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2020 BEST PRACTICES AWARD



BLUE OCEAN ROBOTICS

- for humans

**2020 EUROPEAN
PROFESSIONAL SERVICE ROBOTS
PRODUCT LEADERSHIP AWARD**

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Background and Company Performance

Industry Challenges

A professional service robot is typically used in a non-industrial setting. These robots vary in form and application and are primarily used to automate repetitive, hazardous, and time-consuming tasks, effectively freeing the human workforce to focus more on cognitive functions. Professional service robots are mainly used in hospitality, healthcare, construction, agriculture, and fulfillment settings. According to Frost & Sullivan, the professional service robot market is expected to grow at a compound annual growth rate (CAGR) of 22 to 25% over the next three years.

Even though the demand for professional service robots is increasing rapidly, numerous service applications are not yet being targeted/fulfilled by robot manufacturers (vendors), which lead to numerous challenges for customers, especially in critical sectors. For instance, on a single day, one out of sixteen patients in Europe contracts a hospital-acquired infection (HAI), resulting in millions of dollars spent to treat these affected patients. In the construction sector, the challenge is that tasks are being executed locally. Construction companies typically insource a low-wage workforce from developing economies, resulting in quality issues and low productivity. In the cleaning services sector, some of the world's leading cleaning companies have employed half a million people, and these companies face huge rates of employee attrition (close to 40% of the total workforce) every year. The primary reason for this is the nature of the job, which involves working at odd hours, working overtime, and not having a formal recognition/appreciating system for employees. Therefore, these companies spend a significant amount of time and money hiring, onboarding, and training new employees. Professional service robots can be of great use in all these industries because they can fill the resource gap and can perform tasks with high quality and productivity.

Robot companies that recognize the challenges in these critical sectors and that can offer service robots to enhance their production output will find themselves best positioned to remain competitive in the dynamic European market.

Product Family Attributes and Business Impact

Product/Service Value

Founded in 2013, Denmark-based Blue Ocean Robotics develops, manufactures and sells a wide range of professional service robots to facilitate the automation of repetitive and hazardous tasks in critical industries, especially healthcare, hospitality, construction and agriculture. The company's offerings include mobile telepresence robots called GoBe Robots, a UV-C light emitting robot known as UVD Robots for disinfecting hospitals, and PTR Robots for safe patient handling and rehabilitation in hospitals. Compared to competitors that position their robot portfolios under one company name, Blue Ocean Robotics has positioned each of its robots in their own subsidiary-venture company. This unique strategy makes Blue Ocean Robotics the first Robot Venture Factory worldwide.

**UVD
ROBOTS****GOBE
ROBOTS****PTR
ROBOTS**

Blue Ocean Robotics' flagship product, UVD Robots, enable hospitals to reduce transmission of viruses, bacteria, and microorganisms. Healthcare-Associated Infections (HAIs) drive up costs in the global healthcare sector. With the recent coronavirus (COVID-19) pandemic coming out of China, hospitals have been witnessing a rapid increase in patient count. These increases facilitate the spread of such infections making them difficult to control within the hospital premises, because the hospital environment is not frequently disinfected as much as it should be.

Figure 1: UVD Robot



Image Source: Blue Ocean Robotics

To address this, UVD Robots autonomously move around hospitals decontaminating surfaces with UV-C light. Compared to competitors that offer manual and passive UV-C light emitting solutions, which are immobile and can emit UV-C light only to a restricted radius around it, the UVD Robot is the first and only autonomous mobile robot that disinfects a variety of surfaces using UV-C light, giving it superior utility over competing solutions. The UVD Robot has been clinically tested and approved by Odense University Hospital, a leading hospital chain in Denmark with over 11,000 employees. The unique value proposition of the UVD Robot is that it can be easily controlled with a tablet. Moreover, the robot can kill 99.99% of bacteria and microorganisms.

For example, Sunay Healthcare Supply, a leading medical equipment supplier to the Chinese market, signed an agreement with Blue Ocean Robotics to ship UVD Robots to more than 2,000 hospitals in coronavirus-hit China. This agreement demonstrates high

confidence shown by healthcare customers in the UVD Robot, which effectively reduces the chances of transmission of viruses, bacteria, and microorganisms.

Positioning

Blue Ocean Robotics serves as a 'one-stop shop' for meeting critical robot requirements, such as telepresence, disinfection robots, and rehabilitation robots, in the healthcare industry. For example, patient lifts, such as bed to bath and chair to stretcher, used in hospitals are passive, and they require the assistance of a minimum of two nurses to lift a patient. With these conventional lifts, hospital staff are often subjected to work fatigue and are at much higher risk of injuries from operating these passive patient lifts. For the benefit of both the hospital staff and patients, Blue Ocean Robotics launched PTR Robots, a subsidiary company that offers robotic patient lifts known as Multi Tower Robots.

Figure 2: Multi Tower Robot

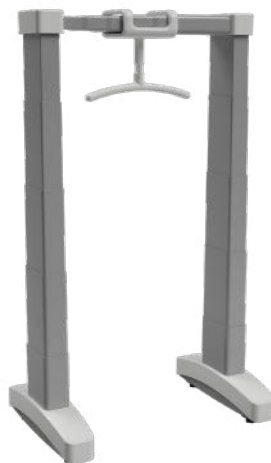


Image Source: Blue Ocean Robotics

In addition to patient lifting, the Multi Tower Robot serves the following two critical purposes for the successful rehabilitation of patients: sit-to-stand training and walk training. With the press of a button, the Multi Tower Robot can extract or retract, spanning wider over the bed, thereby enabling easier transfer of patients to a wheelchair or lift the patient and transfer over the bed-end. The Multi Tower Robot can also handle patients without any reach or range restrictions from tracks. Plus, there is no need for ceiling mounts in operation theatres, intensive care units (ICUs), or diagnostic rooms. In most any room the Multi Tower Robot can be employed with ease making it an easy to adopt technology. The robot's multi directional wheel technology and retractable/expandable assembly allows it to be especially beneficial in narrow and confined spaces. For these reasons, Frost & Sullivan is convinced that Multi Tower Robots offer the ideal working set-up for caregivers.

Compared to competitors' products, in which the patient is unable to take an active part in the lift, the Multi Tower Robot offers assistive navigation through an intuitive finger operated joystick, which allows patients or caregivers to minimize the use of their hands when carrying out difficult transfers. Another unique value proposition of the Multi Tower Robot is its mobility. While competitors' patient lifts are guided by ceiling tracks and

limited to only one room, the Multi Tower Robot can be easily moved between rooms. The tower offers fleet management, through which users can autonomously summon the robot where and when needed. Furthermore, the robot offers artificial intelligence (AI)-based data processing capabilities with which healthcare providers can diagnose and forecast the recovery of the patients.

Many renowned hospitals in Denmark such as University Hospital Køge, Odense University Hospital and Horsens Hospital are customers of PTR Robots. The several unique features of the Multi Tower Robot have positioned Blue Ocean Robotics' subsidiary company PTR Robots as the preferred vendor of choice because it addresses the unmet needs of both the hospital staff and patients.

Design

Blue Ocean Robotics places a high degree of emphasis on the design aspect of its products, providing a truly solid design that offers an aesthetic appeal and serves the intended application with full efficiency. In line with this, Blue Ocean Robotics discovered a critical challenge related to communication issues faced by service sector personnel, which was solved with a game-changing robotic design known as GoBe Robots, which are Telepresence Robots. Many advanced communication technologies, such as email and videoconferencing, have often failed to connect personnel who work remotely. In the healthcare industry, telemedicine is widely adopted to provide telecommunication technology remotely. While telemedicine has been around for a while, the key challenge is that it has to be managed and operated manually to perform the communication through a phone or tablet computer. This type of framework lowers the efficiency of the healthcare worker, and could negatively impact patient health or lose business for the hospital. Because Blue Ocean Robotics has a huge customer base in the healthcare sector, it wanted to help these customers overcome the challenges of manually-controlled telemedicine solutions. Therefore, in 2019, Blue Ocean Robotics acquired Suitable Technologies' assets and rights to its iconic GoBe Robots.

Figure 3: GoBe Robot



Image Source: Blue Ocean Robotics

The GoBe Robot has a large display and can virtually drive users to remote locations, allowing them to interact with people screen-to-face. This solution is unique, because the health care worker or doctor does not have to depend on the manual assistance to take a

mobile/tablet PC-based telemedicine around the hospital. With the GoBe Robot, the doctor can simply be at the luxury of a remote location and move around virtually within the hospital, which makes the GoBe Robot a game-changing product in the healthcare industry. For instance, Miramont Family Medicine, a leading healthcare firm in Colorado, has facilities that are separated by several hundreds of miles. The reliance on manual assistance from the hospital staff and the lack of virtual mobility within the hospital premises deprived physicians of the ability to diagnose even simple ailments. With the GoBe Robot, physicians at Miramont Family Medicine can now instantly connect with patients from their remote locations, with the touch of a button on a smartphone. This robot saves both physicians and patients several hours of driving time, in turn benefitting the hospital's earnings. The differentiating factor of the GoBe Robot is that it is the only such robot in the market that enables remote telepresence technology, thereby providing Blue Ocean Robotics with a clear first-mover advantage in the professional service robots market.

Operational Efficiency and Customer Acquisition

Blue Ocean Robotics has a high customer acquisition rate because of its unique business model, which positively impacts the company's operational efficiency as well. While competitors typically acquire customers by selling their single/multi products, Blue Ocean Robotics' business model is based on the revenue generated from developing, managing, and performing the administrative work for its subsidiary-venture companies, such as UVD Robots, PTR Robots, and GoBe Robots (formerly known as Beam Robots). What makes Blue Ocean Robotics unique in the global professional service robots market is that it is the only company that earns royalties from robot sales in its subsidiary-venture companies.

In general, service industries, such as healthcare, construction, and hospitality, are capital intensive and reluctant to invest/pay upfront costs for a service robot. The shortage of a skilled workforce, highly competitive service markets, and more interest in robotic solutions are threatening traditional business models in the service sector. Owning and managing a robotic system can be quite expensive because, on top of the hardware, software is required that is specific for each application. Therefore, robot pricing is one of the key factors in maintaining a high customer acquisition rate. Compared to competitors that sell their robots at a full-priced upfront cost, Blue Ocean Robotics offers its products in the following four flexible pricing schemes:

- Sale of robots at full price
- Robot-as-a-service (RaaS)
- Renting
- Leasing

Blue Ocean Robotics delivers a fulfilling ownership experience to customers by offering the industry's first RaaS solution. This service is unique because it is an out-of-the-box solution that is ready to be deployed in the service line. Blue Ocean Robotics, through its vast experience, recognized that some of its customers' key challenges include capital expenditure (CAPEX) and the time taken to set up the robots. To deliver an enhanced

purchase and ownership experience, Blue Ocean Robotics offers a three- or six-month trial rental. Compared to competitors that offer term-based rentals, such as an upfront investment and long-term commitment, Blue Ocean Robotics offers a no-term rental. This model appeals to numerous customers that have a small budget coming entirely out of their operating expenditure (OPEX). Signing up for a trial is as easy as swiping a credit card and renting a robot, instead of going through a lengthy purchase-approval process.

Growth Potential

Blue Ocean Robotics' growth potential can be best exemplified by the company's ability to attract capital from a broad investor base, enabling the company to strengthen its product commercialization. Blue Ocean Robotics' investment rounds were \$7.4 million in 2016 and \$14.8 million in 2018. Because the company doubled its value in only one year (2018-2019), with a current value of about \$120 million, it attracted new investments in 2019 as well. The company raised a third investment round of nearly \$12 million in 2019, indicating that investors value Blue Ocean Robotics' unmatched capabilities.

A key aspect that serves as a differentiator for Blue Ocean Robotics in Europe is its focus on enhanced value-delivery robotic solutions that can provide benefits over the long term. Customers are the main focus, and every activity undertaken by the company is geared toward improving their interests. Moreover, a clear understanding of its customers' requirements enables Blue Ocean Robotics to tailor its robotic solutions to meet the diverse requirements of installers, users, and distributors.

Another factor exemplifying Blue Ocean Robotics' growth potential is its rapidly growing workforce of skilled employees. Over a few months in 2019, Blue Ocean Robotics hired almost one new staff member every day to meet the demand for new-order fulfillment. The company currently has around 150 employees, and with the increasing demand for its products worldwide, it will continue to infuse more resources to strengthen its capabilities in sales, marketing, customer service, finance, and production.

Conclusion

The Professional Service Robots market's recent growth in the healthcare industry is because of its numerous benefits such as automating repetitive tasks and access to remote communication, thereby enabling users to focus more on efficiency and productivity. Blue Ocean Robotics' unique approach (the Robot Venture Factory) allows it to focus on more than one product, through its subsidiary-venture companies. Thus Blue Ocean Robotics' brand portfolio includes GoBe Robots, UVD Robots, and PTR Robots. Frost & Sullivan is quite impressed with Blue Ocean Robotics' approach on being the one-stop-solution for robot needs in the healthcare industry. With the recent outbreak of the coronavirus (COVID-19), hospitals are largely benefitting from Blue Ocean Robotics' UVD Robots, which autonomously disinfects the hospital environment.

For its fierce differentiation through innovation, dedication to robotics-based solution, collaboration with healthcare customers, and strong overall performance, Blue Ocean Robotics is recognized with Frost & Sullivan's 2020 Product Leadership Award.

Significance of Product Leadership

Ultimately, growth in any organization depends on customers purchasing from a company and then making the decision to return time and again. A comprehensive product line filled with high-quality, value-driven options is the key to building an engaged customer base. To achieve and maintain product excellence, an organization must strive to be best in class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding Product Leadership

Demand forecasting, branding, and differentiating all play critical roles in finding growth opportunities for your product line. This three-fold focus, however, must be complemented by an equally rigorous focus on pursuing those opportunities to a best-in-class standard. Customer communication, customer feedback, pricing, and competitor actions must all be managed and monitored for ongoing success. If an organization can successfully parlay product excellence into positive business impact, market share will inevitably increase.

Key Benchmarking Criteria

For the Product Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Product Family Attributes and Business Impact—according to the criteria identified below.

Product Family Attributes

Criterion 1: Match to Needs

Requirement: Customer needs directly influence and inspire the design and positioning of the product family.

Criterion 2: Reliability and Quality

Requirement: Products consistently meet or exceed customer expectations for performance and length of service.

Criterion 3: Product/Service Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

Criterion 4: Positioning

Requirement: Products or services address unique, unmet needs that competitors cannot easily replicate or replace.

Criterion 5: Design

Requirement: The product features an innovative design, enhancing both visual appeal and ease of use.

Business Impact

Criterion 1: Financial Performance

Requirement: Overall financial performance is strong in terms of revenue, revenue growth, operating margin, and other key financial metrics.

Criterion 2: Customer Acquisition

Requirement: Product strength enables acquisition of new customers, even as it enhances retention of current customers.

Criterion 3: Operational Efficiency

Requirement: Staff is able to perform assigned tasks productively, quickly, and to a high quality standard.

Criterion 4: Growth Potential

Requirements: Product quality strengthens brand, reinforces customer loyalty, and enhances growth potential.

Criterion 5: Human Capital

Requirement: Company culture is characterized by a strong commitment to product quality and customer impact, which in turn enhances employee morale and retention.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging industries • Scan multiple regions 	Pipeline of candidates that potentially meet all best-practice criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best practices criteria • Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best practices criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best practices positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized award candidates
6 Conduct global industry review	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible award candidates, representing success stories worldwide
7 Perform quality check	Develop official award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select recipient 	Decision on which company performs best against all best practices criteria
9 Communicate recognition	Inform award recipient of recognition	<ul style="list-style-type: none"> • Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of award and plan for how recipient can use the award to enhance the brand
10 Take strategic action	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess award's role in strategic planning 	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.