

# Saving costs, time and effort using Amazon SageMaker

## Executive summary

**Ainnova Tech** wanted to create the future of accessible early detection of diseases, breaking the status quo and impacting the world with solutions that save lives and improve people's health.

His value proposition will allow:

- Add new revenue streams.
- Reduce costs and save time for primary care providers.
- Develop a streamlined and cost-efficient process for medical specialists.
- Enhance patient satisfaction and boost the reputation of medical centers.

## The challenge

The main challenge faced in this project was cost reduction, since previously the implementation of the training used On-premises machines that lasted a long time, so this generated large monthly costs. So, the main focus on this project was to catch an idea and turn it into reality as soon as possible.

Another challenge was that the project needed to monitor their models to find errors and opportunities for improvement in less time.

## Why AWS?

The ease of creating, monitoring, and automating machine learning models with Amazon SageMaker allowed us to use tools that would help us reduce costs during training and choose the best model.

### About Customer



Figure 1 – Ainnova Tech Logo

Founded in 2019 and based out of Nevada City and headquartered in San Jose, Costa Rica, and Houston, Texas.

**Ainnova Tech** is designed to create solutions for early detection of diseases using artificial intelligence

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*"We have achieved multiple global awards, signed partnerships with hospitals and a globally recognized medical device Company".*

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## The Solution

Amazon SageMaker can develop custom machine learning models faster with little effort. Building a trained model from raw data is complex and requires a detailed understanding of the data, problem, and techniques to build a successful machine learning process.

The pipeline integration in Sagemaker provides us with the creation of machine learning process pipelines and is fully managed. The main processes that can be created are data processing, training, data validation. Creating stages for each of the processes helps us segment errors and non-dependence on the results of each stage, as well as obtain cost savings by not using the same instance in each stage and only using the computing power in the processes required. Amazon Sagemaker includes a Tuning service in which it automatically calculates the best hyperparameter option so that our model has a better result in terms of metrics.

This entire process helps orchestrate changes in codes, data, hyperparameter improvements, and above all a direct flow that is all automated. It's worth mentioning that SageMaker provides a collaborative space using Amazon SageMaker Studio for developers to work together in real-time, allowing for better organization.

Additionally, the model is monitored using SageMaker Model Monitor, which allows obtaining statistics to be used as appropriate. The use of both features allows you to focus on solving problems and obtaining the best model, in addition to saving time, effort, and costs.

### “Amazon SageMaker.”

Amazon SageMaker enables you to build, train, and deploy machine learning (ML) models for any use case with fully managed infrastructure, tools, and workflows. Amazon SageMaker has some features that help with **monitoring, integration, and deploying.**

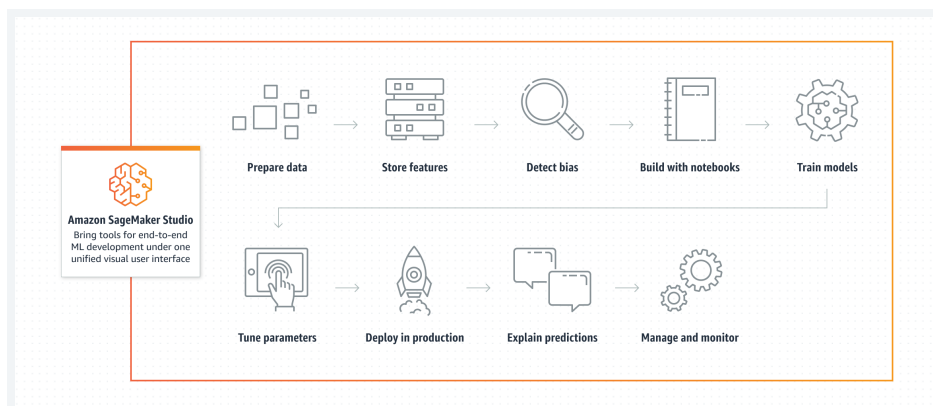


Figure 2 – Amazon SageMaker Studio

## Best features of Amazon SageMaker

- **Unified End-to-end ML**
- **Cost Optimization**
- **Team Collaboration**
- **Integration with AWS Services**
- **Monitoring of models**

## Results and Benefits

The use of Amazon SageMaker allowed us to create a collaborative space in Amazon SageMaker Studio, where the development team could work together, thus allowing better management of development across the team.

Additionally, having automated code deployment thanks to the use of SageMaker Pipelines allowed for very rapid advancement of new features or bug fixes.

### Unified End-to-end ML

Prepare data, build, train, deploy, and monitor your models – all in one place

### Team Collaboration

Shared spaces offer real-time collaboration and project organization between team members, with data scientists, ML engineers, and business analysts

### Cost Optimization

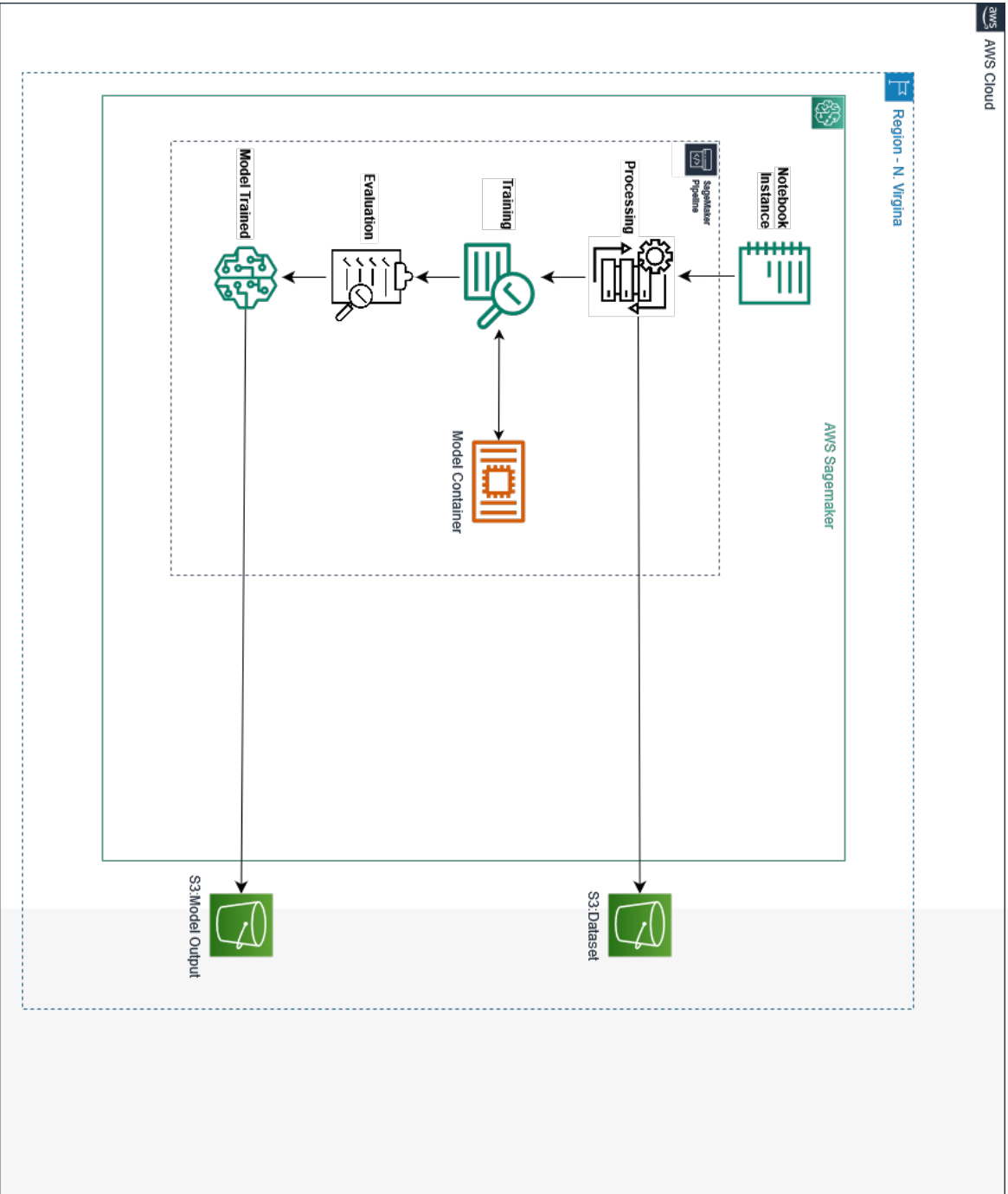
Provide features like automatic model scaling and spot instance support to help optimize costs. You pay only for the computing resources you use

### Monitoring of models

Offers built-in model monitoring and management capabilities to track model performance, detect issues, and manage model versions



# Ainnova Tech High Level solution diagram



## Next Steps

For **Ainnovia Tech**, this was their first project with Amazon SageMaker. They worked with SageMaker Pipelines and SageMaker Model Monitor and got great results. Due to the success of the implementation, the client is considering implementing new functionalities for his models using AWS services, since the SageMaker Pipelines have saved them both time and money.



### Monitoring

This solution provides model tracking with SageMaker Model Monitor, allowing for better review of the data.



### LOW TCO

Save money by using spot instances for the training step and other jobs that need the model.



### Fully Managed

Using SageMaker Pipeline gives you the opportunity to stay focused on code development while deploying faster.



### About IO Connect Services

IO Connect Services is a company specializing in Information Technology Consultancy Services. All our team members have one thing in common: our enthusiasm for technology and our passion for customer service excellence. We provide services in all North America, LATAM and Europe. Our headquarters are in NYC metropolitan area, and we also have offices in Guadalajara, Mexico and Madrid, Spain.