Nommad Transforming the Future of Renting with GenAI and AWS – Customer Case Study.

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1. About the Customer

NOMMAD, a key player in the real estate and property rental industry, is transforming how property owners, brokers, and tenants interact. With a diverse portfolio of long-term and short-term rental units, NOMMAD's core mission is to minimize vacancies and secure optimal rental agreements with maximum efficiency.

As part of their ambitious digital transformation, NOMMAD is leveraging artificial intelligence and cloud-native solutions. This strategic move aims to significantly improve negotiation outcomes, refine tenant selection processes, and boost overall operational efficiency.

NOMMAD is also recognized for its innovative guaranteed rent model, providing a seamless, tech-driven experience for all users. As the platform expanded, it encountered increasing operational complexities, particularly with manual rental negotiations, tenant selection, and pricing decisions. These challenges impacted their speed, consistency, and user experience.

To overcome these hurdles and future-proof their platform, NOMMAD has teamed up with Nova, an AWS Advanced Consulting Partner. Nova brings extensive expertise in Generative AI (GenAI), serverless architecture, and platform modernization, making them an ideal partner to help NOMMAD achieve its digital transformation goals.

2. Customer Challenge

Prior to adopting the AI-driven platform, NOMMAD's negotiation process was largely manual, requiring property owners or brokers to individually handle tenant offers, counter offers, and candidate evaluations. This resulted in prolonged negotiation cycles (averaging 12 days per lease agreement) and inconsistent pricing outcomes, often below target minimum rental rates.

Without an automated system, brokers struggled to manage multiple properties simultaneously, leading to missed opportunities, slow response times, and increased vacancy days. The lack of real-time insights and automated scoring of tenant profiles (such as affordability, references, and stability) hindered the ability to identify the most suitable tenants.

The risk of continuing with manual negotiations was clear: increased operational workload, lost revenue due to underpriced agreements, and longer vacancies. NOMMAD needed a modern, scalable platform to optimize negotiations and provide real-time data-driven decision-making.

3. Why AWS?

The selection of AWS as the cloud platform for NOMMAD's AI Negotiation Agent was driven by several critical technical and business requirements that aligned perfectly with AWS's capabilities.

The core solution included:

- **Amazon Bedrock (Claude 3 Sonnet):** Used for real-time AI negotiation and dynamic counter-offer generation, leveraging predefined rules (Algorithm v5.2) and tenant compatibility scores.
- **Amazon API Gateway:** Exposed secure endpoints for brokers, tenants, and third-party applications to interact with the negotiation engine.
- **AWS Lambda:** Hosted the serverless negotiation logic, integrating LangChain workflows and Bedrock LLM calls.
- **Amazon DynamoDB:** Stored property details, tenant profiles, and negotiation session logs for fast, scalable access.
- **Amazon CloudWatch:** Provided monitoring, logging, and metrics for negotiation sessions and API performance.

4. The Solution

During the pre-implementation phase, NOVA worked closely with the customer to capture negotiation rules, define the Affinity and Stability scoring models, and validate workflows through a proof of concept. NOVA's support extended into the post-implementation stage with proactive system monitoring, data quality checks, and iterative updates to AI negotiation strategies.

The solution was deployed using Infrastructure-as-Code, ensuring repeatability and scalability. Integration with Stripe supported automated payment processing post-negotiation. NOVA also provided knowledge transfer sessions and operational documentation for the customer's internal teams.

Serverless-First Architecture

NOMMAD was designed to operate under highly variable workloads, ranging from low activity during off-peak hours to high traffic during peak rental seasons. A serverless-first architecture was chosen to ensure scalability, reliability, and operational efficiency. At its core, AWS Lambda powers the system, providing automatic scaling, no server management,

and a pay-per-use model that aligns perfectly with NOMMAD's unpredictable usage patterns. This design ensures resources are only consumed during active negotiation processes, resulting in optimal cost efficiency.

The system's negotiation workflow is managed by a series of distinct functions. The process starts with **Negotiation Start Function** which orchestrates the initial scoring and session creation by validating data, calculating compatibility scores, and using Amazon Bedrock for the first AI-generated response. This function is secured with a limited IAM role and optimized for performance. As the dialogue continues, **Negotiation Continue Function** processes ongoing rounds and counter-offers, leveraging conversation history for contextual AI responses and applying dynamic pricing logic, with a Dead Letter Queue for error handling. Once an agreement is reached, the **Accept Offer Function** finalizes the deal, validates the terms, integrates with payment systems, and creates a secure audit trail with enhanced logging. Finally, the **Rank Offer Function** supports property managers by implementing a sophisticated "Affinity and Stability" scoring system to rank tenant applications, delivering detailed breakdowns in a structured JSON format optimized for bulk processing.

AI/ML-Powered Negotiation Engine

At the heart of NOMMAD lies its intelligent negotiation engine powered by **Amazon Bedrock**, specifically the **Claude 3 Sonnet** model. This allows NOMMAD to deliver real-time, AI-driven responses with:

- **Direct Foundation Model Access**: No infrastructure overhead.
- **Enterprise-Grade Security**: Data never leaves AWS, ensuring confidentiality.
- **Prompt Engineering Control**: Fine-tuned for real estate-specific use cases.
- **Cost-Efficient AI Usage**: On-demand pricing aligned with negotiation volume.

The negotiation engine implements a dual-dimension scoring algorithm that evaluates tenant-property compatibility: Affinity Scoring (Property Compatibility), Stability Scoring (Reliability Assessment), and Dynamic Pricing Calculation.

Data Management and Storage Strategy

NOMMAD leverages **Amazon DynamoDB** for its primary data store, enabling seamless scalability and high availability with:

- **Auto-Scaling**: From hundreds to millions of sessions.

- **Low Latency**: Single-digit millisecond performance.
- **Point-in-Time Recovery**: 35-day retention for backup and compliance.
- **Global Tables**: Support for international multi-region replication

The system uses a **single-table design** with strategic partition and sort keys for optimal performance:

- **Properties Table**: Stores property details with owner preferences and pricing thresholds
- **Tenants Table**: Maintains tenant profiles with qualification information
- **Negotiations Table**: Records active and historical negotiation sessions
- **Offers Table**: Tracks individual offers and counter-offers with timestamps

Security and Compliance Framework

Real estate transactions involve sensitive financial and personal data, requiring enterprise-grade security. AWS provided:

- **Individual IAM Roles**: Least-privilege access control for each Lambda function
- **AWS Secrets Manager**: Secure storage and automatic rotation of API keys and encryption keys
- **KMS Encryption**: End-to-end encryption for data at rest and in transit
- **PII Redaction**: Automatic detection and redaction of personally identifiable information in logs
- **SOC 2 Compliance**: Built-in compliance frameworks supporting GDPR and industry regulations

Operational Excellence and Monitoring

The platform required comprehensive observability and automated operations:

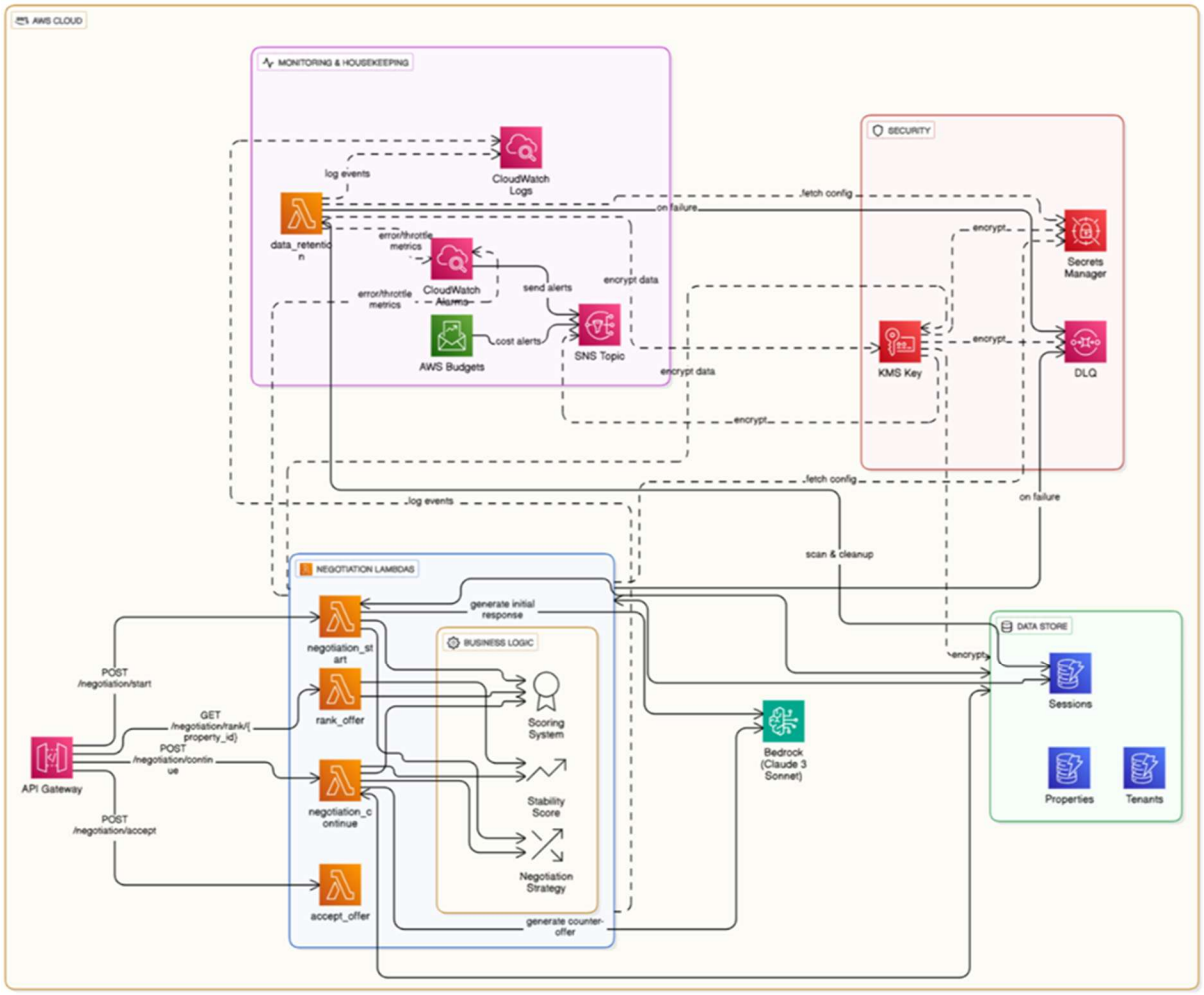
- **CloudWatch Integration**: Unified logging, monitoring, and alerting across all services
- **Infrastructure as Code**: AWS SAM templates ensuring consistent, repeatable deployments
- **Cost Management**: AWS Budgets and Cost Explorer providing granular cost tracking and optimization
- **Dead Letter Queues**: Automatic error handling and retry mechanisms for resilient operations

Integration and Ecosystem Benefits

AWS's comprehensive service ecosystem enabled rapid development and integration:

- **API Gateway**: Secure, scalable API endpoints with built-in throttling and authentication
- **SNS/SQS**: Event-driven messaging for decoupled, resilient system architecture
- **AppRegistry**: Centralized application metadata and resource governance
- **CloudFormation**: Complete infrastructure lifecycle management and disaster recovery capabilities

5. Analysis Architecture



6. Results and Benefits

The implementation of NOMMAD's AI-driven negotiation platform has provided early signs of improvement and operational efficiency:

- **Faster Negotiation Response Times:** AI-driven counter offers to respond to tenant proposals in seconds, significantly reducing delays compared to manual processes.
- **Improved Pricing Consistency:** The system enforces minimum acceptable price thresholds, reducing the risk of underpriced agreements.
- **Operational Scalability:** Brokers can manage multiple properties simultaneously with 24/7 AI negotiations, minimizing manual intervention.

7. About the Partner

NOVA is an AWS Advanced Consulting Partner specializing in AI/ML solutions, cloud-native application development, and serverless architectures. With expertise in AWS services such as Amazon Bedrock, Lambda, API Gateway, and DynamoDB, NOVA delivers innovative platforms that drive operational efficiency and business growth. NOVA's experience in building generative AI-powered negotiation systems and its commitment to continuous improvement ensures that customers like NOMMAD achieve rapid digital transformation and measurable business outcomes.