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Getting Started With AI And Machine Learning To Improve Warehouse Management

Presented by:
Lucas Systems



Presenters



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What You Will Learn

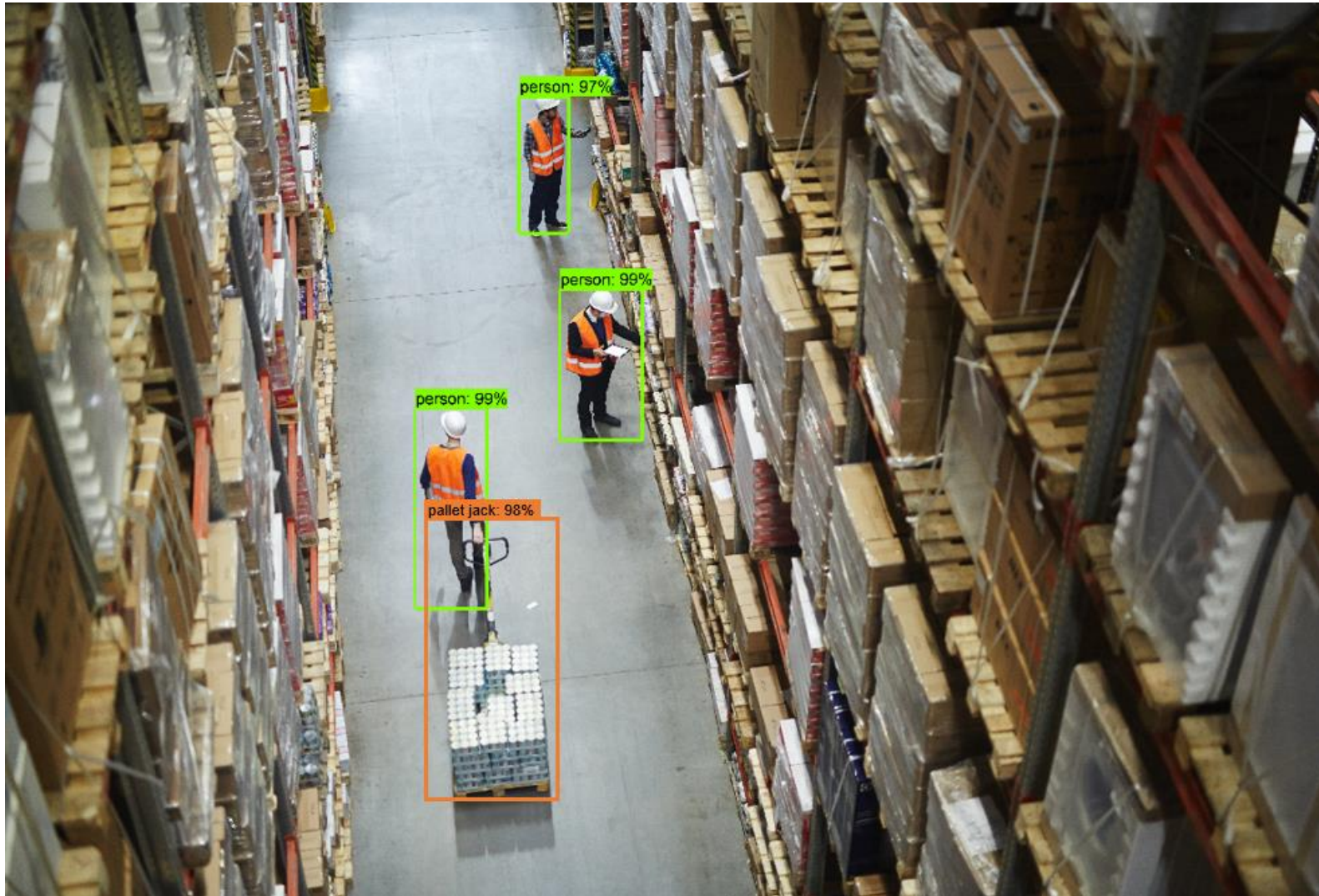
What is Machine Learning and where is it used today?
How can it be used to improve warehouse operations?
How can DCs get started with Machine Learning?

What Is Machine Learning?

- A subset of Artificial Intelligence (AI)
- Apply *learning algorithms* to large sets of data to create a predictive model
- Model continually adapts
- Models and predictions improve over time

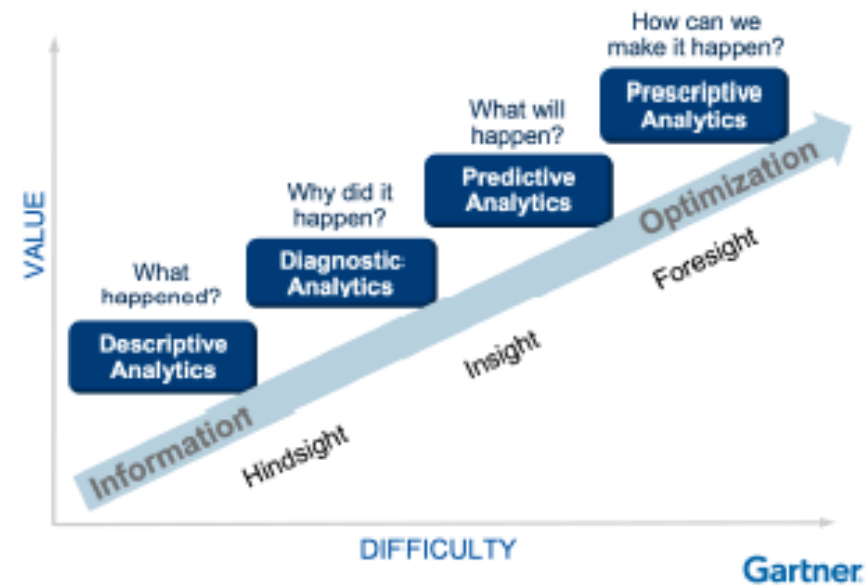
- In Warehouse Management, ML can be an alternative to traditional optimization approaches that are costly to implement and maintain

ML Is All Around Us



Technology Makes ML Practical

- Key reasons for increased popularity of analytics as tool for business decision making:
 - Increased Data
 - Faster Computers
 - Better Algorithms
 - Lower Fixed Cost
 - Service Applications
- Not possible ~15 years ago

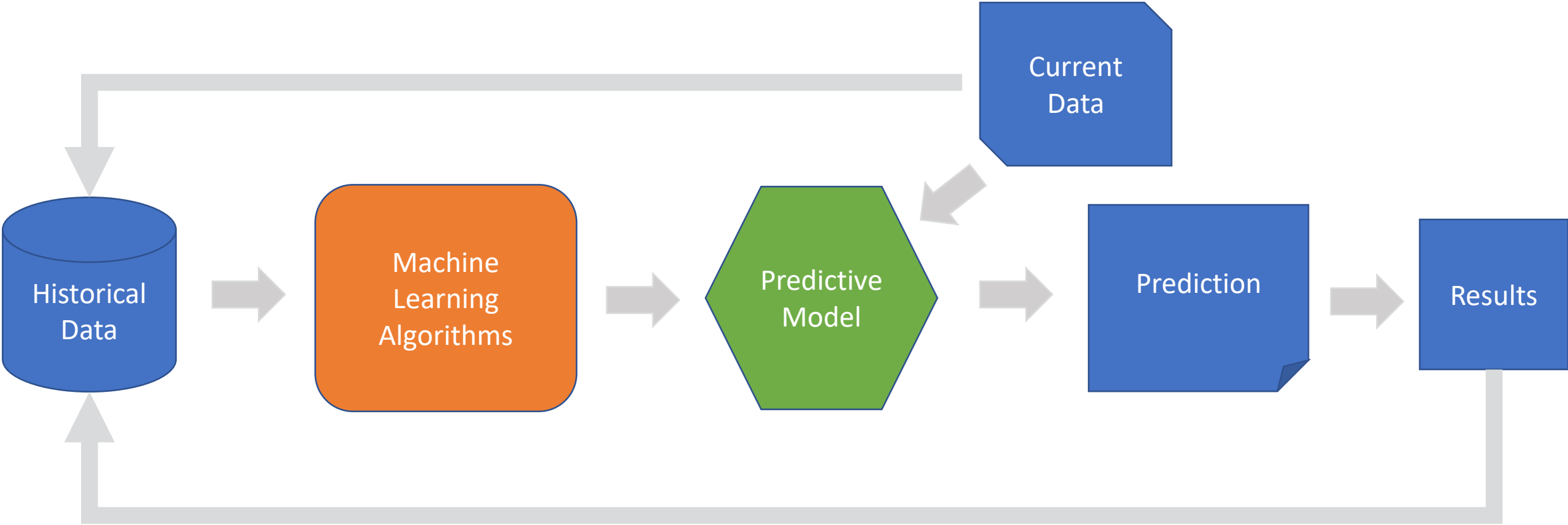


Source: *From Analytics to Impact*, by Willem-Jan van Hove, CMU Tepper School of Business, October 30, 2018.

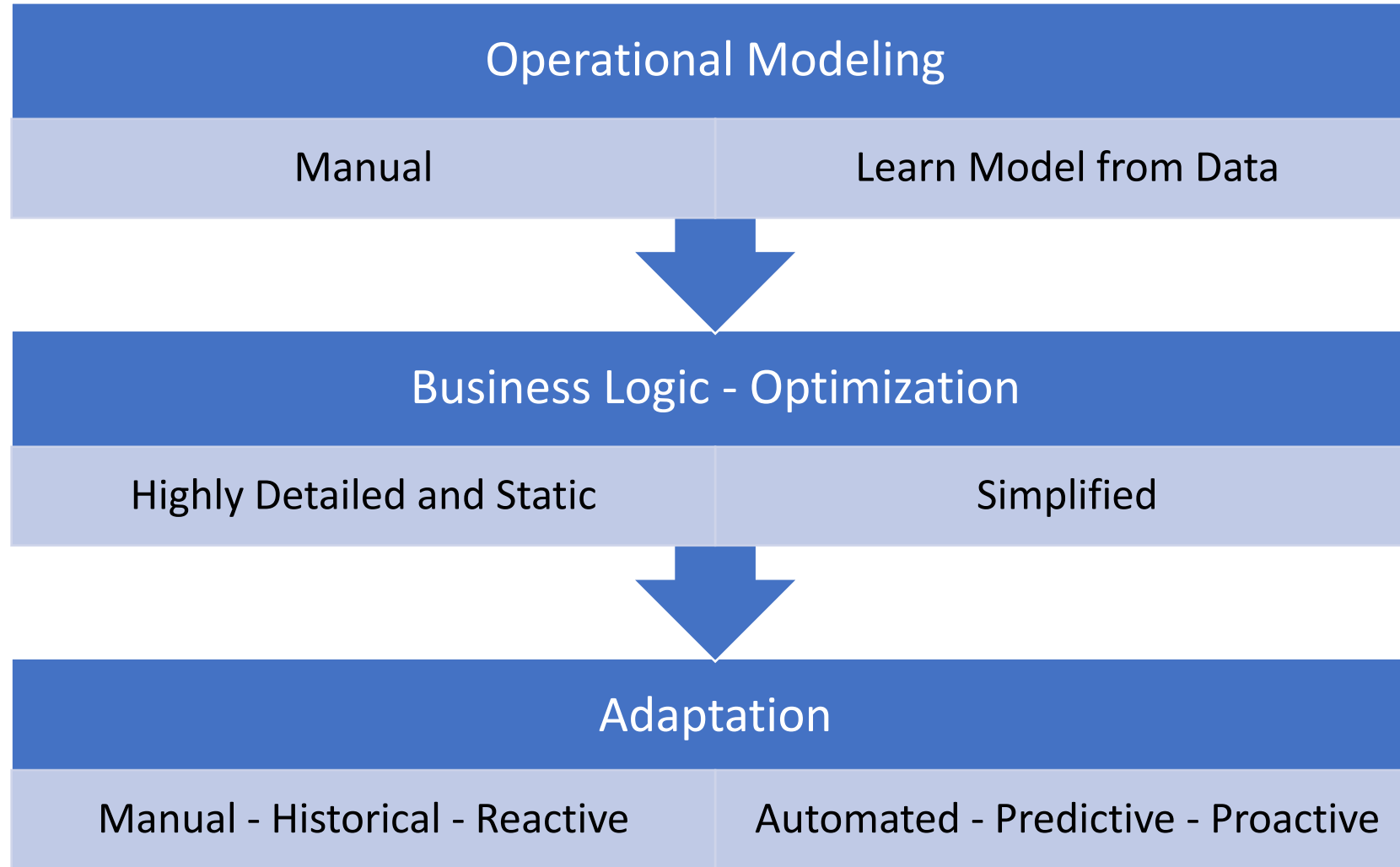
Why the Buzz?

- Great potential to improve planning and operations
- Costs are reasonable, even for smaller operations
 - Cloud-based data storage
 - Plentiful computing power
- But, there are challenges
 - Clean, abundant data (the “right” data and enough of it)
 - Niche software engineering requirements
 - Scramble for data scientists

Machine Learning Approach



ML Versus Engineered Approach



Two Applications of ML in the DC

Workforce Planning

- Learn an accurate pick model
- What-if simulation & analysis
- Allocate resources to:
 - Predict staff requirements
 - Reduce over and under staffing
 - Reduce idle time and overtime

Dynamic Slotting

- Learn an accurate cost model
- Identify heavy-hitters
- Recommend best moves to:
 - Increase picking efficiency
 - Increase replen efficiency
 - Increase overall capacity

Advantages of Machine Learning

- Eliminate time-consuming, expensive modelling
- ML models are dynamic – self-tuning vs. static
- Adapt to differences across locations and other factors that may not be apparent
- More accurate than static models and historical averages
- Lower-cost to implement and maintain

What You Need To Get Started

- Data, lots of data
 - Typical WMS data may not be sufficient
- Sandbox
 - Compute horsepower (GPUs, CPUs, clusters)
 - Data science tools and know-how
- Ingestion-to-Inference (Compute) systems
 - Integration with data-producing systems (WMS, WCS)
 - Machine learning lifecycle systems (train, evaluate, and deploy models)
 - Integration with decision and control systems

QUESTIONS?

CONTINUE THE CONVERSATION AT BOOTH S4263

For more information

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Visit ProMat Booth S4263

