

# IoT Pioneer Ayla Networks Builds Machine Learning Business Targeting Internet Service Providers

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## Introduction

Internet service providers (ISPs) around the globe face the same headwinds. Slowing or declining topline revenue growth is driving a push into new services and ecosystems while hypercompetitive pricing pressure and margins are spurring a need for lower opex and capex to maintain profit levels. Advanced analytics – including the use of machine learning and, more broadly, artificial intelligence – has become a vital tool for increasing revenue, lowering costs and enhancing the customer experiences (CX). 451 Research's Voice of the Enterprise: AI & Machine Learning, Use Cases survey results revealed that telcos are among the vertical leaders in adopting AI (73%), clearly ahead of vendors in other data-intensive industries such as energy, healthcare and financial services. The market's use of AI can be traced back to its roots building self-learning and self-healing capabilities into networks.

IoT connectivity and analytics pioneer Ayla Networks has developed a new business to address this narrative. The company has already gained early traction among some huge brands, including some of the largest global ISPs, for its TransformAI predictive care offering.

## The Take

Ayla Networks, whose core business is centered on its connectivity-focused IoT platform, would at first glance appear miscast in the role of an advanced data analytics vendor targeting broadband service providers. As management explains it, however, the company's 10 years of IoT experience directly fed its data platform foundation, and a rolodex of ISP relationship helps as well. Essentially, TransformAI analyzes the signals generated by the IoT edges of connected homes, including from routers and gateways, as well as myriad devices connecting to the gateways. From there, it can

process the data using advanced data science techniques (ML) to find the signal in the noise and ultimately deliver insight, root cause and remediations that can help save millions of dollars in support calls averted, truck rolls avoided, and network/device issues diagnosed and obviated before getting noticed by customers. This culminates in the delivery of a better ISP CX at a lower cost.

While it's early yet, the initial returns are promising and Ayla's existing customers are looking to do more. While they haven't yet arrived at this decision point, it could come as early as 2022, when the firm's leadership team might need to consider additional R&D, staffing, go-to-market strategy and even branding of new business on its own merits rather than as part of the overall Ayla umbrella. The platforms may be common, but the core customer and market landscape are very different between consumer and industrial IoT and home internet services.

## Context

Ayla Networks was founded in 2010 and is headquartered in Santa Clara, California. The company has raised just under \$125m from outside investors since its inception and currently has 150 employees. It started out as a consumer IoT platform and connectivity specialist and has since pivoted its focus more intently on the commercial enterprise and ISP sectors. Ayla supports enterprise/commercial product OEMs in creating 'connected product experiences' via its embedded software running on standard microcontrollers and communications chips; APIs for building applications; a cloud management platform; and optional IoT data analytics and visualization services.

Seeing an opportunity to apply the latter two competencies, the vendor is also pursuing an emerging business opportunity with ISPs at the intersection of device virtualization and management, IoT data analytics and insights, and predictive analytics – which is the focus of this report. Ayla notes that it currently has about 60 customers and 15 million devices under management and that its customers are generating 4.9 trillion transactions per month across those device estates. 451 Research estimates that the company's revenue for calendar year 2020 was \$23m – we believe that was up over 50% from CY 2019 (estimated \$15m).

## Products

Ayla's TransformAI is a platform that it claims deploys six ML models generating roughly 25 million inferences per hour that predict the likelihood of service-impacting issues with greater than 75% accuracy. There is continuous optimization of the ML models to maintain accuracy through back-end testing and automated retraining via a real-time ML pipeline. The system has 'glass box' capabilities revealing the key features driving prediction probabilities that can facilitate faster root cause analysis.

TransformAI can ingest data through industry-standard formats such as TR-069, TR-369, LwM2M, OMA-DM, its own Ayla Edge Agent, and EMS inputs. Data is validated, enriched and normalized for machine learning. Ayla's recommendation engine can proactively suggest remediation actions based on customer-designed business parameters and logic and then measure effectiveness, which makes ROI analysis straightforward. Targeted outcomes are issue detection, root cause discovery, issue prediction and resolution actions (i.e., avoiding service calls, which saves costs and makes for happier customers). The platform can be integrated with adjacent ISP customer service platforms, including self-care, assisted care, field tech, and any existing OSS/BSS.

The vendor has a huge advantage in its long-term partnership with a Fortune 50 global ISP. The project required analysis of a complex and massive data set – i.e., it's getting paid to jump into the deep end and figure out how to swim. So far so good, and of course any scars it picks up better prepare for what lies ahead. In this engagement, Ayla is focused on addressing home internet operational challenges and customer experience killers around issues such as STB/internet modem

reboots. The firm has been able to virtualize the environment and analyze the relevant factors on both gateway and downstream connecting device data, identifying anomalies and recommending fixes such as preemptive reboots during off hours, proactive alerting, and immediate device upgrades.

Ayla's core selling point is that it can get ISPs on track to solve these issues at high predictive accuracy with a very small up-front investment and limited integration with legacy systems. In the case described, the whole project was up and running in a matter of a few days and was run for a trial period of three months. In the end, Ayla was able to identify 11 service-impacting issues that, once fully rectified, will save about \$75m per year in direct costs via reduced call-center interactions, truck rolls and device swaps, while also improving CX. The company has current proof-of-concept and early commercial deployments globally at other major service providers.

## Competition

Rivals with ML products targeting ISPs with connected home operations start with the internal data science and customer care teams in place at major ISPs. These are typically large groups of data professionals who build custom platforms designed for their bespoke environment that leverage best-in-breed ML offerings from a combination of on-premises software providers and public cloud suppliers (e.g., IBM, AWS Sagemaker, Google, Microsoft, Databricks, TIBCO, MathWorks, Alteryx, SAS, etc.). Comcast is an example of a major ISP with an engineering team that has designed its own offering (Comcast Octave).

Ayla's pitch to this profile of ISP comes down to a buy vs. build economic argument and the general folly of custom software development where commercial off-the-shelf options are available and proven. The challenge in displacing internally developed services, of course, is that these firms often view their internal approaches as critical competencies and IP, so they are culturally ingrained and therefore difficult to disrupt. Off-the-shelf services are also offered by core connected home CPE modem vendors such as Arris, Cisco and Motorola. A pure-play contender in this segment is Plume, which provides a suite of ISP services for proactive support, including Wi-Fi optimization and subscriber insights. OSS/BSS incumbents Amdocs and Netcracker also active in this segment.

### SWOT Analysis

Strengths	Weaknesses
Ayla has deep domain expertise and has developed a significant pipeline of business for its ISP-focused services with a relatively small team and limited brand recognition within ISP home network and care operations. Gaining traction with these constraints indicates that it has found an underserved segment for its capital-light approach and business model. ISPs have proven to be the most aggressive adopters of ML technologies.	The vendor's early success in ISP analytics brings with it a resourcing challenge. Management must allocate Ayla's limited resources for two mostly distinct lines of business (IoT and connected home machine learning) with arguably little synergy beyond the core platform and analytics know-how. It will need to align R&D and go-to market resources carefully to ensure that it can remain successful in both growth segments.
Opportunities	Threats
Its ISP offering, if it maintains its current growth trajectory, might be better managed as a distinct entity vs. inside Ayla. The vendor's team could consider a variety of spinoff options, including licensing core software IP to a new company entity to maximize value for existing stakeholders while ensuring that the ISP LOB is resourced appropriately across all facets. Extending to fixed wireless or mobile networks is also a possibility for TransformAI.	Competitive threats include the general verticalization of AI/ML services offered by cloud suppliers and the value-added ecosystem that surrounds them. ISPs themselves are a threat if they continue to believe that data sciences should be a core competency that is built up internally vs. outsourced. Another threat is the slow evolution of ISP organization design and processes, which are not optimized to easily act on data-driven insights.

Source: 451 Research