Advancing 5G Services to Reduce Churn Rate

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Promoting enhanced customer experience (CX) is becoming a significant challenge for operators as 5G networks develop and broaden the number of services on offer. With such a wide span of services, operators are struggling to prioritize CX across all aspects as they are unable to sustain consistent customer maintenance.

To manage this and diminish the risk of increased churn rate as a result, it is imperative that operators achieve a better understanding of their customers to deliver a high-quality service. This can be done by analyzing customer behavior so that their needs can be addressed and met with services in real-time.

The role of Machine Learning and the Internet of Things

Machine Learning (ML) ensures a quality 5G service by utilizing unsupervised modelling in Internet of Things (IoT) technology. Currently, IoT devices are put under stress due to their inbuilt fault levels being exceeded. This causes disruption among interconnected devices as the entire system attempts to compensate, which impacts performance levels. ML solves this by allowing the device to learn normal activity and recognize network elements moving outside of this for broader and faster adaptability to new environments. ML also allows for a more rapid response to work maintenance, identifying and solving issues within the system before subscribers can even be impacted. This is especially valuable in data rich environments where issues are difficult to manually define, and data is too vast to plausibly manually analyze.

The enhancement that ML brings to the fault tolerance of IoT is not only important around the home for the convenience of commercial users but also crucial in emergency scenarios for maintaining communication pathways. For example, consider the critical nature of fault tolerance in the development of the [System for eDetecting and forecasting Natural Disasters based on IoT (SENDI)](#). Here, ML enhanced and collaborated with IoT and wireless sensor networks to predict oncoming natural disasters, anticipate a failure in communication and provide a line for emergency broadcasting.

The development of these revolutionary systems in answer to pressing real-world

issues is valuable to our society on a global scale. Furthermore, ML is proving highly effective in its role as a catalyst in the progression of IoT technology. The fact that such technology can have an impact far beyond the domestic scope is telling of its scale, which explains why operators are currently struggling to harness it for customer use. However, these scenarios showcase the importance of ML technologies in aiding this. They demonstrate its ability to effectively improve IoT performance no matter the extent, whether it be improving CX or implementing safety measures.

Digital Twins: how does ML contribute?

Other answers to sub-optimal CX and rising churn rates include the analysis of subscribers using Digital Twin technology. Data is gathered from various sources, including subscriber devices, network logs, customer relationship management (CRM) systems and payment and billing records, to build a digital file on how customers use the network. The data is then analyzed to provide insight into the type of service they might prefer or be looking for. By monitoring customer usage, predictions can be made as to those likely to unsubscribe, allowing operators to put retention measures in place to deter them from doing so. In addition, new subscribers can be scouted via cross-selling and uplifting. A company can profile their existing subscribers to identify who is benefiting the most from their services and hence identify potential subscribers who match the same behavior to offer them services they would find beneficial.

Digital Twins technology uses ML and AI technology to collect data and learn independently. By doing this, a model digital lifestyle can be created for each subscriber, showing areas of downtime and areas that need improving. This virtual representation can be accessed as a web service for operators to use to better their service performance which and improve their customer experience. Such implications to business mean that the company can take a more dedicated approach to solving customer issues and offering better 5G services. This innovation has affected the progression of the Industrial Internet of Things (IIoT) greatly. The past industrial environment had significant issues with distributing widespread solutions, only having access to limited data at any one time. However, following the development of Digital Twins within the cloud and the introduction of ML, data can be automatically harvested and sifted through to provide rapid, targeted fixes.

Introductions of Digital Twins have also improved real-time customer care, with companies now having access to automated advice on how to respond to an incoming service call. The system can also identify other matters of security, including predicting those who may move into bad debt, identifying subscription fraud and billing or payment issues, providing dynamic credit management and sending predictions of usage limit alerts. Such predictions are generated by the analytical modelling which, while more traditional, can provide proactive identification of potential issues when performed continuously. Once the problem has been recognized, digital integration ensures that technologies such as ML can take over and orchestrate the implementation of automatic or self-managed fix solutions. Neural Technologies have been testing digital twin effectiveness using its Analytical Data Model in its latest development. Findings suggest applicability to the IIoT as well as the telecommunications space.

Such vast application of these technologies finds them undeniable useful in our modern, digitalized age. There is potential for applications to organizations, networks and processes, in addition to customers. Ultimately, the ability to allow 'what-if' scenarios to be done in the virtual world without affecting the real world help to eliminate uncertainty to offer the best possible specific solution.

Generative Adversarial Networks: the evolution of ML

This has been advanced even further in some scenarios, with AI and ML technology being used to build generative adversarial networks (GANs). This offers the opportunity

for virtual faces to replace bots in answering subscriber queries, transforming business approaches to customer service.

The learning ability of GANs is incredible: they are able to reconstruct human behaviors spanning a great range, from speech patterns to fine art. For example, a portrait that recently sold for $432,000 was generated by GANs technology by compiling data on art history and reproducing its findings.

The potential for such ML technology to decide on the most convincing replica of humanity fascinates. Such technology has been regarded by Yan LeCun, Facebook AI research director, as "the most interesting idea in the last 10 years in ML," and is applicable to any range of data.

Let's consider it in a customer service context. It offers the potential for subscribers to receive service that feels personal without the need for large teams of customer service employees or more basic bots that have limited data reach and analytical ability. Being extremely advanced, such systems would serve the industry once put in place.

Looking forward

As is apparent, such technologies can cater to every issue and need that arises from the ever-transforming technological sphere. When focusing on CX, the immediate gains are apparent. CX would be valuably improved and companies would see better revenue as a result of the subsequent decrease in subscriber churn rate. By addressing every angle of the customer's needs and predicting potential issues before they even require attention, this level of support would be deeply impactful, with evident gains in customer satisfaction.