



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine

Open-source in DAFM

National Open-Source Innovation Summit 7th February 2025
Louise McKeever CIO

DAFM VISION

A sustainable, innovative and competitive agri-food, forestry and seafood sector

DAFM MISSION

Lead, enable and regulate the sector in a way that optimises its contribution to social, economic and environmental sustainability



Animal Health and Welfare



Food Safety, Public Health
and Consumer Issues



Farmer Schemes and Payments



Forestry Sector



Farming Sectors



Research



Food Industry Development,
Trade, Markets and the
Economy



Rural Environment and
Sustainability



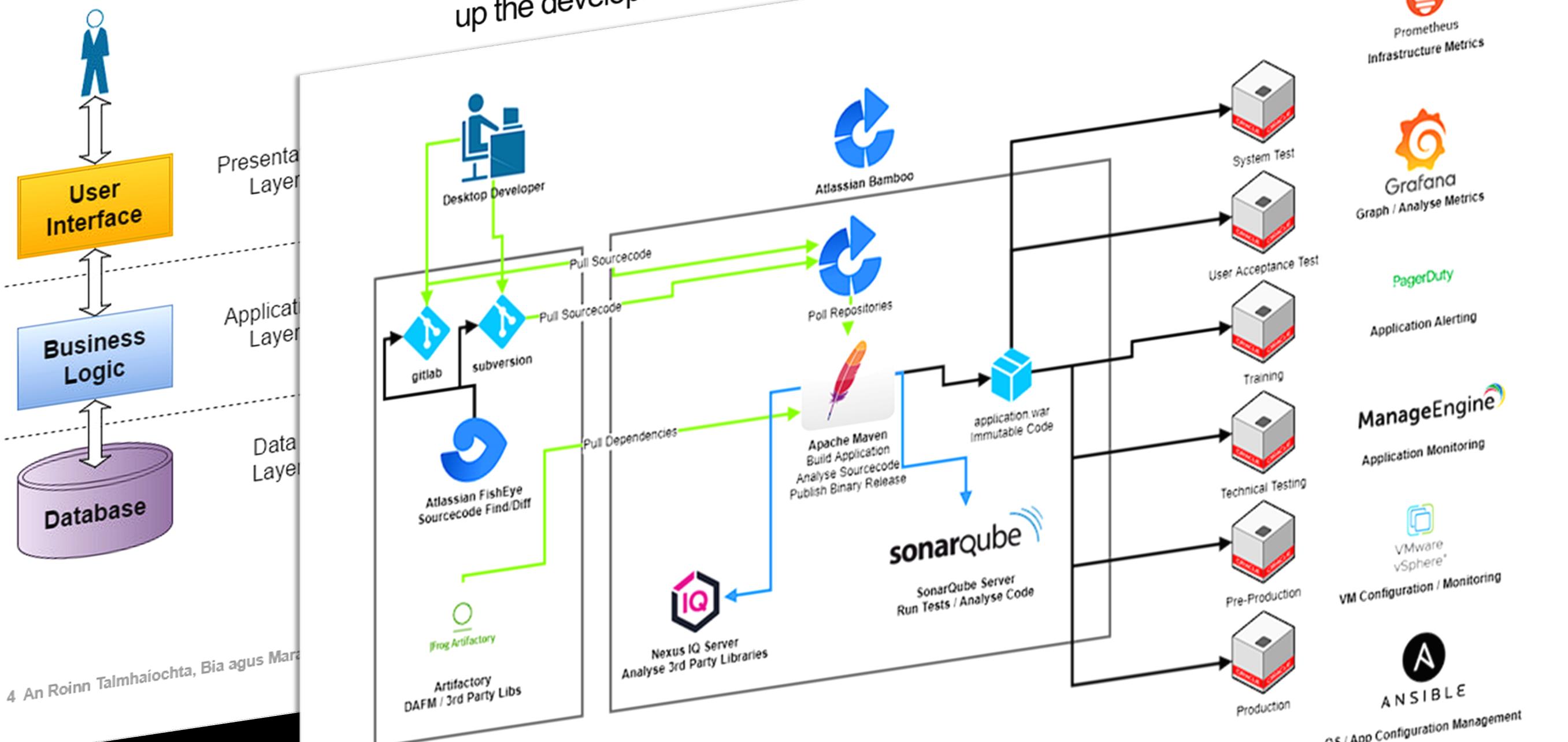
Seafood Sector





DAFM NTier Infrastructure

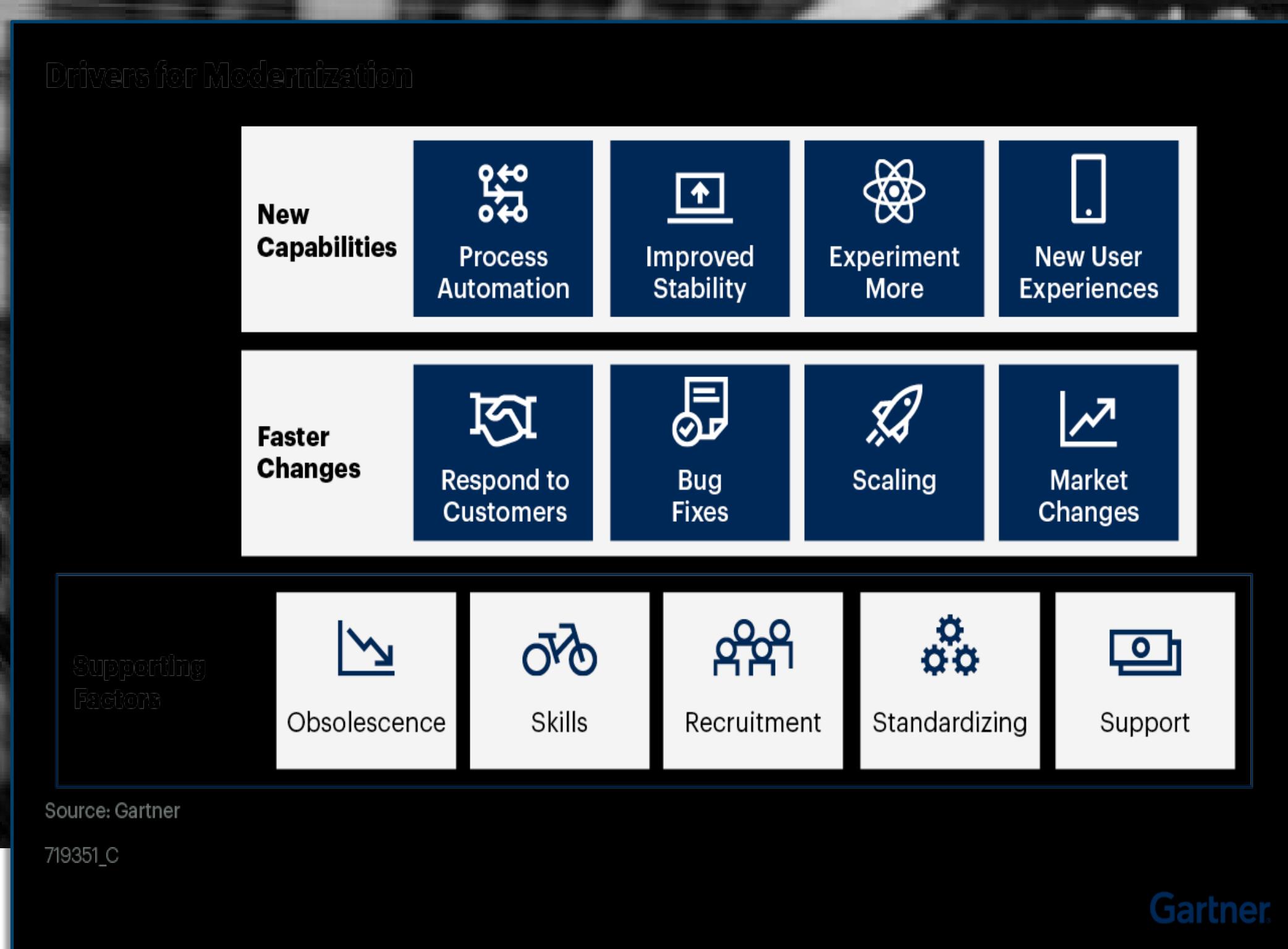
- DAFM have a number of products and supporting tools deployed that make up the development and deployment area for NTier:



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NTier Environments

- Development
- System testing
- User testing
- Performance & Security testing
- Training
- Pre-live check (& Debug)
- Production



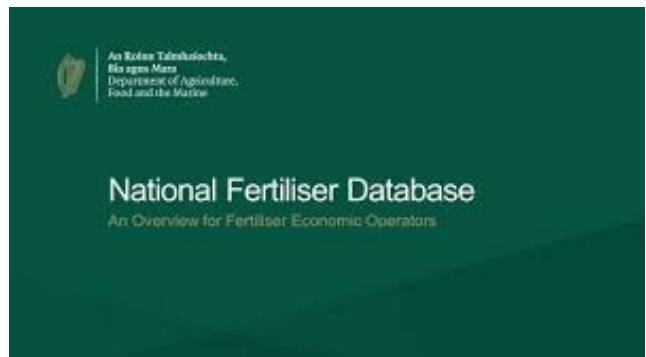
Modernisation Why change?

Containers

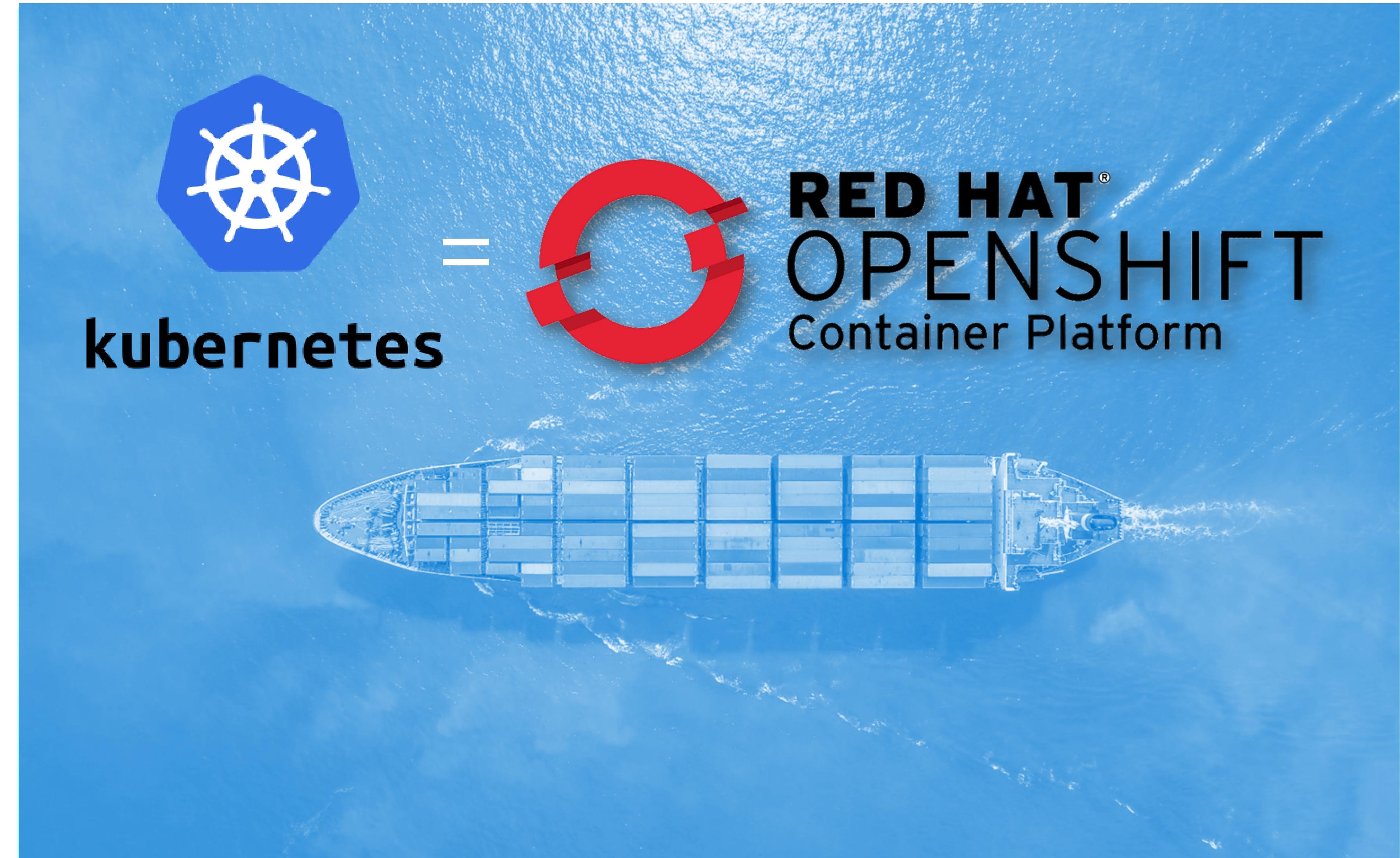
- Self-contained applications
- Can transport easily
- Easy to replicate and to scale
- Easy to automate
- Easy to manage
- Highly secure (*on OpenShift*)

DevOps

- One team responsible



Ireland builds intelligent
text analysis solution to
protect farmers' data



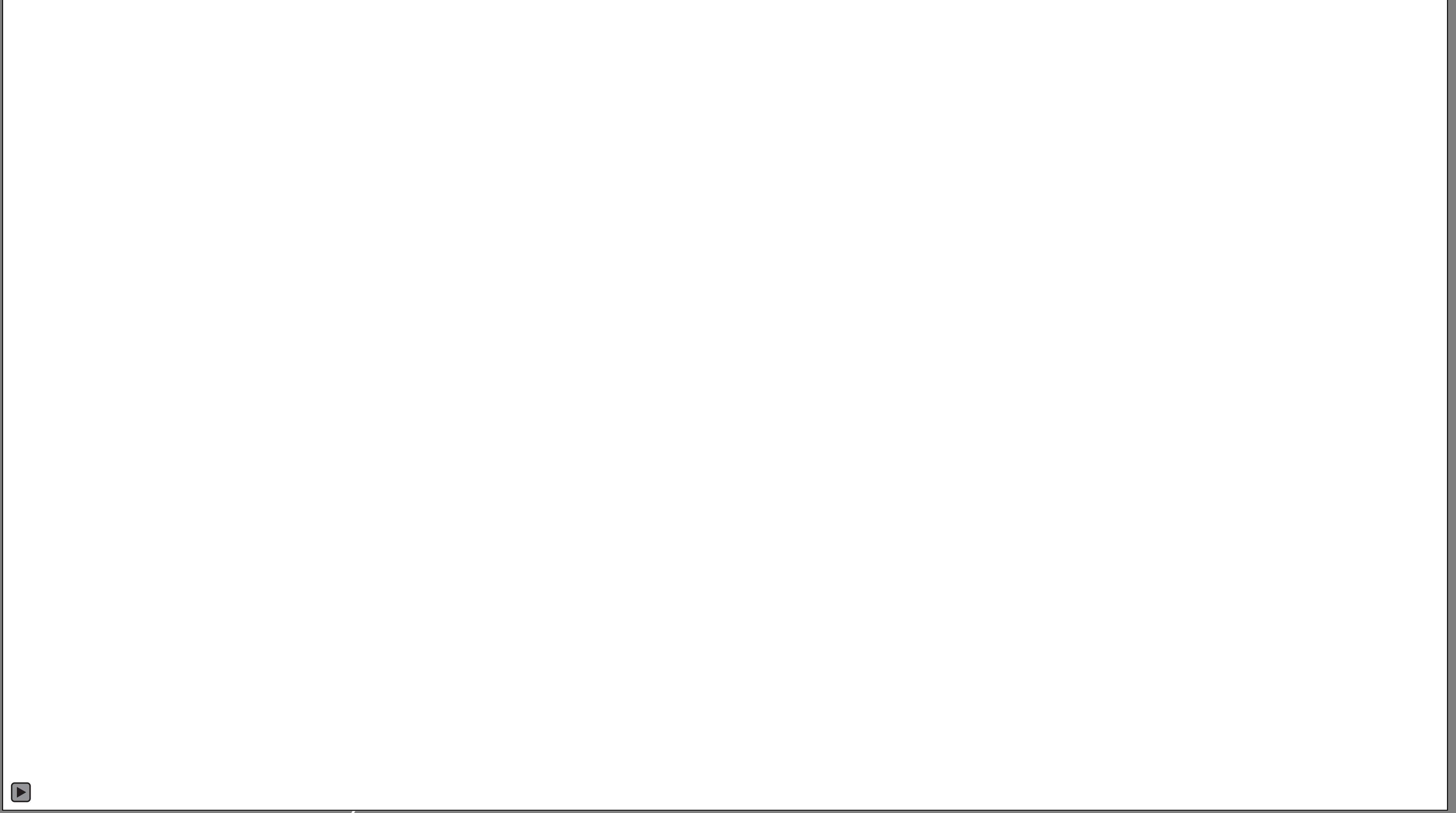
Smart Text solution – automating compliance and security



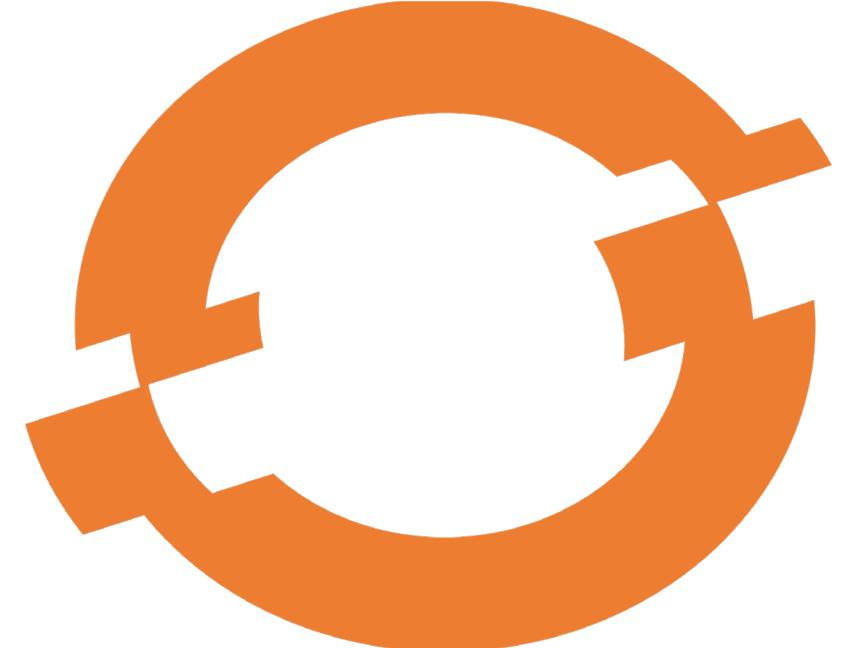
[Ireland builds intelligent text analysis solution
to protect farmers' data - YouTube](#)

**Ireland builds intelligent text analysis
solution to protect farmers' data**

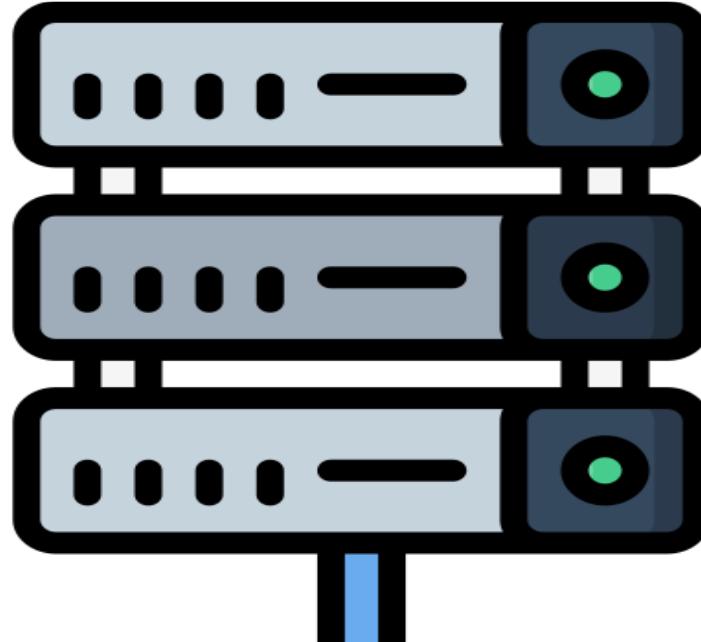
Strategic IT Platform | OpenShift today



Platform Engineering | DAFM Scale



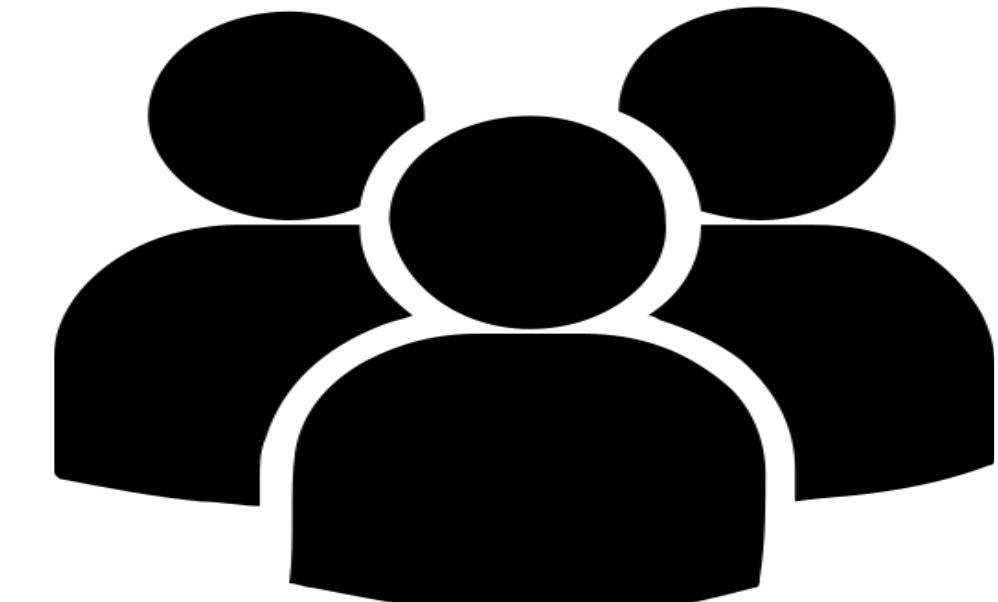
5 Clusters



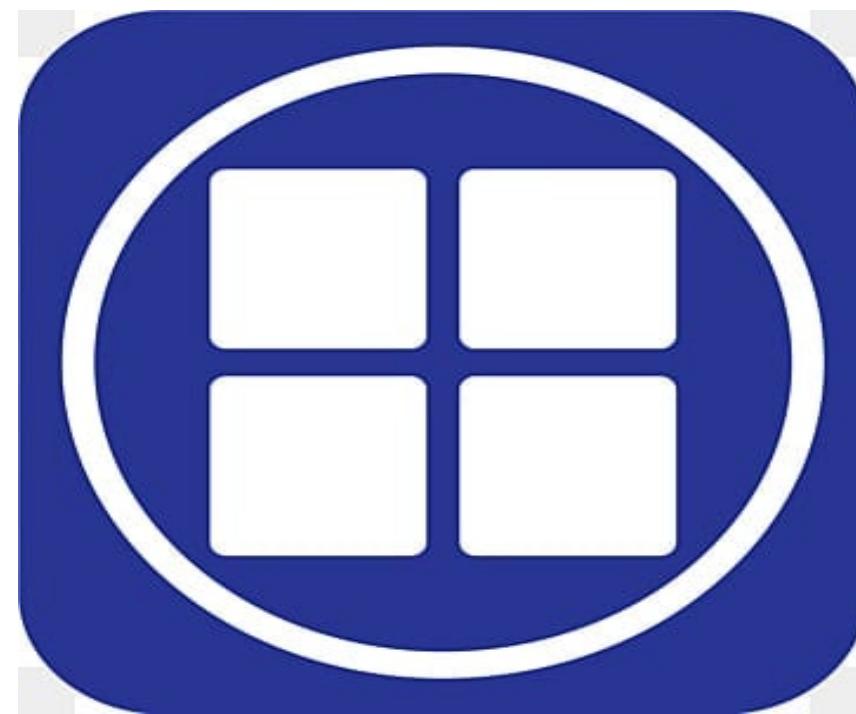
40 Nodes



3,860 Pods



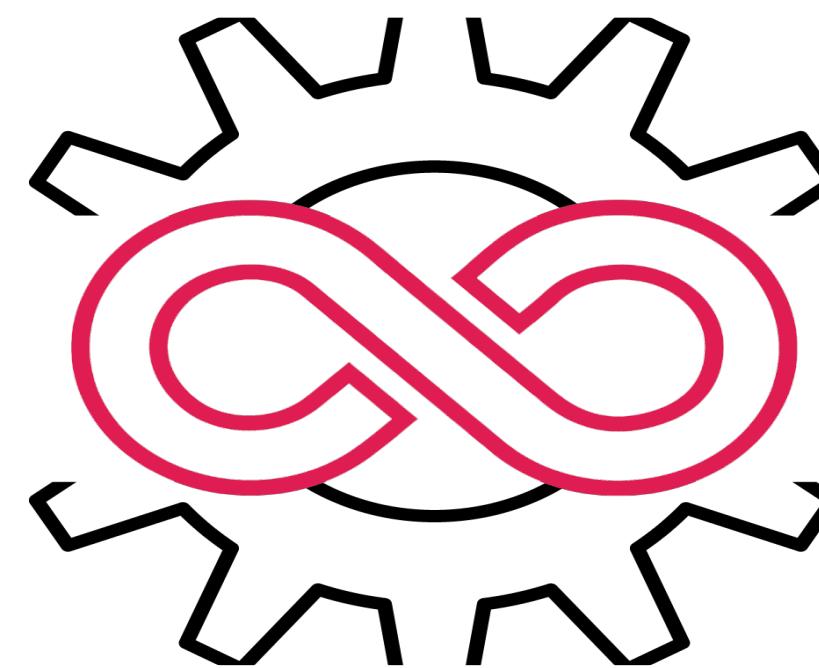
23 Business Units



188 Live Prod Apps



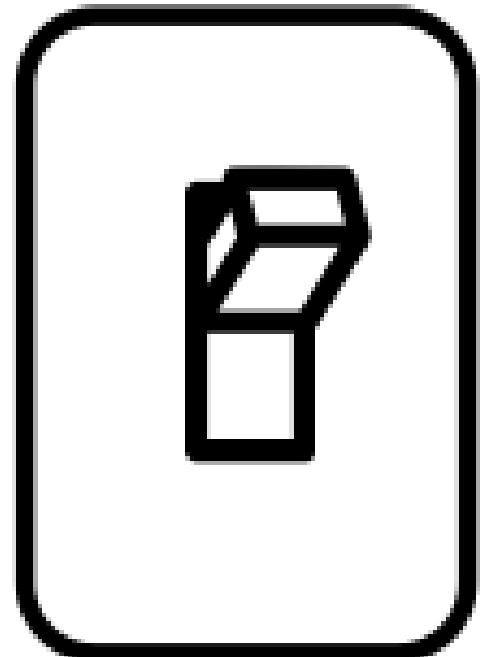
593 Developers



3,149 Automated Changes



- Scale down
- Automatically switch off
- Sleep state
- Quickly become available when needed
- “Kepler” – recording carbon footprint



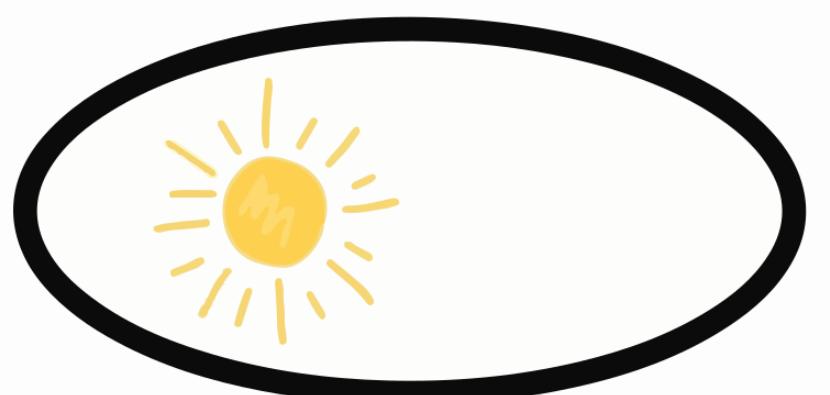
LightSwitchOps - Holly Cummins

- Added "Green-IT" Labels for deployments
- Scaling Automation
- 30% cost saving (finite resources)



Quarkus

- Quicker start-up & and throughput times
- Lower memory footprint
- 50% carbon footprint



KEPLER

- Visualize power consumption metrics in the OpenShift console.
- Compare with published energy mixes to gather carbon footprint.
- Awareness / Measure / Changes

K E P L E R

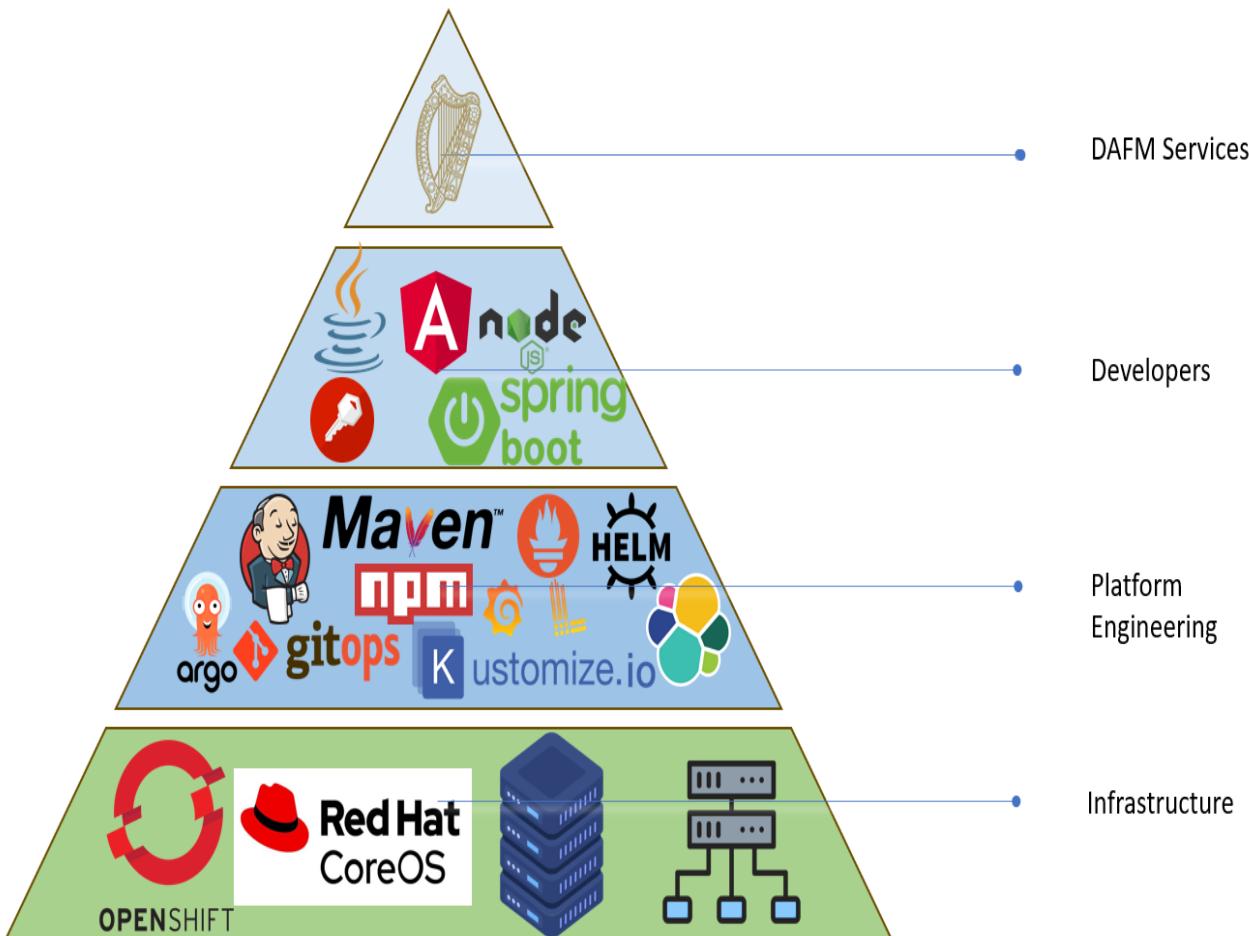
- Sustainable IT POC (Kepler) ran in Q4 2023 and continued in 2024.
- Kepler software was used to track projected power saving and carbon usage savings based on the scaling down of the application.
- Monitoring of the actual power usage of the server showed real-time reduction in power usage on the servers.
- Kepler dashboards showed a potential saving of 30 – 40% in power usage for the application during the POC.
- Power monitoring tools showed that the host CPU can take up to 45 minutes to cool down. This puts potential savings closer to 25 – 30%.
- The Department is in the process of rolling out light switch ops out across the Department's non-PROD environments and to allow Devs the ability to automatically scale up their own applications if needed during agreed downtime



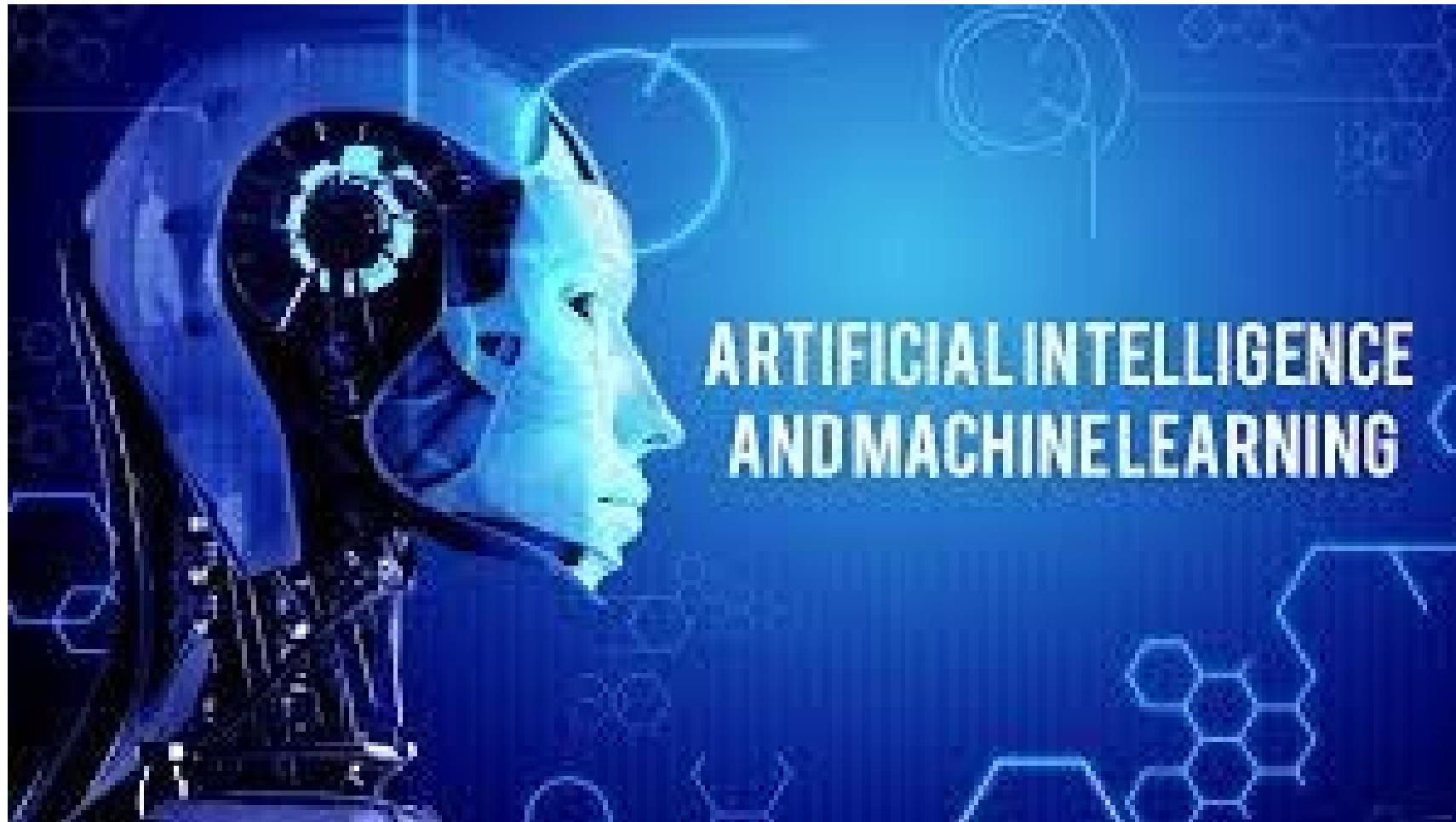
- This project was one of the first in the world to avail of the ability to measure carbon footprint per individual workload.
- The result is a platform where workloads can be scaled, increased according to demand or disabled when idle, where systems are made from smaller, reusable components, and services can continue uninterrupted throughout the year.
- 25-30% power saving based on the POC with one development team.
- We are now actively developing using Quarkus, which has rapid startup, feeding into our strategy of workloads only when needed. – currently used by several development teams.



- DAFM is a strong innovator and actively encourages the use of Open-Source software to improve processes and effect positive change.
- The Pre-Development cluster allows new and innovative technologies to be tested and deployed safely in our enterprise environment.
- Development and operations teams are regularly completing POCs on software with the potential to deploy to Dev and then to Production. Two of the most recent are;
 - Kogito process automation software
 - ELK Logging stack
- Examples of Opensource use in DAFM:
 - API Registry – APICurio Studio;
 - GEO Server, core to our serving of map related web content;
 - QGIS for adding/amending map or GIS content;
 - Maven & Jenkins for building java apps;
 - OpenJDK java libraries and our front-end technology, Angular are Opensource.



Artificial Intelligence in DAFM



Research & Analysis projects:

- Predicting the likelihood of TB outbreaks
- Image analysis of crop claimed under CAP schemes
- Image analysis for identifying species susceptible to H5N1 (Bird flu)
- Customer Segmentation analysis for developing Agri-food policies.
- Analysis for identifying risk factors for Microbial Food Safety.
- Analysing content to produce IT documentation.
- Automatically preparing test scenarios.

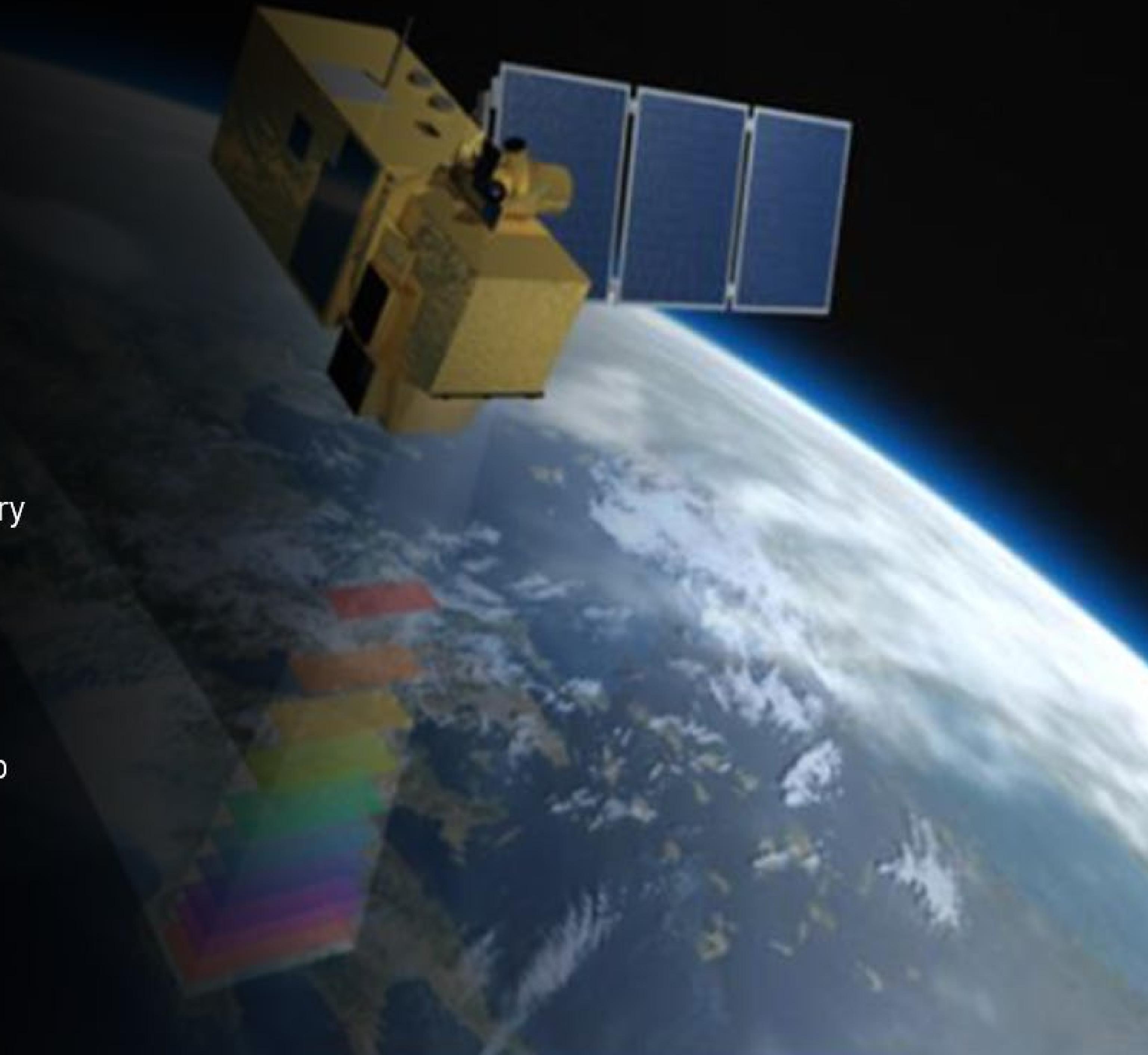
Operations:

- Smart Text analysis to prevent and contain data breaches.
- Area Monitoring System (AMS)



Area Monitoring System

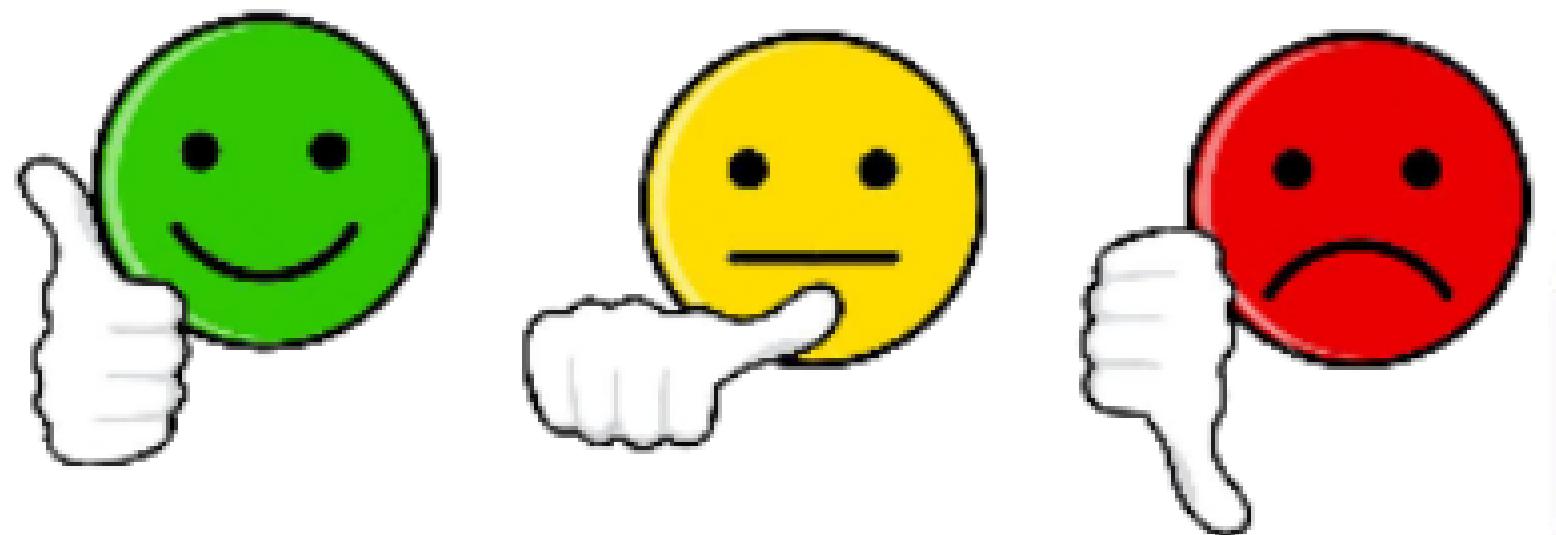
- The use of the Area Monitoring System (AMS) to monitor area-based schemes in EU Member States became mandatory on January 1, 2023.
- AMS is the observation and assessment of agricultural activities and practices on agricultural areas by Copernicus Sentinel satellite data.
- The AMS interprets this satellite imagery to provide decisions on agricultural activity on land parcels using computer algorithms.



Area Monitoring System & AgriSnap

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Traffic Light Approach



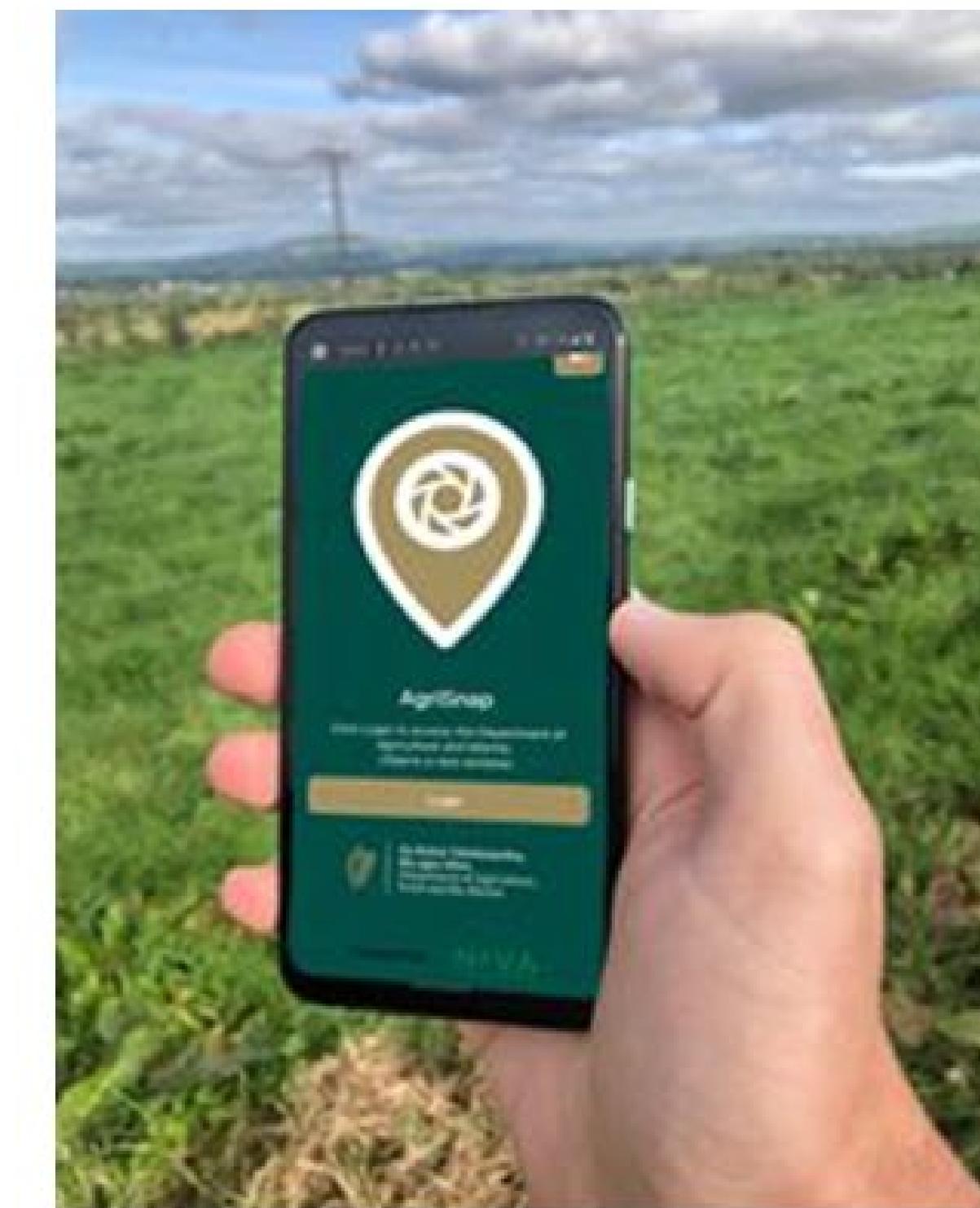
Machine learning



Big Data Innovation of the Year.
Public Sector Digital Transformation Awards 2024

AgriSnap

- AMS will monitor 100% of land parcels. Previously, it was 5%
- AgriSnap is the DAFM geotagged photograph app.
- It enables users to take geotagged photographs using their smartphone and submit them securely to DAFM in an efficient and secure manner.



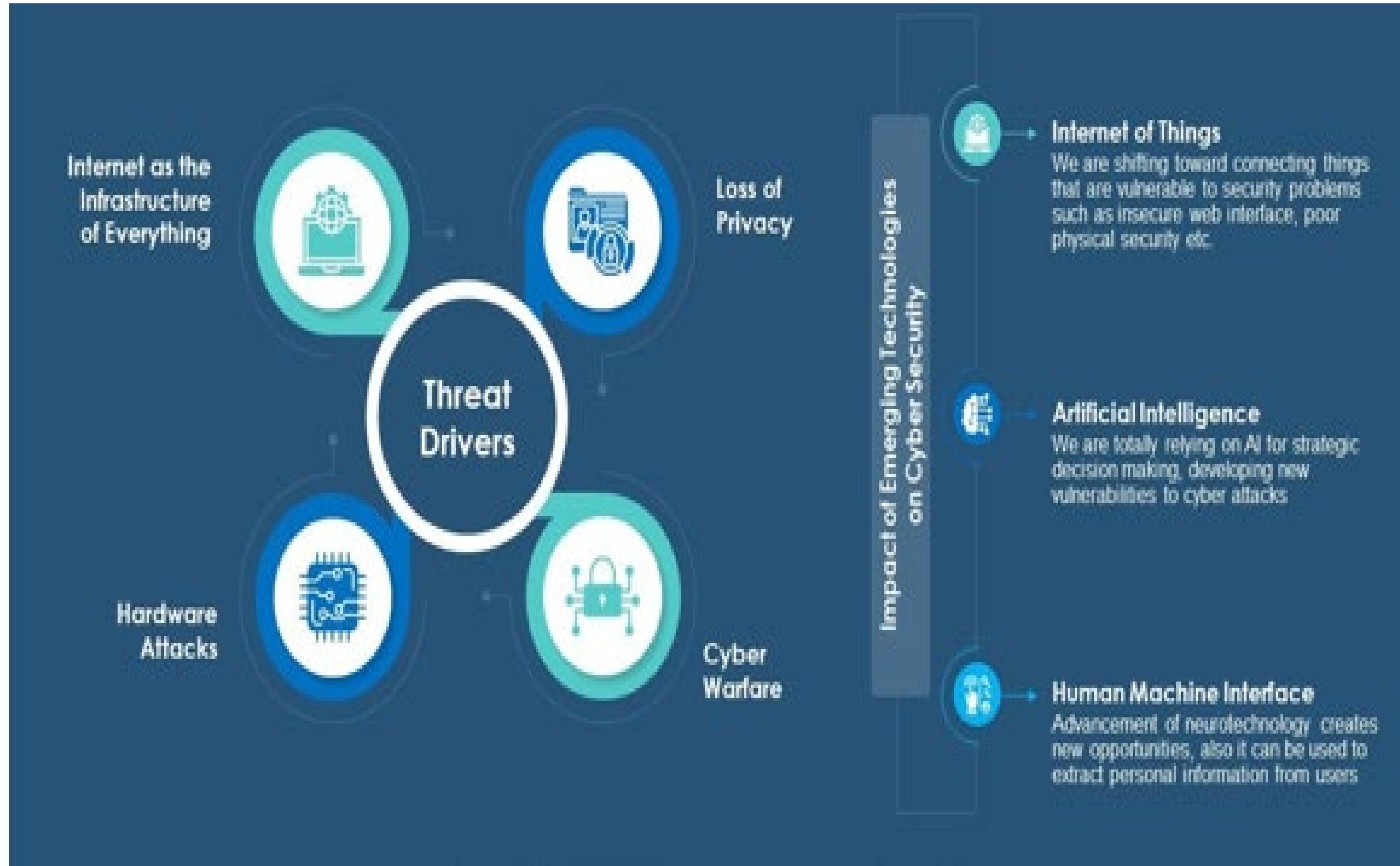
[gov.ie](#) - A description of the AgriSnap app, its use and where to download it

Artificial Intelligence in Agriculture



Its potential in agriculture continues to grow as technology advances.

Threat Drivers and Emerging Technologies Impact on Cyber Security



Risk based approach



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