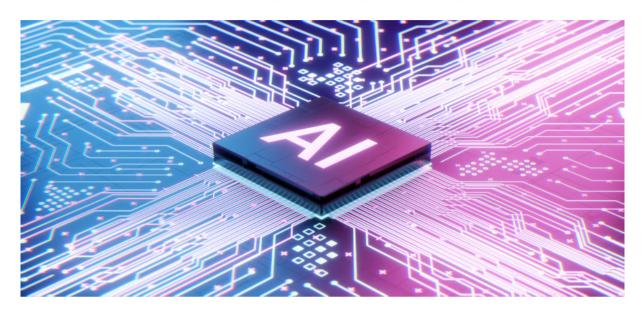# The Rise of the Smart Network: AI Takes the Wheel

Network connectivity is at the heart of digitalization, and while much has been done to improve performance and capacity, our networks are under unprecedented pressure.

Working from home, edge computing, the data revolution and the need for speed are all predicated on access to reliable and fully available networks with sufficient capacity.

Enter AI, and just as it is transforming so much of the digital landscape, it is also impacting network connectivity.

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In this case, fortunately, the impact is entirely benign as AI is used to anticipate congestion and adjust bandwidth allocations based on needs and traffic flows.

It is also playing a critical role in enhancing network security. It is clear that traditional security measures are struggling to meet the challenge of increasingly sophisticated threats, but AI can identify threat patterns and respond more rapidly.

In terms of networks, SD-WAN has been around for a long time, but integrating AI into SD-WAN solutions presents a game-changing technology to drive better performance and optimize efficiency and reliability.

It is a trend that is also strengthening the hands of telcos, with many investing in AI as they look to make their network performance a differentiator for customers.

Accenture analysis, for example, claims that AI has the potential to reduce network downtime for telcos by up to 50% for telcos.

Market set to boom

Standards also have a role to play, and as 5G networks are built out and we move towards 6G, there are collaborations around embedding AI within networks built on common frameworks, as in the 6G-XCEL venture involving IBM under the sponsorship of the US and EU.

At the same time, the International Telecommunications Union has developed the ITU Y.3172 standard to integrate ML into 5G, offering an architectural framework for future networks.

With this in mind, the telco AI market is booming and is projected to go from USD1.2 billion in 2021 to almost USD40 billion by 2039.

As Cloudera's Anthony Behan has noted, "this is because AI systems can do things that humans simply can't, and in the blink of an eye."

"An AI can identify patterns of weather that can be layered with machine learning (ML) algorithms trained on past incidents," explains Behan, Cloudera's managing director for communications, media and entertainment.

"By analyzing previous instances of adverse weather and their likelihood to occur again, these two technologies can recommend preventative measures engineers can take to avoid an outage.

"An example might be predicting the severity of high wind, with AI able to make a call on whether telco towers need more robust defenses to avoid being taken offline."

AI and ML, says Behan, take a lot of the guesswork and grunt work out of engineers' hands, enabling them to address problems before they become major issues. When a major issue does occur, AI-powered decisions also drastically reduce the mean time to repair.

"Proactivity in predicting surges of traffic and advising customers can also be aided by AI," he says. "Systems can be trained to autonomously manage and optimize network workloads, enabling telcos to make informed decisions about what technologies should be used at times of high demand," he adds.

"There are a range of technologies available to manage demand–from 2G-5G in wireless networks, and copper to fiber in wired networks. Most telcos will have these capabilities in use–all of which are useful for different solutions and enable telcos to be flexible. But only if they're smart about how to use them to provide network stability."

Data quality

Having refocused on core offerings, AI will play a crucial role as telcos look to deliver a better service.

With 6G networks on the horizon, the landscape will only become more complex, and Behan says it is "vital that telcos prepare now and unify their data, so services are unhindered."

"Without quality data powering AI models, there will be a risk of the AI failing and misunderstanding context ˉ or even providing inaccurate recommendations that will tarnish brand reputation," he says. "To fully unleash AI's potential, the industry must prioritize curating diverse, unbiased data, coupled with thoughtful data practices to protect that data.

"AI has the potential to revolutionize the industry, but only if it's built on solid foundations.