NOPSEMA

Case Study

MECHANICAL ROCK

Executive Summary

Australia's offshore energy regulator sheds risk and technical debt by adopting a **cloud-based event-driven architecture.**

Faced with significant changes to their fragile legacy core regulatory management system, NOPSEMA partnered with application modernisation specialists Mechanical Rock, to implement a pragmatic strategy toward freeing themselves from 10 years of technical-debt, and an ageing data centre.

The process of replacing their monolithic system began with the development of a decoupled domain-specific application hosted on Amazon Web Services (AWS). The solution provides the foundations for NOPSEMA's ongoing system modernisation, including:

- The ability to **confidently** make changes without disruption
- **Reduction** in the likelihood and impact of system failure
- Improved **cost optimisation** controls
- Significant improvement in **security** and scalability

Stepping up to meet increased expectations

NOPSEMA is under increasing pressure to evolve their services in line with growing public and legislative expectations.

This includes ensuring greater transparency, improving processes, and responding to a higher demand for digital services - all while operating within a cost recovery budget model.

All of NOPSEMA's core regulatory activities have been managed on a 10-year-old legacy application hosted in their local data-centre. Development has been intermittent and has led to a convoluted code-base with complex interdependencies.

Image source: NOPSEMA

Overhauling business critical workflows

As their **preferred software delivery partner**, Mechanical Rock was engaged to implement a set of policy framework changes into the regulatory management system. This would necessitate an overhaul of the key investigation workflow, presenting significant business and operational challenges.

With Mechanical Rock's guidance NOPSEMA sought to overcome these challenges by developing a strategy to modernise their core system:

- Begin the process of replacing their monolithic system gradually with domain specific smaller applications (e.g. Investigations)
- Develop these new applications using a contemporary programming language and event-driven architecture
- Migrate the applications and data to Amazon Web Services (AWS) to provide greater flexibility and efficiencies when implementing the new architecture
- Prioritise application modernisation based on the need to change business processes

Achieving the early success

Mechanical Rock delivered an elegantly decoupled, domain-specific application for the management of investigations, based on the new event driven architecture.

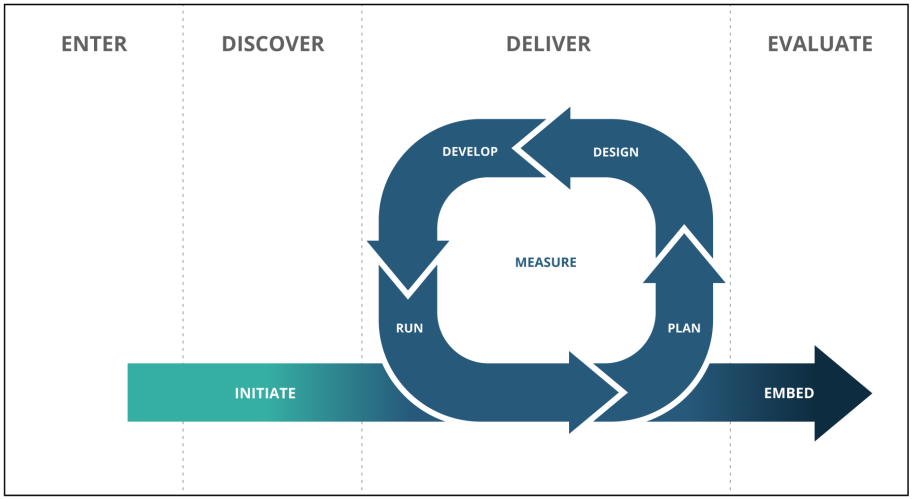
The new application **integrates seamlessly** with the existing regulatory management system, allowing users to easily access the new workflow.

The solution was implemented as a cloud native application:

- React front-end, bringing to life a slick modern user interface design
- Serverless microservices to support specific business logic (AWS AppSync, AWS Lambda, AWS DynamoDB)
- Integrated authentication through NOPSEMA's existing 3rd party authentication provider
- Role-based feature access
- Continuous data replication to the on-premise data warehouse to support legacy reporting requirements

In addition, Mechanical Rock was able to help NOPSEMA **modernise their ways of working**, including business process improvement and a move from projects to product based continuous delivery.

The transformation included DevOps practices such as everything-as-code, continuous build and continuous operations.



End-to-end delivery process

Building confidence for the future

The new Investigations application enables a transparent, consistent and improved approach to how investigations are conducted, and supports compliance with the Australian Government Investigations standards.

The solution also provides the solid foundation for the modernisation of NOPSEMA's systems, including:

- The ability to make timely changes to the system without disruption
- Significant reduction in the risk of failure and the time taken to restore services in the event of failure
- Improved cost optimisation controls, implemented through the observability and monitoring capabilities provided by AWS cloud infrastructure
- Significant improvement in the security and scalability of the core system
- Flexibility to use commercial off-the-shelf software to replace parts of the application

NOPSEMA are now able to proceed with the migration from their legacy core system to a **modern event-driven architecture** at a pace that best suits their budget and operational cycles.

Are you ready to modernise your technology stack? We can help.

Get in touch so we can chat about your plans over a coffee

contact@mechanicalrock.io
www.mechanicalrock.io