses whereas ChatGPT's basic versions don't have such a feature though ChatGPT plus (costs USD 20 per month) can use plugins to incorporate images in results. Besides investing in many Gen AI startups, Google has also solidified its position with a vast portfolio of tools such as MusicLM (text-to-music), SingSong (creates instrumental music to assist input vocals), and Studio Bot (Coding assistant).. Furthermore, Google has built a comprehensive AI platform, Vertex AI that enables users to build, deploy and scale machine learning models while providing access to 100 foundation models that include home-grown models such as PaLM, Imagen, Codey and Chirp as well as Meta's Llama 2 and Anthropic's Claude 2. Google also announced a custom silicon, TPU v5e, hosted on Google Cloud for Gen AI models.
- **NVIDIA:** Generative AI tools' output depends on the amount of dataset used for model training. These LLMs have robust hardware requirements and currently NVIDIA has taken a lead in this space with its data centre GPUs being used to perform advanced AI tasks. To build on this strength, NVIDIA has further developed its own LLM named 'Nemo Megatron'. On the back of increased demand for AI chips, NVIDIA's revenue has gone up significantly during the past quarter. It has been actively collaborating with many global companies such as Adobe, Google, Medtronic as well as Indian companies such as Infosys, Reliance and TATA to further deepen its hold in this space.
- **Meta:** Meta has launched its own Gen AI tool 'Llama' in Feb'23 to stay in the race. Meta CEO & founder Mark Zuckerberg has announced that Gen AI will be integrated into all of Meta's products such as Whatsapp, Instagram and Facebook (currently it includes AI-generated stickers and AI powered-virtual assistant). Compared to earlier earnings calls when metaverse used to be the primary focus topic, the latest earnings call saw that

being replaced by Gen AI. Meta has been ramping up in the Gen AI space with text-to-audio (AudioCraft) and text-to-image (CM3leon, which needs five times less training computing power as per company). Meta is also facing copyright infringement lawsuits from various authors.

- **Microsoft:** Being one of the early movers in the generative AI space, Microsoft integrated ChatGPT to its Bing search engine in Feb'23. Since then, the company has diversified its Gen AI tools portfolio with Bing Image creator, GitHub Copilot, and Microsoft Viva sales. Microsoft has been constantly backing OpenAI and had invested USD 11bn by 2023. The company's CFO Amy Hood has indicated that in the near-term investments into AI will come at a cost but will give [huge return](#) on investment in future. Recent [media reports](#) have suggested that the company is also looking to build an AI chip similar to NVIDIA's GPUs.

Exhibit 11. Snippet of new Bing chat interface



Source: Microsoft Bing

- **IBM:** IBM recently launched its next generation AI and data platform 'watsonx', which helps enterprises to integrate AI in their businesses. Watsonx has a studio for new foundation models, generative AI and machine learning, which helps businesses to create, deploy and manage both traditional and generative AI that can adapt to new scenarios. IBM has partnered with Meta to host the Llama 2-chat 70 billion parameter model in the watsonx.ai studio. A few of the industry leaders such as Intel, Samsung SDS, etc., have partnered with IBM to incorporate watsonx in their businesses.
- **Alibaba:** Alibaba launched its own open source LLM, Tongyi Qianwen (meaning seeking truth by asking thousand questions), in Apr'23 to compete with the likes of OpenAI and Meta. Tongyi Wanxiang (meaning tens of thousands of images) launched in Jul'23 is a text-to-image Gen AI model that will be powered by the company's proprietary text-to-image diffusion model 'Composer', that is focused on industry specific applications and will understand prompts in Mandarin and English. Alibaba Cloud also launched ModelScopeGPT, an interface to link together over 900 AI models to perform tasks efficiently.
- **Baidu:** China's search giant, Baidu, introduced its chatbot 'Ernie' in Mar'23 but it only got government approval for public release in August as China had mandated regulatory approval for Gen AI tools. Baidu became the first Chinese company to get approval for public release, which gives it an early mover advantage to fine-tune its product compared to competitors. Baidu plans to launch a suite of new AI-native apps in the near future.

- **Anthropic:** Founded by former OpenAI members in 2021, Anthropic has developed its own foundation LLM, 'Claude'. It is currently a leading startup in foundation LLMs and chatbot development domain besides tech giants such as Meta, Google, and Microsoft. So far, this company has raised USD 1.25bn from the likes of Google, Microsoft, Zoom, and SK Telecom Ventures with Amazon stepping in recently as a strategic investor with USD 4bn investment. The company plans to build a frontier model 'Claude-Next' described as "next-gen algorithm for AI self-teaching" that will be 10 times more powerful than any of today's existing models and for that it plans to raise ~USD 5bn over the next 2 years.
- **Cohere:** In the space crowded by global tech leaders, very few startups have managed to make an impact. Founded in 2019, Cohere specialises in building and training cloud agnostic LLMs that can be used by enterprises for their applications. Even during the recent startup-funding winter, investors have been keen on investing in generative AI space especially in startups providing foundation models. Cohere has raised USD 445mn in total, including investments from big companies like NVIDIA, Oracle, and Salesforce. The company recently launched Chat API that can help knowledge assistant or customer support chatbots in a simple and reliable manner.

Exhibit 12. Major companies across the globe are adopting Gen AI in multiple use cases

Meta's big generative AI bet: Chatbots, AI characters, creative tools, and more

Facebook parent Meta heats up AI arms race by bringing a slew of generative AI feature to its apps that billions of people use, including Instagram and WhatsApp

VIKAS SN | SEPTEMBER 28, 2023 / 06:19 AM IST

Infosys and Microsoft collaborate to provide cutting-edge AI solutions

By Linika Ghosh • September 27, 2023 • 2 Mins read

Retailers Around the World Embrace Generative AI: Survey Shows that More than 90% of Retailers Plan to Increase AI Investment

September 28, 2023 09:00 ET | Source: Lucidworks, Inc.

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Generative AI Generation Gap: 70% Of Gen Z Use It While Gen X, Boomers Don't Get It

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Sep 9, 2023, 04:26pm EDT

From physics to generative AI: An AI model for advanced pattern generation

Inspired by physics, a new generative model PFGM++ outperforms diffusion models in image generation.

Rachel Gordon | MIT CSAIL
September 27, 2023

How generative AI is fueling product development



Sanjay Kukreja • ETCIO
Updated On Jul 15, 2023 at 05:47 PM IST

Read by:
915 Industry Professionals

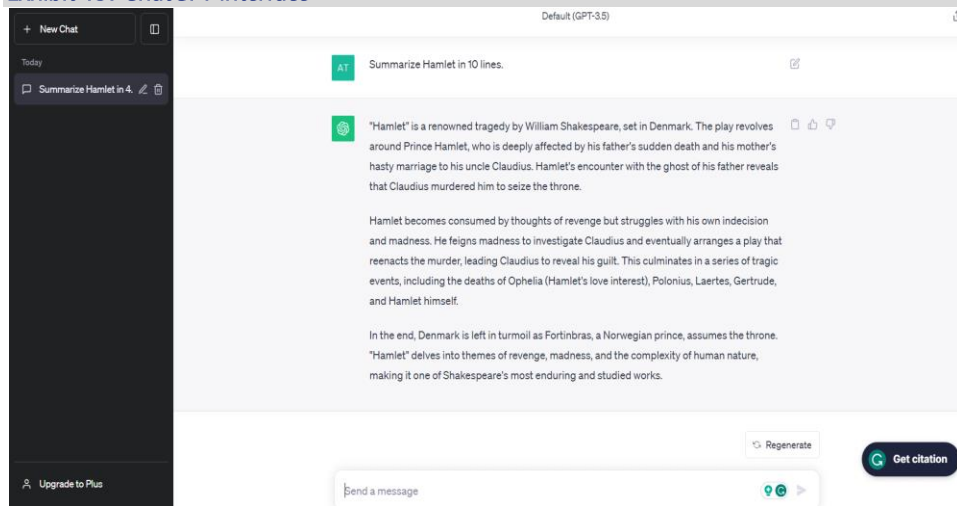
Source: Industry, JM Financial

Key Generative AI tools

As of Jun'23, over 200 businesses have received USD 25bn+ in funding over the past five years across foundation and application layers.

ChatGPT: Built by OpenAI, this is the most popular natural language chatbot tool so far, which generates human-like responses to given prompts or questions. As ChatGPT is only trained on data before Sep'21, OpenAI recently announced that with new 'Browse with Bing' update, ChatGPT bot will search the internet for the response (currently available to Plus and Enterprise users but will be rolled out to all users soon). With new update, ChatGPT can also be used as a voice assistant similar to Alexa, though it will be much more powerful and dynamic. Company plans to incorporate the recent iteration of its text-to-image model 'DALL-E 3' into ChatGPT. With API, developers can embed ChatGPT functionality into their own apps and products. OpenAI has released its paid plan 'ChatGPT Plus' (trained on GPT-4) which even lets users include images in prompts. Furthermore, the company launched 'ChatGPT Enterprise' in Aug'23, which lets companies train it on their own business data for customisation. ChatGPT can be used for multiple purposes from content creation to translation, coding, and research.

Exhibit 13. ChatGPT interface



Source: chatgpt.openai.com

Stable Diffusion: Developed by Stability AI, Stable diffusion is a text-to-image generative AI tool that uses the idea of "diffusion" to produce pictures. It begins with a random noise image and gradually improves it through a number of processes to get a coherent and aesthetically pleasing outcome. Users can train their own models using their own datasets and adapt the image generation process to suit their particular requirements.

Exhibit 14. Stable Diffusion generated image with the prompt - Liquid metal drops with steam bouncing off of an open MacBook Pro



Source: Clippedrop by Stability.ai

DALL-E: DALL-E is a generative AI technology developed by OpenAI that enables users to create new images from text prompts. It can not only generate photorealistic images but also create paintings or emojis. DALL-E can be used in a variety of sectors. It can be used to create visuals that explain various topics in the field of education and to produce distinctive and innovative visuals that can be used in advertising and marketing to draw in and hold audiences' attention, and in product design to quickly visualise new ideas.

Exhibit 15. DALL-E generated image with a prompt -a bowl of soup that is a portal to another dimension as digital art



Source: labs.openai.com

Midjourney: Similar to DALL-E, Midjourney is a generative AI tool that generates images from natural language prompts. Midjourney has gained popularity for its ability to create striking and unique artwork that can even be used for creating gaming / movie characters. Unlike several other AI art generators that work on browsers or through APIs, Midjourney currently operates as a Discord bot, requiring users to interact with it through the Discord platform. Midjourney tool costs USD 10-120 per month, depending on the plan.

Exhibit 16. Midjourney generated image with a prompt - Star Wars' Darth Vader in cyberbunk getup

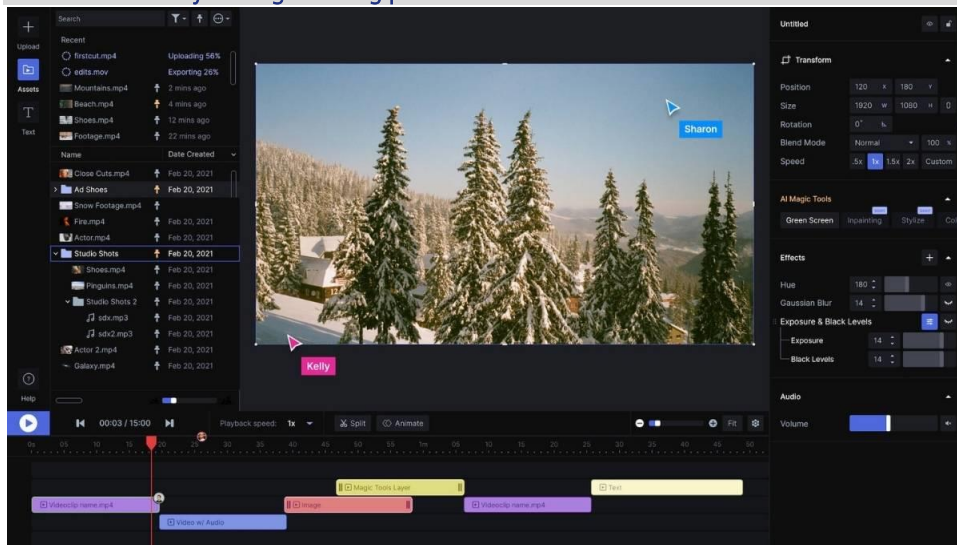


Source: androidauthority.com

Jasper: Launched in Jan'21, Jasper is a text-to-text/image generative AI tool, which helps users in high quality content creation to improve their productivity. It has multiple usecases for content writers and bloggers, marketing professionals, academic writers, business professionals, developers across various industries. It is powered by GPT-4 model and can generate content in 26 languages. Jasper tool costs USD 39-99 per month, depending on the plan. It is currently industry leading in copywriting Gen AI tools and raised over USD 143mn in funding.

Runway: The co-creator of Stable Diffusion, Runway launched their own video-to-video generative AI tool that uses words and images to generate new videos out of existing ones. Company recently unveiled their Gen-2 runway, which is a multimodal text/image/video-to-video Gen AI tool. This tool has huge potential to transform film production industry as it can help in automating many of the manual tasks like creating visual effects, post-production editing such as colour grading, animations to name a few.

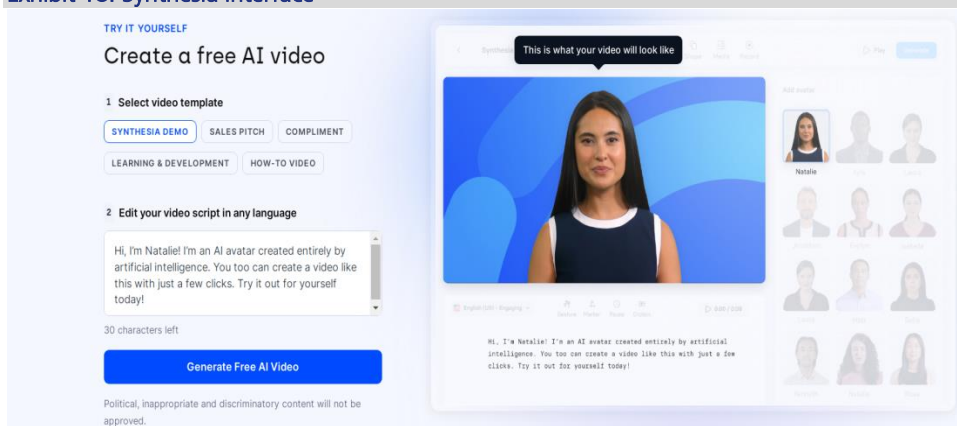
Exhibit 17. Runway video generating process



Source: runwayml.com

Synthesia: Video content creation has been a complex, time and capital consuming process that requires investment in audio and video equipment. But Synthesia, a text-to-video generative AI tool, lets users create video content without the need for camera equipment or design skills. This tool has multiple usecases for digital content creators, marketers, bloggers, learners, etc. Industry giants like Meta and Spotify have been early investors in this tool, with NVIDIA recently stepping in as a strategy investor.

Exhibit 18. Synthesia interface



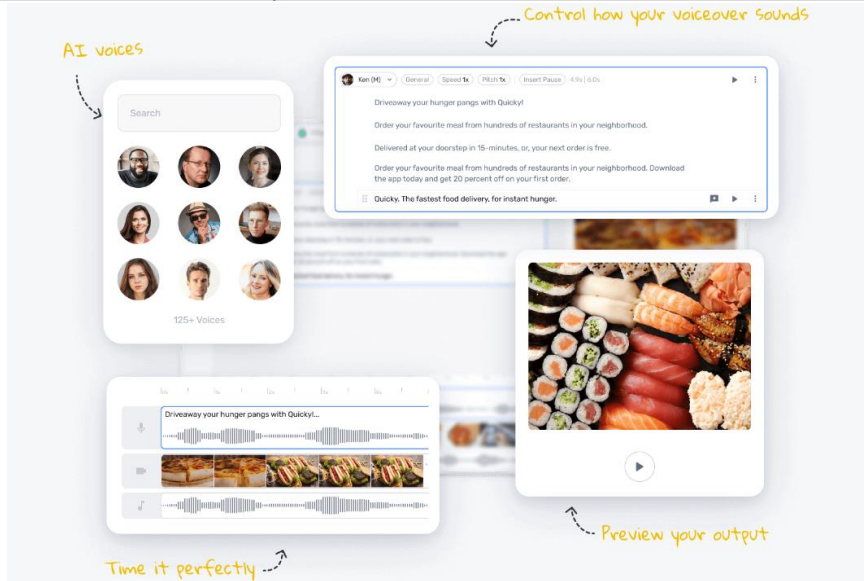
Source: Synthesia.io

AlphaCode: AlphaCode is a generative AI tool developed by DeepMind (subsidiary of Google), to generate code in various programming languages. Even though it's a long way for coding Gen AI tools to replace human programmers it can be effectively used to assist

humans in coding, debugging the codes as well as helping new developers quickly understand a large and complicated code base.

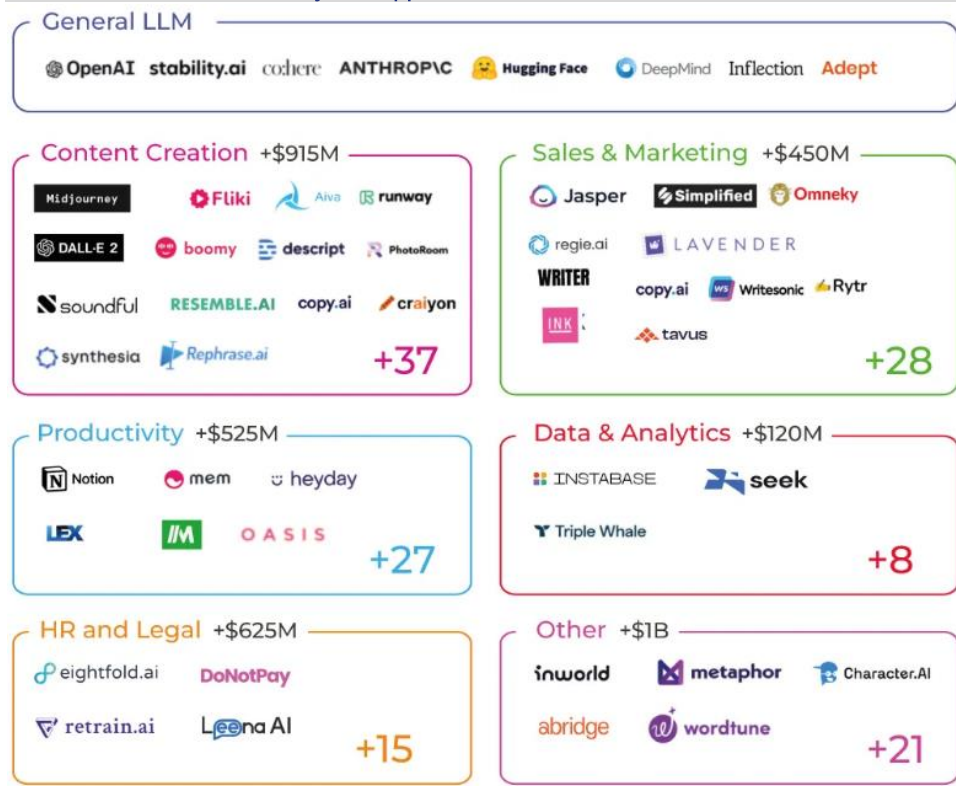
Murf: Murf is a web-based text-to-audio generation AI tool developed by Murf AI. Besides this, it also performs other functions such as voice cloning, voiceover, and voice changing. It has potential use cases for educators aiming to create e-learning videos and tutorials. Additionally, content creators can utilise it for producing audio and video content. Murf Studio's AI voiceovers can be used instead of a freelance voice artist.

Exhibit 19. Murf AI' voiceover process



Source: Murf.ai

Exhibit 20. Generative AI ecosystem applications for end-users



Source: SokoSolutions and Unigram Labs

Key Generative AI use cases for corporates

While Generative AI can have use cases across departments, Customer Support and Sales and Marketing could be the highest impacted functions. Most of these cases align to productivity improvement with relatively lower revenue improvement use cases foreseen.

Sales: Generative AI is likely to push boundaries of what can be achieved in sales. In comparison to the current approach, Gen AI can simultaneously scour social media, industry research, product pages and customer reviews. Generative AI can combine huge swathes of data such as demographic information, consumer behaviour and market trends to create customer segments. These customer segments can then be targeted via personalised outreach to generate high quality leads with high conversion rates through dynamic customer journey. Gen AI tools could ensure that the journey is bespoke for every consumer.

Marketing: Generative AI can potentially replace marketing agencies as it can generate initial drafts of brand advertising, social media posts and product descriptions. Tools such as DALL.E, Midjourney can be used for visual content generation. In multilingual countries such as India, Gen AI can also help with localisation of website or advertisements through low cost translation or dubbing. AI can also be used to perform A/B testing of various communications before launching at scale. Furthermore, it can then suggest the ideal platforms where brand dollars should be spent where the desired customer segments are likely to be most engaged. Gen AI can also improve conversion and lower cost through search engine optimisation (SEO) by synthesising key SEO tokens for performance marketers.

Exhibit 21. Business leaders' survey on estimated impact of Gen AI (%)



Source: McKinsey Analysis

Customer Support: Generative AI tools can become the always-on assistants for customer support executives, enhancing their efficiency and significantly boosting customer satisfaction. **1)** Gen AI chatbots can provide the first line of service 24x7 with contextual, human-like responses. As most customer queries are standard with factual responses, the chatbots should be able to resolve most of them with only the more complex queries reaching human executives. **2)** When these executives handle the query, they can receive real-time assistance with Gen AI tools continuing to listen to the calls and generating real-

time information quickly and hence reducing response time. **3)** Post the call, AI can generate transcripts for training or feedback and summary bullets for follow-up or further processing.

According to McKinsey research, at a company with 5,000 customer service agents, generative AI usage increased issue resolution by 14% and reduced time spent handling an issue by 9% while also lowering agent attrition by 25%.

Software Engineering: For Gen AI, computer language is just another language and hence coders can use generative AI tools to boost productivity by automating code writing, predicting and pre-empting problems while also being able to rapidly convert programming languages. Engineers can iterate on potential system design configurations and then get assistance from AI tools in generating drafts, finding prompts and navigating the database. These tools can then also test the code for any bugs by iterating self-generated test cases. Microsoft’s GitHub Copilot and Replit are being used by software developers for pair programming.

Research and Development: Product designers can use generative AI to iterate designs and also ideate more options as deep learning generative design tools can help with virtual simulation phase and also optimise test case for efficient testing, reducing the time to market. Foundation models are being used to generate molecules for chemicals and biotech companies and can also be used to design larger physical products.

Risk: Considering that generative AI tools can process a large amount of text, they can be used in banking and insurance companies as text modalities are prevalent in regulatory language. These tools can generate on-demand reports along with auto alerts in case of any violation.

Exhibit 22. Share of organisations using generative AI in given function (%)



Most regularly reported generative AI use cases within function, % of respondents

Marketing and sales	Product and/or service development	Service operations
Crafting first drafts of text documents 9	Identifying trends in customer needs 7	Use of chatbots (eg, for customer service) 6
Personalized marketing 8	Drafting technical documents 5	Forecasting service trends or anomalies 5
Summarizing text documents 8	Creating new product designs 4	Creating first drafts of documents 5

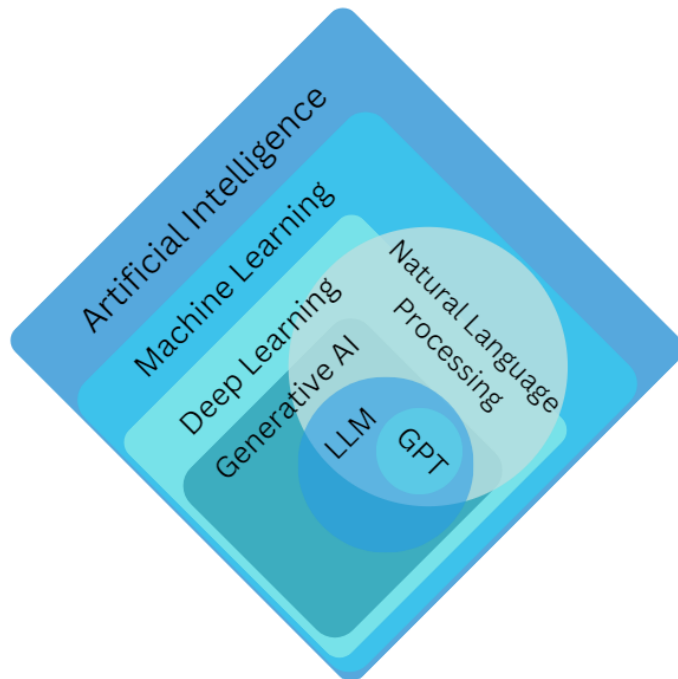
Source: McKinsey Global Survey on AI, April 11-21, 2023.

Generative AI vs Traditional AI

Artificial Intelligence is the broad term for intelligent machines that encompasses machine learning, natural language processing, neural networks and deep learning.

- **Purpose:** Traditional AI is primarily artificial narrow intelligence, which is trained to perform specific tasks with predefined rules and patterns. Generative AI creates new, original content in response to natural language prompts or images based on the existing data that it was trained on.
- **Training environment:** Traditional AI is trained on labelled data with well-defined inputs and outcomes. Generative AI undergoes reinforcement learning from large datasets without specific task labels, gaining the contextual awareness on its own.
- **Data requirement:** Traditional AI uses relatively smaller datasets to train the model for specific tasks such as voice or image recognition, or recommendation based on preset objectives. Generative AI requires as much data as possible in order to create new content that did not exist in the training data.
- **Outcome:** Traditional AI is used for well-defined tasks such as object recognition, recommendation system, and sentiment analysis based on the predefined rules learned during training. Generative AI can be used for imaginative tasks such as image creation, music composition, etc., with a level of unpredictability.
- **Complexity:** Traditional AI models are relatively less complex due to clear objectives and criteria while generative AI models are far more complex as they are designed to be creative and versatile.
- **Examples:** Traditional AI in the real world is seen in email spam filters, e-commerce recommendation systems, virtual assistants such as Siri or Alexa and chess-playing programmes. Generative AI in the real world is seen in AI-generated pictures, text, music and video, immediate summaries of long calls / books and design of products.

Exhibit 23. Gen AI LLMs are a fusion of neural networks, NLP and deep learning



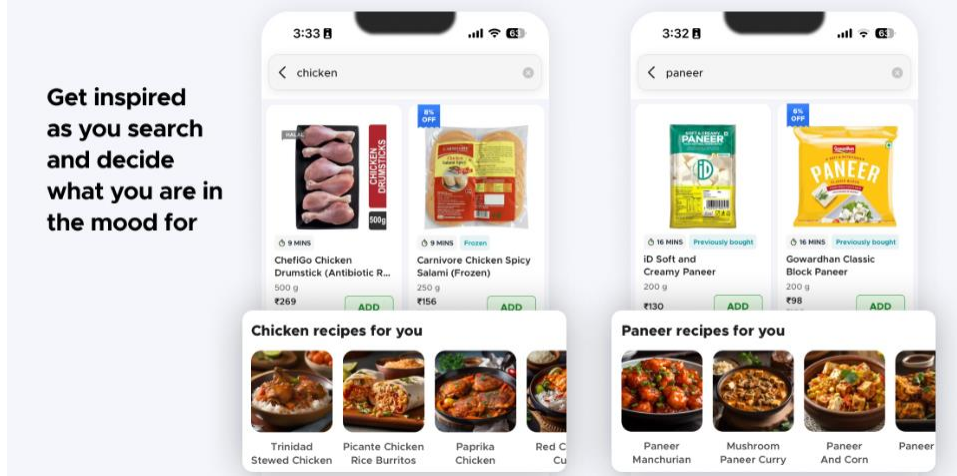
Source: Industry, JM Financial

Gen AI in India

While India certainly lacks a large language model of its own, Indian companies are investing in the application layer to make non-deterministic models work in production use cases. The ecosystem is relatively nascent and is replete with challenges as Indian companies tie up with global pioneers.

Zomato: Blinkit, the quick commerce platform of Zomato, has introduced 'Recipe Rover' driven by ChatGPT and Midjourney models. When a customer searches for a food item, the app displays multiple recipes related to that item. The food delivery giant also plans to integrate generative AI into customer interfacing features as well as in backend tools such as product photography, customer support, etc. With huge customer data at its disposal, Zomato has a lot of potential to integrate this curated data with LLMs and create more customer-friendly features.

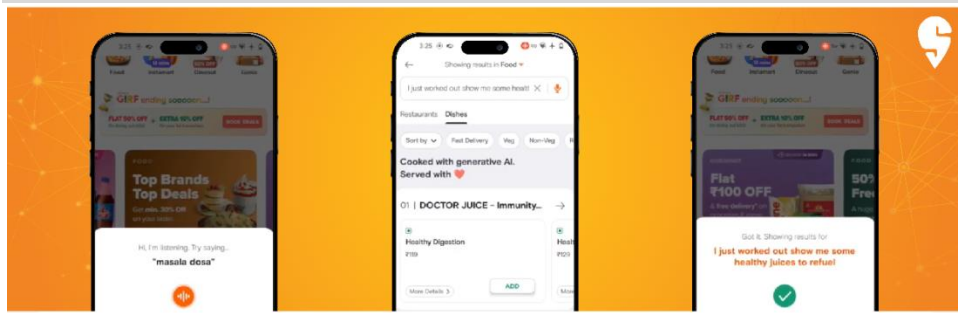
Exhibit 24. Blinkit's Recipe Rover interface



Source: blinkit.com

Swiggy: Swiggy's neural search that has been built using LLMs will use generative AI to respond to specific food-related terms and queries. Neural search will also support voice-based queries and will be integrated into swiggy Instamart also. The company is also planning to use generative AI for dineout conversational bot and building in-house LLM that will help restaurants and delivery partners for faster issue resolution.

Exhibit 25. Neural search



Source: swiggy.com

Policybazaar: This leading insurance-tech company has already been using AI-driven technology solutions for fraud detection using an AI-based risk framework that checks for liveliness and avoids deep fakes. It is also used for motor vehicle inspection, wherein the customer just has to create and upload a video of the vehicle and AI does damage assessment. Policybazaar has developed in-house capabilities for voice-to-text conversion, which is useful in gathering customer data; with generative AI this process can be further streamlined for better consumer behaviour insights.

BYJU's: The most valued Indian edtech startup BYJU's has launched BYJU's Wiz, which consist of three transformer models – BADRI (identifies strengths and weaknesses of students to provide personalised learning content), MathGPT (first-in-industry model to provide

accurate solutions for complex math problems) and TeacherGPT (personalised guidance and grading). The company's CLIO Dev Roy believes that BYJU's Wiz will bring in a new era of [hyper-personalised learning](#) and redefine the future of learning.

MakeMyTrip: MakeMyTrip has collaborated with Microsoft to use generative AI to introduce voice-assisted booking in Indian languages. It will help the user by offering personalised travel recommendations based on their preferences, curating holiday packages and booking them. The company's CEO Rajesh Magow expects generative AI integration to alter the landscape of travel bookings.

HealthifyMe: HealthifyMe has recently raised funding to invest in generative AI integration such as 'Ria', its AI-powered virtual nutritionist. The company is incorporating generative AI into its coach-facing system to provide personalised nutrition advice and increase productivity of nutritionist and trainers. The company's CEO Tushar Vashisht believes that the blend of [human coaching and AI](#) will help it in its mission to 'healthify' people.

Reliance: Reliance industries partnered with NVIDIA to develop AI supercomputing data centres, which can help in creating foundation large language models that can be trained on regional languages. The company's MD Mukesh Ambani expects that this sector will expand and is committed to create up to 2,000MW of [AI computing capacity](#). RIL plans to foray into semiconductor manufacturing, which can take care of supply chain needs for AI infrastructure.

Rephrase.ai: This bengaluru based text-to-video generation startup (founded in 2018) has raised total of USD 13.9mn so far. It works on B2B model with more than 15000 customers so far. The platform allows users to select/create high-quality avatars that uses input texts which is to be delivered in video. It also allows inputs like blog post, slide deck or essay. While most consumers normally choose to watch video to learn new information, most professionals express their ideas through text and rephrase aims to bridge that gap.

Blend: Founded in 2021, Blend is image and design editing startup that allows users especially ecommerce merchants to create and edit professional product visuals in less than a minute. Blend uses deep learning and generative AI technology to generate images instantly. Currently, it generates over a million designs each day and plans to scale five-fold in another year of operations.

InsurStaq: Founded in 2022, InsurGPT (Insurance specific LLM developed by InsurStaq.ai) is a conversation based assistant that responds to user queries on personal insurance. The app offers data-backed advice, insights from existing policies, and personalised recommendations for new policies.

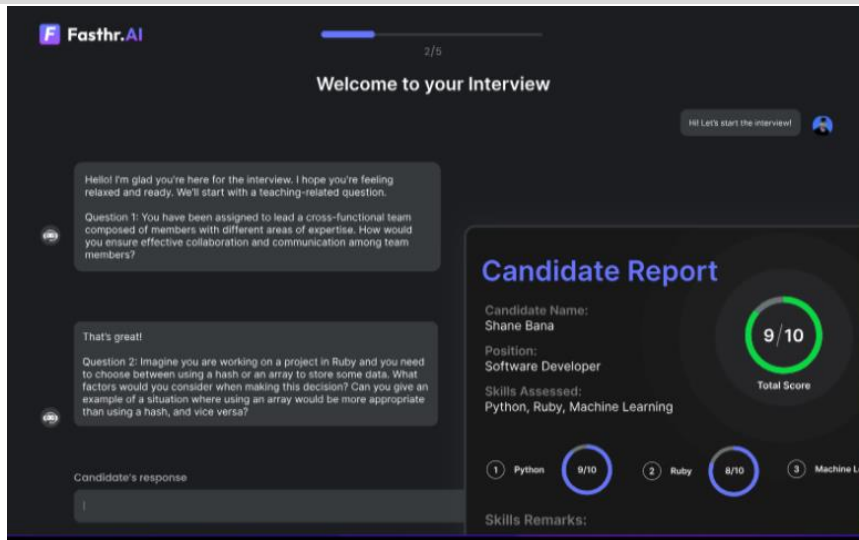
Exhibit 26. InsurGPT interface

The screenshot displays the InsurStaq.ai web interface. On the left, there is a 'Hospital Locator' section with a map showing 90+ network hospitals. The main chat window is titled 'ICICI Lombard's Health Policy' and shows a user asking 'Is cataract covered in ICICI Lombard's Health Policy?'. The AI assistant responds with a detailed answer: 'Yes, cataract is covered under ICICI Lombard's Health Policy. The policy provides coverage for expenses related to the treatment of cataract up to the sum insured limit. For example, if the sum insured limit is Rs. 10,000, then the policy will cover expenses related to the treatment of cataract up to Rs. 10,000. However, it is important to note that expenses related to the treatment of cataract within 90 days from the first policy commencement date shall be excluded unless they are pre-existing and disclosed at the time of underwriting.' Below the chat, there are three follow-up questions: 'Is Cataract covered in this Insurance Policy?', 'What are the Top-ups I can buy with this Policy?', and 'Does this policy cover...'. On the right, there is an 'InsurByte' section with a 'Byte-sized lesson on underlined Insurance Jargon' and three dropdown menus for 'What are Pre-existing...', 'What are Pre-existing Diseases?', and 'What is Sum Insured?'. The bottom of the interface features a search bar for asking questions about the policy.

Source: insurstaq.ai

Fasthr: Founded in 2022, Fasthr is a talent screening platform which uses GPT 4 as LLM and evaluates candidates to measure skills and on-job capabilities. It allows users to customise evaluation tests as per the job requirement. It also provides a detailed real time scorecard for recruiters.

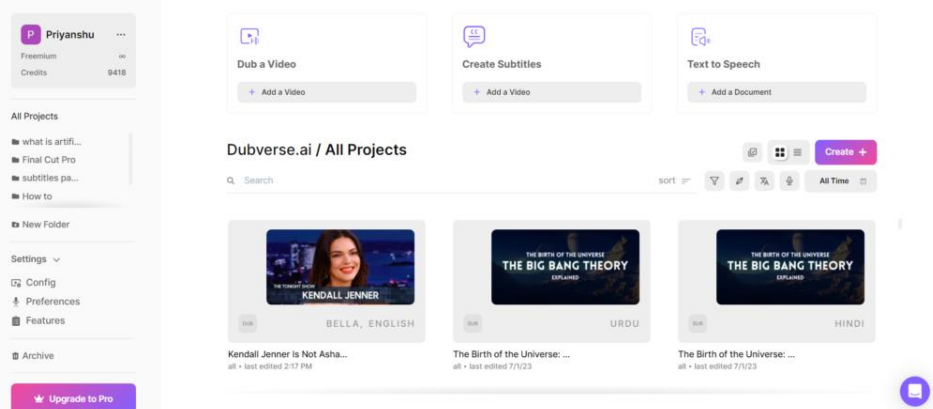
Exhibit 27. Fasthr interface



Source: fasthr.ai

Dubverse: Founded in 2020, Dubverse is a generative AI creator platform that provides solutions like subtitling, voice substitution, and video recreation. It allows users to use voices in various languages and voices, lip-sync videos, and subtitle videos. The company raised USD 800k in its recent seed funding round.

Exhibit 28. Dubverse interface



Source: dubverse.ai blog

Zpod: Founded in 2023, Zpod is a generative AI startup that generates creative ideas and drafts for effective LinkedIn posts from online articles. It allows users to create personalised posts reflecting their style in just a few minutes.

Tata Consultancy Services: TCS has partnered with Microsoft and Google to launch a suite of applications to provide generative AI solutions to various enterprises. TCS is constantly working on upskilling its workforce in the field of AI. The company's chairman N Chandrasekaran says that leveraging generative AI would further require [technology innovation](#) and investments, hence, he adds, the company will not reduce R&D spending on new tech projects like generative AI as he expects it to have a radical effect on industry.

Accenture: As many companies are looking to ride on the generative AI wave, many of them require external help to guide them in this process and that's where consulting firms step in. Considering this vast potential, Accenture recently announced USD 3bn investment in its data and AI practice, and extensive R&D to reinvent the service industry using generative AI. The company believes that generative AI will impact 40% of all working hours and will be a key

driver for [Total Enterprise Reinvention](#) (a deliberate strategy to achieve new performance frontier). The company also collated stats that show that 98% of executives believe Gen AI will be crucial to their strategy going forward and Accenture is already helping 100+ clients implement Gen AI projects across creating, automating, advising, protecting and coding.

Tech Mahindra: Tech Mahindra became the first IT giant in India to launch a generative AI studio that will have text, code, image, video, audio and data generation capabilities. The company is not only using Gen AI for internal purposes such as HR, marketing, and customer servicing but also provides AI solutions to various enterprises. It is keen on fostering new partnerships especially with startups or products with niche capabilities to build solutions involving advanced generative AI capabilities.

Ernst & Young: With rival consulting firms stepping in with huge investments, EY launched its own platform 'EY.ai'. The company had invested USD 1.4bn in the development of this tool and has partnerships with Microsoft's Azure OpenAI, Dell, IBM, SAP, etc. It plans to upskill its workforce in this space and release its own LLM called 'EY.ai EYQ'. EY Global CEO Carmine Sibio believes that [adoption of AI](#) is more than a technology challenge and it's about fully realising the potential of this technology evolution.

Exhibit 29. Compared to the USA and Israel, India is a relatively newer entrant

	India	USA	Israel
Total Funding in AI, 2013-2022	USD 8 Bn+	USD 249 Bn+	USD 11 Bn+
No. of Generative AI Startups, May 2023	60+	400+	70+
Total Funding in Generative AI Startups, till date	USD 590 Mn+	USD 22 Bn+	USD 1 Bn+
Generative AI Unicorns, till date	Nil	14	Nil
Foundation Models, till date	Nil	30+	2+
No. of Generative AI Startups funded, disclosed	30%+	65%+	60%+

Source: Nasscom

Exhibit 30. Challenges for generative AI startups in India

Capital Requirements	Inability to secure adequate funding for cost-intensive research and development
Data Availability	Insufficient high-quality data at a substantial scale for training models
Computational Resources	Significant computational power required for running complex generative models, which is a costly affair
Regulatory Compliance	Adherence to rapidly evolving regulations and standards pertaining to AI technology
Workforce	On-boarding and retaining AI researchers and engineers from a limited talent pool
Monetization	Lack of clarity around a revenue-generating business model

Source: JM Financial

Potential use cases in our coverage companies

Generative AI has the potential to absolutely change customer support, sales and marketing for companies while also enhancing efficiency to drive profitability. With use cases still evolving, it feels unlikely that any of these players will be disrupted but they will certainly need to evolve to generate most value out of Gen AI.

Affle: Affle is already helping its corporate clients discover, acquire and engage consumers through proprietary deep learning, AI-powered algorithms. With significant data on consumers, the company can potentially fine-tune Gen AI tools for in-house usage to run client campaigns, generate personalised content for users and immediately iterate depending on user response. These tools can also suggest user personas to target depending on the product and service offered by the clients. With Gen AI having multiple use cases in marketing, certain tools will help marketeers ideate and run brand campaigns but it's unlikely that they will be able to deliver customer acquisition RoI as delivered by Affle anytime soon.

CarTrade: CarTrade's core value proposition lies in massive auto-related digital traffic that is attained at minimal costs. The company can use Gen AI to further improve its search engine optimisation (SEO) capabilities and generate leads for partner auto OEMs. Further, the company also publishes auto-related content on its website and social media. Gen AI tools can not just help CarTrade draft the content but also show personalised versions to each visitor in his/her preferred language. Even video content can have vernacular versions through low-cost dubbing capabilities of Gen AI though it is still a work in progress for regional Indian languages. The company can also nurture the generated leads using automated chatbots, messages or emails to drive conversion while generating update reports on OEM marketing campaigns. For its remarketing business, it can use AI vision for inspections where the inspection reports can be automatically generated by Gen AI. Finally, there also remains certain probability of disruption with AI tools accessing internet to suggest potential vehicle models to the consumers basis their requirements as well as generating the needed comparisons on the tool itself.

Delhivery: Considering the complexity associated with logistics and the need for frequent status updates across the network, Delhivery can potentially incorporate Gen AI to enhance efficiency and automation across its business. Gen AI tools can identify complex patterns and correlations across large amount of data generated across Delhivery's value chain to extract key insights and trends. This can help the company in fleet planning along with automated chatbots to manage fleet-owners. While Delhivery has already built certain apps for route optimisation and geo tagging, Gen AI can take this a notch further as it can combine Delhivery's proprietary data with publicly available information. Finally, there will be potential to automate document processing, dynamic pricing and iterative 3-D model generation for loading trucks to optimise volumetric weights. On end-customer front, Delhivery can use image processing capabilities of generative AI for quality control when picking returns.

EaseMyTrip: Online travel agents (OTAs) such as EaseMyTrip help their consumers with trip planning, hotel and flight booking. Considering the B2C nature of the business, they require large customer support teams. The company can use Gen AI to handle a significant share of customer queries such as flight status, hotel amenities, check-in/check-out timings, reschedule and cancellation via automated chatbots and voice calling. Further, for hotel listings, Gen AI can help generate room descriptions as well as help users in writing reviews for their stay. Gen AI tools can also potentially disrupt OTA business, as they can suggest hotels to the travellers basis their preferences in a conversational format and also making the booking directly with the hotel. This takes away the traveller effort to search for the right hotel by searching on multiple OTAs and reading reviews.

IndiaMART: For classifieds businesses, Gen AI can be immensely helpful in creating quality listings by generating product description, specifications from the image itself. Considering the MSME nature of sellers on the platform, Gen AI virtual assistant can help these sellers with listing, pricing as well as buyer interactions and negotiations once connected. Gen AI tools, once enabled, can also track traffic and user behaviour data to suggest subscriptions pricing to the company. Gen AI can also become the always-on assistant for IndiaMART's sales fleet in coordinating meetings, taking notes, summarising meeting takeaways and follow-ups for their managers.

Info Edge: Comparable to IndiaMART, generative AI can help recruiters on Naukri create listings by helping with job description and eligibility criteria that can be followed up by running screens across available candidates to check for a potential match. The company can also launch AI-enabled resume builder and interview simulator platform for candidates that can suggest potential questions and answers depending on the job profile and company. Similarly, 99acres and Jeevansathi can leverage Gen AI to help with listings as well as match-making. As expected, a large burden of customer support for all these businesses can be borne by Gen AI tools while sales team can have an on-demand assistant.

Justdial: As shared for the above companies, Justdial can also leverage generative AI to help its consumers in creating quality listings while supporting the sales and customer support efforts. The company can also create vernacular versions of its website/app in order to cater to users in their native languages. Further, there remains the potential of creating hyper-personalised user experience on Justdial.

Nykaa: Being a B2C platform, Nykaa can firstly use Gen AI to create hyper-personalised experiences in preferred languages for its user base with product descriptions and landing pages having the potential to leverage AI tools. These product descriptions can be optimised for SEO ranking. Further, as Nykaa also generates text / video content extensively, first drafts and video creatives can be generated with 'brand voice' recommendation basis the data from consumers' posts on social media. AI data analysis can also help create beauty routines for buyers depending on the skin type while recommendation engine can provide complementary products together. There are already "create the look" use cases where buyers can upload a picture and AI can suggest the corresponding products. Moreover, Nykaa can leverage personalisation capabilities of AI to tailor bespoke marketing campaigns based on behavioural and demographic details to improve conversions and RoI. For brands advertising on Nykaa, the company's recently launched ad-tech platform can suggest taglines or discounts while targeting the desired user personas.

Policybazaar: Call centre support and digital marketing accounted for almost a third of Policybazaar's revenue in FY23 and these are the two prominent use cases for Gen AI. The company can use Gen AI to run highly targeted digital marketing campaigns and even 200-300bps improvement in conversion can help enhance the profitability sharply. While insurance selling of complicated health and life insurance categories in India will certainly require human touch in the near future, the company can use Gen AI to sharply enhance productivity of its call centre team as routine queries and data facilitation can be handled by a human-like AI. The company can also leverage AI tools for fraud detection as AI can source consumer data from public forums while also listening to consumer interactions for risk profiling. Call summaries and takeaways (already executed) will further improve customer experience as a new customer support executive will already know the needs of the customer. Finally, Policybazaar has been leveraging its data to co-create insurance products and we believe the company opening up to Gen AI will result in highly personalised insurance products being offered. We do however note that simpler products such as motor insurance can potentially be disrupted by Gen AI as customers can directly get responses to their prompts and do not need handholding to buy. On Paisabazaar front, document generation and risk profile recommendation for financiers can also use Gen AI capabilities.

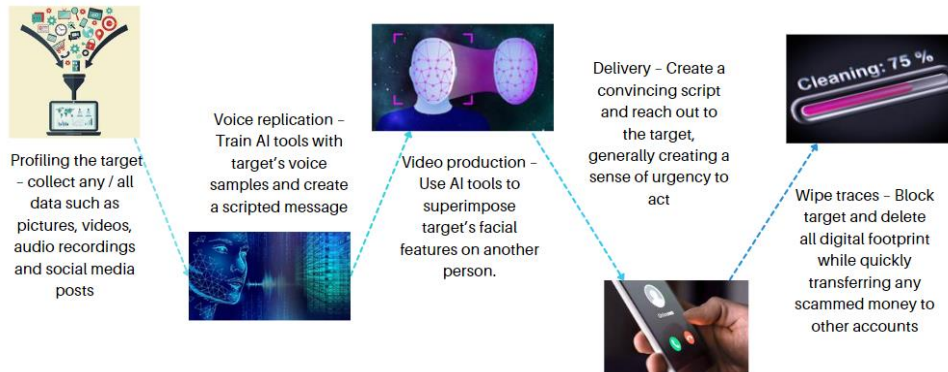
Zomato: Zomato announced experimentation with generative AI in June 2023 and as mentioned in the previous section, the company is looking to integrate AI into product photography, customer support, etc. While the current bots do not result in good customer experience due to the limited responses with minimal context, Gen AI chatbots are expected to handle most customer queries on Zomato and Blinkit as the processes are relatively standardised. Both the platforms can leverage Gen AI to reduce frictions in customer journey by finding recipe information and cart building basis items that go together, family size and dietary preferences. The company can also work with restaurants to create visually appealing menus and accurate product descriptions and suggest potential advertisement or discounting opportunities. On Blinkit front, Gen AI can read package labels to provide nutrition information, ingredients, etc. to the buyers. Further, Zomato can also use Gen AI to optimise routes for its riders and automate rider support and incentive payments.

Risks from Generative AI

Though Generative AI has powerful benefits across a multitude of use cases, it has its share of pitfalls that need to be accounted for. While these risks should be taken seriously, we need to note that it is not unusual for a major innovation (cars, computers et al) to introduce threats that need to be controlled while letting the innovation progress.

- **Bias and Fairness:** While the models are expectedly creative, they would inadvertently amplify the biases present in their training data and hence could demonstrate gender / race / caste prejudices. For example, if the training data mostly mentions caucasian scientists, the generated answers could assume that scientists are caucasian. In order to avoid this, AI will need to learn higher level reasoning and human values. This is the primary reason why Gen AI responses need to be checked.
- **Deepfakes and misinformation:** We have already seen fake accounts, and morphed images on social media over the past decade. AI amplifies this with the potential of deepfake audio and video that can even be used to alter the course of a democratic election process. While this will require the population to be careful (as we have learnt to ignore lottery texts and emails), Gen AI itself can provide the solution with deepfake detectors being built by some of the major companies such as [Intel](#).

Exhibit 31. Anatomy of a deepfake scam



Source: JM Financial

- **Hacking and Phishing attacks:** As discussed, Gen AI is able to generate software codes. Hackers that iterate codes in order to get entry can use AI to make their job easier and faster with [codes shared in underground hacking communities](#). Similarly, public information can be gathered from multiple sources to launch phishing attacks as well.
- **Job loss due to automation:** Gen AI is expected to become an always available assistant for most executives and its ability to perform standard repetitive tasks has raised concerns of job loss, particularly in countries such as India where employment needs to be generated for the large population. This will require a section of the workforce to reskill, which will result in a more productive work environment.
- **Student learning impact:** As Gen AI is capable of writing articles or essays, concerns are emerging that students will not gain writing skills and will use AI tools. Though, tools already exist to check whether something was written by Gen AI, we believe this could be similar to what calculators did to mathematics. Education companies such as [Khan Academy](#) have figured creative ways to use Gen AI to teach.
- **Data privacy issues:** There has been [news across Europe](#) about data protection breaches with some other countries also joining in as OpenAI is not able to comprehensively detail how it has processed personal data. While OpenAI has reiterated that it only uses public information, it is not clear what the sources are and if it is using information shared to another entity for a specific purpose.

As highlighted above, there is an immediate need for governments to come up to speed with developments in artificial intelligence and make informed laws and regulations while also coordinating with other countries across the globe. These governments will also need the private companies to develop security measures rapidly while preventing the misuse of AI.

Road ahead

With ChatGPT gaining 100mn users within 2 months of launch in Nov'22, generative AI has already seen strong traction with the number of LLMs already reaching double digits. While there remain several challenges, there is a general acceptance that generative AI is here to stay and is likely to penetrate a wide array of knowledge work.

Human-level performance: Despite the achievements such as clearing US medical licensing exam, law school exam and Wharton's MBA exam, there remain arguments that these tools do not reason at all like humans and are only doing reflexive statistical analysis with no deliberate reasoning. Though the current capabilities are good enough to improve workforce productivity sharply, according to a [McKinsey report](#), Gen AI is expected to reach median level of human performance by the end of this decade for a variety of technical capabilities. Furthermore, the report expects Gen AI tools to compete with the top 25% of people in these tasks before 2040, almost 40 years faster than earlier expected.

Exhibit 32. Experts expect tech could achieve human-level performance sooner with Gen AI



Source: McKinsey Analysis.

Domain-specific LLMs: Compared to broad-based LLMs such as GPT or PaLM, as companies embrace Gen AI we will see evolution of specific LLMs which will use a base LLM that will be fine-tuned on proprietary company data for usage within the organisation. This requires relatively lesser data and less computing time than creating a new model from scratch. These LLMs will perform well-defined tasks as they will be trained on curated and labelled data and hence are less likely to hallucinate. Current examples of specific LLMs include BloombergGPT, ClimateBERT, Med-PaLM2 and ChatLAW.

Regulatory guidelines and ethics: With generative AI evolving faster than the regulators or society could apprehend there has not been appropriate response on this technology. With [OpenAI CEO Sam Altman openly asking for AI regulation](#), we expect the governments to come up with proper regulations with regards to data acquisition for training models, disclosures to customers as well as prohibition in certain use cases such as interacting with children or any category of people where risk of manipulation exists. Regulation would also be necessary as market forces might not necessarily result in development that helps the poorest or promotes equity. Considering the global nature of these tools, similar to crypto, AI regulation might require a concerted effort from governments of different countries.

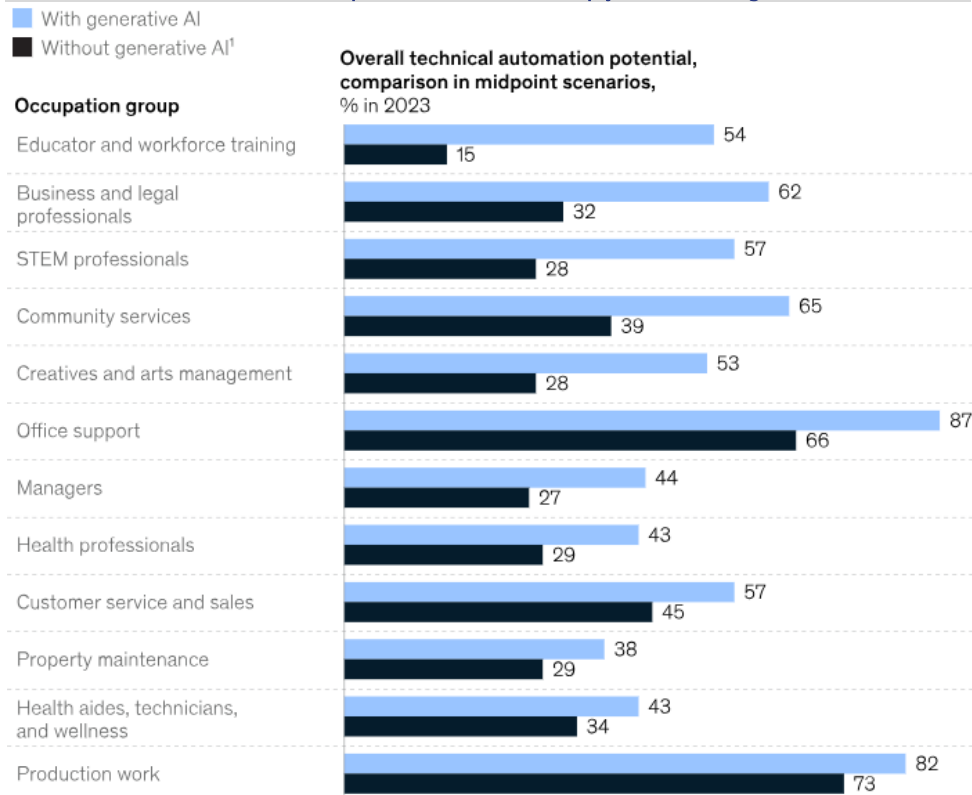
Exhibit 33. Likely impact on industries will depend on a variety of factors

	Law firms	IT services	Consulting	Financial Services	Manufacturing	Healthcare
Share of digital products / services						
Share of knowledge work						
Share of repetitive work						
Commodity nature of products?						
Regulatory freedom						
AI surprise factor						
Overall impact of Generative AI						
		High	Medium	Low		

Source: JM Financial

Automation of knowledge work: AI so far was focused on physical activities and was impacting the lower income workforce. In comparison, generative AI would mostly impact knowledge work with strong use cases in fields such as education, law, technology and art. Going forward, we expect significant productivity enhancement for professionals in these sectors and the organisations adopting Gen AI gaining market share from the ones that dither. As computing power gets cheaper, Gen AI’s ability will increasingly resonate with a white-collar worker.

Exhibit 34. Technical automation potential has risen sharply for knowledge work



Source: McKinsey Analysis.

Artificial General Intelligence (AGI): While generative AI is capable of automating a variety of standard tasks, the end goal for AI is to reach general intelligence – ability to accomplish any intellectual task that human beings can perform. The consensus is still divided on whether artificial general intelligence can ever be achieved and, if yes, then the time frame required. However, the evolution of LLMs has again brought back the conversation on AGI with suggestions that integration with psychology and neuroscience can be the required path. Microsoft researchers have already published a [paper](#) suggesting that GPT-4 should be viewed as an early version of an AGI system.

Most organisations are evaluating their pathways to incorporate generative AI in their businesses across a variety of use cases. Despite the interest and media excitement, the number of companies that have actually incorporated Gen AI tools remain a small subset of the ecosystem. Investors, however, have so far experienced dismal results in the last two disruptive technologies (cryptocurrency and metaverse) though we do not believe the story is yet over for these technologies. We do, however, believe that investor patience is warranted and enough due diligence should be conducted as the hysteria might result in several pretenders emerging. In conclusion, we believe Generative Artificial Intelligence will penetrate a variety of roles across industries globally, simultaneously improving productivity and world GDP. We are at the beginning of what AI can accomplish and the future is filled with opportunities.

APPENDIX I

JM Financial Institutional Securities Limited

Corporate Identity Number: U67100MH2017PLC296081

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Rating	Meaning
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Hold	Price expected to move in the range of 10% downside to 10% upside from the current market price for stocks with market capitalisation in excess of INR 200 billion and REITs* and in the range of 10% downside to 15% upside from the current market price for all other stocks, over the next twelve months.
Sell	Price expected to move downwards by more than 10% from the current market price over the next twelve months.

* REITs refers to Real Estate Investment Trusts.

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