

# A New Era of Opportunity

## The Development of Artificial Intelligence in Telecommunications



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The world is in the midst of a technological renaissance. Artificial intelligence (AI), particularly generative AI, is spearheading the transformation of industries and redefining our understanding of what is possible. For telecommunications, a sector already defined by rapid change and innovation, AI presents a unique opportunity for development, growth, and enhancement of the user experience.

Before delving into the specific ways that AI is reshaping telecommunications, it is crucial to understand the core areas of AI that drive this transformation. These are the building blocks for the foundation on which the advanced applications are built: machine learning, natural language processing and computer vision.

Machine learning is the heart of artificial intelligence, enabling systems to learn and improve from experience, much like humans do. This learning is based on data analysis, from which the system extracts patterns and rules that it then uses to make decisions and predict future events. Machine learning utilises various methods, depending on the type of problem and the available data. Supervised learning is much like learning from a teacher, where the system receives labelled data (input and desired output) and learns to map between them. Unsupervised learning, on the other hand, is more akin to self-discovery, where the system searches for hidden patterns and structures in unlabelled data. Deep learning is based on neural networks with multiple layers, and is particularly effective in modelling large amounts of complex data, such as images, sound, and text. Re-

inforcement learning is a method in which the system learns through interaction with the environment, receiving rewards for correct decisions and penalties for incorrect ones, which is key for developing autonomous systems.

Natural language processing (NLP) focuses on the interaction between computers and human language. NLP makes it possible for machines to understand, interpret, and generate human language in various forms, such as text, speech, and even sign language. NLP is essential for the development of chatbots, virtual assistants, translation systems, and sentiment analyses, which are used to understand opinions and emotions expressed in text.

Computer vision is a field of AI that allows machines to “see” and understand visual information from the world around us. Computer vision is used for analysing images and videos, recognizing objects, tracking movement, and even developing autonomous vehicles that can navigate traffic independently.

### Utilising Artificial Intelligence in Telecommunications

Now let us explore in more detail how the AI technology is being used to transform the telecommunications industry. Here are some key applications of artificial intelligence that already present opportunities for significant improvements in network operations, customer service, security, and efficiency.

One key application of AI is optimisation and automation of networks and information systems. The AI algorithms can analyse the vast amounts of data in real-time, enabling automatic network optimisation, predictive maintenance, and the prevention of faults before they occur. If issues do arise, AI can help to resolve them more quickly, ensuring even more reliable services.

Cybersecurity is another important area of AI application. Artificial intelligence assists in detecting and preventing cyberattacks by analysing traffic patterns and identifying anomalies. At

Telekom Slovenije, we have been using AI to achieve this with great success for quite some time.

In customer support, the AI-powered chatbots and virtual assistants provide fast and efficient customer support, improving customer satisfaction while reducing costs.

Artificial Intelligence has the capability to increase productivity by automating routine tasks, allowing employees to focus on more complex and strategic activities where the human factor is crucial and adds value.

Last but not least, artificial intelligence is a game changer in the area of personalised marketing and sales. AI can analyse data to provide offers completely tailored to each and every customer. This improves sales and customer satisfaction, and positively impacts customer loyalty. With the help of AI, sales staff can offer the best services to customers, adding their human touch, understanding, and empathy. After all, we conduct business with people and will continue to do so in the future.

### The Convergence of AI and other Transformative Technologies

The true power of AI is amplified when combined with other cutting-edge technologies, such as 5G, quantum computing as well as robotics and automation.

The fast, low-latency nature of 5G networks provides an ideal platform for AI applications that require real-time data processing and communication. This synergy unlocks the potential for smart cities, autonomous vehicles, and other innovations that were once in the realm of science fiction.

Although still in its early stages, quantum computing promises an exponential increase in processing power. AI algorithms can optimise quantum processes, while quantum simulations could accelerate AI research, leading to breakthroughs in drug discovery, materials science, and financial modelling.

AI is crucial in the development of advanced robots and automated systems capable of performing complex tasks in various environments. In telecommunications, robotics can be used to automate network maintenance, equipment installation, and even customer support. Advanced robots equipped with AI can autonomously diagnose and resolve issues at remote locations, reducing costs and increasing efficiency.

### Artificial Intelligence is an Opportunity You Cannot Afford to Miss

The integration of artificial intelligence into telecommunications is not just a technological trend but a fundamental shift that will transform the entire industry. AI is not merely a tool for enhancing existing processes but a catalyst for developing entirely new services, business models, and ways of interacting with customers.

Naturally, the path to full AI integration has some challenges. Issues related to data privacy, ethical dilemmas, and employee adaptation are real obstacles that need to be addressed carefully. However, the potential benefits that AI brings – from network optimisation and improved customer service to the development of innovative products and services – far outweigh the potential risks. Telecommunication companies that recognise and harness the potential of AI will be the ones shaping the future of the industry. By investing in development and implementation, they will create a competitive advantage, attract new customers, and increase their market value. The question is not whether AI will change telecommunications, but how quickly and effectively companies will adapt to this new reality. The future of telecommunications lies in the hands of those who are ready to embrace AI as a strategic imperative and use it to create a better future for all. ■