

# BLACK-i ENVIRONMENTAL

## SAFETY FIRST! HOSPITAL DEPLOYS INNOVATIVE NEW AUTONOMOUS DISINFECTANT ROBOT

It was a day in mid-January this year, just after lunch, when a cheer went up from a small band of people in a room at a well-known Rochester, NY, hospital. Doctors, nurses, others walking by wondered what the excitement was about. And were surprised to discover that the object of attention was a compact, autonomous ultraviolet disinfectant robot, supplied by the hospital's professional cleaner company, moving independently and safely throughout the room.



***Autonomous robots sanitize faster, better, cheaper than alternate methods.***

The group cheer was for a job well done, of success over skepticism, of anticipated profits over cost. In fact, it was a graduation of sorts. A few staff members from Rochester-based CleanCraft, a 400-employee professional cleaning company in upstate New York caring for 10 million square feet of healthcare, office and university space, modified their standard procedures to learn to program and operate the unique, powerful robot.

Health care systems have used manual ultraviolet devices to sanitize space for years. However, the labor costs associated with these devices is high, as staff must move them to different spots within each room, often four or more times, leaving each time because powerful UV light is hazardous to humans.

### Low Cost Solutions to Big Problems

The pandemic motivated health care providers to seek alternatives that enhanced sanitizing while cutting overhead. Enter powerful anonymous robots that reduce costs dramatically. For example, a cleaning person being paid an average of \$13.19/hour responsible for sanitizing 10 single patient rooms using a manual UV-C device positioned five times for 10 minutes each would cost \$180.40. For an autonomous robot, the labor cost would be \$6.60.

***Over a five year period, labor costs associated with a manual UV-C device would amount to \$329,230 versus \$12,045 for the autonomous robot. A hospital — any organization! — could buy or lease many autonomous robots for the \$317,185 difference***

***And get the job done much faster and better.***

This is the real world. A leading NHS hospital in March, 2019, fully disinfected a 21,527 square foot outpatient oncology department in a total of 90 minutes, plus three minutes of labor time. The total labor cost was \$0.66. In comparison, two weeks earlier, the hospital used a manual UV-C device to perform the same service, which took 20 hours for the device and 20 hours of labor at a total labor cost of \$265.

The price of autonomous robots has been coming down, and in many cases cost little more than a manual UV-C device. Black-I Environmental, Inc., is the company that sells and services the powerful autonomous robot, which was designed specifically to combat SARS-CoV-2, as well as other high risk pathogens, including hospital acquired infections (HAI). Black-I Environmental is part of the Black-I Robotics family of robots and robotic devices, which since 2008 has designed and deployed robotic systems for a variety of private companies and government agencies, including the Defense Department, Homeland Security, the Army Corps of Engineers as well as universities, including Princeton and MIT. Black-I is headquartered in Tyngsboro, Massachusetts, just outside Boston, a center of the robotics industry.

## Love at First Sight

Training of CleanCraft's staff took approximately 20-hours, some with Black-I trainers on hand, some via Zoom. Trainees learned to use a tablet to control the robot, map a room, including beds, equipment, etc., then how to program the robot to avoid the obstacles and maximize disinfection in areas with shadows or corners. Staff quickly caught on and enjoyed working with novel and effective technology. Initial training was done at CleanCraft's education center, and was followed by a demonstration of the robot's capabilities at two local hospitals, economically sanitizing surgical suites, nurses' stations, examination rooms, waiting rooms, locker rooms and other facilities in record time, to the excitement and amazement of hospital staff.

The following week, Ty Hookway, CleanCraft's CEO — noted as an innovator in the professional cleaning industry — signed two agreements, one with Black-I, one with a hospital, given that only one robot was available at the time. With Black-I, he signed a profit sharing agreement, as he wanted to cap his risk. If the robot failed to perform as expected, he simply had to return the robot. It didn't fail!

***The agreement was to disinfect selected facilities five days a week. The robot exceeded expectations, and at the end of February, the hospital requested the robot seven days a week. And Hookway sent out 13 robot-based proposals to healthcare institutions and clients in other industries with whom he has contracts.***

## Easy Fit to Existing Processes

So how does the robot fit into CleanCraft's disinfectant process? In a nurses station, for example, a cleaning person does two things: ensure that nothing has been moved since the space was mapped and the robot programmed, and perform a preliminary cleaning. The same person then uses an electronic tablet to control and move the robot into the station, turns it on and leaves the room. A typical room takes from three to 15 minutes, depending on size, with a UV dosimeter card verifying exposure.





*CleanCraft staffer moves an autonomous robot into a surgical suite using a hand held electronic tablet. Staff loves working with exciting new technology as much as hospitals and clinics appreciate higher levels of cleaning and much lower costs.*

## Higher Profits, Better Cleaning

How did the partnership — a cleaning company, hospitals and a robotics company — partner to achieve such quick and profitable success?

Black-I Environmental's general manager Ed Schmitt is friends with Ty Hookway, CEO of CleanCraft. Schmitt showed Hookway videos of Black-I's new PureTech robot, which was being showcased at MassRobotics, the robotics accelerator on the Boston waterfront. Hookway was intrigued, but being a good businessman, he was skeptical, with lots of questions, not only his own, but his clients as well. Here are some, with Schmitt's answers:

How effective is an autonomous robot in killing viruses, bacteria and other pathogens? ***Black-I's autonomous robot deactivates 99-plus percent of coronavirus, bacteria, fungi and other pathogens as well as hospital acquired infections while its HEPA filters purify the air as it moves, capturing 99.7 percent of all contaminants 0.3 microns or greater.***

Since the robot is autonomous — meaning it moves on its own — is it safe? Could it KO a doctor or nurse? Run into expensive medical equipment? ***Robots are safe. The brains of Black-I's robot consist of computers, cameras, laser radars and collision sensors. Each robot is programmed by trained staff and mapped precisely to an area to be sanitized, avoiding any obstacles in its "line of sight." Once programmed, the robot can repeat the process on its own, further saving labor and other costs.***

Would CleanCraft staff learn to program and operate the robot? ***Of course! Staff quickly embraced the technology, while Black-I provided whatever support was needed.***

Is an autonomous robot worth the cost, to CleanCraft, to the hospitals, to other potential clients? ***The fact that autonomous sanitizing robots are being deployed worldwide at an accelerating pace in hospitals, schools, hotels etc. suggests that the answer is a resounding yes. These robots are unique productivity tools that save people's lives!***

When the pandemic ends, will autonomous robots disappear? ***In the connected world in which we live, more pandemics are expected, according to experts. No matter, "clean enough is never clean enough." Hospitals clearly require constant sanitizing, but if the pandemic taught us anything, it's that all spaces must be cleaned an order of magnitude better than in the past. The new normal is not the old normal. Autonomous robots are here to stay.***

Are autonomous robots profitable? ***Yes, across the board, to hospitals, professional cleaning companies, hotels, warehouses, schools — any indoor space. Many professional cleaning companies are establishing new profit centers based on these robots. CleanCraft and Black-I, have been generating revenue for almost six months, and we expect to be profitable within 30 days or so. Disinfecting offices, schools a***

***other spaces also is profitable in the sense that it enables employees to return to work, students to return to the classroom, tourists to return to hotels. Autonomous robots are incredible productivity tools.***

How long until profitability? ***That depends on a number of factors, such as how the unit is financed, whether it will be moved to different buildings via a van or remains in one facility, among others.***



***Autonomous robots pay for themselves in a matter of months, sometimes just weeks.***

Here's just one modest scenario: a leased robot backed by two part time employees and a van could cost up to \$9513/month in expenses. Disinfecting 8600 square feet of space at 0.20 cents a square foot 22 days a month would generate revenue of \$37,840 per month, or earnings before taxes of \$28,327 per month. That's an EBIT of \$339,924 annually. The numbers are similar no matter the industry. And robots never get sick, never get tired and never ask for a raise.

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You can access our website at [www.blackienviroental.com](http://www.blackienviroental.com)**

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