

avassa



Avassa for Edge AI **Case Description**

EDGE AI

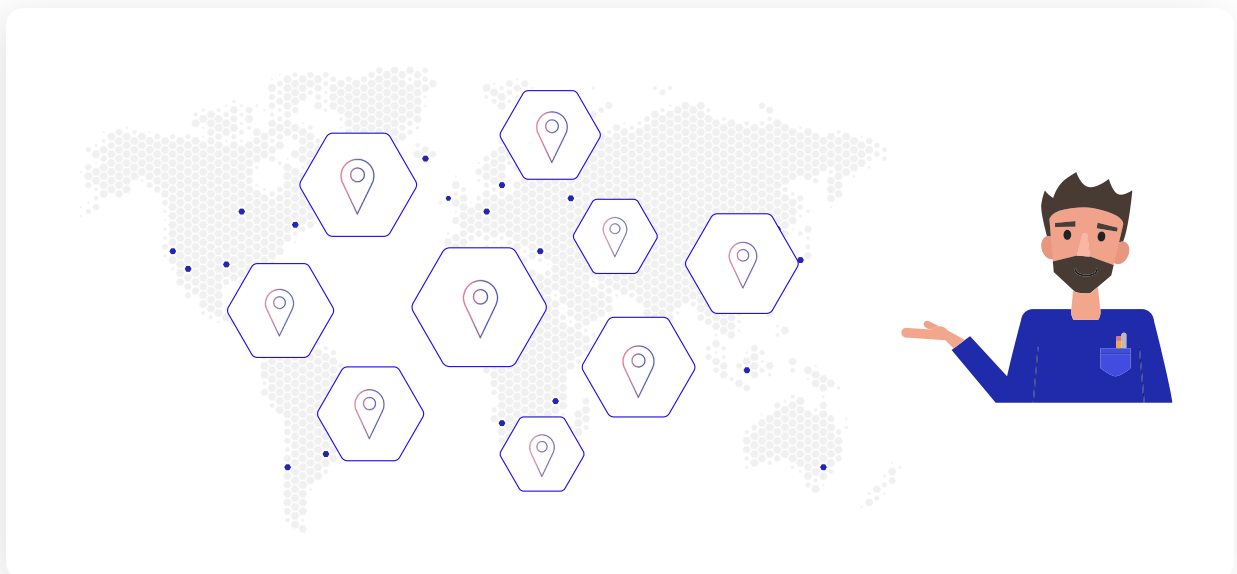
Case Description

In this case, we'll look at a case description for the preceding challenges, key drivers, and accomplished benefits of an implementation of Avassa for Edge AI. An equipment provider for production lines embarked on a quest to revolutionize their operations through automation.

Their mission? To liberate customers from the tedious work of manual on-site inspections and introduce an Edge AI Vision system. With great success, they executed a first implementation of industrial PCs, armed with cameras, to oversee the 24/7 operations in the production lines. A sophisticated Edge AI anomaly detection model was deployed, poised to intercept any faulty items with unwavering precision.

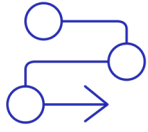
The result? A seismic shift in efficiency and operational excellence as manual actions drastically decreased, and the standard of deliveries skyrocketed.

Although, this transformative solution demanded on-site visits for model and software updates, which became a problem as the implementation size grew. Here, a need arose of an application and model management solution allowing remote and automated deployment and operations.



Challenges

The company initiated a project to address the following challenges:



Software and AI model updates at customer sites were both costly and time-consuming, as they required on-site visits. Most customer networks won't permit open ports for manual remote updates, increasing complexity.



Retrieving training data from factory floors for model enhancement was previously impossible.



Some customers desired a localized endpoint for the edge AI application, enabling them to incorporate a site-specific dashboard. This entailed configuring the host to open ingress ports locally.



An underlying challenge for industrial environments is that the factory floor network normally does not have even outgoing internet connections.

Drivers for implementing Avassa for Industrial IoT

The market demanded the capability to offer the automated production line as a service. This entailed providing real-time insights into any application or host issues, along with ongoing feedback on inference quality, such as model drift. Customers expected the ability to remotely investigate and resolve issues promptly, ensuring seamless operations and optimal performance.

Also, the company quickly saw a need for managing applications and trained models according to separate lifecycles, with separate features cadences and monitoring needs. This called for a solution sooner rather than later to avoid for complexity to spiral.

Avassa for Edge AI implementation description

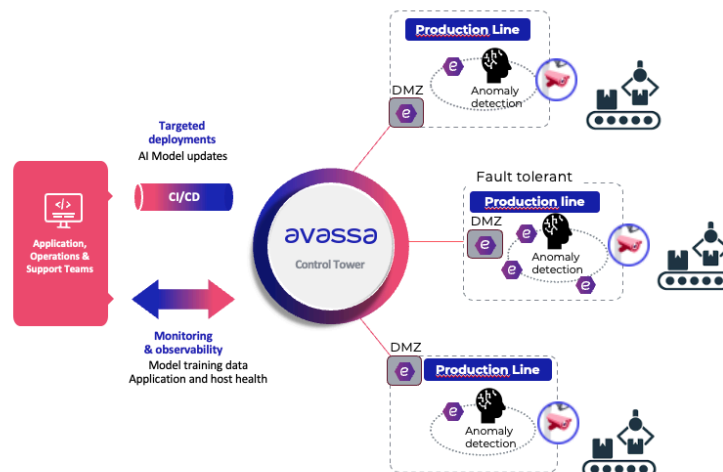
To tackle the above mentioned challenges, the production line supplier chose to leverage the Avassa Edge platform to lifecycle manage the Edge AI applications and models.

The development team designed a CI/CD pipeline to generate a FastAPI model serving end-point and the model server including the trained model as containerized models. These were pushed to the Avassa Control Tower for automated deployments across all edge sites. The IT operations team integrated application metrics and model health, including model drift, into the existing IT monitoring tools.

With that solution in place, Avassa for Edge AI unlocks:

- Connectivity to the factory floor: Avassa's Edge Enforcer requires only a single outgoing port. All bidirectional communication is then conducted over this port, eliminating the need to open incoming ports or set up VPNs. Moreover, in scenarios where the factory floor prohibits outgoing ports altogether, the Avassa solution can seamlessly proxy all communication through an Edge Enforcer operating within the customer's DMZ.
- Fully automated remote updates of applications, AI models, and the operating system.
- Leveraging the Avassa built-in pub/sub bus to stream training data back to the cloud.
- Automatic configuration of edge local ingress networking, facilitating customer integration through a REST endpoint towards the Edge AI application.
- Remote monitoring of all production lines, offering proactive alerts, real-time health state, and telemetry data.
- Remote troubleshooting: The support organization can utilize Avassa tools to remotely investigate application issues, such as checking container logs or accessing a remote terminal to the container.

During the implementation of the Avassa Edge Platform, the solution provider recognized the opportunity to offer higher service level agreements (SLAs) to end-customers through Avassa's clustering features at the edge. This entails having at least three hosts on the factory floor.



Key benefits of implementation

As outlined by the solution description above, a fully automated CI/CD pipeline with AI model deployments led to several benefits for the organisation. The benefits span from internal efficiency to increased customer satisfaction. It transformed the Edge AI project from a good research idea into real benefits since the models were actually deployed in reality.

The major benefits included:

- Accelerated deployment of new trained models
- Reduced cost since on-site visits could be reduced to a minimum
- Enhanced customer satisfaction through remote monitoring and troubleshooting capabilities
- Increased automation with significantly faster model turnaround times, including timely feedback on training data.



“Before including Avassa as part of our delivery, we had to manually install, version, and troubleshoot our devices which quickly became very time-consuming as we began to scale. With Avassa, we are able to deliver our product as-a-service and lifecycle manage the distributed software in a centralized, remote, and secure fashion. This helps us significantly reduce overhead and instead focus on creative competitive new features for our customers.”

Team leader



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