Technology Innovations for FM

Improve operational efficiency with some of the latest technological ideas

iwfm

SOUTH WEST REGION

Housekeeping

Introduction to today's event

- Your Hosts

- Your Sponsors

- Your Exhibitors

- Our Charities

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Participation

in **IWFM South West Region**

#FacMan

𝕏 **@IWFM_SouthWest**

Introduce yourself in 30 seconds!

- **Name**

- **Role**

- **Organisation**

- **Share one key feature of an inspirational workplace**

Technology Innovations for FM

E-brochure

10.00am – 10.45am
Preparing Technology for ESG Reporting
Peter Lemon, Business Strategy Lead, MACS EU Ltd

10.45am
Coffee and Networking

11.00am – 11.45am
The modern electronic building – 22 Bishopsgate
Robert Miles, Partner, Troup Bywaters and Anders
Glenn Cowell, Smart Systems Manager, 22 Bishopsgate/JLL

11.45am – 12.30am
The Ethics of Using AI in FM
Gordon Mitchell, Co-Founder, WHOLUS & IWFM Technology SIG Chair

Preparing Technology for ESG Reporting

Preparing Technology for ESG Reporting

Session Overview

This presentation aims to communicate the importance of ESG reporting, the role of technology in facilitating it, and the benefits of proactive adoption for a sustainable and responsible business future.

During this session we will:

- Look at the changing technology landscape.

- Discuss what is Environmental, Social, Governance and why ESG Reporting is Essential in the Modern Business Landscape.

- Talk though a step-by-step approach to ensuring a strategic and technology-driven path toward sustainable and responsible business practices.

- Understand the relationship between technology and ESG reporting, exploring how it shapes the future of corporate responsibility and accountability.

- Discuss balancing business goals and sustainability and how ESG Reporting integrates with Operations.

- Look at new and emerging technologies and discuss the benefits and challenges to adoption of ESG technology.

Meet the Speaker

Peter Lemon
Strategic Business Lead I Macs EU
E: peter.lemon@macs.eu
www.macs.eu

Peter Lemon

Peter has over 35 years of experience leading transformative programs in both the Public and Private Sectors. His expertise covers Enterprise Asset Management technology, organisational change, and business process improvement, guiding initiatives from conception to successful implementation.

With a rich knowledge base, Peter excels at aligning business strategy with operational execution. He serves as a trusted advisor to senior leadership, specialising in delivering complex asset management technology solutions for strategic decision-making and operational excellence.

Peter has a proven track record of delivering multi-million-pound technology programs. Notably, he was responsible for delivering one of Europe's largest enterprise asset management systems. Internationally recognised, Peter is known for his thought leadership in strategic technology solutions and operational enhancements, benefiting owners, operators, occupiers, and investors in asset management.

Passionate about aiding organisations in thriving amid change, Peter focuses on optimising Enterprise Asset Management operations through various strategic technology-led solutions.

What is ESG Reporting?

ESG stands for **Environmental, Social, and Governance**. ESG is a holistic approach to evaluating a organisations impact on the planet, society, and its internal governance.

Embracing ESG principles is not only aligned with global sustainability goals but also positions organisations for long-term success by meeting the expectations of investors, stakeholders, and regulatory bodies.

Environmental (E):
- Focuses on a company's impact on the environment.
- Includes considerations such as carbon footprint, waste management, and resource efficiency.
- Addresses issues related to climate change, pollution, and natural resource conservation.

Social (S):
- Evaluates a company's relationships with its employees, communities, and broader society.
- Encompasses aspects like labor practices, human rights, diversity and inclusion, and community engagement.
- Aims to ensure fair and ethical treatment of employees and positive societal contributions.

Governance (G):
- Examines the structure and effectiveness of a company's leadership and decision-making processes.
- Involves aspects such as board composition, executive compensation, and shareholder rights.
- Promotes transparency, accountability, and adherence to ethical business practices.

Preparing Technology for ESG Reporting

We are working in a new era where technology meets enduring sustainability principles - a world where our buildings and Infrastructure not only stand tall but also stand smart.

- As businesses navigate a world defined by sustainability and responsible corporate practices, ESG reporting has become a cornerstone for transparent and accountable business operations.

- The intersection of technology and ESG reporting is transformative, offering businesses the tools needed to not only meet regulatory requirements but to proactively demonstrate their commitment to sustainable, responsible, and ethical business practices.

- This symbiotic relationship between technology and ESG reporting is shaping the future of corporate responsibility and accountability.

The World around us is Changing

MACS

Our world is becoming INSTRUMENTED

Buildings and Infrastructure are a data-rich environment

- Smart Meters - electricity, water, gas
- Building Management Systems and Building sensors - lighting, fire, environment, CO2
- Public safety and surveillance systems
- IP-enabled devices - servers, PCs, multifunctional devices, actuators, control devices
- Highway / Railway traffic surveillance

Our world is becoming INTERCONNECTED

It's now possible to bring this data together as never before, and combine it with data from other sources

- Networked environments – fiber, wireless, public spaces, offices
- Networked sensors, sensor platforms, concentrators
- Networked meters and building management systems
- Taxonomies for integration within buildings and across buildings at an enterprise level
- Interconnected systems - costs, space-use, portfolio management, facilities management

Virtually all things, processes and ways of working are becoming INTELLIGENT

This presents the opportunity to use analytics to maximise and demonstrate property's contribution to the business

- "Enterprise-view" visibility of the building/enterprise/city operations
- Smarter decisions to reduce operations costs, especially energy & water usage and carbon / GHG emissions
- Optimisation and integration of assets, resources, work, safety, environmental systems
- Real-time analytics of sensor & meter data to optimise operational performance
- Behavioral modeling of physical, natural, and people systems
- Visualisation for user awareness and action
- Machine to machine optimisation systems

Why Technology in ESG Reporting Matters

Investor and Stakeholder Expectations: In an age where investors and stakeholders increasingly prioritise sustainable and ethical business practices, ESG reporting has emerged as a key tool for organisations to communicate their commitment to environmental and social responsibility.

Regulatory Compliance: Governments and regulatory bodies worldwide are emphasising the importance of ESG disclosures. Technology not only aids in ensuring compliance with evolving reporting standards but also facilitates the integration of diverse data sets to provide a comprehensive ESG picture.

Risk Management: ESG factors are critical indicators of business resilience and long-term viability. Leveraging technology allows organisations to identify, assess, and mitigate ESG-related risks, thereby safeguarding their reputation and financial stability.
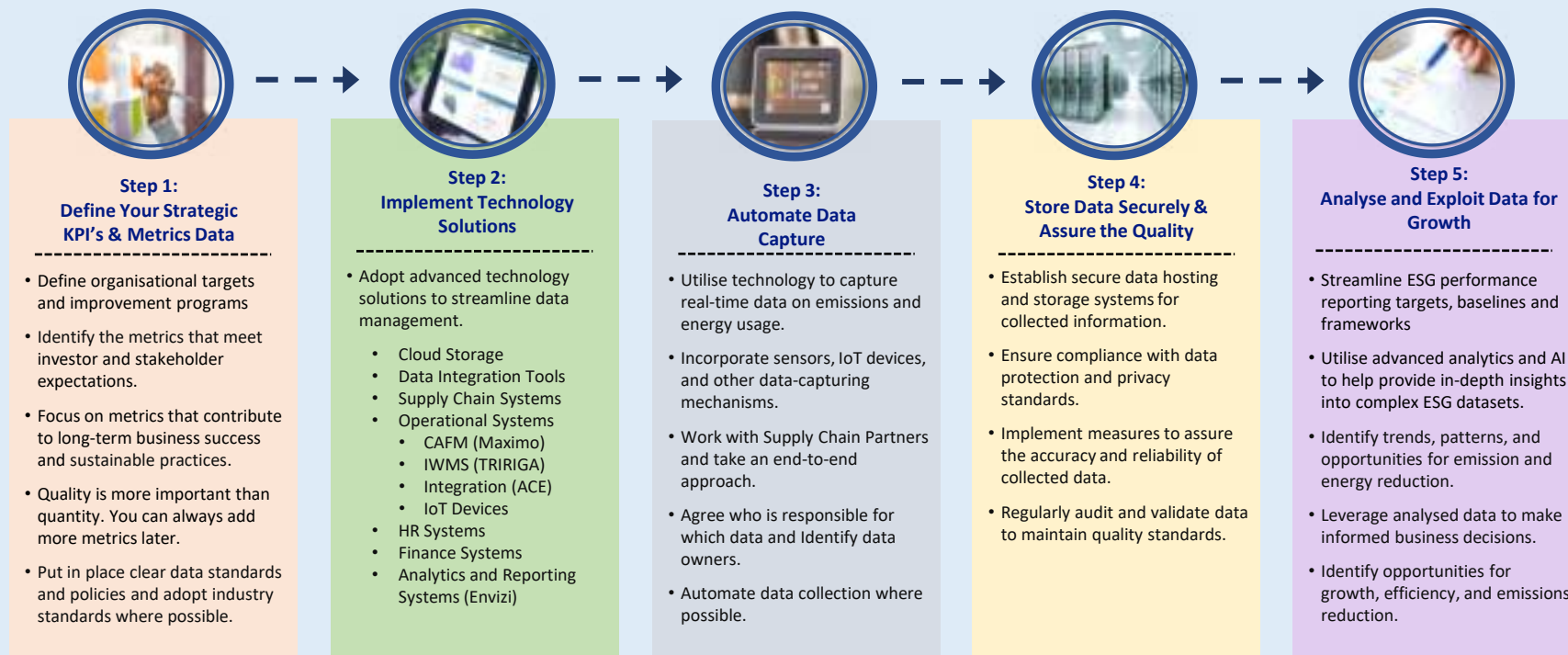
Real estate portfolios and facility infrastructure offers big opportunities
for more **sustainable operations**

For many companies, a **20% cut** in energy costs represents the same bottom-line benefit as a **5% increase** in sales

Source: Gov.UK

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How To Prepare Technology For ESG Reporting

Step-By-Step Guide to starting your ESG Technology Journey

This step-by-step approach ensures a strategic and technology-driven path toward sustainable and responsible business practices.

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Step 1:
Define Your Strategic KPI's & Metrics Data

- Define organisational targets and improvement programs
- Identify the metrics that meet investor and stakeholder expectations.
- Focus on metrics that contribute to long-term business success and sustainable practices.
- Quality is more important than quantity. You can always add more metrics later.
- Put in place clear data standards and policies and adopt industry standards where possible.

Step 2:
Implement Technology Solutions

- Adopt advanced technology solutions to streamline data management.
  - Cloud Storage
  - Data Integration Tools
  - Supply Chain Systems
  - Operational Systems
    - CAFM (Maximo)
    - IWMS (TRIRIGA)
    - Integration (ACE)
    - IoT Devices
  - HR Systems
  - Finance Systems
  - Analytics and Reporting Systems (Envizi)

Step 3:
Automate Data Capture

- Utilise technology to capture real-time data on emissions and energy usage.
- Incorporate sensors, IoT devices, and other data-capturing mechanisms.
- Work with Supply Chain Partners and take an end-to-end approach.
- Agree who is responsible for which data and Identify data owners.
- Automate data collection where possible.

Step 4:
Store Data Securely & Assure the Quality

- Establish secure data hosting and storage systems for collected information.
- Ensure compliance with data protection and privacy standards.
- Implement measures to assure the accuracy and reliability of collected data.
- Regularly audit and validate data to maintain quality standards.

Step 5:
Analyse and Exploit Data for Growth

- Streamline ESG performance reporting targets, baselines and frameworks
- Utilise advanced analytics and AI to help provide in-depth insights into complex ESG datasets.
- Identify trends, patterns, and opportunities for emission and energy reduction.
- Leverage analysed data to make informed business decisions.
- Identify opportunities for growth, efficiency, and emissions reduction.

ESG Reporting Metrics

- ESG metrics offer a comprehensive view of an organisation's sustainable and responsible practices.

- Understanding and reporting on these metrics are enablers to meeting investor and stakeholder expectations, managing risks, and contributing to long-term business success.

- Reporting Standards follow widely accepted frameworks, including:

  - Global Reporting Initiative (GRI)

  - Sustainability Accounting Standards Board (SASB)

  - Task Force on Climate-related Financial Disclosures (TCFD)

  - Corporate Sustainability Reporting Directive (CSRD) - Europe

  - IFRS - International Sustainability Standards Board (ISSB)

  - Social Value Impact Evaluation Standard (IES)

Environmental
Measures a company's impact on the environment.

Includes:
- Carbon emissions
- Energy consumption
- Water usage
- Waste management
- Green House Gas Emissions

E

Social
Assesses a company's relationships with people and communities.
Includes:
- Diversity and inclusion
- Employee relations
- Community engagement
- Workplace Health and Safety
- Responsible Supply Chain

S

Governance
Evaluates the structure and effectiveness of corporate governance.

Includes:
- Corporate Governance
- Risk Management
- Executive compensation
- Shareholder rights
- Transparency and ethics

G

ESG Metric Types

No one size fits all - focus on issues most relevant to your organisation, industry and stakeholders and identify the significant ESG factors impacting your business performance.

Utility billing data Electricity Gas Water	**Transport and stationary fuels** Diesel, petrol, LPG, propane aircraft fuel, LNG, bio-fuel	**Refrigerants & fugitive gases** 100+ gas types	**Electricity produced** Solar, wind, bio-gas, hydro, thermal	**Meter data** NMI meters, smart meters, sub-meters
Certificates & offsets RECs, carbon effects	**Waste & recycling** 300+ waste & recycling data types	**Materials** 100+ material types, construction and building	**Transportation** Air travel, taxi, train, car	**BMS and IoT data** Control signals, sensors
Social & environmental Community investment, donations, volunteer hours	**Company metrics** Headcount, rooms, beds, meals, sales	**Production metrics** Unit, tonnes, £, litres, hours	**Building metrics** m2, FTEs, occupant hours, building ratings, visits	**Weather data** HDD, CDD, rainfall, humidity, irradiation

Technology's Role in ESG Reporting

Technology plays a pivotal role in enhancing the accuracy, efficiency, and transparency of ESG reporting.   Leveraging technological not only ensures compliance but also positions organisations for informed decision-making.

Data Aggregation and Management

- Technology facilitates the collection and aggregation of vast and diverse ESG data sources.
- Automated systems ensure accuracy, reliability, and efficiency in handling large datasets.

Real-time Monitoring and Reporting

- Technology enables real-time monitoring of ESG metrics and performance.
- Instantaneous reporting allows for timely responses to emerging sustainability trends and challenges.

Machine Learning and Predictive Analytics

- Machine learning algorithms analyse historical data to predict future ESG trends.
- Predictive analytics enhance risk management and strategic decision-making.

Reporting Platforms

- Dedicated platforms streamline ESG reporting processes.
- Centralised repositories enable efficient collaboration, analysis, and adherence to reporting standards.

Integration with Financial, Operational and HR Systems

- Integration with financial, operational and HR systems ensures seamless incorporation of ESG metrics into overall reporting.
- Aligns ESG considerations with broader business strategies.
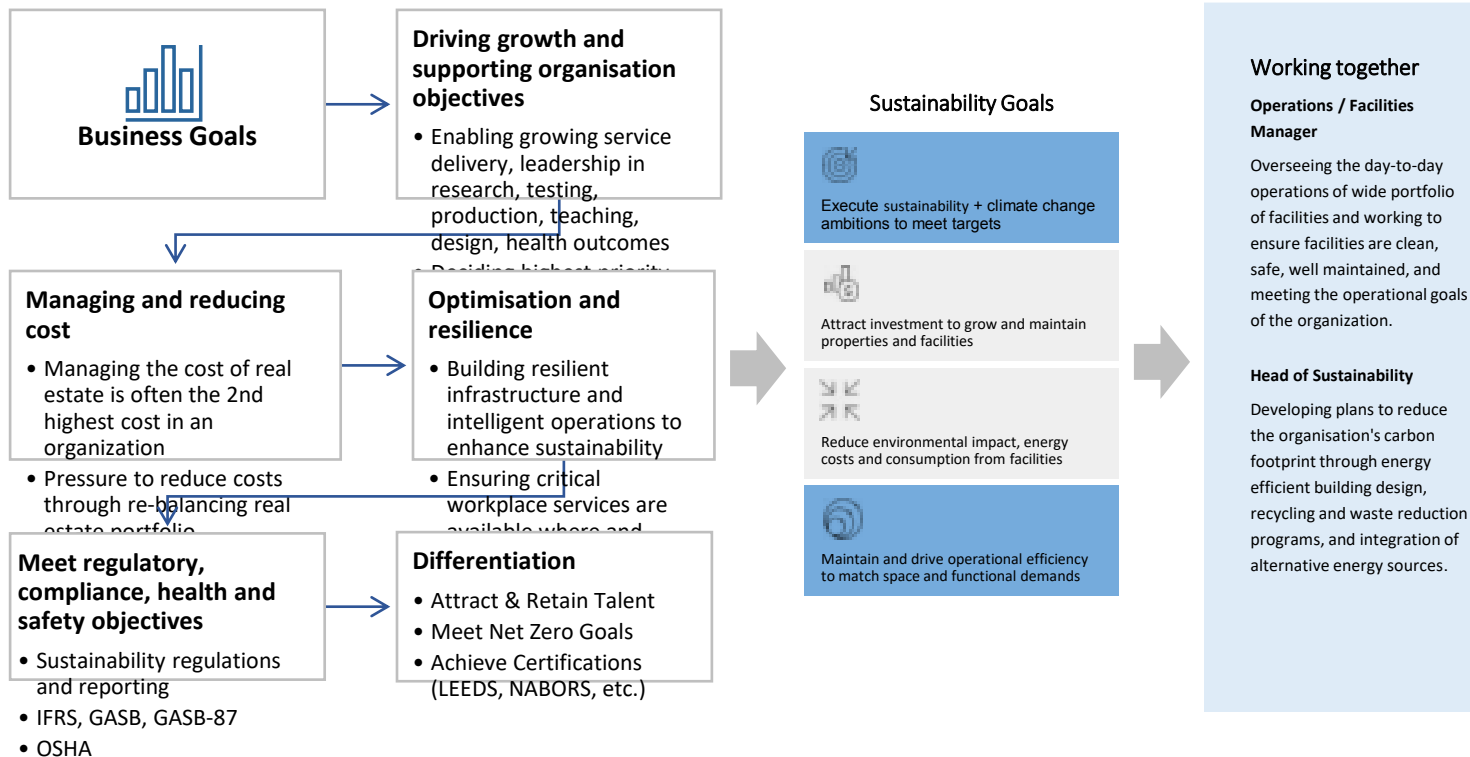
ESG Reporting Ecosystem

User	Technology	Measure	Analyse & Plan	Act & Adapt	Report & Comply

Growth ↑ **Existing Business**

Users:
- Sustainability Manager
- Finance Dir / Accountants
- HR / Line Managers / Employees
- Operations & Facility Managers
- Data Manager
- Supply Chain Partners

Technology:
- Reporting & Analytics (Envizi)
- Finance Systems
- HR Systems
- Operational Systems (Maximo / TRIRIGA)
- Data Hosting & Storage
- Connected Systems, Smart Edge IoT Devices

Measure / Analyse & Plan / Act & Adapt / Report & Comply (top band):

Measure	Analyse & Plan	Act & Adapt	Report & Comply
Create sustainability baseline from building, occupancy and environmental data	Analyse consumption, emissions and KPIs to benchmark performance and outliers		Streamline performance reporting to ESG reporting targets, baselines and frameworks
Maintain a single system of record for corporate sustainability data	Analyse decarbonisation opportunities and issues	Define organisational targets and improvement programs	Track and report on program performance

Second band:

Measure	Analyse & Plan	Act & Adapt	Report & Comply
Compare potential locations	Analyse facility evaluation criteria (sustainability, lease terms, utilisation, carrying costs,…)	Manage change to space usage and lease terms, identify inefficient space to be disposed	Facility performance reporting
Compare alternative sustainability improvement programs and projects	Prioritise environmental impact of project alternatives	Align and manage resources, schedules, and budgets to execute projects	Report environmental improvements as per regulatory requirements
Capture operational anomaly data	Investigate and perform root-cause analysis on asset condition and anomalies	Capture environmental impact from facility asset maintenance work	
Perform facility condition assessment and identify environmental opportunities	Score facility asset condition and tag sustainability impact	Optimise maintenance strategies to extend asset service life	

Infrastructure band:
Data Storage | Gateway, Proxy | App Services | Data Visualisation | Cloud Services | • Big Data • Analytics • Digital Twin

Bottom band:
Supplier System | IoT Devices

Right column: Carbon Reduction ↓ Targets

New and Emerging ESG Technology

Future Trends, Emerging Technologies and Innovations include:

- **Artificial Intelligence (AI) and Advanced Analytics**
  - AI-driven analytics will offer deeper insights into ESG data, identifying patterns and correlations.
  - Predictive analytics will become more sophisticated, aiding in proactive risk management and strategic decision-making.

- **Internet of Things (IoT) Integration**
  - Increased use of IoT devices for real-time environmental monitoring.
  - Integration of IoT-generated data for more comprehensive and accurate ESG reporting.

- **Blockchain for Enhanced Transparency**
  - Wider adoption of blockchain technology for secure and transparent ESG data storage and verification.
  - Blockchain's immutability will strengthen the credibility of reported ESG information.

- **Automated ESG Reporting Platforms**
  - Continued evolution of platforms that automate ESG reporting processes.
  - Integration with AI to enhance data accuracy and streamline reporting.

- **Quantum Computing for Complex Data Analysis**
  - Quantum computing's ability to handle vast datasets will revolutionise complex ESG data analysis.
  - Speedier and more accurate assessments of environmental, social, and governance data.

- **ESG Mobile Applications for Stakeholder Engagement**
  - Development of user-friendly mobile applications for stakeholders to engage with ESG information.
  - Enhanced transparency and accessibility for a broader audience.

Balancing Business Goals

Business Goals

Driving growth and supporting organisation objectives

- Enabling growing service delivery, leadership in research, testing, production, teaching, design, health outcomes
- Deciding highest priority

Managing and reducing cost

- Managing the cost of real estate is often the 2nd highest cost in an organization
- Pressure to reduce costs through re-balancing real estate portfolio

Optimisation and resilience

- Building resilient infrastructure and intelligent operations to enhance sustainability
- Ensuring critical workplace services are available where and

Meet regulatory, compliance, health and safety objectives

- Sustainability regulations and reporting
- IFRS, GASB, GASB-87
- OSHA

Differentiation

- Attract & Retain Talent
- Meet Net Zero Goals
- Achieve Certifications (LEEDS, NABORS, etc.)

Sustainability Goals

Execute sustainability + climate change ambitions to meet targets

Attract investment to grow and maintain properties and facilities

Reduce environmental impact, energy costs and consumption from facilities

Maintain and drive operational efficiency to match space and functional demands

Working together

Operations / Facilities Manager

Overseeing the day-to-day operations of wide portfolio of facilities and working to ensure facilities are clean, safe, well maintained, and meeting the operational goals of the organization.

Head of Sustainability

Developing plans to reduce the organisation's carbon footprint through energy efficient building design, recycling and waste reduction programs, and integration of alternative energy sources.

Integrating ESG Reporting into Operations

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For enterprises to grow while cutting emissions, they need a repeatable process to 'operationalise' sustainability

Growth

Existing Business

Measure

Identify most environmentally critical assets and the operational changes that provide the largest reduction of consumption and emissions.

Analyse & Plan

Link the environmentally critical assets to business goals for additional business benefits and return on investment. Create prioritized roadmap.

Act & Adapt

Prioritise and act on the largest consumption, emissions reduction and business benefit opportunities

Report & Comply

Achieve sustainability goals early while running your business more efficiently and effectively

Carbon Reduction

Targets

To support business growth while reducing emissions and energy, organisations need to Define the data they need, and implement technology solutions that Capture, Store, Assure, Analyse and Exploit the data.

Key Benefits of ESG Technology Adoption

The integration of technology in ESG reporting offers a myriad of benefits, ranging from improved accuracy and efficiency to enhanced stakeholder engagement and compliance adherence.

Enhanced Accuracy and Data Integrity

- Technology ensures precise data collection, reducing the risk of errors in ESG reporting.
- Automated processes enhance data integrity and reliability.
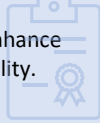
Efficiency and Time Savings

- Automated ESG reporting platforms streamline data collection, analysis, and presentation.
- Significant time savings allow for more frequent and timely reporting.

Real-time Monitoring and Response

- Technology enables real-time monitoring of ESG metrics.
- Organizations can respond promptly to emerging issues and trends.
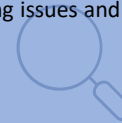
Comprehensive Data Analysis

- Advanced analytics provide in-depth insights into complex ESG datasets.
- Identifying trends and patterns contributes to informed decision-making.
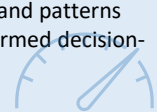
Improved Stakeholder Engagement

- Technology facilitates transparent and accessible communication of ESG information.
- Mobile applications and online platforms engage stakeholders effectively.

Cost Savings and Resource Optimisation

- Efficient use of technology leads to cost savings in ESG reporting processes.
- Resource optimisation ensures sustainability in reporting practices.

Enhanced Compliance and Reporting Standards Adherence

- Technology aids in meeting evolving ESG reporting standards.
- Ensures compliance with regulatory requirements and global frameworks.
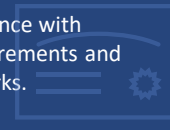
Unified System of Record

- Eliminate numerous systems and spreadsheets, while reducing reporting overheads.
- Improve transparency for all stakeholders across the organisation.

Challenges in Adopting ESG Technology

Data Quality and Standardisation
- Varied data sources and lack of standardised metrics can lead to inconsistencies.
- Ensuring data accuracy and comparability remains a persistent challenge.

Lack of Clear Reporting Standards
- The absence of universally accepted ESG reporting standards poses challenges for consistency.
- Organisations often face difficulties in aligning their reporting with diverse frameworks.

Integration of Non-financial Metrics
- Integrating non-financial ESG metrics with traditional financial reporting remains a complex task.
- Determining materiality and relevance of non-financial factors poses challenges.

Evolving Regulatory Landscape
- Rapidly changing and evolving ESG reporting regulations can lead to compliance challenges.
- Keeping up with regulatory updates and ensuring accurate reporting is a continuous struggle.

Stakeholder Skepticism and Greenwashing
- Stakeholders may question the authenticity of reported ESG information.
- Greenwashing, or the exaggeration of sustainability efforts, is a growing concern.

Limited Data Availability and Accessibility
- Some organisations may face challenges in obtaining relevant ESG data, especially in emerging markets.
- Limited data accessibility hinders comprehensive reporting.

Complexity in Scope and Materiality Determination
- Defining the scope of ESG reporting and determining material issues can be complex.
- Identifying what matters most to stakeholders and the business requires careful consideration.

Conclusion

- Technology plays a pivotal role in enhancing the accuracy, efficiency, and transparency of ESG reporting.

- The integration of technology in ESG reporting offers a myriad of benefits, ranging from improved accuracy and efficiency to enhanced stakeholder engagement and compliance adherence.

- Organisations leveraging technology effectively position themselves to thrive in the dynamic landscape of sustainable and responsible business practices.

- Successfully navigating the ESG reporting challenges requires a strategic approach, collaboration, and a commitment to transparency.

- Streamline ESG performance reporting targets, baselines and frameworks. Quality is more important than quantity. You can always add more metrics later.

- Addressing these challenges head-on is essential for organisations aiming to establish credibility and meet the growing expectations of stakeholders in the realm of sustainable and responsible business practices.

Questions & Answers

Coffee Break

Restart 11.00am

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The Modern Electronic Building 22 Bishopsgate

Robert Miles, Troup, Bywaters and Anders

TB+A / 22 Bishopsgate
November 2023

Contents

- Intro to 22BG

- FM Strategy Evolution

- Design for Performance / Management

- Intelligent Buildings

- BIM

- Digital Topology

- IoT

- DLM

- NZC

HV, MV, Generators & LV Systems

HV-33000v

KEY FACTS –
2 Number 15MVA Transformers.

Both supplies large enough to power the building independently

MV-11000v
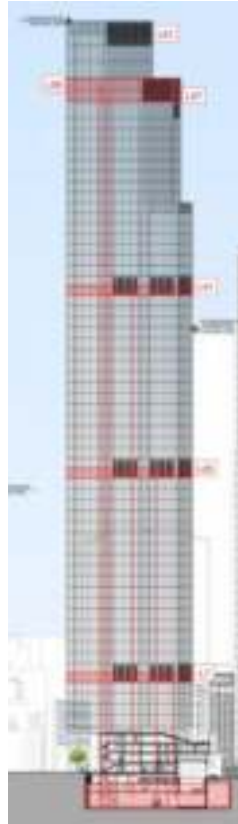
KEY FACTS –
14 Number 11KV/400V Transformers.

6No. MV panels.

1.5 mile of MV cabling

6 No. 2000 KVA Gen sets. 105 Tonne.

Fuel system with 10 separate tanks. 120,760 litres of diesel weighing 108 tonne. **Enough fuel for a car to drive to the moon and back twice @ over 1 million miles.**

90%+ load capacity of entire building load

GEN-11000v

KEY FACTS –
49 LV panels and automatic transfer switches

39 bus bar runs

594 Distribution boards

All tenants boards plug and play!

22 miles of LV cabling for sub-main supplies. Enough to reach Basildon from where you stand.

LV-400/230v
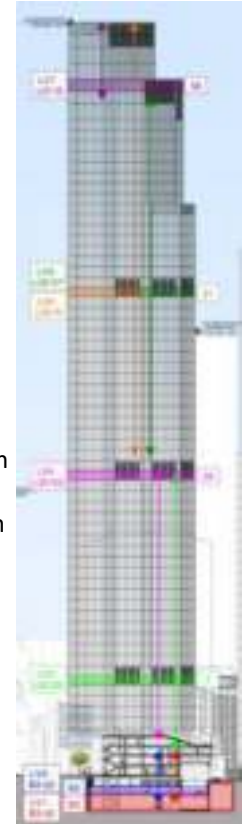
BMS & ICT Networks

BMS KEY FACTS –

BMS -
    No. of panels = 140
    32000 points picked up

CAT A (Tenants Spaces) -
Blind control =
    No. of blind controllers = **9000**
    No. of FCU's = **3300**

The BMS senses the FCU working at 100% duty, in turn the BMS shall close the blinds to reduce solar gain and reduce cooling/energy demand.

IT KEY FACTS –
The only network supplying all **NON** life safety systems reducing cable and signal management

2No. MER Rooms – B2 & L41
Dual fibre feeds too each network switch

System information:
    Number of panels = 81
    Number of outlets = 2558
    Quantity of cabling = 26 mile

IN OTHER WORDS THE LONDON MARATHON

Wi-Fi in for Landlord areas.
Location sensing tech for entrance lobby

FIRST PROJECT EVER TO OFFER UNBROKEN 4G SIGNALS WITHIN LIFT CARS!

Blown fibre tubing for tenants future data connections

Comfort Cooling & Heating

Chilled Water Schematic
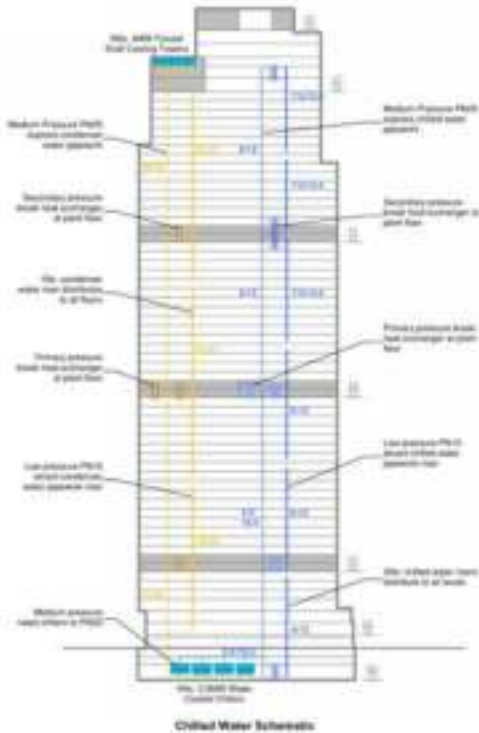
COOLING KEY FACTS –

Chilled water provided by 4No. 3.5MW chillers in B3.

The chillers are the equivalent of 1 million domestic fridge freezers and have the capacity to produce 4800 tonnes of ice a day.

Heat expelled by 5No. 4MW forced draft cooling towers on L58.

The cooling towers expel 150 litres of heat every minute. The same as a bath of water.

There is over 20 miles of chilled and condenser pipework installed holding over 350,000 litres of water, weighing in at 350 tonne.

HEATING KEY FACTS –

Heating is provided by 8No. 1MW high efficiency boilers and 3No. 250KW CHP (Combined Heat & Power) units.

This heating capacity is the equivalent of 300 houses combined.

There is over 20 miles of heating pipework installed holding 120,000 litres of water, weighing in at 120 tonne.

Heating Schematic
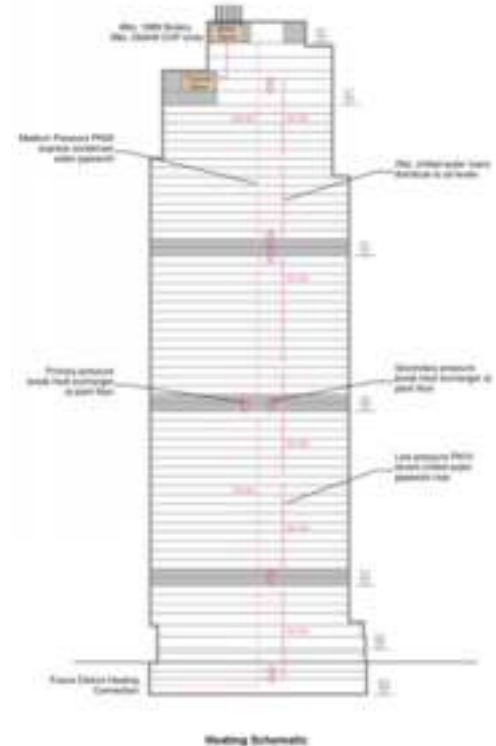
Ventilation & Water Services
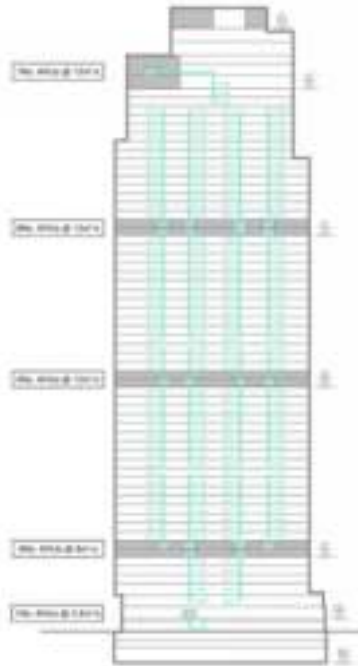
Primary Office Ventilation Schematic

VENTILATION KEY FACTS –

28No. Air handling units (AHU) and 27No. fans moving 500m³ of air per second at 12mph.

That is this area twice in air a second.

35 miles of ductwork total.

WATER KEY FACTS –

Water is provided by 3No. water tanks and a pumped-up service.

The floors are fed down from the tanks.

The tanks have the capacity of 233,000 litres, weighing 233 tonne.
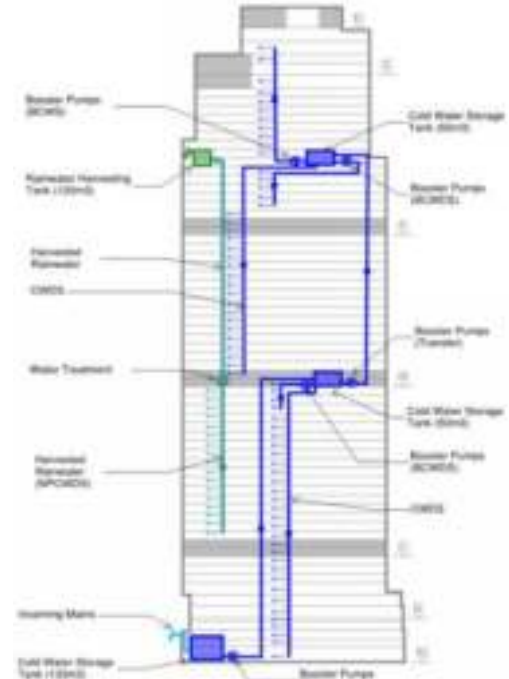
Domestic Cold Water System

Fire Suppression & Wet Risers

Sprinkler System
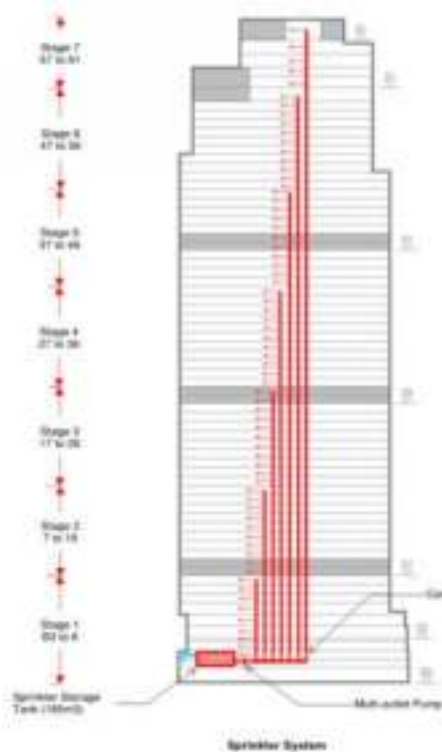
FIRE SUPPRESSION KEY FACTS –

2No. 200KW sprinkler pumps with 7 stage activation.

These are the largest multi stage pumps in Western Europe giving 34 bar pressure and 1350 litres per minute flow.

There are in total 20000 sprinkler heads.

The sprinkler tanks holds 185,000 litres of water, weighing in at 185 tonne.

WET RISER KEY FACTS –

The wet riser consists of 2No. Outlets on each floor for use by the Fire Brigade.

The system is split in two at level 25.

The wet riser is served by 2No. 135,000 litre tanks and pumps giving 8 bar pressure at the outlet and 1500 litres per minute.

At that rate our wet riser could fill 10No. Baths of water in under a minute.

Wet Riser System
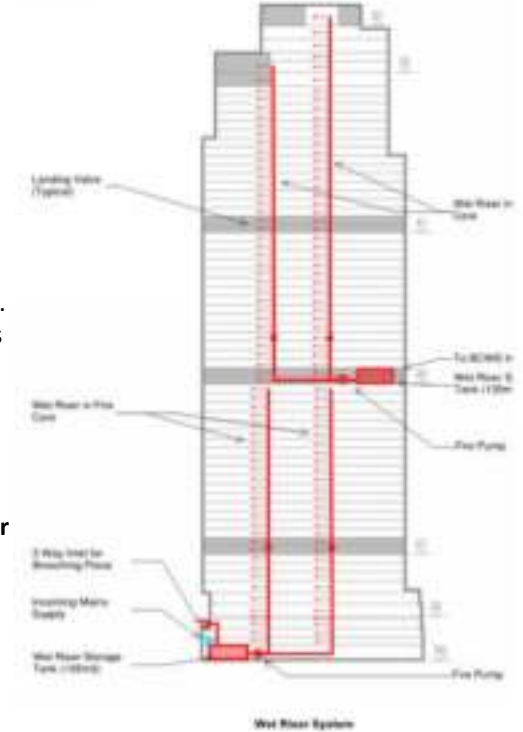
Evolution of FM Strategy from MEP Design Concepts

• Project life cycle

TROUP
BYWATERS
+ ANDERS
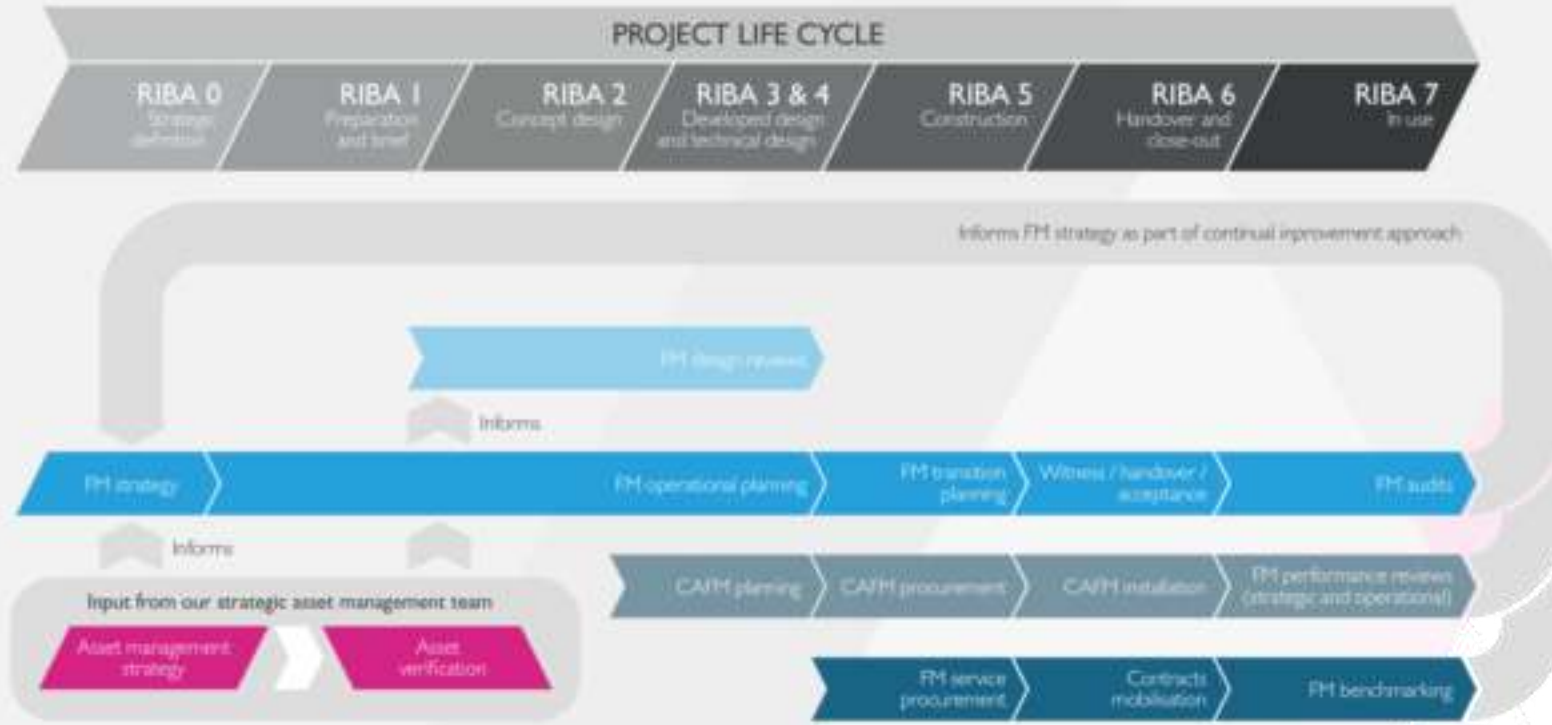
Designing for performance and management

Business as usual – high energy consumption, in excess of design predictions

Business operations and ESG align to SBTi or equivalent, sustainable governance applied to all capital works projects and operating buildings

Project design and performance KPIs set. These align to UKGBC/LETI net zero carbon EUIs

Soft landings process begins, FM team / professionals engaged
Concept energy modelling drives design of architecture, building services & building operating system (BOS)

CIBSE TM54 / NABERS UK (detail mechanical system modelling) & RICS BS EN 15978 LCA modelling begins
Modelling links to building service engineering, with particular regard for controls, BMS integration and performance capture

Metering, monitoring and BOS strategy finalised
Extended & advanced commissioning, soft landings requirements and performance validation specs drafted

Design for performance rated in tenders
Supply chain workshops focus on challenging delivery aspects

BMS set up, full commissioning & comprehensive training provided
Graduated handover, design KPIs reviewed

Design and construction professionals involved
Extended, advanced commissioning & seasonal commissioning

Building operators, FMs and building users engaged (POE)
Performance review targets – NABERS rating, CIBSE TM63

Monitoring of building operation & continued POE
Fine tuning for performance optimisation

UKGBC net zero aligned performance

It takes more than a good design to realise low energy, low carbon performance

Energy consumption

RIBA 0   1   2   3   4   5   6   7   7+1yr   7+2yr   7+3yr

Intelligent systems

The people within buildings determine the success of a building. The use of intelligent systems and smart technologies enhances the value we generate from our time indoors.

When people are placed at the forefront of design and operational decisions, we better understand their journey through a building and as such which intelligent systems and smart technologies can be leveraged to add value to their lives. Your real estate digitisation process starts with broad stakeholder consultations which captures the breadth of people's needs and subsequently maps out the potential digital journey.

This people centric approach sets out your brief for your digitalisation and defines a hierarchical technology architecture that works for you. This leads to a set of performance specifications which enable a robust procurement process.

A Harvard business review conducted in 2019 determined that employees who are satisfied with their work environments are 16% more productive, 18% more likely to stay and 30% more attracted to their company over competitors.

TROUP
BYWATERS
+ ANDERS

User Experience

UX Values

Our research has identified six values that help to define end user benefit and to measure it against meaningful technological solutions.

We believe these values reflect commonalities across all user groups and can therefore help to define the basis for designing built in technologies and use cases. These are

Speed	Users seek to be quicker and more productive
Simplicity	IB interactions are intuitive and Seamless
Responsive	The environment needs to be adaptable and respond to users needs
Connected	Users want to be connected to people and things
Inspiring	Users want to receive moments of awe and wonder
Nurturing	Users want to feel cared for with improved wellbeing

User Experience

Experience Categories

Furthermore, our research has identified six experience categories. These qualified experiences help to define tangible outputs for the built environment.

Access — Users wish to intuitively gain access to spaces, services and information that they are permitted to

Find — Describes interactions that support users in finding and booking spaces, services and people

Restore — Improve access and connection to building and organizational services that enable users to rest, recharge and restore

Control — Enable users to control and feedback to their environment, helping users create space for themselves and their needs

Focus — Describes facilities and interactions that aid building users to focus on their tasks at hand

Maintain — Enable the building operators and facility managers to gain a deeper understanding of their space and provide informed oversight of the work carried out in the building

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+ ANDERS

Building information Modelling in use Post Occupation

Landlords full Model

Chiller detail

Physical Chiller O&M data

CAT B Model

CAT B FCU
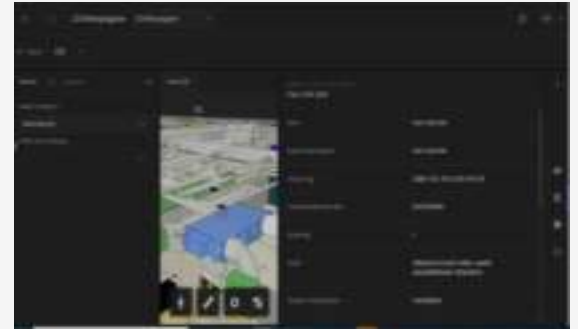
CAT B FCU detail & O&M data

BIM is More Than a 3D Model
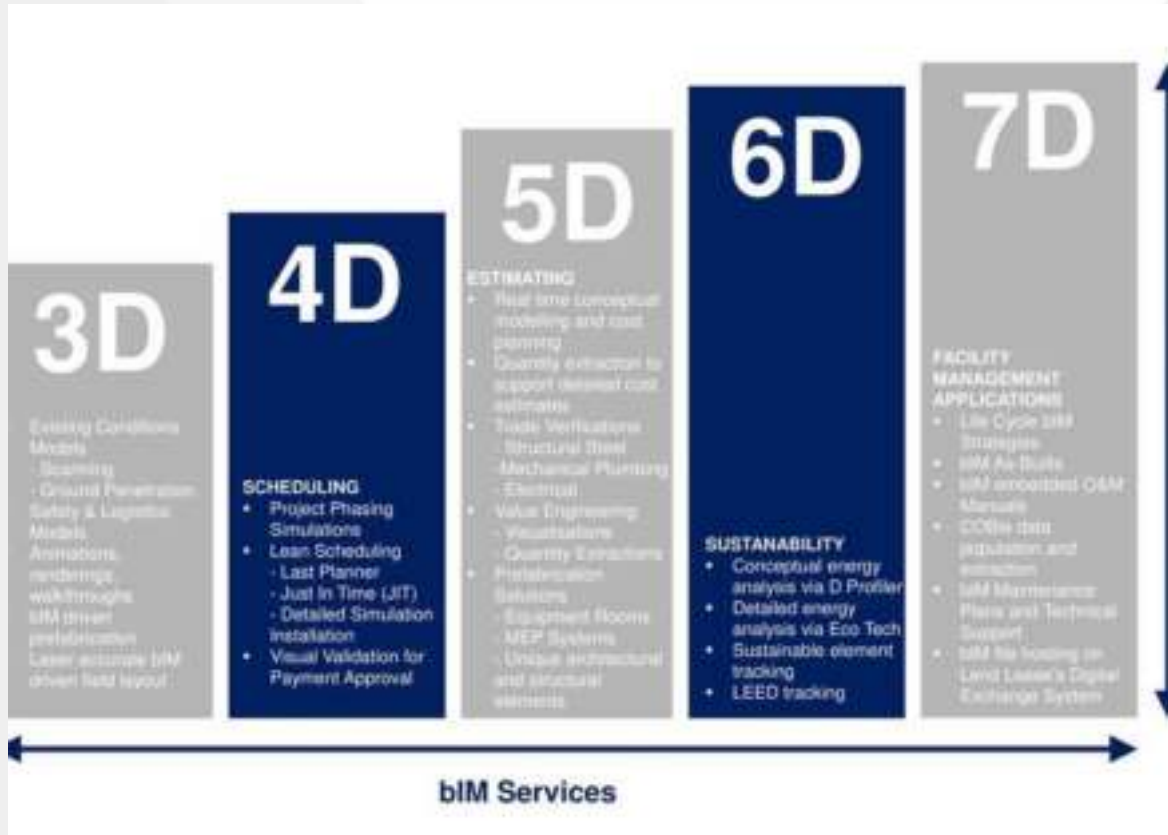
- BIM Level 3 is an integrated working method using a common data environment (CDE), which enables better collaboration and model evaluation irrespective of the software solution used by each team member. This is effectively your working model and takes the project up to stage RIBA stage 6 .

- For the remainder of the assets 20 /30-year lifecycle we need to innovate.

- 7D BIM basically comprises 3D + time schedule + cost intelligence + sustainability. In the occupied phase we make use of 7D building information modeling in the maintenance and operation of a project throughout its entire life cycle.

The Digital World

CAFM

Energy Monitoring Platform

FDD Fault Rule
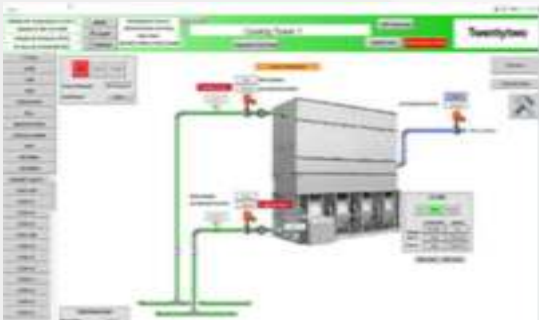
BMS

O&Ms

CbM Dashboard

Building Applications
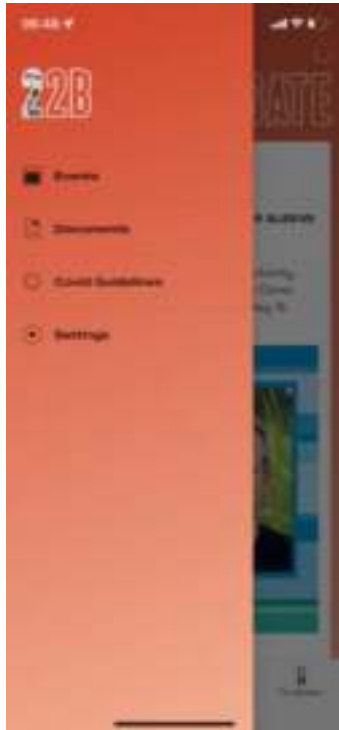
Building App

Social Wall

Booking Visitors

Access

iwfm

Building Application Continued

Hospitality
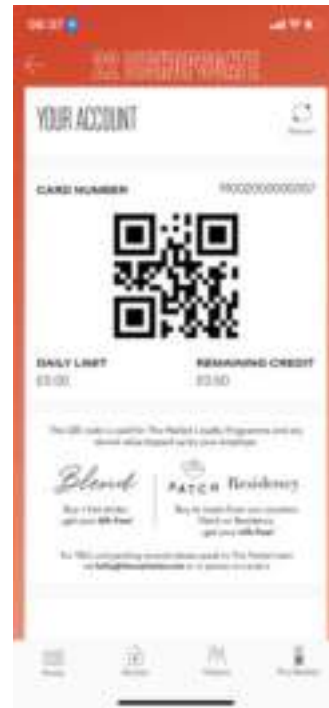
Pay for services

Events

Guidance

iwfm
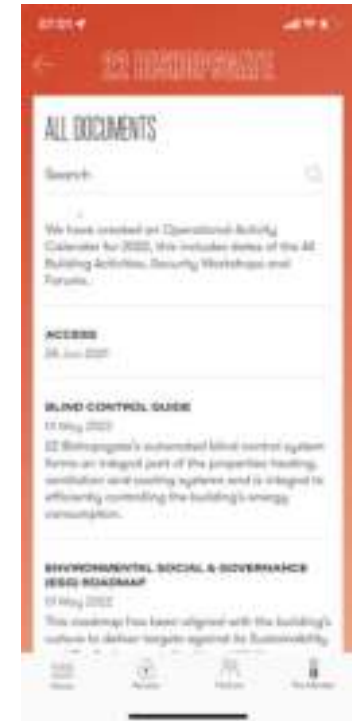
IoT Intelligent Building Technology Deployment Examples

- Tri-axial accelerometers CBM sensors such as the WISE -24100

- LoRaWAN wireless condition monitoring sensor enables continuous monitoring of vibration and temperature.

- Informs maintenance strategy. Move away from TbM to CbM

- HTM approved. Compliments HSG274 / BG50

- Monitors with bi-directional communication capability.

- Connectivity in all scenarios -

- Network Redundancy & Secure Private APN or can connect to IoT WiFi

- Improves L8 Risk profiling

- Can inform closed circuit performance. Acts as continuous commissioning protocol

- Sontay Duct Mounted IAQ. Sitting directly on house BACnet but just as viable as IoT

- PM 2.5/10PPM

- Co2

- TVOC

- %RH

- Temperature

- RESET approved. Being used to satisfy WELL accreditation

Intelligent Building – Inputs & Outputs

Inputs

Digital twin

Value

Inputs:
- Carbon embodied/operations
- Energy use
- Water Temperature
- Motor temperature
- Pump Temperature
- Hours run
- Reactive maintenace history
- Statutory maintenance requirement
- Bearing temperature
- Vibration sensor
- Suction/discharge pressure
- Location
- Design specification
- Costs opex/capex
- Commissioning data
- Raring/duty
- O+M's/drawings etc

Digital twin:
- EMS
- BMS
- CAFM
- BA/FDD
- BIM
- CDE

Value:
- Improved asset performance
- Reduced operational costs
- Predictive maintenance strategy
- ESG reporting
- Real-time energy and carbon reporting
- Reduced risk
- Occupier heath and wellbeing
- Improved comfort and quality
- Increased productivity
- Automated user defined reports
- Increased compliance
- Informed decision making
- Higher performing building
- Increased asset value
- Continuous improvement
- Improved process and workflow
- Whole life cycle costing
- Increased asset uptime

Building Operating System

Data-led, Performance Based Asset Management

VALUE CREATION

ASSET MONITORING & HEALTH
Real-time data on individual assets is displayed

CONDITION - BASED MAINTENANCE
Parameters are established and intelligent alerts are generated

PERFORMANCE - BASED MAINTENANCE
Parameters are processed & optimal performance ranges are defined

PREDICTION - BASED MAINTENANCE
Models predict when an asset will fail

Maintenance planning is automated & execution enhanced by digital technology

Continuous Performance

Corporate Strategy and Objectives

Asset Management Policy

Asset Management Strategy

Design for Performance
+ Aligns with corporate objectives
+ Strives for restorative and regenerative outcomes
+ Positively impacts people and nature

Design for Management
+ Utilisation – smart and flexible solutions
+ Bridges performance gap between design and operation
+ SMART enablement

Operate to Perform
+ Outstanding asset performance
+ Achieves critical success factors
+ Data driven solutions and decision making

Performance Monitoring, Measurement, Analysis – Driving Continuous Improvement

Strategic KPI's

Tactical KPI's

Operational KPI's

Sustainable, net zero carbon performance, starts at design and does not end

RIBA Plan of Work 2022	0 Strategic Definition	1 Preparation and Brief	2 Concept Design	3 Spatial Coordination	4 Technical Design	5 Manufacturing and Construction	6 Handover	7 Use
BSRIA Soft Landings	Inception and Briefing		Design			Construction	Pre-Handover	Initial Aftercare / Extended aftercare and POE

Design for Performance

Design for Management

Operate to Perform

Early-stage design input is as impactful as managing to perform (operational energy)
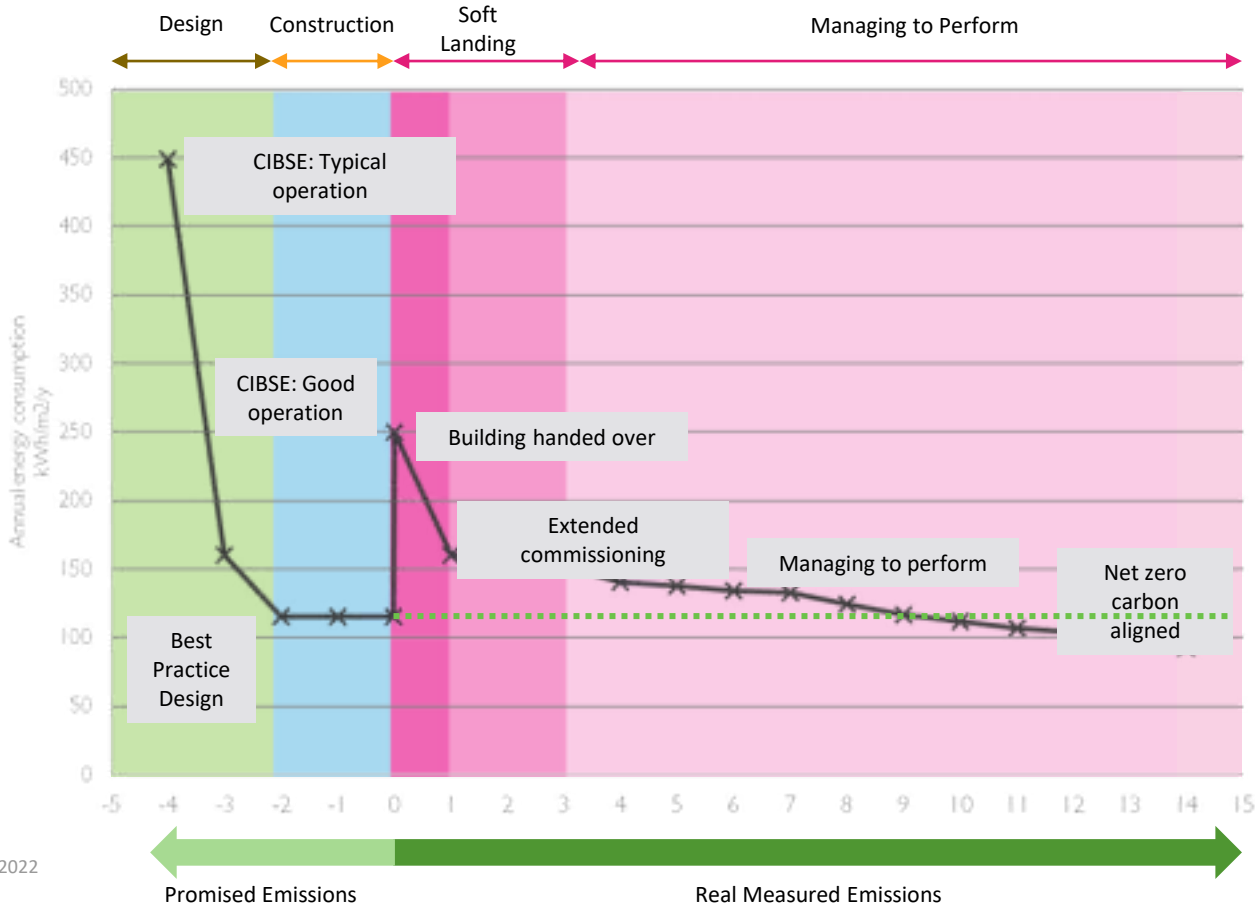
"*You do not rise to the level of your goals. You fall to the level of your systems*"

James Clear

twfm

TROUP
BY WATERS
+ ANDERS

High-performing partnership
Higher performing buildings

Thank you for your time

The Ethics of Using AI in FM

Gordon Mitchell, WHOLUS and IWFM Technology SIG Chair

iwfm

SOUTH WEST REGION

Trustworthy AI in Facility Management

Agenda Today

Trustworthy AI in Facility Management
- A Strategic Overview
- Robustness
- Reliability
- Resilience
- Controllability
- Predictability
- Bias and Fairness
- Verification and Validation
- Jurisdictional Challenges
- Society

Gordon Mitchell
WHOLUS iESG Co-Founder

- IWFM (Institute of Workplace and Facilities Management) Technology SIG Chair
- ISOTC267 - WG6 (Digital Data and Technology) Convenor
- CENTC348 WG6 (Space Measurement integrating BIM) Convenor Support
- BSI (British Standards) FMW/01 (Digital Standards Group
- BSA (Building Safety Alliance) SIG3 (Golden Thread) Chair
- Building SMART International FMOpenBIM steering Group
- BE-ST (Built Environment - Sustainability Technology) Scottish Innovation Centre Governance Board Member

Trustworthy AI in Facility Management: A Strategic Overview

In facility management, ensuring AI trustworthiness is key, focusing on design and validation standards, stakeholder benefits, compliance with legal and sectorial standards, clear accountability, and regional considerations. These elements are crucial for AI's reliability, functionality, and alignment with stakeholder objectives.

Trustworthiness in AI for facility management professionals hinges on several pivotal aspects.

- AI systems must adhere to the latest design and validation standards, ensuring reliability and safety in critical operations.
- They should be developed with stakeholder objectives in mind, emphasizing transparency and benefits for users.
- Compliance with legal and sector-specific standards is non-negotiable, particularly given the sensitive nature of facility data and infrastructure.
- Additionally, clear accountability for AI operations and adaptability to regional / community variations are essential.

These factors collectively ensure that AI applications in facility management not only boost operational efficiency but also meet ethical, legal, and practical requirements.

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AI Robustness: Ensuring Performance Under Pressure

Robustness in AI systems is their ability to perform consistently as intended, despite challenging conditions. It involves resilience and reliability, and is crucial for maintaining safety. Training with extensive, noisy data can enhance an AI's robustness, allowing it to handle atypical inputs and maintain performance within an acceptable range.

- Reliable AI ensures consistent performance of building management systems across various functions like energy, security, and maintenance.
- It guarantees correct system responses to both expected and unforeseen inputs throughout its operational life.
- AI reliability is crucial for the safety and efficiency of facility operations, affecting both property and people.
- Redundancies such as system backups are key to maintaining service continuity in case of AI component failures.
- Trust in AI by facility managers hinges on the technology's proven reliability for safe, efficient, and uninterrupted facility services.

WHOLUS

AI Reliability: Ensuring Predictive Precision and Decision Consistency

AI reliability is the system's capacity to deliver accurate predictions, recommendations, and decisions during its operational life. It depends on robustness, generalizability, consistency, and resilience, ensuring AI processes inputs correctly, supports functional safety, and remains dependable, even when encountering varied or unforeseen data.

- AI reliability in facility management ensures critical systems like HVAC, lighting, and security operate accurately over time.
- It requires AI systems to handle diverse inputs and environmental conditions without deviation from expected performance levels.
- Robust AI backups are essential, providing fail-safes that maintain operations during system disruptions.
- Reliable AI systems support the functional safety of a facility, activating necessary protections automatically during anomalies.
- Facility management depends on AI's consistent decision-making abilities to optimize operations and maintain safety standards.

AI Resilience: Adapting and Recovering from Operational Disruptions

AI resilience is the system's ability to swiftly regain functionality after disturbances. It encompasses fault tolerance, allowing continued operation, albeit with possible limitations, during disruptions. Resilience is distinct from reliability, with potentially reduced service levels post-incident as predetermined by stakeholder requirements, including strategic recovery protocols.

- AI resilience in facility management ensures essential systems quickly recover from incidents, minimizing operational downtime.
- Fault tolerance within AI allows facility systems to maintain functionality during failures, ensuring critical operations like security and environmental controls persist.
- Resilient AI systems can operate at a degraded level, which stakeholders might deem acceptable in crisis scenarios to maintain core functions.
- Distinguishing between reliability and resilience, facility management may prioritize systems that guarantee basic services during disruptions.
- Recovery strategies are integral to resilient AI, enabling facilities to restore full operational capabilities systematically post-incident.

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WHS Solutions

AI Controllability: Steering the System with Precision Intervention

AI controllability is the system's ability to be directed or influenced by an external entity. It ensures that responsible agents can override or guide the AI's operations through reliable intervention mechanisms, determining who can control specific aspects of the AI's functionality.

- AI controllability in facility management allows operators to manually override automated systems for tailored responses to unique situations.
- It provides facility managers the assurance that they can intervene in AI operations, enhancing accountability and operational safety.
- Defining control hierarchies ensures clarity on which staff or regulatory body can intervene in different AI system components.
- Reliable intervention mechanisms are crucial for emergency situations where human decision-making is paramount.
- Controllability supports compliance with regulations, allowing designated authorities to direct AI systems within legal frameworks.

AI Predictability: Ensuring Reliable Outcomes for Stakeholder Confidence

AI predictability allows stakeholders to anticipate system outputs confidently. Essential for ethical considerations and trust in AI, predictability is about consistency in performance rather than specific predictions of behavior, achieved through objective measures and statistical assurances of the system's accuracy and appropriate responses.

- Predictable AI helps facility managers anticipate system behavior, fostering trust in automated management processes.
- Objectively measurable criteria are used to establish AI predictability in critical systems like fire safety and emergency responses.
- Statistical assurances of AI behavior underpin risk assessments and contingency planning in facility operations.
- Improving accuracy in AI predictions reduces unexpected outputs in managing utilities and resources.
- Predictable AI systems support ethical facility management practices by ensuring transparency and reliability in decision-making.

AI Bias and Fairness: Striving for Equitable Machine Learning Outcomes

AI bias refers to the necessary distinctions AI makes to adapt to different situations. However, unfairness arises when AI unjustly benefits certain groups, often due to data or cognitive biases. Addressing this requires recognizing and mitigating unintended biases to ensure equitable and discrimination-free AI decisions.

- Bias in AI can affect facility management systems, leading to unequal service delivery or resource allocation.
- Ensuring fairness in AI systems is crucial to maintain trust among facility users and stakeholders.
- Regular audits of AI decision-making processes help identify and correct unfair biases in facility management applications.
- Data used in AI systems for facility management should be representative and free from historical biases.
- Facility managers must be aware of bias in AI to prevent discriminatory practices in areas like energy distribution or space utilization.

AI Verification and Validation: Certifying Systems for Reliability and Relevance

Verification and validation are critical processes in AI to ensure systems are built correctly and fulfil their intended purposes. Verification checks if AI meets specified requirements, while validation confirms it serves its intended application, with some systems being fully verifiable and others only partially or not at all.

- Verification ensures all components of an AI system in facility management meet design and operational specifications.
- Validation confirms that the AI system performs reliably in real-world facility management scenarios.
- Complete system verification is ideal, allowing for comprehensive checks on all components within facility management systems.
- Partial system validation may be employed for complex AI applications where individual component verification isn't feasible.
- Systems that are unverifiable require robust validation processes to ensure they still meet the overall functional needs of facility management.

Navigating AI Jurisdictional Challenges: A Global Compliance Strategy

AI systems often cross borders, encountering varied legal landscapes. Developers must navigate differing international and UK laws for data handling and system functionality. Adherence to local regulations is essential for legal compliance, requiring a proactive approach to track and meet diverse jurisdictional requirements for AI deployment and operation.

- Facility management systems using AI must comply with specific legal standards of the UK and international jurisdictions where they operate.
- Legal variations may require adaptations in data collection, usage, and disposal methods for internationally deployed AI systems.
- Proactive planning is needed to ensure AI systems in facility management adhere to local regulations across borders.
- Continuous monitoring of legal compliance is essential throughout the lifecycle of AI systems in facilities.
- Flexible design and operational strategies enable AI systems to adjust to the dynamic legal requirements of different jurisdictions.

AI and Society: Evaluating Risk in Technological Deployment

The societal impact of AI systems is assessed by their risk potential, influenced by factors like autonomy, supervision, ethical considerations, transparency, and the degree of automation. High-risk scenarios include unsupervised AI with opaque decision-making in ethically sensitive domains, necessitating rigorous standards and policies beyond basic impact analysis.

- Facility management AI systems are assessed for societal risk based on their operational scope and impact potential.
- Systems with manual oversight in ethically charged areas, like resource distribution, are managed to mitigate risk.
- Transparent decision-making processes are critical for AI systems affecting facility safety and occupancy.
- High automation levels in AI systems controlling essential services require rigorous external supervision protocols.
- Legal and ethical standards guide the implementation of AI in sensitive areas of facility management, such as accessibility and emergency response.

THANK YOU!

WHOLUS iESG

 Gordon Mitchell

 https://www.wholus.com

 gordon.mitchell@wholus.com

* Scan for a free download copy of ISO/IEC 22989:2022

Lunch

Back at 1.30pm

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Welcome Back…

1.30pm – 2.00pm
Live Demonstration – A drone doing real time visual inspections with intelligent analysis of video
Mike Edwards, Head of Business Development, Herotech8
Paula Lloyd, Pre Sales Consultant, MACS EU Ltd

2.00pm – 2.30pm
Automated Drone Infrastructure – OpenAir Drone on Demand.
Mike Edwards, Head of Business Development, Herotech8

2.30pm – 3.00pm
Visual inspection – intelligent computing for finding defects
Paula Lloyd, Pre Sales Consultant, MACS EU Ltd

E-brochure

iwfm

Live Demonstration- Drone Pass With Video Analysis

Mike Edwards, Herotech8
Paula Lloyd, MACS EU Ltd

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SOUTH WEST REGION

Automated Drone Infrastructure – OpenAir Drone on Demand

Mike Edwards, Herotech8

Visual Inspection – Intelligent Computing for Finding Defects

Paula Lloyd, MACS EU Ltd

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SOUTH WEST REGION

Agenda

▶ Introduction

▶ Overview of MACS

▶ Introduction to Maximo Application Suite

▶ Maximo Visual Inspection

▶ Case study

▶ Q&A

We are MACS

MACS

IBM Platinum Business Partner	**110+** employees	**170+** customers	**10** offices in Europe & Africa
3 project methodologies	**6** supported languages	**3** data centers	**> 900** certifications
1998 year of establishment	**> 30** Maximo courses on offer	**> 450** Interface implementations	**TCL** ISO 9001 **TCL** ISO 27001 CYBER ESSENTIALS PLUS — web security certified

Our Customers

MACS

Maximo Visual Inspection

Fast, Easy, and Accurate AI

Key capabilities

Ingest — Label
Deploy — Train

Client examples

SMART Modular Technologies

ADNOC

HITACHI

Harry Butler Institute
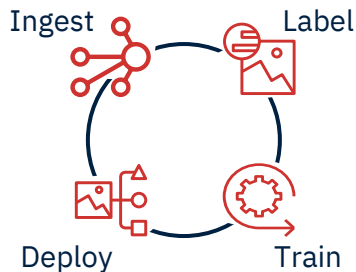
Oxford Cancer Biomarkers

Key benefit

▶ Point-and-Click AI Model building

▶ Process Automation

▶ AI-Powered Insights at scale

▶ Real-time Quality Assurance "Error Proofing"

▶ Improve efficiency & performance of Assets

Manage	Monitor	Health	Predict	Visual Inspection	Schedule	Mobile	Assist	Safety
Intelligent Asset Management	Monitor and Detect Anomalies	360 View of Assets	Predictive Failures	AI-Powered Insights	Schedule Work and Resources	Technician Work Execution	Prescriptive Assistance	Actionable Insights for Worker Safety

Maximo Application Suite
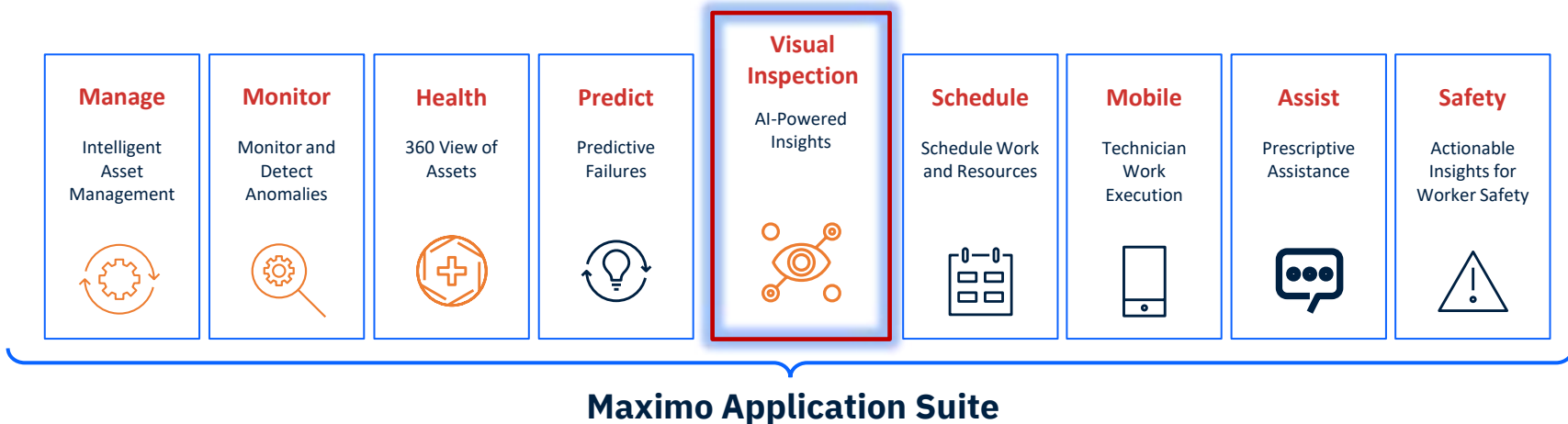
IBM Maximo Application Suite (MAS)

A single, integrated, hybrid cloud-based platform

Visual Inspection
AI-powered insights

Predict
Use data to predict failures

Monitor
Manage and detect anomalies

Health
Manage Health

Manage
Understand and manage maintenance

Digital Twin
1-click download

MACS

Case Study…

MACS
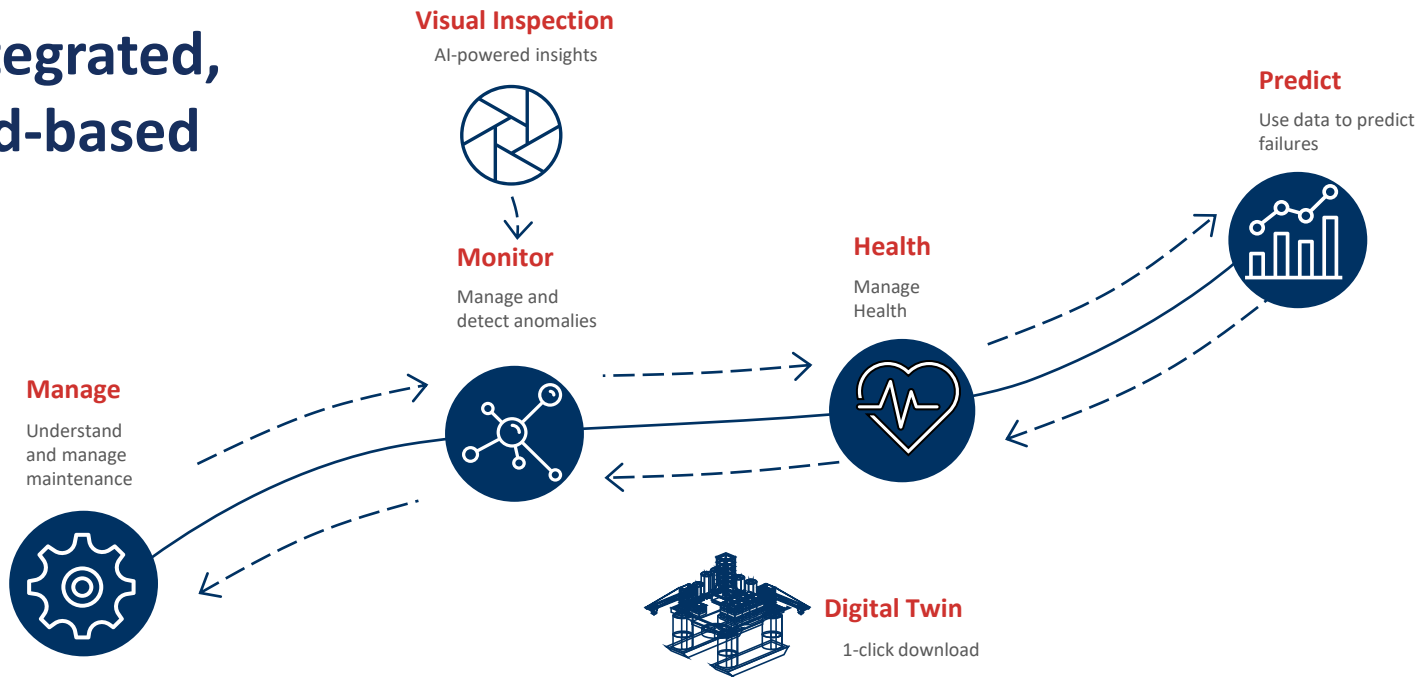
The Path to Value – Asset Management

MACS

Catch failures sooner and prevent failures

Increase first-time fix rate and improve mean time to repair

Labor costs savings by auto-detection

Increase revenue

▶ Decrease unplanned downtime
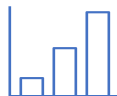
▶ Increase first-time fix rate and improve mean time to repair

▶ Labor costs savings by auto-detection of asset condition

▶ Increase revenue

10% **15%** **30%** **By millions £**

How to train a Model
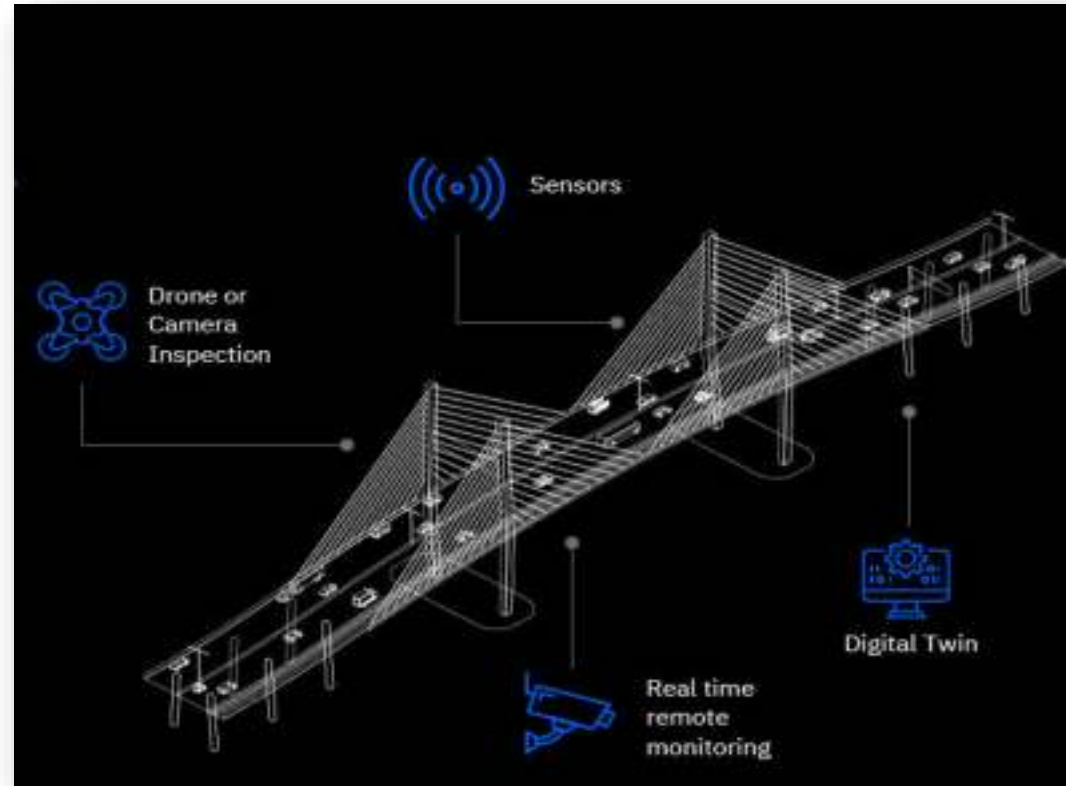
There was a time when a **3 year old** could spot a bird better than a computer…

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Maximo Visual Inspection Dashboard
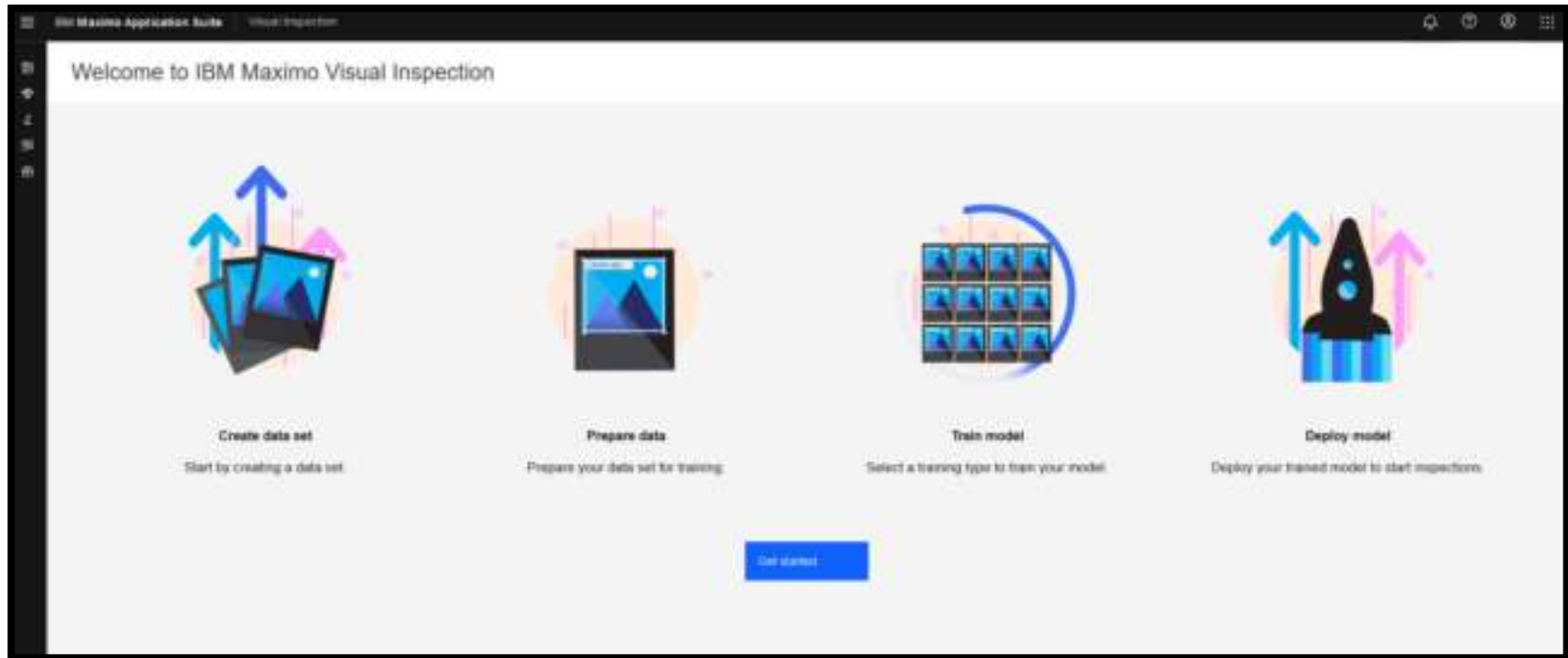
Training a Data Set
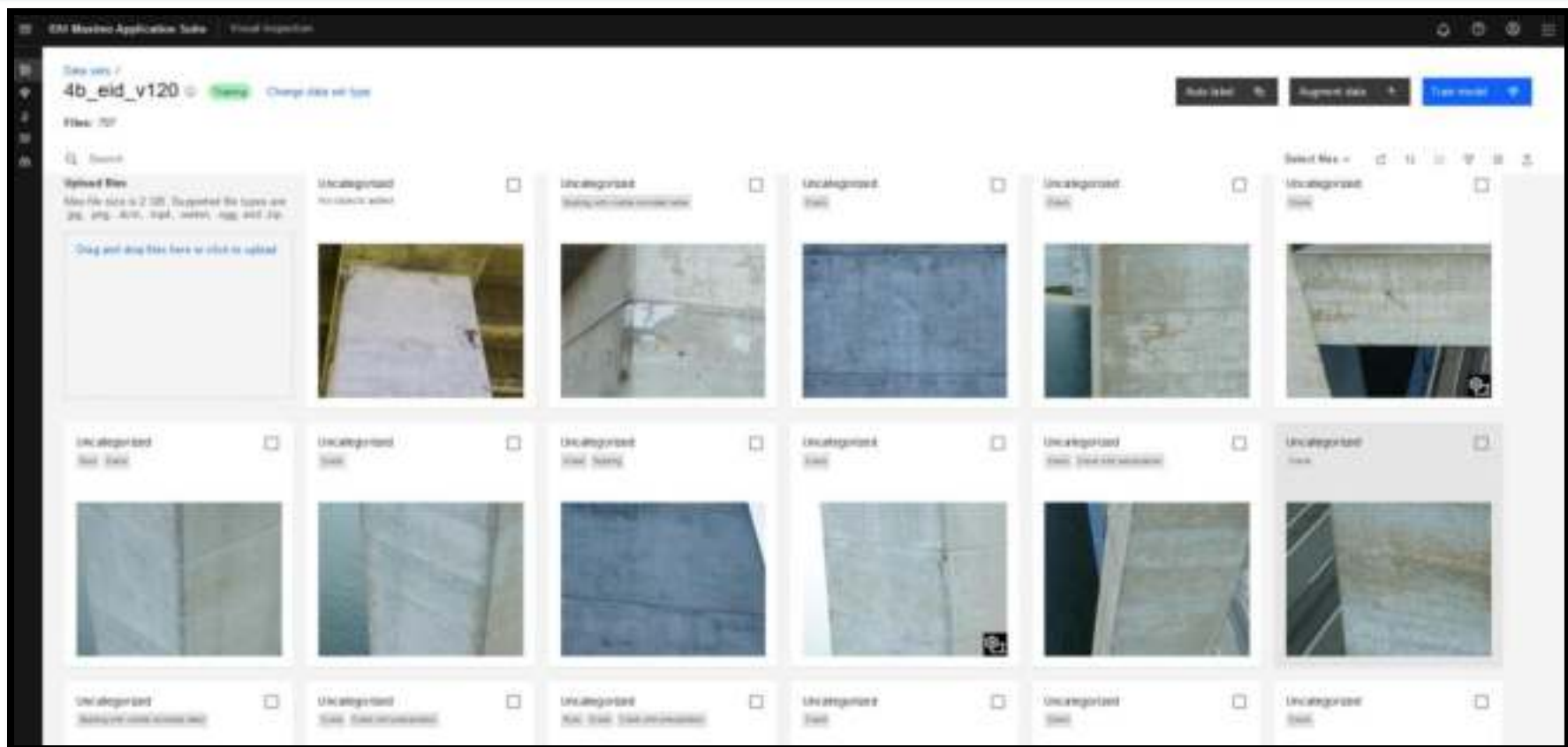
Label, Train and Deploy
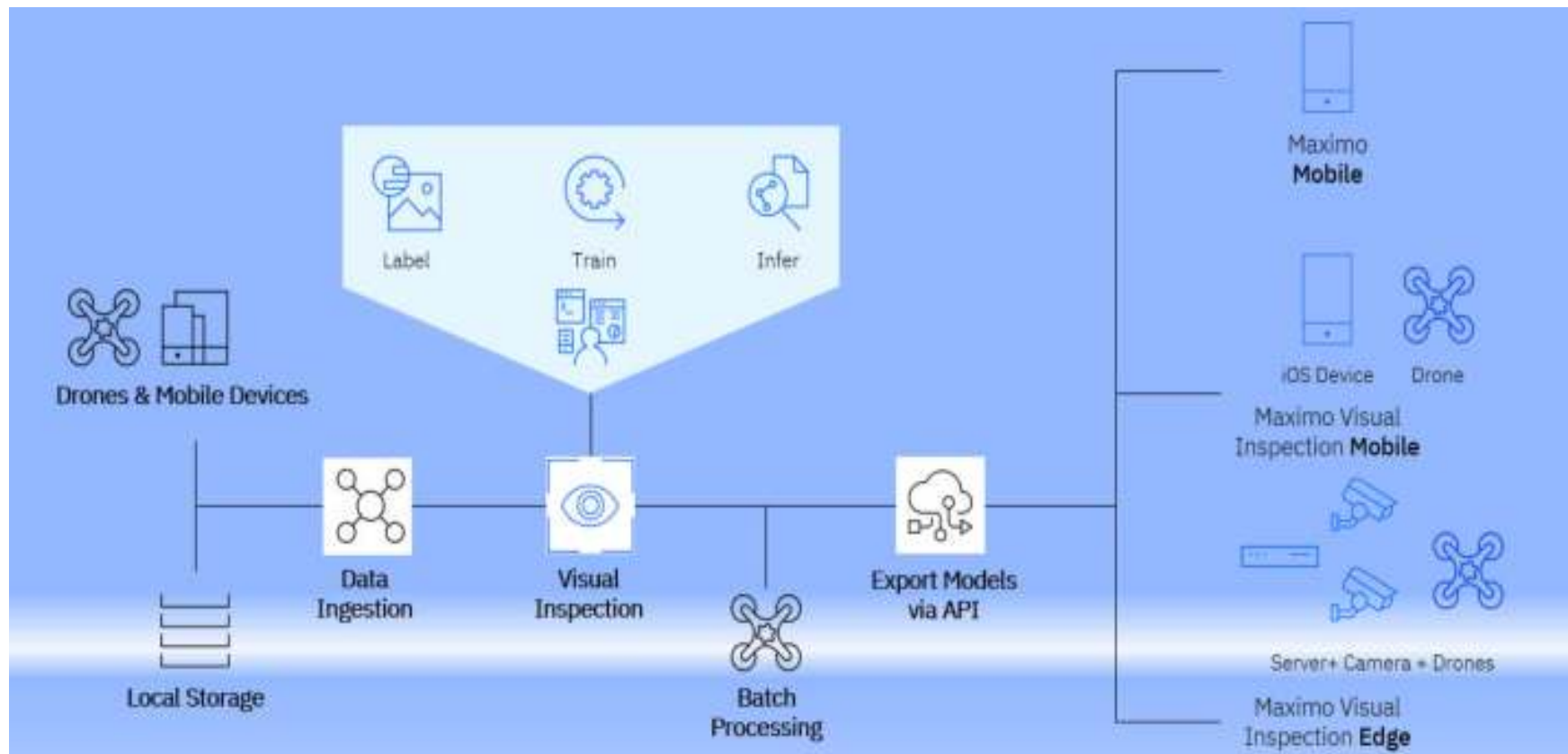
Training Data set for the first set of pictures
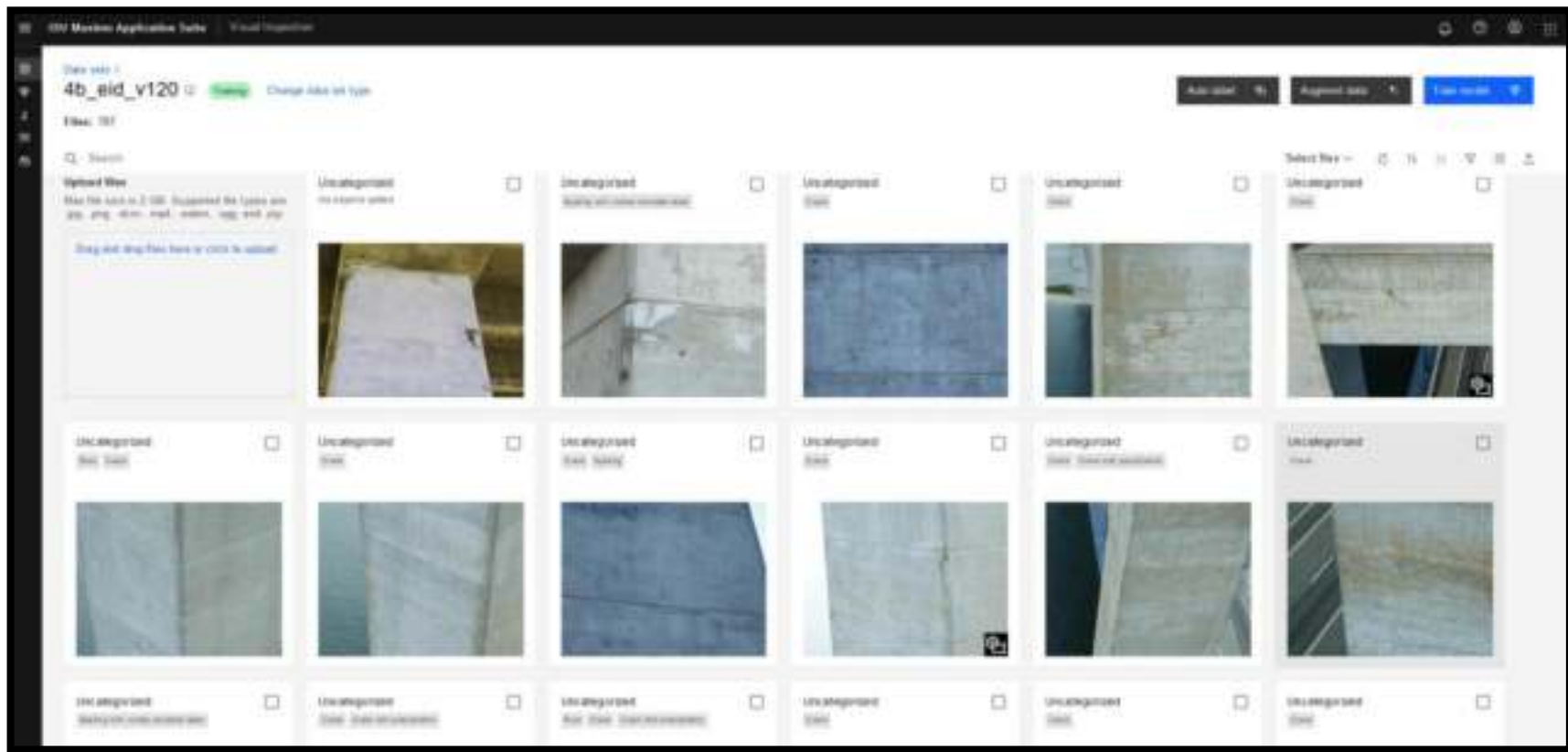
Clasifying Maximo Visual Inspection Models

Object Detection
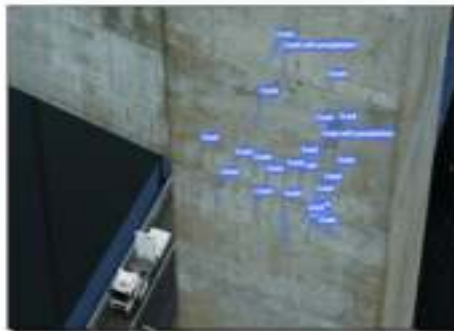
High Resolution

Image Segmentation

Anomaly Detection
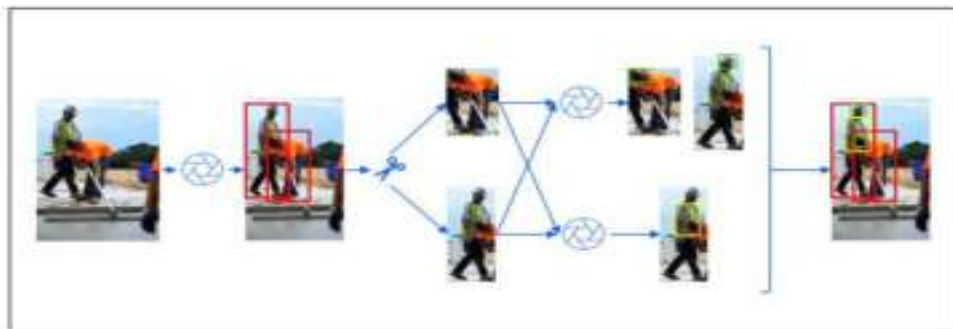
Composite models

Good practices

TinyYOLOv3 and FasterRCNN are smaller or faster but may not have the best accuracy. Since training is only done once, its best to use the model that achieves best accuracy.
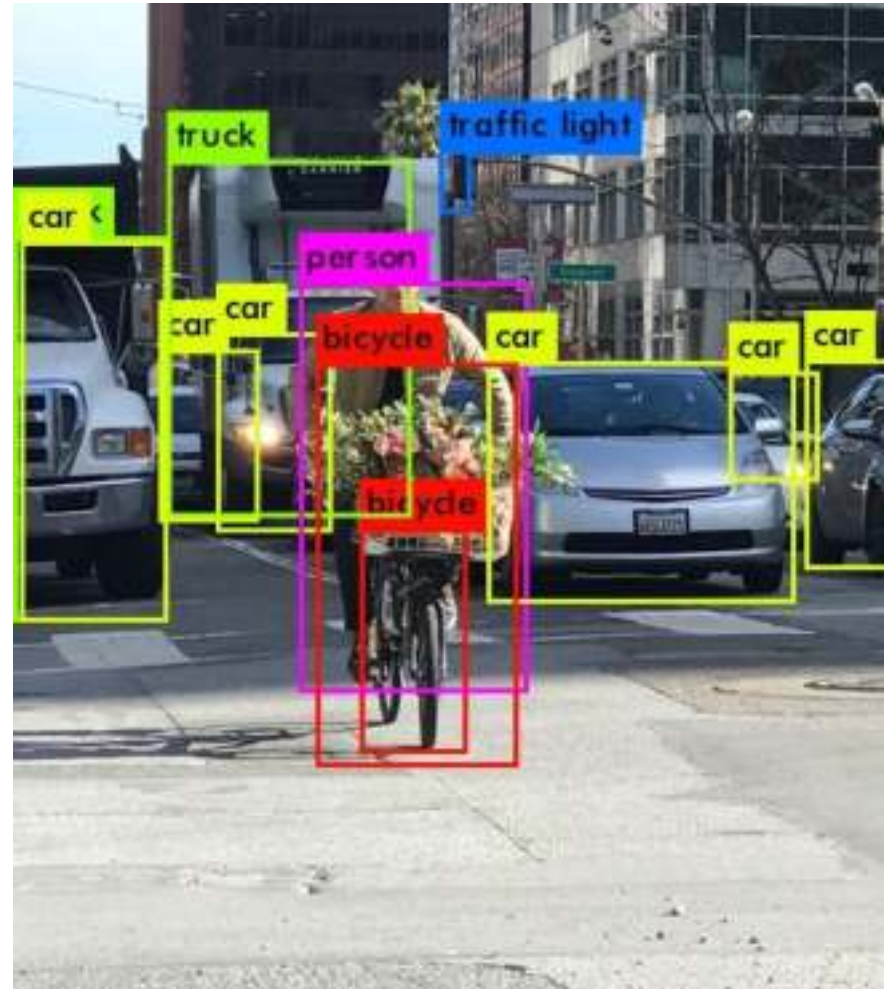
QUESTIONS & ANSWERS

Product information

- IBM Maximo Visual Inspection Overview
  - https://www.ibm.com/products/maximo/visual-inspection

- IBM Maximo Visual Inspection Documentation
  - https://www.ibm.com/docs/en/maximo-vi/continuous-delivery

MACS

Thank you for listening!

Contact us:

www.macs.eu   @MACS_EU

info@macs.eu   MACS

+44 (0)20 8432 7432   MACS

MACS

IBM
Platinum Partner

Technology Innovations for FM

3.00pm – 3.15pm
Annual General Meeting

3.15pm – 3.30pm
Closing Remarks & Prize Draws

E-brochure

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IWFM South West Regional Committee

Annual General Meeting

06 December 2023

Agenda

- Welcome
- Chairs Address
- Election of Committee Roles
- Q & A
- AOB
- Close of formal proceedings

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Institute of Workplace
and Facilities Management

Welcome

- Record any Apologies

- Present last years AGM Minutes for approval

- Review any matters arising from last years minutes

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Chairs Address

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**Connect with members on the IWFM
Community groups forum**

Our online forum enables members to interact with other IWFM members and volunteers via discussion groups.

The groups, which belong to IWFM Regions, Special Interest Groups (SIGs) and Networks can be used to:

• promote best practice

• knowledge share

• learn and grow

• discuss, share, ask questions and seek guidance.

Access the forum at iwfm.org.uk

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IWFM Mentoring: the path to professional growth

A one-to-one personalised career support service for members in professional grades and those with a complimentary one-year membership as part of their IWFM qualification. You can be a mentor, mentee or both.

The benefits of becoming a mentee
- Receive guidance on advancing your career, achieving your goals and overcoming challenges.
- Gain support in developing your knowledge and skills in line with the IWFM Professional Standards.
- Access impartial advice and an alternative perspective.
- Have a non-judgemental sounding board for your ideas.

The benefits of becoming a mentor
- Pass on your knowledge and experience to help others grow.
- Give something back to the profession by providing support to others.
- Cultivate leadership and communication skills.

Find out more at iwfm.org.uk/mentoring

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30 years back
3 trends for the future

Discover our new flagship report

Download at

iwfm.org.uk/insight or

scan the QR Code >

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iwfm
30 YEARS

iwfm

30 years back
3 trends for the future

IWFM South West Committee 2023

- **Preparing for Disaster**

Sponsored by Thomas Carroll

Wales Millennium Centre, Cardiff – 49 attendees

- **Creating Inspiring Workplaces**

Sponsored by Interaction

UWE, Bristol – 42 attendees

- **Technology Innovations for FM**

Sponsored by Macs EU Ltd

UWE, Bristol – 42 attendees

Aligning regional activity

To generate leads for individual and organisational membership

To support career of choice initiatives by engaging with schools, universities &, IWFM Training Centres

Collaborate with IWFM Specialist Interest Groups to disseminate content aligned to the IWFM Professional Standards and Persona Groups

Increasing Volunteer Participation & Member Value

Promote networking based on inclusivity and engagement for the majority

To develop, agree and deliver, stakeholder engagement to support growth and alignment to the IWFM strategy

To on-board and welcome new members into the region/nation

Investors in Volunteers

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IWFM Roles

Roles / skills / experience

Chair
- Attend Members Council (strategic Advisory Board)
- Liaison with SIGs and other regions
- Committee Recruitment/retention
- Deliver monthly online welcome meetings for new members (rotating)

Deputy Chair(s)
- Attend "Operational" Members Council
- Monitor performance against tactics
- Committee Recruitment/retention
- Deliver monthly online welcome meetings for new members (rotating)

Committee Member(s)
- Supporting regional activity including organising CPD events to the membership
- Attending Committee Meetings
- Acting as Volunteer Ambassadors of IWFM, promoting the benefits of membership

Secretary
- Arrange Committee meetings & note-take
- Arrange monthly welcome meetings for new members
- Post event follow-up (satisfaction levels)

Treasurer
- Focus on the finance
- Ensure events are profitable & good VFM for sponsors
- Post event follow-up (financial)

What skills are required going forward?

| Engagement/Comms /Social media | Educational Sector Experience/Access | Equity & Diversity Champion | Event Organiser |

Election of Committee Roles

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Roles / skills / experience

IWFM Roles

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COULD THIS BE YOU?

Engagement/Comms/Social media

Education Sector Lead

Equity & Diversity Champion

Event Organiser

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Q&A

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Safe journey home

See you next time

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