ARVAS

The Future of Smart Surveillance

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ARVAS

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ARVAS is an AI-assisted video anomaly detection system that requires no input of rules or pre-configuration. It continuously analyses video streams and highlights any abnormal behaviour to operators in real time.

Transform Surveillance from Reactive to Proactive

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Live Streaming	Stream on Motion	ARVAS

● Percentage of videos that require manual monitoring

Live Streaming	**Stream on Motion**	**ARVAS**
100%	50%	1%

Live Streaming
- Too many monitors
- Limited attention span
- Concept of operations: Reactive & Forensics

Stream on Motion
- Filters out approximately 50% of video footage with no motion

ARVAS
- Filters out 99% of normal motion
- Tap on the shoulder
- Proactive, Real-time Surveillance
- Increased Situational Awareness

ARVAS

ANOMALY **R**ECOGNITION **V**IDEO **A**NALYTIC **S**YSTEM

Self-learning with wider coverage

- **Unsupervised Machine Learning**
  ARVAS uses the latest machine learning techniques.
- **Autonomous Real-Time Detection**
  No set up of any rules needed, other than installation.
- **Unlimited Variation of Behaviours**
  Behaviours are no longer limited by fixed rules. ARVAS learns automatically to distinguish between normal and abnormal behaviours.

Easy Deployment

- **High Compatibility**
  Able to accept relatively low rates and resolutions, accommodating older legacy camera sources.
- **Not Scene Dependent**
  Applicable to any camera scene.
- **Highly Scalable**
  Scalable for thousands of cameras. ARVAS can extend your current video surveillance system or be installed from scratch with a VMS.

Highly Efficient Systems

- **Event Clustering**
  ARVAS' system can cluster similar events together and allow user prioritization.
- **GPU Acceleration**
  Effectively serves a larger number of cameras per server

Effective, proactive monitoring leads to a lower reliance on routine physical patrols, with **faster real-time response** to anomalous events, **preventing incidents from escalating** and **collecting unknown data.**
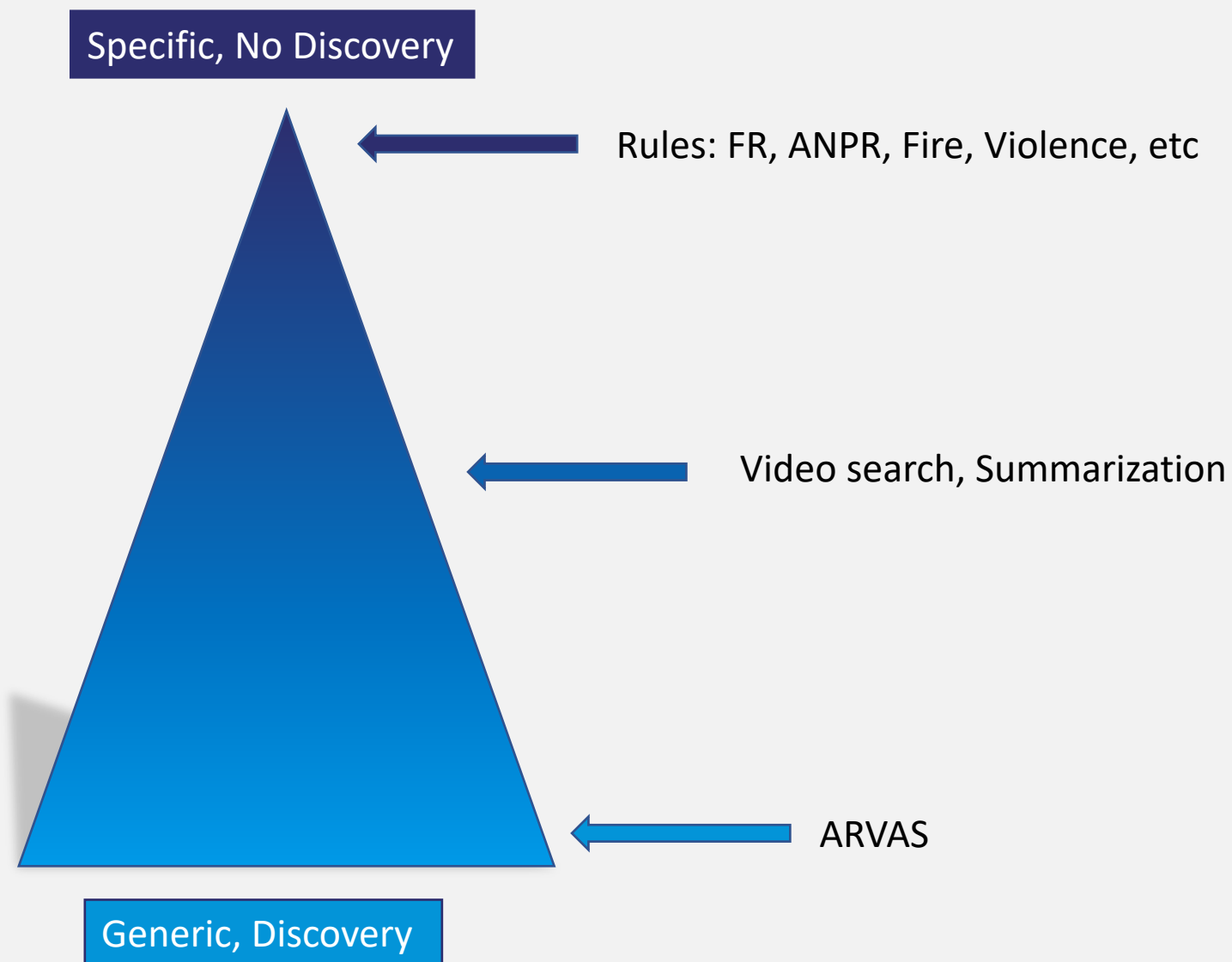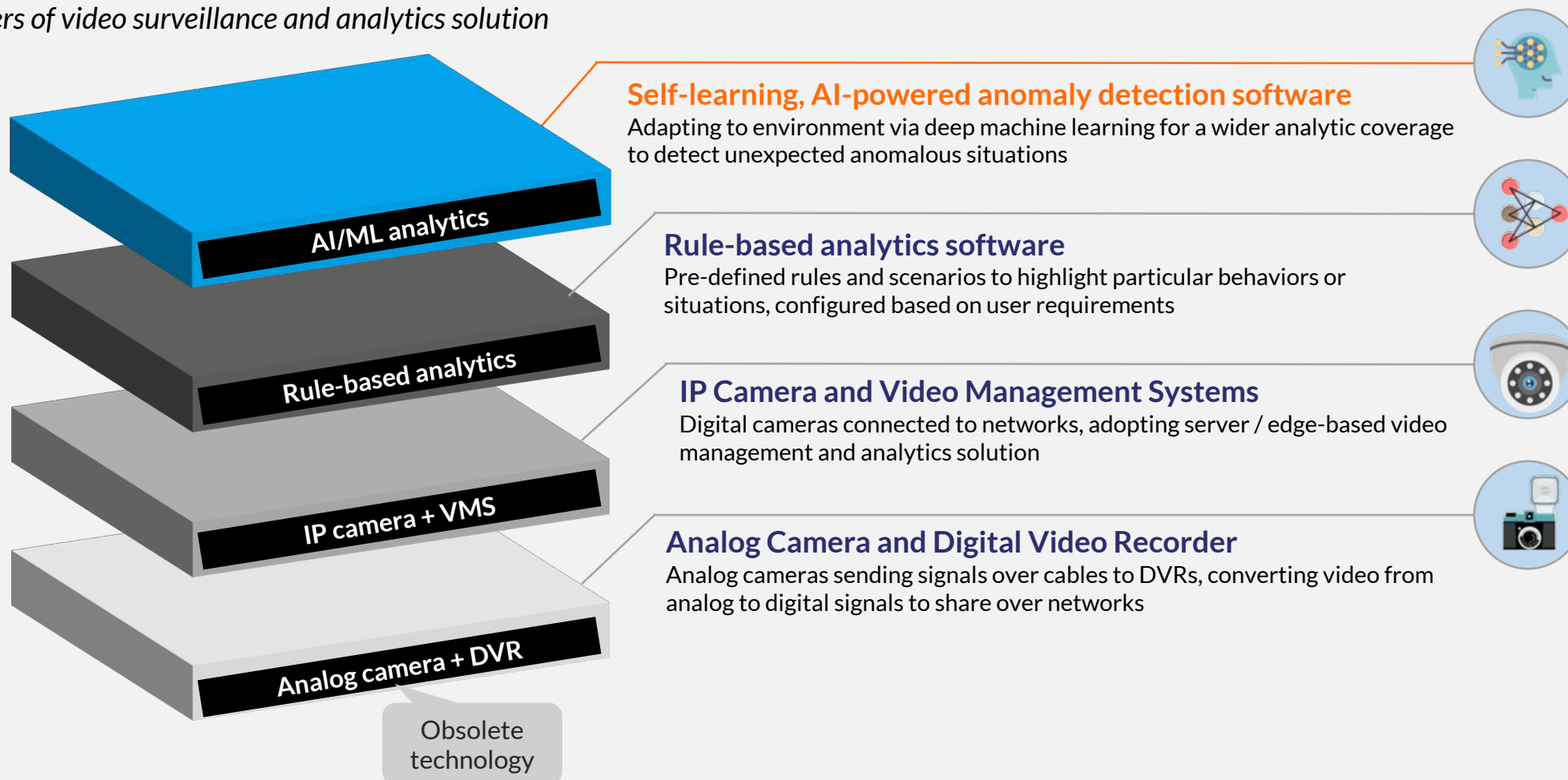
How ARVAS can be Integrated to Surveillance Operation

ARVAS can be applied in conjunction or in replacement of traditional video analytics software to classify objects and detect unexpected scenarios
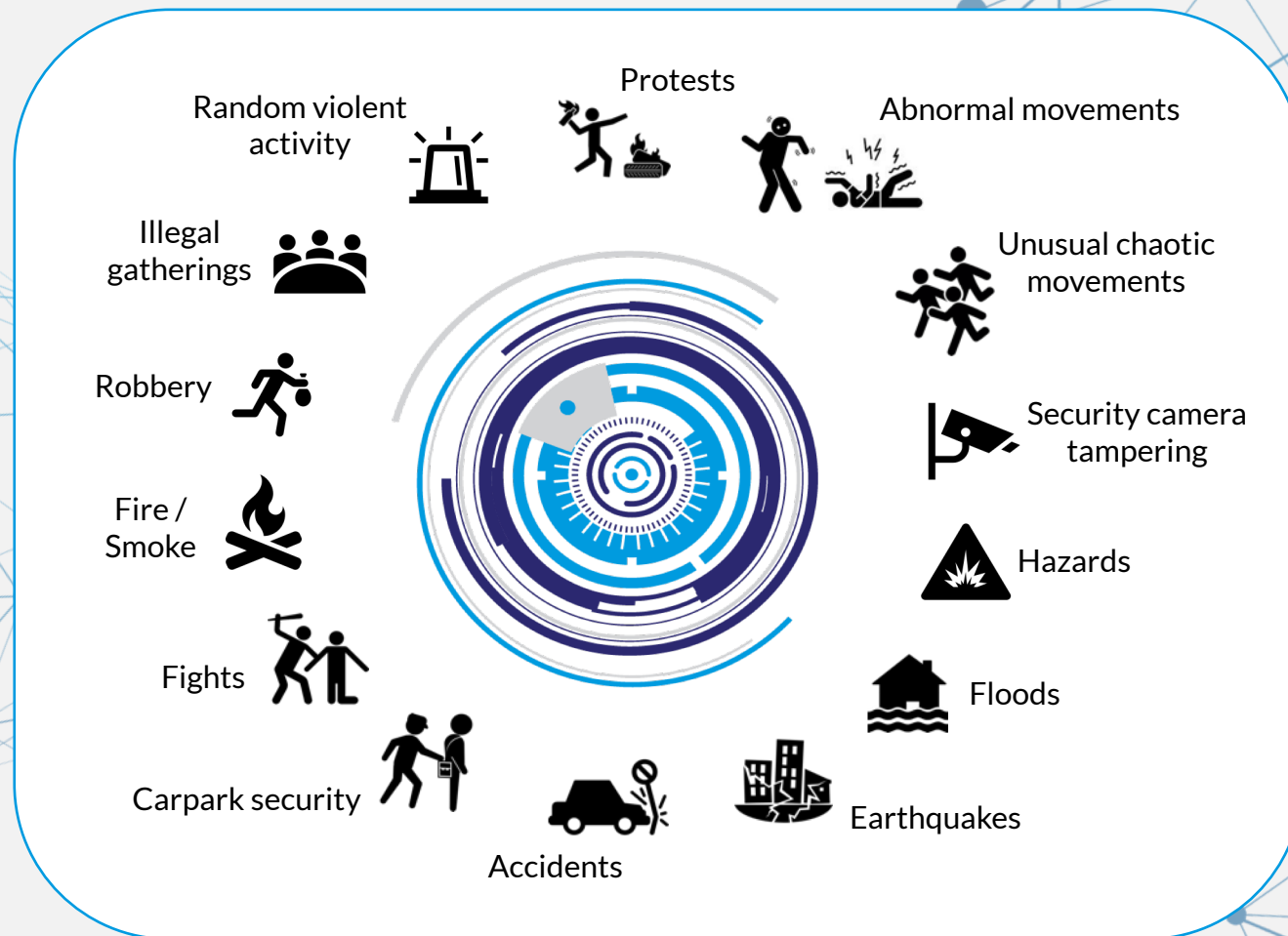
Layers of video surveillance and analytics solution

AI/ML analytics

Rule-based analytics

IP camera + VMS

Analog camera + DVR

Obsolete technology

Self-learning, AI-powered anomaly detection software
Adapting to environment via deep machine learning for a wider analytic coverage to detect unexpected anomalous situations

Rule-based analytics software
Pre-defined rules and scenarios to highlight particular behaviors or situations, configured based on user requirements

IP Camera and Video Management Systems
Digital cameras connected to networks, adopting server / edge-based video management and analytics solution

Analog Camera and Digital Video Recorder
Analog cameras sending signals over cables to DVRs, converting video from analog to digital signals to share over networks

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Detect unlimited range of anomalies with ARVAS in place

With self-learning capability, ARVAS can adapt to different environments and detect **unlimited range of anomalies** across all sectors to **improve situational awareness** and to **detect the unknown**.

* Important: ARVAS is not specifically built to detect these scenarios. These are examples of behavior that is generally abnormal and thus potentially detected by ARVAS based on the scene. ARVAS does not understand or classify the type of event.

- Random violent activity
- Protests
- Abnormal movements
- Illegal gatherings
- Unusual chaotic movements
- Robbery
- Security camera tampering
- Fire / Smoke
- Hazards
- Fights
- Floods
- Carpark security
- Earthquakes
- Accidents

ARVAS can adapt to different environments and detect unlimited range of anomalies

Potential Safety & Security Applications

Commercial
- ▶ Loss prevention
- ▶ Loitering / Crowd management
- ▶ Camera tampering

Education
- ▶ Silent hours monitoring
- ▶ Intrusion detection
- ▶ Safety

Industrial
- ▶ Workforce safety
- ▶ Asset protection
- ▶ Intrusion detection
- ▶ Fire / Smoke

Critical Infrastructure
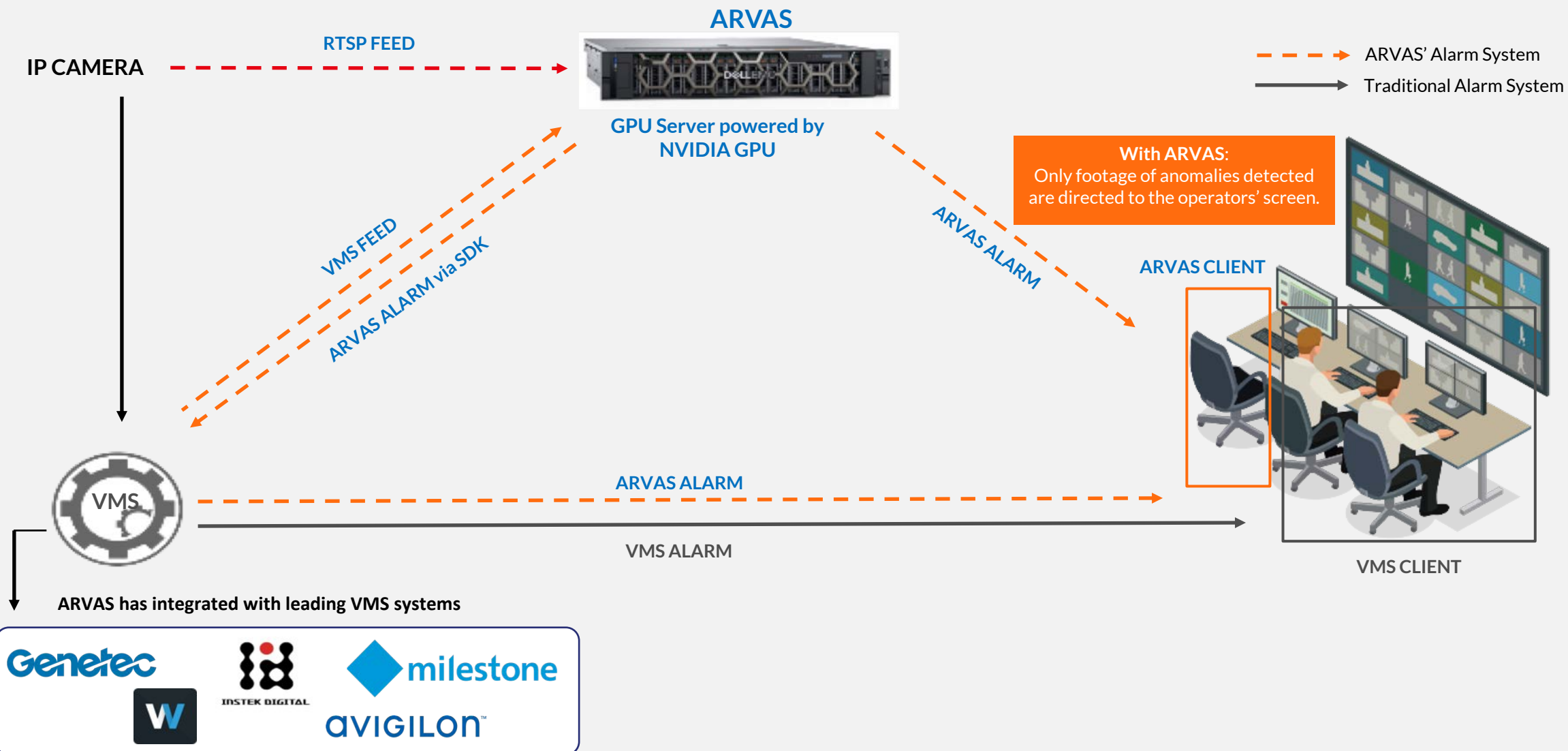- ▶ Violence, burglary and vandalism
- ▶ Intrusion detection
- ▶ Camera tampering

Banking
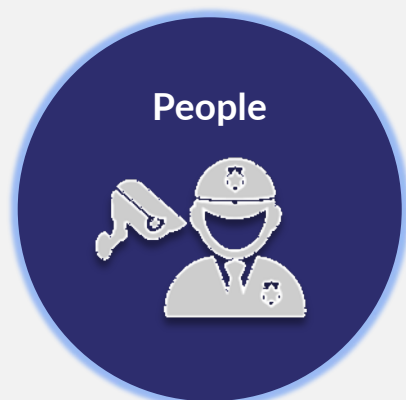- ▶ Camera tampering at ATMs, data centres and branches
- ▶ Burglary

Overview of Deployment Architecture

ARVAS

IP CAMERA

RTSP FEED

GPU Server powered by NVIDIA GPU

- - - → ARVAS' Alarm System
——→ Traditional Alarm System

VMS FEED

ARVAS ALARM via SDK

ARVAS ALARM

With ARVAS:
Only footage of anomalies detected are directed to the operators' screen.

ARVAS CLIENT

VMS

ARVAS ALARM

VMS ALARM

VMS CLIENT

ARVAS has integrated with leading VMS systems

Genetec

INSTEK DIGITAL

milestone

avigilon™

ARVAS – Award Winning Video Analytics

We were acknowledged by PM for effective Public Safety Use and recognized by industry experts

PRIME MINISTER'S OFFICE
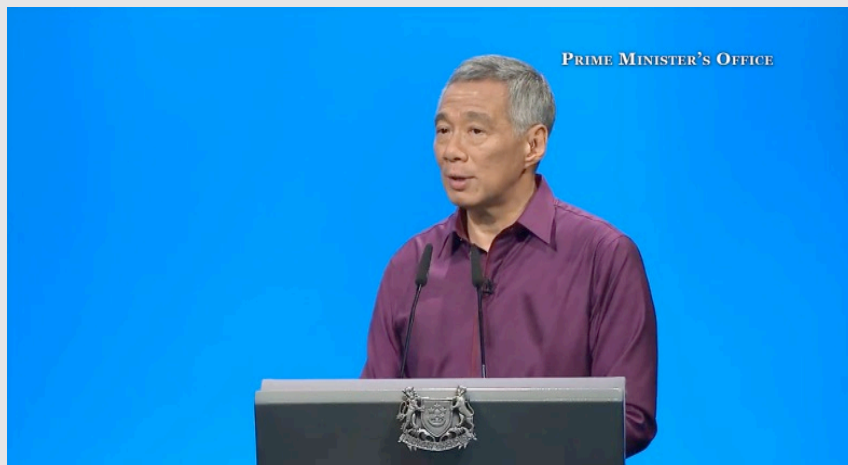
ARVAS was mentioned by Singapore Prime Minister as part of Smart Nation Initiatives during his National Day speech to enhance our public safety while reducing manpower.

"…and we are learning to analyse this combined data, for example, using **artificial intelligence** to **automatically flag** when something **unusual** is happening. So if I have 10,000 cameras, I don't need 1,000 people watching those cameras. I just need maybe just 10 people. Each person can watch 1,000 cameras and if the AI detects that something funny is happening, it will pop up and the man can pay attention and a response can be directed."

Merlion Awards
Safety & Security Asia

11th Merlion Awards 2018 serve to honour outstanding concepts, new designs and products in the field of security. Underlining the importance of innovation, the Awards give well-deserving companies the accolades of excellence and pride of place to showcase their exemplary solutions and products at the annual Safety & Security Asia exhibition organised by Conference & Exhibition Management Services Pte Ltd (CEMS).

The Awards are divided into four categories: Surveillance, Access Control, Alarm Systems and Mobility Technology. Judged by a distinguished panel comprising of industry experts from academia and independent bodies, the Awards are recognition of the highest standards of product innovation excellence in the ASEAN region and beyond.

Straits Times 3 Oct 2018

Only 1 of 2 companies awarded Gold for Surveillance Category in 2018.

Thank You

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Solution of: