



WHITEPAPER

GenAI Opportunities, Risks, and Use Cases for the Telecommunication Industry



A 2024 NVIDIA survey found that 43% of telco respondents reported investing in GenAI. This interest was, of course, generated by the launch of OpenAI's ChatGPT model allowing anybody to ask questions of a large language foundational model (LLM). What is the future for GenAI? Gartner believes that "by 2026, over 100 million humans will engage robo-colleagues to contribute to their work". Now that is a quick-moving technology.

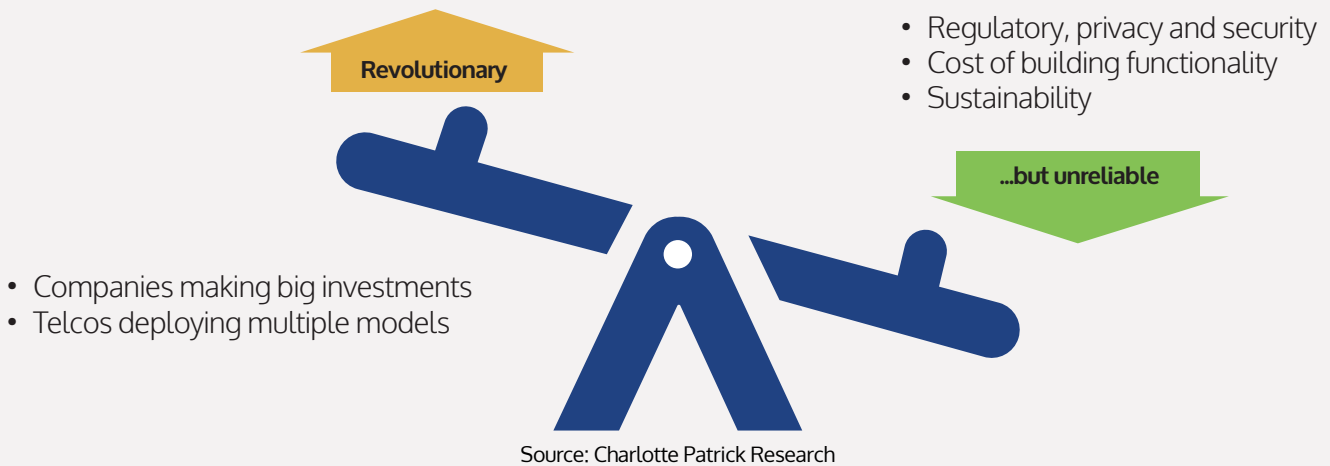
“ Over the next few years, GenAI trends are expected to reshape every knowledge-fueled task and role, reconstruct knowledge practices and resources across every industry, and deliver a tenfold increase in task productivity.”

GenAI Trends for Business: Why, When, and Where to Begin, Forrester

Drivers and inhibitors to GenAI roll out

As telco’s experience builds with GenAI, there is general industry agreement that it will bring new skill sets and significant value across the organization – but without a significant breakthrough in LLM development, it will be some time before they can be relied upon to provide reliably accurate answers, speak to customers or be left to oversee a network process unsupervised.

Figure 1: Drivers and inhibitors



2023 was the year of announcements of extravagant GenAI spending plans from the biggest tech companies:

<p>\$10bn from Microsoft into its partnership with OpenAI</p> <p>Financial Times</p>	<p>\$300m of investment from Google into Anthropic</p> <p>The Verge</p>	<p>\$3bn and a doubling of its headcount of data and AI experts from 40,000 to 80,000 from Accenture</p> <p>Forbes</p>
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2024 has seen telcos deploying multiple models across their organizations with hands-on experience growing in both the telcos and their vendors. However actual committed spend is relatively modest. A 2024 survey from McKinsey found only 7% of telcos saying that GenAI was over 20% of their digital budget, with most saying that the percentage was under 5%. Those investing big in GenAI include SK Telecom which invested \$100b into Anthropic with the intention of creating a telco specific LLM in 2023. Other Asian telcos are also developing their own models. China Telecom’s 2023 report describes its “1+N+M” Xingchen large models series product portfolio covering four major capabilities around language, speech, visual and multimodal capabilities.

A TM Forum survey found that telcos had 3 significant concerns when considering LLMs deployment: privacy and security (80% of respondents citing this as an issue), lack of truth function (74%) and legal implications through the use of public data (74%).

Countries and regions are moving towards regulations in areas such as privacy, IP and AI governance. In December 2023, the European Parliament passed the EU AI Act which included a new risk category for GenAI, “systemic risk”. GenAI providers, will be required (regardless of the risk the model poses) to create and regularly update technical documentation and make it available for AI system providers using the model. They must comply with EU copyright law, publicly share a summary of how the provider trains the LLM, and undertake an ongoing series of risk evaluations, assessments, and mitigations. They also need to monitor and report serious incidents.

Telcos express concern that this type of regulation will not be able to keep up with the pace of innovation and become more burdensome over time as regulators struggles to legislate. That said, they also noted that working to meet regulations helps them develop good oversight of the models they use and ensure that models are fit for purpose and unlikely to pose a major risk to the organization.

Investment by telcos is inhibited by the expense and complexity of developing GenAI-based solutions with reasonable levels of reliability. A range of methods from prompt engineering to RAG and onwards into the expensive area of what Gartner refers to as Composite AI (Composite AI is where a range of models will work together to improve accuracy and efficiency) will need to be rolled out over time. This will require more investment from model developers and the time to test and roll out new capabilities. However, with the appearance of good-quality self-healing capabilities, this expense may suddenly disappear. Either way, there is likely to be a continued need to wait for improvements to become available before investing.

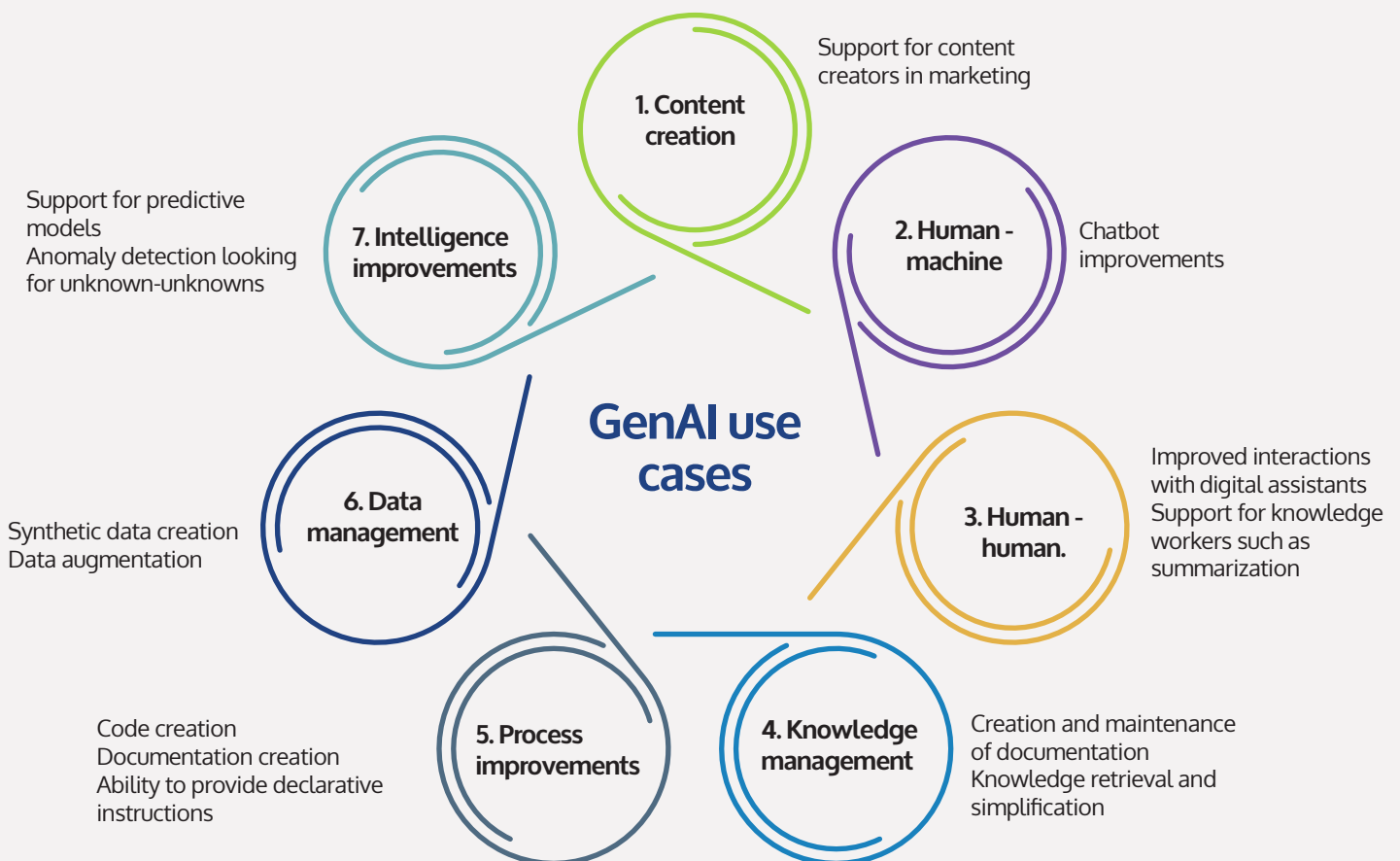
The future of GenAI in the telco is also somewhat dependent on a range of resolutions to the topic of environmental sustainability of the computing and networking required to support an increase of LLM usage. Solutions include using SLMs (small language models), cost declines in the hardware to deploy models more locally, and other technical solutions to reduce usage.

In the short term, telcos need to focus on those use cases which make financial and practical sense in order to realize the best return on their investment.

Identifying the strongest GenAI Use Cases

In a Gartner webinar poll of over 2,500 executives across industries, 38% indicated that customer experience and retention is the primary purpose of their GenAI investments. This was followed by revenue growth (26%), cost optimization (17%) and business continuity (7%). The reasonably even spread of interest indicates the lack of specific killer use cases and the need for telcos to understand the range of options available and what is bringing value to their peers currently. Figure 2 describes 7 categories of GenAI use case – with popular telco use cases in blue text.

Figure 2 Seven categories of GenAI use case



Source: Charlotte Patrick Research

Content Creation: The creation and processing of content

This category contains the most well-known use cases including the creation of original content (text, audio, and video) along with related capabilities including editing, the ability to suggest alternative ideas, language translation, and proofreading of text. In McKinsey's 2024 study, this was the most commonly reported GenAI use case. It is seen most often in marketing with the creation of content to support marketing strategy and personalized marketing. Its rise in popularity is related to the availability of models and a range of start-ups with offering products usable by a range of vertical marketing teams.

Human-Machine: Improvements in natural language understanding and generation provide better interactions between humans and machines

GenAI has the opportunity to enhance the reasonably lackluster experience of telco customers with chatbots provided on the web, mobile, and other channels. It also provides new digital assistant capabilities as it works with an employee. Functionality includes the ability to answer more complex multi-part questions, support multiple languages, and in the future, play a part in the scheduling tasks.

Various digital assistants are also being developed for the NOC and SOC teams. An example is the Vitria AIOps Solution, which uses GenAI-based chat functionality and content creation to accelerate incident response and resolution by

- Determining the likely fix for incidents by analyzing large datasets and recognizing data patterns that may not be immediately apparent to humans
- Articulating these to the network team via a digital assistant

This high-impact use case improves the customer experience and decreases operational costs by breaking down organizational silos and improving cross-team alignment - eliminating miscommunications and time-consuming ticketing "ping-pong" between teams.

Human to Human: Improvements in customer interactions with contact center agents and other customer-facing staff; especially when engaged in complex interaction

Digital assistants for the contact center can use GenAI to improve the synthesis of information from various sources. LLMs can also bring suggestions of next-best action to agents and provide capabilities such as summation which takes notes during a call between an agent and a customer that can be added to the case and used by the next agent interacting with that customer.

An example of this functionality is from Telstra using an LLM to take recent customer notes, interactions, and transactions and concisely summarize the customer's recent history and status. Trials during 2023 showed that 90% of employees using the tool saved time and increased effectiveness, resulting in 20% less follow-up contact. Team members also noted that the tool enabled them to more quickly understand and tactfully engage with challenging or sensitive circumstances, such as those in need of financial assistance.

Knowledge Management: Use cases related to knowledge bases, catalogs, and other information stores in the telco

Telco knowledge management solutions (KMS) create, curate, manage, and distribute knowledge—making it accessible to different teams, including network support, customer services, sales teams, and field services. GenAI plays a part in:

- Knowledge generation (e.g. the automatic creation of knowledge articles from existing data sources, such as product documentation, customer support tickets, and employee training materials)
- Knowledge management (e.g. the identification of gaps and patterns in a knowledge base, the automatic tagging and categorization of documents, articles, and data)
- Assistance for those using knowledge bases (such as new functionality for digital assistants to allow a human to ask complex questions (e.g. "What went wrong last week?") or automatically create frequently asked questions (FAQs) and their corresponding answers.

Process Improvements: Use cases accelerating and improving workflow quality

A range of use cases for GenAI is categorized in Figure 2 under the heading "process improvements". These include:

- Code creation including the ability to use declarative instructions in natural language
- Management of APIs including their creation in real-time, as needed
- Generation of documentation for new code, APIs, and processes
- Creation of test data, anomaly detection, and adversarial testing within testing
- Generation of synthetic data for security and privacy testing

Data Management: Improving the accessibility and quality of data stored in the telco

This category includes management of the underlying data and activities such as governance. There is a lot of discussion about the use of GenAI to generate synthetic data, but it also has a part in the augmentation of existing data sets to improve quality, and by adding value to data exploration, summarization, and visualization.

Intelligence Improvements: Adding capabilities into models for anomaly detection, prediction and personalization

A range of standard techniques are used in a telco, including anomaly detection, predictive techniques, and personalization in areas such as marketing campaign management. The part that GenAI plays will depend on whether it offers the best model for the job and the expense of training the model versus other models that could be trained. In summary, the current part that GenAI plays in each of the three techniques above is:

- Augmenting other anomaly detection models by learning normal behavior and patterns, scoring and handling novel anomalies
- Accelerating predictive models by preventing overfitting, estimating uncertainty and augmenting data
- Improving personalization by generating content, augmenting the data used and improving noise reduction.

Key takeaways

Research from TM Forum finds that 94% of telcos believe GenAI will significantly impact their business in the next one to five years. Telcos will need to develop skills and transform their organizations in a number of areas simultaneously. Key tasks will include:

Creation of a central hub

This hub provides a library that can be used for inspiration, to capture information on business case, time to ROI and size of opportunity. It will also serve to give the senior team a dashboard that they can use to assess whether the company is focussed on the correct projects.

Move to a proactive approach

Move from a reactive approach to tackling issues of AI strategy, risk, and regulation by, first, creating a set of guiding principles, then implementing a robust risk management process, and lastly ensuring that there is measurement/monitoring of progress against suitable goals.

Quality data and training

To enable GenAI to function efficiently, there must be good quality data and training of the model. The pedigree of the vendor in these areas is crucial and due diligence must be done before vendor engagement and solution acquisition to ensure that they are grounded in understanding of the data and its application across the telco.

The pace of AI technology development may be more rapid than any other technology seen in the last 20 years. Its implications are broad and there is legitimate employee concern about its impact on their lives. Reassurance, education, and upskilling via employee and leadership training programs and putting tools into everyone's hands are therefore crucial tasks in the short-term.