

AIMS VAA

VIRTUAL ASSET ASSESSMENT

TECH
mahindra
ALTAVEC

EMPOWERING UTILITIES WITH
DIGITAL NETWORK INTELLIGENCE

The new reality for utilities

The challenges for utilities just keep coming - climate events, grid balancing, renewable integration, operating cost pressures, reliability and environmental expectations are loading more and more expectations on energy providers. More is being demanded from operational asset performance, and so a re-think of traditional asset management is required.

It's never been more necessary for asset operators to access to the right data in the right tools at the right time.

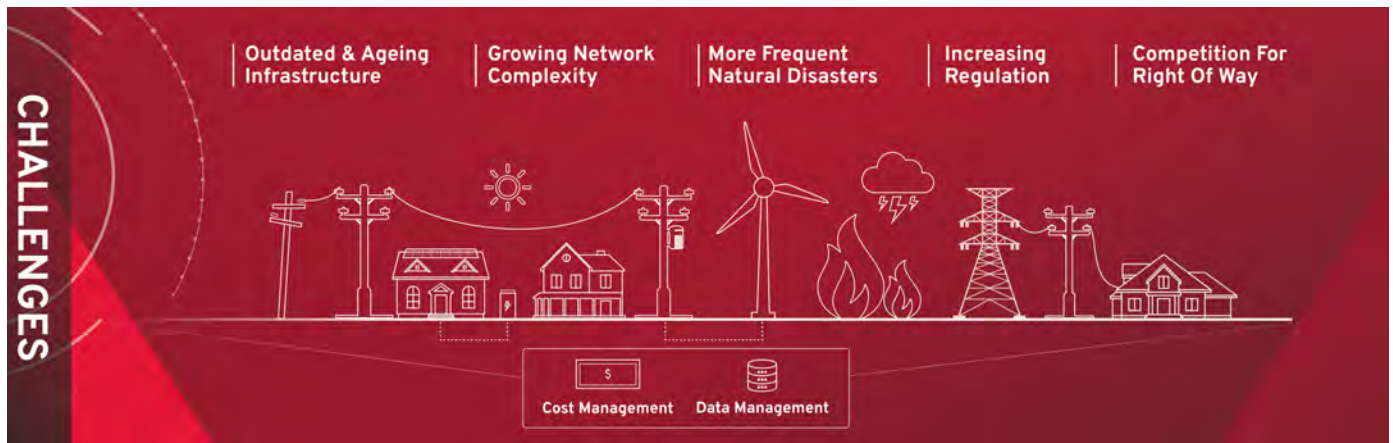
The desire for re-imagined models of delivery must address the considerations of decarbonisation, digitalisation, decentralisation, and deregulation.

Utility asset management typically involves dispersed teams, located across regions and departments, all answering to multiple stakeholders. As these stakeholders demand differing measures, outcomes and reports, the needs for integration and a single platform becomes increasingly important.

How can inputs, outcomes, and expectations be met using the current practise of storing asset condition data in disparate platforms? This only makes collaboration difficult, and access real-time data almost impossible.



The challenging landscape for utilities



Utilities across Australia and the globe are increasingly turning to the potential of digital data and digital intelligence to assess the condition of assets.

The increasing use of digital technologies and data analytics is disrupting traditional business models, changing the way linear assets are designed, built, inspected, and operated.

Do more with less

A significant number of linear assets, such as pipelines and power lines, have reached the end of their lifespan and require replacement or refurbishment. The cost of constructing and maintaining linear assets continues to rise, putting pressure on owners to find ways to reduce costs while still meeting regulatory and customer requirements. In addition to managing aging assets, the energy sector is bringing new equipment into the mix. Deloitte found that with the growth of renewables and distributed energy resources, the energy sector is managing 10 times more assets than it managed 20 years ago, and these assets will continue to grow. This mix leads to increased complexity, as equipment may have electronic components with different life spans, depreciation rates, operating scenarios, and maintenance requirements.

Inspections re-imagined

Existing field-based assets can be located across thousands of km, situated in remote, rugged or densely populated, hard-to-get-to urban regions. There is increasing awareness that digital options can provide an alternate to traditional asset management - reducing the need for resource-intensive and lengthy onsite inspections. Previously, assessing business critical assets using traditional inspection methods often involved individuals with a specific skill set traveling long distances to locations that were hard to locate and access.

Remote sensing and digital asset data capture programs can now reduce the need for crews travel to locations, where traditionally they would spend hours finding and assessing assets, and then documenting changes or maintenance requirements. These field crews and their specialist skills can now be allocated differently - having them inspect the captured asset data or digital images from the safety of the office results in more efficient use of resources, and reduced health and safety hazards for employees.

Drown in a data lake or swim in a data stream?

Utilities can face a common challenge when adopting digital asset management strategies: how to manage and optimise the use of digital data once captured. After all, the asset data was captured in the hope of optimising the inspection process, to effectively share information across the organisation.....to maximise its value. But it seems that's not always achieved, and utilities need help to ensure their digital dollars go further.

Drivers such as population growth, transition to renewables and emission reduction targets are leading to increasing complex networks. In addition to managing ageing assets, utilities are continually integrating new technology into their infrastructure, and are facing additional data sets to manage.

One of the challenges in addressing data issues is overcoming entrenched departmentalised systems and a risk-averse corporate culture. Many enterprises are unprepared due to behavioural norms such as territorial data hoarding and lagging technical capabilities. This often results in cumbersome extract, transform, and load (ETL) and master data management processes increasing the latency at which data can be made available to applications and decision makers.



The need for speed

The speed at which data can be delivered to users and applications can be a significant challenge when data is distributed across various database platforms, applications and other data sources— on-premises as well as in the cloud. In addition to creating latencies, fragmentation and silos of inaccessible data, the growing diversity and complexity of data environments can also impact scalability. These were all top challenges cited by enterprises, along with the challenge of data integration (62%) and application modernisation (60%).

Half of enterprises are currently struggling with searching and discovering data, especially when data is spread across different environments. Given the increased frequency and severity of climate events inflicting significant damage to infrastructure and assets, the ability to swiftly access both current and past data from various systems is becoming more crucial than ever. The expectation of communities, regulators, and environmental groups in responding such events requires asset owners to continually to invest in reducing environment impacts while maintaining safety and reliability.

Skills shift

The COVID-19 pandemic, technological advancements, and regulatory changes, as well as the shift towards renewables, and declining workforce have created a state of upheaval across several industries. The utility sector was slow to adopt automation in the past. However, the recent retirement of experienced workers who are not being replaced has sparked a change in this trend. As the number of industrial assets and the data they generate grows at an exponential rate, companies are looking for ways to inspect these assets with fewer staff. The use of technologies such as drones, AI, and ML automation can perform inspections that are not safe for humans, thus filling the gap created by the shortage of skilled workers.

Digital intelligence is solving utility problems

The frequent use of the term 'digital transformation' seems to cover a lot of ground, but what is it really, and how can it assist utilities to solve their network problems.?

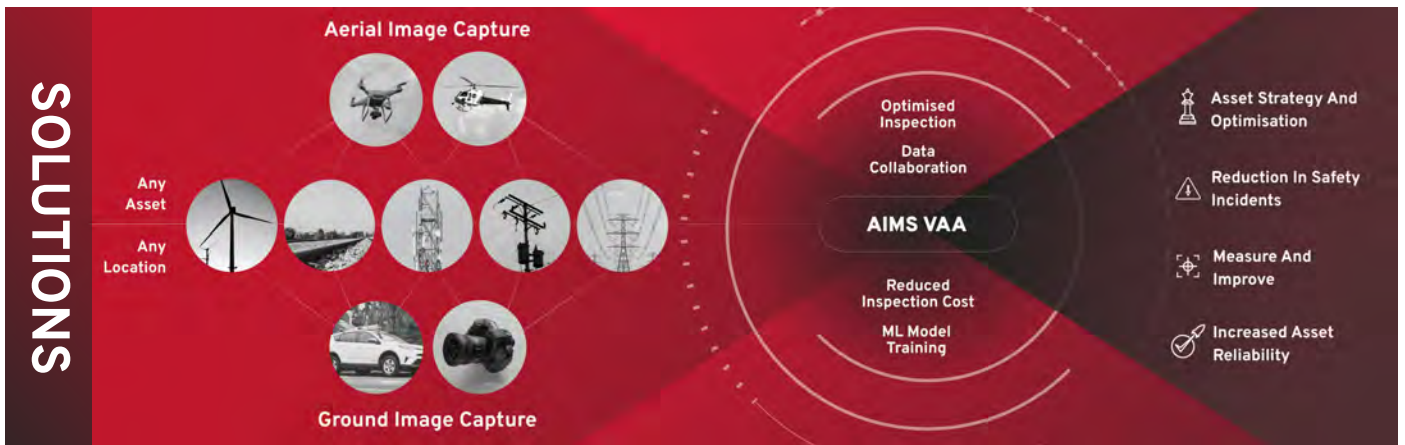
For utility asset functions the inspection department is essential for optimising asset performance and staying competitive in a rapidly changing market. Artificial Intelligence (AI) is proving to be able to pull actionable insights from complex data sets and deliver recommendations to inspection teams. For example, AI can estimate an asset's current state based on prevailing environmental and usage conditions without requiring a physical inspection.

AI can also improve asset reliability by identifying risks and providing the information needed to fix equipment before it fails. This leads to increased efficiency and safety in the-

field and ultimately results in greater network reliability for the consumer. The use of machine learning (ML) algorithms for data intelligence is rapidly advancing. Consider that ML is like having a team of experts working around the clock to analyse data sets and pull the most valuable insights. The larger the data set, the more accurate the predictions, as machine learning is not biased towards one sample, in fact the more data accessible by the ML algorithm the more accurate the predictions and insights become.

Technologies such as ML and AI provide deeper insights into each asset's condition. With this information, you can optimise your maintenance strategy to increase the assets' lifespan and minimise the need for replacement parts or equipment. The future will see more automated asset inspections using technologies such as AI.





Solutions to problems

Altavec's AIMS Virtual Asset Assessment Module is a cloud-based platform that streamlines the process of capturing and analysing images of assets. The system uses images taken by helicopters, drones, or field inspectors, and automatically associates them with the appropriate assets based on the image metadata. This rapid and streamlined process takes less than 24 hours with images captured on one day are uploaded and ready to review by the next. This eliminates the need for manual association and makes the process more efficient.

Data can be captured in field by aerial, ground or remote sensing technology and the resulting data sets are highly valuable and can deliver a utility from run to fault to predictive maintenance models.

Once the captured data and images are processed, they flow through an optimised assessment workflow underpinned by sophisticated machine learning models, allowing asset defects to be identified, recorded and audited before being made available to the asset owners for rectification. The information is stored for customers to take advantage of the platform's machine learning models, to further reducing the need for manual assessments and decreasing costs.

The platform offers secure APIs for automated ingestion of assessment results, democratisation of data across internal and external -

stakeholders, and is a strategic enabler for machine learning model development and training. AIMS VAA has the potential to improve maintenance planning with compressed program schedules, reducing the number of safety incidents in the field, as fewer people are required to physically inspect assets. These benefits translate to improved network reliability for AIMS VAA users, decreased operational safety incidents, optimised field works deployment.... making it an invaluable asset management solution. -



Altavec has extensive experience in developing asset inspection software and completing complex asset capture projects, making them experts in addressing complex industry problems. Their decades of experience in assisting utilities with asset and vegetation management has made them a sought-after solution provider in this field.

The increasing use of digital technologies and data analytics is disrupting traditional business models and changing the way linear assets are designed, built, inspected, and operated.

Organisations faced with these challenges or undergoing digital transformation are turning to Altavec and its Virtual Asset Assessment (VAA) software to solve this problem.

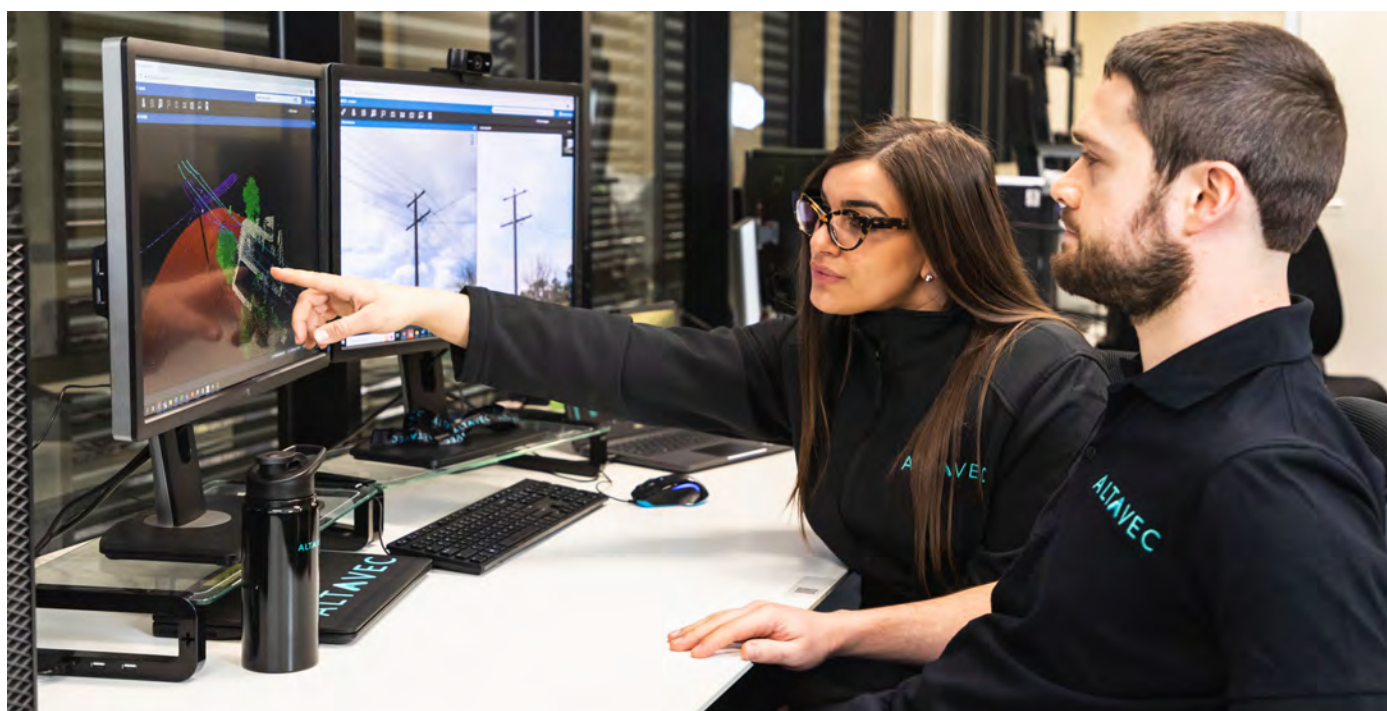
AIMS VAA, Altavec's innovative asset assessment software, supports utilities in maintaining their assets and has simplified the change management process by providing assessment software that is easy to use, easy to implement and can be accessed from the safety of the office.

However, AIMS VAA provides the ability for all stakeholders to easily, accurately and collaboratively examine assets reducing the need for technical or site-specific knowledge.

This leads to more effective communication of site and asset conditions, maintenance requirements, and processes to personnel, increasing engagement and understanding.

Altavec's solution includes an intuitive, office based audit process with effective metrics that provide valuable insights. This results in increased overall asset management productivity and efficiency by reducing the need for resource-intensive and lengthy onsite inspections. Time that would normally be consumed through travel to remote locations, finding and assessing assets, and then documenting changes or requirements can now be allocated elsewhere, resulting in a more efficient use of resources and reduced health and safety hazards for employees.

Ultimately, innovative data-driven applications like AIMS VAA that provide ubiquitous connectivity between assets, locations, and even industries are the future of asset management. We believe that this solution has the potential to revolutionise the way assets are managed, making it more efficient, cost-effective, and safer for all stakeholders.



Case Study Utility

Problem overview

This Australian energy company operates numerous transmission and distribution assets, facing the annual challenge of complying with regulations, managing operational budgets, and providing a safe and reliable energy supply to their communities. The traditional method of ground inspection required qualified electrical engineers and line technicians to spend a large portion of their day travelling to difficult-to-access or hazardous assets, exposed to safety risk whilst encountering time-consuming and costly data capture activities. The result of field activities was the generation of a large defect catalogue which was difficult to manage yet growing continually, accessed in silo and not usable for other business purposes.

Solution

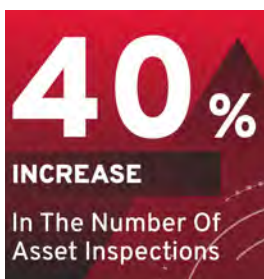
The utility engaged Altavec's team to implement AIMS VAA with the objective of undertaking an aerial inspection program using a combination of helicopters and drones equipped with high-resolution cameras. The drones remotely captured detailed information and images of the assets, reducing the need for ground inspections and minimizing safety risks for the utility crew.

Results

Since adopting AIMS VAA the customer has reported ongoing benefits, including a 90% reduction in image and data management, a 40% increase in the number of assessments that can be performed by an inspector, earlier identification of network risks, and a 50% reduction in effort across their asset assessment program.

The aerial inspection program delivered additional quantifiable benefits for the energy company, including:

- Time savings: inspections were reduced by up to 60% compared to traditional methods.
- Cost savings: cost of inspections was reduced by up to 30% compared to traditional methods due to the reduced need for specialised personnel and equipment.
- Improved safety: risk of workplace injuries and accidents was reduced by eliminating the need for personnel to physically access hazardous or hard-to-reach areas.
- Enhanced accuracy: high-resolution cameras on the drones enabled the capture of detailed information and images, providing a more accurate picture of the condition of the assets.
- Better asset management: regular aerial inspections provided up-to-date information on the condition of assets, enabling rapid, effective asset management and decision-making, resulting in cost savings and improved asset utilisation.



Conclusion

The energy utility's asset inspection program was successfully transformed using AIMS VAA, resulting in measurable operational time and cost savings, improved safety outcomes, and enhanced network accuracy. Better asset management and decision-making was enabled, helping the utility to operate more efficiently and effectively. As a result, the extended use of asset inspections via AIMS VAA now cover other parts of network operations, further streamlining its maintenance and repair processes and improving the overall management of its assets. Network problems solved in a landscape of challenges.

About Tech Mahindra ALTAVEC

With a 20-year catalogue of success in the utility sector, Tech Mahindra Altavec (previously known as Geomatic) brings extensive experience in developing asset inspection software and completing complex asset digital transformation programs. Purely focused on solving complex industry problems with digital intelligence solutions, their expertise is sought-after, and the suite of solutions offered is considered industry leading.

With a strong partnership approach and demonstrated record of critical asset management, vegetation management and field mobility outcomes, Altavec is trusted by industry to solve their network problems.

Altavec's propriety in-house development of asset inspection software and completing complex asset digital is delivered by a renowned team of programmers, data analysts, surveyors and skilled spatial assessors.

The increasing use of digital technologies and data analytics is disrupting traditional business models and changing the way linear assets are designed, built, inspected, and operated. Organisations faced with these challenges or undergoing digital transformation are turning to Altavec and its Virtual Asset Assessment (VAA) software to solve this problem.

Simplify
your network
compliance

100,000 km +
of network captured

2,000 +
active users

20,000,000 +
assets managed

TECH
mahindra
ALTAVEC

Tech Mahindra - Altavec
500 Collins Street, Melbourne, 3000
solutions@altavec.com

Learn more at
www.altavec.com