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How to Turn Facilities Data into AI-Driven Insights

About the Author

Dave Wesley is the Principal Platform Architect for Nuvolo's IWMS solution, bringing 20 years of technology leadership focused on SaaS and operational innovation in the built environment. Over his career, he has advised Fortune 500 companies, universities, and government agencies on implementing practical, high-impact facilities management solutions.

Today, he helps shape the product direction for Nuvolo's Integrated Workplace Management System (IWMS), guiding the integration of the core products Asset & Maintenance, Space & Workplace, Capital Planning & Projects, Real Estate & Portfolio, and Sustainability & Energy, along with their AI-driven enhancements.

Introduction

Why AI Starts with Facilities Data

Artificial intelligence has quickly become more than just a buzzword in facilities management. Vendors are promoting AI-powered tools, leadership teams are asking how AI can reduce costs or improve efficiency, and facilities professionals are being told that AI will transform the way buildings operate.

At the same time, many facilities teams are unsure where to begin.

The reality is that AI is not something organizations simply turn on. While the technology itself has advanced rapidly, AI is only as effective as the data it relies on. Unfortunately, it is often viewed as a shortcut, especially by organizations hoping for a magic tool to fix their outdated software or fragmented data environments. Industry guidance challenges this assumption. JLL research shows that AI is not a "leapfrog" technology, but one that widens the gap between digital leaders and laggards. Without accurate, consistent, and well-structured facilities data, AI cannot produce reliable insights. This widens the gap between organizations with a solid foundation (who are "AI-ready") and those without.

The good news is that facilities teams already collect large volumes of data every day through asset records, work orders, inspections, and maintenance activities. This means that the challenge is not a lack of data. The issue is that facilities data is often incomplete, inconsistent, or spread across disconnected systems, making it difficult for AI to learn from.

This guide is designed to help facilities professionals understand what AI really is, how it is being used in facilities management today, and why data is the foundation of any successful AI initiative. Most importantly, we hope to provide practical guidance on how to prepare your facilities data so AI can deliver meaningful, defensible insights.

01

The Role of AI in Facilities Management Today

What AI Is and How It's Used in FM

Artificial intelligence in facilities management can be applied in practical ways to support daily operations, planning, and decision-making. However, it is often misunderstood as a single, all-encompassing capability. In reality, it consists of several distinct technologies, each with specific use cases and data requirements.

> *Understanding what AI is and how it is used today helps facilities teams set realistic expectations and focus on preparation rather than hype.*

Today, AI helps facilities teams:

- Identify recurring maintenance issues and cost drivers
- Highlight assets with abnormal failure or downtime patterns
- Reduce manual reporting and analysis effort
- Improve visibility across buildings and portfolios
- Optimize energy usage across sites

A Breakdown of AI Capabilities

AI in facilities management is best understood as a set of complementary capabilities rather than a single solution. Some common capabilities available to FM teams today include:

Rule-Based Automation

Rule-based automation follows predefined instructions and logic. The automation does exactly what it is told and relies on structured inputs to function correctly. In facilities environments, rule-based automation is commonly used to:

- Route work orders
- Enforce preventive maintenance schedules
- Trigger alerts and thresholds
- Support compliance and approval workflows

While rule-based automation does not adapt or learn over time, it still depends on clean, standardized facilities data to operate reliably.

Machine Learning

Machine Learning uses historical facilities data to identify patterns and make predictions. In facilities management, it helps teams move beyond reactive analysis by uncovering trends that are not always visible through manual reporting.

Common applications include:

- Predicting asset failures
- Estimating remaining useful life
- Identifying abnormal maintenance trends
- Optimizing preventive maintenance strategies

Machine learning models improve over time, but only when the data they learn from is accurate, consistent, and complete.

Generative AI and Natural Language Processing

Generative AI and natural language processing use large datasets to interpret, summarize, and explain facilities data using everyday language. In facilities environments, these capabilities make information more accessible and easier to use.

Common applications include:

- Summarizing maintenance activity
- Answering operational questions using plain language
- Interpreting technician field notes to suggest standardized codes

These tools do not replace structured data. Their accuracy depends on having consistent asset context, defined codes, and reliable work order data to give outputs.

Why Data Matters Across All AI Capabilities

Across all of these approaches, the requirement is the same. AI relies on structured, reliable facilities data. Missing asset attributes, inconsistent work order closures, or unstandardized failure codes limit AI's ability to produce trustworthy insights. AI does not understand facilities operations on its own. It learns from the data facilities teams capture every day.

02

Why the Data Foundation Matters

The Connection Between Data Quality and AI Outcomes

As discussed thus far, facilities data forms the foundation of any AI initiative. Without a strong data foundation, even the most advanced AI tools will struggle to deliver meaningful results.

Common data challenges in facilities management include:

- Duplicate or inconsistent asset records
- Missing installation dates and critical asset attributes
- Inconsistent naming conventions across systems or sites
- Incomplete or poorly closed work order histories

When these issues exist, AI outputs become unreliable, making it difficult for AI to recognize patterns or draw accurate conclusions.

Siloed systems also present a major obstacle, including:

- Asset data stored separately from maintenance records
- Maintenance histories disconnected from cost and capital planning data
- Limited visibility across assets, buildings, or portfolios

When data lives in separate systems, AI cannot see the full picture. Important relationships between assets, costs, and performance are lost, limiting AI's ability to generate insights.

Start With an Asset and Maintenance Management Platform

Strong data foundations are built through consistent processes and governance, supported by software systems that enforce data quality.

> *An asset and maintenance management platform, like Nuvolo's Asset & Maintenance product, helps standardize asset hierarchies, enforce required fields, and ensure work orders are closed with accurate resolution details.*

By capturing maintenance activity in a consistent format, these platforms create the structured, connected data AI needs to learn effectively.

Facilities teams that invest in data discipline through asset and maintenance management software are better positioned to adopt AI because their data is already organized, reliable, and ready to be used. Plus, if the software is able to integrate with other applications, including capital planning and space management, AI is better positioned to see the entire picture and learn from those insights as well.

03

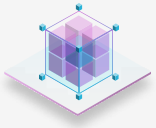
How to Prepare Your Facilities Data for AI

Assessing Your Organization's Readiness

Preparing facilities data for AI can be complex. The level of effort depends on the volume of data, the number of systems involved, and how much cleanup and standardization is required. For many organizations, a dedicated partner is often needed to help assess data quality, align systems, and ensure preparation is done correctly.

That said, facilities teams do not have to wait to get started. There are practical steps organizations can take today to understand their current data maturity, identify gaps, and begin building a stronger foundation for AI. The following steps provide a starting point for assessing readiness and making meaningful progress, regardless of where an organization is in its data journey.

Practical Steps Facilities Teams Can Take Today



Step 1: Assess Your Current Data Maturity

Start by understanding what data exists, where it lives, and how reliable it is. Facilities teams should take inventory of asset records, maintenance and work order histories, and any condition or performance data currently being collected. This includes identifying which systems hold critical information and whether enough historical data exists to support trend analysis. The goal is not perfection, but clarity on the current state.

Step 2: Identify Inconsistencies and Gaps

Once the data landscape is understood, teams should look for common issues that limit usability. This often includes duplicate or missing assets, incomplete maintenance histories, inconsistent naming conventions, or work orders that lack clear resolution details. Identifying these gaps helps prioritize cleanup efforts and highlights where AI would struggle today.

Step 3: Standardize How Data Is Captured

AI depends on consistency. Facilities teams should define and enforce clear standards for asset naming, hierarchies, and required fields. Maintenance workflows should support consistent failure, cause, and resolution coding, and ensure maintenance work is logged against the correct asset every time. Standardization ensures the same information is captured the same way across sites and teams.

Step 4: Validate Data Accuracy and Integrity

Standardization defines how data should be captured. Validation confirms that it was captured correctly. This step focuses on verifying that asset tags and IDs match physical equipment, work orders are linked to the correct assets, and maintenance logs are complete and properly closed. When records are incomplete or inaccurate, AI learns from bad information, making its outputs unreliable and, in many cases, unusable.

Step 5: Reduce Data Silos Where Possible

Facilities data is often spread across multiple systems. Teams should identify where asset, maintenance, cost, and capital planning data are disconnected and look for opportunities to improve alignment. Even partial integration or better alignment of asset hierarchies can significantly improve AI's ability to see patterns across the asset lifecycle.

Step 6: Establish Ownership and Ongoing Discipline

Data preparation is not a one-time effort. Facilities teams should define clear ownership for asset and maintenance data, document expectations, and enforce workflows that support data quality over time. Without governance, data quality degrades, and any progress made toward AI readiness quickly loses value.

Step 7: Align Efforts to Real AI Use Cases

Finally, data preparation should be guided by outcomes. Facilities teams should clarify which decisions AI is expected to support, such as predicting failures, prioritizing capital investments, or identifying energy saving opportunities. This helps teams focus on the data that matters most and avoid unnecessary complexity.

04

The ROI of AI-Ready Facilities Data

Where Data Discipline Delivers Measurable Value

Once facilities data is prepared correctly and aligned to clear use cases, the benefits start to show quickly. Accurate asset records, complete maintenance histories, and consistent processes improve daily operations on their own. When AI is applied on top of that foundation, those gains scale further, helping facilities teams reduce costs, improve efficiency, and manage risk more proactively. The return on this work shows up across several key areas of facilities management.

1. Asset and Maintenance Performance

Unplanned downtime and reactive maintenance remain some of the most expensive challenges in facilities management. Industry research consistently shows that equipment failures drive higher labor costs, increased workplace disruption, and shorter asset lifespans.

> *Deloitte's research on predictive maintenance suggests that it can increase productivity by 25%, reduce breakdowns by 70%, and lower maintenance costs by 25%.*

2. Sustainability and Energy Efficiency

Sustainability and energy efficiency have become core responsibilities for facilities teams, driven by rising energy costs, corporate ESG goals, and regulatory pressure. Results by BrainBox AI, a sister brand within Trane Technologies, show that AI-driven HVAC optimization has delivered **15-25% in energy savings** in real-world commercial and residential buildings, while still maintaining occupant comfort.

3. Risk, Security, and Safety

Risk, security, and safety remain top priorities for facilities leaders, regardless of AI adoption. According to JLL's Global State of Facilities Management Report, occupant safety, reliability, and resilience consistently rank among the highest strategic priorities for FM organizations, reflecting the responsibility facilities teams carry for people, assets, and compliance. When facilities data is accurate and kept up to date, AI can help teams spot patterns in failures and inspections earlier, making it easier to address risks before they turn into larger problems.

What It Takes to Turn AI into ROI

AI does not create ROI on its own. Clean, consistent, and governed data does. But data only delivers value when facilities teams are equipped to manage AI, embed it into daily workflows, and act on its recommendations. Organizations that pair strong data foundations with clear ownership, defined processes, and accountability are the ones that turn AI insights into real results.

Conclusion

Turning AI Preparation into Practice

AI has the potential to support better decisions in facilities management, but only when it is built on the right foundation. Throughout this guide, one theme remains consistent: **AI learns from the data that facilities teams already create every day.** When that data is incomplete, inconsistent, or disconnected, AI struggles to deliver value. When it is accurate, structured, and governed over time, AI becomes a practical tool rather than a failed experiment.

The path forward does not require chasing technology or overhauling systems overnight. It requires discipline. Assessing data maturity, standardizing how information is captured, validating accuracy, enforcing governance, and aligning efforts to real AI use cases all contribute to stronger operations today. AI simply amplifies those gains.

For facilities teams, that is where AI stops being hype and starts delivering real, defensible value.

Get Your Data Ready for AI with Nuvolo

Before AI can deliver accurate insights or recommendations, your data needs to be reliable, standardized, and connected. Nuvolo helps facilities teams clean up asset data, streamline maintenance histories, and centralize information across buildings, so AI tools have a strong foundation to work from.

If your organization is ready to take the next step with AI, Nuvolo can help you build the clean, connected data foundation you need to achieve reliable results and long-term success. Get started making your buildings safer and smarter.

Contact Us Today →

About Nuvolo

Nuvolo is a global leader in modern, cloud-based Integrated Workplace Management Systems (IWMS). As part of Trane Technologies, Nuvolo benefits from strategic alignment with innovators in building controls and energy optimization, including BrainBox AI, to deliver smarter, more sustainable operations.

Nuvolo's flagship solution, Connected Workplace, unifies facilities management, space optimization, and enterprise asset lifecycle management into a single, seamless platform. This empowers organizations to streamline operations, improve efficiency, and make data-driven decisions with confidence.

Nuvolo supports a wide range of industries, including healthcare, life sciences, retail, public sector, higher education, technology, financial services, and large enterprises.

Recognized as a market leader by Verdantix and IDC MarketScape, Nuvolo continues to set the standard for CMMS solutions worldwide.

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