5 Ways ROS Drives Faster Robot Deployment & Adoption

Robotics Summit & Expo
Wednesday, June 5th 2019

WAYPOINT ROBOTICS

We are

WAYPOINT ROBOTICS

WE ARE DOING FOR ROBOTICS WHAT APPLE DID FOR MP3 PLAYERS.

Company origins

BRIEF HISTORY OF WAYPOINT ROBOTICS.

CEO AND CO-FOUNDER
JASON WALKER

PATRICK HUSSEY
CTO AND CO-FOUNDER

CORY HUSSEY
GENERAL COUNSEL

Stanley ELEVATOR

Corey Hussey is COO and General Counsel at Stanley Elevator, a 65 year old privately held company

iRobot

Jason Walker (CEO) and Patrick Hussey (CTO) worked together at iRobot, on Roomba

CYPHY WORKS

Walker left iRobot and cofounded CyPhy Works with Helen Greiner

SEGWAY

Patrick Hussey left iRobot for Segway

STANLEY INNOVATION

Patrick and Cory Hussey founded Stanley Innovation – a robotics R&D company with an agile team, focused on prototyping and innovation

WAYPOINT ROBOTICS

Walker and the Husseys join forces to start Waypoint Robotics – a fully independent robotics product company built to scale up to meet growing market demand

Jason Walker

CEO & Co-Founder

Waypoint Robotics, Inc.

Jason Walker is the CEO and co-founder of Waypoint Robotics. Waypoint is focused on making autonomous mobile robots accessible to more people and companies. Prior to founding Waypoint, Mr. Walker was the co-founder and Director of Operations at CyPhy Works (now Aria Insights). Mr. Walker also served as Lead Roboticist and Principal Investigator for CyPhy Works' contracts with agencies such as DARPA, NIST, and the National Science Foundation. Mr. Walker has 18+ years of experience in product and business development, including B2B, consumer, and government markets. Prior to co-founding CyPhy Works he was the quality, reliability, and testing manager for the Roomba vacuuming robot at iRobot. Walker received a BSEE with a concentration in Robotics and Control Systems from Kansas State University and is a lifelong entrepreneur.

Where we are now

Real needs. Slow progress.

- Low unemployment. High demand.
- Industry 4.0 on the doorstep. Bobby is pushing carts. Yet...
- Companies, especially small to mid-sized manufacturers (SMEs), have been slow to adopt robots.

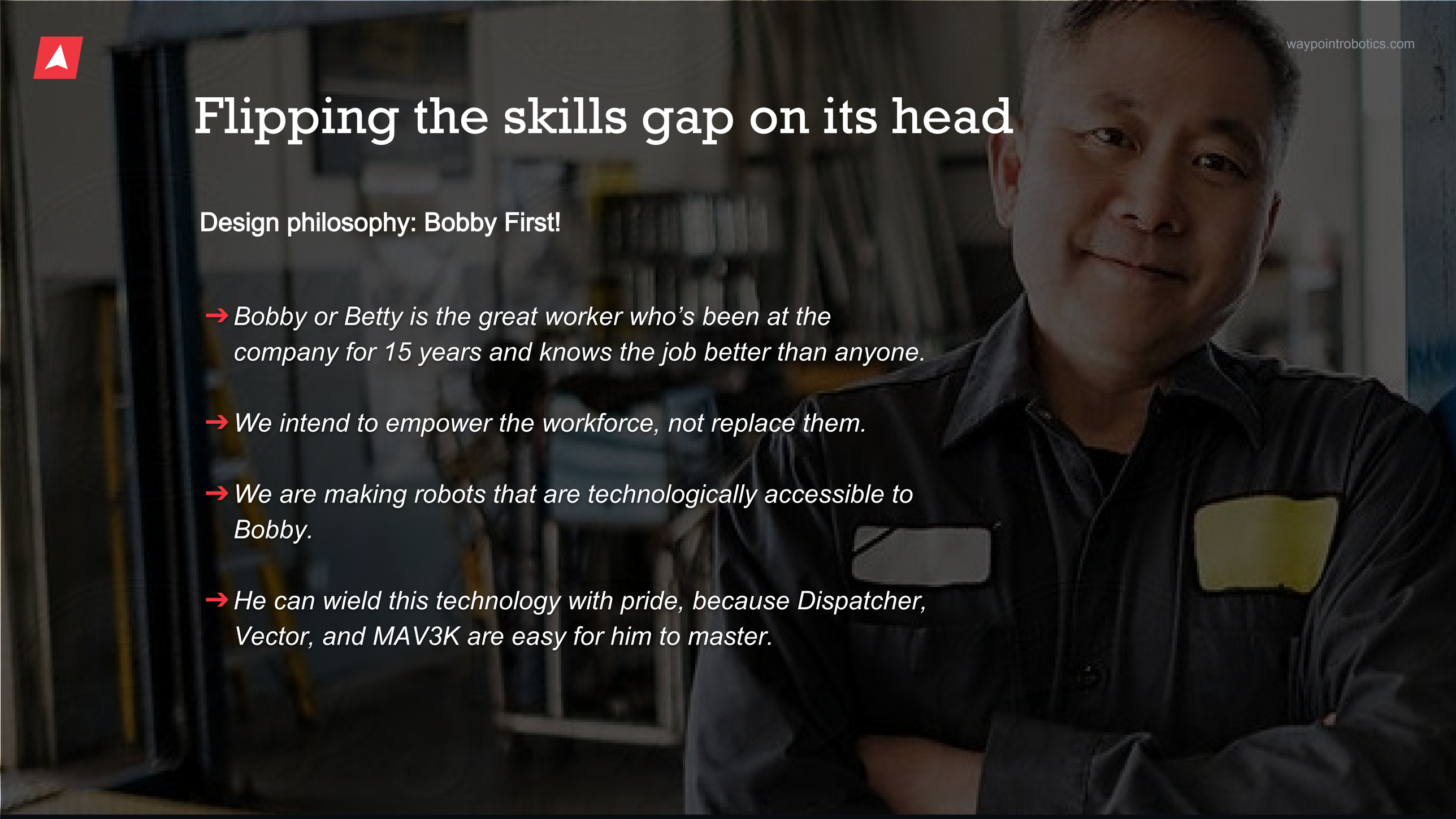
What if the problem is with the machines?

- Historically, robots have been defined by their limitations: Complex, Inflexible, and Expensive.
- Mobile robots are often challenged by real world conditions. They require sterile, controlled environments, and infrastructure additions.
- Experts are needed for setup including mapping, route planning, and fleet management.
- Accessibility is the key to unlocking robotics for SMEs.

Flipping the skills gap on its head

Design philosophy: Bobby First!

- ➔ *Bobby or Betty is the great worker who's been at the company for 15 years and knows the job better than anyone.*
- ➔ *We intend to empower the workforce, not replace them.*
- ➔ *We are making robots that are technologically accessible to Bobby.*
- ➔ *He can wield this technology with pride, because Dispatcher, Vector, and MAV3K are easy for him to master.*



ROS is the bedrock for ease of use

- Allows modularity at both a software and hardware level
- It forces all components to “speak the same language”
- Gives you the flexibility to do things locally or in the cloud
- ROS’s flexibility and modularity makes it easier to customize robots to the client’s need, without having to redesign a great deal
- It also enables clients, integrators, and robot manufacturers to carry out such customization, where the end result is a better user experience and a happier end user

ROS in a Nutshell

- Not really an Operating System (meta-OS?)
- Born in 2007 at Willow Garage, initially based on previous Stanford work
- Hundreds of official packages, many more from 3rd parties
- Thriving community of thousands, all over the world

- The most successful robotics middleware in the world, and has survived many other open and proprietary ones
- Establishes clear definitions of messages to be passed in a publisher-subscriber model

5 Examples of ROS Enabling Faster Deployment & Adoption

Waypoint Vector Integration with Oracle

- **Rosbridge** Websocket interface allowed Oracle to integrate their cloud services into a mobile inspection solution

- By being able to issue plain-**Python** high level commands from their existing script, their onboard, cloud-connected computer effectively “riding” vector to different locations

Manufacturer of Water Quality Systems

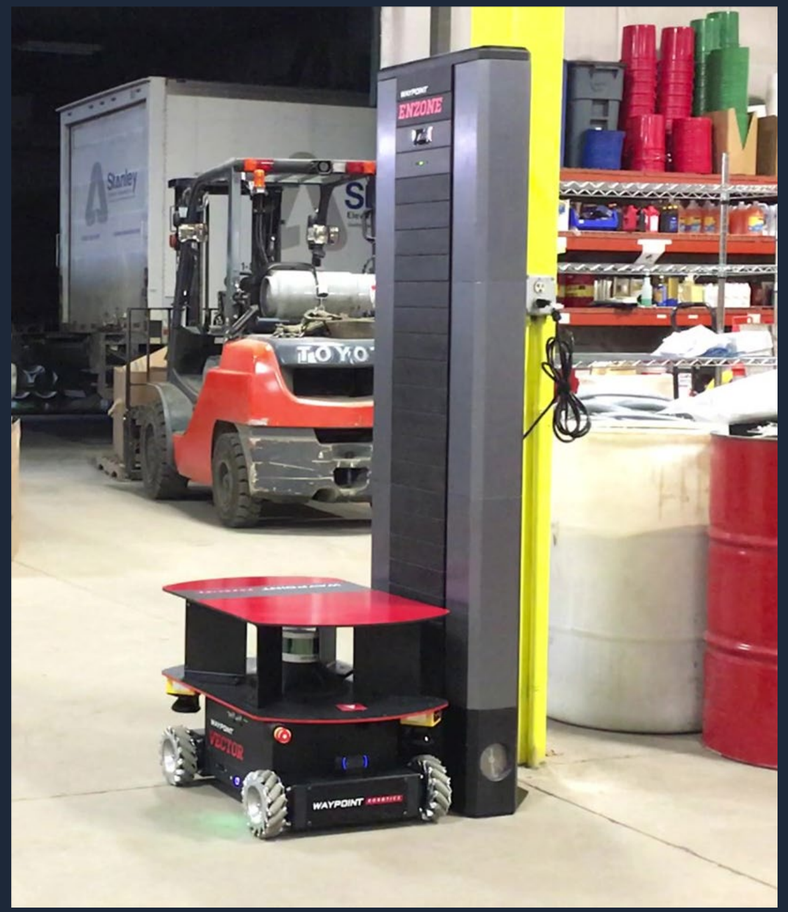
- Due to having an extremely dynamic environment, this customer has to constantly add and modify waypoints on the map. Thanks to the **Robot Web Tools** (a collection of ROS packages), they are able to enjoy a friendly and accessible UX that makes those operations a breeze.

- Modularity of ROS graph allowed streamlined customization of robot behavior and comply with their specific corporate safety policies

Computer Equipment Manufacturer

- **Rospy** has allowed their engineers to integrate their own custom hardware and add their own ROS code and nodes and integrate them seamlessly with the mobile platform

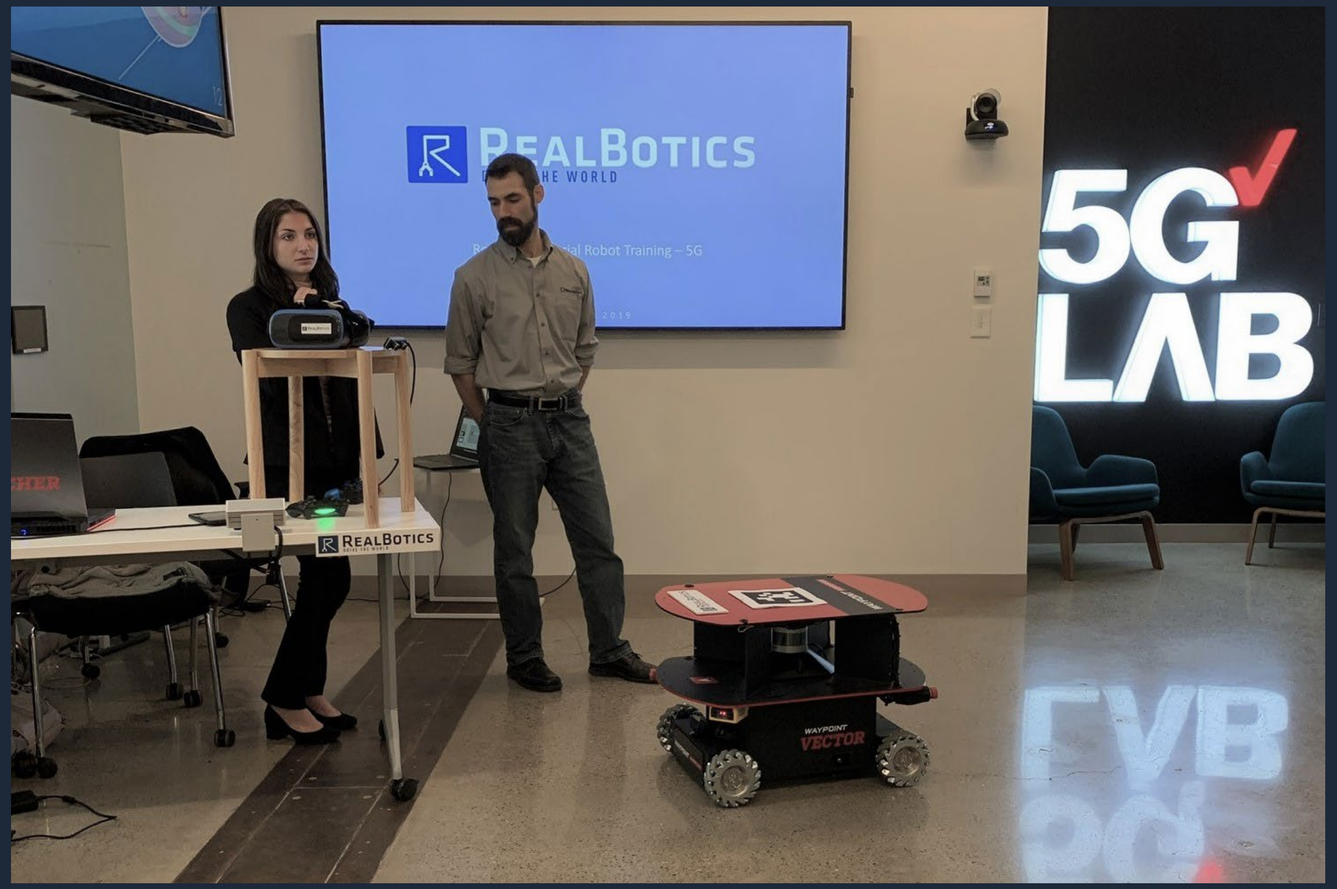
- State of the art **mapping algorithms** allowed this customer to correctly map areas with very large loops



RealBotics & Vector 5G network integration

- **Introspection** tools (rosgraph, rosmsg, etc) enabled provided accurate snapshot **of** system architecture, as opposed to volumes of documentation commonly found on a system with proprietary protocols

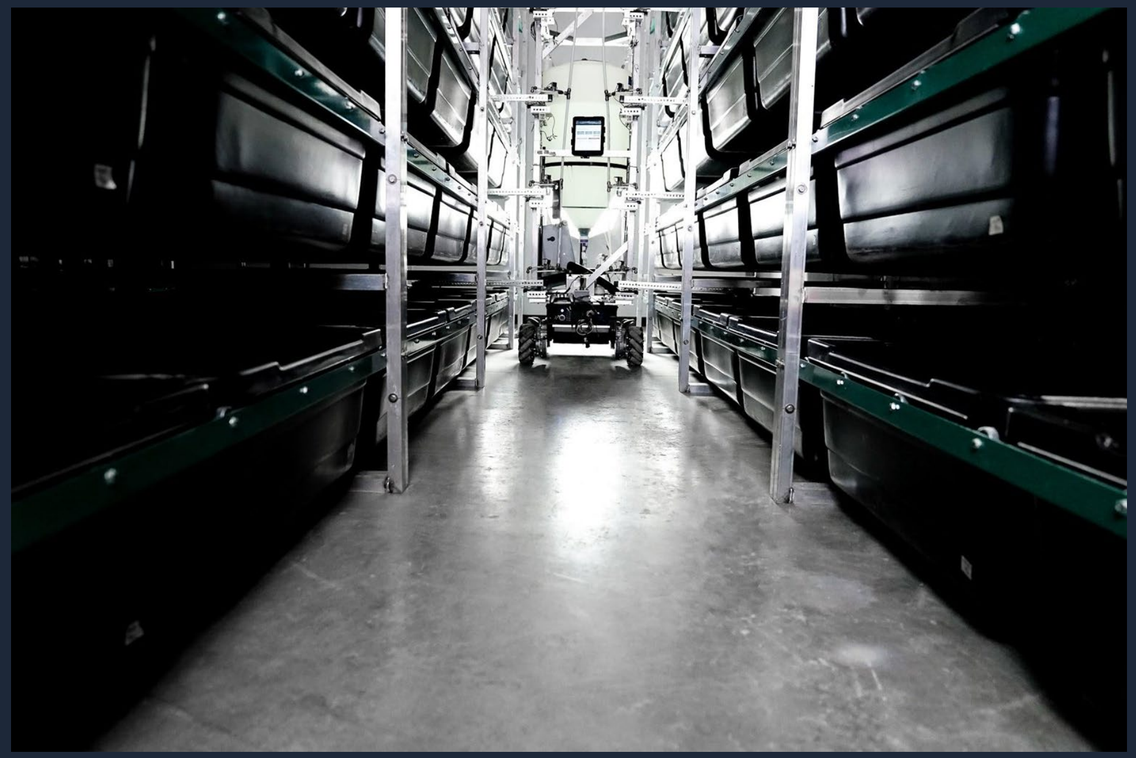
- By identifying the correct topics to publish on, RealBotics was able to successfully integrate Vector with their offering



Cricket Farming

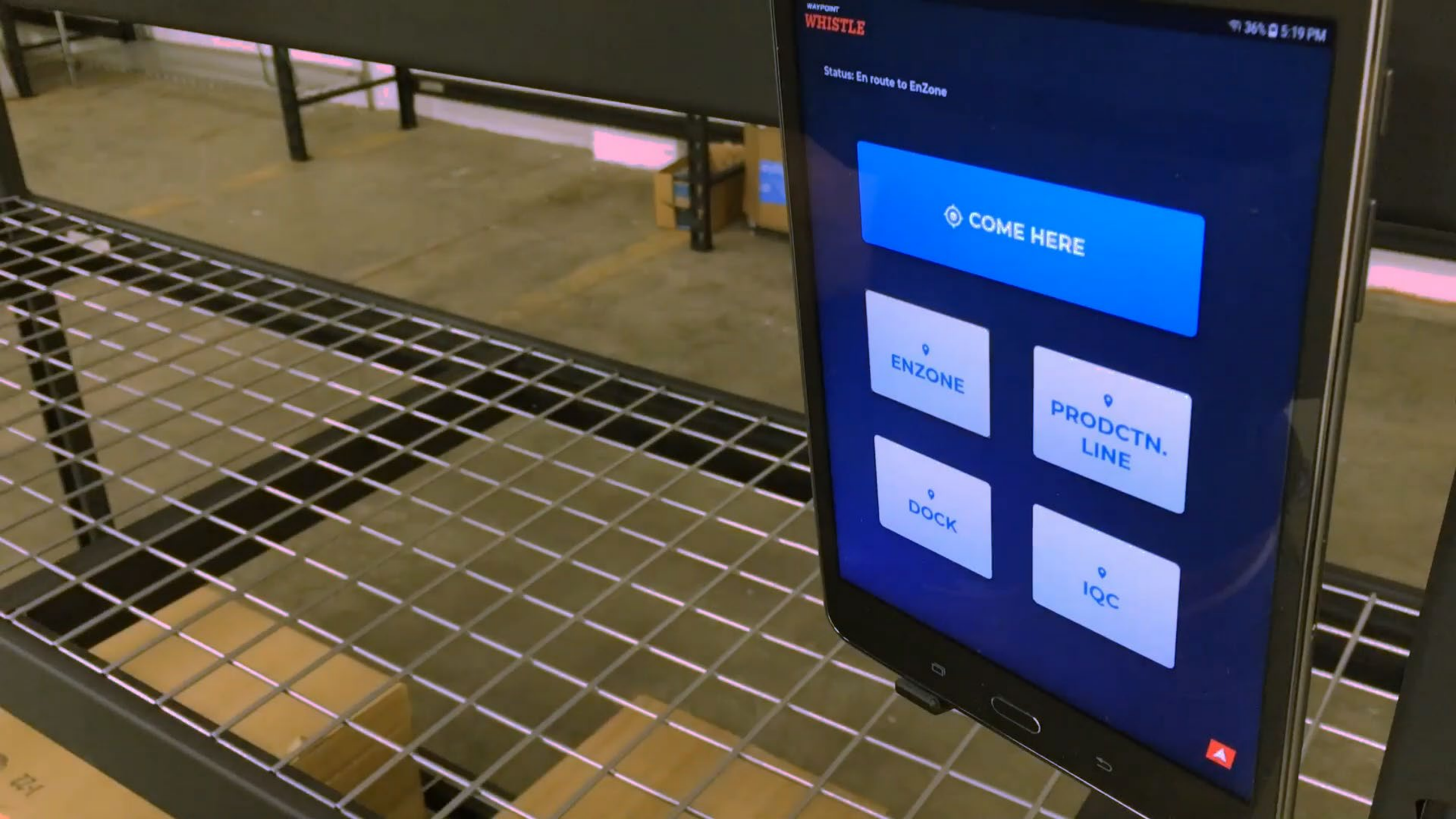
- ROS built-in **navigation/localization** capabilities, as well as **support for a variety of sensors**, allows for smooth daily operation within homogeneous, narrow aisles and confined spaces

- User created a unified dashboard for IOT, production data, and autonomous mobile robot.



15 minutes to autonomy

WAYPOINT ROBOTICS


WAYPOINT
WHISTLE
36% 5:19 PM
Status: En route to EnZone
COME HERE
ENZONE
PRODCTN. LINE
DOCK
IQC

Eliminate Barriers to Increase Adoption

3D Perception:

Robot detects objects so users do not have to account for the unexpected

Worry-free power:

Robot keeps itself powered with wireless opportunity charging. Eliminates need to maintain electrical contacts

Internet/network independence:

Continuous operation without requiring an internet connection

Speed and accuracy:

Omnidirectional robots have no tradeoff between speed & accuracy (differential robots do)

For more information:

jason@waypointrobotics.com

@ImRobotMechanic

@waypointrobo

/waypointrobo

www.waypointrobotics.com