

A photograph of a construction site. In the foreground, several construction workers wearing white hard hats and high-visibility green safety vests are seen from behind, looking towards a large building under construction. One worker on the left is pointing towards the building. The building has a modern facade with blue-tinted glass panels. Scaffolding and construction equipment are visible on the right side of the building. In the background, a tall, classical-style building with a clock tower is visible against a clear blue sky. The overall scene is bright and sunny.

AI in Civil Engineering

Introduction



Stuart Ladbrook
Chief Executive Officer

Stuart has been at the heart of the Onwave technology business since 2011. Stuart has over 25 years of experience within the Telecoms, Construction and Rail sectors having also worked at Thales, Mouchel and BAM.



Simon Romp
Chief Technology Officer

Simon is responsible for setting the technical direction for Onwave products. Simon brings over 20 years' experience designing and implementing performant and resilient business focused technical solutions both on premise and in the cloud.

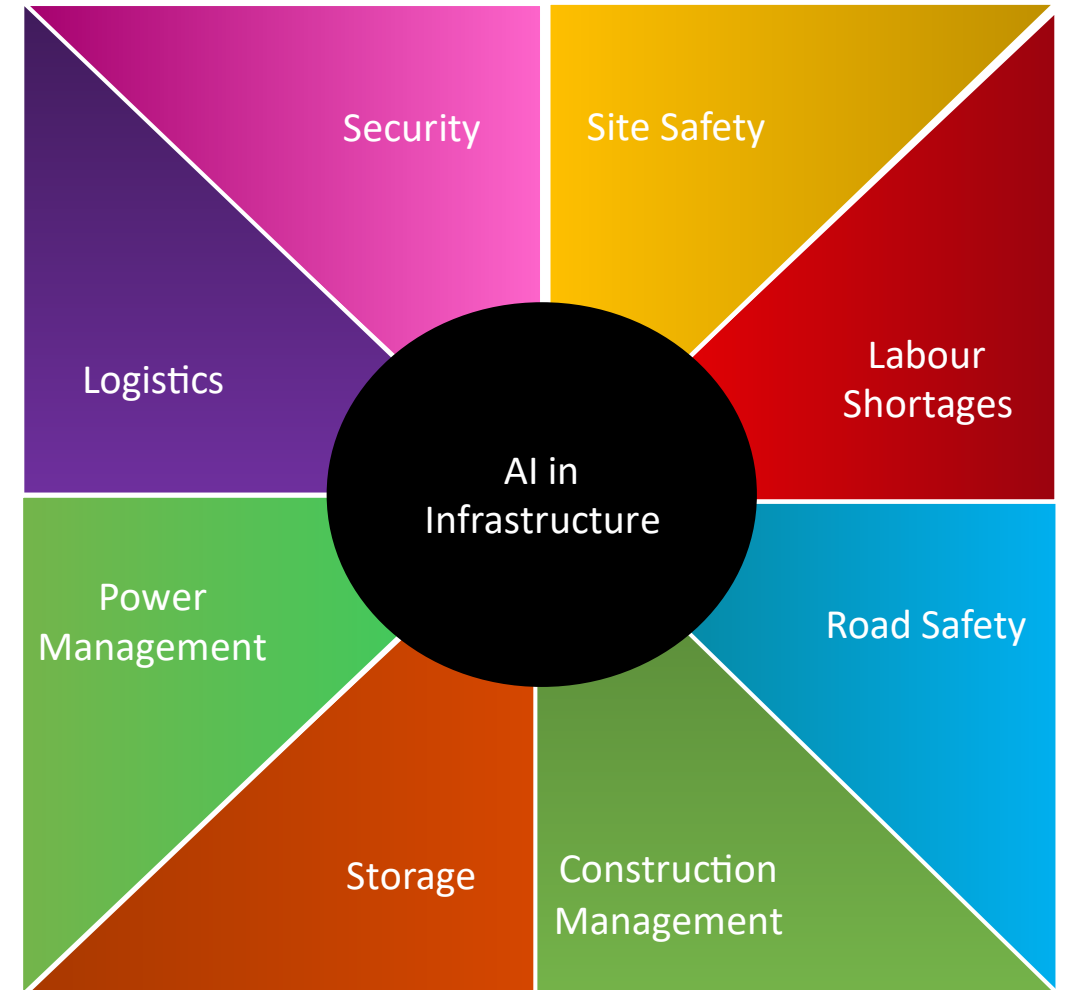
Agenda

- AI within the Civil Engineering arena
- Data Collection
- Risks & Obstacles
- AI Governance
- OWL Case Study
- Final thoughts



AI within the CE Industry

- How does AI play part in the Construction Delivery to handover phases?
- What are the barriers to adoption of AI during construction and execution phase of projects?
- How is AI viewed by different personas and what impact can this have?
- What are the risks and how do you ensure these are controlled?



Data Collection

Construction presents unique data collection and processing challenges:

- AI tools typically need lots of data to “Train the system”
- Data comes from multiple sources in multiple formats with different protocols and payloads.
 - IoT devices / HD Video and LIDAR cameras
- Sites mobilise fast and can often be remote both geographically and from connectivity perspective
- Contractors often don't have the luxury of a well contained environment like a factory or office

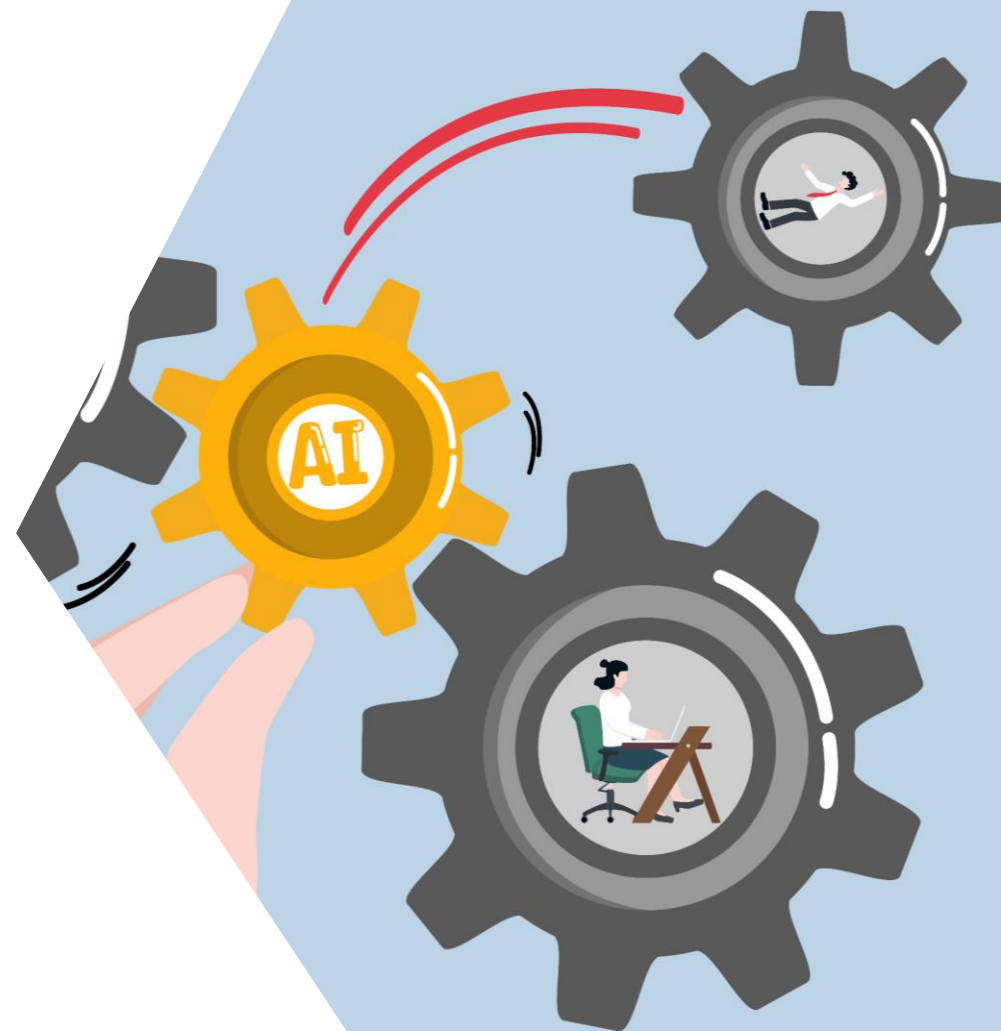


Data Collection

We are witnessing a shift in thinking:

- Customers and contractors are working together to create shared private networks using 4G or 5G
- The adoption of Private Mobile Networks (PMN) for better coverage and flexibility
- Shift of compute power to the edge for local processing
- Proliferation of data platforms with customers looking to converge and centralise data

As these happen there are opportunities to leverage AI.



Engagement

Different user groups perspective on AI adoption:

- **Technology leaders** - champion AI as vital for overcoming challenges and staying competitive.
- **Field workers** - diverse views; some doubt AI's ability to replace manual tasks, while others fear job displacement.
- **Security teams** express concerns about insecure AI tools exposing valuable IP or causing privacy issues.

AI Implementation

- These diverse perspectives underscore the need for an AI strategy, underpinned by fit for purpose governance.



AI Implementation

Ensuring data quality, security, transparency, incident management, and the cultivation of AI-related skills for effective implementation.

AI implementation involves addressing key aspects of:

- Well defined use case – How is AI going to help?
- Data governance
- Data security
- Visibility (or lack of)
- Incident management
- AI Skills and Training



Case Study - OWL

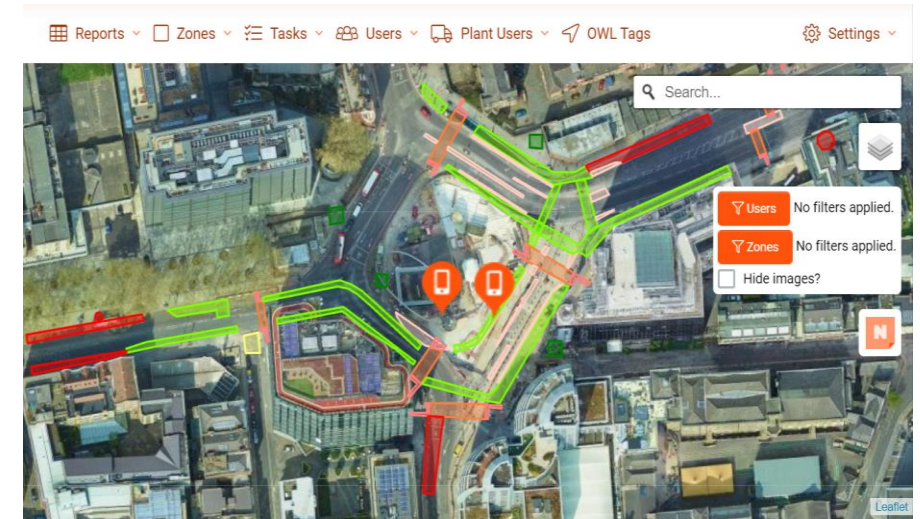
How we are seeing AI with respect to our OWL geofencing/ geo-warning platform:



Augmented Workers

Using data received directly from wearable devices and combining this data with camera feeds or other data sources we can start to build a comprehensive view of the project:

- Use multiple public/private datasets for a full project view
- Identify patterns for risk assessment and mitigation
- Improve efficiency by predicting delays and deviations
- Predict plant/user interactions for better planning
- Use Natural Language Processing (NLP) for faster data interaction
- Use AI to unlock information from manuals and NLP for improved user experience
- Analyse large datasets for informed decisions



Conclusions

AI is here to stay.

AI will fundamentally change the way we undertake repetitive tasks.

Companies should be selective in picking use cases that offer real value from AI.

AI should have human oversight and a fit for purpose governance framework.

Our staff will need to be upskilled to maximise the potential and minimise the risk of using AI.

"The development of full Artificial Intelligence could spell the end of the human race." – Stephen Hawking.

We all have some responsibility in shaping its future.





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