

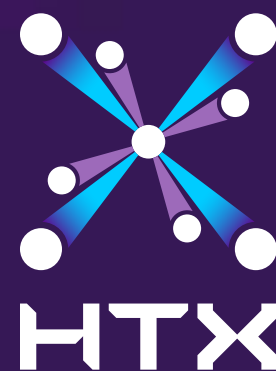


# Hands Across HTX

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HTX (Home Team Science and Technology Agency)

## ANNUAL REPORT FY2024



HTX is the Science and Technology agency in Singapore that integrates a diverse range of scientific and engineering capabilities to innovate and deliver transformative and operationally-ready solutions for public safety. As a statutory board of the Ministry of Home Affairs, HTX works at the forefront of science and technology to empower Singapore’s frontline of security. The mission is to amplify, augment and accelerate the Home Team’s advantage and secure Singapore as the safest place on planet earth. Singapore’s Home Team Departments include the Singapore Police Force, Singapore Civil Defence Force, Immigration and Checkpoints Authority, Singapore Prison Service and Central Narcotics Bureau.

[htx.gov.sg](https://htx.gov.sg)

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# Why WE EXIST

## Our Mission

Advance  
Science &  
Technology

Force  
Multiply  
our Home  
Team

Secure  
Singapore's  
Future



# Year in Review

## KEY HIGHLIGHTS

### APRIL 2024

#### Launch of MAP-TXS

Milipol Asia-Pacific – TechX Summit 2024 opened at Sands Expo and Convention Centre, showcasing a slew of cutting-edge public safety technologies.

#### Partnerships galore

HTX inked partnerships with several companies, including Samsung Electronics, ST Engineering, Rohde & Schwarz, and Knovel Engineering, to enhance its capabilities to force multiply the Home Team.

#### Launch of EPL

Developed by HTX and the Singapore Civil Defence Force (SCDF), the Electric Pump Ladder, the world's first fully electric pump ladder, was launched.



### MAY 2024

#### HTX Convention 2024

More than 1,400 Xponents gathered at the Mediacorp theatre for the HTX Convention, which reflected on the agency's five-year journey and shone a spotlight on its goals for the year ahead.



### JUNE 2024



#### HTX at IdeaFest

Our various Centres of Expertise (CoE) showcased their innovations across six booths at the inaugural IdeaFest.

#### HTX Family and Sports Day

Despite the rain, Xponents turned out in force to indulge in fun and games at the HTX Family and Sports Day held at Marina Barrage.

#### Taking part in "Hell Week"

HTX's Human Factors and Simulation CoE participated in the Special Operations Group (SOG) Selection Course's Rite of Passage (ROP) Week.



### JULY 2024

#### New MHA NS Portal

A revamped portal for Home Team National Servicemen, which HTX's Training and Learning Systems Office (TLSO) had a role in, was launched.

#### New myResponder launched

Developed by HTX and SCDF, the new myResponder app packed with new features was launched.

#### Launch of Traffic Priority System

This new system, which allows first responders to hasten a patient's delivery to the hospital by 30 to 100 seconds, was officially launched.

#### Partners Appreciation Night

HTX held its inaugural Partners Appreciation Night at the National Gallery of Singapore to pay tribute to the external parties it collaborates with.

#### School outreach

HTX made appearances at the Raffles Institution Career Fair and Victoria Junior College's EdVantage! Fair to engage with young STEM talents.



### AUG 2024

#### Awards galore

Six Xponents were conferred the Minister for Home Affairs National Day Awards (Individual) during the Home Team National Day Observance Ceremony.

#### DEF CON 32

Two teams of Xponents took part in the largest hacking and security conference in the world, finishing a very impressive third and fifth in their respective groups.

#### Passport-less clearance

New gantries that allow travellers to clear immigration without having to use their passports went live at Changi Airport.

#### Partnerships with SUTD and Yellow Ribbon Singapore

HTX and SUTD signed a framework agreement that would see both sides work together in areas like data science and robotics. HTX also signed a Memorandum of Understanding (MoU) with Yellow Ribbon Singapore (YRSG). The MoU will see HTX handle YRSG's Information and Communication Technology functions.

#### Awards for B&P CoE

HTX's Biometrics & Profiling (B&P) CoE took home two awards at the Science, Technology, and Engineering Innovation Challenge.



### SEP 2024

#### Launch of Blue Dolphin

Blue Dolphin, a 2nd Generation Marine Rescue Vessel jointly developed by HTX, SCDF, DSTA, and Penguin International Limited, was launched.

#### To the land down under

HTX Chairman Aubeck Kam led a delegation comprising personnel from the Ministry of Home Affairs and HTX to Australia to reinforce bilateral ties.





## OCT 2024

### HTX at Smart Nation 2.0 launch

Xponents from the Sense-making & Surveillance (S&S) CoE and the Plans and Strategy division presented audio and video deepfake detector AlchemiX at the Smart Nation 2.0 Launch Showcase in Punggol Digital District.

### CBRNE seminar

HTX's Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) CoE held a seminar attended by 80 experts from around the world.

### CE wins award

HTX Chief Executive Chan Tsan took home the Most People-Focused CEO accolade at the HR Excellence Awards.



### Recognition of excellence

Xponents received accolades at the Minister's Awards Presentation Ceremony.

### Celebrating Capability Sustainment

The second edition of HTX's Capability Sustainment Innovation Day was held.



### HTX at RGS

Our outreach efforts took us to Raffles Girls' School for the first time.

### HacX! finals

Ten teams competed for the grand prize of S\$10,000 at the HacX! finals.

### Hatch Demo Day

Hatch's Dimension X Cohort 3 showed off their proofs-of-concept innovations at Demo Day.



## NOV 2024

### We turn five!

HTX celebrated its fifth birthday in style with a "dash" in the morning and a dinner at the Sands Expo and Convention Centre.



## DEC 2024

### Keeping a lookout on NYE

Xponents played a role in keeping the public safe during the New Year's Eve countdown. Among the innovations used was the Q-Crowd Counter.



## JAN 2025

### CBRN workshop

HTX co-hosted a three-day workshop with the United States Embassy in Singapore and SCDF to facilitate exchange of best practices in CBRN disaster response.



## FEB 2025

### Research agreement with CNRS@CREATE

HTX signed a research agreement with CNRS@CREATE to enhance its ability to better predict and respond to potential threats with the use of AI.

### MoU with Civipol

HTX signed an MoU with Civipol. The two parties will rebrand the Milipol Asia Pacific – TechX Summit (MAP-TXS) as Milipol TechX (MTX).

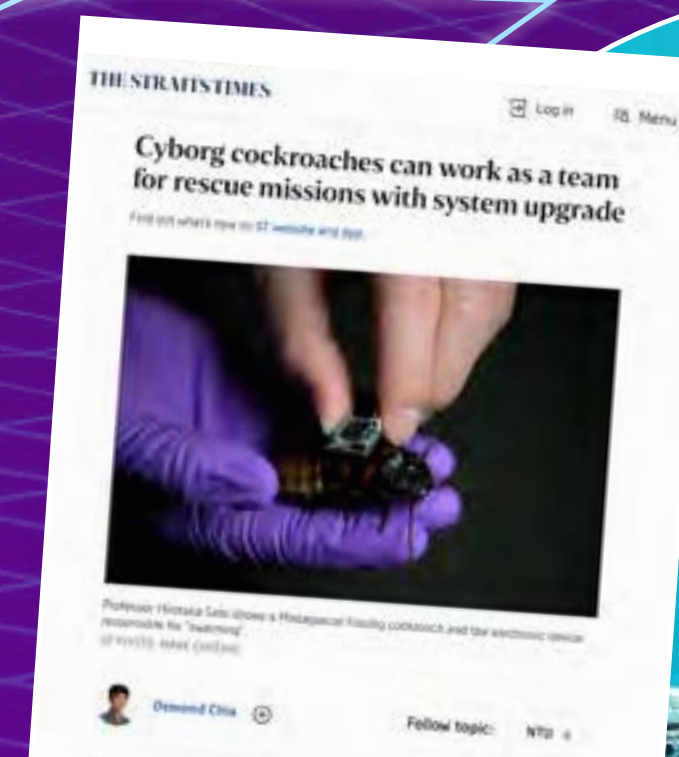


### Hatch Demo Day

Eleven start-ups showcased tech they developed with guidance from HTX and Home Team Departments at Demo Day for Hatch's 4th cohort.

### Roaches in the limelight

The Straits Times featured our cyborg cockroaches and highlighted HTX's collaboration with NTU on swarming technology.



## MAR 2025

### Q Tech Connect

HTX's Q Team CoE opened its doors to the Home Team for an exclusive look at its latest innovations.



### MoU with Booz Allen Hamilton

HTX signed an MoU with Booz Allen Hamilton to improve capabilities in areas such as cybersecurity, firefighting operations and forensic investigations.



### Launch of joint venture

Codex Solutions, a joint venture between HTX and ST Engineering, was launched. The new entity will build up HTX's software development capabilities with dedicated software development teams.





# MILIPOL ASIA-PACIFIC – TECHX SUMMIT 2024

Bringing public safety innovations under one roof

The inaugural Milipol Asia-Pacific & TechX Summit (MAP-TXS) took place in Singapore’s Sands Expo and Convention Centre from 3 to 5 April 2024, bringing together over 12,000 senior government officials, industry experts and leaders, security providers, integrators and academia who exchanged insights into security solutions, challenges and trends.

Co-organised by HTX, GIE Milipol and Comexposium Singapore, the biennial event came under the auspices of the Ministry of Home Affairs (MHA), Singapore and the Ministry of the Interior of France. The event was graced by Singapore Home Affairs and Law Minister K Shanmugam and France’s Minister of the Interior and Overseas Gérald Darmanin.

Themed “Powering Innovation: A Safe & Secure Future”, the trade exhibition featured 307 exhibitors from United States, France, Italy, Germany, China, Hungary and Singapore.

The HTX Pavilion showcased solutions from HTX and key partners such as ST Engineering, CISCO, DXC Technology Services and Samsung.

In the HTX Zone, an experiential journey through our solutions – including the Biometrics Self-Enrolment Kiosk and insect-hybrid robot – showed how science and technology help the Home Team secure borders, safeguard public spaces, solve crimes and save lives.

MAP-TXS also hosted prominent professionals in a high-level conference themed “AI and Homeland Security”, which addressed topics such as governments’ deployment of AI in public safety and human-centric AI innovation.

Associated events such as the AI Capture-the-Flag (CTF) challenge attracted participation from over 100 international cybersecurity professionals and students.

**Read more:**  
<https://go.gov.sg/txs2024-day1>

12,000  
international  
visitors

Across  
31  
countries

307  
Exhibitors

Minister for Home Affairs and Minister for Law Mr K. Shanmugam noted in his opening address that the “**very strong turnout**” for the opening of MAP-TXS “**demonstrates a clear desire for the homeland security community to work together.**”



HTX ZONE:  
SECURING BORDERS



HTX ZONE: SAVING LIVES



HTX ZONE: SEEDING  
INNOVATIONS



HTX ZONE:  
SOLVING CRIMES



HTX ZONE: SAFEGUARDING  
PUBLIC SPACES



POWERING INNOVATION:  
A SAFE & SECURE FUTURE

3 – 5 April 2024 | Sands Expo & Convention Centre | Singapore





## ASSOCIATED EVENTS



## AI AND HOMELAND SECURITY

03 - 05 Apr 2024  
Sands Expo & Convention Centre, Singapore







## HTX TURNS 5!

HTX celebrated its fifth anniversary on 1 December 2024 with not one, nor two, but three events on 29 November. To kick things off, hundreds of Xponents participated in a morning “dash” to HQ, symbolising HTX’s formation.

Later that evening, Xponents as well as a host of dignitaries, including guest-of-honour Home Affairs and Law Minister K Shanmugam, got to learn more about HTX’s journey through a gallery at the Sands Expo and Convention Centre, where the 5th anniversary ceremony and D&D were also held.

The gallery brought viewers back in time to when HTX was launched by the then Prime Minister Lee Hsien Loong, highlighted the agency’s valiant response and contributions to the Covid-19 pandemic, and showed how it has grown from strength to strength in terms of its tech capabilities and culture.

Rounding things off was a fun-filled dinner and dance, during which HTX Chief Executive Chan Tsan praised the staff for their resilience and commitment, and expressed pride in their achievements and contributions to Singapore’s safety and security.

Read more:  
<https://go.gov.sg/htxturns5>

Permanent Secretary (Home Affairs) Pang Kin Keong, inaugural and past HTX Chairman Chew Hock Yong, Guest-of-honour Minister for Home Affairs and Minister for Law K Shanmugam, HTX Chairman Aubeck Kam, and CE Chan Tsan cut HTX’s birthday cake!



HOP ON!



THE BEGINNING



RISING ABOVE COVID



SCALING NEW HEIGHTS



FORCE MULTIPLYING THE HOME TEAM



QUINTESSENTIALLY HTX







*"The next chapter of HTX's story is ours to write. It will require continued hard work, resolve and boldness to go where no one has. But I have no doubt that together, we will continue to exponentially impact Singapore's safety and security."*

- CE Chan Tsan



**DASH TO 5!**

*"If we didn't have HTX, where will we be, what would our (Home Team) capabilities have been in the last five years? I look at what HTX has done in these five years, what it's doing now, so deeply embedded into all of our different (Home Team) departments. Whether it's cyber, digital, crime control, drone, our boats, border control systems, making a very significant contribution with trust. I think all of you deserve a huge round of applause."*

- Guest of Honour Minister for Home Affairs and Minister for Law K Shanmugam





# What WE DO



and *How*  
WE DO IT

## Our Science & Tech Capabilities

### DIGITAL

- C3 (Command, Control and Communications)
- Cloud Technology
- Cybersecurity
- Data Science
- Artificial Intelligence
- Digital & Information Forensics
- Digitalisation
- Network/Communications
- Sense-making & Surveillance

### ENGINEERING

- Vehicle & Weapon Systems
- Marine Systems
- Protective Security & Safety
- Robotics, Automation and Unmanned Systems

### SCIENCES

- Biometrics & Profiling
- Chemical, Biological, Radiological, Nuclear and Explosives
- Forensics
- Human Factors & Simulation





## SAVING LIVES

A look at our innovations that have helped the Singapore Civil Defence Force do what they do best – save lives and property.

### The first of its kind

Launched at the Milipol Asia-Pacific - TechX Summit in April 2024, this modern firefighting vehicle used by the Singapore Civil Defence Force (SCDF) is the world's first fully electric pump ladder.

The EPL project, which involved HTX's Vehicle and Weapon Systems (VWS) Centre of Expertise (CoE), comes with a bunch of features, including an Energy Backup Unit that can automatically recharge the vehicle's onboard battery and generate electricity for equipment and auxiliary devices, as well as a radio-controlled firefighting robot.

Its max range? A whopping 600km.

In addition, the EPL is designed for pump and roll operations in both the forward and rear directions, enabling firefighters to use the pump and move the EPL at the same time. What this means is precious time savings during firefighting operations.

What's more, firefighters can even oversee the vehicle's functions conveniently from a tablet as the EPL is fully digitised.

**Read more:**

<https://go.gov.sg/txs2024-epl>



### Mind your back

Firefighting can be backbreaking work, especially when firefighters need to haul Compressed Air Foam (CAF) backpacks that can weigh up to 25kg. Given this weight, putting on the backpack with the incorrect posture could cause musculoskeletal injuries.

To address this issue, HTX's Human Factors & Simulation CoE joined hands with their peers from SCDF to devise a solution that allows firefighters to retrieve the backpack in a safer manner.

The result? A sliding tray located at the rear compartment of the Light Fire Attack Vehicle that allows the backpacks to be retrieved at waist level, thus significantly reducing the need for bending, twisting, or lifting.

**Read more:**

<https://go.gov.sg/firefightersafety>





# Everyone can be a hero

Whoever said you need to be in the SCDF to save lives? When armed with the right lifesaving skills, even civilians can do so with the myResponder mobile app, which was first launched in 2015.

On July 4, 2024, a new myResponder mobile app jointly developed by HTX and the SCDF was officially launched, giving registered Community First Responders (CFRs) access to new features, such as being able to see whether other CFRs are responding to the same incident.

CFRs attending to an incident will also be able to communicate with one another using the new chat function, thus allowing them to better coordinate their response, such as who is bringing an AED or fire extinguisher to the scene.

**Read more:**  
<https://go.gov.sg/new-myresponder>



# Beating the red light

When it comes to saving lives, every second counts. Getting stuck at a traffic light is one way those precious seconds are used up in vain. Enter the Traffic Priority System (TPS), which directly addresses this problem.

A project by HTX, SCDF and the Land Transport Authority, TPS essentially allows ambulances ferrying patients suffering from life-threatening conditions to “cut the queue” at traffic lights, thus expediting their delivery to the hospital.

For this to work, SCDF ambulances are equipped with special on-board devices (OBDs) that communicate with road-side equipment (RSE) installed at TPS traffic junctions located near to public hospitals. When necessary, the SCDF Operations Centre will use the Advanced C3 Emergency System (ACES) to trigger the TPS, which will in turn activate the ambulance’s OBD and RSE. This process of whitelisting will ensure only ambulances which are granted priority can trigger the RSE.

When the ambulance comes within 200m of the traffic junction equipped with TPS, the RSE will detect the OBD through dedicated short-radio communications and trigger the traffic light controller to ensure the traffic lights are in the ambulance’s favour.

TPS started its progressive roll-out on 15 July 2024.

**Read more:**  
<https://go.gov.sg/traffic-priority-system>



# Next-gen marine rescue

Boasting markedly improved capabilities compared to the first generation of marine rescue vessels, the 2nd Generation Blue Dolphin vessel was launched on 30 September 2024.

The result of a collaboration between HTX, SCDF, Defence Science and Technology Agency and Penguin International Limited, the new vessel has a Rigid Hull Inflatable Boat (RHIB) and a customised fire monitor which would aid firefighting operations in shallow waters.

The vessel is also equipped with a sonar for underwater search-and-rescue operations and can quickly detect chemical and biological agents at lower concentrations using its advanced Chemical, Biological and Radiological detection systems.

Moreover, the new vessel, when compared to the first-generation Red Dolphin, is 10% longer, meaning it has more storage space for firefighting, rescue and medical equipment.

Despite the larger platform, the vessel’s improved hull design and advanced control system for vessel propulsion allow it to match the Red Dolphin’s top speed of 30 knots.

**Read more:**  
<https://go.gov.sg/nextgenbluedolphin>

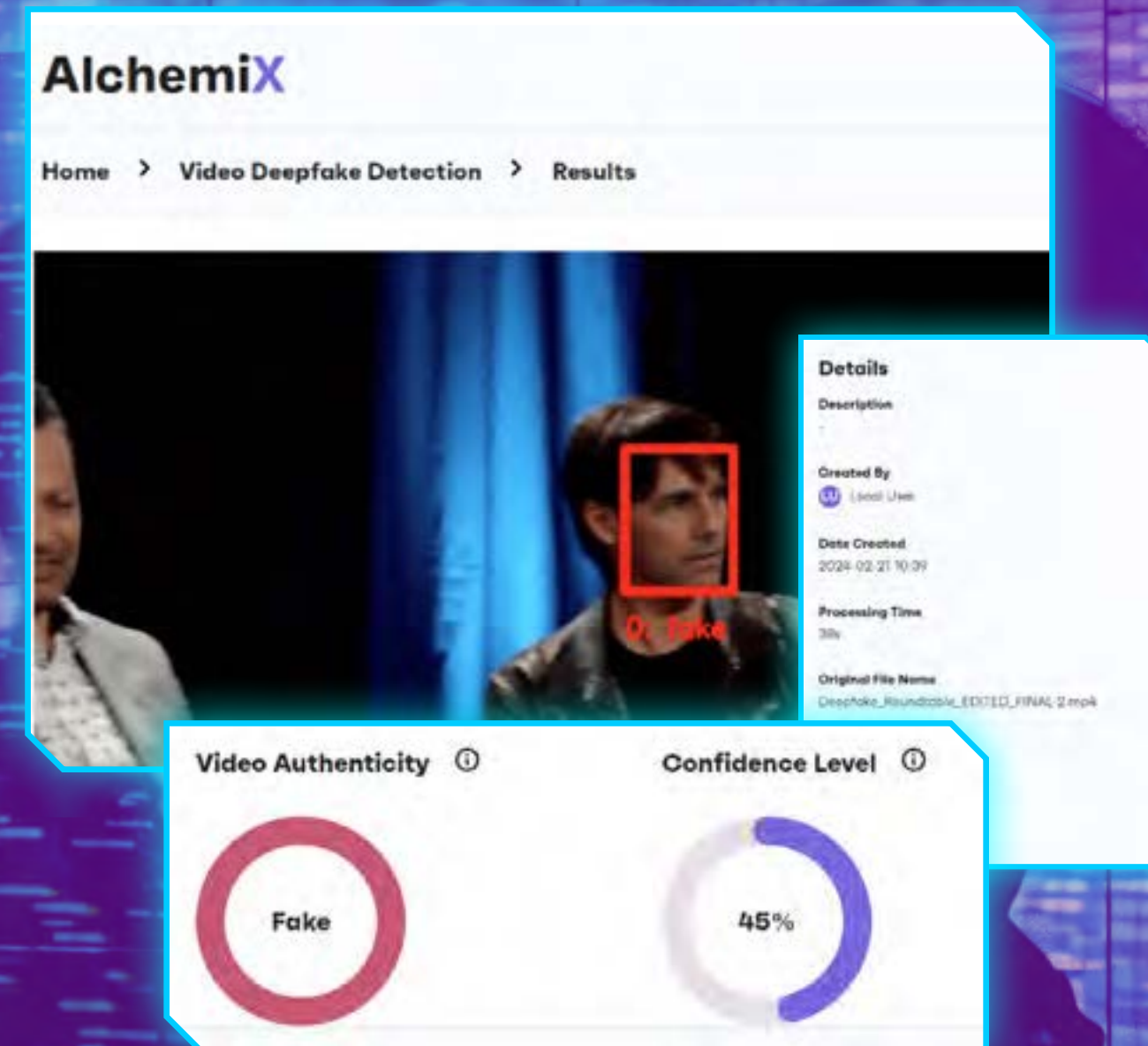






# ENHANCING PUBLIC SAFETY

Equipping the Home Team with the right solutions to tackle emerging threats and supercharge measures that keep Singapore safe.



## AlchemiX

Criminals, beware. Access to powerful generative AI tools may have made it easier to create high-quality, low-cost deepfake audio or video recordings for scams, blackmail or attempts to sow social unrest, but HTX's Sense-making and Surveillance (S&S) Centre of Expertise (CoE) has developed just the tool to fight the scourge.

Cue AlchemiX.

Launched at the Milipol Asia-Pacific – TechX Summit (MAP-TXS) 2024, the deepfake detector can identify whether audio or video recordings are genuine with just an upload of a media file. AlchemiX can also compare an audio recording to a real voice sample to determine the level of similarity.

AlchemiX is a formidable weapon in the non-stop arms race against evolving deepfake technologies.

[Read more:](https://go.gov.sg/txs2024-alchemix)  
<https://go.gov.sg/txs2024-alchemix>

## InXeption

At the Home Team, every second counts in solving crimes. Clear evidence is required to swiftly apprehend criminals, but image evidence can sometimes be far from clear.

For example, key evidence taken in the heart of the action could sometimes have a “motion-blur” effect, or CCTV footage could be pixelated due to lack of light.

The solution? InXeption – HTX's smart photo enhancer, which was launched at MAP-TXS 2024.

The tool's deep-learning algorithms can identify images exhibiting three types of quality issues – namely low light, blurry photos and low-resolution photos.

Unlike commercial software, InXeption can address these issues automatically in less than three steps, producing clear lit-up pictures, “motion de-blur” effects and even pixelation rectification to reveal facial details, as powered by facial super resolution technology.

And the results? Considerable time saved in the Singapore Police Force's (SPF) crime-solving efforts.

[Read more:](https://go.gov.sg/txs2024-inxeption)  
<https://go.gov.sg/txs2024-inxeption>







## NEMO

Ever felt overwhelmed looking at the barrage of information presented in the news? Imagine the Home Team officers who have to pore through thousands of articles across news platforms to keep abreast of developments and events that could jeopardise Singapore's security.

NEMO, our in-house AI-powered news monitoring solution, was developed to reduce the labour-intensiveness of that process.

It automatically collates relevant articles and sorts them into neat topics, even distilling the most salient points of the articles using Machine Learning (ML) for the Home Team officers.

Showcased at MAP-TXS 2024, NEMO also stands apart from other online news monitoring tools as it allows users to train it on "custom topics" and observe trends that matter most to them.

And unlike most AI models which require hundreds or even thousands of training materials to learn how to pick out the right articles, NEMO can do so with just a limited number, leveraging Few Shot Learning (FSL).

**Read more:**

<https://go.gov.sg/txs2024-nemo>



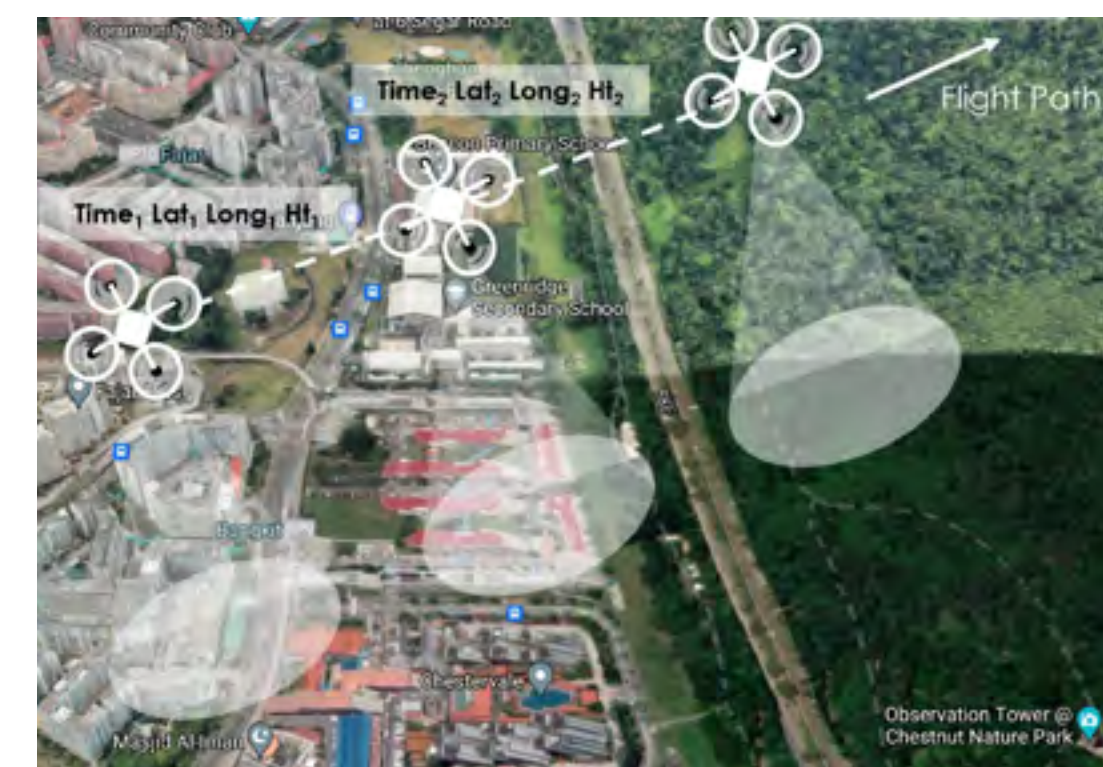
## Multi Drone Operating System

Drone technology is fast evolving, and in the not-too-distant future, the Home Team's drone fleet is set to expand for deployment in high-stakes situations such as search-and-rescue missions or emergency medical deliveries.

But the diverse array of drones would come with varying operating systems and modes of operation. To manage this, the Aerial Systems team from HTX's Robotics, Automation & Unmanned Systems (RAUS) COE worked on the Multi Drone Operating System (MDOS) project, which aims to integrate multiple drone systems into a single dashboard.

Developed by High Lander Aviation Ltd, the MDOS will grant Home Team officers greater versatility in drone control.

It will also augment monitoring capabilities with live video feeds and telemetry data, and enhance operational safety by leveraging its proprietary algorithm to calculate flight paths and prevent collisions.



**Read more:**

<https://go.gov.sg/txs2024-mdos>

## Mobile Crash Barrier spreader beam

The Mobile Crash Barrier (MCB) is a large, heavy and robust equipment that protects hostile vehicles from entering a restricted area. Now, imagine having to transport the monster of a machine and set it up.

Lorry cranes are often needed to lift the hefty barrier, but they can sometimes be way too tall to enter or operate in certain sites where the MCB is required.

Together with the Police Logistics Department (PLD), HTX devised a spreader beam that can be attached to the MCB, allowing for the harness attachment points to be positioned at a much lower height – 2.1 metres lower, to be exact. With this, the MCB can be deployed at sites with lower height restrictions.

Sounds simple? The project underwent several trials before a viable solution was found. Even something seemingly as trivial as the number of harness attachment points could significantly affect the balance of the MCB during transportation.

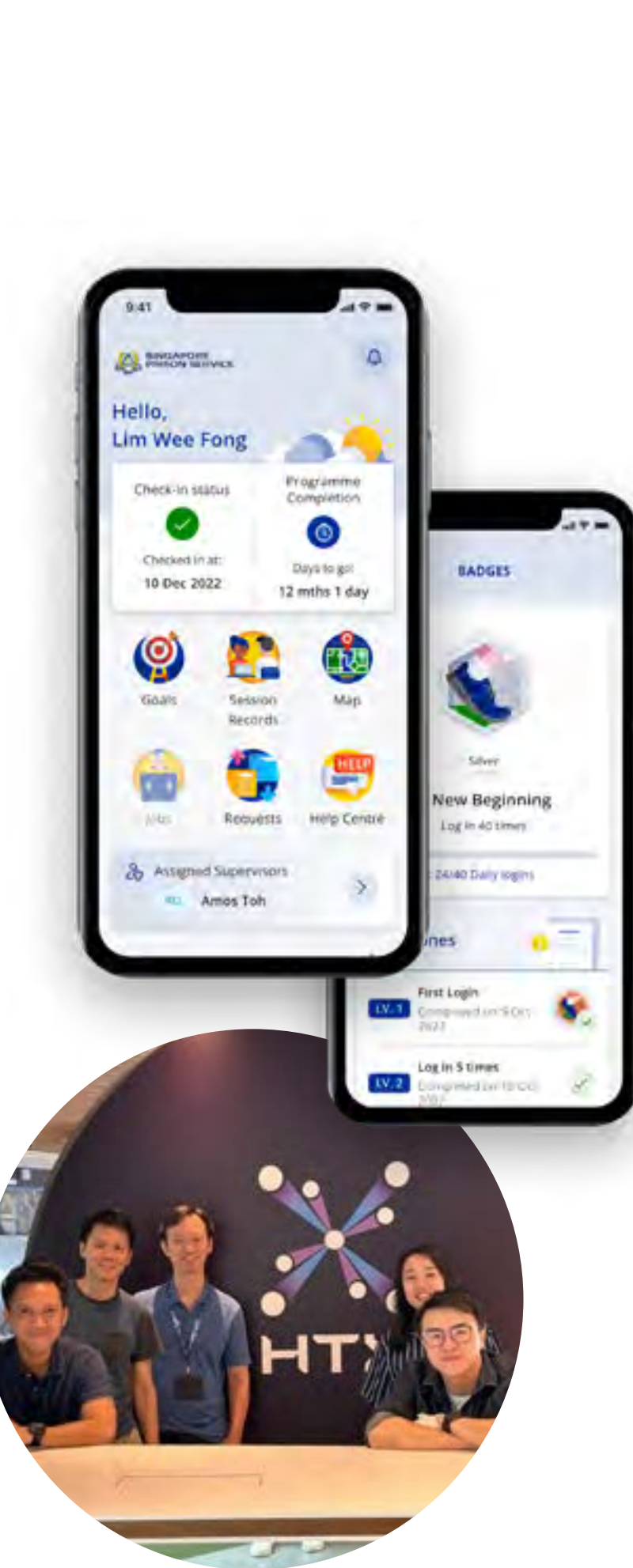
For their efforts, the HTX team was awarded the Dare to Try Award at the 2024 Home Team Innovation Awards (InnovA).

**Read more:**

<https://go.gov.sg/htx-mcb>







## Self-Help and Rehabilitation E-application (SHARE)

Supervisees in Singapore – offenders serving the tail-end of their sentences in the community – often struggle to find their feet after their release from prison. There’s usually temptation to fall back on old habits and difficulties in obtaining job opportunities.

To help them take greater ownership of their rehabilitation journey and provide greater access to rehabilitation materials and community resources, HTX, the Singapore Prison Service (SPS) and Activate Interactive Pte Ltd worked together to create SHARE, which allows supervisees to set and track goals, check in with supervisors, search for jobs, participate in self-learning courses and submit requests.

SHARE may look like yet another mobile application, but the winner of the Singapore Digital Initiative of the Year (Correctional Services) Award at the GovMedia Conference & Awards 2024 has already positively impacted its supervisee users.

And with the application’s help in streamlining manual processes, SPS officers can better focus on core tasks like supervision and counselling.

**Read more:**  
<https://go.gov.sg/share-app>

## Scam Analytics and Tactical Intervention System (SATIS)

Keeping Singapore safe means combating scams too. But how good are we at taking down scam websites?

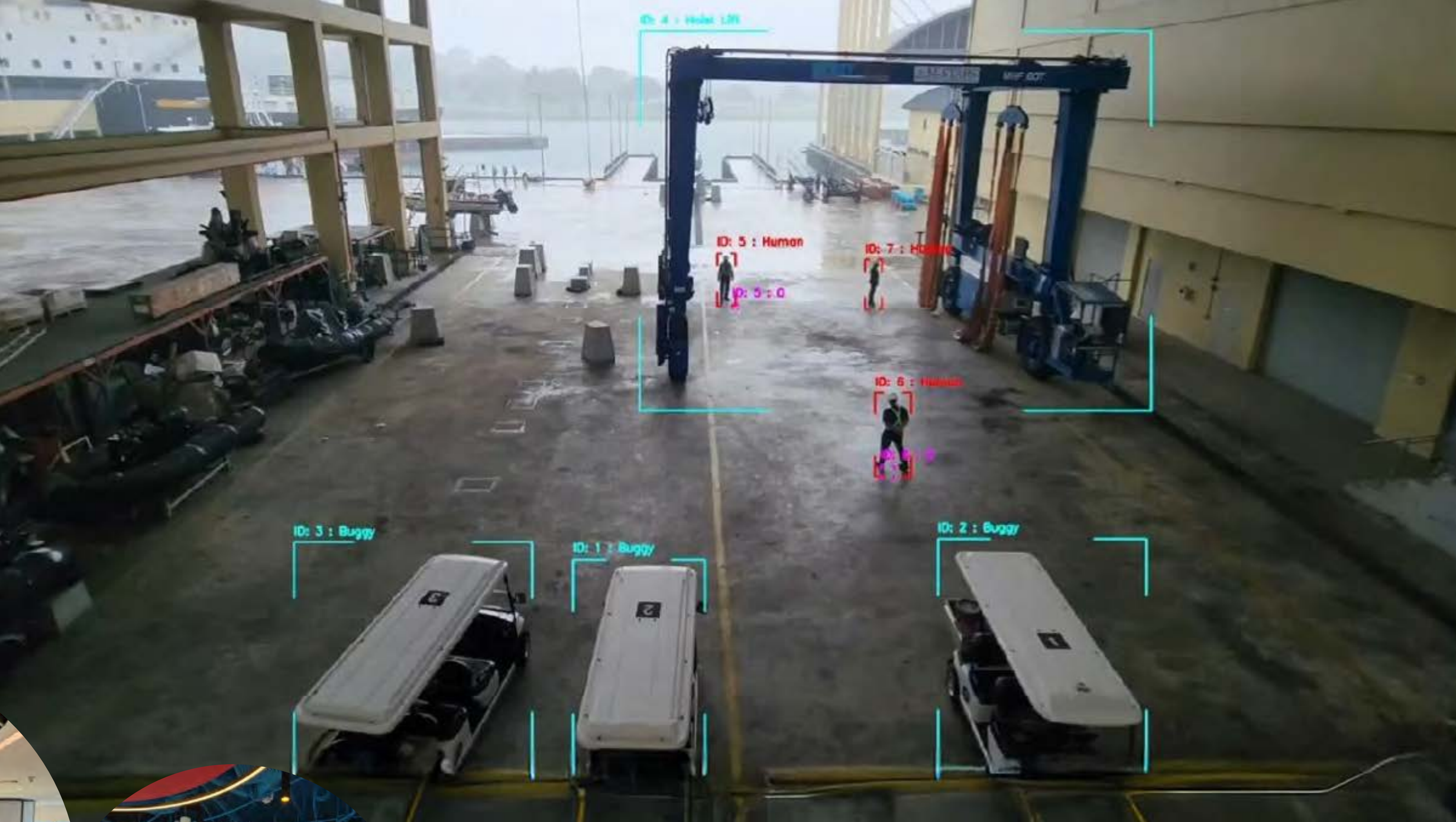
Since the launch of SATIS in 2023, thousands of scam-related websites have already been identified and disrupted.

Made possible by HTX and GovTech for the Singapore Police Force (SPF), SATIS allows the police to triage, assess and disrupt scam websites expeditiously.

The teams have been working to enhance SATIS using AI tools, namely GovTech’s rMSE (recursive Machine-Learning Site Evaluator) and HTX’s LinkEval (Link Evaluator), which will further strengthen SATIS’ ability to automatically scan and identify malicious websites.

In addition, HTX’s Blacklist Reference System (BRS) is also supporting the fight against scam websites, enabling the police to block them within minutes.

**Read more:**  
<https://go.gov.sg/beatingscams>



## SafeX

Workplace safety is no joking matter, especially for Home Team officers who work in dynamic environments filled with equipment, vehicles, machinery and weapon systems.

This is why HTX’s engineers have leveraged AI to create SafeX, a system that can quickly notify supervisors if it detects dangerous situations and safety lapses.

Using an AI Vision model to analyse CCTV footage and detect safety infringements, including high-risk work activities, dangerous vehicular movement, housekeeping lapses, and even personnel who aren’t wearing Personal Protective Equipment (PPE) in hazardous environments, the trial for SafeX has successfully concluded and the system is being explored for operational implementation.

**Read more:**  
<https://go.gov.sg/safex>







## SOLVING CRIMES

A look at our innovations that have helped the Home Team perform better and catch the bad guys quicker.

### Futuristic CSI

Crime scene investigations usually involve taking many photographs of the scene to document evidence. Thanks to the HoloDeX, this labourious task could soon be a thing of the past.

Developed by Sivakumar Ponapalam, a Principal Engineer with HTX's Disruptive Technologies Office (DTO), HoloDeX can create a 3D "twin" of the scene that allows investigators to conduct their investigations in the virtual world even after the scene has been cleaned up.

What's more amazing is that this innovation can even recognise the user's spoken commands and create written notes based on his or her instructions!

While HoloDeX is currently still a nascent technology, it already has several use cases for the Home Team. Aside from preserving crime scenes, accident scenes, or fire scenes, the device can also send first responders who are equipped with smart wearables crucial real-time data and insights about the incidents they are responding to.

HoloDeX can also be used for post-incident fire investigations, crime scene reconstructions and to provide realistic and risk-free Extended Reality training.

HoloDeX was showcased to international attendees at the Milipol Asia-Pacific – TechX Summit in April 2024.

**Read more:**  
<https://go.gov.sg/htx-holodex>

### The power of "super hearing"

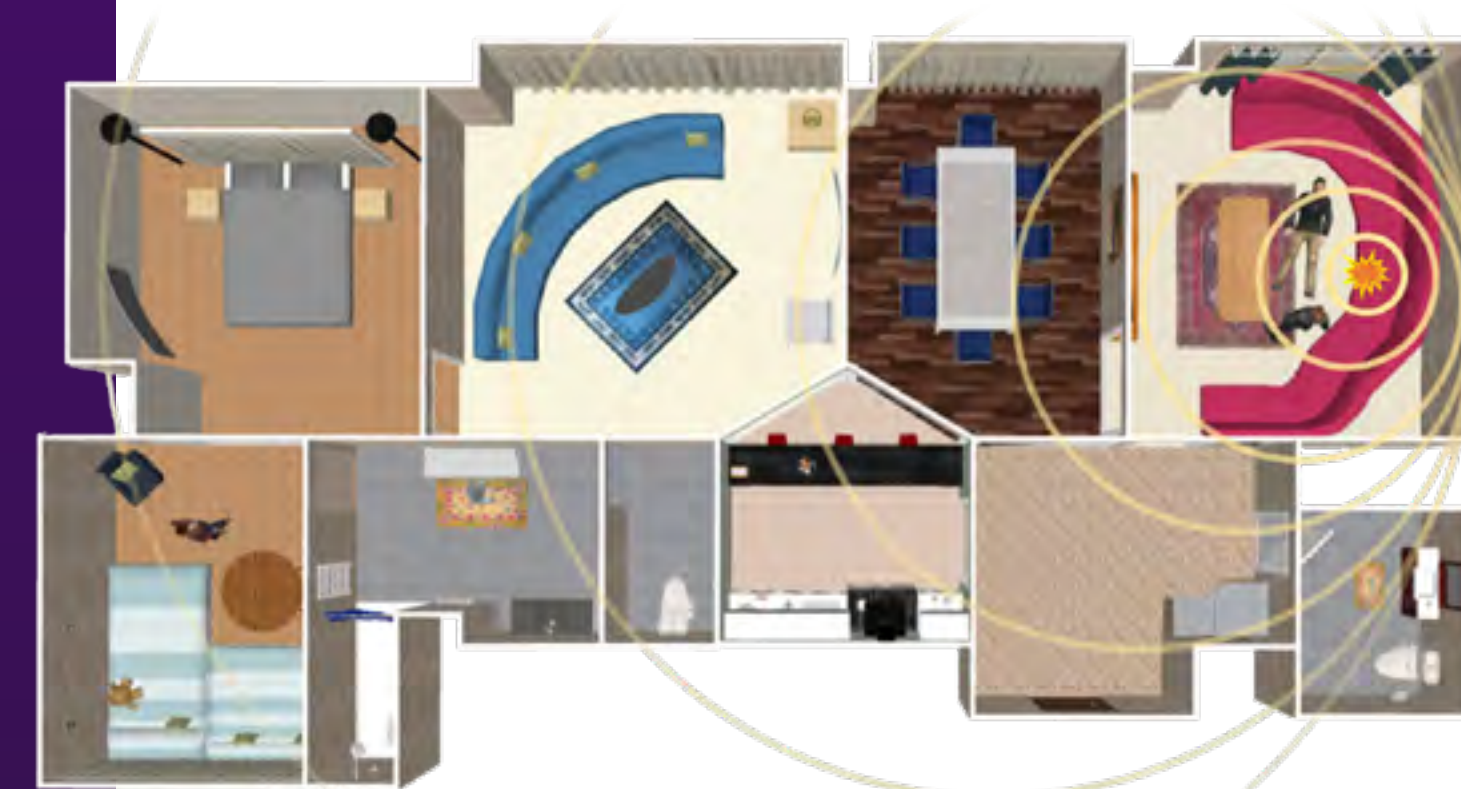
Developed by Dr Wong Swee Liang and Dr Yuan Yidi from HTX's DTO, an artificial intelligence (AI) model called ALLURE (Acoustic Localisation Leveraging on Unique Reverb Environment) could one day be used to help investigators trawling through CCTV footage determine where a sound like a scream or a gunshot occurred.

How does ALLURE do this? It first determines the unique echo signatures of the different rooms in the scene based on their 3D geometry, their furniture, and the materials they are made from. By generating simulations of each room's echo signature relative to known audio recorder positions, ALLURE can replicate all the possible echoes that can be captured.

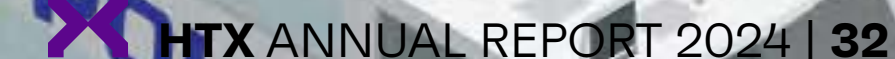
Based on these simulations, ALLURE, which was showcased at the Milipol Asia-Pacific – TechX Summit in April 2024, can then identify the room where the audio recording has the best match.

Though it is still in the proof-of-concept stage, ALLURE already has an impressive 80% accuracy rating.

**Read more:**  
<https://go.gov.sg/txs2024-allure>





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Cosmic scanning

While X-ray scanners can detect contraband or dangerous materials such as explosives or narcotics, they do have their limitations as X-rays cannot penetrate beyond 400mm of steel.

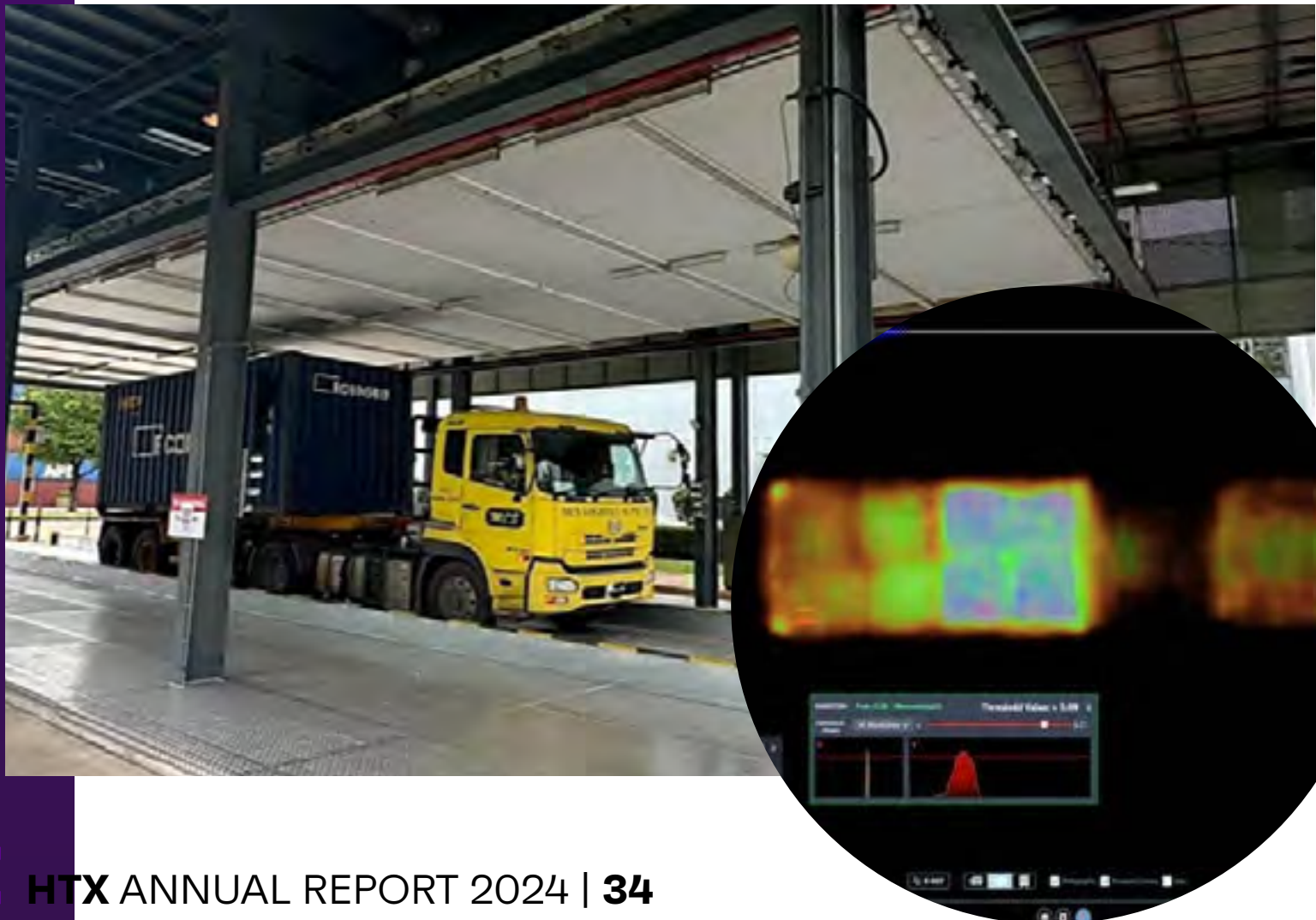
Muons, on the other hand, can “see through” up to 1,000mm of steel.

And this is why HTX’s Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) CoE has been experimenting with using muon scanning to complement the existing X-ray scanners at land checkpoints.

During its trial of the Muon-based Scanning Portal (MBSP), CBRNE CoE conducted a range of tests to determine whether muon scanning could detect narcotics, explosives and radiological material hidden within cargo shipments.

As it turned out, the muon scanner could even pinpoint the location of the hidden radiological material!

*Read more:*  
<https://go.gov.sg/txs2024-muonscanning>



Walk-look-clear

Would you believe us if we told you that the passport-less clearance at Changi Airport could become even more convenient? Well, it very well could, thanks to a prototype conceptualised by HTX’s Biometrics and Profiling (B&P) CoE.

Dubbed Identification on the Move (IOTM), this innovation’s crowning glory is its ability to scan iris images at up to almost twice the standoff distance achievable with conventional scanners.

What this means is that we could one day simply breeze through the clearance lane without having to stop to have our iris scanned.

But don’t fret. This doesn’t mean that bad actors can simply run through the lane - IOTM has AI-powered capabilities that can detect individuals who attempt to dash through the clearance lane or tailgate other travellers. Once these bad actors have been identified, IOTM’s modular intervention feature - flappers - slam shut to prevent anyone from passing through.

*Read more:*  
<https://go.gov.sg/txs2024-iotm>



Photo: Synergy4Tech

Helping X-ray scanners see better

Just like how optometrists use eye test charts to check our vision, border security officers also have special tools that can be used to test the vision of X-ray machines.

This is crucial because X-ray machines play a critical role in preventing threats like improvised explosive devices (IEDs) and illegal goods from slipping past our borders.

To help the Immigration and Checkpoints Authority (ICA) perform “vision checks” on their machines, HTX has been collaborating with a company called Synergy4Tech. These evaluations involve using test pieces that, well, test an X-ray machine’s ability to distinguish subtle differences in shades of colours. This is important as a machine that lacks this quality would likely not be able to differentiate between explosive powder and everyday items like flour or sugar.

*Read more:*  
<https://go.gov.sg/visiontest>

Additionally, the CBRNE team uses Synergy4Tech’s XTE Check test pieces for X-ray penetration and wire resolution tests. While the X-ray penetration test determines how deep X-rays can penetrate concealment, wire resolution tests provide an indicator of how well wires can be visualised in the X-ray images presented to image analysts.

Looking ahead, the CBRNE team envisages that such test pieces can provide a set of “health indicators” to all the X-ray scanning systems at the borders regularly. The results can also be centrally monitored through a network. This would ensure that any sub-optimal system can be attended to and rectified promptly.



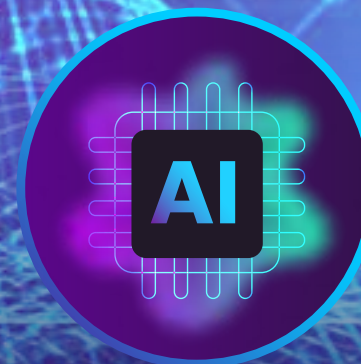


# HTxAI MOVEMENT

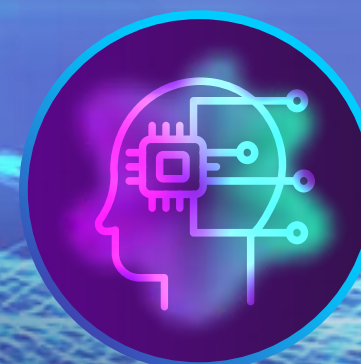
Not just riding the AI wave - we're staying ahead of the curve



**EMPOWER  
XPONENTS (HTX)**  
to transform Home Team operations to meet future needs and challenges.



**EXPLOIT AI**  
to transform Home Team operations to meet future needs and challenges.



**ENABLE HOME  
TEAM OFFICERS**  
to use AI in their work.

To effectively tackle the latest challenges in today's complex and ever-evolving digital landscape, the Home Team must possess cutting-edge artificial intelligence (AI) capabilities that allow it to stay ahead of the curve.

This is exactly why HTX has embarked on its ambitious HTxAI (Home Team multiplied by artificial intelligence) movement to empower our officers with AI.

Our goal? To become an AI-first agency that will foster an AI-enabled Home Team. The journey to realising this goal will involve three key steps: empowering Xponents with AI capabilities and instilling in them an AI-first mindset, exploiting AI to transform Home Team operations to meet future needs and challenges, and equipping Home Team officers with the necessary skills to leverage AI to enhance their work of keeping Singapore safe and secure.

Since the HTxAI movement was officially launched on 17 May 2024 at the annual HTX Convention, the agency has allocated a significant portion of its S\$400 million Research & Technology budget for 3 years to AI research and development.

The movement has been a fruitful one thus far. Since it started, HTX has developed several AI solutions aimed at augmenting the productivity and efficiency of Home Team officers. These innovations include QCaption, which can automatically generate captions for videos, and Paperwork, which can speed up the creation of documents like tender evaluation reports by intelligently populating certain fields.

All Xponents have also been given access to Microsoft 365 Copilot, which can boost efficiency and productivity in tasks like analysing data and drafting reports and presentations.



Ang Chee Wee,  
HTX Chief  
AI Officer



Launch of HTxAI at the  
HTX Convention 2024



Xponents learned  
more about HTxAI  
at an eXpresso!  
town hall



The HTxAI  
movement at  
their Jan 2025  
townhall



# COLLABORATING WITH PARTNERS

## Strategic Partners for Innovation



## Universities and Research Institutes



## Local Government Agencies



## Foreign Government Agencies





## Key Industry Partners



### HTX partners Samsung to develop next-gen solutions

Samsung Electronics Singapore and HTX signed a MoU on the sidelines of MAP-TXS 2024 to enhance online and public safety in Singapore through technology.

This partnership focuses on co-developing solutions to improve the efficiency and safety of frontline Home Team officers. It also aims to protect citizens from cyber threats like scams and create a safer digital environment.

Key collaboration areas include enhancing national cybersecurity, augmenting frontline operations and developing next-generation mobility solutions.

Both organisations highlighted the goal of using innovation to equip officers with future-ready tools to tackle evolving challenges and safeguard the community.

**Read more:**

<https://go.gov.sg/txs2024-mr-htxsamsung>



### HTX announces collaborations with partners on sidelines of Milipol Asia-Pacific – TechX Summit 2024

On the sidelines of MAP-TXS 2024, HTX announced several new collaborations to enhance public safety and national security in Singapore. These include partnerships with six industry and academic institutions, including ST Engineering, Rohde & Schwarz, Samsung Electronics, and Knovel Engineering, to translate research into operational capabilities, focusing on areas like unmanned systems and AI.

International cooperation will be boosted through an MoU with the Australia Border Force for knowledge exchange. Furthermore, agreements with IEEE and the Tsinghua-Hefei Institute will provide global access to technology and expertise. Collaboration with Thales will also be extended to develop security solutions for borders and critical infrastructure.

HTX Chief Executive Chan Tsan stressed the importance of these cross-sector partnerships in harnessing science and technology to keep Singapore safe amidst growing complexities.

**Read more:**

<https://go.gov.sg/txs2024-mr-htxcollabs>





## ST Engineering and HTX collaborate to drive innovation in key S&T areas

ST Engineering and HTX announced an expansion of their strategic collaboration to drive innovation for Singapore's Home Team. This extended five-year agreement focuses on co-creating and trialling new concepts, identifying next-generation capabilities, operational support, and talent development.

Both organisations reaffirmed their commitment to strengthening Singapore's public safety. HTX will broaden the scope of their existing Master Agreement with ST Engineering and add focus areas such as unmanned systems (aerial, ground, maritime), advanced communications, weapon systems, smart vehicles and Artificial Intelligence (AI).

This partnership, initiated in 2015, has already yielded significant solutions. Examples include an autonomous unmanned surface vessel equipped with the AUTONOMAST™ system for maritime surveillance and emergency response, and the HoloDeX system, which utilises spatial computing and AI for virtual crime scene reconstruction and analysis.

**Read more:**

<https://go.gov.sg/txs2024-mr-steandhtx>



## Partners in giving ex-offenders second chances

HTX and Yellow Ribbon Singapore (YRSG) signed an MoU on 14 August 2024.

Under the agreement, HTX will manage YRSG's Information and Communication Technology (ICT) functions. This move is part of YRSG's digital transformation and is aimed at improving compliance with government ICT policies, enhancing IT security, and optimising technical support.

**Read more:**

<https://go.gov.sg/htx-yrsg-mou>



## HTX joins hands with CNRS@CREATE to enhance homeland safety with AI

HTX and CNRS@CREATE, the Singapore arm of France's National Centre for Scientific Research, signed a research agreement on 4 February 2025. This partnership aims to improve HTX's prediction and response capabilities for threats like chemical accidents with the help of AI.

The collaboration involves developing advanced modelling and simulation tools specific to Singapore's tropical urban setting. This includes creating a sophisticated data-driven environmental model and Chemical, Biological, and Radiological (CBR) sensor fusion technology, leveraging CNRS@CREATE's DesCartes hybrid AI platform. HTX will provide precise wind data using a 3D Lidar system to validate the model's environmental simulations.

Once developed, this advanced simulation capability will enable the Home Team to rapidly and accurately predict areas at risk from hazardous plumes, enhancing response times to incidents like industrial chemical releases and supporting better strategic planning to ensure public safety.

**Read more:**

<https://go.gov.sg/htx-cnrs>



## HTX and Civipol sign MoU for 2026 summit and beyond

HTX and its international partner Civipol signed a new MoU on 13 February 2025.

The agreement follows their successful joint organisation of the 2024 Milipol Asia Pacific – TechX Summit (MAP-TXS). Under the new MoU, the event will be rebranded as the Milipol TechX (MTX), and HTX and Civipol will continue to co-organise it biannually, starting in 2026. Civipol is the technical cooperation implementer for the French Ministry of Interior and manages the Milipol event network.

The rebranded MTX aims to be a leading global platform showcasing technological innovations for public safety and facilitating collaboration among agencies.

Milipol TechX 2026 is scheduled for 28-30 April 2026 at the Sands Expo & Convention Centre.

**Read more:**

<https://go.gov.sg/mtx-mou>



## HTX signs MoU with Booz Allen Hamilton

HTX had in March 2025 signed an MoU with Booz Allen Hamilton, a US consulting and technology firm focused on national security. This partnership aims to bolster the Home Team's capabilities in areas including cybersecurity, firefighting, and forensic investigations.

The collaboration spans five key areas, including improving first responder safety and operational efficiency, strengthening cybersecurity resilience against evolving threats, and enhancing operational efficiency using technologies like AI and digital twins.

HTX's Forensics Centre of Expertise (CoE) aims to shift towards intelligence-driven analysis using digital tools, while the Human Factors and Simulation CoE plans to use wearable technology, developed with Booz Allen Hamilton, to monitor frontline officers' physiology, manage heat stress, and optimise their performance and decision-making in high-risk situations.

**Read more:**

<https://go.gov.sg/boozallen>



## HTX ups the ante in software development for Home Team

Incorporated on 26 March 2025, Codex Solutions – a joint venture (JV) between HTX and ST Engineering, aims to enhance HTX's software development capabilities for Home Team operations.

The new entity will establish dedicated software development teams using industry best practices to deliver core software modules for selected mission-critical systems.

HTX Chief Executive Chan Tsan described the JV as a strategic move to build in-house capacities, highlighting ST Engineering's strong track record in public safety. Ravinder Singh, ST Engineering's President, Defence & Public Security, stated that the JV leverages their extensive experience to provide significant capabilities supporting HTX's mission as a force multiplier for the Home Team.

**Read more:**

<https://go.gov.sg/codex>



# SEEDING INNOVATION



## DIMENSION HATCH



### 4th Dimension X Demo Day

Hatch, HTX's innovation centre, showcased technologies from 11 global start-ups during its 4th Dimension X Demo Day on 26 February 2025. The Dimension X programme connects start-ups with HTX or Home Team experts to develop solutions addressing public safety challenges.

Featured innovations included AtlasRobotics' autonomous underwater navigation for anomaly detection, SpherePoint's transponder system which enables real-time communication and localisation, Dtect Vision's deepfake detection tool, BeEmotion's AI behaviour analysis software, ZeroMark's anti-drone solution, Cadre Research Labs' novel method for analysing ballistic toolmarks without test firing, and Manifold Tech's 3D scanning system for fire scene analysis.

HTX leadership praised the start-ups' potential to enhance Home Team operations. Participating companies valued the programme not just for funding, but for the opportunity to enter the public safety market, understand regional regulations, validate technology for new applications, and forge valuable connections. The event highlighted collaborative innovation for Singapore's safety and security.



[Read more:](https://go.gov.sg/dx-cohort-4)  
<https://go.gov.sg/dx-cohort-4>



# REACHING OUT TO STEM TALENTS

Cultivating interest in STEM and engaging potential talents start from the young



## HacX! finals

The finals of HacX! 2024, a hackathon organised by HTX and Microsoft Singapore, featured 10 student teams competing for a S\$10,000 grand prize. The event empowers students to tackle public safety challenges using science and technology.

DataDream Team won with EdgeGuard, a device designed to mitigate window frame damage caused by rope friction during SCDF DART rappelling operations. Its arc hinge reduces friction and pressure, while also providing damping for a smoother descent.

Second place went to REAct for NoodleGuard, another solution for rappelling damage that utilises foam pool noodles within a curved structure to dissipate force on window railings.

Third place was awarded to Group 12 for PinPoint, an AI application that helps police investigate high-rise littering by generating a heat map predicting the litter's origin based on its landing point, object type, and wind speed.

**Read more:**  
<https://go.gov.sg/hacx2024>



## School career fairs

We didn't just invite students to visit HTX, we brought HTX to them too.

At these outreach events, we showcased our innovations for the Home Team, such as our AI deepfake detection tool, AlchemiX, and our search-and-rescue robo-dog, Spirit40, at the Raffles Institution (RI) Career and Scholarship Fair on 12 July 2024, the Victoria Junior College's (VJC) EdVantage! Fair on 31 July 2024 and at Raffles Girls' School (RGS) on 30 October 2024.

Students also got to hear about the meaningful work Xponents who once studied in their schools do at HTX.

The HTXpress once again stole the show as the students checked out the public safety-themed immersive games onboard and learned more about our mission and work.

At RGS, the deployment also included a "trick and treat" section with a Halloween lucky dip, seeing as Halloween was just round the corner.

Through such events, HTX continues to inspire future talents in STEM and the public safety field.

**Read more:**  
<https://go.gov.sg/htx-at-ri>  
<https://go.gov.sg/htx-at-vjc>  
<https://go.gov.sg/htx-at-rgs>

## Student Attachment Programme

During the June school holidays, 25 students from HTX's partner schools and the Ministry of Education's (MOE) Engineering and Technology Programme Scholarship convened at the week-long HTX Student Attachment Programme.

During this event, the participants got to meet our science, engineering and digital innovators, experience our cutting-edge science and technology solutions up close, and witness how our groundbreaking research empowers Home Team operations.

**Read more:**  
<https://go.gov.sg/htx-sap>





# Who WE ARE



## OUR VALUES

1  
thing that  
drives us

### Mission

We are the Home Team's  
Force Multiplier

### Teamwork

We work together to make  
the extraordinary happen

### Empathy

We appreciate and care for  
one another, and celebrate  
our achievements together

2  
things that  
bind us

3  
things that  
set us apart

### Exuberance

We exude energy, optimism  
and a can-do attitude in  
pursuit of excellence

### Foresight

We apply exceptional thinking  
to anticipate future threats  
and opportunities

### Innovation

We constantly experiment,  
undaunted by failure, to create  
solutions for tomorrow's challenges





# OUR CULTURE & PEOPLE

## HTX Family and Sports Day 2024

Despite a rainy morning, nearly 2,000 Xponents and their families attended the HTX Family and Sports Day 2024 at Marina Barrage on 21 June 2024. The event launched the 10-day Annual Walk and Run challenge and featured various activities, including games, bouncy castles and scrumptious food. The Women in HTX club also promoted gender diversity and inclusivity during the event.

*Read more:*

<https://go.gov.sg/family-day-2024>

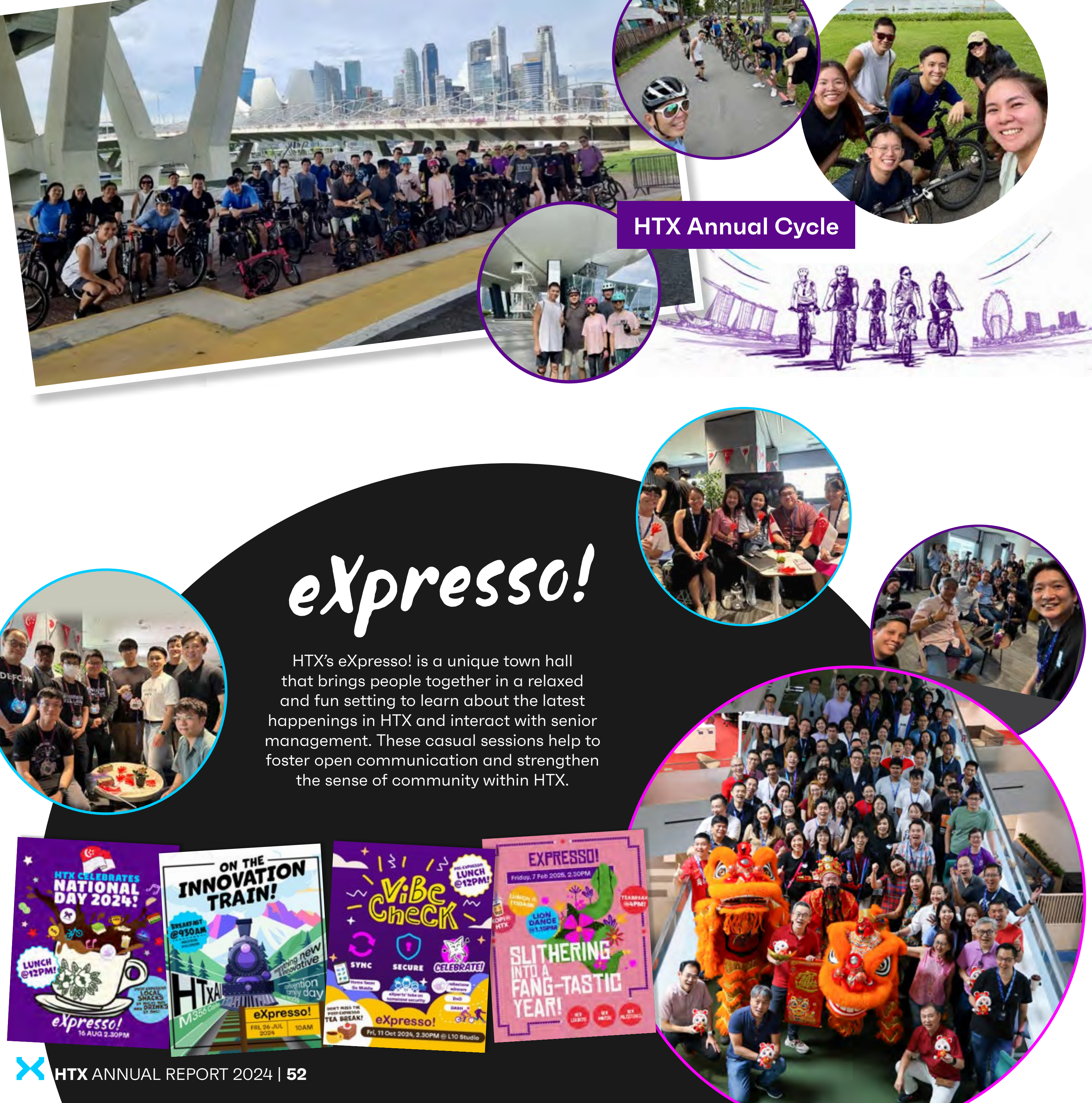
## Exploring new frontiers: HTX Convention 2024

The second annual HTX Convention on 17 May 2024 saw over 1,400 Xponents embark on an interactive journey to restore “cosmic stability”, which symbolised HTX’s core values. During the convention, CE Chan Tsan reflected on HTX’s five-year success, attributing it to staff’s exuberance, foresight, innovation, empathy and teamwork. He also unveiled HTX’s future AI-First strategy. Chief Innovation Officer Pan Yong then emphasised failure as crucial for innovation. The event also saw the launch of the new Hi-5 system for staff connectivity.

*Read more:*

<https://go.gov.sg/htx-convention-2024>

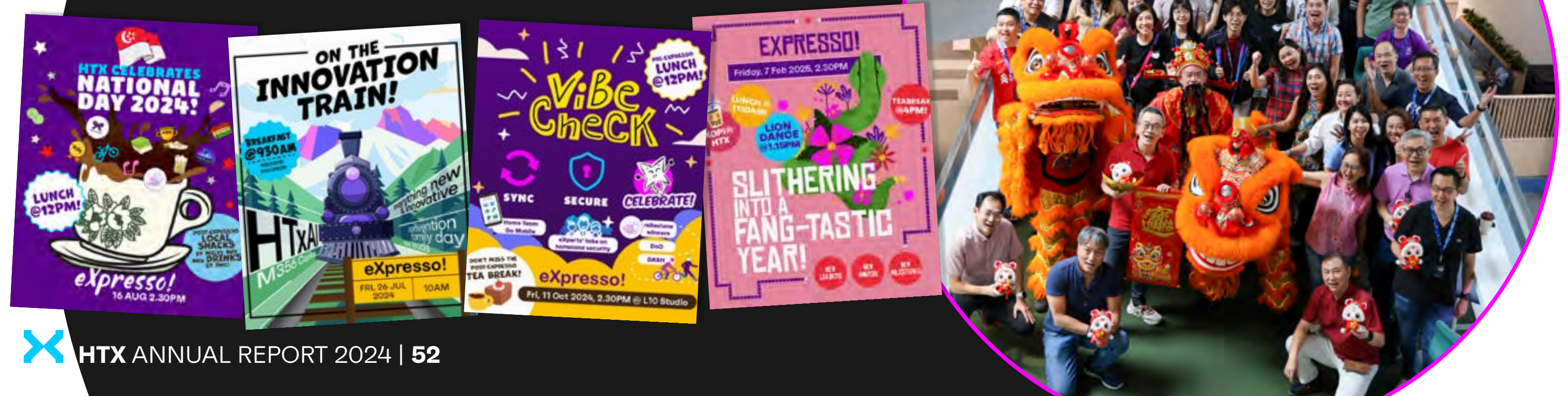




HTX Annual Cycle

# eXpresso!

HTX's eXpresso! is a unique town hall that brings people together in a relaxed and fun setting to learn about the latest happenings in HTX and interact with senior management. These casual sessions help to foster open communication and strengthen the sense of community within HTX.



# OUR COMMITMENT TO SUSTAINABILITY

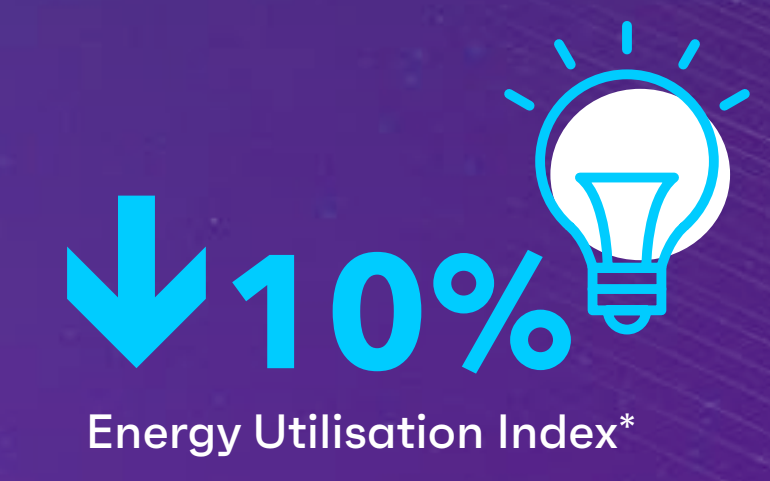
Sustainability goes beyond trends. It is a necessary undertaking with profound implications for not just the environment but our lives.

This is why HTX has set the goals of lowering our Energy Utilisation Index and Water Efficiency Index by 10%, and Waste Disposal Index by 30%, by 2030. Furthermore, we will strive to achieve net-zero emissions by 2045.

HTX will also work with our landlords across Singapore to help them decrease their carbon emissions, as well as take steps to lower our own, including purchasing energy efficient office equipment and switching lights off during lunch hours. Educational initiatives will also be rolled out to inculcate a green mentality in all HTX staff.

*Read our Sustainability Disclosure here:*  
<https://go.gov.sg/htx-sd-24>

## OUR GOALS



\* by 2030  
 ^ by 2045



# BOARD OF DIRECTORS



**Mr Aubeck KAM Tse Tsuen**

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Permanent Secretary (Development),  
Ministry of Home Affairs; Permanent Secretary,  
Ministry of Social & Family Development



**Mr CHAN Tsan**

CHIEF EXECUTIVE

Deputy Secretary (Development),  
Ministry of Home Affairs



**Mr HOONG Wee Teck**

Commissioner,  
Singapore Police Force



**Mr YAP Wee Teck Eric**

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Singapore Civil Defence Force



**Mr SIM Wai Meng Marvin**

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Immigration & Checkpoints Authority



**Ms SHIE Yong Lee**

Commissioner,  
Singapore Prison Service



**Mr TEE Chong Fui** (served until 31 Aug 2024)

Director,  
Central Narcotics Bureau



**Ms Janet ANG Guat Har**

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Chairman, Public Transport Council;  
Former Nominated Member of Parliament



**Prof CHONG Tow Chong**

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**Ms Carmen WEE Yik Cheng**

Founder and CEO,  
Carmen Wee & Associates



**Mr CHANG Yew Kong** (Deceased)

Chairman, Management Committee,  
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**Mr THAM Kok Leong**

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Practice), Allen & Glenhill LLP



**Mr Prithvi Suresh RAI**

Founder and CEO,  
Borneo Data Pte Ltd

\*As on 31 March 2025



# SENIOR MANAGEMENT

**Mr ANG Chee Wee**  
ASSISTANT CHIEF EXECUTIVE (DIGITAL)  
ASSISTANT CHIEF EXECUTIVE (ENTERPRISE)

**Dr LIM Kia Yong**  
ASSISTANT CHIEF EXECUTIVE  
(OPERATIONAL ICT)

**Mr CHAN Tsan**  
CHIEF EXECUTIVE

**Mr Colin TAN**  
ASSISTANT CHIEF  
EXECUTIVE  
(PROGRAMMES)

**Mr CHEN Yeang Tat**  
DEPUTY CHIEF EXECUTIVE  
(OPERATIONS)

**Mr NG Yeow Boon**  
DEPUTY CHIEF EXECUTIVE  
(DEVELOPMENT)





# Where WE WANT TO GO



*“The last five years have been immensely fruitful for HTX and I am heartened by our journey so far. This has been made possible by our exceptional Xponents and our trusted partners from around the world.*

*But we cannot rest on our laurels even as we celebrate reaching the five-year milestone.*

*HTX has pivoted quickly to ensure that our strategies are enabled and empowered by what AI can offer. I’m delighted that the AI movement is steadily gaining pace and has already yielded results that would further bolster the Home Team’s efforts to keep Singapore safe and secure.*

*I am confident that it will continue to revolutionise the Home Team’s capabilities in the years to come.”*

**Mr Aubeck Kam Tse Tsuen**  
Chairman, HTX

*“The HTX family has grown significantly since our launch and I’m proud that our impact in force multiplying the Home Team has expanded in tandem.*

*Our people-first culture has been pivotal to our success. We will do our utmost to ensure that this culture continues to blossom as we welcome more talent across diverse STEM disciplines to strengthen our collective mission.*

*Looking ahead, our pursuit of Science and Tech innovation, particularly in AI, will deliver new breakthroughs to enhance public safety. The question we now ask ourselves is: how else can we harness science and technology, together with our partners, to transform Home Team operations for the next bound.*

*Time and again, HTX has shown that we are not afraid to venture into uncharted territory and take on bold and audacious projects. This will not change. I look forward to working with all my fellow Xponents to shape the future of public safety and security, together.”*

**Mr Chan Tsan**  
Chief Executive, HTX



## VISION

Exponentially Impacting Singapore’s Safety and Security



UP NEXT...

AI TechXplore

MTX





# acknowledgements

We are deeply grateful for the collective efforts and commitment of a remarkable team of Xponents who have contributed to the creation of this publication. Your talent, dedication, and collaborative spirit have been instrumental in shaping this work:

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