OPTIMISING INVENTORY AND ASSET MANAGEMENT

Engineering the Future of Inventory: Smarter Maintenance Through Automation, Accuracy and Access

Jon Elwell – TBOX TECH

TBOX TECH innovates inventory management and MRO management solutions to streamline operations, enhance productivity, and reduce costs.

With cutting-edge technology like RFID, Storerooms, Vending Technology and Asset Tracking, we bring efficiency to industries worldwide.

For 2025, the UK's total Maintenance, Repair, and Operations the expected (MRO) spend across all industries is estimated at £10-15 billion. This figure encompasses key sectors like aerospace, automotive, manufacturing and utilities.

Cutting-Edge MRO Management Solutions

- **RFID & IoT:** Real-time tracking, automated inventory, reduced errors.

- **AI & Machine Learning:** Predictive maintenance, optimised inventory, data-driven decisions.

- **Cloud-Based Software:** Centralised data, ERP integration, scalable.

- **Augmented Reality:** Remote assistance, 3D overlays, faster repairs.

- **AS/RS (*Automated Storage and Retrieval Systems*):** Efficient storage, quick retrieval, real-time updates.

- **Mobile Apps:** On-the-go access, instant updates, improved collaboration.
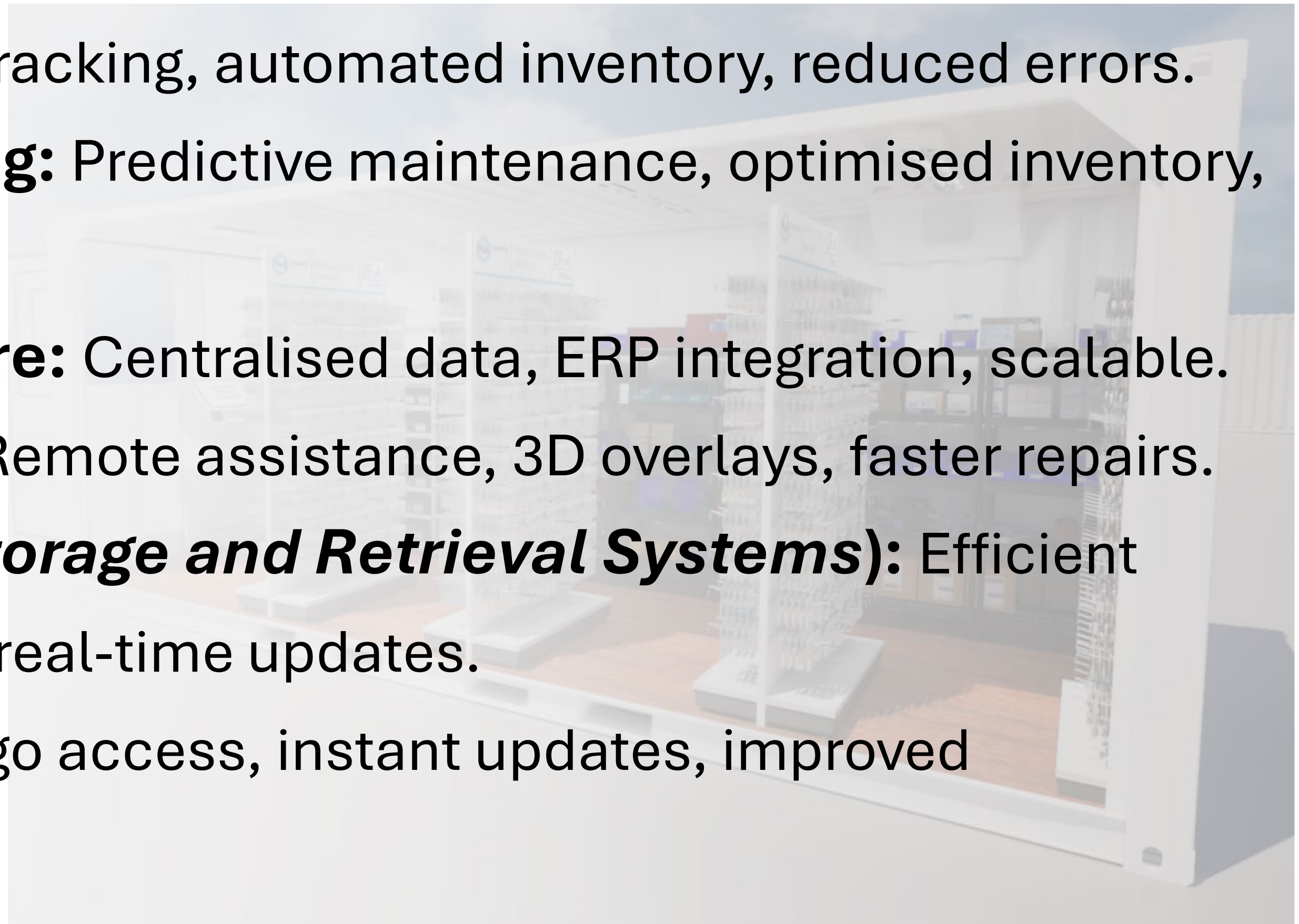
Future MRO Management Solutions

- **RTLS Solid State:** Solid-state battery enabled real-time tracking,

- **Mesh Networked Tech:** Provides precise asset visibility, reducing search times and optimising resource allocation.

- **Advanced Condition Monitoring:** Tracks environmental factors like temperature, humidity, and vibration to ensure asset integrity.

- **AI-enabled vision systems:** Use machine learning to analyze visual data, detect patterns, automate tasks, and enhance efficiency.
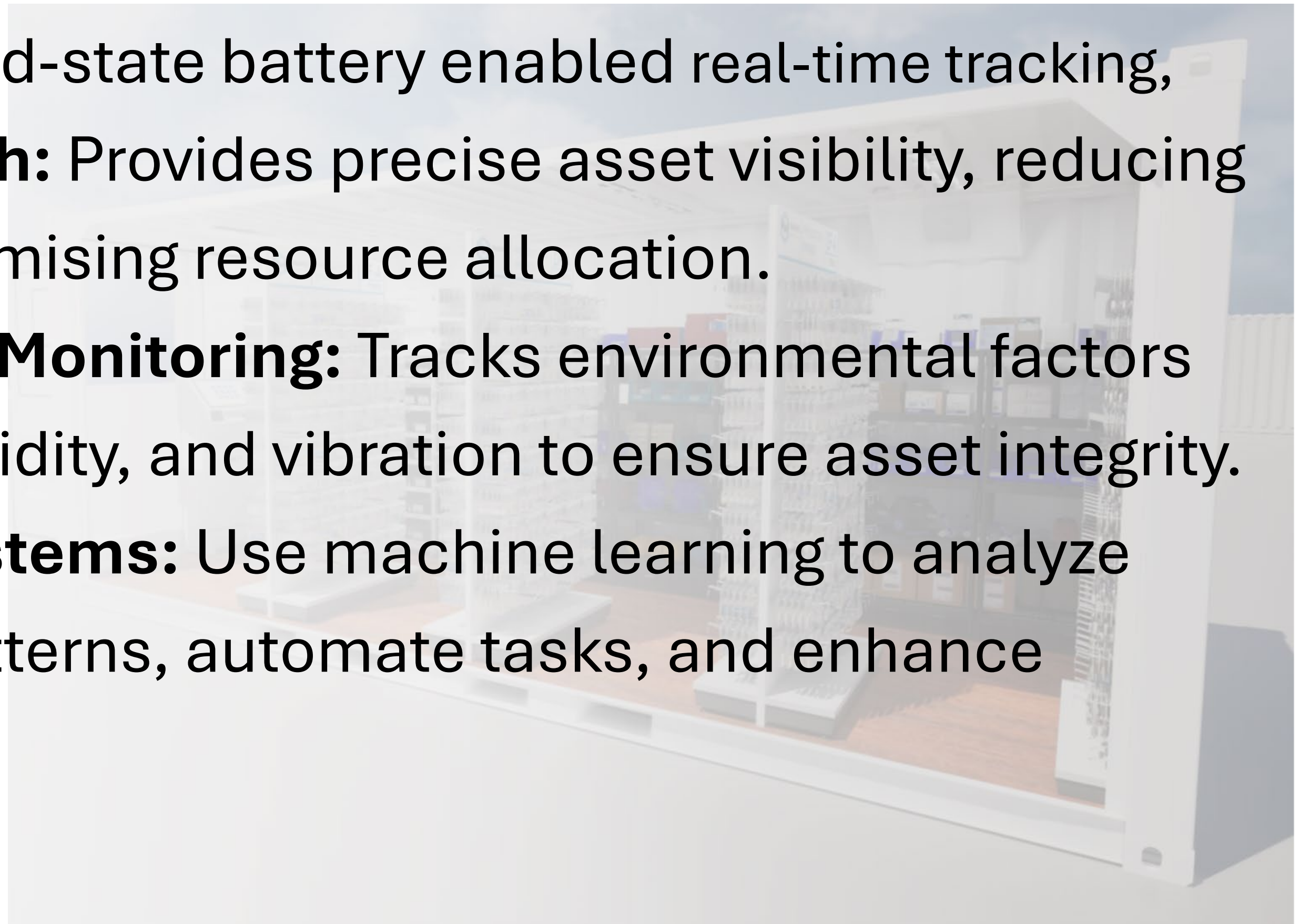
What is IoT?

The **Internet of Things (IoT)** refers to a network of physical devices embedded with sensors, software, and connectivity, enabling them to collect and exchange data. These devices range from smart home appliances to industrial machinery, all communicating autonomously to improve efficiency and decision-making.

IoT plays a crucial role in sectors like healthcare, transportation, and manufacturing, transforming how we interact with technology
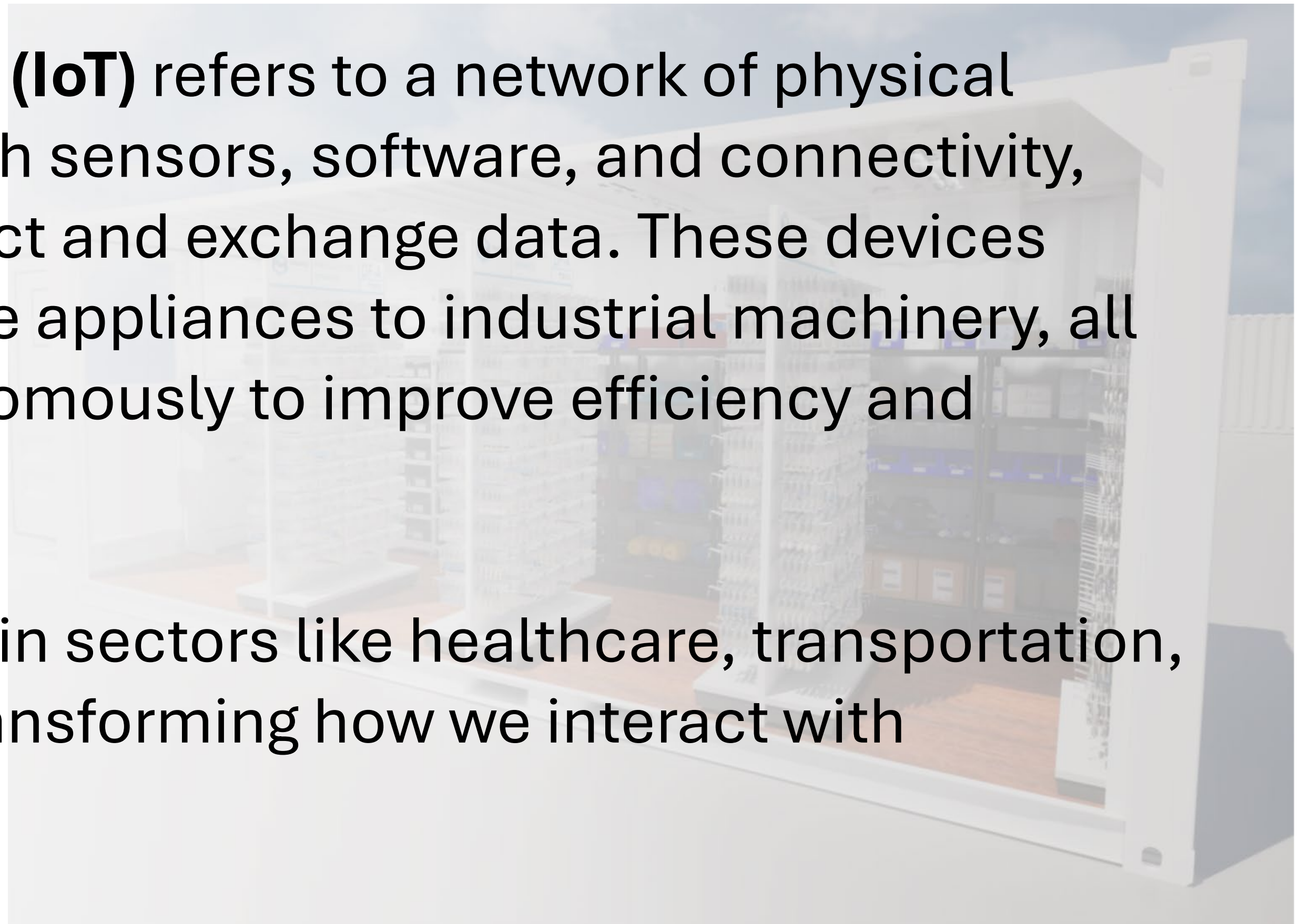
Buzzwords

IoT = **I*D*i*o*T -** *Internet (Didn't integrate) of Things*

Industry 4.0 = *4.0 light years to implement @ 4 times Cost*

Hyperautomation = *Combining Advanced technologies (eventually)*

Digital Twins = *Three times as expensive as digital (only children)*

Approximately **70%** of digital transformation projects Relating to the management of MRO, fail or fall short of their goals across industries, including manufacturing and engineering, due to:

- **Cost overruns**
- **Timeline delays**
- **Organisational resistance.**

Why Change Management is Crucial:

- **Engages Employees:** Keeps staff informed and involved, *reducing resistance*.

- **Prepares the Organisation:** Ensures everyone is ready for new processes and technologies.

- **Supports Transition:** Provides the necessary resources and training for a smooth shift.

- **Aligns Goals:** Helps align the team with the new technology's objectives, boosting overall success.
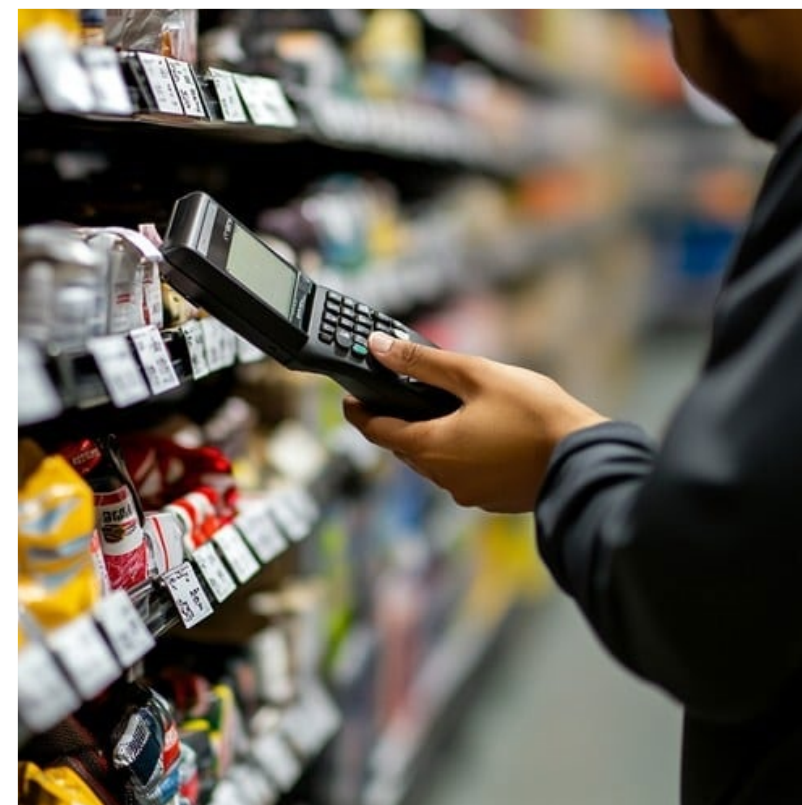
Human Factor in MRO Project Implementation:

- **Central Role:** The human element is critical for successful project implementation.
- **Managing Resistance:** Expect resistance, but it can be mitigated.
- **Strategic Approach:** Overcome challenges with thoughtful strategy.
- **Consider Needs:** Align with business needs and goals for success.

Barcode Managed Storerooms

Pros
- Cost effective
- Simple to implement

Cons
- Requires human input
- Enforced SOP's to ensure accuracy (70-85%)

Line-side and Stores Vending

NFC Near Field Communication

With the introduction of smart phone and tablet technology there are additional device types that can be considered for a wide range of applications that are applicable to many RFID tracking Projects

Mobile RFID Solutions

We have worked with many handheld RFID reader manufacturers and have developed systems on many of the most popular units, selection of the optimal solution for this project will be implemented based on the environmental and application requirements.
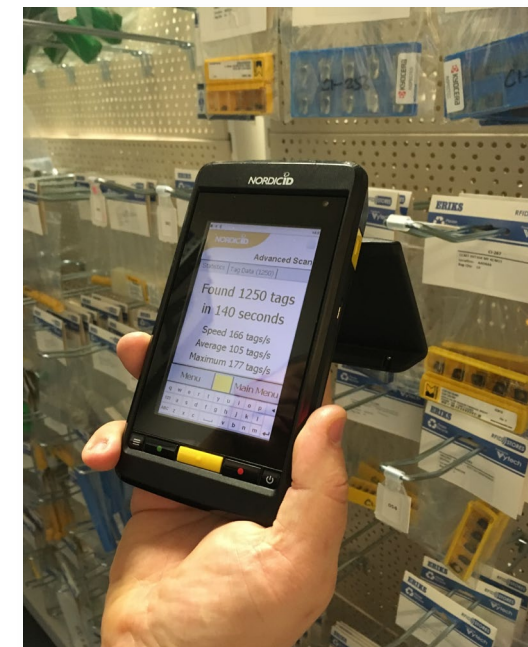
RTLS

A real-time location system is a technology that detects the current geolocation of a target, which may be anything from a vehicle to an item in a manufacturing plant to a person.
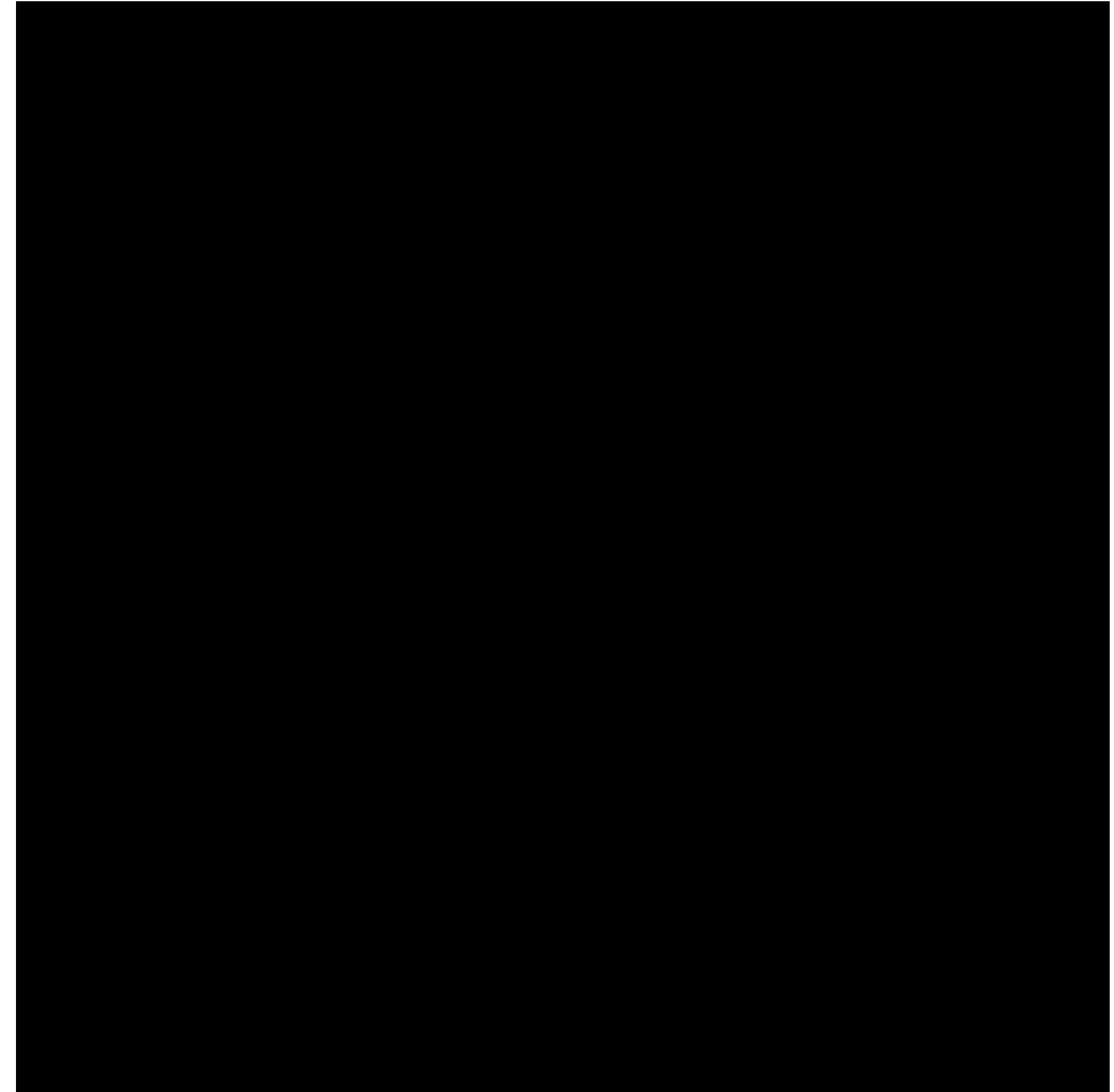
Available Hardware solutions include:

- RFID Solutions
- MRO Storeroom Systems
- Vending Solutions
- MRO Parts Asset Tracking

Each solution is designed to maximise efficiency and provide real-time inventory control.

Case Study: Implementing cost effective solution with Masfix

RFID Kiosk Solution

Affordable Setup: £6,000 unit cost, £4,000 implementation & £200 monthly support fee. **(or FOC if Masfix implement and Supply)**

Rapid Deployment: Operational within days, minimal downtime.

Efficiency Boost: Cuts errors, reduces stock discrepancies.

Tailored for MRO: Perfect for managing maintenance storerooms.

TBOX - Unipres MRO Integration Success

- **Implementation Year: 2012**
- **Duration of Success:** 13 years with minimal incidents
- **Technologies Used:** ProVyda Vending & RFID Portal
- **Key Outcomes:**
  - *Rare system stockouts over 13 years*
  - *Internalised MRO management*
  - *Recent software revamp for enhanced control*
- **Result: Minimal downtime, maximum control.**

Prior to Technology Implementation

Stores Cover Times	Visits Per Day (24H)	Total Visits	Average Travel & Retrieval Time	UK National Average (25K)	Total Cost
Day - Manned Cover 06:00-23:59	227	81684	00:12:00	£2.40	**£196,041.60**
Night - Un-Manned (Key Required) 00:00 - 06:00 + Sunday 24H	32	11521	00:27:00	£5.40	**£62,213.40**
				Total	**£258,255.00**

TBOX Technology Implemented

| Stores Cover Times	Visits Per Day (24H)	Total Visits	Average Travel & Retrieval Time	UK National Average (25K)	Total Cost
24H RFID Portal Controlled Stores	131	47106	00:09:00	£1.40	**£65,948.40**
Line Side ProVyda Vending	86	30838	00:07:00	£1.80	**£55,508.40**
				Total	**£121,456.80**

Comparison Between Year 1/Year 2	Year 1 Average Travel & Retrieval Time cost	Year 2 Average Travel & Retrieval Time Cost	Total 1st Year Saving
	£258,255.00	£121,456.80	**£136,798.20**

UNIPRES

MRO Project ROI Analysis

Title: Return on Investment for Capital MRO Project

- **Annual MRO Spend:** £600,000
- **Estimated Downtime Cost:** £60,000 per year
- **Project Cost:** £100,000
- **Uptime Increase:** 80%
- **Annual Savings:** £48,000
- **ROI Period:** Just over 2 years
- After two years, all savings are net benefit.
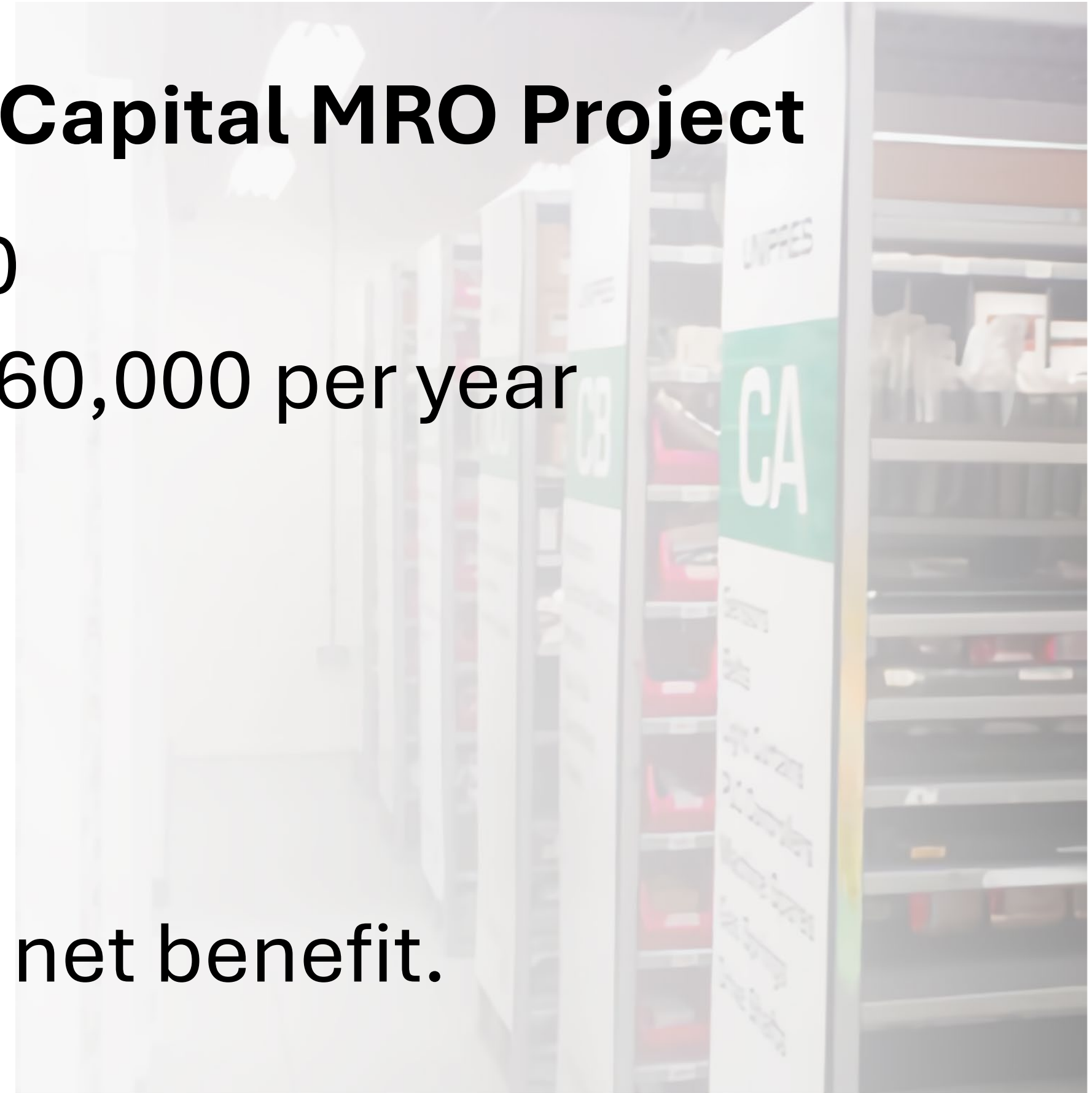
Implementing RFID automated solutions deliver the following benefits:

- Increased productivity
- Reduced operational costs
- Enhanced security
- Real-time inventory tracking
- Scalable solutions for MRO Management

Thank you for Listening,

Any Questions?