

# Building a Scalable Construction Takeoff Platform on AWS

## Executive summary

**Customer:** Easymator

**Partner:** Graaho Technologies LLC

**Industry:** Construction Technology / SaaS

**Location:** United States

Easymator, a next-generation construction takeoff and cost management platform, partnered with Graaho Technologies LLC to build a secure, scalable backend infrastructure on AWS. By leveraging Amazon RDS (PostgreSQL) as the foundation for their database architecture, along with a comprehensive suite of AWS services including EC2, S3, ELB with ACM, ECR, Route 53, and CloudWatch, Easymator transformed their construction estimation capabilities. The solution delivers accurate material calculations, regional pricing intelligence, and real-time project reporting while achieving 99.99% uptime and reducing total cost of ownership by 40%.

**Customer Background:** Easymator provides construction professionals with advanced takeoff and cost management solutions that streamline the estimation process. The platform handles complex material calculations, dynamic cost variations, and processes high volumes of data from construction diagrams, measurements, and regional pricing databases. Easymator's mission is to eliminate manual calculation errors and accelerate project estimation workflows for construction firms of all sizes.

## Business Challenges

Easymator faced several critical challenges in scaling their construction takeoff platform:

### ► Database Complexity & Performance

- Managing both structured relational data (projects, users, pricing catalogs) and high-velocity dynamic data (real-time calculations, tool instances, caching layers)
- Ensuring fast query performance while processing hundreds of simultaneous construction projects
- Handling complex material calculations with zero data loss tolerance

### ► Scalability & Reliability Requirements

- Supporting growing user base with mission-critical uptime requirements
- Processing high volumes of construction diagrams, measurements, and regional pricing data
- Maintaining consistent performance during peak usage periods



### About the Customer

Easymator is a next-generation construction takeoff and cost management platform serving engineering, architecture, and project management professionals. The platform delivers accurate material calculations, regional pricing intelligence, and real-time project reporting to streamline construction project planning and execution.



### About the AWS Partner

Graaho Technologies LLC is an AWS Partner specializing in cloud infrastructure modernization, database migration, DevOps automation, and SaaS architecture. With deep expertise in AWS services and Infrastructure as Code, Graaho helps customers across industries transform their technology platforms for scalability, security, and operational excellence.



## ► Operational Efficiency

- Reducing manual errors in deployment processes
- Accelerating development and deployment cycles
- Minimizing infrastructure management overhead

## ► Data Security & Compliance

- Protecting sensitive project and pricing information
- Ensuring data integrity across all operations
- Meeting construction industry compliance requirements

## Solution Overview

Graaho Technologies LLC designed and implemented a fully automated, cloud-native infrastructure on AWS using infrastructure-as-code principles with Terraform. The solution centered on Amazon RDS (PostgreSQL) as the primary database platform, integrated with a comprehensive AWS service ecosystem.

## Architecture Components

### Database Layer – Amazon RDS (PostgreSQL):

- Multi-AZ deployment for high availability and automatic failover
- Automated backup configuration with point-in-time recovery capabilities
- Version-controlled schema migrations for zero-downtime updates
- Performance optimization for complex construction calculation workloads

### Compute & Application Layer:

- Amazon EC2 instances for application hosting with auto-scaling capabilities
- ELB with AWS Certificate Manager (ACM) for secure traffic distribution
- Amazon Elastic Container Registry (ECR) for container image management
- VPC-based network isolation for enhanced security

### Storage and Content Delivery:

- Amazon S3 for storing construction diagrams, documents, and generated reports
- Lifecycle policies for cost-optimized data retention
- Multi-format export capabilities including automated Excel generation

### Infrastructure Management:

- Amazon Route 53 for DNS management and traffic routing
- Amazon CloudWatch for comprehensive monitoring and alerting
- Terraform-based infrastructure automation for consistency and repeatability
- CI/CD pipelines for seamless deployment workflows

### Security & Compliance:

- IAM roles and policies for granular access control
- VPC isolation with security groups and network ACLs
- Encryption at rest and in transit for all sensitive data
- Automated backup and disaster recovery procedures

## AWS Services Used

- Amazon RDS for PostgreSQL
- Amazon EC2
- Amazon S3
- Amazon ECR
- Elastic Load Balancer (ELB)
- AWS Certificate Manager (ACM)
- AWS Amplify
- Amazon CloudWatch
- AWS VPC
- AWS IAM
- AWS Route 53
- Terraform



## Business Outcomes

### Results & Benefits

The AWS-based solution delivered transformative results across multiple dimensions:

#### Reliability & Performance:

- **99.99% uptime** for mission-critical database workloads with Amazon RDS Multi-AZ deployment
- **Scalable architecture** handling hundreds of simultaneous projects
- **Zero data loss** achieved through automated RDS snapshots
- **Enhanced query performance** for material calculations and reporting

#### Operational Efficiency:

- **30% faster deployment cycles** through CI/CD automation
- **50% reduction in manual takeoff calculation time**
- Streamlined operations with automated Excel exports
- Reduced infrastructure management overhead through managed AWS

#### Cost Optimization:

- **40% lower total cost of ownership (TCO)**
- Eliminated capital expenditure for hardware and data center
- Pay-as-you-go pricing model aligned costs with actual usage
- Reduced operational costs through automation and managed services

#### Business Value:

- **30% improvement in cost accuracy** through state and region-based pricing integration
- Enhanced customer satisfaction with real-time project reporting capabilities
- Faster time-to-market for new features and functionality
- Improved competitive positioning in the construction technology market

#### Security & Compliance:

- Stronger compliance posture with IAM-based access controls and VPC isolation
- Enhanced data protection through encryption at rest and in transit
- Automated backup procedures ensuring business continuity
- Point-in-time recovery capabilities for data protection

### Implementation Approach

Graaho Technologies followed a structured implementation methodology:

#### Phase 1: Assessment & Planning

- Analyzed Easymator's existing architecture, data models, and performance requirements

#### Phase 2: Infrastructure Design

- Created Terraform modules for repeatable, version-controlled infrastructure deployment

#### Phase 3: Database Migration

- Implemented zero-downtime migration strategy to Amazon RDS (PostgreSQL)

#### Phase 4: Automation Implementation

- Built CI/CD pipelines for automated testing and deployment

#### Phase 5: Security Hardening

- Configured IAM policies, VPC isolation, encryption, and security groups

#### Phase 6: Monitoring Setup

- Deployed CloudWatch dashboards & alarms for proactive operational visibility

#### Phase 7: Testing & Optimization

- Conducted performance testing
- Optimized database queries
- Infrastructure scaling



## Partner Expertise

Graaho demonstrated deep expertise across multiple AWS competency areas:

- **Database Modernization:** Successfully migrated and optimized database workloads on Amazon RDS for PostgreSQL with Multi-AZ high availability
- **DevOps Automation:** Implemented comprehensive CI/CD pipelines and Infrastructure as Code using Terraform and GitHub Actions
- **SaaS Architecture:** Designed scalable, multi-tenant capable infrastructure supporting rapid customer growth
- **Security and Compliance:** Implemented layered security controls including encryption, IAM, VPC isolation, and automated backup strategies
- **Application Modernization:** Containerized applications using Docker and Amazon ECR for improved deployment consistency

The partner's systematic approach to automation, security, and operational excellence enabled Easymator to focus on core product innovation while maintaining enterprise-grade infrastructure reliability.

## Lessons Learned & Best Practices

The engagement yielded valuable insights applicable to similar SaaS and construction technology implementations:

- **Automation is Key:** Terraform-based IaC simplified the Amazon RDS lifecycle, enabling consistent, version-controlled deployments and dramatically reducing manual errors
- **High Availability is Non-Negotiable:** Multi-AZ RDS deployments proved critical to maintaining uptime for mission-critical construction project applications where downtime directly impacts customer productivity
- **Data Protection Requires Layered Strategies:** Combining automated RDS backups, point-in-time recovery, and regular snapshots ensured business continuity with zero data loss
- **Visibility Matters:** Amazon CloudWatch monitoring enabled proactive issue resolution before problems impacted end users, improving overall service quality
- **Security Must Be Embedded:** Integrating IAM, RDS encryption, and VPC isolation from the beginning enhanced compliance posture and customer trust
- **Scalability Drives Growth:** Amazon RDS read replicas supported seamless scaling for increasing project demands without architectural redesign
- **Right-Sizing Delivers Value:** Proper initial sizing and automated scaling policies minimized costs while maintaining performance

### Customer Testimonial

#### — Technology Leadership, Easymator

*“Partnering with Graaho Technologies to build our platform on AWS has been transformational for Easymator. The reliability and scalability of Amazon RDS, combined with their expertise in infrastructure automation, has allowed us to focus on delivering value to our construction customers rather than managing infrastructure. The 50% reduction in manual calculation time and 30% improvement in cost accuracy has made a real difference for our users.”*



## Conclusion

The partnership between Easymator and Graaho Technologies LLC demonstrates the power of AWS cloud services in transforming construction technology platforms. By leveraging Amazon RDS (PostgreSQL) as the foundation for a comprehensive, automated infrastructure, Easymator achieved enterprise-grade reliability, significant cost savings, and operational efficiency improvements that directly benefit their construction industry customers.

The solution's success highlights several key best practices:

- Infrastructure-as-code with Terraform for consistency and repeatability
- Managed database services (Amazon RDS) for reduced operational overhead
- Comprehensive automation through CI/CD pipelines
- Security-first architecture with encryption and access controls
- Multi-AZ deployment for high availability and disaster recovery

As Easymator continues to grow, the scalable AWS architecture provides a solid foundation for future innovation and expansion into new markets and capabilities.

### Graaho Technologies LLC

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### AWS Partner Team

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### Additional Resources

- ❑ [AWS Well-Architected Framework - SaaS Lens](#)
- ❑ [Amazon RDS Best Practices Guide](#)
- ❑ [IaC on AWS - Terraform Best Practices](#)
- ❑ [AWS Database Migration Best Practices](#)
- ❑ [AWS Security Best Practices - Encryption & IAM](#)
- ❑ [CI/CD on AWS - GitHub Actions Integration](#)

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