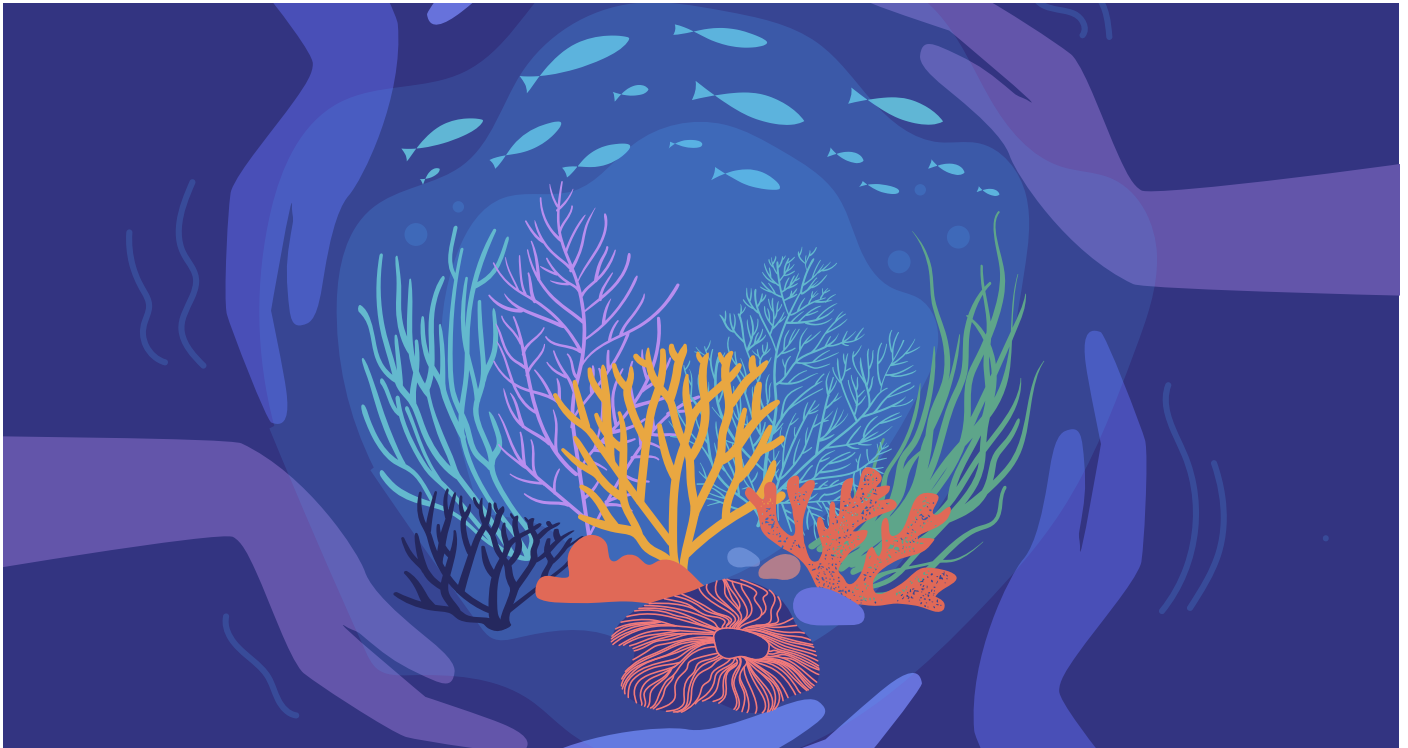# Revolutionizing Marine Conservation with a Scalable Data Platform

The world's largest marine ecosystem, The Great Barrier Reef, is in peril. As climate change and myriad other threats expose the reef to bleaching, it is paramount to gather data about The Reef - a task that cannot be accomplished by an individual or entity alone.

In partnership with Citizens of the Great Barrier Reef, we embarked on an ambitious journey to harness technology for conservation. Our mission: to create a scalable, feature-rich data platform that would drive one of the world's largest marine citizen science initiatives. Through our intuitive platform and mobile app, citizens can contribute towards widespread reconnaissance of The Reef that in turn provides marine scientists with data to build solutions to secure the marine ecosystem.

Technical Innovation:

The solution rests on a foundation of cutting-edge technology, seamlessly integrating various components of this intricate ecosystem. From capturing images of the Reef to analyzing them and distilling actionable insights, our platform leverages onboard computing devices, a robust ML platform and a powerful data engineering infrastructure to make it all possible.

Core Solution Components:

Machine Learning Integration:

Leveraging ML predictions, we significantly reduced the average time for image analysis. This technological leap empowers the rapid and accurate identification of critical marine species and habitats.

Automated Flotilla Deployment:

By automating the process of setting up research flotillas with onboard servers, we've created a scalable model. This ensures that the initiative can expand seamlessly, allowing for increased data collection efforts without a proportional increase in resource allocation.

Data Platform Re-engineering:

We overhauled the existing data platform, liberating it from a complicated codebase and deployment bottlenecks. This transformation allows for greater agility in addressing evolving survey needs and accommodating diverse stakeholders.

Enhanced User Experience:

Simplified Deployment Process:

The deployment process was streamlined, unlocking new features for scientists, including the ability to track new species efficiently.

Real-time Data Analysis and Monitoring:

Scientists can now monitor incoming data in real-time, thanks to the integration of Google Web Analytics and the BigQuery Data Platform. This enhances the efficiency of decision-making processes.

Mobile App Integration:

To further extend accessibility and convenience, we're recreating the capabilities of the data platform for a mobile application, ensuring stakeholders can engage with the initiative anytime, anywhere.

Impact:
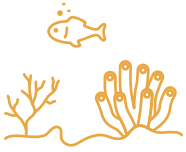
510 **unique reefs surveyed**
this is 15% of reefs across the Great Barrier Reef. Previously only 5% of the Great Barrier Reef was regularly surveyed

86,000+ **images collected**
by snorkellers, divers and volunteers

100+ **vessels & operators**
taking us to these reefs, including dive boats, tourism vessels, sailing boats, superyachts, island operations and tugboats

Great Reef Census data is:

Helping direct Crown of Thorns control vessels
(COTs are responsible for 50% of coral loss on GBR)

Identifying key source reefs, which help nearby reefs recover their coral

Our smart tech solution stands as a testament to the potential of technology in driving environmental conservation. By seamlessly integrating data engineering, machine learning and automation, we've not only enhanced the efficiency of marine research but also demonstrated the tangible impact of technological innovation in preservation of our planet's natural wonders. Together, we can continue to build a sustainable future for The Great Barrier Reef.