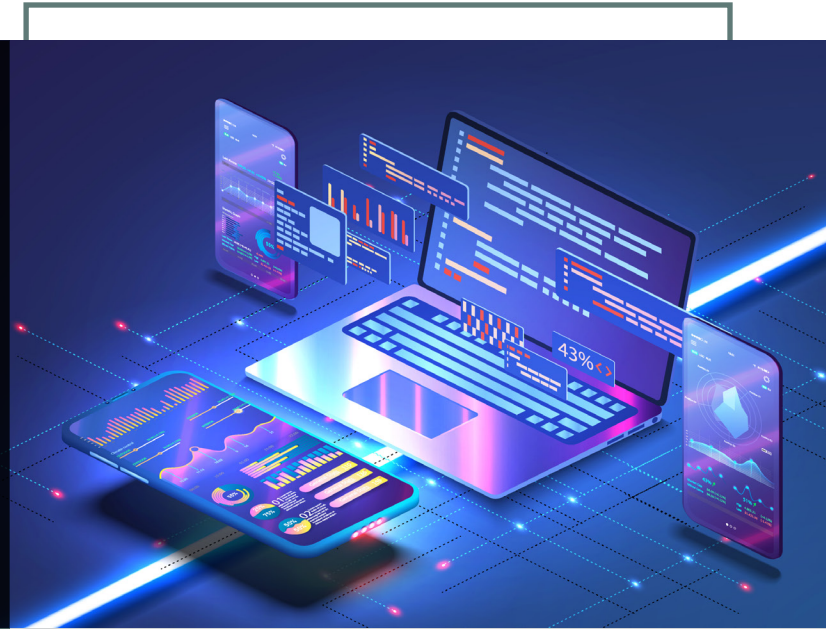# Motherson Technology Services
Ginger Webs
Build a Low-cost Robust Online Proctoring Solution to Ensure High Test Integrity

Client Overview

Ginger Webs Pvt. Ltd. is a Leading Testing and Assessment Solution Provider, driven by an ideology to make unique, easy-to-use, and futuristic applications. Their extensive research and development in the education industry help them develop products that allow end-users to achieve the maximum with minimal efforts. Apart from the education sector, they also offer solutions to corporates, Government & PSUs.

Business Challenges

Being a leading online test solution provider, Ginger Webs found student monitoring difficult, especially during the ongoing pandemic. They saw a massive surge in demand for online examinations, due to which they faced the below challenges:

1 Lack of scalability in the manual monitoring

2 High overhead and cost due to the need for multiple proctors

3 Lack of visibility in terms of examination fair practices

Our Solution

Ginger Webs realized the need for an intelligent online proctoring solution as it would allow them to conduct next-gen online exams via web & mobile devices. In addition, as a part of the solution, they wanted to build a student monitoring feature to handle malpractices and enforce fair and well-proctored exams for universities and corporates.

They expected a solution that would automatically handle the monitoring and alert the proctors only when it required manual intervention. As a result, the customer partnered with us to transform their proctoring process and achieve optimum performance.

We evaluated the overall proctoring process accessing possible solutions. Based on the use-case and the immediate implementation requirement, We proposed an AI-based solution using Amazon Rekognition for Face detection and comparison, which works as follows:

- Students' information is captured in the form of multiple (up to 3) images at fractional time differences and stored on the cloud as authentication and authorization take place during students' initial login.

- These images are processes and trained in the Rekognition model using face API as student authorization takes place.

- The student's live image is captured every 10 seconds and sent via an API to the cloud for validation during the online examination.

- Rekognition API has a region-specific Transactions per second (TPS) limit; for instance, North Virginia has 50, Ireland has 50 and Mumbai has 5 etc etc. The customer system had about 50K students taking the exam at a time. Hence, to address this constraint, We used an analytical function that used region-wise weights to distribute the load.

- The validation operation checks for

various factors like multiple faces, face mismatch etc., in the captured image. If any discrepancy is found, it is displayed at the web application window to proctor for further action.

AWS services used

- Amazon API Gateway
- Amazon Simple Storage Service (S3)
- Amazon Rekognition
- Amazon CloudWatch
- AWS Lambda
- Amazon DynamoDB

Solution Architecture

Ginger Webs Online Proctoring
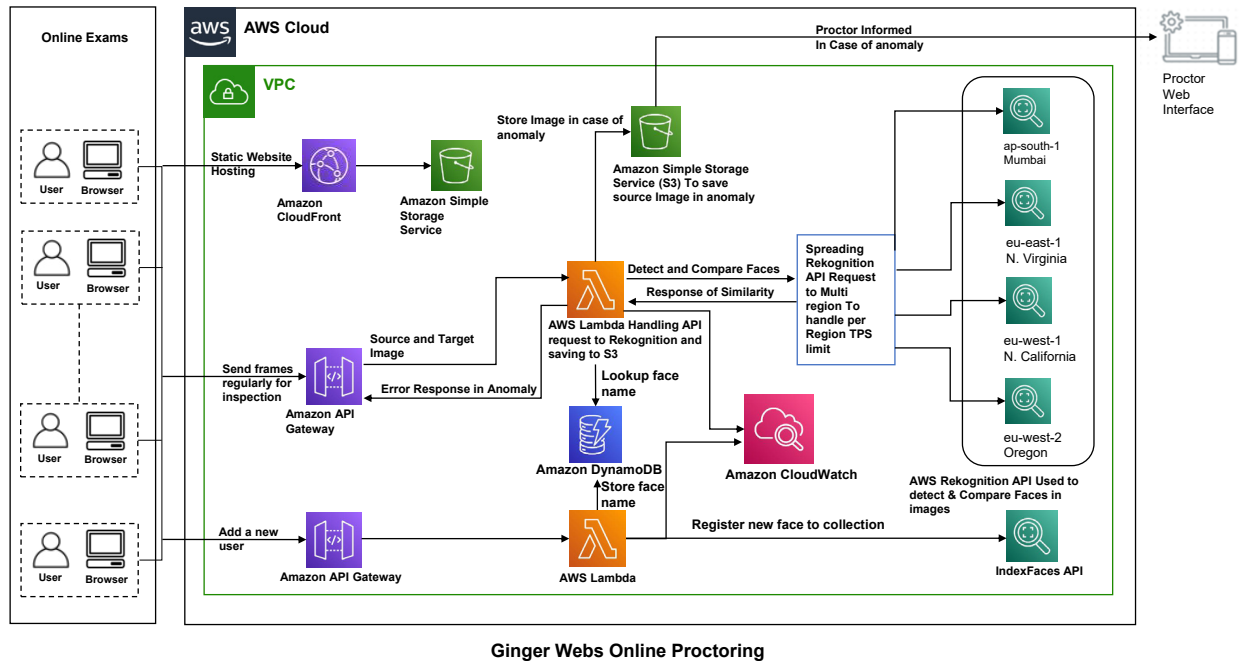
A Quick View of How AWS services helped Ginger Webs in Online Exam Proctoring:

- **Rekognition API helped detect and compare faces, integrating them with other AWS services**
  Amazon Rekognition is designed to work seamlessly with other AWS services, such as Amazon S3 and AWS Lambda. Ginger Webs only paid for the images and videos that were analyzed and the stored face metadata, thus reducing the overall cost of the AI services.

- **Retry and Exponential Backoff during any failure of an API request**
  Using AWS, We helped Ginger Webs retry several times in case any request fails due to an internal error.

- **AWS API Gateway for secured single API request along with Cost saving**
  With API Gateway, We helped the client achieve optimized serverless workloads and HTTP backends, thus attaining up to 71% cost savings and 60% latency reduction. It allowed the client to manage traffic to the backend systems, enabling them to focus on their business logic and services rather than maintaining infrastructure.

- **AWS Lambda helped create multiple API requests internally**
  Using AWS Lambda, We helped the client run code without provisioning or managing servers. Ginger Webs only paid for the compute time they consumed. It also helped them connect with various AWS API's to acquire multiple insights from the inputs.

Benefits

Helped enforce fair examination practices on both students and test providers, leading to enriched user experience

80% reduction in overheads and cost due to less number of invigilators required

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About The Partner

Founded in 1975, Motherson Group is an industry leader and one of the world's largest manufacturers of components for ther automotive and transport industries. The group's diversified portfolio makes it a complete solutions provider across the globe. Motherson Group serves its customers with a wide array of products and services through multiple business divisions including wiring harness, vision systems, modules and polymer, technology & software, aerospace, health & medical, logistics, retail and metal products. Motherson Technology Services is a global technology company that offers a consulting-led approach with an integrated portfolio of industry leading solutions that encompass the entire enterprise value chain. Our technology-driven products and services are built on two decades of innovation, with a future focused management philosophy, a strong culture of invention and co-innovation, and a relentless focus on customer-centricity. An SEI CMMI Level 5 company, we have delivered best-in-class services to 430+ clients in 41+ global locations across all continents. We are a business division of Motherson Group, one of the largest manufacturers of components for the automotive and transport industries worldwide with 150,000 employees across the globe.