



Streamlining Remote Horizontal Inspections: A Data Automation Approach

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Horizontal pipeline inspection operations ensure safety and reliability of pipeline infrastructure and are regular procedures in the marine industry. The combined length of worldwide oil and gas pipelines is enough to circle Earth 30 times.



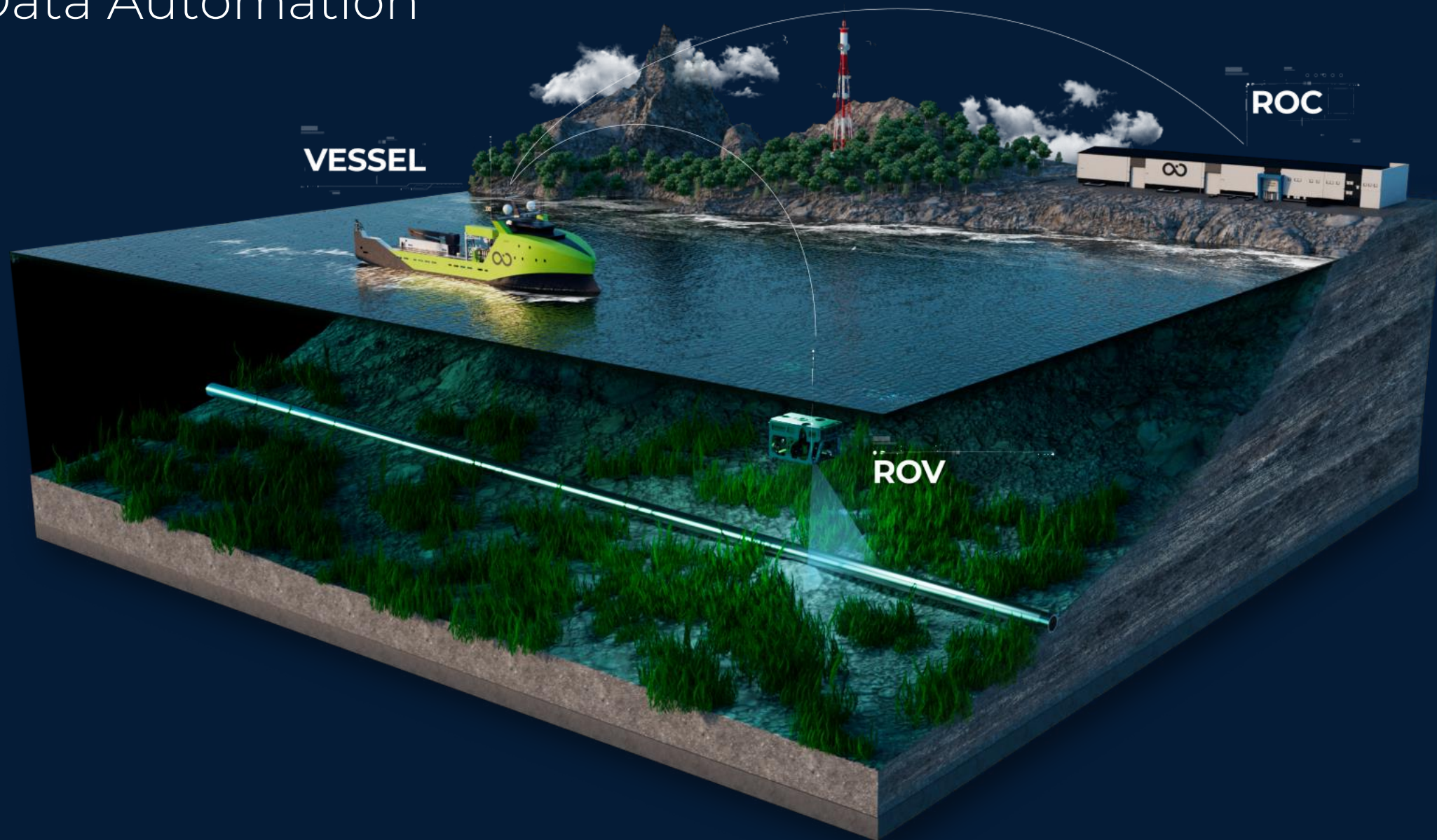
Towards remote horizontal inspection

Remote horizontal inspections require Data acquisition, Quality Control and Data Processing

- How do we move data onshore as fast as possible?
- How do we guarantee data quality?
- How do we reduce data processing lead time?

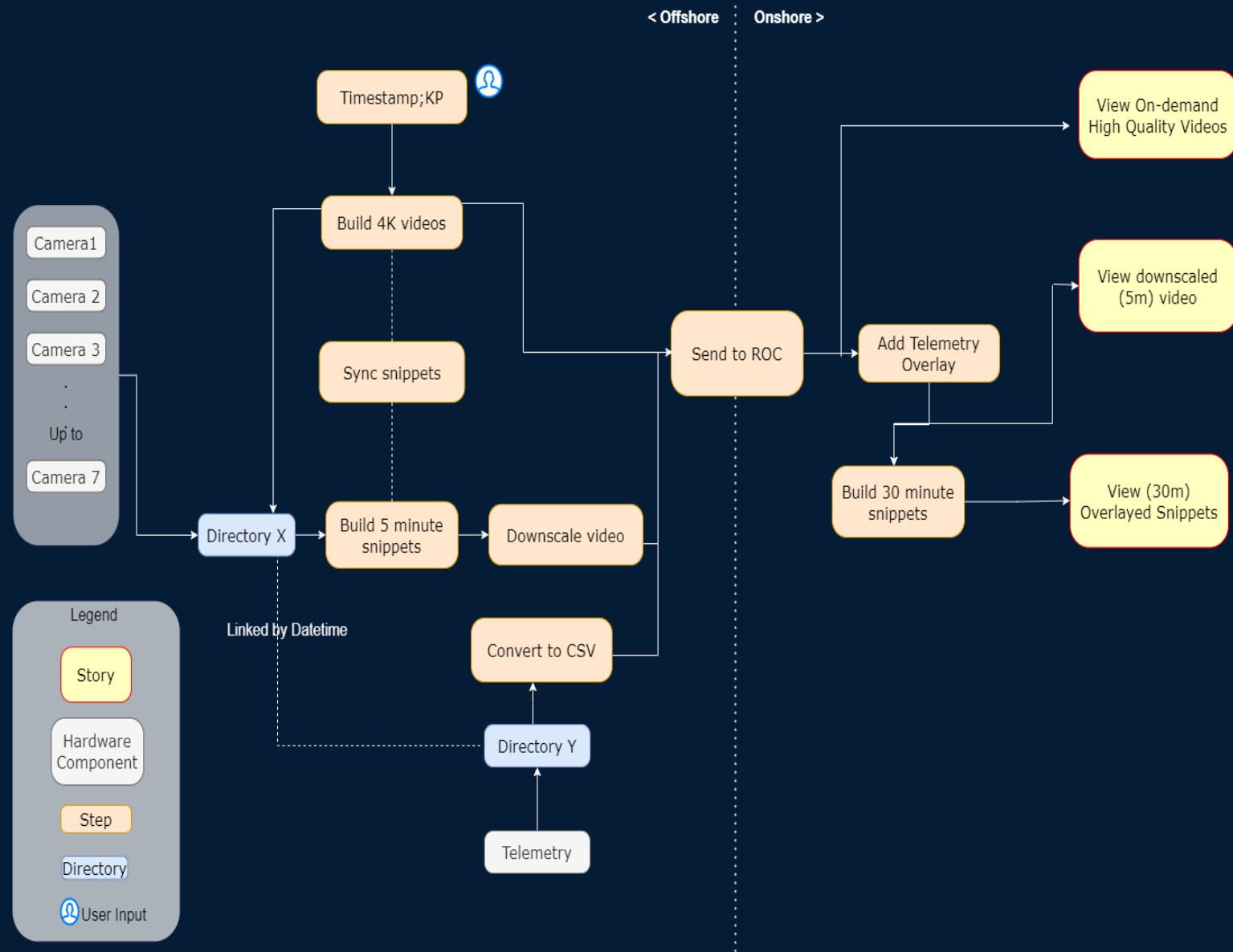


Data Automation



Remote Data Collection and Transmission

- Acquired stills are compressed and stitched into a light video snippet
- Data is transferred to Remote Operation Center via Starlink as soon as possible
- User can request a high-resolution video of a desired interval
- Overlay is injected at Remote Operation Center
- Videos are concatenated to 30-minute video



Manual Data Quality Control

- Stills are compressed and subsampled at the Vessel.
- Stills are sent to Remote Operation Center as soon as possible and displayed to the surveyor.
- Surveyors assure that the stills acquired comply with visibility criteria.
- Surveyors assure that the stills acquired comply with quality criteria – expected camera alignment, expected lighting and no obstructions.



Automatic Data QC

- AI algorithm classifies stills in terms of visibility in a scale of 1-5.
- AI algorithm recognizes when still is over-lit or under-lit.
- AI algorithm recognizes when camera alignment is not the expected.
- AI algorithm recognizes when there is an obstruction in the image.
- Surveyor receives a real-time alert on screen dashboard for each quality issue.
- Final automatic report has detailed information on all quality issues reported during operation.



Bad Visibility - Live Alert

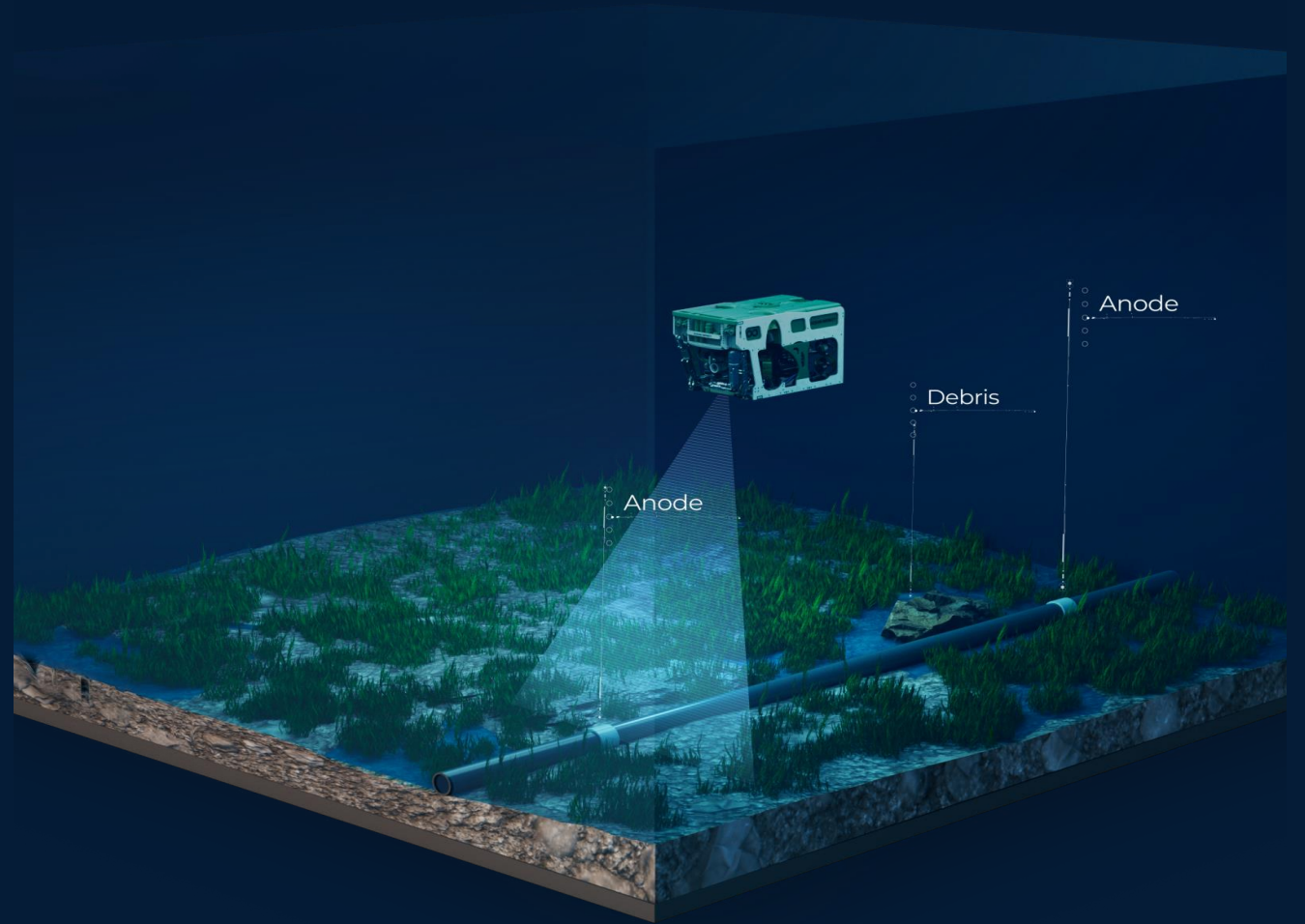


Moderate Visibility



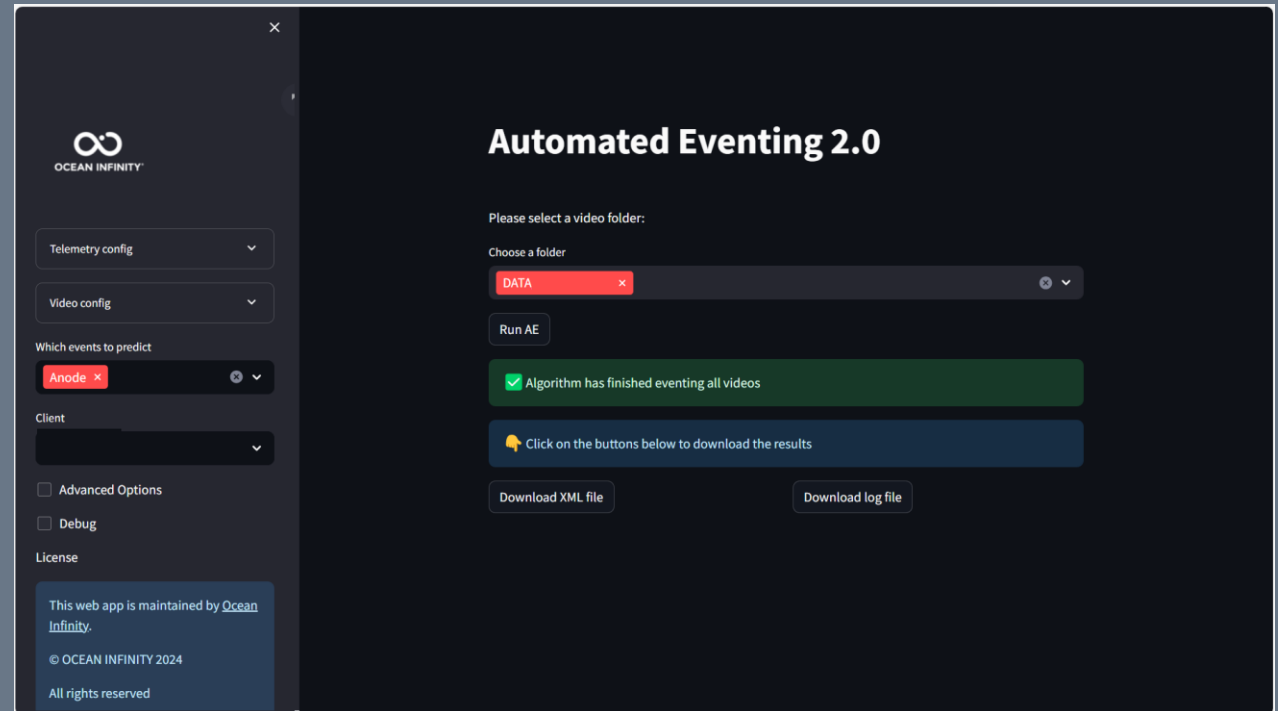
Data Processing – Pipeline Inspection

- Data processor should identify and flag all relevant events in the acquired videos: **Anodes**, **Debris**, **Free Span**, **Buried Pipe**, **Damage**, **Damaged Field Joints**, **Intervention**, **Engineering Features**, **Crossings**, **Movement**.
- Second phase Data Processor use Multi-Beam data to further describe events.



Automated Eventing

- AI service that detects all primary events in pipeline inspections videos.
- It returns an .xml file with all primary events in a desired format according to client criteria.
- Can process multiple videos and up to 6 times faster than video length.





Client

EVENT_FORMAT_1

Which events to predict

Debris x Anode x

Select Precision:

8 Bit

Inference Method:

Torch

Show Selected Configuration

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Version 0.0.2

Using streamlit 1.17.0

Automated Eventing

Select a file

demo_vid2

Clear file list

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Predict

We create innovative
robotic technology to
transform operations
at sea to enable
people and the planet
to thrive.





Thank you

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