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The AI-Ready Warehouse Performance Management Playbook

A Step-by-Step Guide to Unlock the Power of AI Across Your Warehouse Network

An Easy Metrics Playbook

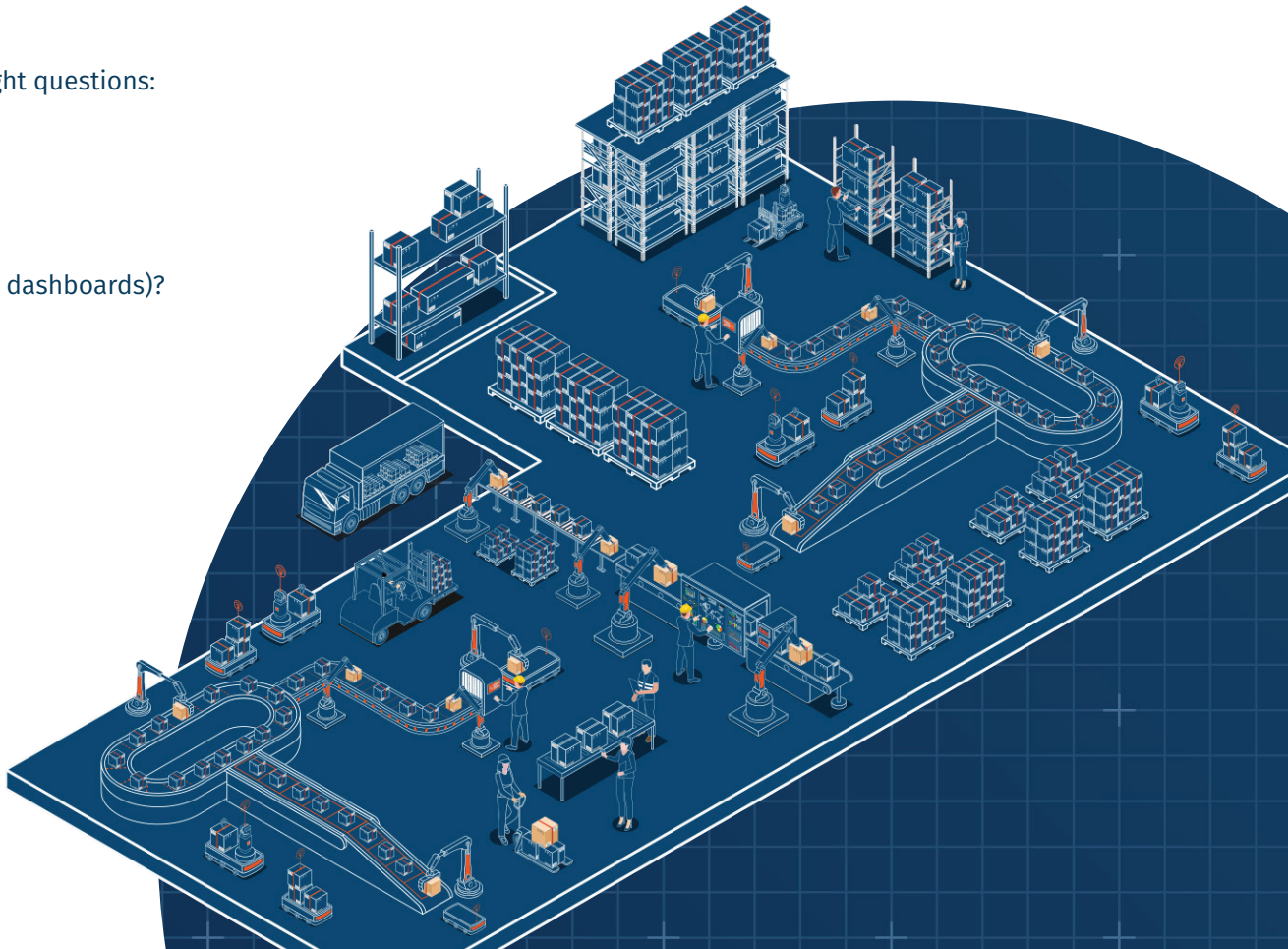
The Promise of AI in the Warehouse is Real — If You Start with the Data

AI is helping advance business optimization in many new ways. When built and implemented on a solid data foundation, it can be transformative. However, it isn't a silver bullet. For many people managing warehouse operations, AI still feels like a magic wand with too many changing unknowns. And while technology moves fast, ROI doesn't come from hype. It comes from real-life use cases that spur meaningful action.

Today, the best operations leaders are asking the right questions:

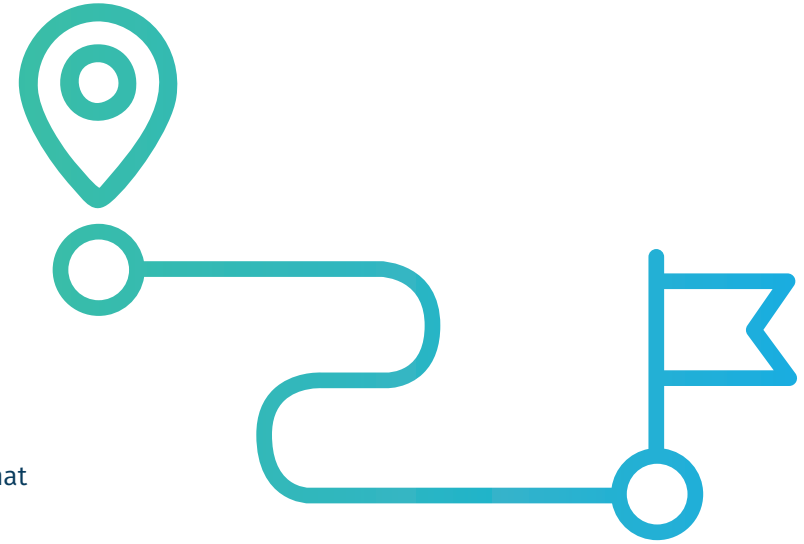
- Where should we begin with AI?
- What are the real use cases for our warehouse?
- And how do we ensure results (not just cool-looking dashboards)?

In this playbook, **Dan Keto**, Co-Founder and CTO at Easy Metrics and supply chain industry consultant **Tandreia Bellamy** map out how warehouses can take a pragmatic, results-focused approach to AI. Let's break down the journey into five practical steps with lessons, outcomes, and takeaways you can act on right now.



STEP 1:

Start with the Outcome. Then Work Backward.



Don’t begin with AI and look for a place to use it. Instead, start with the business problem.

We’re in an AI “dot-com moment.” We’re seeing a frenzy of investment in a still-evolving technology without foundational readiness. Many companies are chasing tech before defining what success looks like.

The better approach? Work backward.

For example, start by identifying specific core challenges like missed SLAs, low labor utilization, or inconsistent throughput. Once the pain points are clear, prioritize the data and insights needed to solve them, then match the right AI approach to the solution.

LESSON LEARNED:
Avoid the trap of “AI-first” thinking. Know the problem before you choose the tool.

TAKEAWAY:
Outcomes must define the roadmap. Not the other way around.

“Before you invest in any AI solution, make sure you understand the problem you're trying to solve. Technology should support your goals, not define them."

- Dan Keto

STEP 2:

Build a Unified Data Model

When you have a clear understanding of the pain points you need to address, you are ready to build a unified data model. Every AI-enabled initiative begins with a single, powerful asset: clean, connected data. AI is only as strong as the quality of the information you feed into it.

In most warehouses, information lives across dozens of siloed systems—order management, robotics, ERP, labor, WMS, and more. To make AI actionable, you have to bring all the data together into a unified model. But it's not just about connecting disparate systems; it's about translating what's captured across platforms into a common, usable framework.

At one Easy Metrics client site in Toronto, 11 facilities all used different names for the same task. This lack of standardization made it impossible to compare performance or apply AI effectively. The solution? A common operational taxonomy and a unified data warehouse.

LESSON LEARNED:
You can't optimize what you can't align. Standardized nomenclature and taxonomy are the unsung heroes of AI-enabled warehouse performance management.

TAKEAWAY:
Build a clear data foundation before layering in intelligence.

"Creating a common taxonomy in all of your systems is absolutely critical if you're going to move toward a data-driven strategy in your network of warehouses."

- Tandreia Bellamy

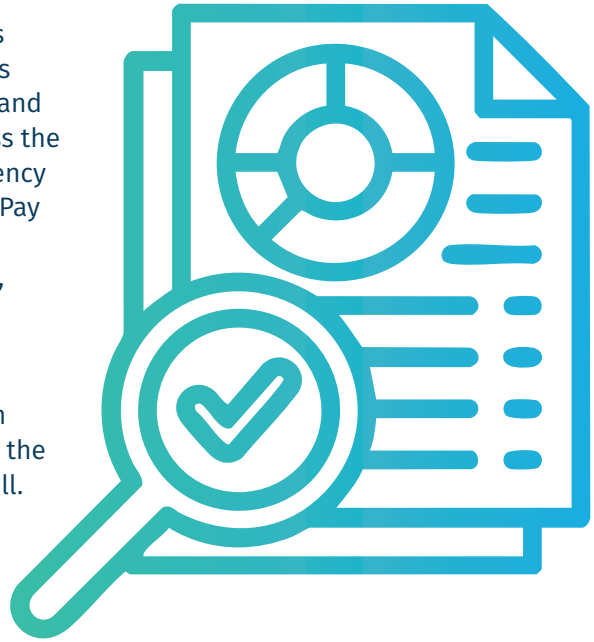
STEP 3:

Validate, Clean, and Tune Your Data

Once you have built the foundation for your unified data, the next step is to do a full data audit. A data audit ensures you have complete, accurate, and consistent operational information. This is the foundation required for any system using AI, in order to generate reliable insights. Without this step, AI tools are likely to deliver misleading results or amplify existing inefficiencies.

To do a data audit, start with an inventory of all data sources across your warehouse operations, such as WMS, labor tracking, robotics, ERP, and transportation systems. Then assess the quality, completeness, and consistency of key fields across those systems. Pay close attention to misaligned nomenclature, missing timestamps, inconsistent units of measure, and duplicate records.

From there, create a transformation layer to normalize inputs and fill in the blanks. Most importantly, start small. Run AI tools on a day's worth of validated data before you scale.



LESSON LEARNED:
Even the best AI models can hallucinate if fed useless information, without paying close attention. Guardrail your results by fine-tuning inputs.

TAKEAWAY:
Test small. Clean everything. Then expand.

"Warehouse leaders often assume they have full visibility into their operations until they look under the hood. It's not uncommon to discover that 40-50% of workflow data is incomplete, inconsistent, or just wrong." **- Dan Keto**

STEP 4:

Focus on Practical Use Cases (That Drive ROI)

Once your data is cleaned and validated, the next step is to explore practical use cases for leveraging AI. Even as AI is becoming more commonplace and widely accepted, in many instances it can still feel futuristic. Shareholders and other stakeholders may have broad ideas of what AI could accomplish (or streamline), but the realities on the floor call for specifics and defined actions.

Fortunately, in many warehouses, AI-enabled solutions are already delivering value when **applied to the right problems.**

Some proven use cases Easy Metrics sees in the field:

- Automated Forecasting
- Load Balancing
- Labor Optimization

Automated Forecasting
AI models analyze historical order patterns, seasonal trends, and time-of-day workflows to accurately predict inbound and outbound volumes.

Business Impact
- Anticipates labor demand with greater precision (often outperforming human forecasts by 10–20%)
- Reduces overstaffing or understaffing, especially during peaks
- Improves on-time performance and SLA adherence

"A use case that solves a real operational pain point can be a good starting place. For example, forecasting is a strong option to prove the concept quickly, but if labor costs are the bigger issue, optimization delivers both visibility and action right out of the gate." **- Dan Keto**

Load Balancing
AI continuously monitors resource capacity (robots, conveyors, labor) and reroutes orders dynamically in response to congestion, downtime, or delays.

Business Impact
- Improves order throughput by reallocating tasks intelligently
- Minimizes downtime caused by equipment failure or process bottlenecks
- Supports real-time orchestration across manned and automated systems

Labor Optimization
AI combines cost-to-serve analysis, employee fatigue modeling, and real-time productivity metrics to recommend optimal labor assignments and shift patterns.

Business Impact
- Increases labor utilization by 3–5%
- Reduces overtime costs and fatigue-related productivity loss
- Aligns labor with workload dynamically, across zones and roles

LESSON LEARNED:
Focus on a limited number of use cases to get started. Don't try to apply AI solutions all at once. Start with no more than three for a more clear-cut ROI.

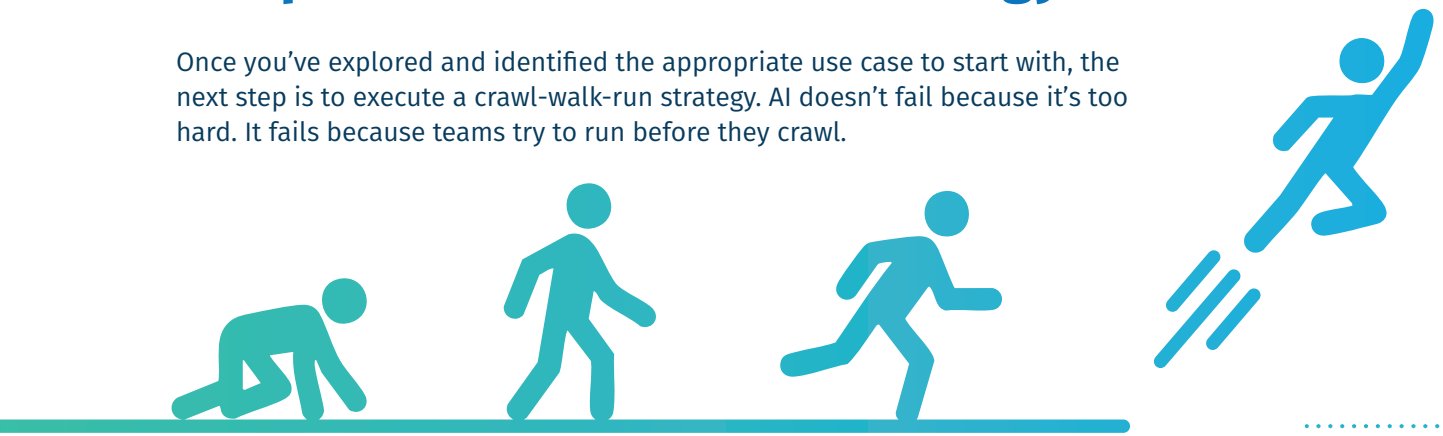
TAKEAWAY:
If AI isn't solving a specific business problem, it's just expensive noise.

"A use case that solves a real operational pain point can be a good starting place. For example, forecasting is a strong option to prove the concept quickly, but if labor costs are the bigger issue, optimization delivers both visibility and action right out of the gate." **- Dan Keto**

STEP 5:

Adopt a Crawl-Walk-Run Strategy

Once you've explored and identified the appropriate use case to start with, the next step is to execute a crawl-walk-run strategy. AI doesn't fail because it's too hard. It fails because teams try to run before they crawl.



Start with one site. One team. One data stream. Don't aim for real-time orchestration until you've nailed the fundamentals. Most importantly, cost-optimize your approach. This means don't throw too many things at the AI wall at once and see what might stick. In reality, poorly designed prompts or ineffective models can rack up thousands in processing costs overnight.

This phase is about building confidence. Teams need to trust the data, understand the process, and see the early wins. While AI is famous for how fast it can get to work, the humans who will be utilizing these solutions every day can't rush through the learning and skills-building stage. After all, if it's going to be an investment worth rolling out across the whole network, everyone must understand what AI is (and isn't) meant to do in your operations.

LESSON LEARNED:
AI won't replace your people. It will supercharge the ones who use it wisely.

TAKEAWAY:
Start with one warehouse. Nail it. Then expand.

"There is a necessary effort of organizational collaboration that will take place if you do this process and do it right. Between the taxonomy, understanding your data and cleaning your data, you will learn a lot before AI is even implemented." **- Tandreia Bellamy**

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"It starts with the data. Inventory the data, find out where the gaps are, and study the use cases of the data with your stakeholders. From there a strategy starts to be built that brings this all together and takes you more confidently into the future." **- Dan Keto**

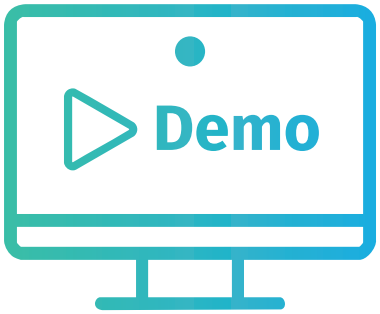
The Bottom Line:

The Future Isn't AI. It's AI-Ready Operations.

The best warehouses aren't just data-driven. They're people-led. AI works best when your team trusts it, understands it, and grows with it.

AI is designed to help your organization move faster, but to use it correctly it's important to take it step by step. Changing processes and bringing in new technology can present a challenge, but with the right foundation and a clear plan, your people can lead it.

At the end of the day, it's really all about your people. Once your teams are comfortable and know how to best use these powerful new tools, that's where transformation really comes to life.



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