NestGuard: Technology for the Conservation of the Hawksbill Turtle

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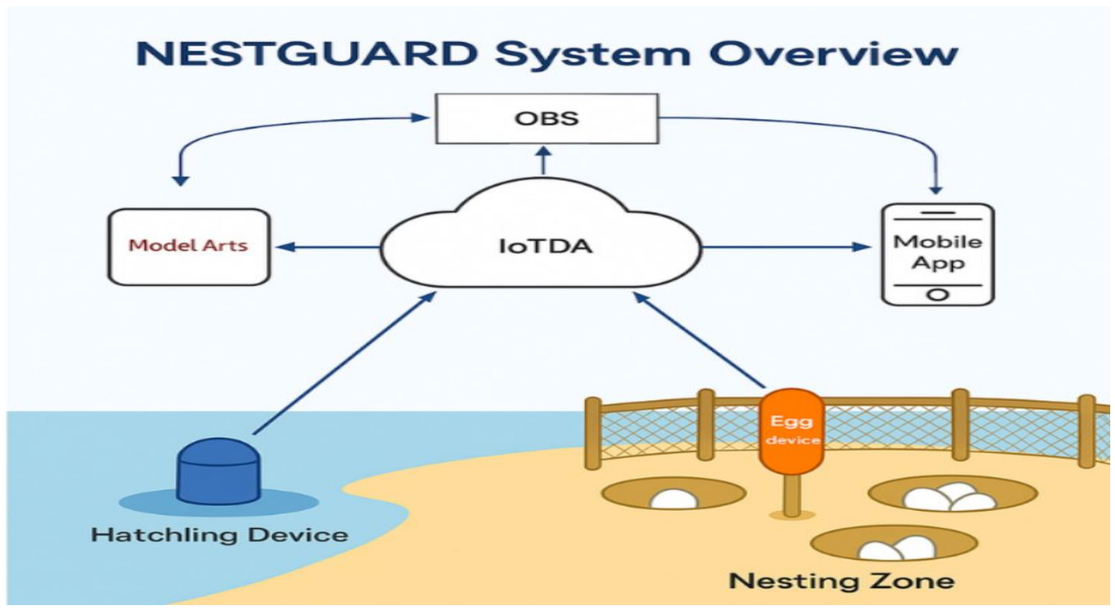
1 INTRODUCTION

The hawksbill turtle has lost more than 80% of its population due to human activities. El Salvador is home to 50% of its regional nesting sites. NestGuard proposes a technological solution to monitor and protect this species, which is critical to marine ecosystems.

NestGuard

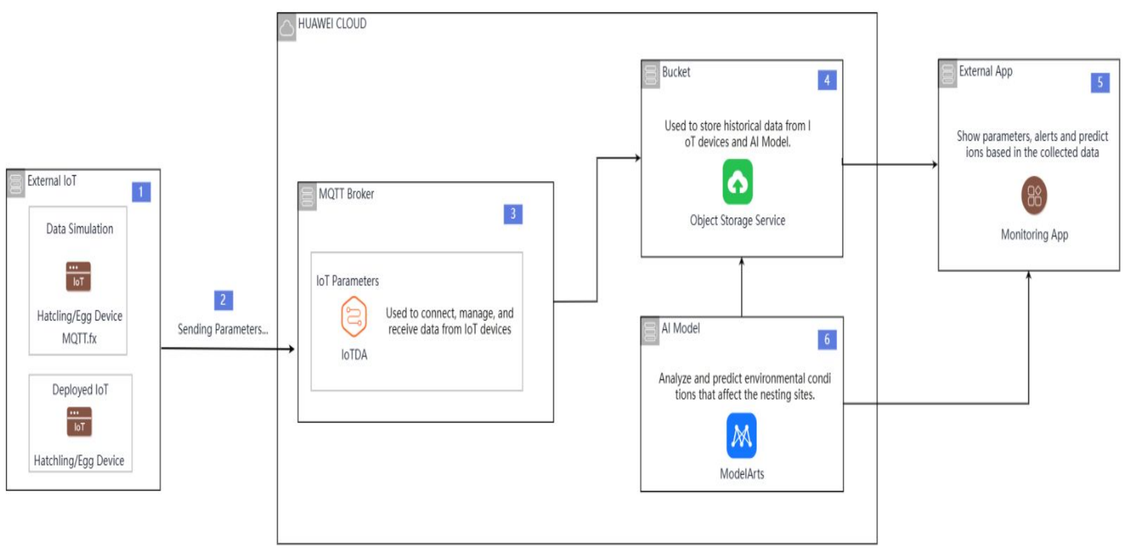
2 OBJECTIVES

The project aims to monitor in real time the nests and marine areas where hawksbill turtles live, predict safe areas using artificial intelligence, support decision-making by NGOs and local communities through accurate data, and ensure the sustainability of the system through a scalable membership-based model.



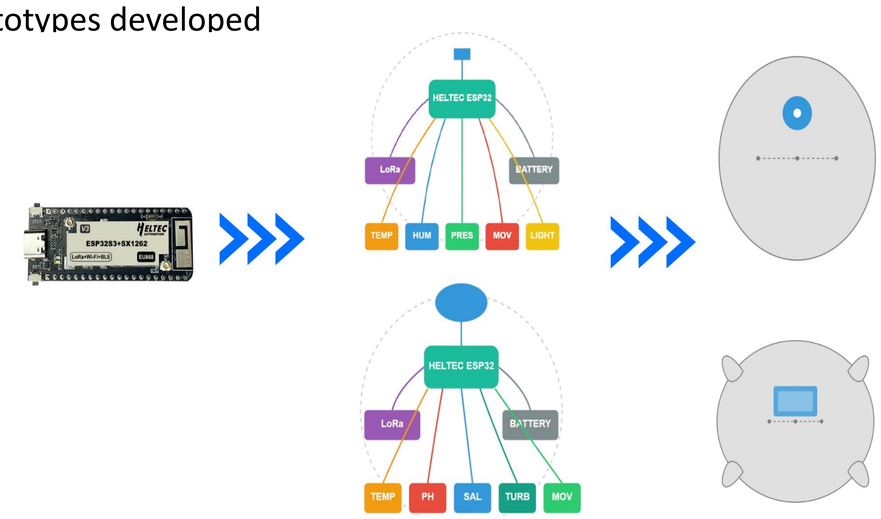
3 MATERIALS AND METHODS

The methodology used was experimental and based on a multidisciplinary approach that integrated hardware development, artificial intelligence, and community participation. Specific sensors were designed to monitor nests and marine areas in order to collect key environmental variables such as temperature, humidity, pressure, salinity, and pH. This data was processed using a One Class SVM model implemented in Huawei ModelArts, enabling the identification of safe nesting areas. The solution was validated in the field in Jiquilisco Bay and complemented with a sustainability model based on scalable memberships.

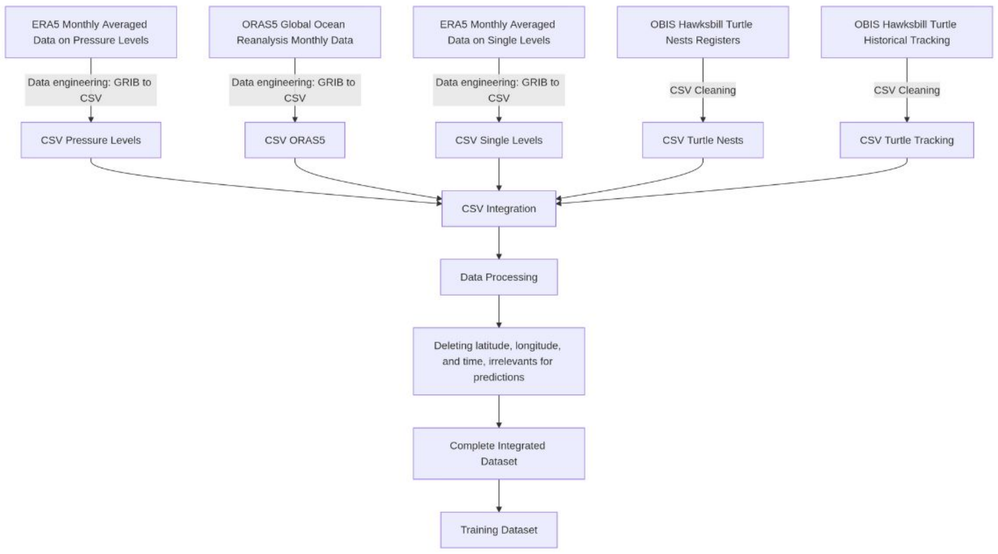


4 RESULTS

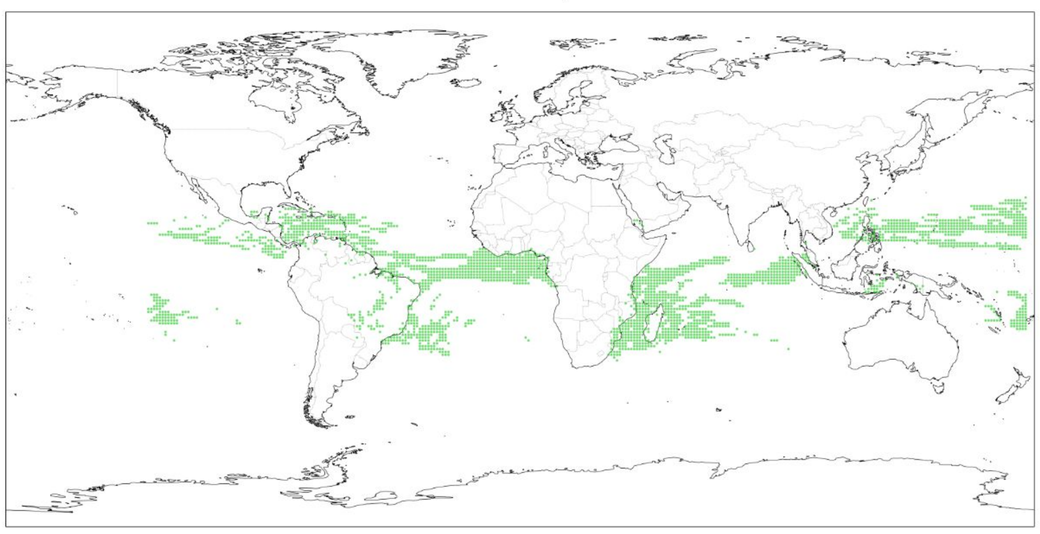
Prototypes developed



Successful predictive model for nesting areas.



National and regional expansion plan.



The project has an economic sustainability model based on a scalable membership structure, aimed at NGOs, companies, and research centers, which allows for the financing of continuous monitoring and the expansion of the solution to new areas.

5 IMPORTANCE

NestGuard contributes to ecosystem restoration, promotes environmental education, strengthens local capacities, and provides access to scientific data for marine conservation.

6 CONCLUSION

Technological innovation at the service of biodiversity: NestGuard integrates sensors, AI, and social participation to save a key species and build a replicable and sustainable conservation model.

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