

CASE STUDY

# Invento Robotics launches new hospital robots during COVID-19 with Freedom Robotics



In 2016 Invento Robotics set out to bring the age of Robotics and AI to traditional businesses with the goal of improving productivity, customer engagement, and sales for customers. Their vision started with Mitra, a humanoid robot with facial recognition and conversational capabilities that provided a platform for businesses to interact with their customers in a new way. Invento found fast success with Mitra in major banks, retail stores, business offices, restaurants, and hospitals across the world.

Then, when the COVID-19 pandemic started, Invento immediately jumped at the new challenge they saw to help hospitals respond to and manage the demand of COVID-19 patients. They knew that in order for them to effectively help flatten the curve of cases, they needed to dramatically scale the number of robots they were able to manage. This meant effective robotic fleet management and teleoperation were necessary, and they found it with Freedom Robotics.

## Saving 8-10 months of engineering on Fleet Management and Teleoperation

Prior to discovering Freedom Robotics, Invento had set aside 8-10 months of engineering dedicated to building a custom fleet management system. The fact is, this functionality was critical to their success and there was no other way to manage and maintain a fleet without a one-to-one human to robot relationship.

"For Invento, and specifically our ability to respond to COVID, fleet management functionality was essential. The fact that Freedom Robotics came pre-packaged and is cloud-based really revolutionized our ability to make our vision and reality much quicker," recalls Balaji Viswanathan, CEO of Invento. With

Freedom Robotics, Invento was able to have an operator manage a fleet of robots from behind a user interface within days. Shortly after discovering Freedom Robotics, COVID-19 came to the forefront across the world and what started as a software partnership for Invento and Freedom Robotics quickly turned into a project to launch robots to fight the global pandemic.

With this speed to market empowered by Freedom Robotics, Invento was able to provide hospitals in India with two revolutionary robotic use cases during COVID-19—both prototyped and deployed within a matter of weeks.

## Reducing the spread of infection & improving contact tracing

The first pandemic-related robot Invento rolled out was a thermal scanning and cleaning robot that greets people as they enter the hospital through voice conversations. The robot determines how to route them based on if they are a guest or patient and most importantly the robot takes their temperature and asks if they themselves or anyone in their family has been feeling sick. The robot stores all this data and provides a terminal print-out to each visitor to validate they have been properly tested as well as improves contact tracing across the hospital.

As a second point of escalation, if the person or someone in their family had been feeling sick, they are routed to another robot that provides remote telemedicine capabilities enabling a doctor to connect into the robot and directly interact with and evaluate that person.

Prior to the robots testing each visitor as they entered, the hospitals had staffed nurses and even many times, doctors to manage this intake. This was not only time-consuming and took away from their ability to treat admitted patients but also exposed the hospital staff to hundreds of people a day they would have otherwise not come in contact with—increasing the likelihood of the virus spreading.

Now, the robots can take on that risk by interacting with upward of 600 people a day and filter down who is in need of medical attention, while providing a safe environment for all hospital visitors and staff alike. "People coming into hospitals are anxious and nervous and we've found that our robots actually are able to ease their worry and lighten the room," said Balaji. "And as the lockdown is removed, these robots will be able to help relieve the concern of continued spread or resurgence of the virus."



# Removing humans from hazardous exposure & improving disinfectant processes

In response to COVID, the second robot Invento provided hospitals was a disinfecting robot that's able to independently disinfect hospital rooms and hallways. The robot uses ultraviolet radiation to clean all surfaces within a given place.

These UV radiations are carcinogenic for humans and therefore being able to do this job without the use of a robot is near impossible. "If a human were to do this job, (1) it's incredibly dangerous for them, and (2) they'd have to maintain a distance of at least 10 feet from the UV rays while cleaning. With our robots and Freedom's teleop ability, we can manage all of this remotely removing the harm from humans and disinfecting a hospital room within 3-5 minutes based on how 'at risk' a given space may be," shares Arvind Nagaraj, Invento's Chief Architect.

"We are also now working on retrofitting the hospital room doors as well as integrations with Freedom Robotics' WebRTC to enable robots not only to move from room to room but floor to floor via elevators to independently navigate while disinfecting the hallways and elevators along the way."

## Critical features from Freedom Robotics

"Some of the most important features of Freedom that we use on a daily basis is the camera feed, the ROS-based mapping, ability to easily toggle between robots, and tunnel into a robot to course-correct an issue with a click of the button."

These features allow Invento to have no on-site man-power or oversight of the robots and instead have their team manage the fleets remotely. And as the demand grows, Invento is looking to outsource the fleet operations to a call center.

"The real 'ah-ha' moments for us when seeing Freedom was the ability to see and easily publish the map to the app interface with a simple click and point. Secondly, the ability to tunnel into any robot and run a script within seconds was amazing," recalls Arvind.



## Becoming the doctor's avatar

"At this point, our COVID pilot programs of the thermal scanning and disinfecting robot have received rave reviews. A video of them even went viral over WhatsApp gaining over 20 million views," shares Balaji. "We are in 10 hospitals across India, including the 2 largest and by end-of-month will be expanding to hospitals in Phoenix and Houston, as well as into the Middle East and Singapore."

The fact of utilizing robots in day-to-day life is very novel in both India and hospitals but Invento has very successfully proven out the value and hospital staff are now proactively identifying more ways they can benefit from these robots. "We've received requests to help automate other tasks across hospitals like helping manage isolation wards to carry out more diagnostic tasks like the use of a pulse oximeter and stethoscope to retrieve and store patient data. Additionally, we see a future where these robots become almost the avatar of doctors helping them see patients more efficiently within their hospitals and even being able to care for those that are sick in rural areas where they don't have access to specialists," said Balaji.

**"OUR FIRST EXPERIENCE WITH FREEDOM WAS DURING A VERY UNIQUE CIRCUMSTANCE. NOT ONLY WERE WE ON A TIGHT TIMELINE BUT WE WERE TRYING TO LAUNCH SOMETHING DURING A GLOBAL PANDEMIC AND LOCKDOWN. THE FREEDOM TEAM WAS ABSOLUTELY GREAT—COULD NOT HAVE ASKED FOR BETTER SUPPORT," RECALLS BALAJI.**

## Moving towards mobility as a service

With the use of Invento robots taking off in hospitals, they have no intention to stay strictly within that vertical. "We want our robots to really be an open product that others can build their own services and products on top of. We have a very strong hardware and industrial design team doing the production in-house, so we can rapidly turn around new hardware design and autonomous navigation within days or weeks. Combine this with Freedom's fleet management, and we can provide our robots to other tech companies who can build a wide range of use cases," envisions Balaji. "We see countless opportunities where our robots can help including surveillance, automotive factories, and food delivery just to name a few. We are excited about what we can achieve with Freedom Robotics at hand!"