



PROMAT 2019

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Drones for Warehouses -- Fully Autonomous Inventory Counts

Presented by:

Corvus Robotics, Inc.



Presenter



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Objectives

- Thoughts on the business case and immediate ROI
- The latest technology in the industry, making drones *fully* autonomous
- Whether your warehouse is suitable for the adoption of inventory drones

Inventory counting hasn't changed in 50 yrs

Money is lost when there's inventory inaccuracies:
Human errors are common in a mundane & repetitive job

- It takes weeks to months to cycle counts
- Plus shutdowns for “wall-to-wall” physical counts
- Cycle count workers making you money instead of losing you money

Warehouses are guessing at their inventory
Losing millions in working capital and revenue to stockouts



Fully autonomous pallet scan drones

- Do full cycle counts daily instead of monthly
- See a financial report every morning, plus list of discrepancies
- Low overhead, don't change racks, labels, setup
- Fully autonomous (fly, land, & recharge without human control)

Drones can find pallet-level inventory labels, scan barcodes, and tie to locations, taking pictures of every bin.

All data can be exported or called via API

ROI

<u>Forklift wear-and-tear</u>	
Forklift cost	\$30,000
Forklift life-hours	8000
Forklifts used in inventory processes	2
Percent of inventory time spent on forklifts	25%
Number of inventory shifts	2
Annual forklift-hours used from inventory process	2,920
FORKLIFT COSTS SAVED	\$10,950
<u>Employee - Annual compensation</u>	
Salary	\$31,063
Bonus	\$369
Social Security	\$2,405
401K/403B	\$1,194
Disability	\$220
Healthcare	\$6,507
Pension	\$2,012
Time Off	\$3,869
TOTAL COMPENSATION PER EMPLOYEE	\$47,639
<u>Employee cost savings</u>	
Number of shifts	2
Number of inventory staff reassigned	1
Total employees reassigned	2
EMPLOYEE COMPENSATION SAVED	\$95,278

<u>Physical inventory shutdown savings</u>	
Days shutdown	2
Temps hired	10
Temp shifts	3
Temp hourly pay (incl. overtime)	\$20
Costs of temp labor	\$9,600
Warehouse annual inventory value	\$34,500,000
Revenue lost from shutdown	\$189,041
INVENTORY SHUTDOWN SAVINGS	\$198,641
<u>Inventory accuracy savings</u>	
Inventory accuracy	98.0%
Warehouse annual inventory value	\$34,500,000
Inventory writeoffs	\$690,000
Inventory accuracy, after drones	99.0%
Savings from improved inventory	\$345,000
Shrinkage, stockouts, misshipments percentage	1.0%
Above, saved after drones	25%
Savings from shrinkage rectification	\$86,250
SAVINGS FROM ACCURACY IMPROVEMENTS	\$431,250
<u>Safety stock savings</u>	
Safety stock, percentage of inventory	15%
Safety stock, value	\$5,175,000
Decrease in safety stock from better inventory	2%
SAVINGS FROM DECREASED SAFETY STOCK	\$103,500

<u>Efficiency gains from improved picking/putaway</u>	
Pct delay or misshipments from busy season	5%
Improvements from more accurate inventory	10%
Busy season inventory value	\$8,625,000
GAINS FROM IMPROVED PICKING/PUTAWAY	\$43,125
TOTAL BENEFIT TO WAREHOUSE	
Warehouse annual inventory	\$30,000,000
TOTAL BENEFIT TO WAREHOUSE	\$930,383



Summary - Business Case

- Reduce thousands of hours of forklift use
- Earn more from worker-hours previously spent on counting
- Fulfill orders faster with improved inventory placements
- Reduce write-offs and shrinkage by catching discrepancies earlier

Technological Advancements

- Manually flown (DroneScan)
- Semi-autonomous (Eyeseer, Infinium Robotics, PINC)
- Fully autonomous

- Payload: Barcode scanning or RFID

Warehouse Requirements

- Not “inventory drones” but “pallet scan drones”
- Checklist:
 - mostly pallet-racks
 - barcodes face outward
 - items stored one-deep (unless RFID)
 - pallet- or carton- level storage (no each-picks)
 - WMS/ERP set up
 - existing cycle count team

Setup and Rollout

- Takes 1–2 days to set up
- Suggestion: 1 facility pilot for 3 months
- If successful (defined success criteria), expand to 3 facilities

- Starting getting returns immediately
- 20x lifetime ROI from labor savings, inventory discrepancies, operational shutdowns, forklift savings, etc.



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Objectives

- 20x lifetime ROI from labor savings, inventory discrepancies, operational shutdowns, forklift savings, etc.
- Latest technology: Fully autonomous drones + RFID
- Qualifications: Pallet racks, single-deep (or RFID), existing budget

For more information

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