

Data & AI : An Industry Perspective

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- Data & AI – Introduction
- Data capabilities and culture
- Case Studies
- Responsible AI



Data is a strategic asset



4X

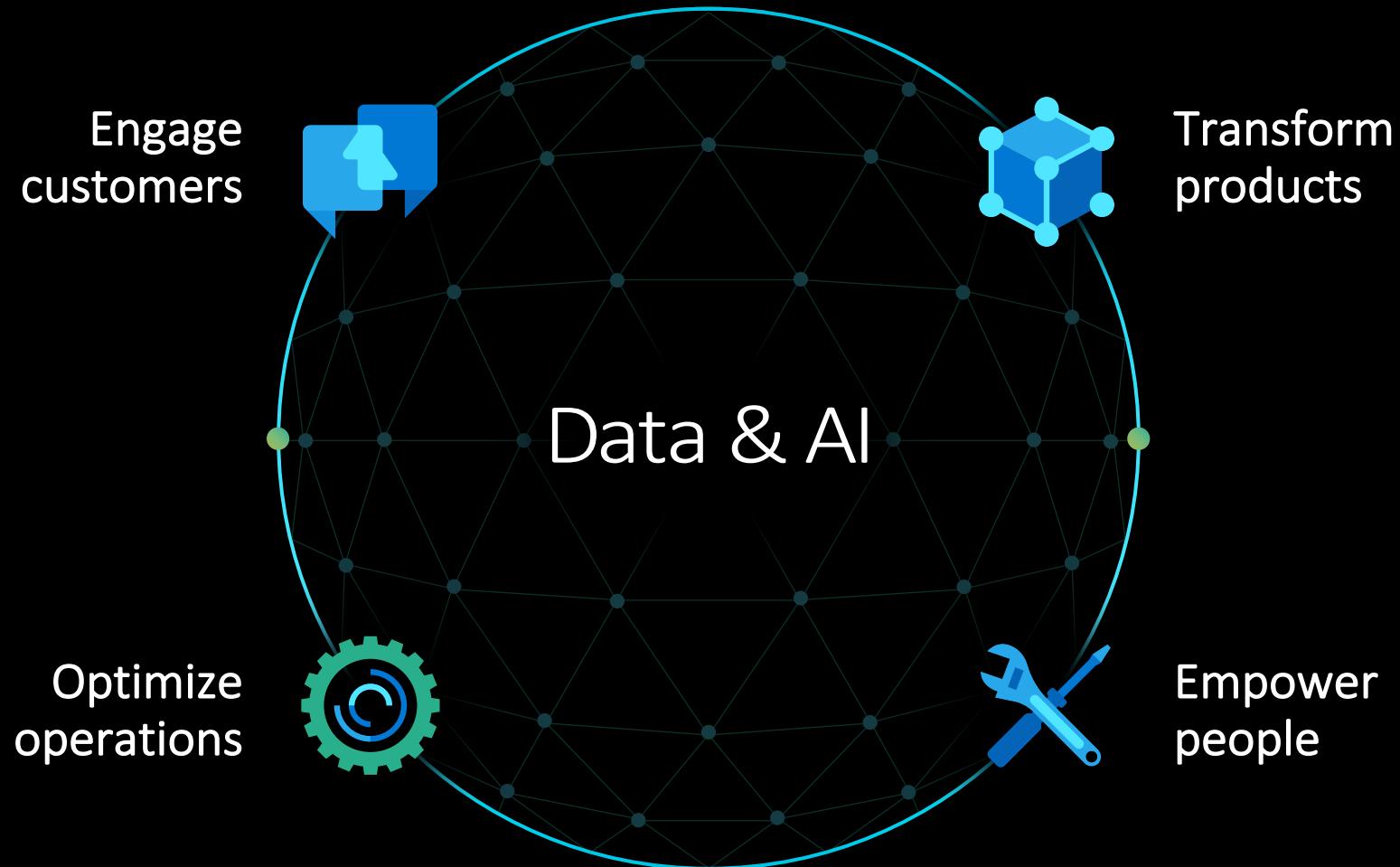
“Companies who embrace
a data-driven culture experience
a 4X improvement in revenue
performance and better
customer satisfaction.”

Harvard Business Review Analytic Services

How world understands Data and AI today



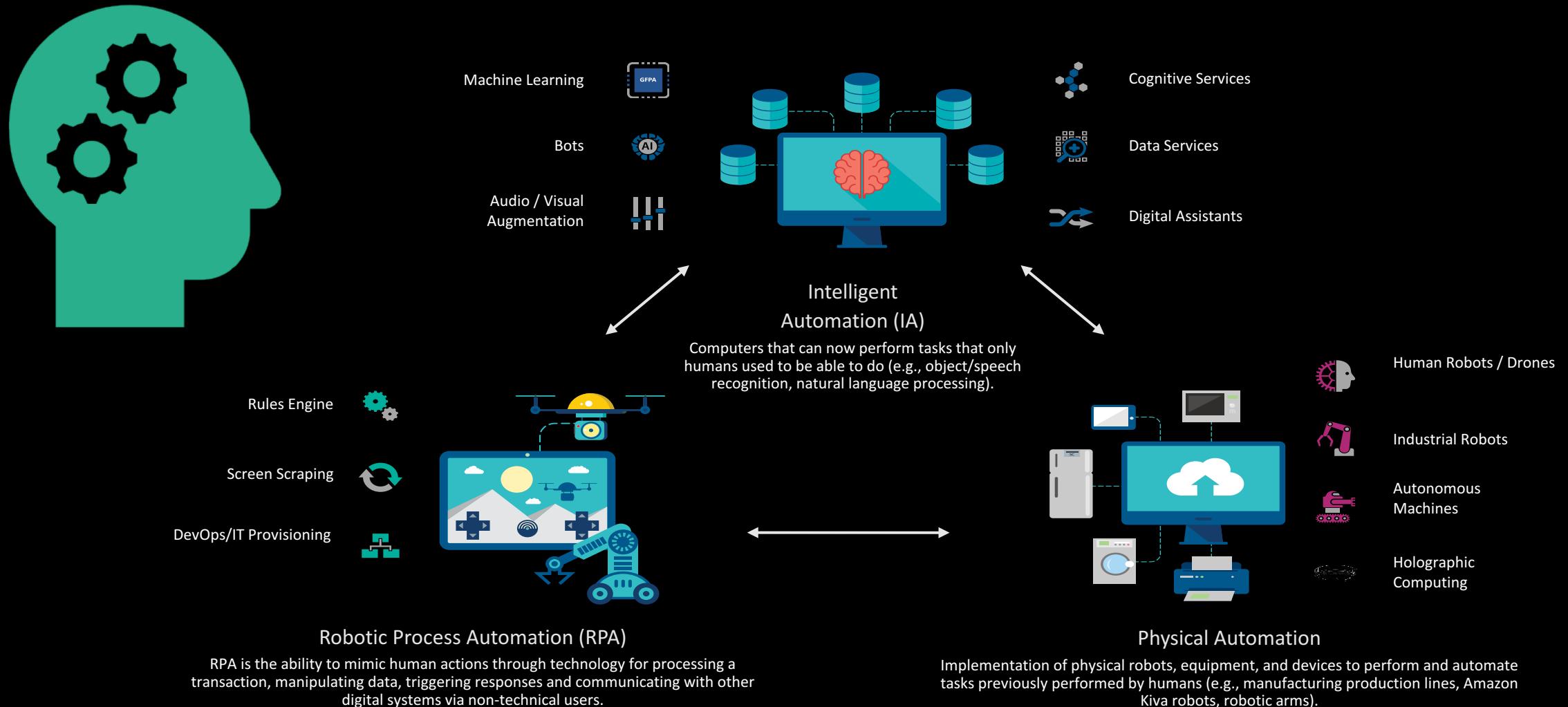
Digital feedback loop



How do we leverage Data?

Data
capabilities + Data
culture = Unique
potential

How should we think about AI?



Implementing AI projects



THE RIGHT QUESTION



SCOPE



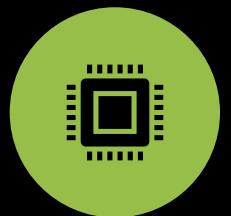
ROLES AND
RESPONSIBILITIES



TIMELINES



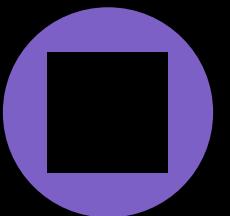
ASSUMPTIONS



PROJECT REQUIREMENTS
(SOFTWARE, HARDWARE,
DATA)



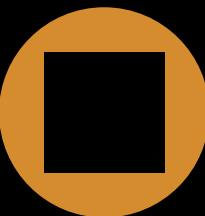
DELIVERY METHODOLOGY



RISK



SUCCESS CRITERIA



RESPONSIBLE AI

Challenges in AI projects

Customer expectations

Human resistance to change

Question formation

Lack of centralised data policy

Wrangling data

Data in multiple silos and formats

Suitability of datasets

Lack of delivery skills

Delivery Methodology

Responsible AI

Resource Industry Positive Communication via UHF Radio

Monitoring and Improving Compliance

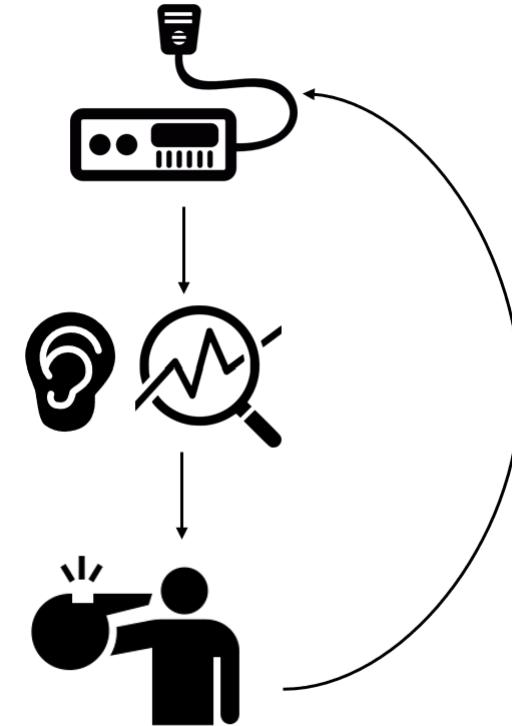
"Copy Loader 1, LV577
coming into your area"



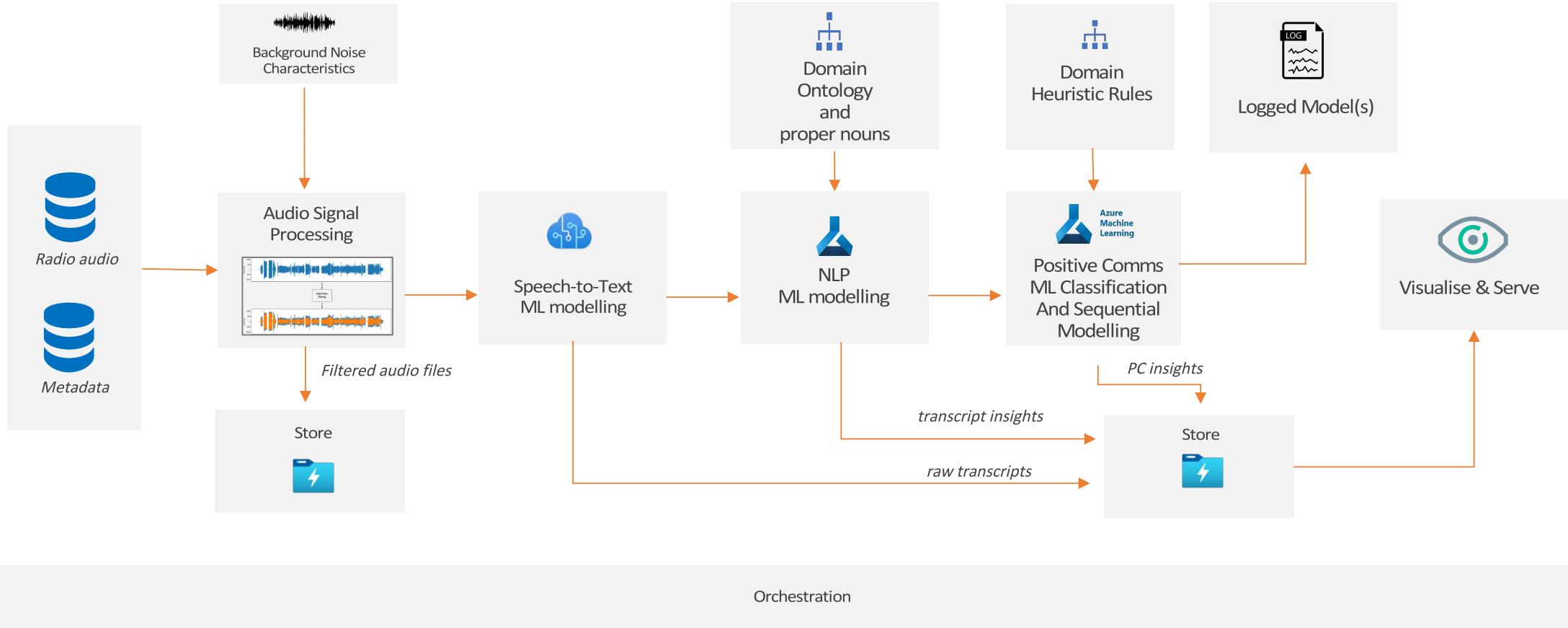
"Copy that LV577, Loader 1"



50m



Conceptual Solution



Healthy Country AI – Automated Turtle Tracker System

© Source: Microsoft

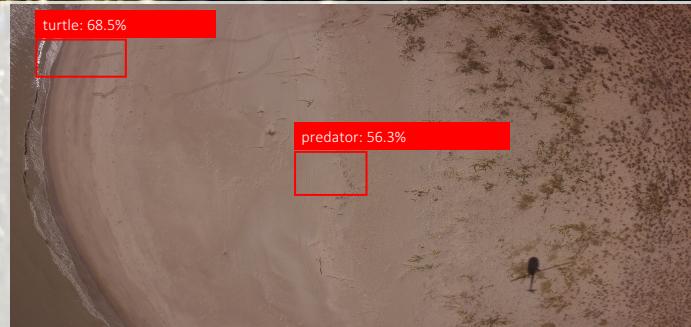
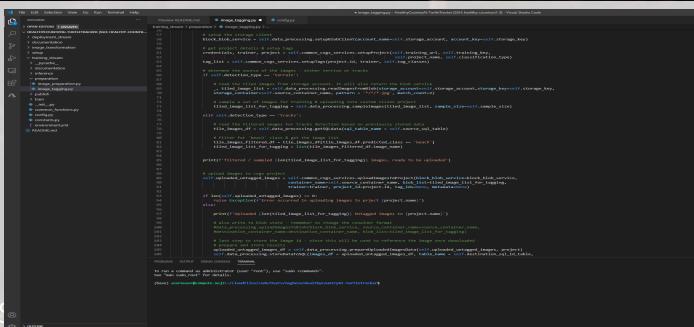
Challenge

CSIRO (Commonwealth Scientific and Industrial Research Organisation), Australia's national science research agency required a system to detect turtle habitation stretching 1000's kms along Australia's coastline.

Aerial survey videos collected by helicopter required hours of painstaking analysis, diverting rangers' time from much needed predator control work. To speed up the process, CSIRO approached Microsoft to see whether AI could help identify relevant information quickly from the tens of thousands of survey images, to pinpoint locations where there was evidence of turtle nesting and predator activity (by identifying animal tracks).

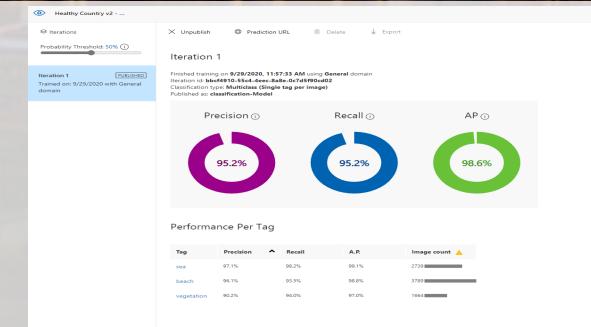
Solution

- The *Turtle-Tracker* was developed using + 100k aerial images to the Azure Data lake store, then developed two Cognitive Services – Custom Vision models; *Terrain Classifier* and *Track Object Detection*.
 - Azure Functions EventGrid trigger process triggers a set of processes including: image pre-processing, image slicing and the two custom vision models. The results of the image processing and models are written back to the Azure Data lake container and Azure SQL database.
 - The results of the *Turtle-Tracker* displayed back to the Azure Data lake store, Azure SQL database and visualised in Power BI.



Benefits

- Automated end-to-end image analysis and inference trigger pipeline scalable reference architecture which allows several future ML workstreams to be integrated within this platform.
 - Scalable reference architecture which allows several future ML workstreams to be integrated within this platform.
 - Both algorithms are showing early promise of detection accuracy, with the *Terrain Classifier* exhibiting a +90 per cent accuracy for distinguishing between *beach*, *vegetation* and *sea* terrain, and the *Track Object Detection* incrementally improving its performance based on +45,000 further images processed and trained.



Healthy Country AI v2 – Turtle Depredation Detector

Terrain Classification



sea



beach



vegetation

Track Object Detection



turtle tracks



predator tracks

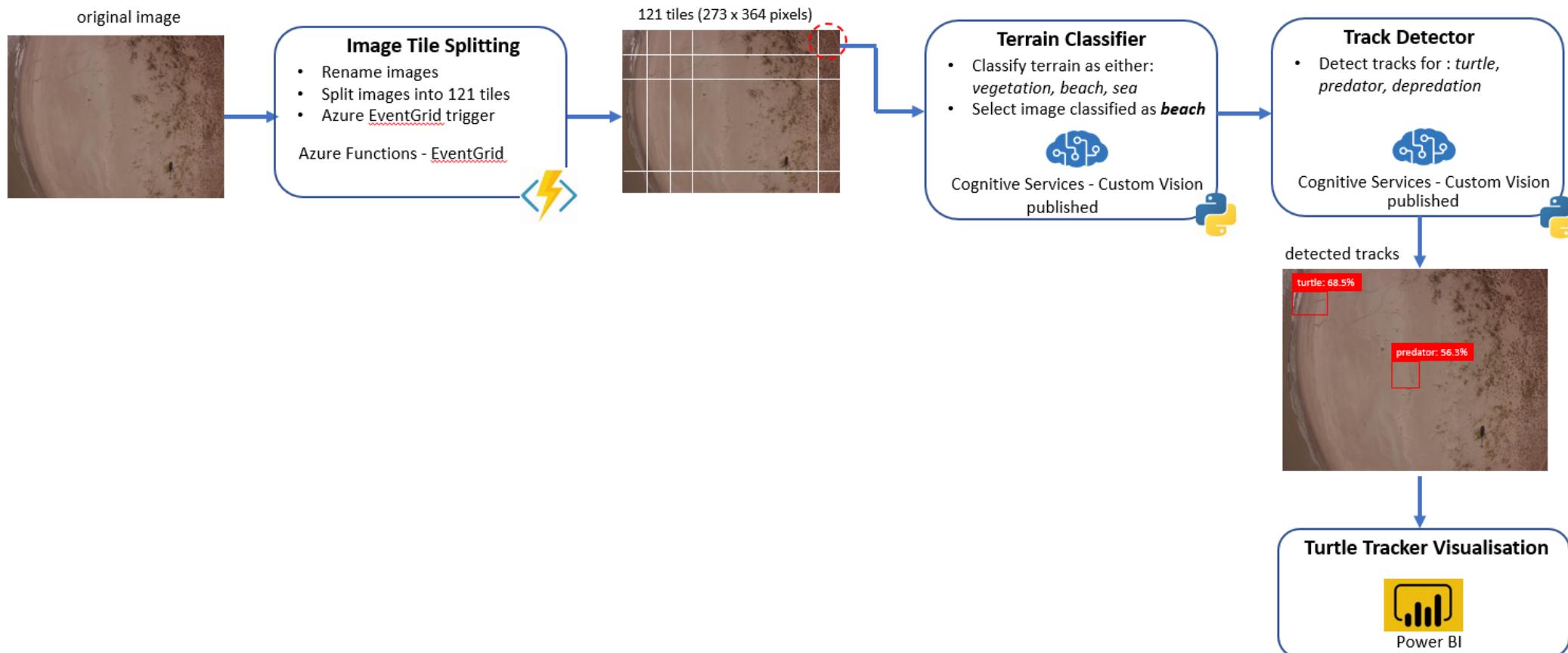


turtle nest depredation

Healthy Country AI v2 – Turtle Depredation Detector

Solution Overview

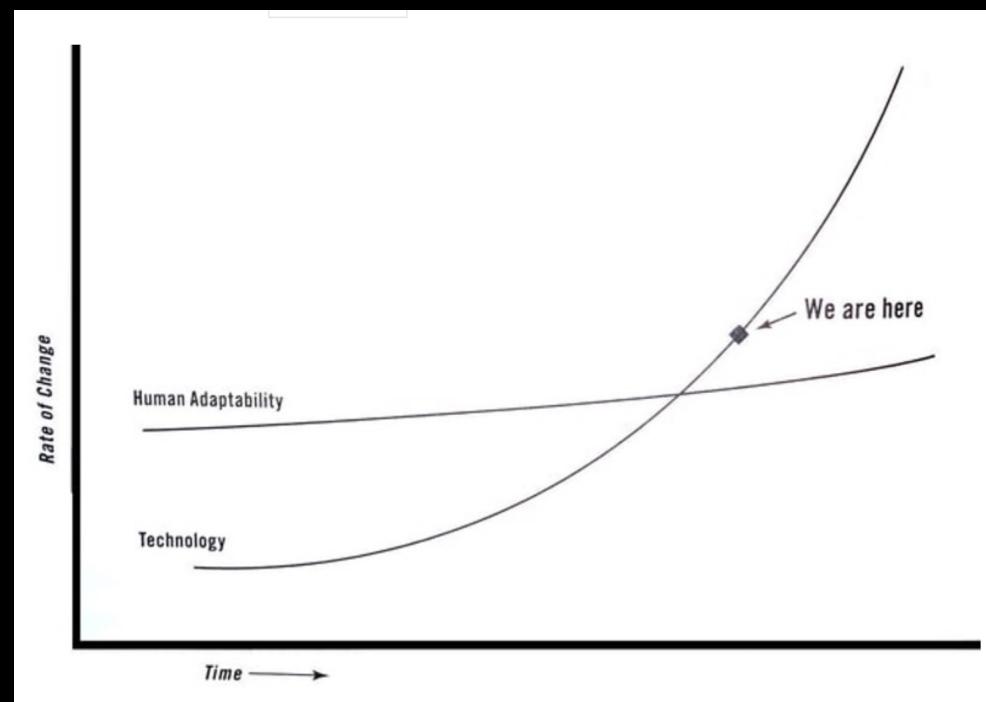
The **Turtle Depredation Detector** solution is show below:



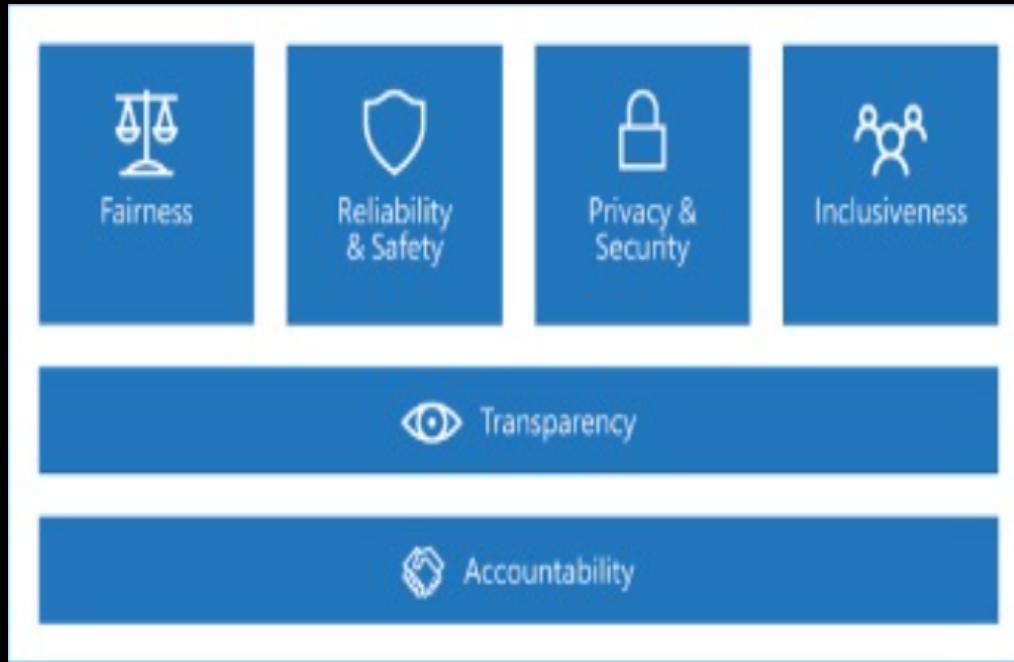
AI also poses challenges that include ethical, legal, and regulatory considerations.

Reference: Thomas Friedman

“Thank You for Being Late: An Optimist’s Guide to Thriving in the Age of Acceleration.”



Responsible AI Principles



AI Principles	Description
Fairness	AI systems should treat all people fairly
Reliability and Safety	AI systems should be understandable
Privacy and Security	AI systems should be secure and respect privacy
Inclusiveness	AI systems should empower everyone and engage people
Transparency	AI systems should be understandable
Accountability	People should be accountable for AI systems

Q&A

Data Science Methodology

Support experimentation

Forwards and backwards flow allows for refinement

Different than Agile

Less about backlogs and features, but more flexible to questions, answers and available data

Accommodates variability

Advanced analytic solutions are based on data availability, volatility, quality and business/data understanding

Cyclical

Accommodates to business needs, environment and data sets over time

