How Distributors Can Create Efficiency and Effectiveness with Applied Al Now

What Al is and why it matters



Levels of Al



General purpose AI

Similar to human intelligence Not there yet/ever

Generative AI

Capable of interacting with natural language Solves extraordinarily broad range of problems



Task specific

Focused on a specific function such as diagnosis, configuration, interpretation, classification, prediction



Al as a feature

One feature as part of a larger system such as transcription

Early AI adoption = future business success

Relative changes in cash flow by Al-adoption cohort, cumulative % change per cohort



Early Movers are expected to increase cash flow by 122%

Followers are expected to gain only 10%

Late adopters may lose 23%



How humans learn



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AI Learns the Same Way, but Needs More Examples





Shopping Cart

Deselect all items

	3M Hookit Disc Pad 05775, 5 in x 3/4 in 5/16-24 External, Yellow \$22.50
•	In Stock prime & FREE Returns ~ This is a gift Learn more Size: 5 in x 3/4 in 5/16-24 External Qty: 1 ~ Delete Save for later Compare with similar items









Chemical Guys BUFX700 Hex-

\$59.99

Logic Quantum Best of the Best

Buffing and Polishing Pad Kit, 1...



•

3M Hookit Disc Pad 05775, 5 in x 3/4 in 5/16-24 External, Yellow **\$21.72** In Stock



•







3M Hookit Disc Pad 05775, 5 in x 3/4 in 5/16-24 External, Yellow **\$21.72** In Stock



3M Random Orbital Sander – Pneumatic Palm Sander – 5" x 3/16" Diam. Orbit – Stikit Disc P... **\$248.75**



Language Understanding



Language Understanding Applications

- Voice Commands for WMS Enable voice-activated commands for WMS, allowing warehouse staff to interact with the system more intuitively.
- Voice search Lets people request information by speaking rather than entering text in a search box
- Voice ordering Lets people order by speaking rather than using a mouse or keyboard
- Automated transcription Automated transcription is the ability to accurately convert speech into text.
- Sentiment analysis Sentiment analysis is the process of analyzing digital text or speech to determine if the emotional tone of the message is positive, negative, or neutral.
- Intelligent chatbot Handle customer inquiries and issues through chatbots or email responses, improving customer service efficiency.



Voice Search and Ordering



Our vision is that Alexa will be the **world's most knowledgeable product expert who knows you**, in a store that sells everything. All those moments when we need or want to know more about the products we use every day, will have instant satisfaction of an answer: just ask Alexa. We are building a digital product expert that is always available, with super-human knowledge of every product ever made.





Sentiment Analysis



Sentiment analysis is the process of analyzing digital text or speech to determine if the emotional tone of the message is positive, negative, or neutral.





Automated Transcription

- Transforming audio or video to text opens up a whole new world of opportunities for data mining and information. The text that is created can easily be analyzed or fed into other applications for further insight.
- This technology is in wide use today from Zoom to Otter
- Automated transcription is being adopted in call centers and integrated into CRM systems

Optimization



Optimization

- The process of finding the best possible solution to a problem. In mathematics, this often consists of maximizing or minimizing the value of a certain function, perhaps subject to given constraints.
- Optimization technology plays a crucial role in improving the efficiency and effectiveness of warehouse and supply chain operations. It helps organizations streamline their processes, reduce costs, enhance customer satisfaction, and make data-driven decisions.
- Optimization is challenging when there are many possibilities to consider.
- There are 3,628,800 possible routes for a driver to go to just 10 locations.
- In distribution, there are several optimization problems in the warehouse and supply chain that, when solved, create much greater efficiency.



Optimization Applications

- Supplier Lead Time
 - Improving Estimated Lead Time Accuracy Machine learning can estimate more accurate lead times that reduce cost of working capital and better meet customer expectations.
- Inventory Management
 - Demand Forecasting Optimization algorithms can analyze historical data and market trends to predict future demand accurately. This helps in maintaining optimal inventory levels and reducing excess or insufficient stock.
 - Inventory Optimization These algorithms can determine the optimal stocking levels, reorder points, and safety stock levels to minimize carrying costs while ensuring product availability.
- Routing and Transportation
 - Route Optimization For distribution and delivery, optimization technology can calculate the most efficient routes for vehicles, considering factors like traffic, delivery windows, and vehicle capacity. This reduces transportation costs and improves delivery times.
 - Load Optimization It helps in determining how to best load cargo onto trucks or containers, taking into account weight distribution and space utilization.



Supplier Lead Time Prediction



There are significant errors in the estimate of actual Goods Receipt vs. Expected Date of Delivery from suppliers



Negative impact to working capital and service levels

AI/ML techniques such can reduce error by 30% to 60%				
	Supplier estimate			
	Supplier			
Model is based on historic data about	Product category/SKU			
	Geography			
	Season/Date			



Optimization Applications

- Warehouse Layout and Design
 - Slotting Optimization Optimization technology can optimize the placement of products in the warehouse to minimize picking and put-away times. This results in faster order fulfillment and reduced labor costs.
 - Warehouse Design When designing new warehouses or reconfiguring existing ones, optimization tools can determine the optimal layout to maximize storage capacity and minimize travel distances.
- Order Fulfillment
 - Picking and Packing Algorithms can optimize the picking routes and packing processes to minimize labor and time required for order fulfillment.
 - Batch Processing Optimization technology can group orders into batches to reduce the number of trips a picker needs to make within the warehouse.
- Demand and Capacity Planning
 - Production Scheduling Optimization can determine the most efficient production schedules to meet demand while minimizing overtime and production costs.
 - Capacity Planning It helps in allocating resources, labor, and machinery effectively to meet varying demand levels.



Warehouse Layout and Design





Picking and Packing





Route Optimization

- Optimize "last mile" deliveries
- Manage challenges dynamically
 - > Traffic
 - > Weather
 - Blocked loading docks
 - > Driver availability
 - Order changes



Image from Wise Systems



Image Recognition



Image recognition problem

Image recognition is a mechanism used to identify an object within an image and to classify it in a specific category, based on the way human people recognize

- Determine the distinct objects
- Identify what each distinct object is







Applications

- Autonomous Delivery
 - Autonomous Vehicles A vehicle capable of sensing its environment and operating without human involvement
 - Drones Unmanned aerial vehicle (UAV) used for distributing packages to customers during the last mile delivery process.
- Inventory Management
 - Warehouse Drones Can identify and count products on shelves, helping to maintain accurate inventory levels.
- Picking and Packing
 - Pick and Place Automation Robots equipped with computer vision can pick items from shelves and place them in containers, increasing the speed and accuracy of order fulfillment.
 - Package Dimension Measurement Automated measurement of packages ensures appropriate packaging materials are used and accurate shipping costs are calculated.



Warehouse Drones



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Autonomous Vehicles







Provider	Range	Capacity	Speed	Status
Amazon Scout	few miles	10 lbs.	3 to 4 mph	trial
Fedex SameDay Bot	few miles	~10 lbs.	3 to 4 mph	trial
Fedex Autonomous Delivery	60 miles	300 lbs.	25 mph	trial



Contactless Checkout





Applications

- Sorting
 - Automated Sorting Computer vision can categorize items based on their size, shape, or other attributes, streamlining the sorting process.
- Item recognition
 - Product item recognition Identify the actual product with computer vision.
 - Contactless checkout Allow customers to shop, buy, and checkout without human assistance using computer vision.
- Order Automation
 - Emails with purchase information are scanned and processed automatically into the ERP.









Item recognition

Figure out what these cutting blades are.



Item recognition + Voice ordering

Integrated shopping & buying AI system

Figure out what these cutting blades are and send a dozen, pronto.

Generative Al





• Generative AI (GenAI) refers to a type of artificial intelligence that is able to generate new content or data that was not in the original training set. It can create data that is perceptually similar to, but not exactly the same as, the data it was trained on. Generative AI models learn the patterns, structures, and features of the training data and use this knowledge to create novel and coherent outputs

- GenAl can do
 - Summarization
 - Classification
 - Prediction
 - Generation
 - Extraction
 - Question-Answering

Generative AI Applications

- Supply Chain Optimization
 - Demand Forecasting LLMs can process vast amounts of data to predict demand for products, helping optimize inventory levels.
 - Risk Management They can assess risks in the supply chain by analyzing market trends, news, and other data sources.
 - Logistics Optimization LLMs assist in route planning, carrier selection, and delivery scheduling to enhance logistics efficiency.
- Procurement
 - Vendor Analysis LLMs can analyze vendor data, market trends, and contracts to aid in vendor selection and management.
 - Pricing They can forecast price trends based on historical data, helping procurement professionals negotiate better contracts.
- Transportation and Delivery
 - Route Planning LLMs can process real-time traffic data to optimize delivery routes.
 - Delivery Scheduling They can optimize delivery schedules based on various constraints like delivery windows and vehicle capacity.
 - Customer Insights and Engagement LLMs can analyze customer data to gain insights into customer behavior and preferences and help in creating more effective engagement strategies.



Generative AI Applications

- Product Recommendations They can analyze user behavior and preferences to generate personalized product recommendations.
- Customer Support LLMs are used in chatbots to assist customers, address inquiries, and resolve issues, improving customer satisfaction.
- Content Generation E-commerce platforms leverage LLMs to create product descriptions, reviews, and other content.





Customers Who Purchased This Item Also Purchased



Product Recommendations

- When done right, product recommendations are the holy grail in distribution.
- Can be used in dialog between customer facing reps or in e-commerce.
- May include recommendations for
 - Cross-sell
 - Reorder
 - Substitutes

Customer Support

- LLMs are used in chatbots to
 - Assist customers
 - Address inquiries
 - Resolve issues
 - Find the right product
 - Sell solutions



Content Generation

E-commerce platforms leverage LLMs to

- Create product descriptions
- Reviews
- Define product taxonomies
- Cleanse and classify products in product taxonomies



State of Distribution Al











Benefits of Al

- Sales data, inventory levels, supplier data, transportation data and have deep data to analyze to make informed business decisions.
- Better customer service, fill rates and inventory management
- Developing marketing content for print and web. Support Customer Service with needed product intelligence to support customers.
- Faster sales growth More efficient sales order entry Eliminate other manual processes
- handling of simple tasks so talent can be utilized elsewhere
- I hope to use AI in marketing efforts more in order to help maximize the time currently spent on marketing tactics. As a small
 independent Distributor, there aren't always enough staff or time to place on getting things done the way you would want to, I
 think that is where utilizing AI will be a benefit.
- More personalized service for our customers using traditional and digital sales channels, better visibility of consolidated demand across the supply chain, more efficient utilization of warehouse space.
- People are naturally indecisive and the brain will always default to the easiest path. Using AI will provide people with new found efficiencies as an aid or a built in research assistant to help in decision making and discussion.
- Speed. Increase the velocity of results in our companies. Offload work so our teams can focus on higher value opportunities.
- We are utilizing AI to generate product sales recommendations on our website and in our CRM. This should help drive incremental revenue and customer satisfaction









Thank you.

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