

# How the Largest Automotive Manufacturing Facility in North America is **Getting Ahead with AMRs**

Presented by:

Lee Weisenberger  
Managing Director of IT  
Universal Logistics



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powered by  MHI

# Universal Logistics

- Truckload
- Brokerage
- Value-Added
- Dedicated Intermodal

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# Universal Logistics - Industries Served

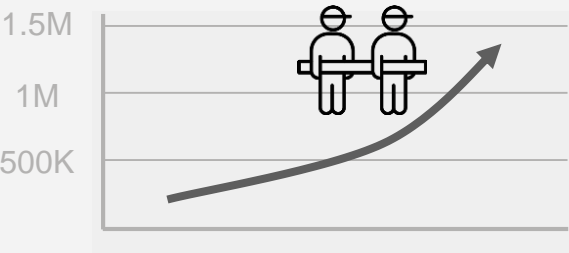
- Automotive
- Retail & Consumer Goods
- Industrial
- Steel & Metals
- Energy
- Others

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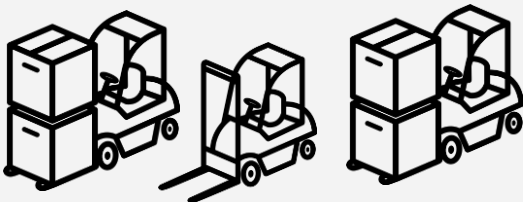
# Manufacturing & Distribution Pain Points

## Labor Shortages

Unfilled manufacturing & distribution jobs (US)



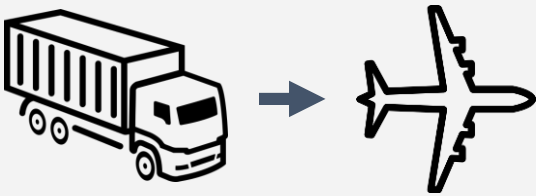
## Labor-Intensive Operations



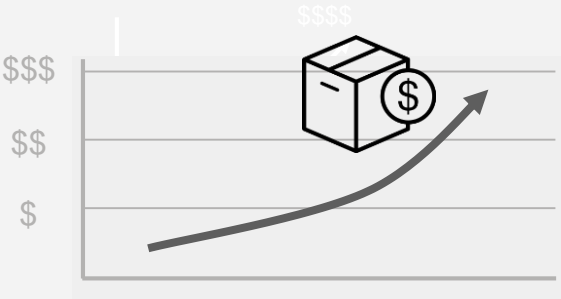
Forklift driver needs to stop/leave cab/pick/continue

## Reducing Cycle Times

Days to Hours



## Lowering Costs



Wages / Turnover / Accidents





# Primary Goals for Universal

- Reduce FTE manual movements & efficiency improvements
- Solve sort-staffing issues
- Ability to redeploy to other sites

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# Universal Smyrna, TN



Supports Nissan Motors plant, largest auto manufacturing facility in North America



Unemployment Rate: 2.4% (one of lowest in US)



Labor shortages in excess of 10% of required staff



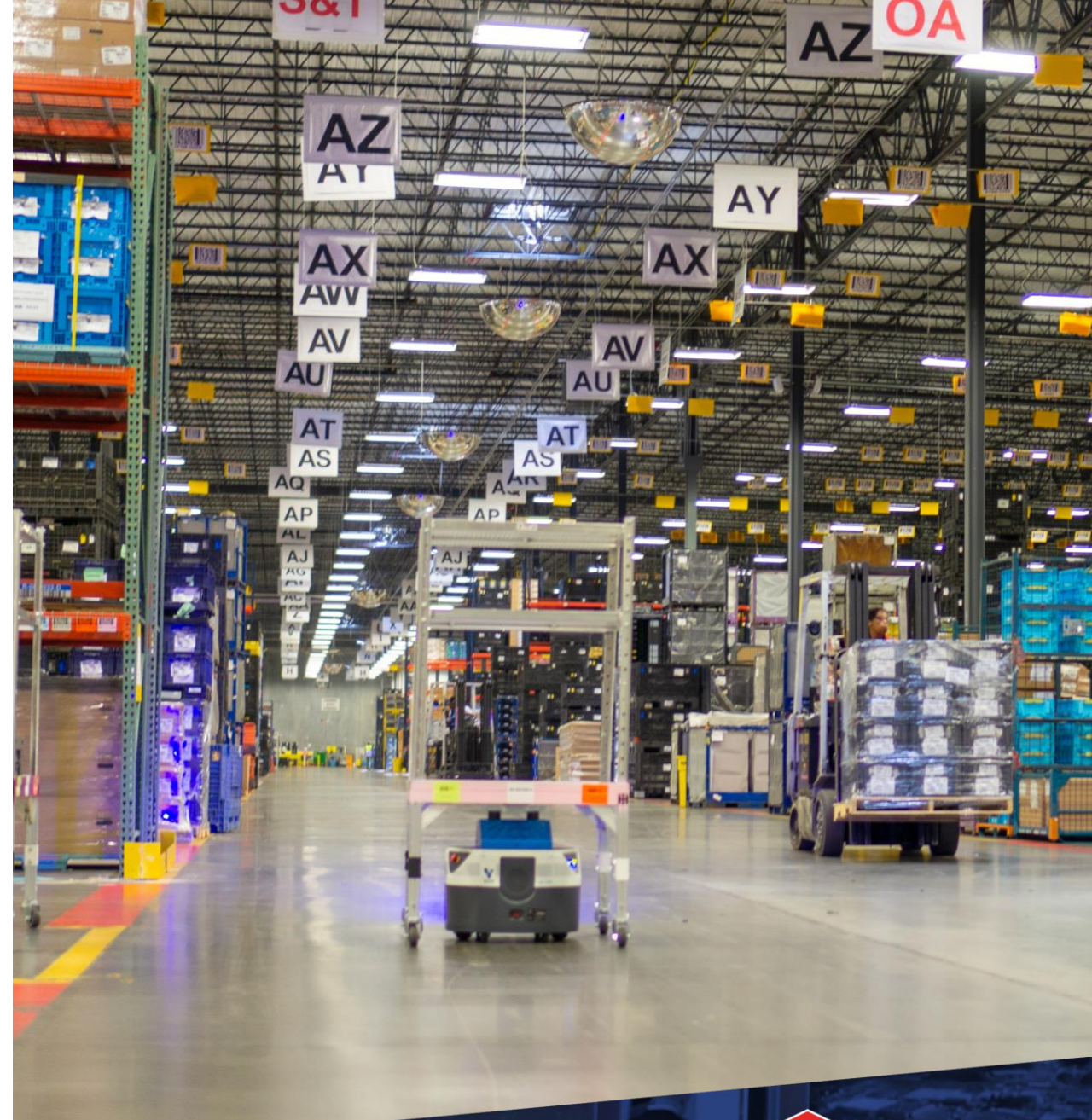
Facility: 1 Million sq ft



Capacity: 640,000 vehicles annually



Production: Nissan Altima, Maxima, Leaf, Pathfinder, Rogue; Infiniti QX60



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# NISSAN

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# Cart-based AMR Solution

## Key Features

- Max Payload 77kg
- Adjustable shelves
- Manage & integrate with laptop, tablet, scanner, etc.

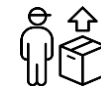
## Key Benefits

- Automates a wide range of workflows
- Easily adapts to existing & new processes
- Lowest robot / FTE ratio
- Very high utilization / low cost
- Recognized for safety (CE mark & ISO 13489 PLb)

## Key Workflows



Order Picking



Replenishment / Putaway

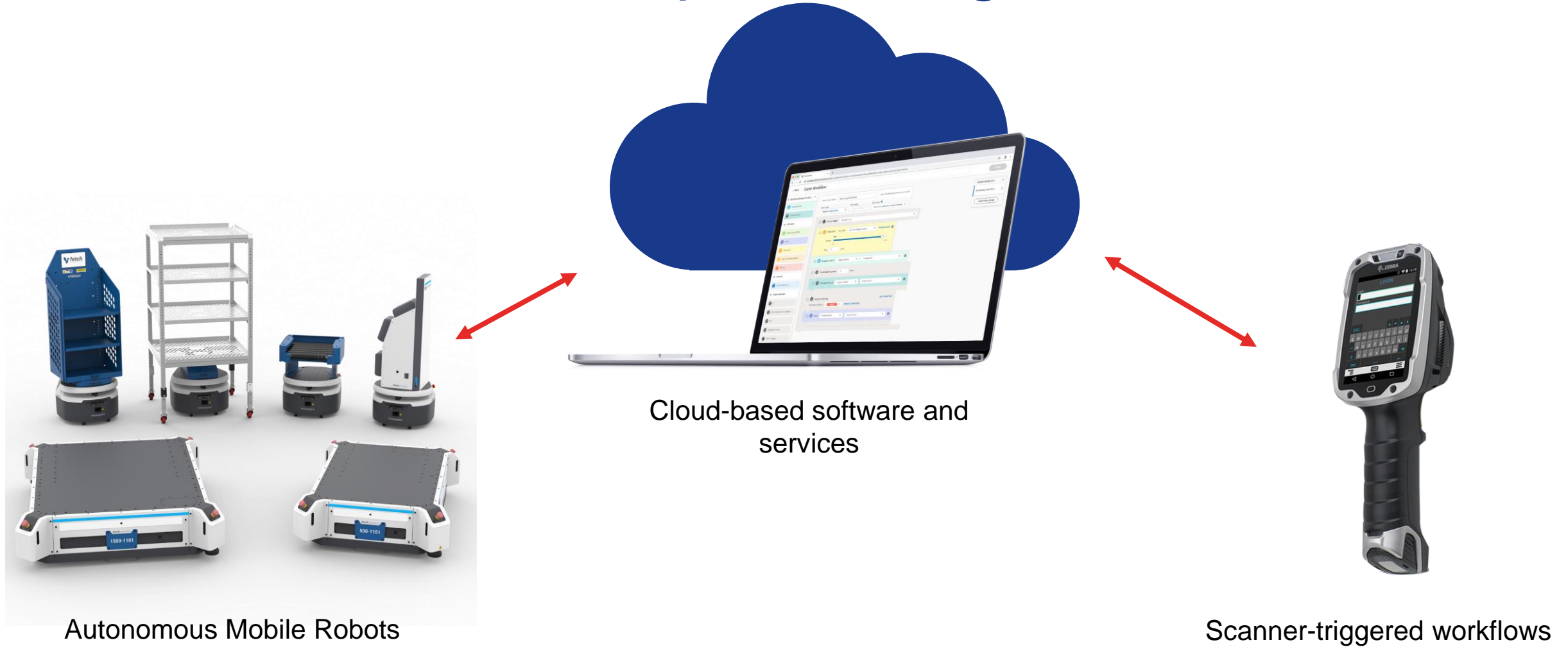


Raw Material Delivery

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# Scanner / Mobile Computer Integration



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# AMR Manufacturing Solutions

## Core Workflows:

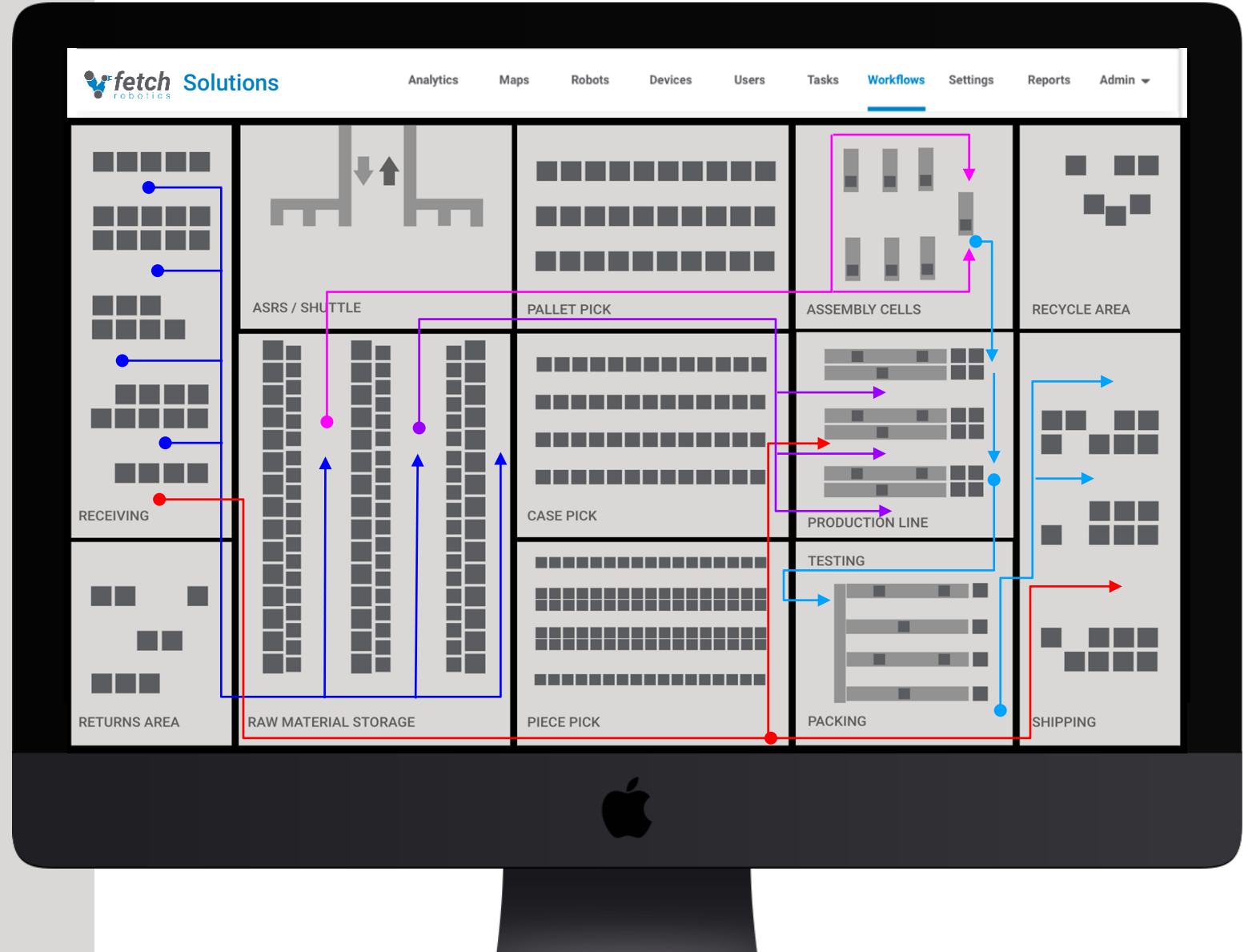
- Receiving to Raw Materials Storage
- Raw Material to Production Line
- Raw Material to Assembly Cells
- End of Line Handling

## Value-added Workflows:

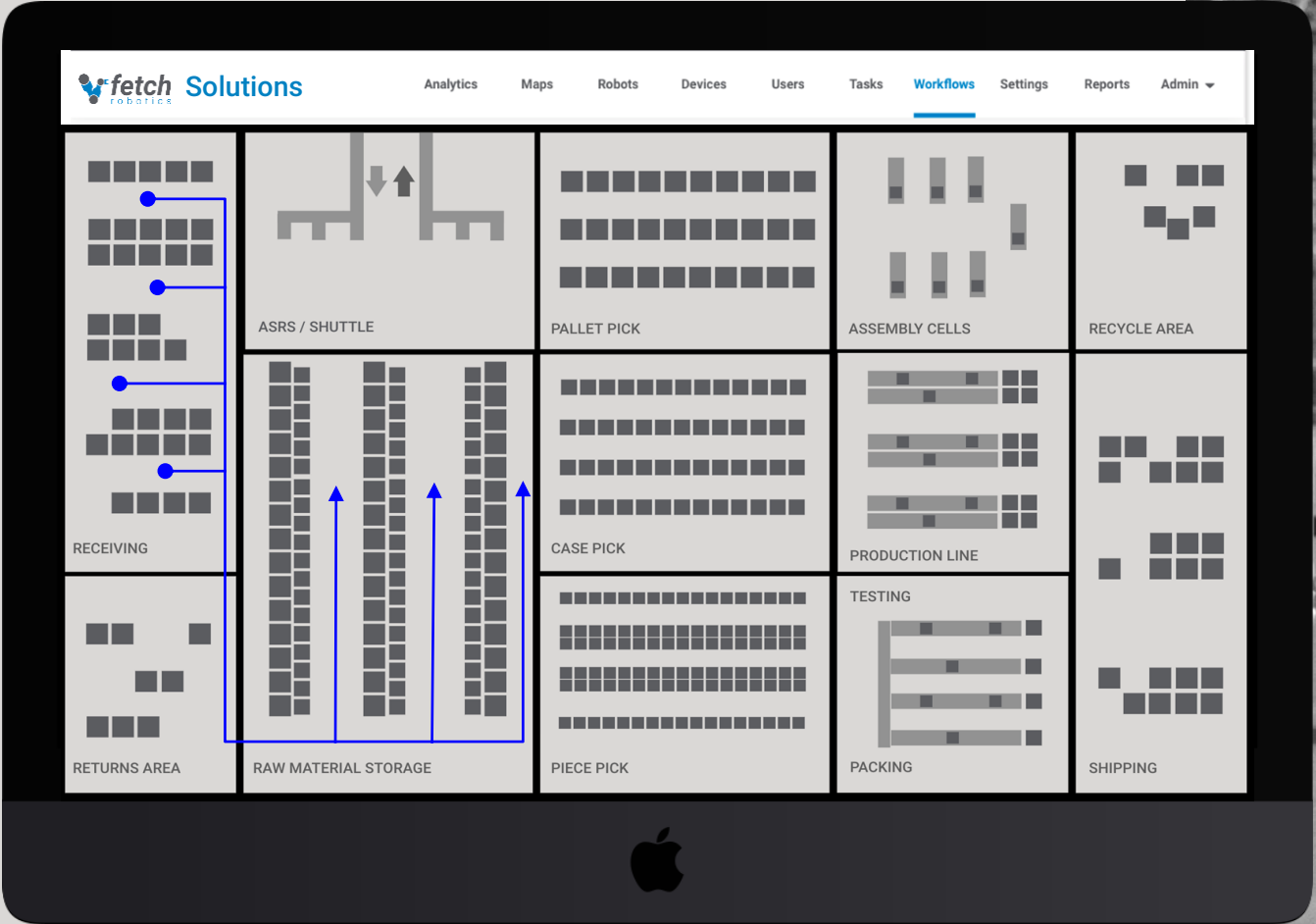
- Urgent Parts Delivery
- Kanban Replenishment
- Detrash to Recycling

## Additional Workflows:

- IQC to Raw
- Raw to Kitting
- Kits to Sub-Assembly & Assembly
- Production Fallout to Troubleshooting / Repair
- Bulk materials / pallets to Assembly
- Floorstock Replenishment



# Receiving to Raw Materials Storage



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# Receiving to Raw Materials Storage





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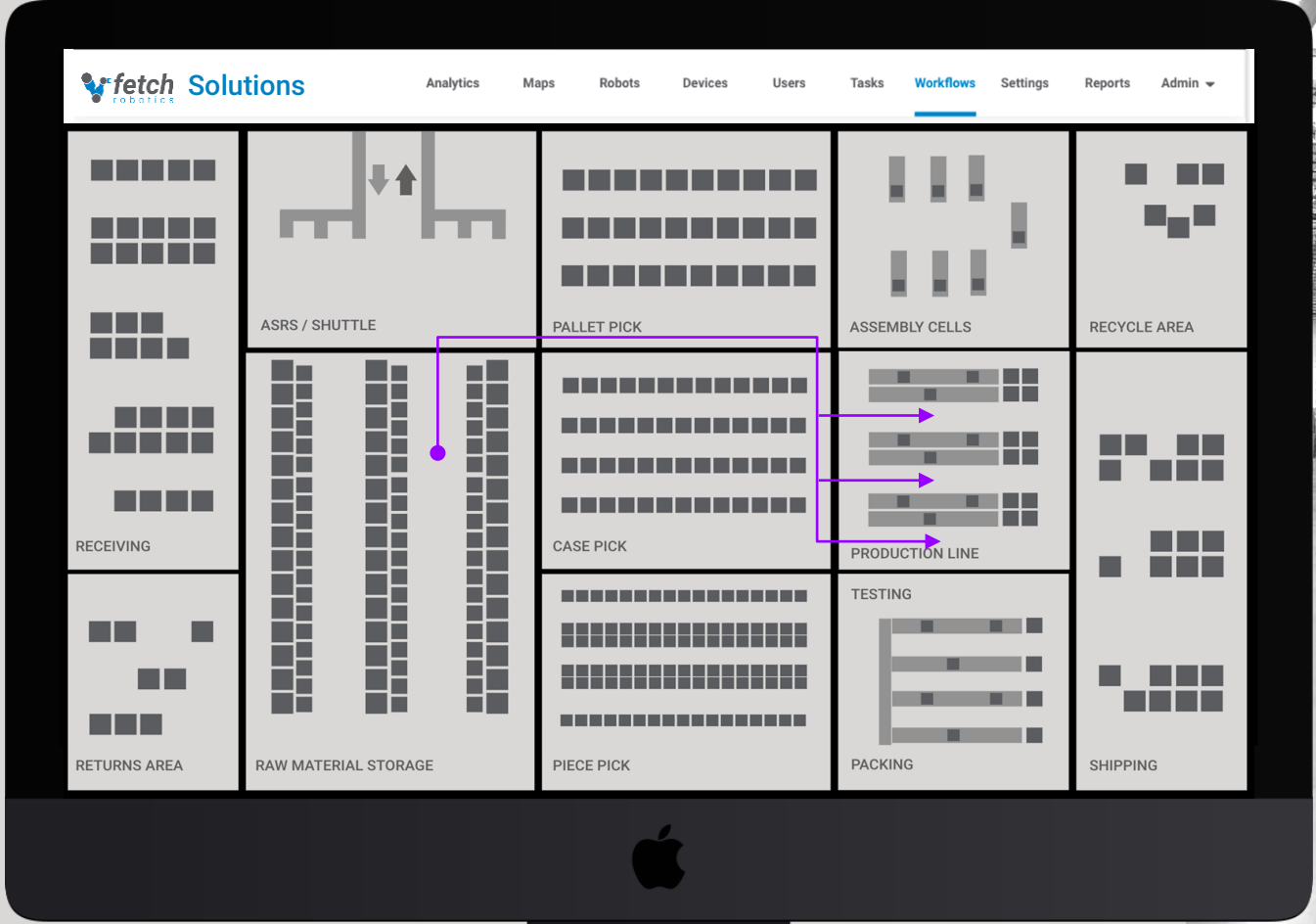


# Receiving to Raw Materials Storage



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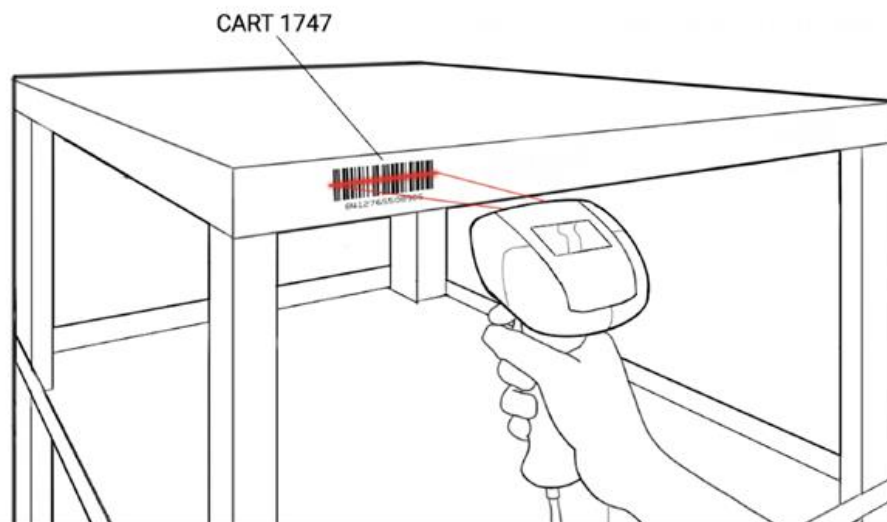
# Raw Materials to Production Line



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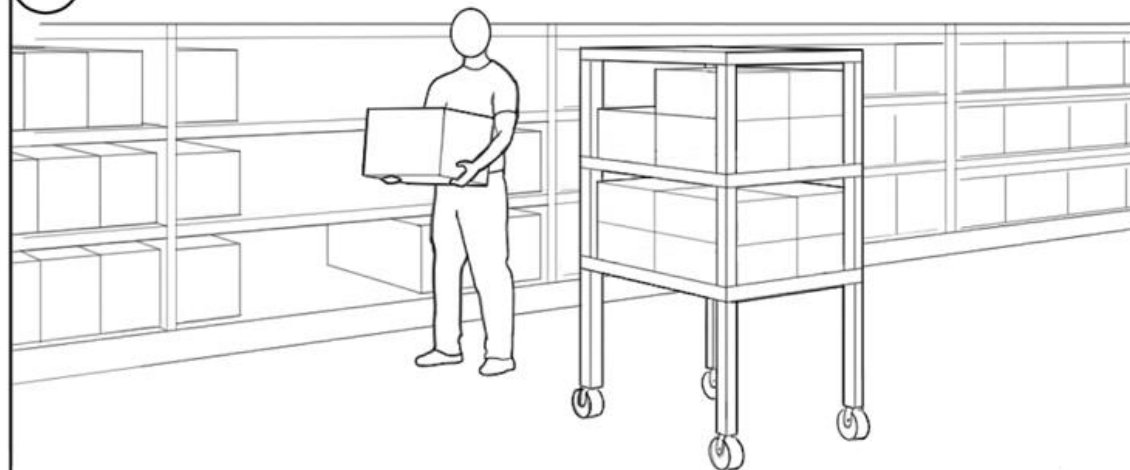


1



Picking Associate selects available FetchCart #1747 from a cart staging area in the Supermarket and pairs it with a pick-list or work order by scanning the Cart ID.

2



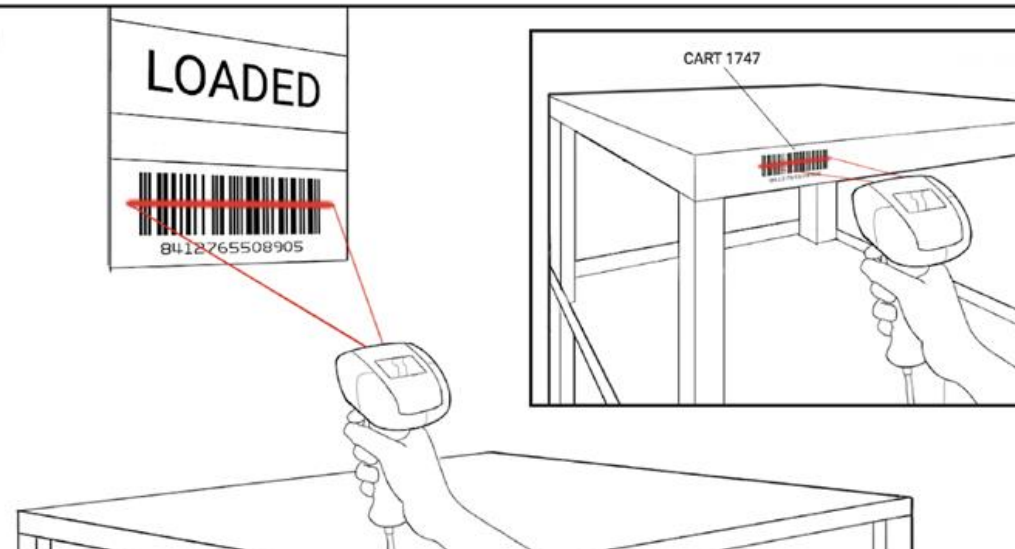
Associates picks material to FetchCart. Can be guided by RF, voice, or other device.

3



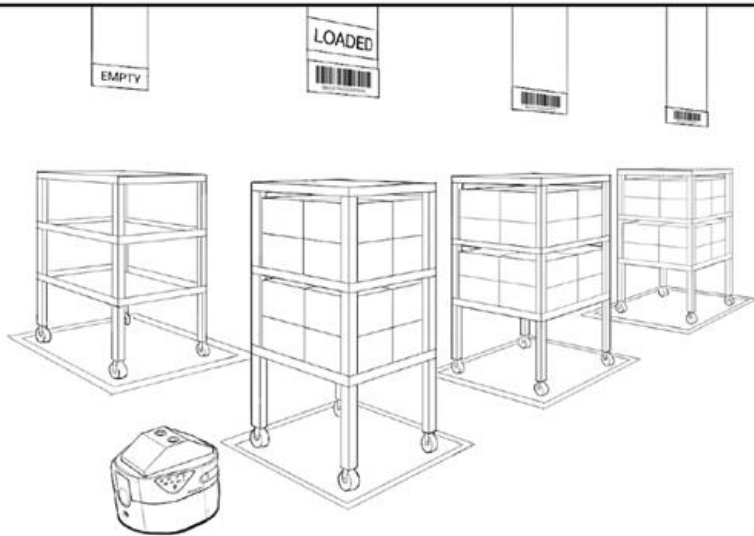
Once pick is completed, associate moves cart to designated Loaded Cart staging area in Supermarket.

4



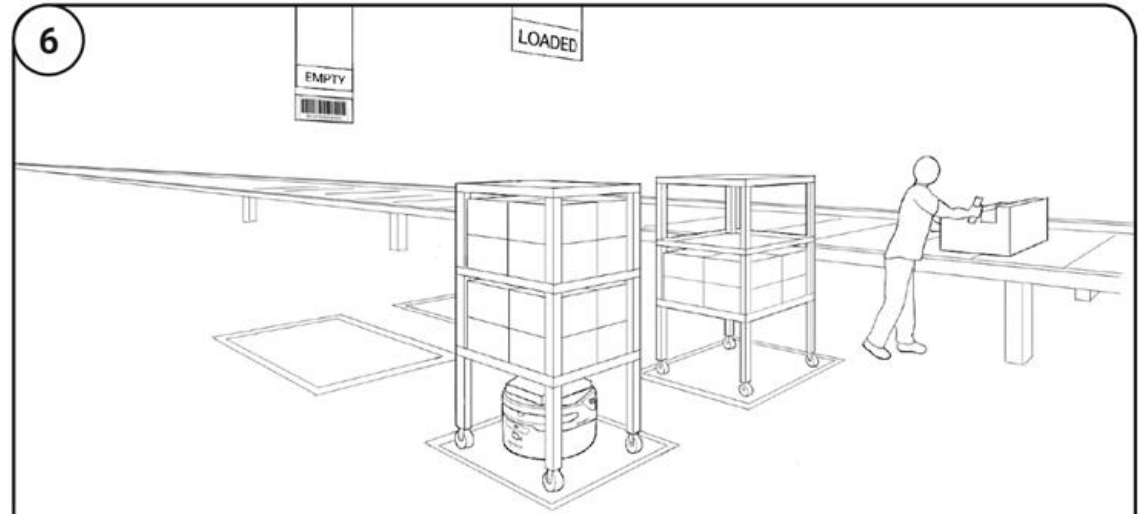
Associate first scans position barcode, then scans Cart ID to trigger robot pickup from Supermarket and delivery to Production Line.

5



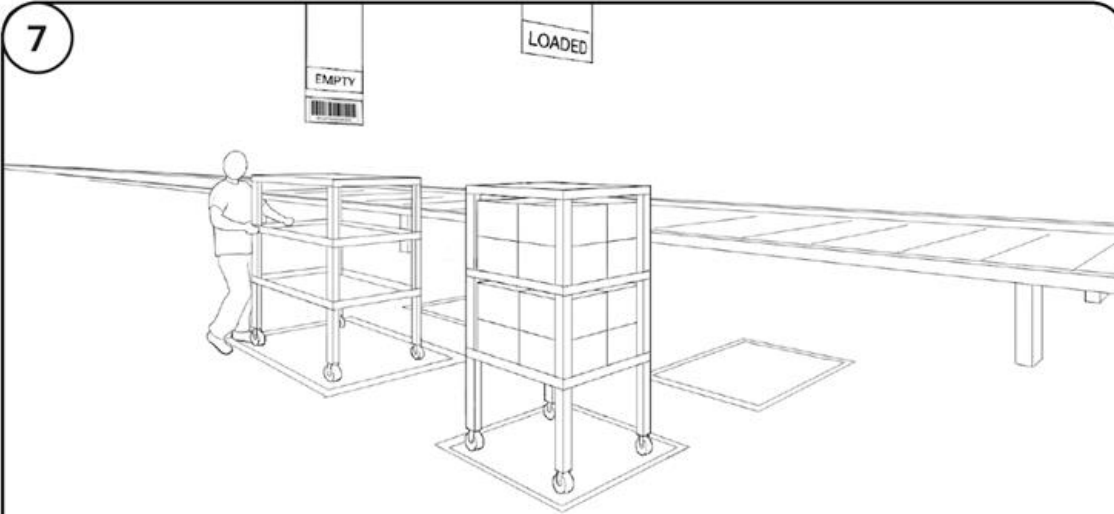
Robot arrives and picks up Cart# 1747.

6



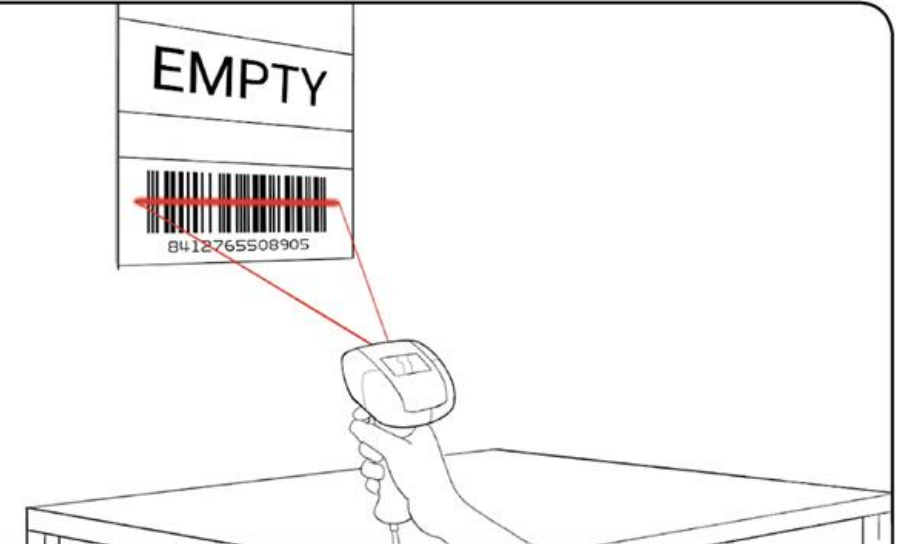
Robot delivers Cart# 1747 to assembly station and proceeds to other tasks. FetchCart can be utilized as a mobile Kanban to replenish raw material to the production line. Material on cart is scanned into WIP and unpaired from cart #1747 upon assembly.

7



Once raw material on FetchCart is consumed, the Assembly Technician moves the empty cart to a pickup area along the Production Line.

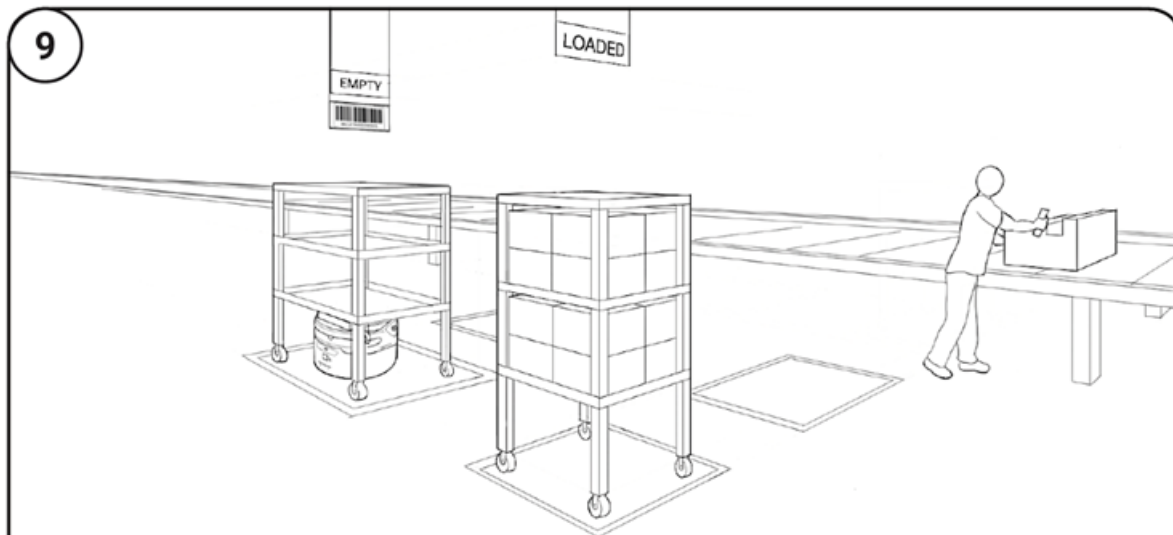
8



Associate scans the position barcode to request robot pickup at Production Line. This triggers a robot to pickup the empty cart and return it to the Supermarket area.

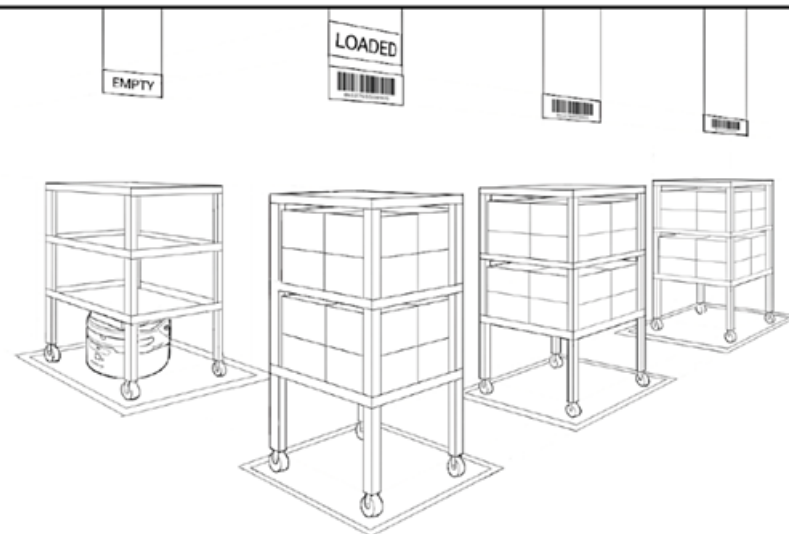


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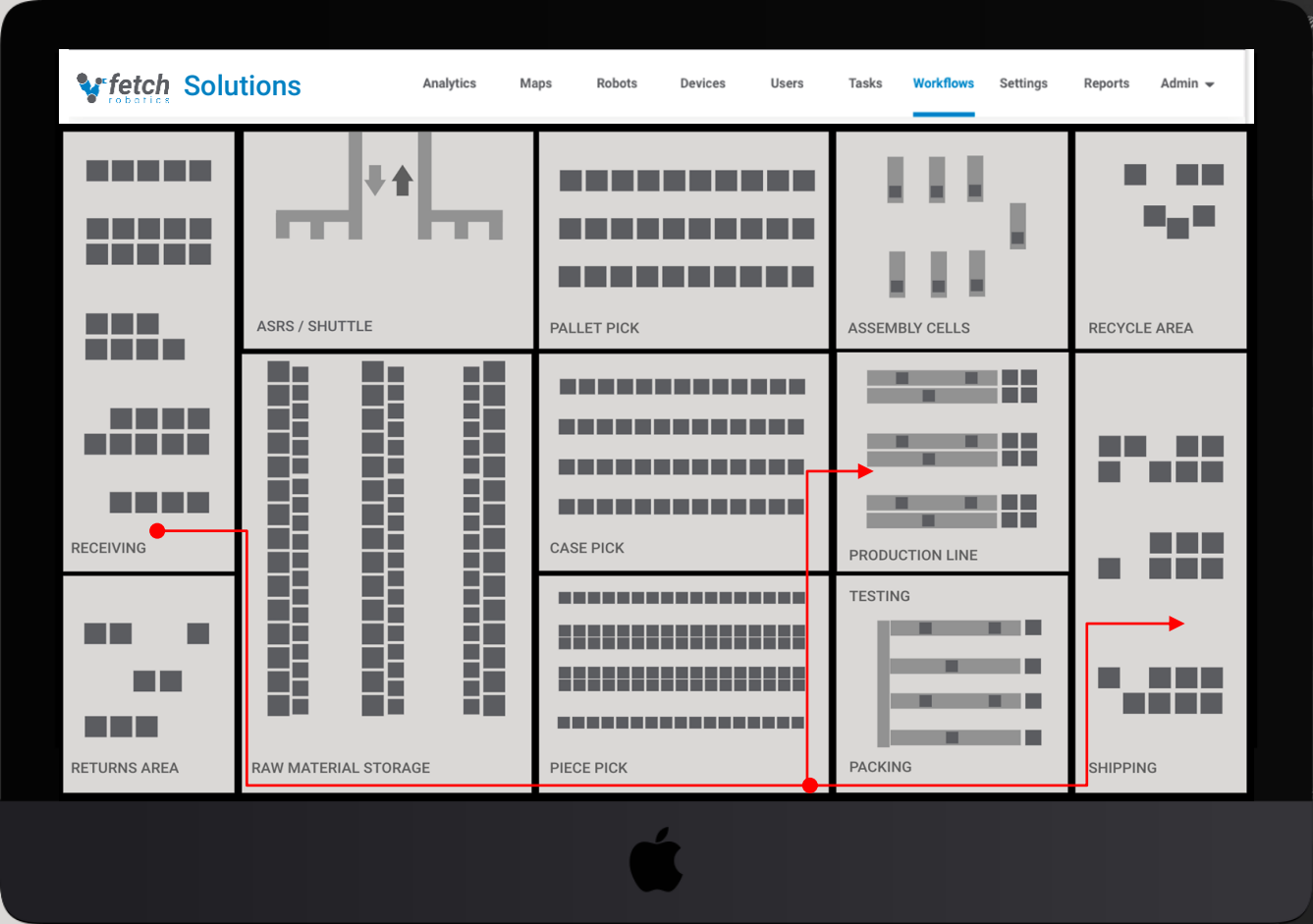
A robot arrives and connects to the empty FetchCart and returns it to the Supermarket cart staging area.

10



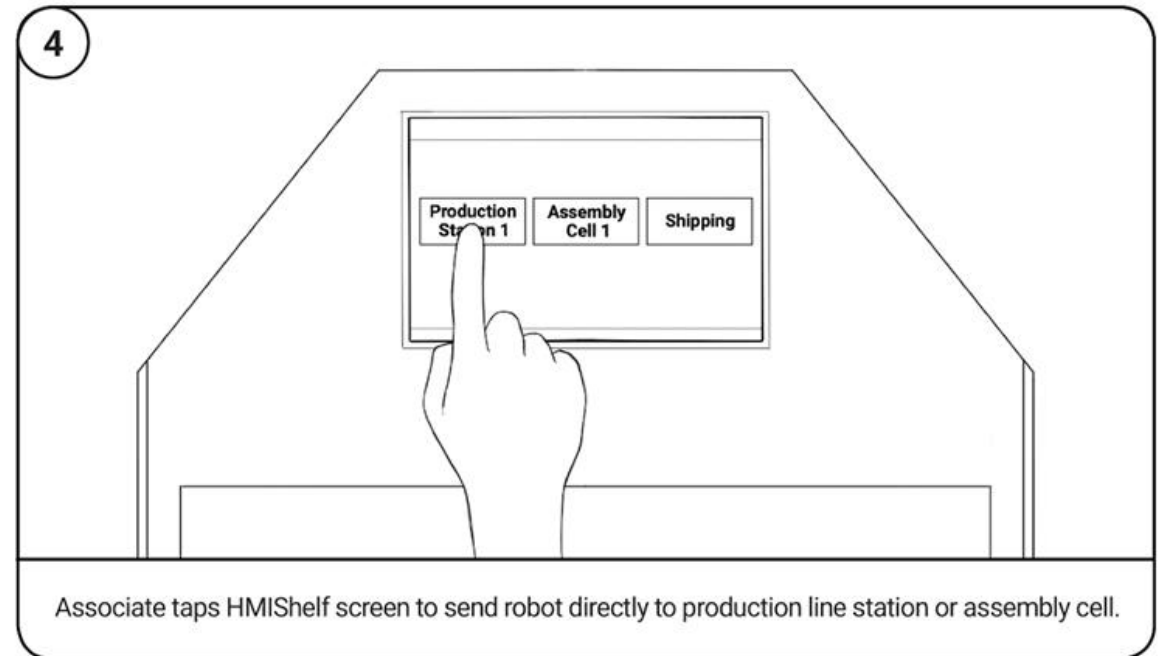
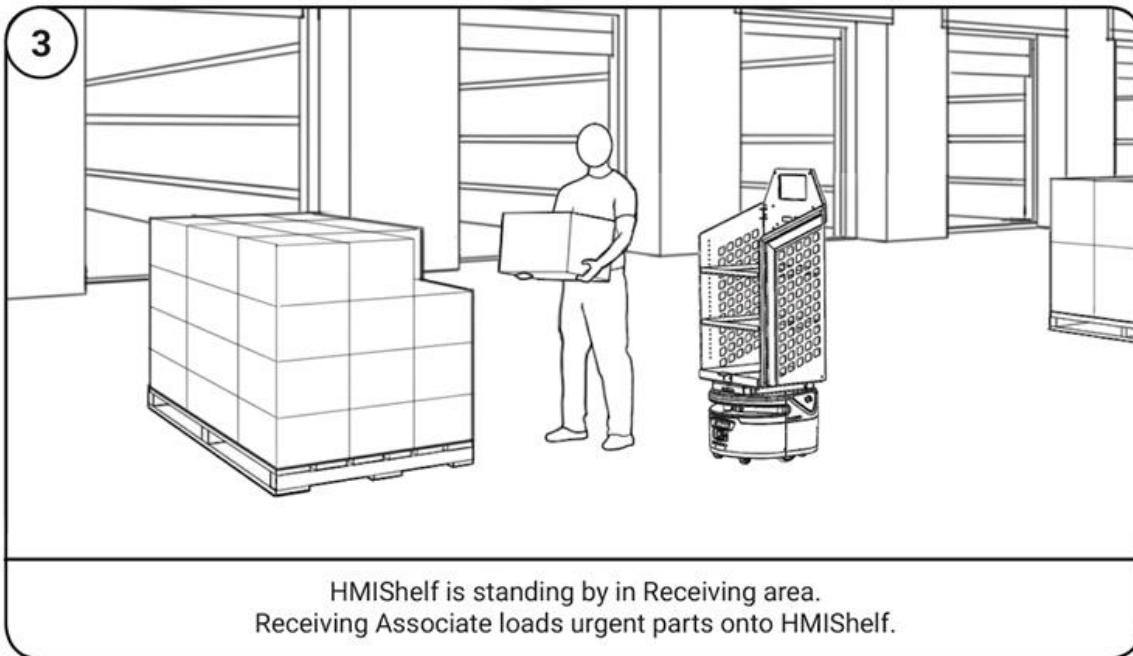
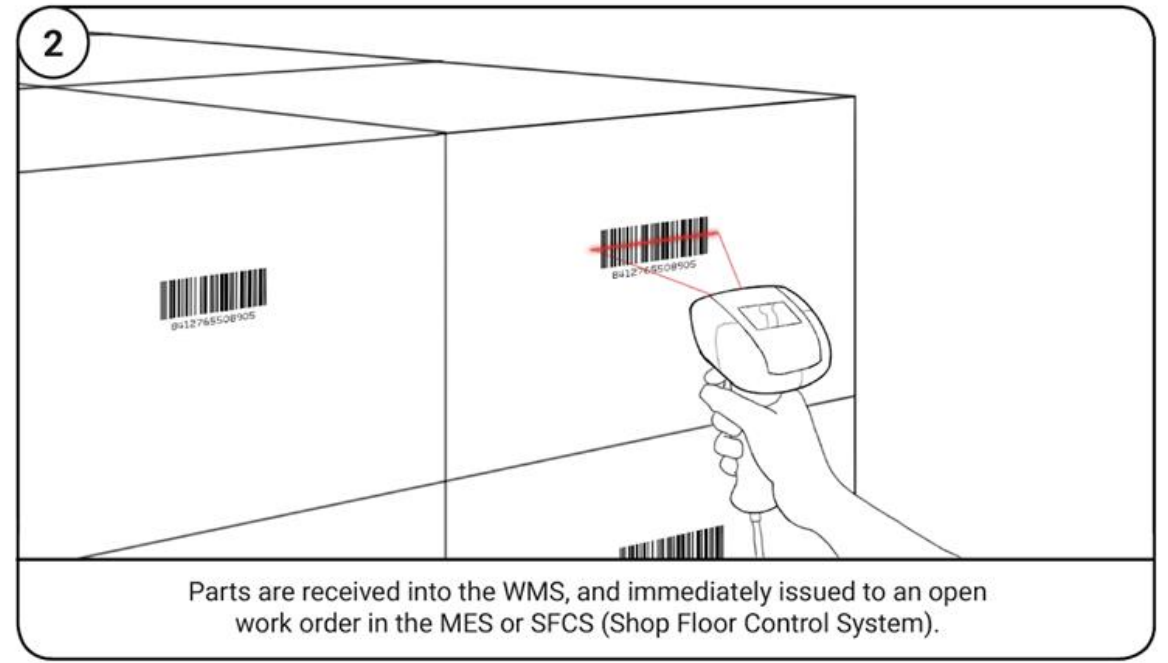
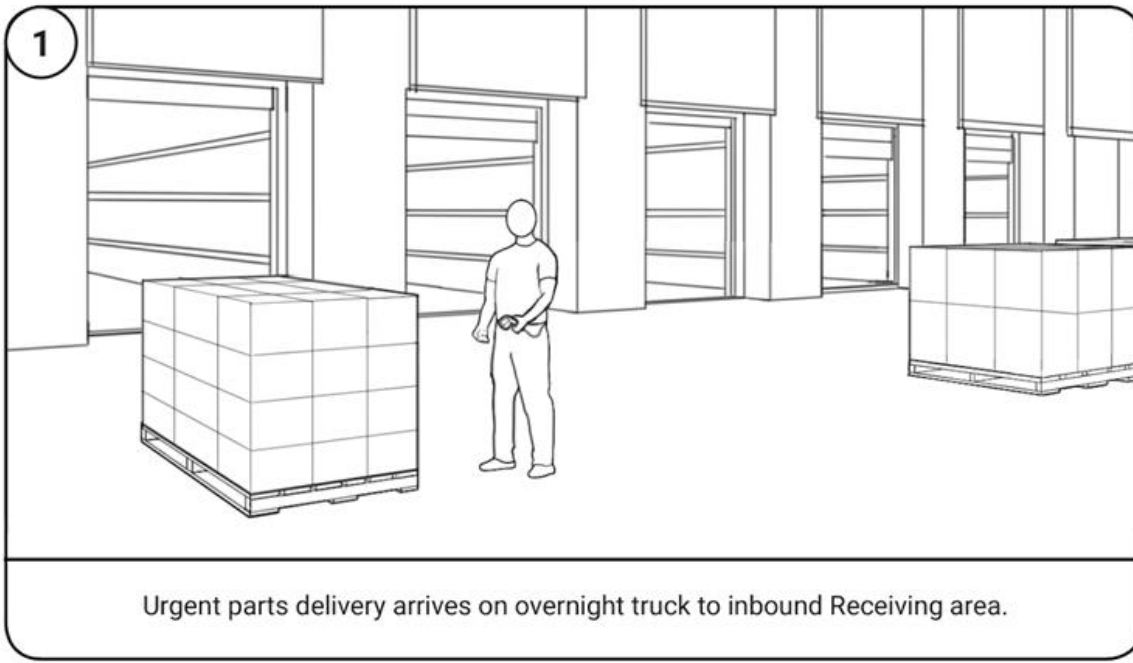
Robot transports full FetchCart to specific assembly station and disconnects. Assembly Tech assembles product on the line with materials from FetchCart.

# Hots Material Delivery

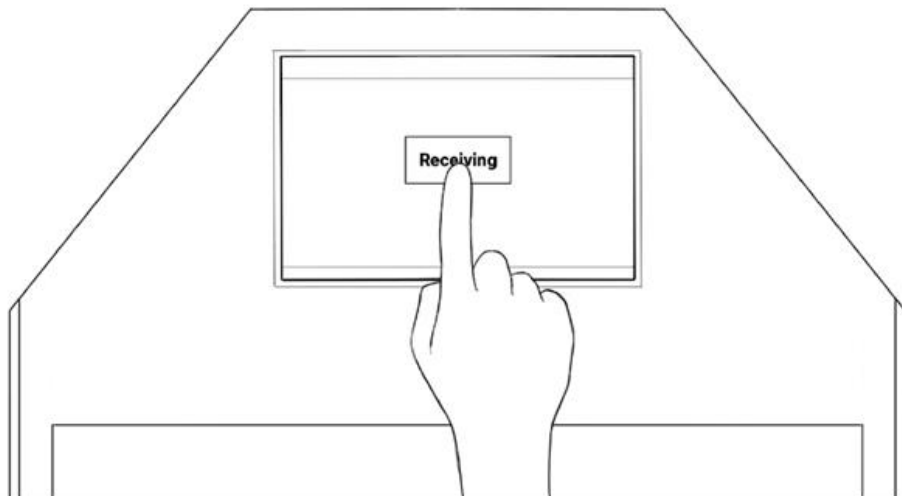


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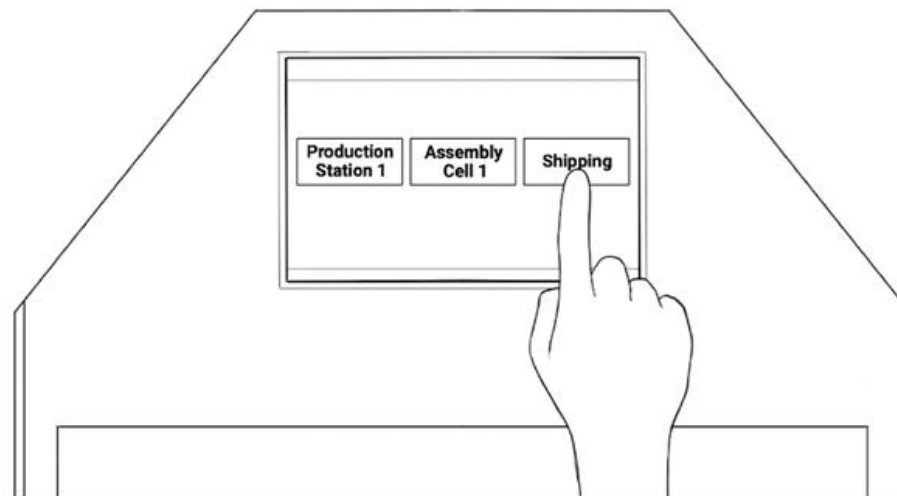


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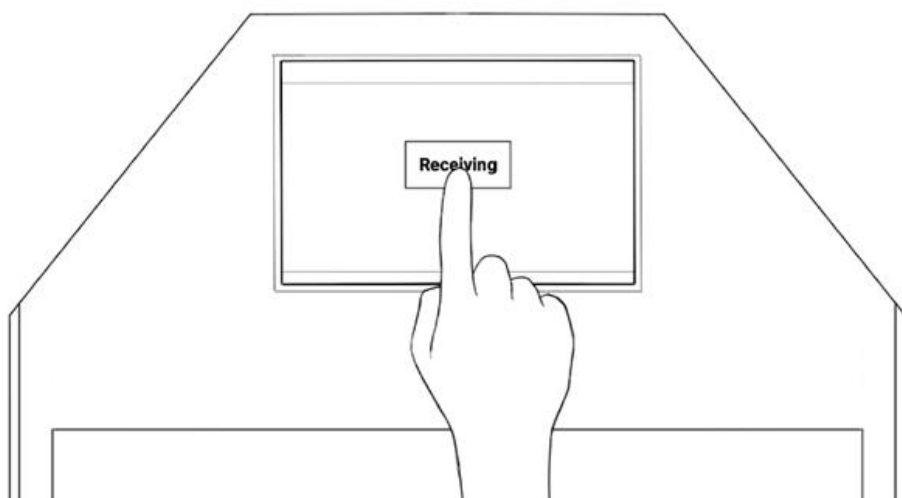
At production line, Assembly Technician receives the parts, then taps HMI screen to send robot back to ready position at Receiving.

6



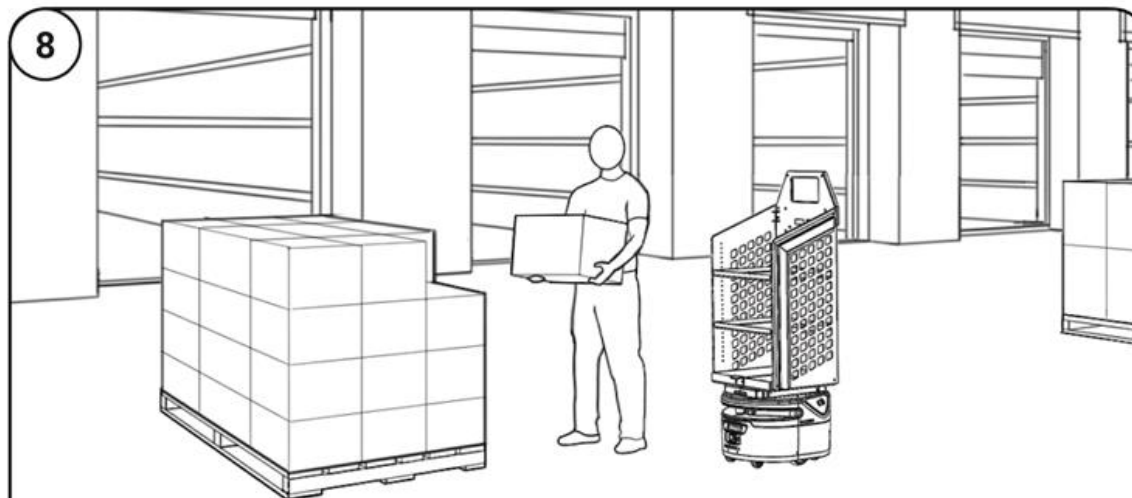
Another urgent shipment arrives, which requires immediate turnaround for dispatch. Associate loads material (individually packed box) onto HMIShelf and taps screen to send to Shipping dock.

7



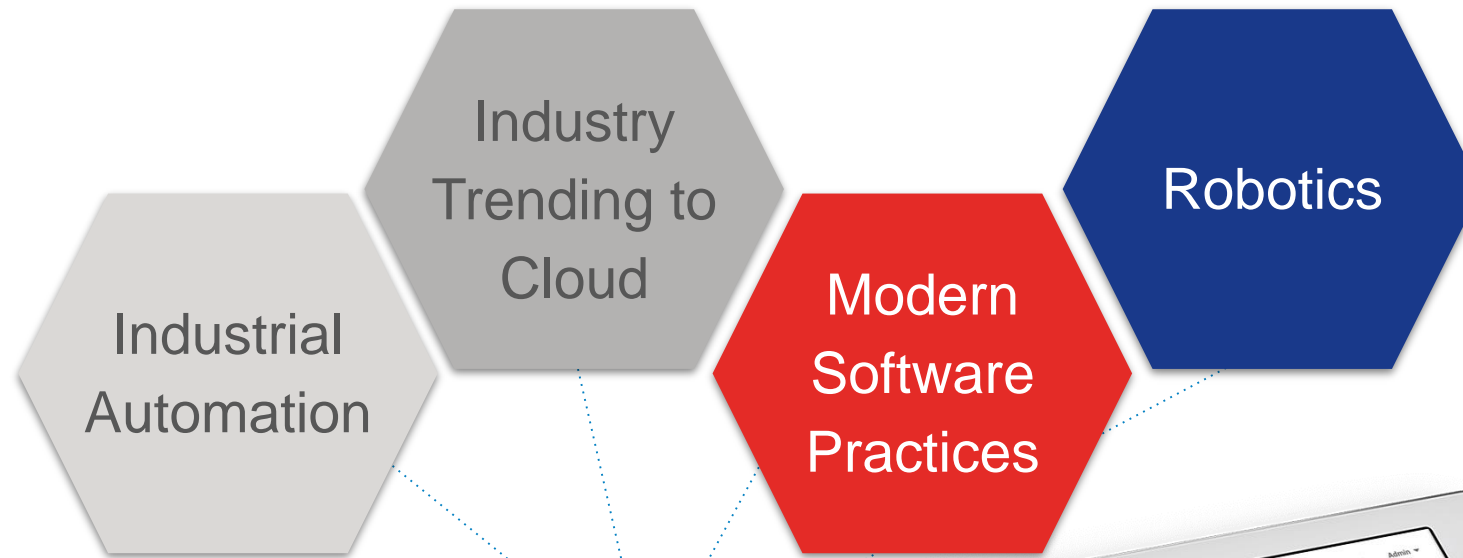
At Shipping dock, shipping associate adds item to order (either overpack or build pallet or single item direct ship), then taps HMIShelf screen to send empty robot back to Receiving.

8



HMIShelf returns to staging area in Receiving, ready for next urgent order.

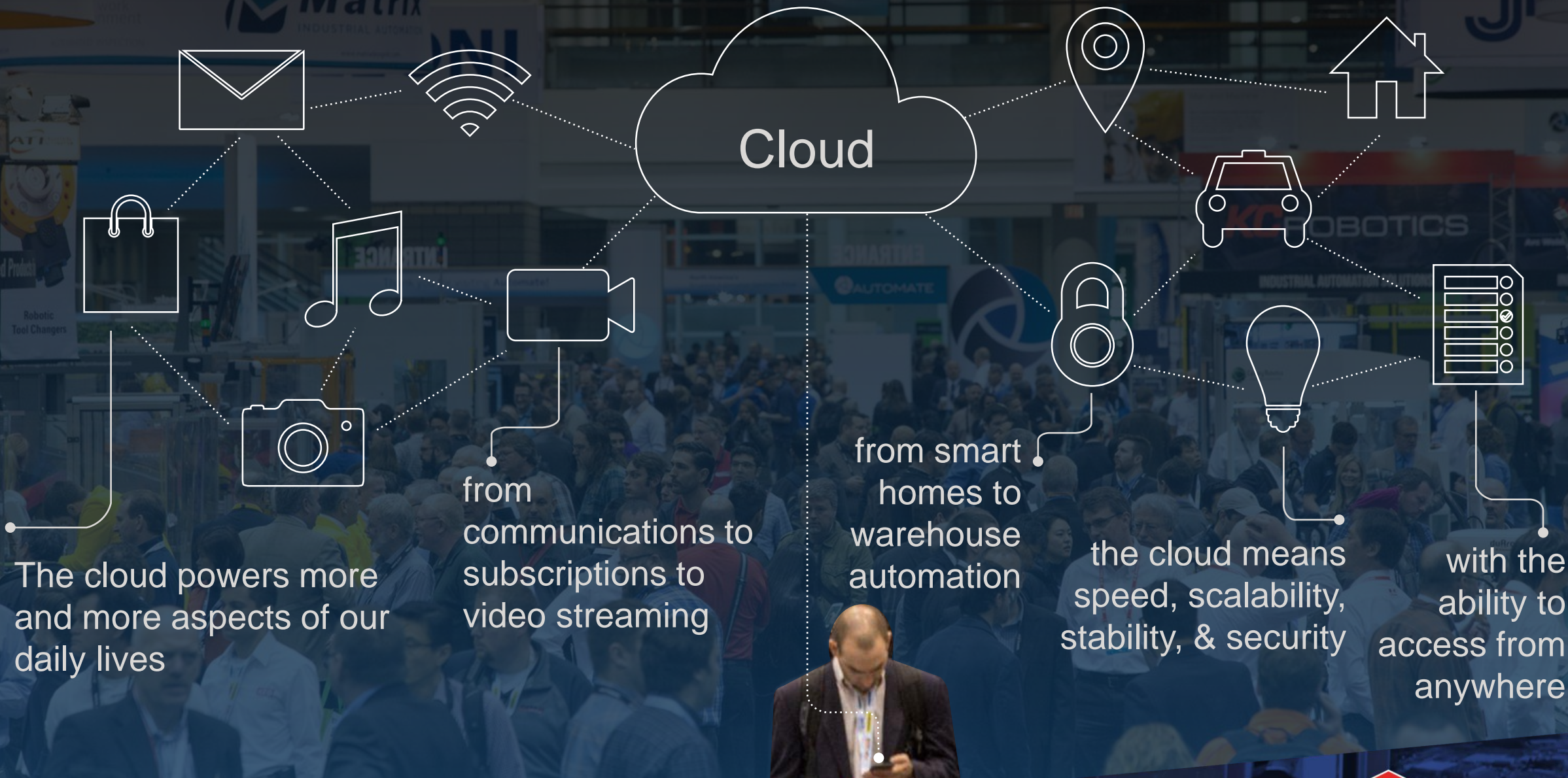




Convergence of technologies enables cloud robotics automation solutions to be a reality



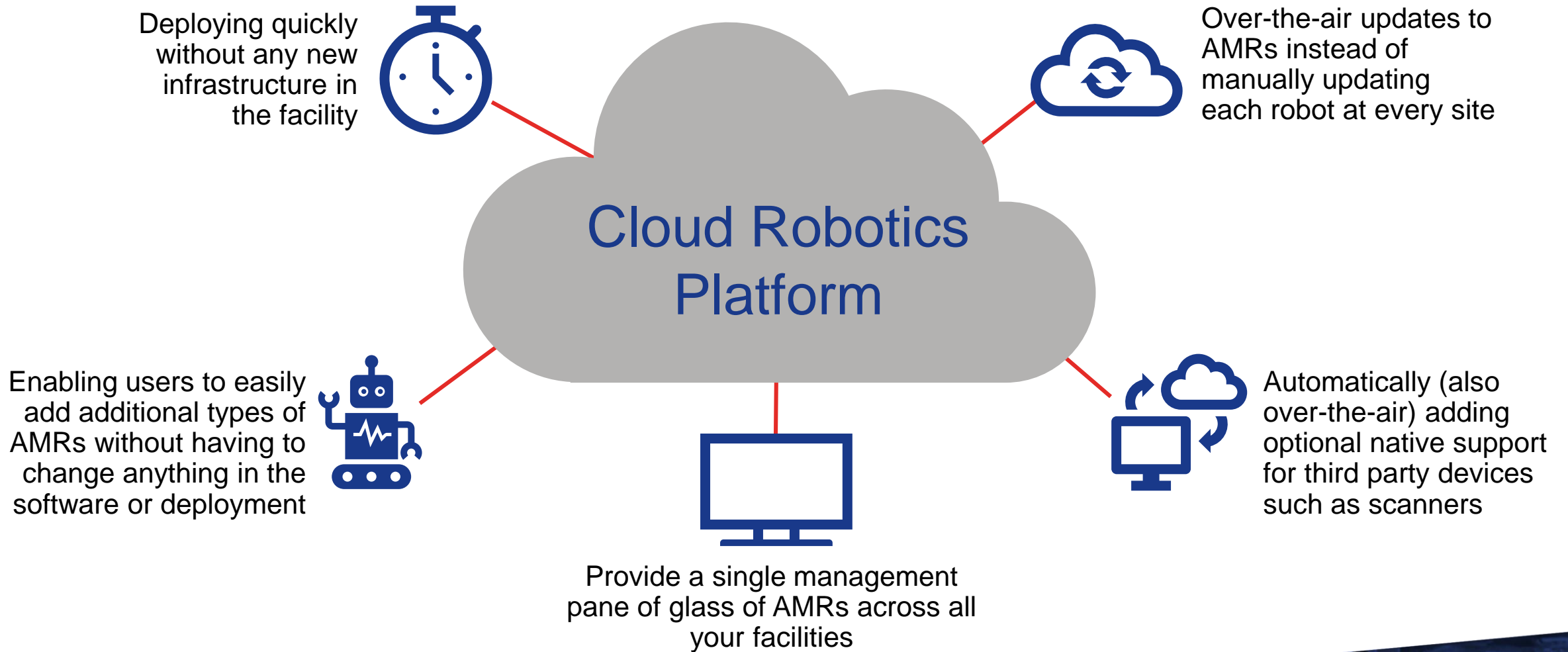
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# Advantages of a Cloud Robotics Platform



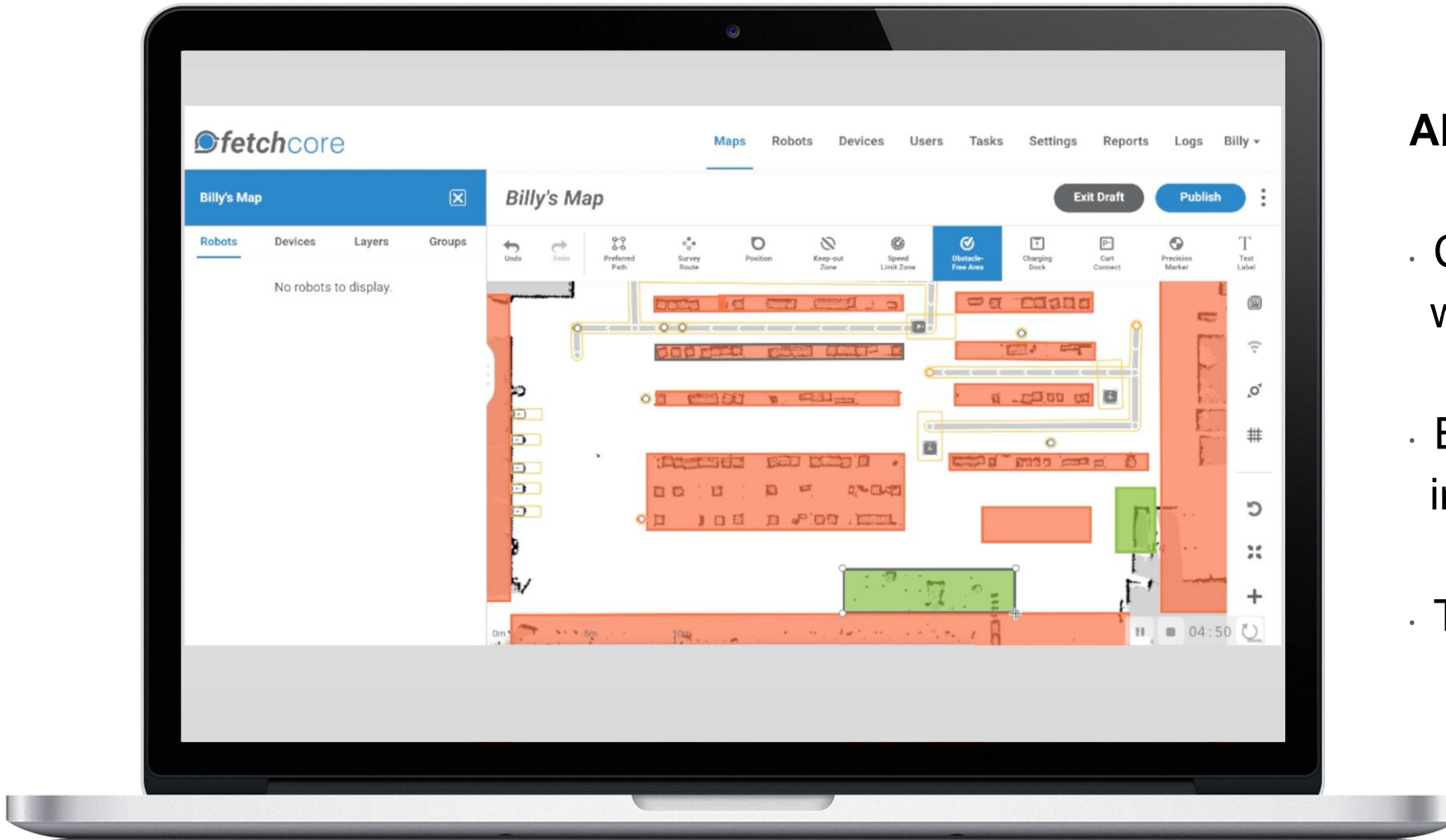
# Cloud Robotics Platform in Action



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# Cloud-based Apps Make It Possible



## All Managed By You

- Create custom tasks, workflows, and schedules
- Easy to use, intuitive interface
- Trigger IoT interactions

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# Deploying Cloud Robotics: Automation in a Day



Months



Weeks



Hours

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# Step 1: Unpack robot



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# Step 2: Connect to WiFi



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# Step 3: Map facility



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# Step 4: Start work!



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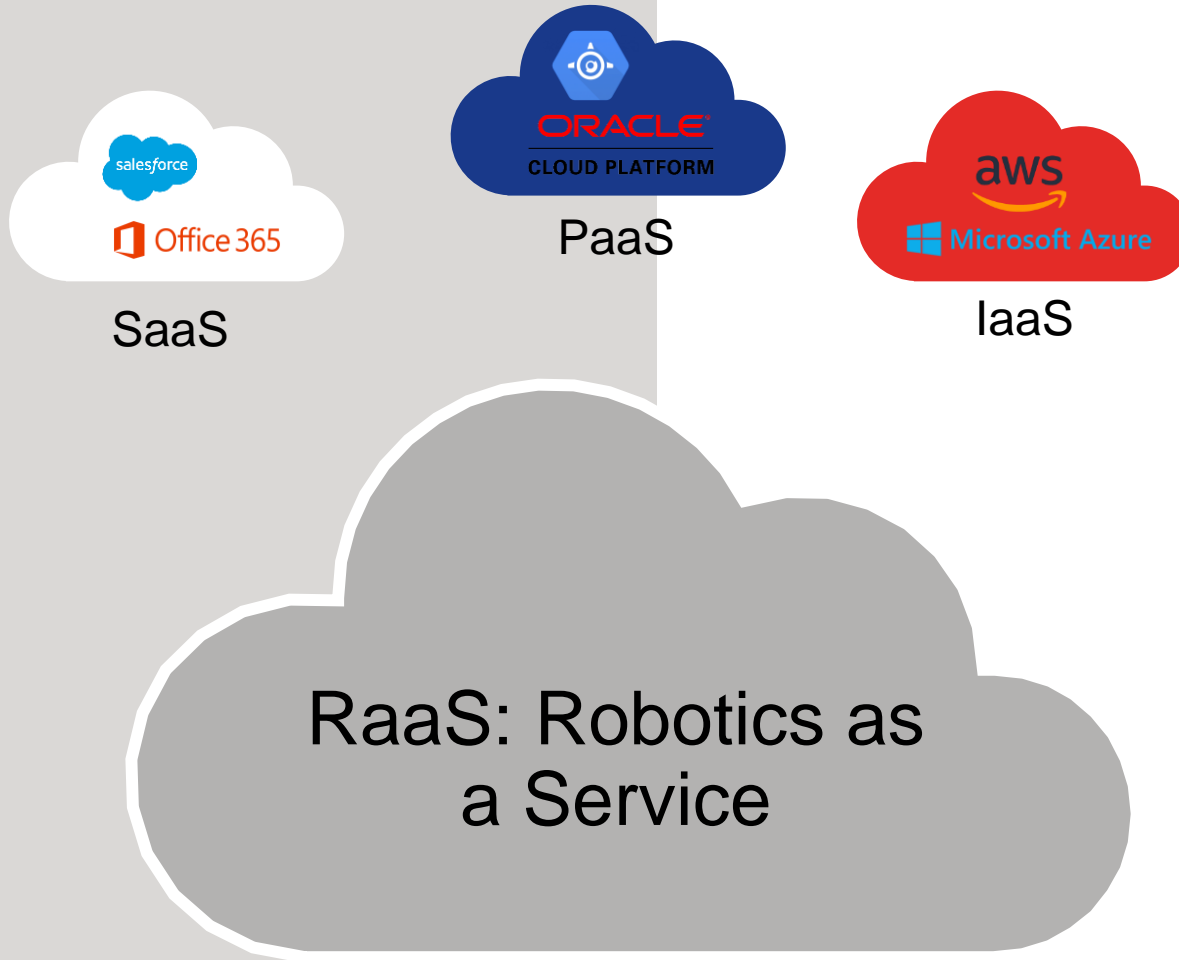
# Accelerating Time-to-Value with Cloud Robotics



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# RaaS: Like any other as-a-Service Model



RaaS is not a Lease. RaaS enables:

- Fast deployment
- Changing service if needed
- Scaling up without scaling infrastructure
- System wide software upgrades
- New features available immediately
- Immediate availability of new native device support
- Surge during peak seasons
- Pay as you go pricing or reserved pricing
- Leveraging other cloud tools such as ML or BI
- Portability -- Move without moving infrastructure
- Technology protection



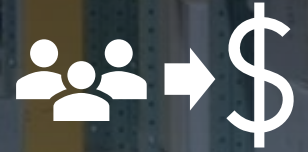
# Our Experience with a Cloud-based AMR Solution



Immediate  
Financial  
Benefit through  
RaaS



Addressed  
Chronic Labor  
Shortages



Focus Staff on  
Revenue  
Generating Tasks



Improved  
Worker  
Satisfaction



Fully Operational  
in Less Than a  
Week



Boost Output  
while  
Managing Costs

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*For more information:*

Speaker email: [lweisenberger@usti.net](mailto:lweisenberger@usti.net)

Website: [www.universallogistics.com](http://www.universallogistics.com)

Or visit MODEX Booth 9011



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