Telecom Trends: Artificial Intellegence and Blockchain Technology
September 2024
A White Paper Collaboration
kwall@bellwatson.com
john@vtecadvisors.com

Introduction

Over the past few years, there have been several buzz words, or perhaps buzz "trends" that have gained mainstream attention. The two that come most immediately to mind are "artificial intelligence" and "artificial intelligence." Unlike previous tech based acronyms or terms like IoT (Internet of Things) or SaaS (Software as a Service), the use cases for these newer trends are only now beginning to come into focus.

Some simple definitions according to IBM:

Blockchain: a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. An asset can be tangible (a house, car, cash, land) or intangible (intellectual property, patents, copyrights, branding). Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved.

Artificial Intelligence: Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.

Potential Use Cases

As it pertain specifically to telecommunications, both blockchain technology and artificial intelligence (AI) are poised to have significant impacts, though in very different ways.   While certainly not an exhaustive framework, here's a brief overview of how each technology could affect telecommunications:

Blockchain Technology:

- Can enable secure, decentralized, and transparent transactions and data sharing in telecommunications networks.
- Can facilitate secure and efficient management of Internet of Things (IoT) devices and machine-to-machine communication.
- Can streamline processes like mobile number portability, roaming agreements, and billing settlements between telecom operators.
- Can enhance data privacy and security by providing a tamper-proof record of transactions and data exchanges.
- Can serve as a single source of truth with regards to contracted vs provisioned vs billed services.

Artificial Intelligence (AI):

- Can optimize network operations, traffic management, and resource allocation in telecommunications networks.
- Can enable predictive maintenance and proactive fault detection in network infrastructure.
- Can improve customer service and support in the telecom industry via virtual assistants and chatbots.
- Can analyze vast amounts of data to personalize services, detect fraud, and improve marketing strategies: all through machine learning algorithms.
- Can enhance network security by identifying and mitigating cyber threats more effectively.

These bullet points articulating what these technologies "can" do begins to establish something of a workable framework. To a great degree, AI can be seen as something that can potentially enhance the delivery of services (pro-active monitoring of networks for example), while blockchain technology is

more about getting everyone to agree as to what the contractual basis for delivery of services actually is.

Evaluation Framework

In trying to forecast trends, or trend adoption, it is usually a good idea to either: look to the past and(or) look for incentives.

- Network optimization: AI algorithms can analyze vast amounts of data from the network to optimize traffic routing, resource allocation, and load balancing, thus improving network efficiency and performance. This would be a win for both the customer (better service) and the provider (few employees needed to carry out this function).

- Predictive maintenance: Machine learning models can be trained to detect patterns and anomalies in network data, enabling predictive maintenance of infrastructure and proactive fault detection and resolution. Again, this would presumably benefit both the customer and the provider.

- Customer service: AI-powered virtual assistants and chatbots can handle routine customer inquiries and provide personalized support. In the short term, this is not likely to be a win for the customer, but certainly will be for the provider as it will represent a significant operational cost savings.

- Fraud detection: AI can analyze call patterns, usage data, and other signals to identify and prevent fraudulent activities, such as unauthorized access or billing fraud. A win for everyone but the criminals.

- Personalized services: By analyzing customer data and usage patterns, AI can help telecom providers offer personalized services, targeted promotions, and tailored product recommendations. While the idea of "personalized" services has a positive connotation, we simply envision AI being able to pinpoint sales opportunities without having to employ sales reps. Win for the provider.

- Network security: AI can enhance cybersecurity measures by continuously monitoring network traffic, identifying potential threats, and responding to attacks in real-time. Another win for everyone.

Across each of these 6 items, the provider "wins" in all of them. To be fair, the customer wins in 5 out of 6 as well, so in terms of "incentives" AI is almost a no brainer within the realm of telecom providers and telecom consumers, though it is certainly up for debate as to who will win "more."

With regards to blockchain technology, we provide a similar looking list of six bullet points:

- Secure and transparent transactions: Blockchain can enable secure and transparent transactions between carriers, partners, and customers, facilitating processes like roaming agreements, billing settlements, and mobile number portability. This would be a win for the customer.

- Internet of Things (IoT) management: Blockchain can provide a secure and decentralized way to manage and coordinate the vast number of IoT devices connected to telecom networks, enabling secure machine-to-machine communication and data sharing. Again, probably a bigger win for the customer.

- Identity and access management: Blockchain can be used to create secure digital identities for users, devices, and services, enabling better access control and authentication mechanisms in telecom networks. Customer wins again.

- Supply chain management: Carriers can leverage blockchain to track and verify the movement of network equipment and components, ensuring transparency and accountability in their supply chains. This one is a win for the carrier.

- Data monetization: Blockchain can enable carriers to securely monetize and share their data assets with third parties, such as advertisers or analytics firms, while maintaining control and transparency over data usage. Big win for carrier.

- SLA management: through the use of Blockchain technology, it is possible to implement "trickle" or "micro" payments via a smart contract. In making automated payments on a daily, hourly, or by the minute basis, customers could halt payments if a network goes down. This ability to force carriers into Service Level Agreement compliance would be a big win for the customer.

Conclusion

In evaluating these 6 items, it is clear that the customer is the big winner with the adoption of blockchain technology. While some may contest our methodology, we believe that on the whole, AI is far more likely to be implemented within the telecom industry than will blockchain technologies. Our reasoning is quite simple: AI will potentially save the carriers money, while blockchain is likely to cost them money. From this vantage point, the incentives to pursue blockchain based solutions are few, while AI has easy to identify operational cost savings for the carriers who adopt it.

It's worth noting that the combination of blockchain and AI could also create powerful synergies, such as using AI to analyze data stored on a blockchain network or using blockchain to secure AI systems and data. The main challenge to the carriers in pursuing blockchain based solutions stems from the reality that in order for a blockchain to truly be considered "immutable" or not able to be changed, hinges on the consensus mechanism of that particular blockchain.

The most well known consensus mechanism is Bitcoin's "Proof of Work," which is energy intensive, but highly secure, and highly decentralized. Ethereum's "Proof of Stake" is less energy intensive, but hacks have occurred on the network, so security is a real concern. There are dozens of other consensus mechanisms, but the importance within this discussion is that few companies are going to be eager to spend money on an energy intensive way of ensuring their great big billing ledger can't be changed if someone makes a mistake. It is difficult for us to imagine a scenario in which a major telecom carrier would like for all of its billing errors to be visible on an immutable blockchain.

Final Thoughts

While predicting the future is sometimes a foolish exercise, we believe that by observing current trends, we can discern future probabilities. Rather than taking our opinions as fact, we hope readers will use our thoughts as guideposts, markers on the way of their own business, entrepreneurial, or technology journey. The terms "artificial intelligence" and "blockchain" come with a host of confusing terms, misconceptions, and hype. We hope our thoughts will better position you to see the opportunity within the challenges.