

Meet Tally, the Robot That Knows What's on Store Shelves

- **BY SOPHIA STUART**
- JANUARY 27, 2016 08:00AM EST
-

Tally from Simbe Robotics could make in-store human inventory checks obsolete.



The Internet has revolutionized shopping, from buying things on Amazon to getting in-store push notifications on your phone. But behind the scenes, shopping tech is ripe for even more innovation. Like it or not, things like patrolling warehouses and recording inventory can be executed by a robot.

[Simbe Robotics](#) (Simbe stands for Simulated Being) has built just that. It's called **Tally**, and it can traverse a shop's aisles for eight to 12 hours on a single charge, counting and checking up to 20,000 individual stock keeping units (SKUs) with greater than 96 percent accuracy. PCMag went to Simbe's San Francisco office recently to watch Tally operate in a test retail environment.

In a demo, CTO Mirza Shah tested Tally by deliberately mis-shelving a box of Cherry Pop-Tarts next to plain old Strawberry. As Tally glided up and down the shelf units, it caught the error every time, even though the boxes are very similar to the human eye. On a handheld tablet (above), Shah tracked Tally's POV as it recorded the data on a 3D rendering of the shelf with SKU information, triangulating the precise location of the usurper Pop-Tarts for store manager reports.



Simbe was founded in July 2014 after Shah reconnected with Brad Bogolea, a fellow computer science Penn State alum and now the CEO of Simbe.

"He was doing autonomous underwater vehicles for the U.S. Navy at that time and we started kicking around ideas about doing a start-up," Bogolea said. "He came out west, got a job at [Willow Garage](#), where he was part of the core ROS [Robot Operating System] team and met Jeff Gee, our product design lead. Eventually, we joined forces because we wanted to build service-based robotics that are 10 times better than their human counterparts."

But why retail? "We found retail has severe revenue losses and operational problems caused by out-of-stocks, overstocks, and other inventory distortion," Bogolea explained. "Today these issues are often addressed by manual audits conducted by a store employee walking around with a barcode scanner assessing each individual SKU."

A CVS or Walgreens, he said, could spend 25 to 40 hours per week on these audits, with a much lower accuracy rate than a device like Tally; about 65 percent.

"In addition, these audits become stale and invalid shortly after they are taken due to the dynamic changes in the store," Bogolea said. "We knew that with a robotics solution we could fully automate this task and perform it faster, [cheaper], continuously, and with far more accuracy."

Enter Tally (above), which sports a 38-inch robotic base and a sensor mast to capture product availability information from the bottom to top shelf of each aisle. It weighs just over 30 pounds and is made of an aluminum frame and a plastic shell.

"We started off doing foam mock-ups, looking at form factors and movement styles from real life—mainly penguins and children, in the end," said Gee. "We then proceeded to 3D-printed panels and laser cut framing to test sensors, form, size, and weight. Tally is now produced using CNC [computer numerical control], but for larger production we will use injection molding, of course."

As for the software, Shah said the Simbe platform is built on top of thousands of open-source packages, some of the most critical coming from the Robot Operating System (ROS) and Open Computer Vision (OpenCV) projects. "Our heavy use of open source allowed us to move much faster and focus our internal development efforts on the actual problem of helping retailers improve the performance of their stores by mitigating inventory distortion," he said. In fact, open source robotics OS saved Simbe Robotics about 22 years (yes, you read that right) in development time.

Data collected by Tally can be used to track trends in sales, shelf positioning, and so on, for a whole slew of retail analytics. For example, major packaged goods companies that pay a premium for eye-level customer awareness will use Tally for A/B testing of packaging, promotion, and price changes while verifying that their stuff is exactly where they paid for it to be.

Essentially, Tally becomes a benign spy in the store who never sleeps, stopping only to charge every 12 hours.

Simbe Robotics, however, sees its venture as more of an entire end-to-end software and data platform business than a standalone robotics outfit, with Tally as the for-rent robot at its center.

So how do humans respond to Tally in-store? Simbe Robotics is currently doing a top-secret test at an unnamed North American store. But Simbe did reveal that it took Tally on a trip to China last year for product testing and evaluation.

Tally breaks into sub-components and can be shipped or transported as carry-on luggage, which is what the team did on their flight to Shenzhen (a place with so many robot component manufacturing and production plants, it's fast becoming known colloquially as Robot Land).

"We were watching consumers' perceptions from a safe distance within line of sight and, as Tally glided up and down the aisles, we were astonished when a couple of Chinese children tried to hug Tally," said Gee.

Perhaps [CCTV-1](#) had just shown a **certain Disney movie about a huggable robot**, or maybe it was just Tally's pleasing appearance and elegant movement that inspired their affection. Whatever it was, Simbe Robotics felt validated that Tally was a hit with the up-and-coming generation of shoppers, because it bodes well for future success with the retail industry at large.

From: http://www.pcmag.com/article2/0,2817,2498439,00.asp?mailing_id=1554653&mailing=DailyNews&mailingID=E34516E57041F999D9DDDC702520CE7D