ST Engineering

RAISE THE BAR

Artificial Intelligence
Empowering Innovations

Foreword by Teo Ming Kian

Chairman

At ST Engineering, our enduring strength has been built upon a capacity to innovate and adapt. Amid a global landscape defined by rapid technological shifts and increasing complexity, it is not sufficient that we merely respond to changes; we must position ourselves to actively shape the trajectory of progress.

Artificial Intelligence (AI) serves as a catalyst in this new era—a transformative force that is fundamentally restructuring industries and expanding the boundaries of what is possible.

As an organisation, our strategic thrust must be to harness this potential to deepen the value we deliver to our customers, stakeholders, and the communities we serve. AI provides the framework through which we can enhance our solutions, drive operational excellence, and establish new benchmarks within the industries we serve and for the broader technological landscape.

The development of these necessary capabilities, however, fundamentally relies on a culture of continuous learning, broad collaboration, and the cultivation of a robust technology-driven talent base. We recognise that strengthening our community through such efforts is crucial for sustained innovation and enterprise. This book serves as both a reflection of our journey and an invitation to participate in building a future where innovation acts as our strategic compass. In this era of rapid transformation, AI has served as a prime enabler of our purpose to deliver sustainable growth and contribute to a more secure and sustainable world.

Foreword by Vincent Chong

Group President & CEO

Artificial Intelligence (AI) is reshaping industries and societies, and redefining how we live, work, and connect. At ST Engineering, this is not a new frontier. We have long harnessed intelligent technologies to innovate our solutions and deliver impact, and we must now harness AI to scale greater heights. As AI advances, so do we, applying its capabilities to drive performance, resilience, and value for our customers and partners.

Our engagement with AI is, at its heart, a journey of innovation. It calls on every one of us to stay curious, adaptable, and bold in exploring new possibilities. By collaborating across disciplines, we can continue to transform how we design, deliver, and sustain our solutions, building a smarter, safer, and more connected world.

AI now underpins many of our offerings: from smart mobility and defence systems to digital services and urban infrastructure. It reinforces our competitive edge and deepens our ability to anticipate emerging needs with precision and agility.

This book captures just a glimpse of that journey and the collective ambition that drives us forward. I invite all our colleagues and partners to read, reflect, and engage in our transformation in the age of AI and beyond.

Introduction by Mervyn Tan

Group Chief Operating Officer (Technology & Innovation)

This book outlines how Artificial Intelligence (AI) serves as a critical force multiplier for ST Engineering's growth trajectory. We have organised this AI journey into three strategic pillars.

Part One focuses on the operational edge. We examine how AI is integrated directly into our product DNA, to deliver smarter, more autonomous solutions that allow our customers to respond to complex challenges with greater speed and precision.

Part Two addresses our internal agility. In an era of manpower constraints, we must leverage AI to automate the routine and optimise the complex. This is about empowering our people to 'punch above their weight' by focusing on high-value innovation rather than legacy processes.

Part Three looks at the horizon. Through targeted R&D and strategic deep-tech partnerships, we ensure that we don't just keep pace with technology but stay ahead of the curve.

As you read these accounts, I hope you will see that this is more than just the adoption of a new technology; I hope that you also see our unwavering commitment to use AI as a tool for resilience, excellence, and we will ensure the continued security of our stakeholders.

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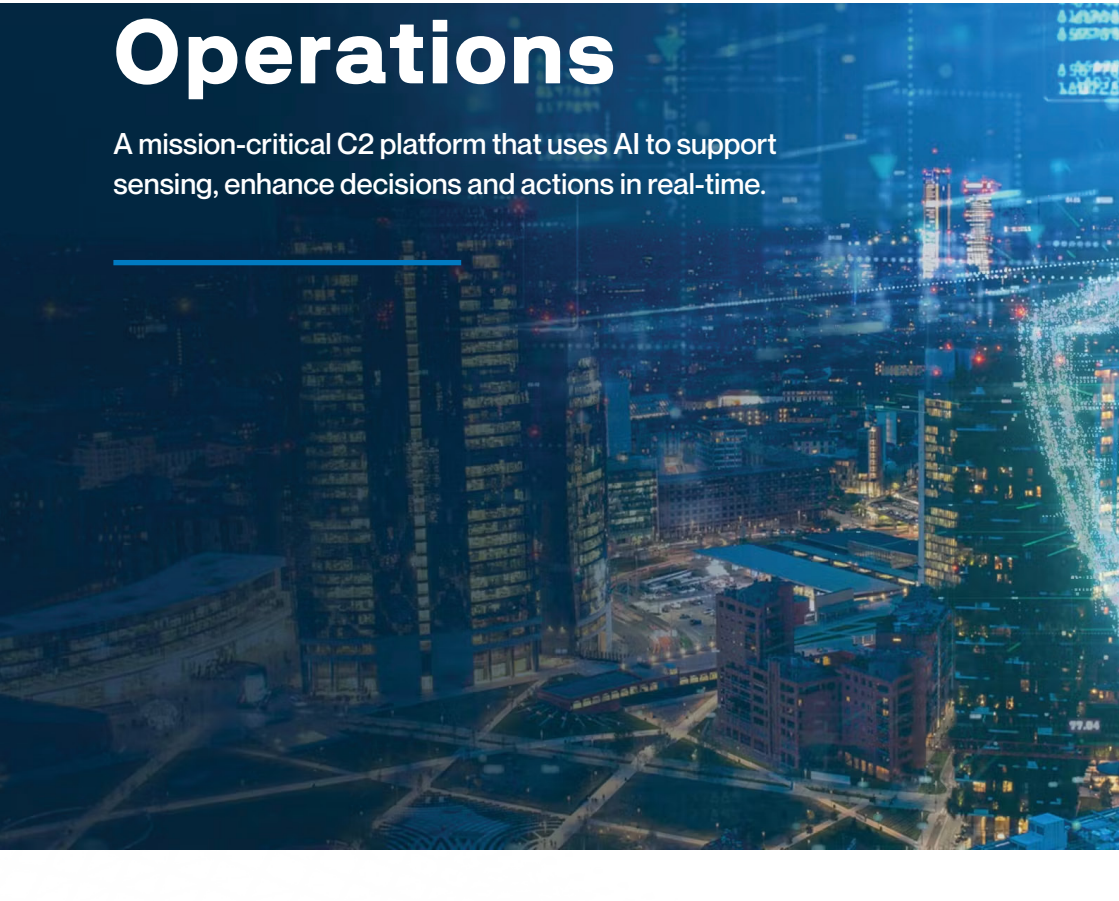
1.1

AI IN OPERATIONS

Artificial Intelligence is enhancing operational environments by enabling faster insights, improving decision-making, and supporting greater efficiency. These capabilities help our customers respond more effectively to complexity while maintaining reliability, scalability, and performance across critical operations.

AGIL® Ops Hub: Effective AI Driven Operations

A mission-critical C2 platform that uses AI to support sensing, enhance decisions and actions in real-time.



There are airports where AI anticipates delays before they cascade, optimising passenger flow during disruptions, synchronising ground teams in real-time, and unlocking fuel savings through intelligent stand and crew planning. There are also hospitals where AI continuously surfaces emerging congestions, inventory risks and localised incidents, enabling staff to intervene early and keep care moving safely and smoothly.

These operational advantages are made possible by AGIL Ops Hub.

Developed by ST Engineering, AGIL Ops Hub is a mission-critical command-and-control (C2) platform that goes beyond situational awareness to proactively orchestrate operations. By consolidating data from disparate systems into a single, unified operating picture, the platform enables teams to anticipate issues, align decisions and act decisively—before disruptions escalate.

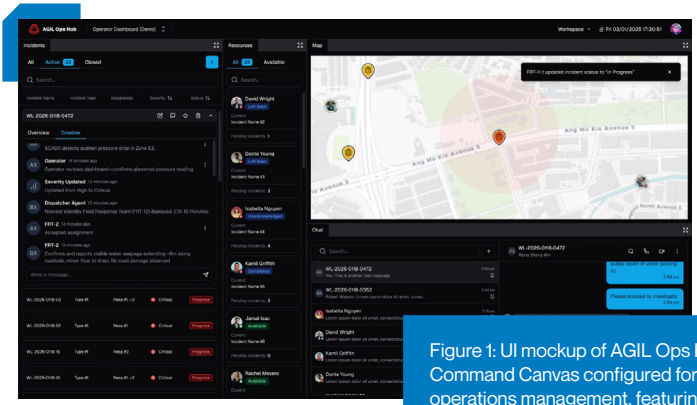


Figure 1: UI mockup of AGIL Ops Hub Command Canvas configured for tactical operations management, featuring Incident Management, Resource Management, Communications, Dispatch and a real-time situational awareness picture

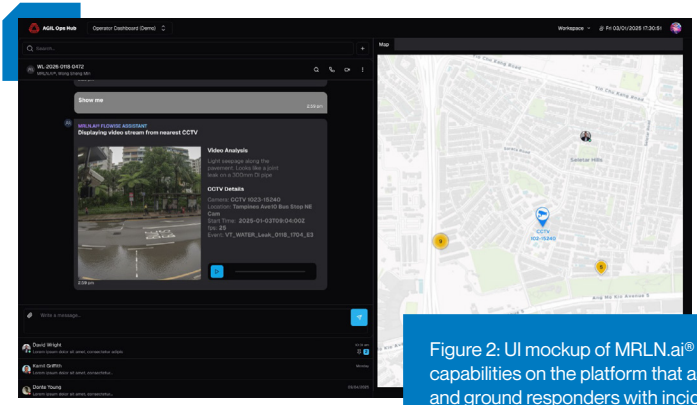


Figure 2: UI mockup of MRLN.ai® powering smart capabilities on the platform that assist operators and ground responders with incident handling, reducing human workloads and increasing operational efficiencies

At its core is a real-time Command Canvas that fuses geospatial intelligence, live dashboards and operational workflows. Rather than simply monitoring Key Performance Indicators (KPIs) and thresholds, operators are guided towards emerging risks and priority actions—coordinating teams and assets, executing electronic standard operating procedures, and replaying decisions and events to continuously learn and improve, all from a single, integrated view.

The proactive capability is powered by MRLN.ai®, ST Engineering's integrated AI engine. Functioning as both an AI platform and an operations assistant, MRLN.ai® continuously analyses multimodal data streams, surfaces early signals of operational drift, and generates timely insights through capabilities such as automatic speech recognition, summarisation and multimodal processing, enabling faster, more informed interventions.

MRLN.ai® enables trusted agentic workflows by ensuring AI models are catalogued and versioned, prompts and policies are governed, approvals are captured, and the full lineage of AI outputs is maintained. This ensures AI-assisted decisions remain transparent, auditable and aligned with operational intent.

Deployed across multiple sectors, AGIL Ops Hub is delivering tangible impact—from improving patient flow visibility and emergency department management in healthcare, optimising satellite operation hubs' management and efficiency to tightening daily planning cycles in water agencies, and enabling early interventions at the first signs of operational drift in seaports.

By unifying systems, decisions and actions, and embedding AI that anticipates rather than reacts, AGIL Ops Hub empowers operations teams to stay ahead of complexity and remain firmly in control when it matters most.

AGIL Ops Hub and MRLN.ai® team members (L-R):

(Rear Row): Chen Zheng Han, Jaryl Ong Zhi Hao, Lam Xin He, Lim Zheng Xuan, Peter Lee, Mah Chern Wern

(Front Row): Dois Koh Eng Han, Nyan Swan Aung, Tan Beng Suang, Yeo Kheng Hui, Balachandran Geethu, Rennie Wee

AGIL® CityAI: Enabling Cities to be Smarter

ST Engineering's urban innovations, powered by AI, are improving lives on a city-wide scale.

At the heart of Qatar's flagship smart city, Lusail, is technology from Singapore—ST Engineering's AGIL CityAI which has been quietly facilitating Lusail's future-forward lifestyle since the project started in 2024.

AI is guiding the metropolis towards its vision of improving lives through efficient and sustainable services. AGIL CityAI orchestrates the city's mechanisms, by unifying more than 10,000 video systems and over 200 Operational Technology systems, that manage physical processes across 80 sites, on its integrated platform. It drives efficiency, reduces dependency on limited manpower and enhances public safety.

This is the City Brain—as the Smart Utilities and Infrastructure team behind AGIL CityAI calls it—at work, and at scale. Comprising a close-knit triad of advanced-AI pillars, the Brain acts as the hub in Lusail's system-of-systems architecture. It is capable of processing events in real-time to detect patterns, trigger alerts and support proactive interventions as situations unfold.

As a key innovation and the first pillar, CityAI Vision, ingests and analyses the thousands of video feeds from security, traffic, and asset-monitoring domains. By reducing reliance on manual monitoring, response times and operational effectiveness have both improved.

The second pillar, CityAI Mind, takes data from diverse sources across the smart city ecosystem—such as video, sensors and enterprise systems—and offers insights that support predictive analytics and better decision-making.

The AGIL CityAI team at the Mobile World Congress 2025 in Qatar (from left to right):

Chua Guo Liang (Assistant Principal Engineer), Benjamin Goh (Business Analyst), Shannon Choy (Technical Director, Digital Platform)

Our AGIL CityAI will act as the digital backbone in Lusail, Qatar's second-largest city – accelerating data-driven decision-making, automating 24/7 city monitoring, and streamlining resources. Lusail will thus be able to swiftly address challenges, creating an adaptive, connected environment for over 450,000 residents and visitors.

CityAI Assistant, the third pillar, is an AI-powered conversational interface that enables operators and stakeholders to interact intuitively with the city's complex systems. Asking questions, retrieving insights and initiating actions are as natural as, if not easier than, dealing with humans, with the advantage of fast and accurate responses.

Combined under AGIL CityAI, they have transformed how the city monitors, manages and optimises its operations. Lusail proves Smart City concepts can be implemented in the real world and lays the foundation for scalable smart city deployments worldwide.

AI-enhanced Modelling and Simulation

AI is rapidly reshaping modelling, simulation, and training, and MAK Technologies is advancing their products and solutions with extensive adoption of AI.

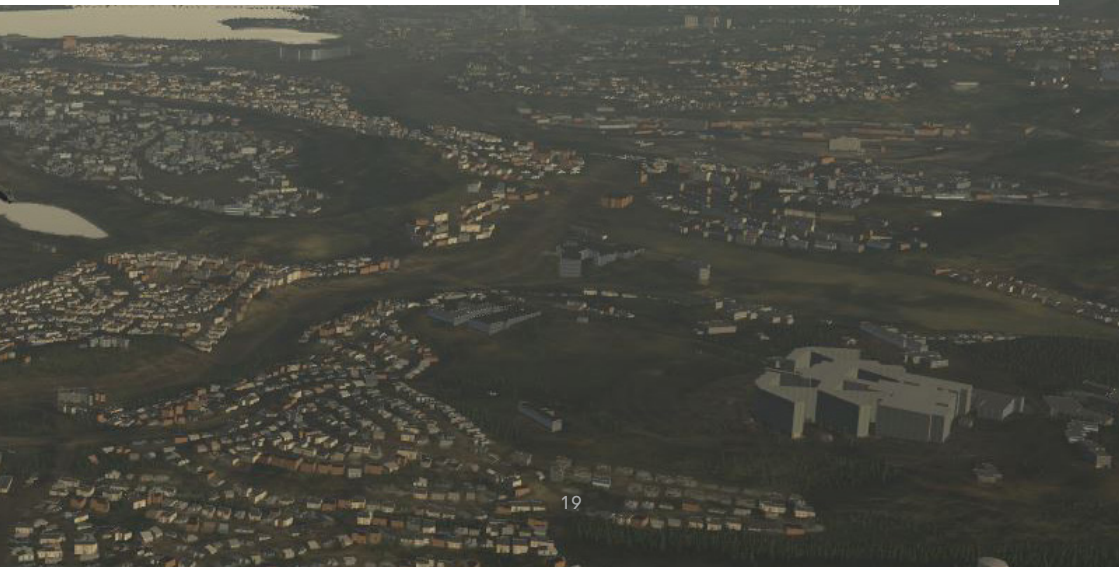
VR-Forces is MAK's comprehensive computer-generated forces (CGF) environment. Its modular and open architecture offers customers the ideal platform for AI-enabled experimentation. Leading technology companies like Boston Fusion and Cervus are using VR-Forces to push boundaries in high-fidelity simulations for training and validating intelligent systems at scale.

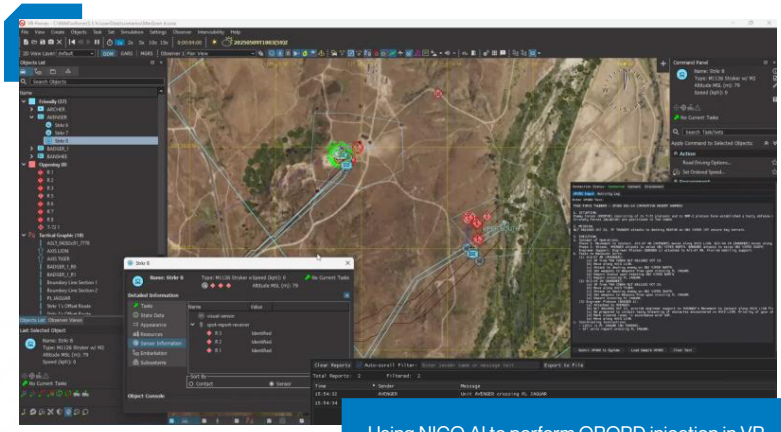
AI-driven capabilities are also being developed into the MAK ONE product line. MAK FIRES was an early AI

An automated Gunner, operated by NICO AI, engaging in a constructive simulation in VR-Forces

innovation that replaced a traditional Forward Observer instructor with an intelligent virtual agent—communicating with the trainee through a natural language voice interface and responding to his commands. This was enhanced into an augmented-reality intelligent human avatar, called NICO, for the U.S. Marine Corps—with an AI "brain" to interpret speeches, gestures, and intent for lifelike role-player interactions.

NICO's AI "brain" was eventually deployed across MAK ONE to power





Using NICO AI to perform OPORD injection in VR-Forces - turning operational orders into behaviors for each of the subunits in the simulated scenario

voice-driven crewmates, auto-generate VR-Forces scenarios and plans from text-based operational orders (OPORD), and translate unit-level commands into entity tasks, giving rise to a rich set of capabilities referred to as NICO AI for Constructive Simulation.

Mike Bosse, the Chief Engineer of MAK's Simulation Solutions Team, has saved man-years of work by using AI to generate hydrodynamics models for ship simulation, simulated radar displays, Instructor/Operator interfaces for launching applications across training systems and to support simulation data ingestion.

> "AI-assisted software development takes some effort to learn what techniques work best. I've learned that it can be very effective to prompt AI to ask me questions based on what information it thinks it needs to complete my task. I've also found success asking AI to iterate on a natural language spec. to make sure it fully understands my intent before asking it to start writing code."

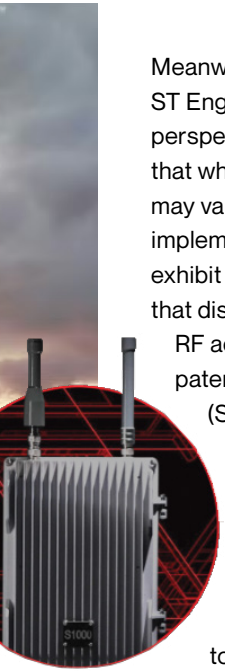
MIKE BOSSE
Chief Engineer

Counter Drone System with Intelligent Waveform Analysis

With ST Engineering's patented AI system, RF Sensor 1000, drone detection swiftly counters constantly evolving drone configurations.

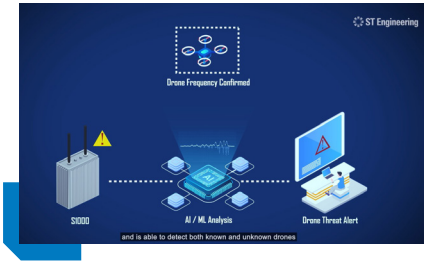
Drones have revolutionised warfare. But as unmanned aerial technology has advanced, so have techniques to evade detection.

Conventional counter-drone systems worked by matching known signal characteristics against predefined libraries of observed radio-frequency (RF) features. However, with frequently updated firmware, operator-modified configurations and intentionally altered operating frequencies or waveforms, these libraries were no longer reliable. In the fast-moving arena of drone threats, this discovery model was not sustainable—counter-drone operations could only play catch-up.



Meanwhile, engineers at ST Engineering adopted a different perspective. They recognised that while drone transmissions may vary in frequency, protocol or implementation, they continue to exhibit intrinsic signal behaviours that distinguish them from benign RF activity. This insight led to the patenting of the RF Sensor 1000 (S1000), pioneering a new approach to drone detection.

The S1000 is employed in a ground-breaking Intelligent Drone Detection System (IDDS) which harnesses AI to learn intrinsic signal patterns and analyse waveforms. Now, drones operating outside known parameters can be identified; even previously unseen drone systems can be recognised. AI has empowered the shift from asking “Which drone is this?” to “Does this signal behave like a drone?”.



This adaptive and scalable strategy is resilient to evolving threats, maintaining robustness against frequency translation and unconventional spectrum usage. Machine learning minimises dependence on continual library updates, enabling the intelligently adaptive IDDS to remain effective in protecting critical assets where deterministic identification is no longer guaranteed.

> “I’m excited that our IDDS, with AI at its core, is directly addressing the growing challenge of identifying unknown drones and the difficulty of neutralising them safely. I believe that with AI, we can build more integrated systems that are able to autonomously tackle adversary drones.”

NIRANJAN GOPINATH
Engineer
Product Development & Integration

Neural Network–Driven Video Analytics for Next-Gen License Plate Recognition

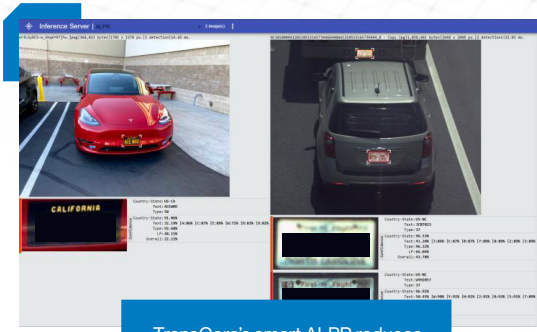
Solving the accuracy, cost, and scalability challenges in tolling smartly.

Modern tolling operations rely on fast and reliable identification of vehicles as they move through highways, bridges, and express lanes. Traditional camera-based systems often fall short when lighting is poor, weather is harsh, or vehicles move at high speed. These issues can lead to missed reads, revenue loss, and increased reliance on manual review teams.

TransCore's AI powered Neural Network Solutions System (N2S2) addresses these challenges with a scalable AI-driven accelerated video analytics platform. N2S2 significantly improves recognition accuracy, lowers operational costs, and enables next-generation tolling programmes such as SmartPass and multi-agency interoperability.

N2S2 comprises both internal AI tools and an advanced AI pipeline used by TransCore's R&D teams, as well as production-ready AI software engines deployed with customers. An example of N2S2's AI components is the automated generation of a Unique Digital Neural Array (DNA) for each processed license plate image, enabling traceability and downstream analytics.

Through N2S2, TransCore helps customers improve revenue integrity



TransCore's smart ALPR reduces misread errors and lowers operation costs

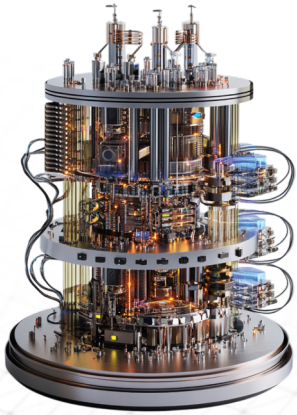
by reducing misreads and lowering operational cost through automated image and classification workflows. N2S2 strong AI differentiator has positioned TransCore as a clear leader in intelligent tolling and automated mobility systems.

Hosted on a flexible cloud-based architecture, N2S2 enables customers worldwide to adopt AI-powered Automated License Plate Recognition (ALPR) technology regardless of their infrastructure maturity. This has allowed TransCore to support partners and customers from North American tolling agencies, smart mobility programmes across Asia Pacific and the Middle East, government smart-city initiatives, and OEMs and system integrators.

Quantizant: Keeping Enterprises Quantum-Safe

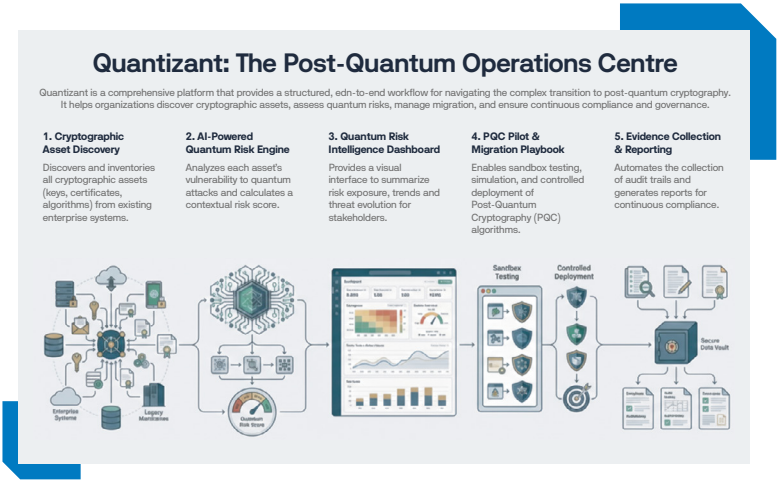
ST Engineering's AI-powered Quantizant platform is helping enterprises prepare for the quantum era with clarity and control.

The rise of powerful quantum computers brings the risk that the cryptography securing virtually every digital system could be broken. For banks and critical infrastructure operators, this is an especially urgent issue. Available to help them transition to post-quantum cryptography (PQC), though, is ST Engineering's Quantizant platform.



With Quantizant, AI agents autonomously discover and inventorise all cryptographic assets, such as keys, certificates and algorithms, in existing enterprise systems. Predictive models then assess each asset's vulnerability to quantum attacks. The Quantum Risk Intelligence Dashboard provides a visual interface that summarises risk exposure and evolution, allowing stakeholders to prioritise what must be protected first. Complex information is made digestible for better decision-making.

Generative AI is also employed. Quantizant's PQC & Migration Playbook creates customised, step-by-step



PQC migration roadmaps. Importantly, users are assured of business continuity throughout the PQC journey, which includes sandbox testing and simulations. The controlled deployment of the hybrid routing strategies is performed with zero downtime—AI orchestration engines seamlessly synchronise cryptographic upgrades across the entire digital ecosystem, from internal systems to external partners and third-party platforms.

Governance is built in: Quantizant automatically collates audit trails and generates reports for real-time compliance assurance.

Every aspect of a PQC transition is taken care of on this appreciably practical platform, as the team behind it brings deep technical capability and operational experience to the project.

> “Quantizant is built on a simple belief: even the most complex quantum-era challenges can be made clear and manageable with the right intelligence. Our AI turns cryptographic complexity into confident, coordinated actions.”

JEFFREY TSE
Technical Lead of Quantizant

Comprising quantum researchers, applied-AI engineers, cryptographic specialists and fintech and banking practitioners, it ensures emerging quantum-safe technologies are translated into solutions that are practical, scalable and enterprise-ready.

AGIL® Co-Trainer: Training made Smarter and Faster

With AGIL Co-Trainer, simulation training is becoming faster, scalable and more realistic.

Simulation training plays a critical role in preparing teams for complex operating environments, yet traditional methods are often resource-intensive and time-consuming. A single trainee session can require a four-person team, with results heavily dependent on individual trainer expertise. As training requirements increase, this approach increasingly constrains both flexibility and scalability.

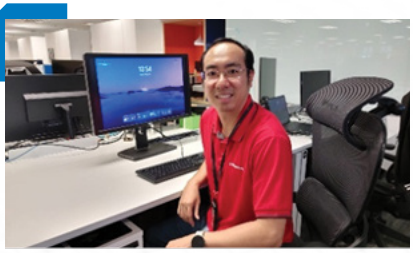
Designed in-house by ST Engineering Digital Systems, AGIL Co-Trainer addresses these bottlenecks by applying generative and agentic AI to transform how simulation training is designed, conducted, and assessed.

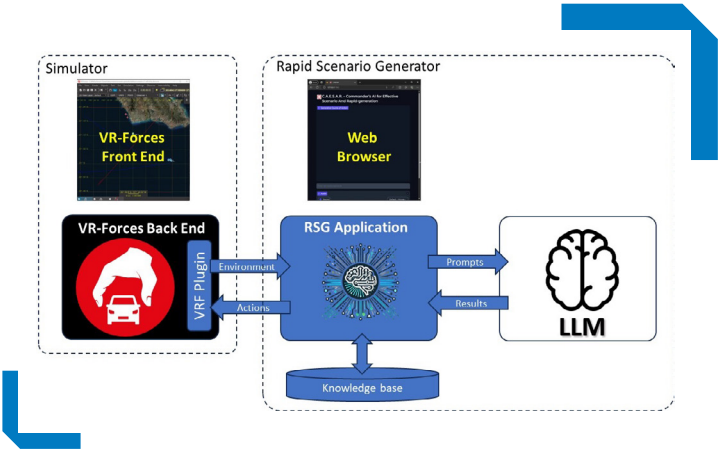
At the core of the system is the Rapid Scenario Generator (RSG). Using simple text or voice inputs, instructors articulate training objectives and operational context, which RSG translates into realistic, executable scenarios.

Leveraging generative AI for scenario creation and agentic AI for orchestration, RSG draws on proprietary and open source data to anticipate the actions of friendly and opposing forces. Using iterative natural language interaction, scenarios can be refined rapidly, reducing the time required to develop complex training scenarios from hours to minutes.

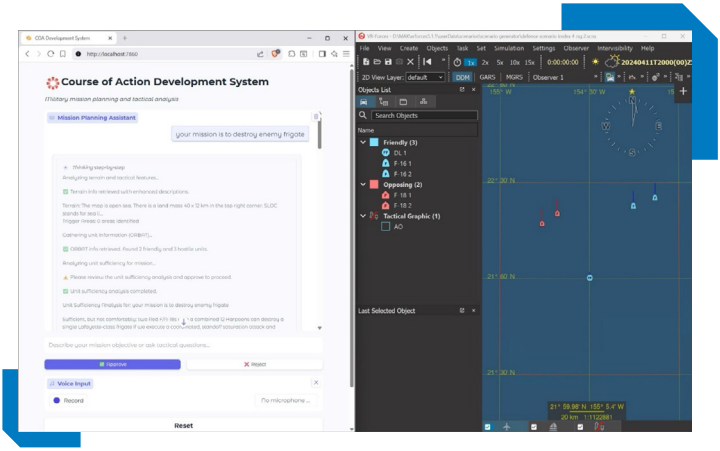
> “By turning natural language into complex, AI-driven scenarios in minutes, we are empowering instructors to achieve more with fewer resources—redefining training for an era where efficiency and resilience matter most.”

KOH MENG HUI
Engineer
Technology Office
ST Engineering Training & Simulation Systems





RSG is integrated with MAK VR Forces, a Computer Generated Forces (CGF) engine that delivers autonomous virtual opponents and teammates. Acting as a virtual commander, RSG orchestrates scenario execution, while adaptive CGF behaviours dynamically respond to learner actions, creating more realistic and responsive training experiences.



Within this environment, learners interact with lifelike virtual teammates that respond to spoken commands, challenge erroneous instructions and prompt action as required. This minimises dependence on human players, reduces training costs and supports concurrent training for multiple learners.

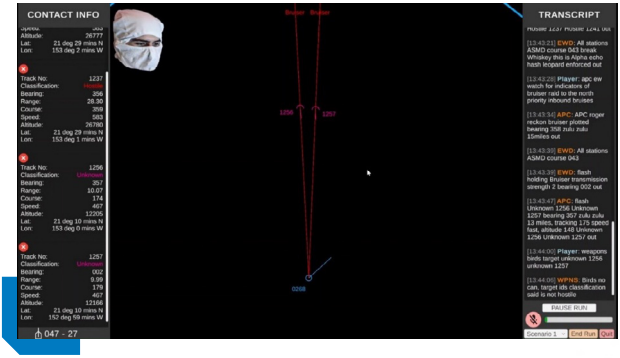
Virtual Teammate

Powered by in-house voice-to-text technologies, AGIL Co-Trainer produces a detailed, objective record of every session. These data enable the creation of measurable performance indicators, and when integrated with Mission Analytics and Review System (MARS) and wearable inputs, support more holistic, evidence-based assessment.

Today, AGIL Co-Trainer is embedded as a standard feature across ST Engineering's simulator offerings for air, land and sea operations.

> "AGIL Co-Trainer significantly streamlines operational procedures, allowing practitioners to focus on higher value tasks while maintaining rigorous training standards."

LESTER CHAN WEI JIAN
Assistant Manager
ST Engineering Training & Simulation Systems



AI Marketplace Commuter App: Smart Urban Solution on the Go

AI recasts public transit networks as a dynamic marketplace.

Bringing relevant promotions from nearby local merchants into the daily commute—that is the premise of ST Engineering Urban Solutions' AI Merchant Matching Engine.

For public transport operators, this is a chance to engage passengers and generate new revenue streams. For merchants, it offers a way to reach a customer base with hyper-personalised promotional content.

Bringing them all together is AI. With data from actual commute patterns and continuous learning from user actions, the app's preference profiling engine is able to channel content to target consumers more accurately.

> "The beauty of this engine is that we're solving real business problems while maintaining absolute data privacy. Every preference inference, every carousel ranking decision happens locally—no user data leaves the transit operator's network. That's not just compliant; it's the future of ethical AI in mobility. I'm proud to be part of a team that proves you don't need to export user data to the cloud to deliver world-class personalisation."

CEDRIC JANER DELAVIN
Senior Engineer

> “What excited me most about this project is the closed-loop ecosystem design. We’re not bolting on advertising as an afterthought—it’s designed into the fabric of the ticketing platform. From commuter to merchant to operator, everyone benefits.”

AMOS TING
Software Engineer

Importantly, it takes a privacy-first approach. All data remains on the operator’s infrastructure, so there is no risk associated with having to export user information to the cloud.

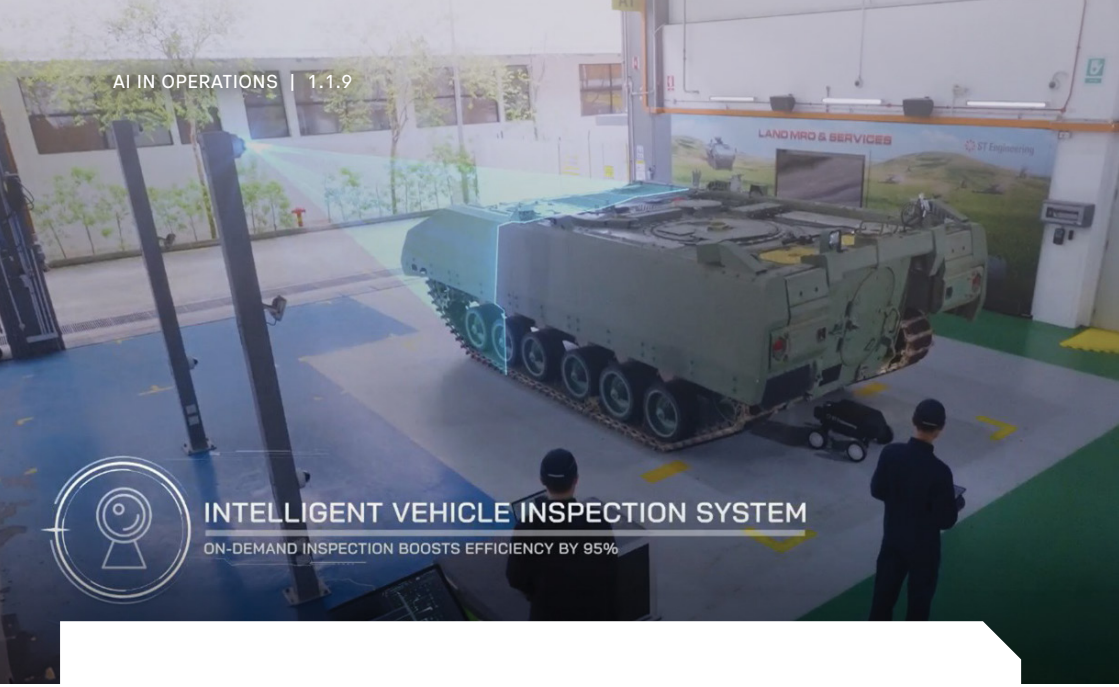
The innovation positions transit operators as platform owners rather than mere service providers.

ST Engineering has made it easy with AI: an Operator Admin Console allows them to check system health, review revenue management and monitor compliance.

For merchants, it is even simpler. With a low tech barrier, on-boarding takes barely 30 minutes; campaigns can be effortlessly created via drag-and-drop on the Merchant Dashboard. Just like that, they gain unique audience access and insights that traditional digital marketing channels cannot replicate.

AI is also behind the real-time matching algorithm, which factors in preferences, timing and proximity when relaying merchant offers. Designed together with the Nanyang Technological University, it provides app users a carousel interface with one-tap interaction for purchases and reservations.

It’s a winning proposition for all, made possible by ST Engineering, with AI.



Engineering the Future of Vehicle Inspection with AI

AI-driven fleet inspection delivers safer workplaces, greater reliability, faster turnaround times and higher operational readiness.

As fleet complexity and operational demands increase, vehicle inspection has become a critical enabler of safety, readiness and efficiency. The shift toward data-driven maintenance and fleet management enables predictive analytics to detect emerging faults early and recommend corrective actions before failures occur, reducing downtime and improving fleet availability. By enabling earlier forecasting of spares and manpower, comprehensive inspections also shorten turnaround times and minimise operational disruption.

The Intelligent Vehicle Inspection System (IVIS) does this by using artificial intelligence to combine advanced robotics and video analytics, augmenting human judgement in vehicle inspections. IVIS automates up to 45% of inspection checklist items, reduces manpower requirements from two technicians to one, and generates standardised inspection reports from unit to depot level.

This streamlines the Handover Takeover (HOTO) process, delivering up to 95% efficiency and more consistent inspection outcomes. By removing personnel from hazardous tasks, IVIS enhances safety and reduces injury risk while offering measurable operational and business value.

Integrated with the Health & Utilisation Monitoring System (HUMS), IVIS forms a comprehensive digital inspection suite that fuses telemetric and structural health data with AI-assisted fault correlation to identify plausible faults and recommend repair options.

> “Vehicle inspection is a critical step in maintenance and overhaul operations. Traditional manual inspections expose technicians to safety risks and are vulnerable to human error. IVIS leverages robotics and video analytics to enhance safety, accuracy, and consistency, reducing physical strain, rework and turnaround time while improving reliability and operational excellence.”

CHEW JIA HAO & LEONARD GOH
Senior Engineers

Platform and workshop data are further integrated with fleet level analytics to identify failure trends, enabling a transition from reactive to predictive maintenance, and reducing turnaround time with assisted fault correlation to identify plausible faults and recommend repair options.

IVIS is designed to scale across multiple platforms, with planned enhancements to support both peacetime and non-peacetime operations. Future upgrades will enable operation on difficult terrain, inspection of running gear and upper chassis and eventual inspection of internal cabins.

Keeping Customers' Aircraft Mission-Ready Through Smarter MRO

Applying AI and advanced robotics to strengthen aircraft maintenance and operational resilience.

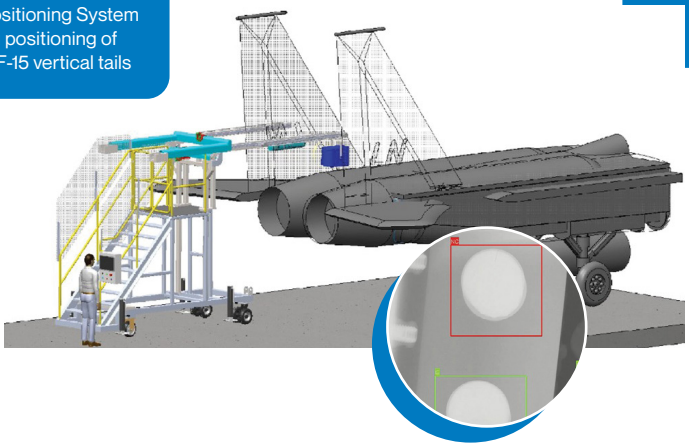
Repetitive, labour-intensive work and extensive compliance checks are persistent challenges in Maintenance, Repair and Overhaul (MRO) operations. Inspecting the vertical tail of a single F-15 aircraft, for example, requires technicians to repeatedly access large aircraft structures at height, with at least 150 different setups per tail. Besides being time consuming, it is also physically demanding and potentially unsafe.

As Engineer Kevin Seet, Smart MRO, Defence Aerospace, puts it, "In aircraft maintenance, speed goes hand-in-hand with accuracy." Reducing bottlenecks while maintaining safety or compliance is therefore a key priority.

To address these challenges, teams at ST Engineering combine AI, automation and advanced robotics to make maintenance more precise, efficient and operationally resilient.

At the core of this transformation is the Aircraft Maintenance Management System (AMMS). Functioning as a digital backbone, AMMS connects

X-Ray Automated Positioning System (XRAPS) automating positioning of X-ray equipment on F-15 vertical tails



planning, execution, material tracking and resource allocation into a single ecosystem, enabling critical decisions to be made in real-time. “This eliminates the information lag we used to accept as normal,” Kevin explains. “We are handed the intelligence we need instantly, so we can make data-driven decisions with confidence.”

The team also developed the X-Ray Automated Positioning System (XRAPS) to automate positioning of X-ray equipment on F-15 vertical tails. This eliminates repeated work-at-height activities and cuts inspection time from approximately 12 man-days to five man-days per aircraft—significantly improving safety and consistency.

In addition, AI is further enhancing Non-Destructive Testing. Digitally augmented computer vision supports technicians in detecting rivet cracks more quickly and accurately, improving turnaround times and fleet availability.

Beyond physical inspections, Smart MRO also empowers technicians with better access to information. AskSunburst, a generative AI chatbot, provides immediate procedural guidance, while ThorInsights, an operationally intelligent weather monitoring agent, analyses lightning sensor data to determine whether post-thunderstorm checks are necessary, cutting unnecessary inspections and downtime.

Together, these initiatives reflect a fundamental shift in how aircraft maintenance is performed. Combining AI, robotics, and human expertise, Smart MRO redefines maintenance so teams work safely and efficiently and aircraft stay mission-ready.

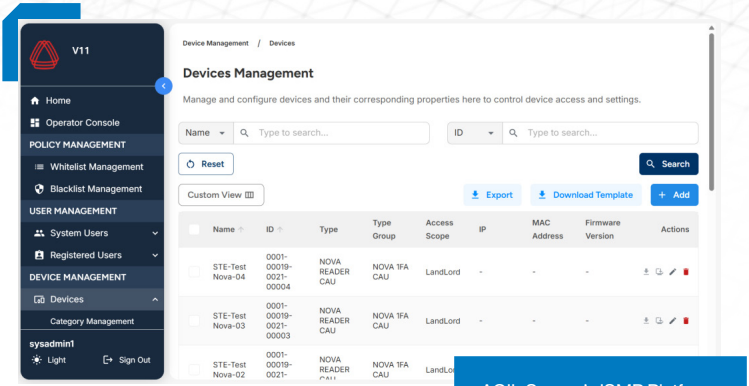
Smarter Troubleshooting for Customers with Conversational AI

AI and NLP help users to diagnose errors quickly and confidently, resulting in faster mean time to resolutions.

In every organisation, users and engineers face the same recurring challenge: diagnosing system errors hidden within complex logs and databases. Traditional troubleshooting often requires specialised knowledge, manual searches, and hours of effort to connect fragmented pieces of information. This slows resolution, increases downtime, and frustrates the teams.

Natural Language Processing (NLP) changes the way troubleshooting is done. An AI chat agent will be able to converse with a user in a natural language like English and perform relevant contextual extractions—identifying key entities such as error codes, timestamps, or system components from raw logs. Users will no longer need to memorise query syntax or decode raw logs. Through correlation and reasoning, the AI agent will connect related events across different databases to provide a holistic reply with explanation, turning technical jargons into clear insights for the user.

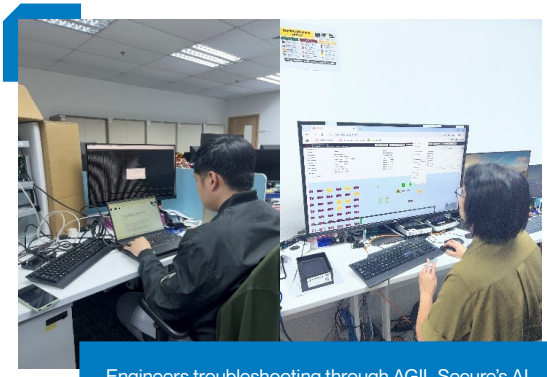
ST Engineering's AGIL Secure, an Integrated Security Management Platform (ISMP) is embedded with NLP capability to significantly change the



AGIL Secure's ISMP Platform

way troubleshooting is done. Instead of scrolling through thousands of log entries on the ISMP, a user now can simply ask: "Why did the service fail yesterday?" or "What are the most frequent errors this week?" The AGIL Secure's AI chat agent will interpret the request, analyse through logs and databases, and deliver actionable insights instantly. The result—faster diagnoses and reduced mean time to resolutions (MTTR), and greater confidence among engineers in solving complex technical issues.

Beyond supporting reactive troubleshooting, AGIL Secure's AI agent also learns from historical error patterns to highlight recurring problems, suggest preventive measures, and recommend configuration changes before failures occur. This ensures that organisations not only resolve today's issues but also prevent future disruptions.



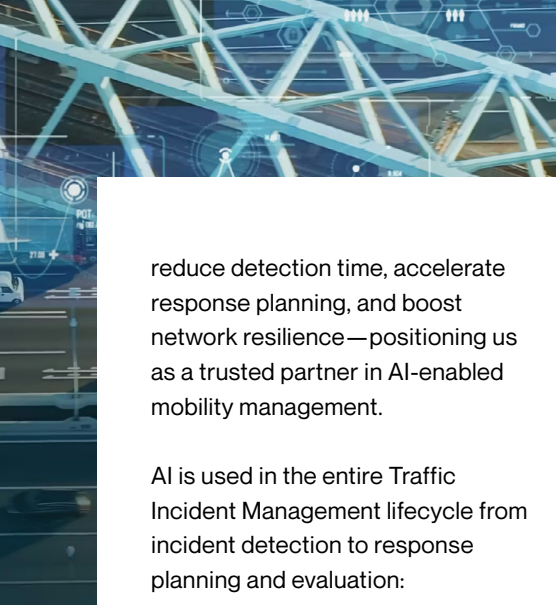
Engineers troubleshooting through AGIL Secure's AI-enabled Operator Console which improves MTTR

Transport Incident & Congestion Management Made Smarter

Our Urban Traffic Management System (UTMS) helps network operators solve complex challenges in today's transport networks.

Across major cities, most congestions stems not from peak demand, but by unpredictable incidents—crashes, stalled vehicles, debris, and weather disruptions. Traditional Traffic Control Centres rely heavily on manual monitoring and operator experience to detect, assess, and respond to these events. As road networks grow more complex, this approach limits response speed and operational consistency.

To address this challenge, we integrated AI into our Urban Traffic Management System Solution, transforming incident response from a manual process into a data-driven, AI-assisted workflow. By integrating AI directly into the operational lifecycle, we help transport authorities



reduce detection time, accelerate response planning, and boost network resilience—positioning us as a trusted partner in AI-enabled mobility management.

AI is used in the entire Traffic Incident Management lifecycle from incident detection to response planning and evaluation:

- **Incident Detection:** Computer Vision models continuously analyse CCTV feeds to detect stopped vehicles and abnormal traffic patterns.
- **Network-Wide Detection:** Artificial Neural Networks monitor live traffic data to identify traffic flow disruptions beyond camera coverage.
- **Proactive Monitoring:** Short-term traffic prediction models forecast congestion build-up, enabling operators to act before queues escalate.
- **Response Plan Generation & Evaluation:** Rule-based and case-based AI generates comprehensive response strategies, including coordinated Vehicle Management System (VMS) messaging and signal adjustments—while predictive models evaluate their effectiveness against a "no-action" baseline.

Together, these AI components reduce operator workload and enhance decision quality, while keeping human oversight central.

ST Engineering has deployed systems in traffic command centres in Singapore and Dubai, helping customers detect incidents faster, reduce clearance times, and provide operators with real-time intelligence to enable quicker and more confident decisions that reduce congestion and enhance road safety.

> "Our goal is always to build AI solutions that solve real operational pain points inside traffic control centres."

DR CHONG CHEE CHUNG
Vice President

AGIL® Care for Efficient Hospital Operations

How AGIL Care uses AI to help hospitals anticipate demand, ease bottlenecks and deliver better care.

Overcrowded emergency rooms, long waiting times and exhausted staff are among the many challenges hospitals face as patient volumes continue to rise. The causes are often systemic. Information is spread across disparate systems causing delays in information sharing. These small inefficiencies ripple across the hospital, creating bottlenecks that place additional strain on both patients and care teams.

AGIL Care was developed to bring clarity to this complexity. By consolidating data from multiple systems onto a single, intelligent platform, it gives healthcare teams a real-time, holistic view of hospital operations.

Through personalised dashboards, staff can monitor key indicators such as bed occupancy, discharge turnaround times and operating theatre utilisation. With

predictive analytics, AGIL Care is also able to forecast patient arrivals, their expected length of stay and associated staffing needs. Based on these insights, the platform recommends how resources, from beds and staff to operating theatres, can be allocated more effectively to reduce idle time and speed up care delivery.

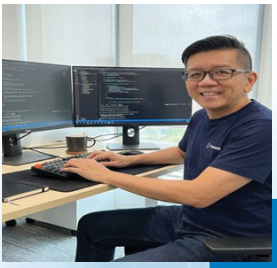
One such example is AGIL Care's Discharge Readiness Management (DRM) module. By coordinating processes across departments such as pharmacy, billing and cleaning, it helps accelerate patient discharge and shorten bed turnaround times, in turn easing congestion and improving patient flow across the hospital.

Together, these capabilities enable a smarter, more coordinated way of working. Hospitals that have integrated AGIL Care report faster discharges and improved patient experience, while maintaining high standards of care.

Designed to be cloud-ready and cloud-agnostic, AGIL Care can scale across multi-hospital networks, supporting healthcare systems as they grow and evolve. It reflects ST Engineering's broader commitment to applying advanced analytics, optimisation and real-time orchestration to complex, real-world challenges—delivering solutions that empower critical systems to work better where it matters most.

> "Data is the foundation, but without intelligence it's just numbers. AI transforms that data into actionable insights, empowering hospitals to make smarter, faster decisions."

JOHAN LOKE
Principal Architect



Navigating Information in the Age of Influence with AGIL® Insights

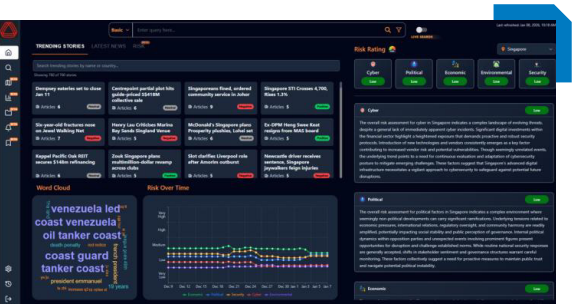
Cutting online noise for real-time strategic intelligence and risk identification.

In an era where perception shapes reality, ST Engineering's AGIL Insights platform empowers organisations to stay ahead of emerging narratives, influence dynamics, and digital risk signals. As information ecosystems become increasingly fragmented and fast-moving, traditional methods that rely on manual monitoring or reactive analysis are no longer sufficient to provide timely and relevant insights. AGIL Insights transforms overwhelming online noise into structured, strategic intelligence. This platform enables organisations to move beyond reactive approaches, proactively identify critical trends and make informed decisions based on comprehensive, real-time analysis of the information landscape.

Team photo from left to right:

Brandon Lim Wee Siong, Low Chuan Kiat, Jeffrey Lim Yi Ren, Chong Xi Yuen Terence, Koh Xian Rong

Where traditional media-monitoring tools focus on keyword tracking and retrospective reporting, AGIL Insights deploys advanced AI-driven narrative mapping and influence analysis across global news, social media,

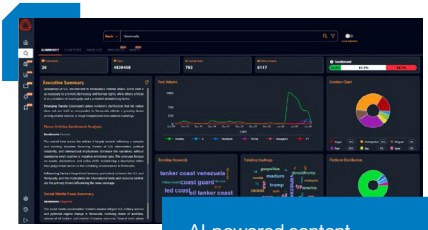


forums, and digital communities to identify evolving themes, coordinated messaging patterns, sentiment shifts, and emerging influence networks. Integrated with AGIL Trust for real-time fact-checking, the platform enables organisations to verify the authenticity and credibility of information. These integrated fact-checking capabilities help users detect misinformation and disinformation to support more informed, trustworthy decision-making.

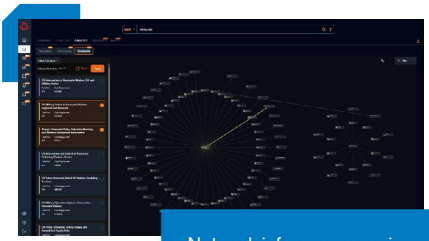
AGIL Insights continuously applies analytics—natural language processing, sentiment sensing, topic clustering, network analysis, and large language models—to perform deep, cross-domain assessments of digital discourse. By fusing structured and unstructured data, the platform detects not just what is being said, but how, by whom, and with what potential impact.

AGIL Insights provides a unified intelligence layer across text, video, and online conversations without requiring users to switch between disparate dashboards. Key capabilities include influencer and network mapping, coordinated behaviour detection, sentiment analysis, alerting and monitoring workflows, and AI-assisted summarisation for rapid situational awareness.

Through integration with global media sources and feeds, AGIL Insights ensures continuous monitoring of the information landscape, surfacing early signals, identifying patterns, and enabling proactive decision-making in complex and volatile environments.



AI-powered content analysis: executive summary & sentiment analysis



Network inference mapping reveal the actors behind narratives across monitored platforms, enabling the identification of patterns

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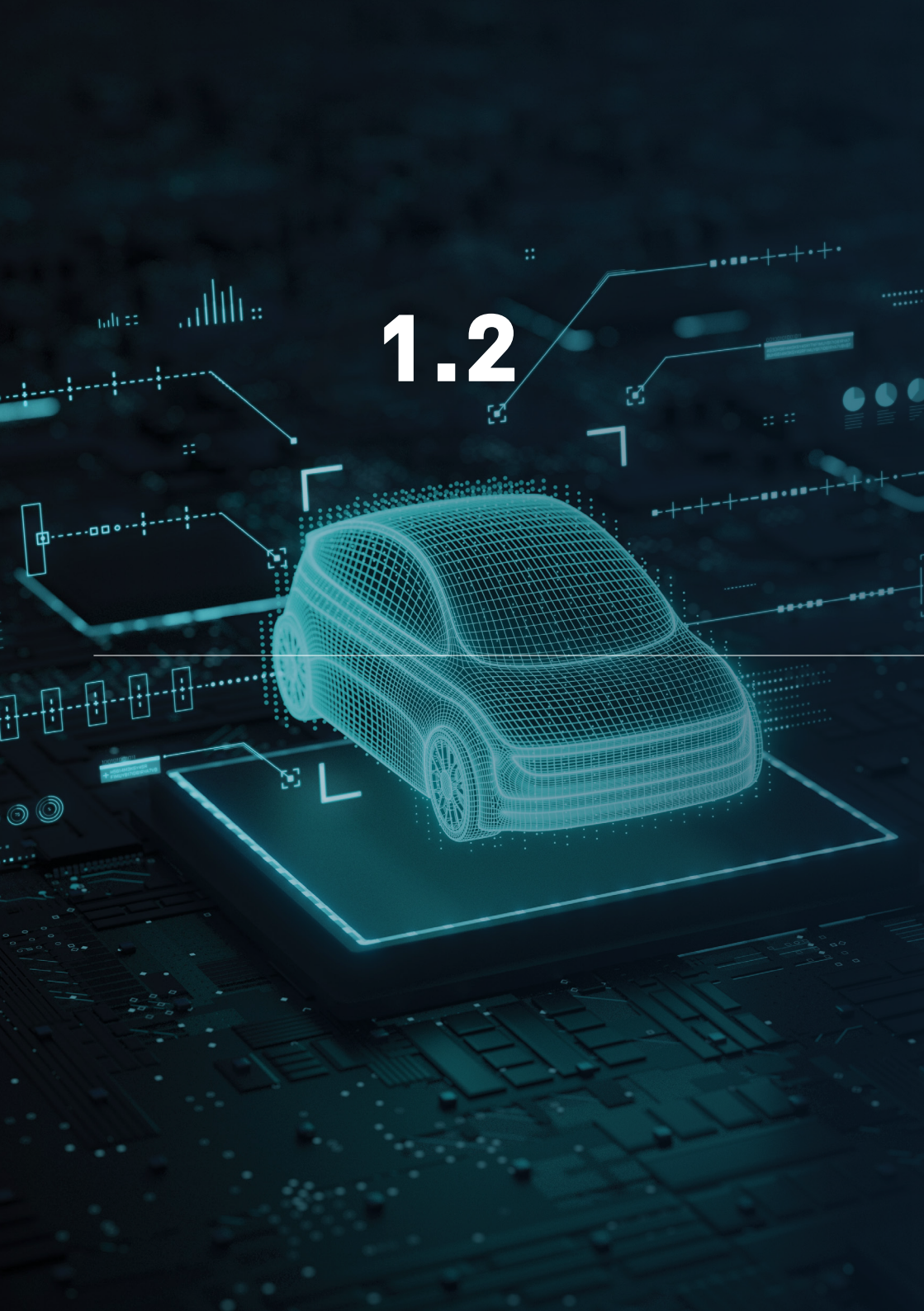


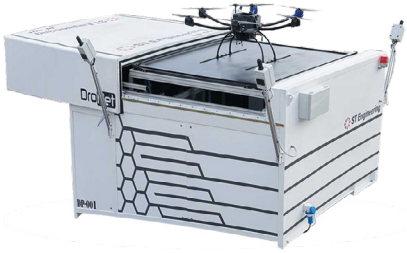
AI IN PLATFORMS AND AUTONOMOUS SYSTEMS

Artificial Intelligence enables platforms to operate with greater autonomy, awareness, and precision. By enhancing perception, decision-making, and responsiveness, AI allows robotic systems, vehicles and autonomous systems to adapt to changing environments and deliver safer, more efficient, and scalable operations.

DroNet™: Delivering Unmanned AI Capabilities

Singapore's first Beyond-Visual-Line-Of-Sight (BVLOS) unmanned aircraft system now enables autonomous, intelligent monitoring of critical infrastructure.

Monitoring critical infrastructure such as reservoirs and power lines can be time-consuming, manpower-intensive, and potentially hazardous. The challenge is compounded as assets become more distributed and operating environments more complex. This is where ST Engineering's DroNet™ comes in.



> "By adopting an automated MLOps framework, we enable continuous model improvement, resulting in more accurate inspections and improved outcomes for end users."
>
> DANIEL TAN
> Principal Engineer

DroNet™ is a fully integrated unmanned aircraft system designed for BVLOS operations. It brings together CAAS-approved unmanned aircraft, a ground control system, centralised docking and charging stations, and the DroConnect AI-powered analytics platform, to enable safer, more efficient aerial monitoring of critical infrastructure.

DroNet™ first took flight around Singapore's reservoirs through a partnership with its water and wastewater management authority. In 2025, this partnership was extended, creating opportunities to further enhance DroNet's AI Vision Analytics through automated Machine Learning Operations (MLOps).

Today, DroNet™ interprets live visual data in near real-time. It can detect and count boats and individuals, and trigger alerts when overcrowding or illegal activities are observed.

These autonomous aerial patrols have reduced reliance on manual surveillance, saving an estimated 5,000 staff hours annually, while strengthening early detection of safety and environmental risks.

Beyond water management, DroNet™ has demonstrated its value in powerline inspection projects with an energy management customer in Thailand. By keeping inspectors safely on the ground while unmanned aircraft conduct close-range inspections, the solution reduces risk, shortens inspection cycles, and improves fault detection accuracy through AI-assisted analytics.

> "Using AI extends our reach into areas that are difficult or unsafe to access manually. It helps engineers detect issues sooner, reduce risks, and care more responsibly for infrastructure that communities rely on every day."

ROY TOH
Assistant Principal Engineer (left in picture)

Complementing these capabilities is an operationally intelligent health monitoring system for unmanned aircraft. By predicting battery degradation and sensor failures before they occur, the system enhances operational safety, reduces downtime and extends the service life of unmanned platforms—sustaining the safety and efficiency of ST Engineering's unmanned platforms for years to come.

ZAEL: Real-time Intelligent Insights for Maritime Vessels

With real-time analysis of data comes faster performance reporting, smarter predictive maintenance and safer operations at sea.

Sea trials—the evaluation of vessels on open water by Classification Societies—are a final crucial step before watercraft can be brought to market. Manual processing of information, however, yields poor insight and can prolong the process.

Having taken part in many such trials, Fan Jun Wei was inspired to bring AI into service. The Product Lead says, "Combined with our deep expertise in naval architecture and proprietary knowledge of vessels, there was immense potential for AI to empower sound decisions, expand cost benefits and improve crew safety."

The result is ZAEL—an intelligent data layer designed to complement existing

ship control and monitoring systems, transforming them into smarter, more proactive instruments. With consolidated operational, performance and safety data on a unified platform, ZAEL's advanced analytics offer actionable insights for better decision-making.

ZAEL Sight for performance validation and optimisation: ZAEL Sight has dual-use applications in commercial and defence vessels—whether workboats, ferries, or high-performance craft.

Sight automates vessel performance reporting, generating near instant, easily interpretable manoeuvring metrics aligned with International Maritime Organization standards. Its fully automated analytics pipeline has reduced the seaworthiness qualification cycle from 3 weeks to mere minutes. Owners leveraging Sight realise faster vessel acceptance and delivery, operate with a leaner crew and avoid hefty retrial costs.

Operators chasing peak vessel performance also gain confidence in pushing the limits of the vessel's manoeuvrability, safely. Sight provides timely feedback that can inform driving techniques. In the case of patrol boats, rapid changes in direction with up to 46% tighter turning diameters are now possible, ideal when agility is critical for mission success.

> "Technology adoption does not always mean costly upgrades with long downtimes. We are constantly looking for ways to streamline the transition for fleets; mining the digital gold outweighs the cost of implementation."

VINCENT CHUA
Business Development Lead (above)

ZAEL Pulse for predictive maintenance: ZAEL Pulse presents a plug-and-play transition from time-based to condition-based maintenance. The AI system employs continuous monitoring of equipment health and accurate predictive models, facilitating better maintenance scheduling for maximised sailing time and savings in operational expense.

With prediction horizons of up to 48 hours, Pulse allows operators to remain voyage ready. Out at sea, Pulse continually detects emerging faults and failures. Armed with AI-analysed data and recommendations, the crew can make timely interventions to avoid unplanned disruptions.

Autonomous Swarms Coordinated by AI

With agentic AI, fleets of drones can coordinate, adapt and act without human intervention.

ST Engineering's Hybrid Drone Swarm Intelligent System is an agentic AI platform designed to enable scalable, resilient drone swarm operations in complex environments. By distributing intelligence across multiple autonomous agents, it allows swarms to operate without reliance on centralised control, adapting continuously as conditions change.

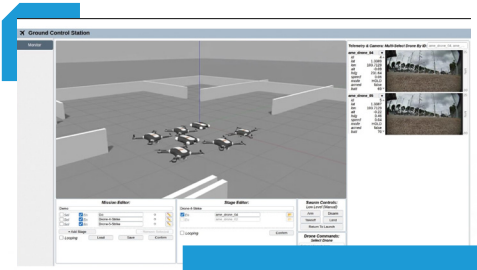
Currently, it is at Technology Readiness Level 3, where Agentic AI is applied to enable drones to coordinate and operate autonomously in real-time. Instead of following fixed instructions,

> “With the hybrid drone swarm intelligent system’s agentic AI, a single drone observes, but the swarm understands”

ANG CHEE BENG
Head Precision Systems

each drone functions as an intelligent agent—capable of adjusting its flight path, collaborating with others, and dynamically assuming roles within the swarm based on its situation.

Advanced machine learning techniques support collision avoidance and optimal path planning, allowing drones to navigate safely and reroute quickly in crowded or unpredictable environments. Over time, the swarm learns from experience, refining behaviours and improving overall performance across repeated deployments.

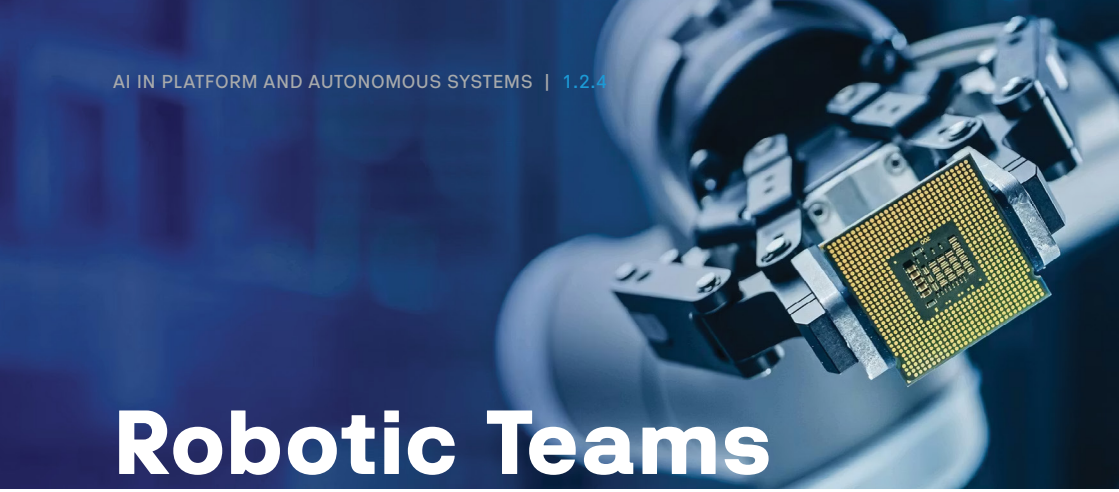


Swarm Ground Control Station

The hybrid (centralised and decentralised) architecture reduces reliance on a single point of control and eliminates a single point of failure. As more drones are added, the swarm scales naturally, with intelligence distributed across agents instead of concentrated in a central system. This reduces decision-making latency and enables faster, more resilient coordination.

Crucially, the swarm remains operational even when individual drones are lost or disrupted. Remaining units can autonomously redistribute tasks, adjust flight paths and continue the mission without interruption.

The result is a scalable, fault-tolerant swarm capable of executing complex coordinated strikes upon human confirmation, on multiple targets within an Area of Operation (AO), while removing the need for continuous human oversight.



Robotic Teams That Scale with Your Operation

AI can coordinate aerial and ground robots so fleets can grow without added complexity.

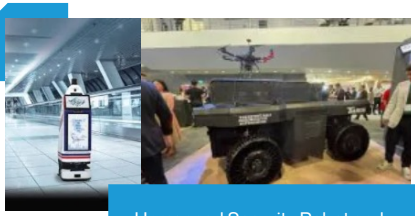
From battlefields to routine facilities management, robots play an increasingly important role in making operations faster, safer and more efficient. However, challenges arise when missions become more complex and operators must coordinate multiple types of robots to work together for successful execution.

ST Engineering's Robotics Management System is designed to address this challenge. Powered by intelligent automation, the system enables aerial and ground robots to operate together as a coordinated team.

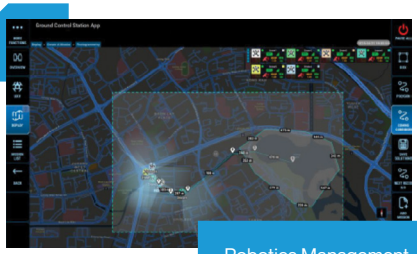
This technology enables robots to assist operators by recommending the most suitable types of robots for a mission and the waypoints each should navigate to. This allows diverse robotic teams to tackle, high-frequency tasks as a single, coordinated operation.

In key installations like airport terminals and strategic sites, our intelligent security patrol robots and quad-legged

> “In our enhanced Robotics Management System, we added an AI-driven intelligence as a System Recommender that selects the most suitable Robotic Agent for each operation, using reasoning to support operators in better decision-making and in accomplishing the mission.”
>
> THAM GUO REN
> Senior Engineer (second from left)



Unmanned Security Robot and Taurus Unmanned Ground Vehicle



Robotics Management System User Interface

robots provide continuous facilities and perimeter surveillance, keeping critical areas protected around the clock. Equipped with advanced AI vision systems, these robots detect and respond to threats or anomalies in real-time, reducing reliance on manual ground patrols and enhancing efficiency and consistency. Our multi-role TAURUS Unmanned Ground Vehicle (UGV), enhanced with AI, serves as a versatile smart platform for surveillance, logistics, material handling, and disaster relief support.

Together, these coordinated robotic operations enhance safety, reduce downtime, and improve operational efficiency. As robotic teams become more tightly coordinated, we expect new, innovative permutations that empower organisations to transform their operations.

Secure Edge Vision and Lightweight Intelligence

PAVE Ultra

Secure AI vision systems built for scalable, real-world deployment.

Modern intelligent systems, from unmanned swarms and vehicle fleets to smart infrastructure, require edge vision solutions that are not only powerful, but also secure and scalable. While many startups have demonstrated impressive proof-of-concept demos, challenges in cybersecurity, system integration, and trusted supply chains often prevent reliable operationalisation.

This is where ST Engineering's expertise comes in.

Unlike conventional approaches that add AI after cameras and hardware are selected, PAVE is designed with AI at its core. This AI-native architecture lets ST Engineering combine in-house specialty cameras with commercial off-the-shelf options, tailoring affordable, scalable solutions to specific applications.

A key feature of PAVE is its signature low-distortion wide field-of-view cameras. Our proprietary technique, reduces the number of cameras required and lowers video-processing demands, minimising compute bandwidth and enabling AI models to run efficiently at the edge, delivering real-time performance within vehicles, robots, and facilities.

Our practical innovation cuts vision-solution costs by 50%, reduces edge-AI power consumption and heat output by 70%, and requires 85% fewer cables and connectors, making it ideal for low-SWAP-C applications.

PAVE began as a ground-up innovation in 2023 and is now integrated into several ST Engineering products. It is also actively considered by local and overseas customers. Today, it is offered in three configurations: 5MP PAVE Lite for manned applications (e.g. FPV drones, vehicles, critical site monitoring), 12MP PAVE Pro for unmanned applications (e.g. UGVs, AI surveillance), and >20MP PAVE Ultra for demanding, high-performance applications.

PAVE Lite (left) and PAVE Pro

> “PAVE began as an innovative camera supporting land systems. It has grown to become a capable edge vision AI solution suitable for many more mission-critical applications. Edge vision AI is starting to be adopted at scale, and I believe we are well-positioned to ride this wave of growth!”
>
> CHIN KAI LUN
> Head
> Emerging Business

In future, embedded cybersecurity components, advanced night vision and specialised cameras designed for amphibious, desert and arctic environments will further extend PAVE’s capabilities across complex operating conditions.

These advancements are supported through collaboration with local and international startups, SMEs, and internal AI teams, with a focus on lightweight AI models and field-updatable tools that keep systems current after deployment.

Transforming Data into Intelligence with AI Factory

A one-stop environment to manage and fast-track the development and deployment of AI solutions.

AI has been widely used across our business to deliver innovation and solutions that add value for our customers. In today's fast-paced environment, we are also using AI to enhance our operations in design and manufacturing, yielding speed, efficiency and reliability.

The AI Factory is one such initiative. It is a modern digital assembly line that systematically supports our engineering team in rapid prototyping, validating and deploying AI-enabled solutions.

This one-stop centre for all things AI is designed to transform raw data into actionable intelligence at scale. Consider it a production ecosystem for AI, where the entire AI lifecycle is managed. From data ingestion to curation, through model development, training, integration, testing and continuous improvement, to regulatory compliance, AI Factory does it all.

In the AI Factory, experimentation is rapid. After an AI solution is developed, it is swiftly integrated into the software-

defined-vehicle (SDV) environment for a quick plug-and-test that does not need physical vehicle configuration. Next, to validate the AI solution on performance, robustness and reliability under real-time operating conditions, it is evaluated using the AI On-the-Move vehicle. The man-machine interface and overall AI workflow are subsequently reviewed as a pretotype mock-up before the solution is deployed for production.

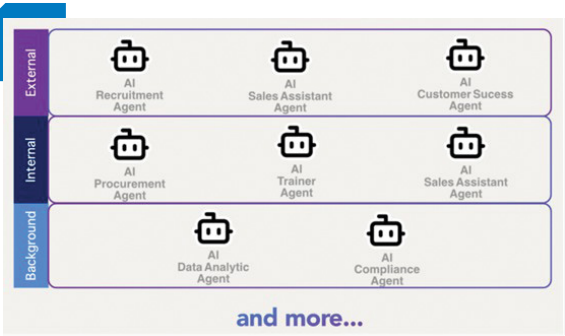
AI Factory leverages the SDV's modular architecture with a structured validation approach. Supported by a suite of AI tools, it accelerates quality product development, resulting in the faster delivery of innovative solutions to the customer. Solutions can then be easily scaled across multiple sites, fleets and operational use cases.

> "As we incorporate more AI solutions into our products, we need a systematic way to develop, test, upkeep and scale them. AI Factory was primarily created to address this need."
>
> DENNIS TAN
> Vice President and Head of AI Land Systems (second from right)

AGIL® Genie Studio: Deploying Enterprise AI Solutions Easily and Safely

When organisations need to get up to speed with using AI in this digital-first era, AGIL Genie Studio provides a safe, fast and fuss-free low/no-code route.

While industries from healthcare to finance recognise AI's potential, moving from isolated pilots to production-grade outcomes remains a significant hurdle. Enterprises often struggle with fragmented tools and risks like hallucinations or sensitive data leaks, which stall deployment at scale. AGIL Genie Studio by ST Engineering closes this gap, providing a platform that makes AI solutions repeatable, governable and scalable across operational processes.



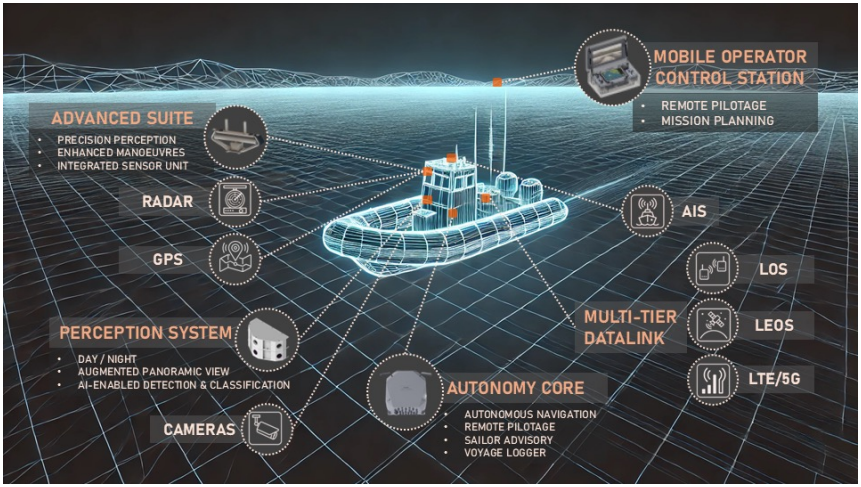
AGIL Genie Studio is a visual orchestration platform that allows teams to design complex AI workflows without specialised coding. Using a drag-and-drop interface, businesses can easily automate multi-step processes and standardise successful agent patterns for rapid, consistent redeployment across functions, preventing innovation from being siloed.

To maintain performance over time, the platform features a dedicated Evaluation Pipeline that automates rigorous checks of AI agent behaviour whenever a change is made to the underlying model or data. By systematically providing benchmarking performance before redeployment, Genie Studio ensures updates improve the system without introducing new errors or regressions.

Safety and ethics are prioritised through integration of AI Verify, a Singapore government initiative, that validates agent behaviours against define boundaries, adding trust for regulated sectors. Combined with an Enterprise RAG engine for grounded intelligence and an Operations Dashboard for real-time visibility, Genie Studio delivers the security and oversight necessary for true digital transformation.

> “AGIL Genie Studio is not just about building AI agents. It enables enterprises to design, deploy and govern intelligent agents that integrate seamlessly into business workflows and deliver measurable outcomes.”

KE NAN
Engineer for
AGIL Genie Studio



Modular Autonomy Core (MAC) for Maritime Vessel Autonomy

With the Modular Autonomy Core (MAC), intelligence can be engineered into almost any vessel.

AI is turning the tides in the maritime sector. Yet even as the industry looks to adopt smarter technologies, many operators face challenges with cost and scale. Vessels vary widely in age, design and systems, and adding autonomy often requires custom engineering for each ship. As a result, deployment is often expensive, slow and difficult to scale across fleets.

This lean autonomy enabler seamlessly integrates into both existing and new-build vessels

The Modular Autonomy Core (MAC), featuring advanced multi-modal deep learning perception, was developed to address this challenge. As an operational intelligence system, MAC fuses data from multiple sensors to enhance vessels' detection and interpretation of their surroundings, even in complex and congested maritime environments.

What distinguishes MAC is its accessibility. Instead of limiting autonomy to purpose built platforms, MAC enables smart and autonomous capabilities on almost any vessel.

Built on ST Engineering's USV development expertise and partnerships with leading research institutions, MAC is engineered for seamless integration with both existing and new-build vessels. Its modular architecture enables flexible capability upgrades without system redesign, reducing integration complexity and supporting the incremental deployment of autonomy to meet evolving operational needs.

Leveraging a common core, the technology is applicable across both civilian and defence fleets, highlighting ST Engineering's capability to deliver advanced autonomy solutions across diverse missions, customers and operating contexts.

By combining modular design, scalable deployment and intelligent autonomy technologies, MAC empowers operators to future-proof their fleets, reinforcing ST Engineering's role as a trusted partner in shaping a safer, smarter and more sustainable maritime future.

> "MAC lowers the barrier to entry and expedites the adoption of maritime autonomy, enabling our class-leading technology to improve the efficiency and safety of maritime operations."

TOK WEI SHENG
Product Lead

1.3

AI IN SECURITY, TRUST AND SAFETY

Artificial Intelligence enhances security by enabling faster threat detection, smarter analysis and more reliable protection. These capabilities help organisations safeguard critical systems, build trust and respond confidently to evolving risks.

Meet AAiS, the New Intelligent Cyber Investigator

Agentic AI is redefining how Security Operations Centres keep pace with an increasingly complex threat landscape.

As cyber threats grow in both complexity and volume, Security Operations Centres (SOCs) struggle to keep pace. Traditional SOC workflows still rely heavily on manual triage and investigation. This contributes to analyst fatigue, delayed threat detection and slower response times—increasing exposure to advanced attacks.

ST Engineering's Agentic AI Security Operations Centre (AAiS) was developed to address these challenges. Rather than replacing human expertise, AAiS augments it with autonomous, adaptive intelligence that operates at machine speed.

At the core of AAiS is a multi-agent AI that conducts investigations in much the same way a Level 1–2 analyst would. It autonomously correlates alerts, analyses relationships and plans investigative paths based on live operational context.

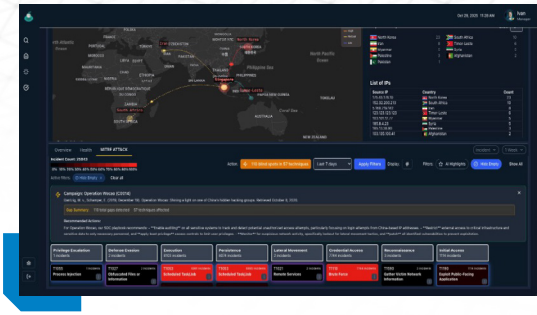
> "AAiS transforms security operations by automating traditionally manual investigative processes, allowing teams to focus on higher-value work."

DR IVAN JACOBS
Vice President and Head of AI Capability Development

"With AAiS, we're empowering analysts to make faster, smarter decisions by embedding advanced AI directly into real-world workflows," says Zhao Heng, Lead AI Research Engineer.

As cyber attacks become increasingly interconnected, visibility across systems is critical. AAiS uses graph-based investigations to surface hidden attack paths and coordinated activity, giving analysts a clear, end-to-end view of unfolding threats. It also applies the MITRE ATT&CK framework to identify detection blind spots and automatically strengthen coverage. Incident reports are generated and tracked seamlessly, streamlining documentation and follow-up.

Importantly, AAiS is designed to improve as it operates. “Our focus was on building a system that continuously learns and adapts in real environments,” adds Shi Han, Lead AI Engineer. “The ability to refine itself over time is what helps analysts stay one step ahead of evolving threats.”



Built on ST Engineering’s 14 years of experience designing and operating SOCs for government and commercial customers, ST Engineering brings deep operational credibility to AAiS. With 22 SOCs delivered globally across domains such as OT, 5G, Cloud, and enterprise IT, this expertise culminated in the successful deployment of our first Agentic AI SOC for the energy sector in Singapore in January 2026.

Keeping Critical Systems Safe with Smarter Cyber Monitoring

How AI helps operators tell cyber threats apart from everyday system issues.

Cybersecurity tools today are built for IT systems such as computers and servers. However, much of the critical infrastructure that keeps essential services running, such as water treatment plants, rail networks and power stations rely on Operational Technology (OT). Designed primarily for reliability and safety, these systems were not built with cybersecurity in mind.

As such, when cyber alerts occur, it is difficult to determine whether OT operations are at risk, and malware-

driven disruptions may be mistaken for routine system faults.

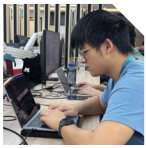
Drawing on its experience securing Singapore's Critical Information Infrastructure (CII), ST Engineering developed the Adaptive and Intelligent Cyber Monitoring System (AICYMO) to provide greater visibility into OT cybersecurity.

AICYMO uses AI to correlate cybersecurity alerts with OT system data, helping operators determine if an issue is cyber-related. This significantly shortens investigation and response times.

Beyond cyber detection, AICYMO also identifies subtle changes in system behaviour that may signal early equipment issues, allowing operators to take corrective action before problems escalate.

These capabilities were demonstrated at one of Singapore's Public Utilities Board's (PUB) CII water reclamation plants. When changes were detected in the plant's aeration process, AICYMO helped operators quickly determine whether the issue was caused by a system fault or a cyber incident, and respond accordingly.

> "Developing AICYMO has shown us how AI can fundamentally improve the way we respond to incidents in critical operational systems."
>
> ETHAN TANG YIDONG
> Development Lead



Looking ahead, AICYMO will form a core component of PUB's Security Operations Centre 2.0 (PSOC 2.0) programme, supporting cybersecurity monitoring across 18 PUB CII facilities island-wide. Its deployment will strengthen PSOC's ability to monitor water systems, respond quickly and reduce operational downtime.

AICYMO Workbench

AICYMO is also being adapted for use in rail networks, building management systems and power generation facilities. Over time, it will continue to learn from real-world operational data to improve its accuracy.

AGIL® SecureAI: Keeping AI Systems Safe

Even as AI plays a crucial role in cybersecurity, AI systems themselves need to be protected.

AI and Generative AI (GenAI) are prime targets for sophisticated cyber threats. Now integral to critical infrastructure, their safe use is paramount.

In Singapore, ST Engineering is leading the way to fortify such systems. AGIL SecureAI is a multi-tiered suite of cybersecurity systems, designed to protect AI and GenAI solutions through all stages of development and deployment. As the first-of-its-kind here, SecureAI has put its cutting-edge techniques to use in key national agencies from GovTech to the Cyber Security Agency of Singapore, and the Home Team Science and Technology Agency (HTX).

SecureAI is a niche product. It offers adversarial robustness assessments of AI, GenAI and agentic AI systems, starting with automated testing for vulnerabilities before deployment, and with continuous real-time monitoring when they go live. It automatically detects, analyses, and mitigates evolving risks, ensuring up-to-date

> “Developing AGIL SecureAI has been a transformative experience, uncovering the many ways AI integrity can be compromised. This drives us to build safeguards that ensure AI technologies remain secure, reliable and future-ready.”

HUYNH
Lead Developer

protection from emerging AI attack techniques. Threats like prompt injection, jailbreaking, data leakage and hallucinations, which traditional cybersecurity tools are not equipped to handle, can be identified; users can also simulate attacks using customisable threat libraries.

Also setting SecureAI apart from competitors is its focus on trustworthiness and security—features not available in most AI tooling platforms. Aside from the full-stack assessments and forensics, it also verifies the authenticity and integrity of data used. In addition, SecureAI tracks and strengthens a system’s security posture through explainable metrics, with security performance benchmarked against prominent international industry standards.

AGIL SecureAI Assessment Results

Cybersecurity needs can be met flexibly and at scale, with SecureAI offered both on-premise for sensitive environments, and as cloud-based Software-as-a-Service, available 24/7 globally. With SecureAI, organisations can embrace the power of AI with confidence.

AGIL® Trust: Assuring AI Contents in the Age of Misinformation

Decentralised and rapid information dissemination in this digital age makes combating misinformation particularly difficult. An innovative AI solution is putting up a strong fight.

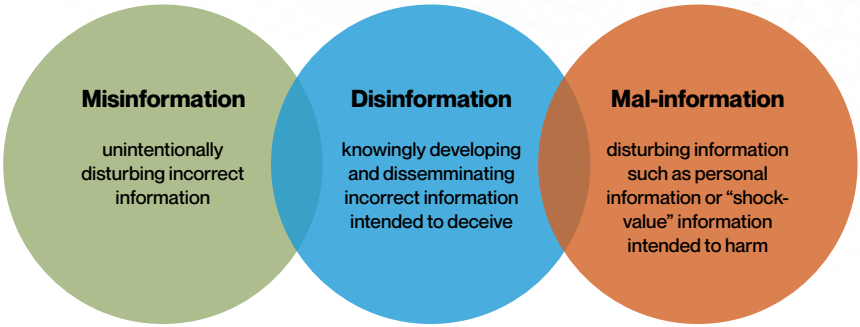
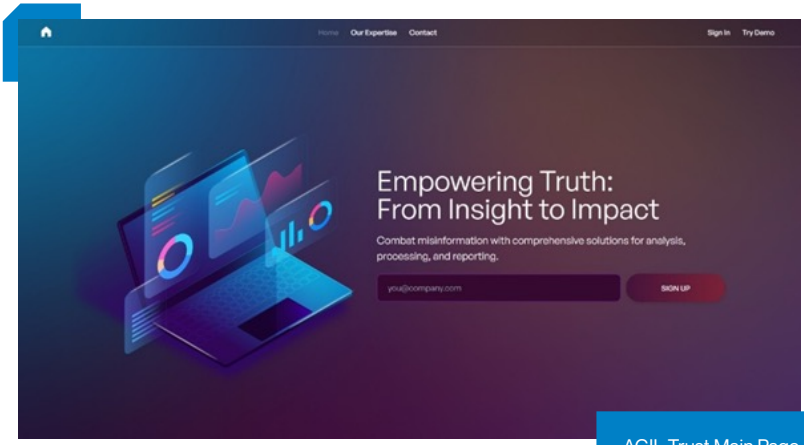


Figure: Information Disorder

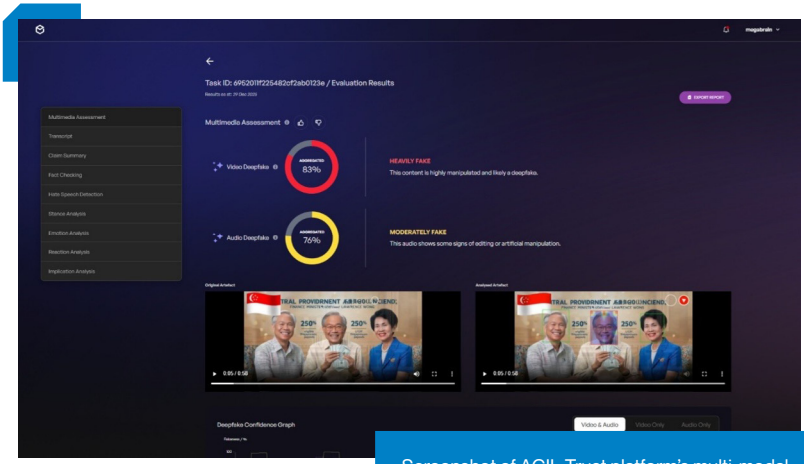
Boon or bane? Generative AI has reshaped the way we work, helping us be more productive, but has also unleashed new threats. Chief among these are misinformation and digital deception. Highly realistic synthetic data is being exploited by bad actors, manipulating public perception and undermining trust. Scams are proliferating. Indeed, misinformation and disinformation have been identified as top risks by the World Economic Forum.

In countering the growing threat of misinformation, ST Engineering's AGIL Trust platform stands out. AGIL Trust fights fire with fire. While current fact checking and deepfake analysis processes are manual and heavily dependent on human expertise, AGIL Trust deploys a powerful suite of AI technologies. The platform performs advanced forensic analysis to deliver authenticity assessments for online content.

AGIL Trust integrates neural machine translation, speech recognition, vision language models and large language models to conduct comprehensive, multimodal analyses across diverse content types.



AGIL Trust Main Page



Screenshot of AGIL Trust platform's multi-modal analysis on deepfakes in misinformation

No more having to manage multifarious subscriptions for tools on various channels—AGIL Trust's fusion engine performs forensic analysis across the entire spectrum of video, text and audio data. Cutting-edge capabilities include facial deepfake detection, audio deepfake detection, speech recognition and translation, summarisation, hate speech detection, stance analysis and emotion analysis. Our partnership with Open-Source Intelligence (OSINT) aggregators ensures a continuous feed of information that is monitored for suspect content.

AGIL Trust also offers an enhanced user experience. Its novel visualisation portal employs two smart virtual assistants enabled by large language models. 'Watch Officer', monitors news and events, and 'Analyst', performs forensic analysis and researches deepfake artefacts, extracting answers and generating insights with context, ChatGPT-style.

This end-to-end solution—a unified platform spanning monitoring, sense-making, and responding with explainable evidence—differentiates AGIL Trust from its competitors. Available either as Software-as-a-Service on commercial cloud or deployed on-premise, the system offers efficiency, accuracy and integrity. It can further be tailored to local contexts across either public or private sectors.

ST Engineering is proud to have developed AGIL Trust from the ground up, leveraging Singapore's own tech talents.

From left to right:

Darryl Kwok Bing Heng, Lim Ming Xuan (Bobby), Tan Ching Fhen, Tan Boon Leong, Koo Jie Hui, Claire Liang Huibao , Tan Jie Qiang , Pan Shu Ting , Won Jiunn Shyong (Kenneth)

Not in picture - Tan Shuijian (Dexter)

Scaling Trusted AI with Effective AI Governance and Verification

Our AI Governance Framework and AGIL VerifyAI is supporting ST Engineering to develop AI solutions that are safe, responsible and trusted.

As AI is being increasingly embedded across enterprise and mission-critical systems, establishing trust, safety and accountability is essential for sustainable adoption. ST Engineering has therefore put in place a structured AI Governance Framework, supported by an internal cross-functional AI Governance Committee (Group Risk & Assurance, Group Legal, Group Engineering Centre and Group Technology Office), to provide company-wide oversight on all AI initiatives. The governance framework ensures that AI solutions are developed and deployed responsibly, and aligned with emerging global regulations and industry frameworks such as the EU AI Act, US AI Executive Order and Singapore's AI Verify initiatives.

Beyond policy and oversight, our emphasis is on practical implementation—embedding governance directly into engineering workflows through verification, testing and validation. This forms our approach to operationalise AI Assurance, ensuring AI systems are robust, safe, explainable, and compliant across their lifecycle.

ST Engineering's AI Governance Framework

To realise AI Assurance-as-a-Service, ST Engineering Digital Systems business has been working with several leading startups specialising in AI safety, testing and verification to develop AGIL VerifyAI—ST Engineering's AI verification and validation platform designed to support safe and responsible AI deployment at scale.

AGIL VerifyAI aims to provide a safe environment where AI Assurance's best practices can be codified to enable systematic testing and validation across different AI applications, including vision analytics systems, generative chatbots and data models. The platform brings together curated test strategies, compliance checklists, open-source and synthetic datasets, safety alignment research and AI governance tools to support end-to-end verification workflows. AGIL VerifyAI will be further enhanced through R&D efforts with Singapore's local academia, focusing on AI safety alignment and model explainability.

With a phased implementation underway, AGIL VerifyAI is positioned as a strategic capability to strengthen trust and accelerate responsible AI innovations for our customers and internal AI for productivity efforts.

AI for Productivity

2

AI for Productivity

Across the Group, we are advancing cutting-edge AI innovations and transforming productivity, safety and engineering excellence.

Our Digital Systems division is rolling out AI coding at scale. This has already delivered significant time savings across its core application development teams, including its MAK Technologies and Miltope business units in the U.S. They have also launched an AI Sandbox to accelerate experimentation with AI models, toolchains, and data integration, which is available to other business areas.

Our Cybersecurity business is pushing frontiers with Agentic AI that automates anomaly detection and response, reducing reliance on human analysts around the clock.

At our Land Systems division, AI-enabled cobots and specialised robotic systems have been deployed with next-generation engineering design tools. These have increased design-to-manufacture speed, consistency and reliability. Land Systems has also advanced its spares forecasting accuracy using new AI forecasting techniques.

Over at our Marine division, we are augmenting operations with an AI-trained knowledge chatbot endowed with shipbuilding know-how, including welding specifications.

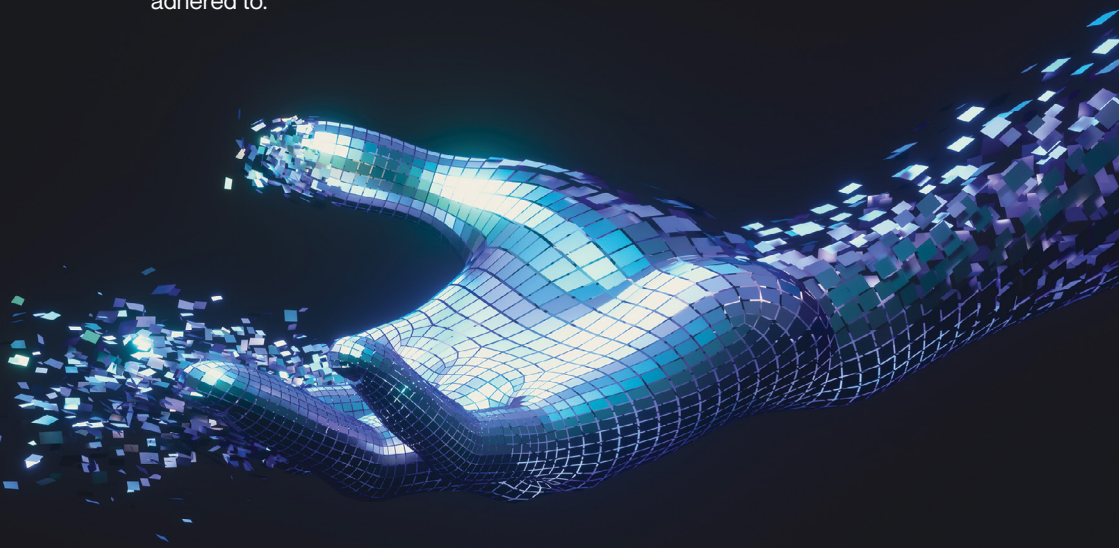
In our Defence Aerospace division, AI-assisted X-ray inspection and real-time, video-based safety monitoring are modernising hangar operations, while the Satcom BA is leveraging reusable data analytics modules to streamline software development.

Our Commercial Aerospace division has been using advanced automation, in labour-intensive repair processes for years. The AI robotic systems they have implemented are today performing complex tasks with far greater speed and consistency.

Across our aerospace, land and marine businesses, computer vision with AI is employed for workplace safety and compliance. Increasingly advanced video analytics solutions are deployed to predict the likelihood of workplace safety incidents and deliver alerts immediately if safety protocols are not adhered to.

At the group level, our group corporate functions have also taken bold steps to develop hands-on AI expertise and deploy AI solutions in their work.

Collectively, these initiatives showcase how we are rapidly embedding advanced AI to drive smarter operations, safer workplaces, and faster innovation across our businesses globally.



STENA Legal's AI Journey

Building governance, speed, and trust at scale

The ST Engineering North America (STENA) Legal team has been advancing its AI capabilities through a global, cross-functional collaboration to develop an AI-powered Corporate Resolution Management System. This initiative was built in close partnership with Group IT, Group Legal, and STENA leadership. Through this coordinated effort, the team delivered a user-validated Minimum Viable Product and laid the foundation for scalable, enterprise-wide governance.

Corporate resolutions are a core pillar of ST Engineering's governance framework, authorising strategic decisions such as capital expenditures, material contracts, and financing arrangements. As the Group continues to grow, sustaining business momentum requires governance

> “We are all-in on AI adoption because it helps us move faster, serve our internal customers better, and focus on work that drives meaningful impact for ST Engineering, all with proper oversight to protect the company.”

ANTHONY FADEL
STENA General Counsel (rightmost)

processes that can scale efficiently. The new platform modernises this work by combining AI-enabled drafting with streamlined workflows and centralised knowledge, improving standardisation and accelerating approvals across the Group.

In parallel, STENA Legal is integrating AI into its daily operations through the deliberate adoption of Microsoft Copilot and related tools. By automating routine tasks, AI has enabled the team to concentrate on high-impact, business-critical initiatives while responding faster and at greater scale to internal stakeholders. In 2025, this shift generated multimillion-dollar impact across STENA through proactive engagement on complex, enterprise-level priorities.

Robotics with AI in Aerospace MRO Globally

The Commercial Aerospace division has rolled out AI-PASS (AI Picking & Sorting Screening Sorter), which incorporates robotics, machine vision in 2D and 3D, optical character recognition (OCR) and AI to solve the many challenges of hardware screening. Bottlenecks used to be inevitable, as every engine would require some 70 man-hours to sort and inspect bolts, nuts and screws, which make up 80% of the hardware. AI-PASS has since reduced processing time by 50% and delivered better quality assurance and workplace safety. It is now scaling across multiple engine types and will add IoT sensors and AI analytics to further enhance operations.

Such solutions in our Commercial Aerospace MRO operations take over tedious and repetitive work. The cumulative impact in adopting them is immense: across the Commercial Aerospace engine MRO operations, turnaround time will reduce by 7.5 days, translating to more than 14,000 man-hours saved annually.

> “As the industry becomes more competitive, we need to continuously improve to be faster and stronger and to deliver better quality. Automating repetitive motions in inspecting hardware using AI-PASS frees us to focus on innovation and complex problem-solving, directly increasing value. By combining our CI principles with the power of automation and AI, we’re not just optimising, we’re transforming our operations to become more efficient, agile and valuable.”

EDWIN YEO
Assistant Principal Engineer
Transformation (far right)

Safety in MRO, is a top priority. Today, our technicians use robots to manoeuvre parts in grit-blasting booths, reducing fatigue and exposure to hazards. Likewise, in metallurgical labs, robots now handle the entire sample preparation workflow, from coupon creation to metallurgical analysis.

AI has also enabled predictive maintenance. With advanced analytics models (including deep learning auto-encoders), equipment failures can be mitigated, extending asset lifespans and cutting machine downtime by up to 50%.

AI is also streamlining our back-office administrative tasks. Robotic process automation (RPA) handles aircraft maintenance task cards, shrinking processing time by 90% and eliminating transcription errors. In procurement, buyers no longer scour multiple sites for parts, with RPA bots aggregating availability, lead times and pricing from various sources.

These improvements have boosted our confidence to expand aerospace MRO operations and double maintenance capacity, and the deployment of AI and automation further reinforces Singapore as Asia’s leading aerospace hub.

Gen AI Chatbots in Shipbuilding

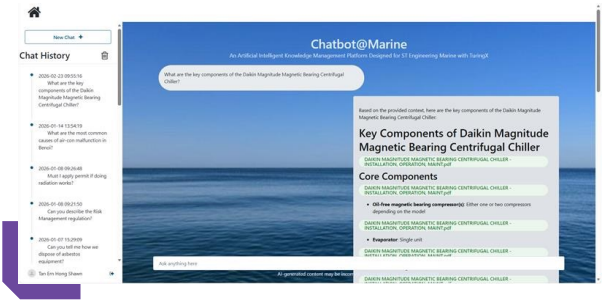
In shipbuilding and MRO operations, our Marine division has begun leaning on an AI assistant that taps on knowledge accumulated over the years to complement staff decision-making. Using the AGIL Knowledge platform developed by our Group Engineering Centre (GEC), a wealth of technical data and standards, such as welding standards for marine vessels, is immediately and easily accessible, offering critical and precise information on demand.

With the rapid progress of generative AI in the past two years, knowledge work that relies on intensive data queries, analyses and summaries can now be assisted by very adept Gen AI chatbots. Our GEC and Group IT AI teams have developed AI Assistants that leverage highly capable open-source foundation models to support various business teams and corporate functions in their respective areas.

The AGIL Knowledge platform helps to aggregate vast amounts of grounded, up-to-date technical data. It empowers teams, like those in our Marine division, to provide answers and suggest best practices in real-time. The platform can also be used as an advanced tool to generate questions and answers for training purposes, to ensure our engineers and technicians are up to speed with the latest technical advances. This has been a game changer for our shipbuilding and MRO operations, which have traditionally been reliant on cumulated human experience alone.

Chatbot@Marine—Policies, procedures and technical documentation at the fingertips

Chatbot@Marine makes searching for information easy. Using AI and GenAI, it also suggests best practices, provides real-time guidance and can even generate training material. Developer Tan Ern Hong Shawn describes it as highlighting how AI has been widely adopted in the organisation. He notes, “By automating the routine task of sieving through documentation for information and handling routine queries, the chatbot frees up precious time for our staff to focus on higher-value activities.”



AI in Smart Manufacturing

Within the defence and public security sectors, a major focus has been on smart manufacturing—using AI, industrial IoT and automation to enhance productivity in the development of defence platforms and systems.

Our Land Systems division has been exemplary in its use of robotics and AI, incorporating end-to-end data analytics in its vehicle assembly processes. From embedded machine learning in predictive maintenance, that keeps projects on schedule, to IoT-enabled systems, AI technology is making a difference for the unit.

On the shop floor, a Material Tracking System provides real-time inventory with clear traceability. The process is faster and simpler—entire bins of components can be scanned via RFID at a shot, saving some 4.8 man-hours a day compared with the previous practice of scanning items individually.

Similarly, IoT underpins the Operations Execution System, which monitors every stage of production. Advanced AI then gleans patterns to improve production planning, reduce waste, and even improve sustainability. Managers can view real-time data and

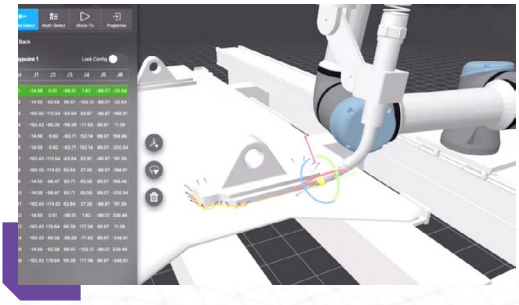
analytics that facilitate how they optimise workflows. The 15 man-hours a day saved translate directly to faster production cycles and better resource utilisation.

AI also drives its logistics systems. In particular, it enables more meticulous and transparent inventory management. AI automatically monitors the availability of critical components as well as demand patterns for faster, more accurate replenishment. Stock information is also shared with customers through a real-time inventory health dashboard, so they can make informed decisions.

With secure AI controls, logistics operations are resilient and efficient, even with limited on-site personnel. The “dark warehouse” is a reality, where fully automated

Scan-to Path—AI helping to guide cobots

Where robotic welding and blasting systems are used, an innovative Scan-to-Path application has simplified the programming of the collaborative robots (‘cobots’, which work with humans in a shared space). Gone are the days when skilled robot programmers were needed to churn out lengthy coding; Scan-to-Path allows new systems to be deployed faster, with just a few clicks needed to generate optimal motion paths.



> “Leveraging AI goes across demand forecasting, logistics, freight management and facilities quality control. This enables data-driven decision-making, operational efficiency and continuous quality assurance at scale.”

OH BOON KHIM
AVP/Head
Freight Services Centre
Synthesis
Land Systems

workflows enable operations to continue without constant human presence, delivering both cost and sustainability benefits to customers. Overall, service value is improved along with supply chain reliability.

In facilities management, AI acts as an intelligent quality controller. All documentation, from maintenance and safety records to contractor submissions, is automatically validated to ensure completeness, compliance and audit readiness. Without any administrative burden, a quicker turnaround time, and greater consistency, facilities teams can focus on delivering reliable service.

At a more rudimentary stage of the manufacturing ecosystem, AI is also making an impact as a design tool. In the Marine division, where customised hull designs are in demand, an AI solution has substantially reduced design and optimisation time.

In addition to providing performance predictions, the AI Hull Designer consolidates all calculations into a single, seamless environment that eliminates the need for multiple software tools. Its user-friendly, integrated interface also shortens the learning curve for new hires. Assistant Principal Engineer, Marine, Kelvin Xu explains, “This solution can significantly simplify the naval architecture workflow, by reducing reliance on multiple software tools and improving overall productivity.”

> “The AI Hull designer positions us as a highly competitive shipyard globally. It equips us to respond faster and more effectively to customers’ needs for tailor-made designs.”

ZACHARY TILERON
Associate Project Engineer
Marine

AI for Software Development (AI Coding)

Software development is getting a leg-up with AI-assisted coding tools.

For many of our software teams, including those in our Group IT and Urban Solutions division, this means writing, testing, optimising, and documenting code more efficiently. Additionally, the quality and reliability of existing codes can be enhanced; in-house best practices, built over time, can be used as templates and integrated into the AI coding tool. For business units, it means accelerated time-to-market.

As ST Engineering reaches for the goal of growing a workforce fluent in AI, help from AI itself with learning to write and refactor codes will be a key enabler. We want as many engineers as possible, not just software developers, to be trained and equipped to leverage AI for developing production-grade software. We expect AI coding tools to lower barriers to software development. Engineers who master these tools—complementing their existing domain knowledge—will have an edge.

> “As a team lead, I have experienced AI Coding sharply reduce development effort, allowing my developers to focus on higher-value work. It has accelerated learning of modern frameworks, supported application modernisation alongside daily operations, and enables standardised, reusable code and seamless migration to a lower-cost tech stack. Beyond coding, AI also generates documentation and unit tests. Our developers are happier that we are delivering outcomes faster with improved quality and security compared to pre-AI coding days.”

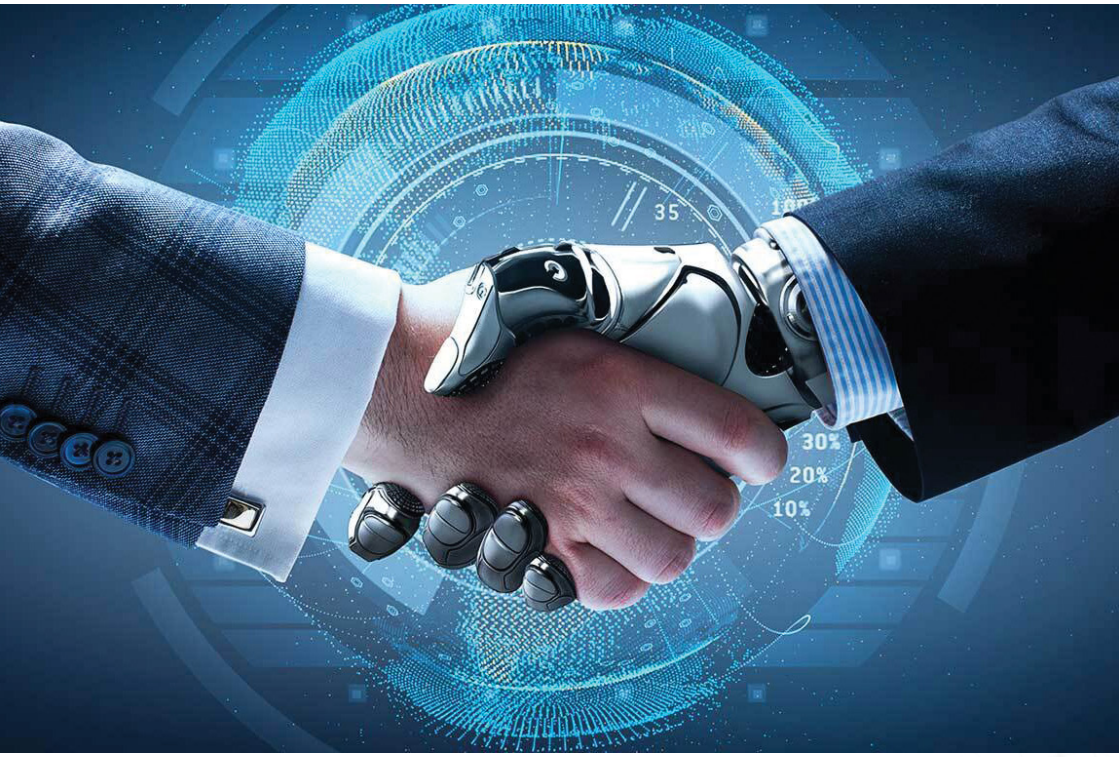
DHANA LAKSHMI KANAKAMEDALA
Team Lead
Group IT (standing)

Supporting Our People Every Day with AI in HR

As our organisation evolves, our HR team is introducing AI into our HR landscape—not to replace people, but to make the everyday processes easier and more meaningful. The goal is simple—reduce manual effort, improve clarity, and create more time for conversations, learning, and good decision-making.

This is the foundation of our HR transformation journey using AI, and it is designed to benefit everyone.

We introduced Joule, an AI chatbot embedded into HRConnects—our core HR platform. Joule understands regular vernacular and allows



employees to complete selected HR tasks without navigating through multiple screens. Today, employees can use Joule to check and update their personal data, review and update their goals, and show recognition to colleagues with a 'Thank You Award'. By making these interactions more natural, Joule reduces friction and supports a smoother employee experience, anytime and anywhere.

Beyond the chatbot experience, HRConnects is also embedded with AI tools that support the HR teams and managers in their daily work. These AI tools assist with tasks such as creating clearer job descriptions, suggesting well-structured goals, and helping draft performance feedback or HR communications. Instead of starting from scratch, AI helps to shorten the time spent on administrative work and allows managers and HR partners to focus on context, judgement, and meaningful conversations.

In learning and development, LinkedIn Learning's AI coaching offers personalised course recommendations tailored to each of our employees. Its AI evaluates an employee's role, current skills, career interests, and broader market trends, then suggests relevant learning paths. This makes development more focused and less overwhelming, enabling employees to take ownership of their growth while staying aligned with evolving business and market needs.

From left to right:

Rochel Lacasandile Arandia (HR Tech Manager), Randolph Tan (HR Tech Manager), Cheryl Tan (Assistant Manager, HR Tech)

From AI Experimentation to Embedding AI into Global Finance Processes

Group Finance has a vision of a future-ready finance function where AI augments human judgement and turns disciplined experimentation into a lasting enterprise capability.

They began their AI journey by bringing people together. Through a Gen AI interest group which actively shares ideas and use cases, and AI workshops and trainings, the finance teams are able to build confidence to experiment with AI responsibly.

This learning quickly turned into real solutions—from policy chatbots to AI-assisted financial analyses—supporting everyday work.

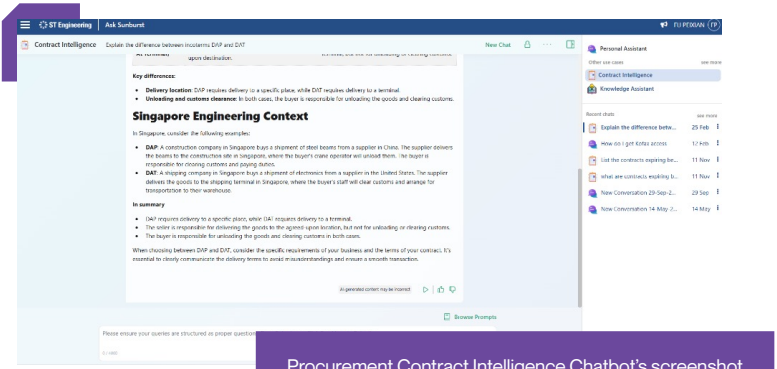
Today, these efforts are being scaled by embedding agentic AI into the global finance processes through close partnership with AI specialists from the Group IT team. The result is a human-led, AI-augmented finance function that is able to turn experiments into practical AI solutions.

Enhancing Procurement Productivity through AI

Launched in mid-2025, the Procurement Contract Intelligence Chatbot is a purpose-built AI solution that empowers procurement employees to work smarter and faster. Developed in close collaboration with Group IT, the AI procurement chatbot serves as an always-available contracting assistant, transforming contract data into actionable insights, from portfolio-wide trends to specific contract details. What once required hours of manual review can now be accomplished in minutes. This frees our procurement colleagues to focus on higher-value decision-making and negotiations.

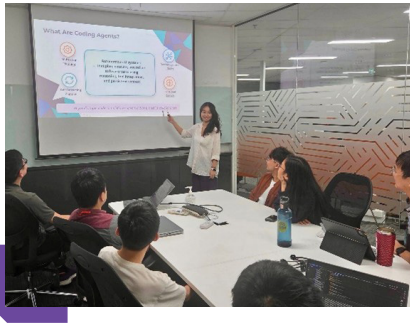
Beyond making day-to-day contracting work more efficient, the AI procurement chatbot has also unlocked an unexpected yet highly valuable use case since going live - onboarding and self-directed learning for new procurement colleagues. New procurement employees are now using the chatbot as an interactive training tool, exploring typical contract structures, understanding common clauses, and building their contracting knowledge.

This dual use of the procurement AI chatbot which serves both the experienced practitioners as well as new team members underscores the many benefits of AI. It not only helps to efficiently get work done but also democratises domain knowledge sharing, which expedites organisational capability buildup.



Procurement Contract Intelligence Chatbot's screenshot

Scaling Up with Reusable AI Modules



> “AGIL Knowledge AI Studio enables engineers to quickly build and deploy GenAI agents that make sense of unstructured data in hours instead of weeks, unlocking insights that were previously too time-consuming to derive.”

TIWANA TEG SINGH
Artificial Intelligence Engineer
Group Engineering Centre (rightmost)

> “Our video analytics models allow us to detect traffic patterns, anomalies and congestion in real-time—turning raw video feeds into actionable intelligence that improves operational decision-making across multiple business lines.”

LIU YI-FAN
Video Analytics Engineer
Group Engineering Centre
(presenting in photo)

Within ST Engineering, the Group Engineering Centre (GEC) has created common reusable AI modules. These modules can quickly be incorporated into various solutions for our customers or repurposed for internal productivity projects across our different businesses. The reusable modules include a video analytics suite as well as advanced data analytic tools for knowledge mining and risk analyses.

Our AI developers enhance their skills as they build cutting-edge AI tools like AGIL Knowledge AI Studio to assist and speed up their work in adapting the AI reusable modules to projects. The result is faster development cycles, more innovative solutions, and greater operational agility.

A Transformative Journey - Whole of ST Engineering Collaboration

Over the past year we have shown an organisation-wide commitment to leveraging AI as a transformative force. From our MRO and production shop floors to corporate offices, AI is driving higher productivity, greater precision, and new innovations. We have achieved faster aerospace turnarounds, smarter and safer manufacturing, and more efficient back-office operations. The journey continues—many areas of our business can still gain more as we refine how we work, as we tap into the power of next-generation AI.

Initiating Next-Gen AI

3

3.1

BRINGING ROBUST PHYSICAL AI INTO THE REAL WORLD

From autonomous robots to digital twins, ST Engineering is advancing research and the partnerships needed to bring AI out of the lab and into the real world.

AI has long excelled at analysing data and optimising digital processes. Historically, robots were limited to being blind automatons performing repetitive tasks. Now, they are evolving into embodied AI capable of perceiving and interpreting their surroundings. Today, their next frontier lies in the physical world, where they must navigate real environments, interact with people and operate as part of larger, interconnected systems.

To meet these expectations, the AI & Data Analytics Strategic Technology Centre (AI.DA STC) works closely with institutes of higher learning (IHLs) and research partners to build the practical foundations needed to grow our robotics and AI pipeline.

Robust Robotics & Swarm AI in Challenging Environments

This capability underpins the team's Autonomous Robotic Swarm AI initiatives, which include collaborations with leading experts from the National University of Singapore, Singapore University of Technology and Design, Agency for Science Technology and Research (A*STAR), Carnegie Mellon University, and the University of Pennsylvania, as well as global startups. The goal is to develop robust, reliable robotics with active correction and self-recovery for complex robotic operations in challenging environments.

William Teo, Lead Edge and Robotics AI Research, describes the work as developing the "brains"—combining robust physical intelligence and multi-robot systems to allow different types of robots, drones, and quadrupeds to adapt and collaborate.

Bronco Roadwheel Assembly by Humanoid at Land Systems

Spatial & Systemic Intelligence with AI Agents

In the digital realm, AI.DA STC is also creating agents that mirror both humans and machines. Ouyang Ruofei, Head of Applied AI, is building a dedicated data factory designed to streamline high-quality data processing and generation, bridging the simulation-to-reality gap.

The data factory focuses on high-fidelity "digital twin" environments where virtual control systems, camera intrinsics and actuator dynamics are rigorously aligned with physical hardware. He works closely with top researchers from Nanyang Technological University and Harvard, as well as with startups.

> "Our work ensures that autonomous platforms operate safely and resiliently, bridging the critical gap between complex research and real-world utility. By forging strategic partnerships and accelerating lab to field translation, we are shaping the future of physical intelligence."

THIA KAI XIN
Head of AI.DA STC

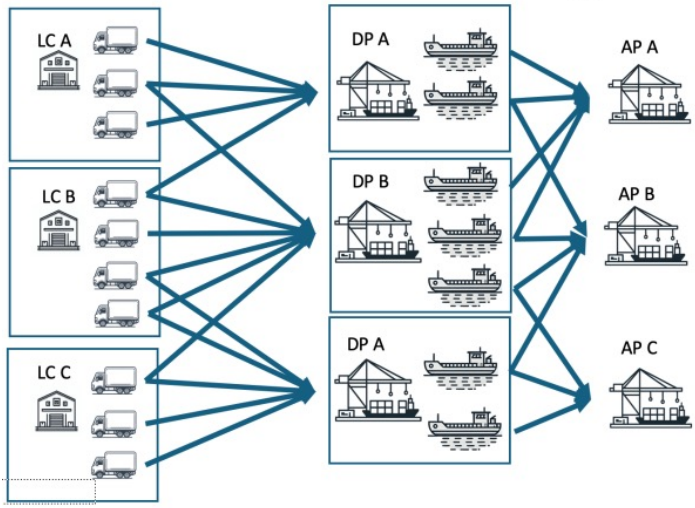
William Teo (second from right) explaining to Minister Josephine Teo on our robotics capabilities at InnoTech 2025

In addition, by treating robots as "AI agents" in both the digital and physical worlds, Polanowski Michal, Head of Generative AI, translates technologies from partners such as the National University of Singapore and the University of North Carolina at Chapel Hill with a focus on efficient AI and large-scale, end-to-end agentic workflow management. Soon, commanders and scientists can safely and accurately test complex scenarios such as human-machine teaming, robotic formations, and counterterrorism operations before deploying them in the real world.

Quantum Algorithms to Power Next Gen Resource Planning

Opening new dimensions in logistics planning.

In transport logistics, speed is critical. Operators must determine the best combination of routes to move cargo from logistics centres to seaports as quickly as possible, while avoiding congestion and delays.



Multiple routing combination considered in logistics optimisation

As each additional shipment, vehicle or route multiplies the number of possible combinations, optimising these routes often goes beyond the practical limits of classical computing approaches.

Quantum AI offers a promising alternative. The field is still evolving, but as Quantum Engineer Joshua Lim puts it, “while reality isn’t always certain, curiosity drives new discoveries”.

Echoing his sentiments, Quantum Computing Lead, Sai Tsong notes, “There are many innovation opportunities with quantum computing!”

On this front, the team at ST Engineering Mission Software & Services is collaborating with Professor Dimitris Angelakis from the National University of Singapore’s Centre for Quantum Technologies to co-develop quantum algorithms for transport logistics optimisation application.

The project explores how complex logistics challenges can be formulated as mathematical optimisation problems and translated into quantum algorithms that can be executed on quantum computers.

Using approaches such as the Quantum Approximate Optimisation Algorithm (QAOA) and Variational Quantum Algorithms (VQA), quantum systems explore vast combinations of routing possibilities to answer questions such as which trucks should serve which departure ports, and which ships should head to which arrival ports.

These algorithms have been tested across different types of quantum computers and benchmarked against traditional optimisation methods. Early results indicate that quantum approaches can reach effective solutions more quickly in highly complex scenarios.

To make these techniques viable on today's quantum hardware, the team also optimised quantum programmes and adopted hybrid classical–quantum approaches to combine the strengths of both computing paradigms. This allows the algorithms to be tested and evaluated for feasibility and performance under realistic hardware conditions.

Together, these efforts point towards a future where quantum AI plays a key role in helping logistics operators navigate growing complexity with greater speed and efficiency.

Quantum Computing Project Team
From left to right:

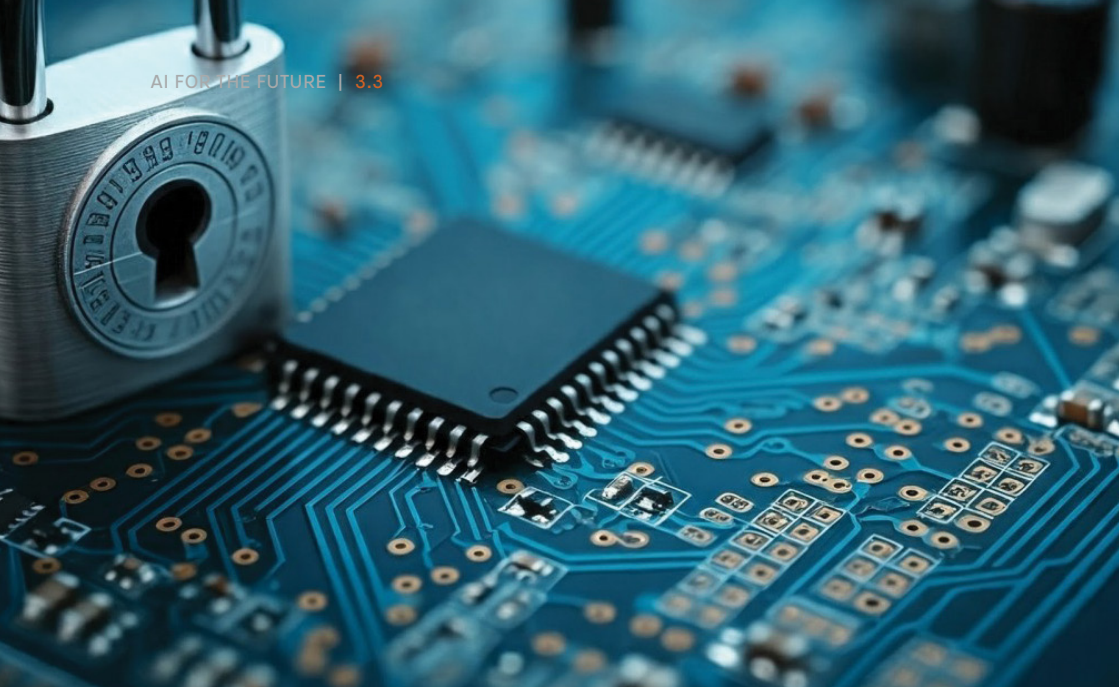
Joshua Lim (Quantum Engineer), Alex Chung (Senior Quantum Engineer), Chan Sai Tsong (Quantum Computing Lead), Arthur Pan (Senior Quantum Engineer), Dexter Tan (Senior Quantum Engineer), Tay Xian Jie (QC Project Manager)

> "Quantum computing is definitely the future of operations research."

ALEX CHUNG
Senior Quantum Engineer
(bottom picture – third from right)

Project Team From left to right:

Chan Sai Tsong (Quantum Computing Lead), Tay Xian Jie (QC Project Manager), Arthur Pan (Senior Quantum Engineer), Alex Chung (Senior Quantum Engineer), Dexter Tan (Senior Quantum Engineer), Joshua Lim (Quantum Engineer)



A Quantum Leap in Cyber Defence

Quantum-enabled AI offers a new edge in strengthening cyber defence as attackers become more sophisticated.

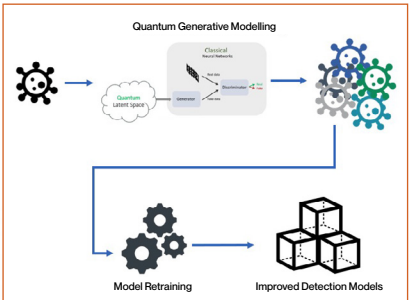
As the cyber threat landscape grows more complex, defenders face an adversary that is not only increasingly sophisticated, but also deliberately subtle. Attackers design intrusions to evade detection by hiding malicious intent in noise, exploiting unknown vulnerabilities, and operating below traditional detection thresholds. While classical AI and machine learning have significantly strengthened cyber defence, they remain fundamentally constrained by their reliance on known patterns and historical data.

> “It’s a lot of trial, error and tiny breakthroughs. You’re experimenting at the edge of ‘nobody really knows yet’. What keeps us motivated is the potential impact, and knowing that even one solid result could push the field forward in a meaningful way.”

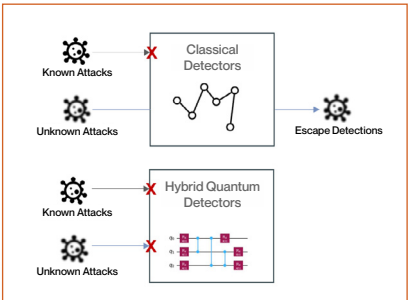
THESATH WIJAYASIRI
Engineer
CS STC

This is because classical machine learning performs best when identifying threats it has encountered before. However, in scenarios involving faint signals, unfamiliar behaviours, or zero-day attacks, even advanced AI systems can struggle. These blind spots are precisely where future cyber risks are expected to concentrate, particularly across large scale, critical infrastructure networks and AI Systems.

To address this challenge, cybersecurity must move beyond classical approaches. Quantum Machine Learning (QML) introduces a new paradigm by encoding data in richer, higher dimensional spaces, making subtle correlations and weak signals which were previously buried in noise more distinguishable.



Technology 1: Generation of New Attacks to Improve Detection Models



Technology 2: Zero-day Attack Detection with Quantum-enhanced Models

> “Quantum is one of the key technologies of the future. Being able to explore how it can advance cybersecurity puts us at the forefront of what comes next.”

FOK KAR WAI
Principal Engineer
CS STC

This capability opens new possibilities for detecting anomalies and malicious activity that would otherwise remain invisible to classical AI systems.

At ST Engineering, upstream research is advancing how quantum-enabled AI can strengthen core cybersecurity capabilities, including intrusion detection, data exfiltration prevention and real-time monitoring of large scale networks. This work is particularly focused on environments that underpin critical infrastructure, where the cost of undetected threats, especially zero-day attacks, can be severe.

Through collaboration with Professor Jack Jacquier from Imperial College London, who is also an ST Engineering Distinguished Professor, the team is exploring how quantum generative modelling can be applied to cybersecurity use cases. Prof Jacquier brings deep expertise in quantum machine learning and quantum generative networks, particularly in the finance domain, and ST Engineering complements his skills with its strong cybersecurity expertise, and ability to translate quantum concepts into practical defensive applications. Much of this work operates at the frontier of current knowledge.

Collaboration is central to turning frontier research into real-world capabilities. The Cybersecurity Strategic Technology Centre (CS STC) works closely with partners, bridging the gap between early-stage research and deployable cyber defence solutions. Looking ahead, quantum technology is not positioned as a replacement for classical AI, but as a powerful complement, and one that enhances AI’s ability to defend itself and the systems it supports.

Together, quantum technology, AI and cybersecurity form a strategic triad, shaping the next generation of defences for an era defined by intelligent systems, adaptive threats and the imperative to secure AI itself.

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