FROST & SULLIVAN

BEST PRACTICES AWARDS

Andrew Alliance
A WATERS COMPANY

2020 NORTH AMERICAN PIPETTING ROBOT FOR LIFE SCIENCES PRODUCT LEADERSHIP AWARD

Contents

Background and Company Performance

Industry Challenges

Globally, the production of pharmaceutical drugs is increasing at a rapid pace, recording an average growth rate of more than 10% per annum. The onset of the COVID-19 pandemic in 2020 has further compounded the demand for drugs, driving drug manufacturers to look out for innovative technologies and solutions that can speed up their research and development (R&D) and manufacturing processes. From R&D through testing, drug manufacturers and developers are faced with the constant challenge of ensuring the accuracy and repeatability of results. The challenge is more persistent for manufacturers of biologic drugs that use microorganisms or substances derived from living organisms. The production of a biologic drug generally starts with Cell Line Development (CLD), before clinical trials or market launch. The manufacturing process requires the individual screening of thousands of cell clones to determine and finalize the one that is best suited for the production of the target drug. Biologic drug development processes demand mechanisms and solutions that can ensure higher accuracy and reproducibility to achieve the desired results.

Drug manufacturing and R&D processes are increasingly faced with challenges pertaining to reproducibility, with a fivefold increase in the withdrawal of scientific publications. In general, for successful drug production, pharmaceutical companies need to be able to recreate experiments, achieve the same results, and validate the results when required. However, as drug development processes become increasingly complex, ensuring repeatability becomes highly challenging. With much difficulty, pharmaceutical companies can repeat the results only in about 10% of their attempts. Consequently, companies incur substantial losses for the time and resources spent on drug development. Challenges pertaining to reproducibility can be attributed to various factors such as improper research practice and poor experimental design. These challenges create a strong need for standardized, traceable, and automated solutions that can offer data analytics capabilities in the laboratories and during drug development to mitigate reproducibility issues.

Product Family Attributes and Business Impact

Based in Geneva, Switzerland, Andrew Alliance is a wholly owned subsidiary of Waters Corporation. The company was formed in 2011 and acquired by Massachusetts-based Waters Corporation in January 2020. Andrew Alliance offers easy-to-use liquid handling robots and connected devices for the life sciences industry and helps scientists and laboratory technicians achieve repeatability, performance, and efficiency in their experiments. It is one of the few companies in the world that manufacture their products in an eco-friendly environment and use carbon-neutral electrical power. Andrew Alliance has been awarded the CO2 Neutral Certification, based on the PAS 2060 standard, which underscores its commitment to providing sustainable solutions.

Match to Needs

Andrew Alliance has developed an innovative liquid handling robot, the Andrew+ pipetting robot that uses conventional laboratory pipettes integrated with a robotic mechanism to improve the repeatability of a liquid handling.

In contrast to competing products that offer either traceability or repeatability, the Andrew+ pipetting robot offers full traceability as well as repeatability in the pipetting process for life science laboratories. A key differentiating factor for the Andrew+ pipetting

Fig.1 Andrew+ Pipetting Robot

Image Source: Andrew Alliance (A Waters Company)

robot is that its different components can communicate and share data with each other. The components included are single and multi-channel pipettes, a stand, and the cloud-based proprietary software, OneLab. While competing products can communicate with their components, the communication is ensured using a wired framework, and the software is restricted to a private server. However, the Andrew+ pipetting robot can communicate with its electronic stand wirelessly using Bluetooth, and the stand is connected to the cloud using Wi-Fi or Ethernet. Critical data pertaining to, for example, errors in analysis, user identity, and user action is sent to the cloud. This enables the user to remotely access the data related to the analysis performed by the Andrew+ pipetting robot, ensuring maximum traceability and repeatability. The unique capability of providing remote data access has enabled Andrew Alliance to match market and customer needs that are increasingly moving toward working either remotely or in adherence to social distancing norms amid the COVID-19 pandemic.

"One of things that we struggled with was that some of our team members were working primarily from home and not able to come into the lab every day so we were trying to figure out ways that we could keep those team members engaged with the science that is going on, and move the (SARS-CoV-2) diagnostic forward. The Andrew+ really allowed us to do that as the software is cloud-based so we were able to design experiments remotely, and working with another research associate in the lab, set up experiments on the Andrew+, and execute them remotely while monitoring with a webcam, in case anything went wrong."

- **James Broughton, Research Leader, Mammoth Bioscience**

Product Value

In 2019, Andrew Alliance launched a software platform called OneLab. While its competitors offer pipettes with built-in software that can share only a set of pre-established protocols, Andrew Alliance's OneLab software allows users to design and share their own protocols. Moreover, while the software solutions used by its competitors can be hosted only on the local server and require high subscription fees, OneLab is completely free of cost and hosted on the cloud, thereby enabling users to handle the Andrew+ pipetting robot from any personal computer or tablet. The ability to remotely operate the pipette through the OneLab software provides Andrew Alliance with a major competitive advantage in the industry.

A researcher can set up the serial dilution, labware, and reagents using an iPad; and after setting it up, the experiment can be remotely and automatically executed on the Andrew+ pipetting robot. This underscores the ease of use of the OneLab software.

Fig.2 OneLab software for automated liquid handling

Fig.3 OneLab software for design, execution, and sharing of protocols

Image Source: Andrew Alliance (A Waters Company)

Moreover, required adjustments such as setting up the appropriate volumes on the pipette can be performed remotely, eliminating the need for manual input. Not only does this capability provide more time for the users to focus on other critical tasks, it also ensures full traceability. The OneLab software records data to comprehensively depict the step-by-step execution of an experiment, thereby allowing for future troubleshooting or audit trails in a regulated laboratory setting.

Frost & Sullivan considers the OneLab software platform as a game-changing solution, as it completely eliminates the challenges associated with traditional pipettes that involve the manual use of small displays and pressing of the buttons with gloved hands. Liquid handling is an arduous task that requires training, cross-verification, and an eye for quality issues such as data duplication. However, with OneLab, users can rapidly transition from laborious manual process to error-free and automated workflows, thereby enhancing productivity and repeatability of the task. Moreover, its easy-to-use and highly intuitive graphical interface allows users to reduce the time to market for the end product.

Design

Pipettes are sold in a variety of shapes and sizes, and manufacturers have traditionally incorporated different technologies to make the best use of the pipette design. With the invention of electronic pipettes, modern laboratories around the world adopted them mainly for the accuracy and precision of their results. However, with respect to design, there were no major changes, as electronic pipettes still required manual intervention at many levels.

Andrew Alliance identified the critical gap in the pipettes market, where users were facing reproducibility issues due to faulty execution in the liquid handling workflows, even when using standard electronic pipettes. Therefore, the company collaborated with Sartorius AG, a leading Germany-based manufacturer of pharmaceutical and laboratory equipment, to design the Andrew+ pipetting robot such that it could provide complete traceability and enhanced repeatability the two critical attributes that both manual and electronic pipettes lacked. The purpose of this collaboration was to deliver a next-generation pipetting technology that could not only enhance reproducibility, but also simplify the complex and slow workflows. The Andrew+ pipetting robot is two times lighter than competing products in the market, which enables researchers to easily install and operate the system where and when required in an ergonomic manner.

In addition to the pipetting robot, Andrew Alliance offers a range of automated connected devices such as Shaker+, Peltier+, and Magnet+. Shaker+ enables the mixing of samples and offers a speed range of 200 rpm to 3,000 rpm. Peltier+ is an all-in-one rapid heating and cooling system that can withstand heating of up to 99 degrees Celsius and cooling of up to 0 degrees Celsius. Magnet+ enables a simple mechanism to purify genomic, plasmid, and mitochondrial deoxyribonucleic acid (DNA), proteins, and cells, with the use of magnetic beads. The uniqueness of this range is that all of the products can be remotely set up and monitored using the OneLab platform, which makes Andrew Alliance a pioneer in the open, connected lab ecosystem of the future.

Reliability and Quality

Andrew Alliance's customer-centric approach to every aspect of product development is focused on maximizing flexibility for customers using the integrated platform. The company ensures that the users of its Andrew+ pipetting robot and OneLab software are always connected to its technical support experts, which underscores its focus on product reliability. Andrew Alliance's competitors lack this capability, as their products are not capable of running on the cloud, and their support teams cannot assess an issue remotely or in real time. On the contrary, Andrew Alliance's technical support team is just one click away for customers, as they are always connected to the cloud environment. Whether it an issue with protocol design, using the pipette, or navigating the software, Andrew Alliance's technical staff can guide users with the right solution remotely and in real time.

A key differentiator for Andrew Alliance is that it ensures data quality and security of the OneLab software platform by allowing the protocols to be accessible only through secure user identification and access control. For instance, a lab sample task can be saved in a consistent and similar manner, which is useful for future analysis and validation.

Moreover, the OneLab software platform leverages the Secure Sockets Layer (SSL) standard for communication over the network. This network creates an encrypted link between the Cloud and the browser, thereby making the platform as secure as a bank account. This feature makes the OneLab software platform a best-in-class solution in terms of reliability, security, and quality, thereby providing Andrew Alliance with a competitive advantage in the market.

Operational Efficiency

The ongoing COVID-19 pandemic has pushed the workforce across several industries to work from home. The life sciences industry has been particularly impacted by this change. R&D of drugs typically requires substantial resources and time. However, with the R&D teams being forced to work from home or from remote locations, away from the laboratory environment, development of essential drugs, diagnostics, and therapeutics might slow down. In the current scenario, it is of paramount importance that the R&D of drugs (especially a vaccine for COVID-19) is not delayed, as mutation of the virus would require a different type of vaccine, complicating the endeavor.

We have had experience with other automation platforms and found that, in some cases, the automation is not flexible. We chose Andrew Alliance as the Andrew+ system was more flexible than others and we saw it better fitted our needs, especially given the circumstances (COVID-19) where we couldn't predict what might happen tomorrow. Its highly flexible workspace enabled us to quickly adapt our workflow. This is why we chose Andrew+."

- **Michela Savoldi-Boles , CTO, Bioside Diagnostics**

With Andrew Alliance's OneLab software, researchers can access the benefits of lab automation from the comfort of their home. Contrary to competing solutions that require users to be well-versed with programming languages such as C++ and Python to set up the protocol, the OneLab platform does not require any programming skill sets. Users can simply use OneLab's Online Protocol Library or design it themselves on a laptop or tablet. Following a simple drag-and-drop method, users can select and set up any labware and define any actions such as shake plates, heat/cool plates, and separate beads. This makes OneLab one of the most user-friendly software platforms for R&D in the life sciences industry. In addition to setting up the labware, OneLab allows users to remotely execute any liquid handling task using the pipette robot. As OneLab and the Andrew+ pipetting robot are connected to cloud, every activity is recorded on the cloud step-by-step, which ensures full traceability and compliance and enables future troubleshooting.

Growth Potential

The global mandate for the testing of new drugs and vaccines for COVID-19 has rapidly increased the need for sophisticated instruments and lab automation systems. Andrew Alliance, with its integrated portfolio of hardware and intuitive software, has several opportunities to grow in this market by helping pharmaceutical companies to accelerate

their R&D processes. Pipetting is not only used in the life sciences industry, but also widely adopted in application segments such as environmental testing, food and beverage testing, cosmetics research, forensics, and oil and gas. Andrew Alliance's fully automated pipettes and a wide range of accessories can be extremely beneficial to all these industries, helping them overcome issues related to repeatability, reproducibility, productivity, and traceability. In the United States, more than $26 billion is wasted annually on repeat research activities due to the errors made in the first attempt. Andrew Alliance's modular pipetting instruments (with their innovative design and adaptability to a wide range of environments) combined with its ecosystem of connected devices (such as Shaker+ connected through the cloud-based OneLab software platform) can help research labs and pharmaceutical companies in the US to avoid significant financial losses due to experimental errors. With such a strong value proposition, Frost & Sullivan believes that the growth potential of Andrew Alliance over the next two years is double that of the rest of the industry.

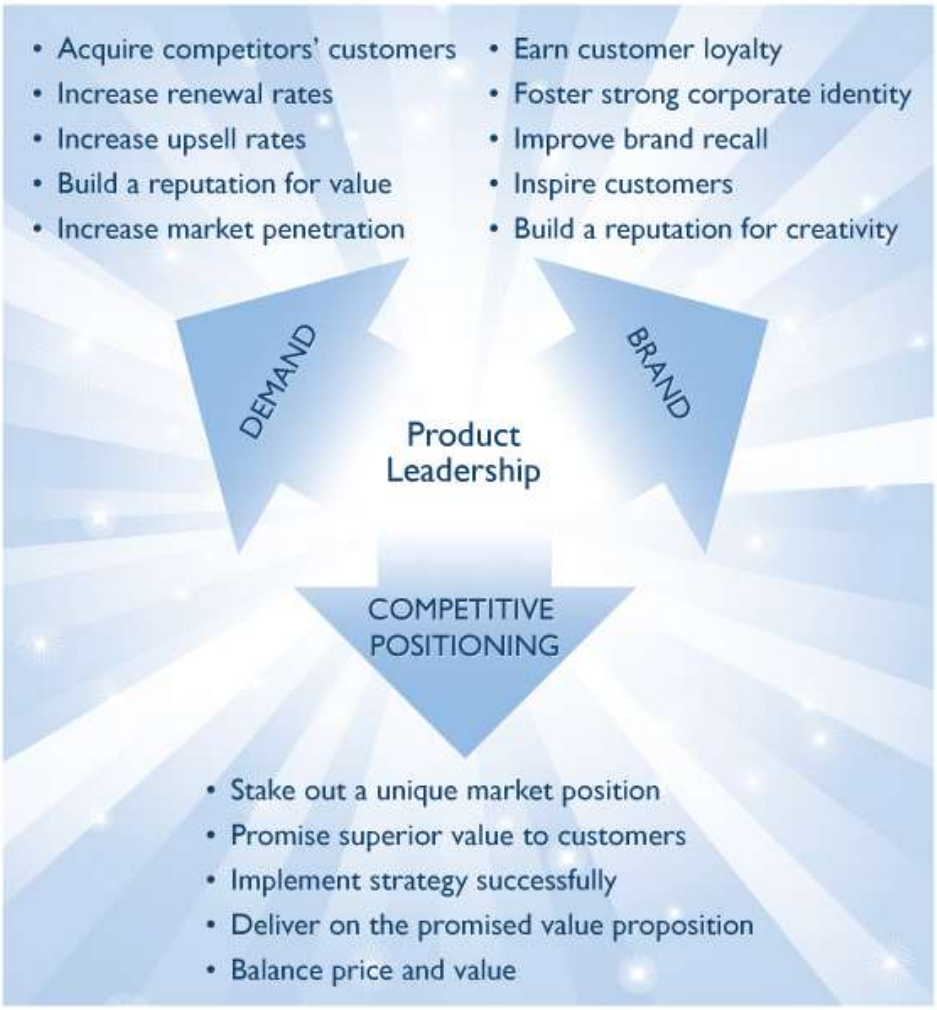
Conclusion

Pipetting is an essential activity performed in laboratories to carry out a wide range of liquid handling analyses. The traditional electronic pipettes and laboratory automation solutions available in the market are designed to suit only a limited number of applications and are often too expensive for research laboratories. Moreover, these solutions require users to be well-versed with programming languages to design a simple protocol. As a contrast, Andrew Alliance's Andrew+ pipetting robot not only automates the liquid handling process, but also allows users to have complete control over the workflow through the OneLab software platform. Even users with zero programming knowledge can easily design a protocol, set volumes for aspiration, or calculate serial dilution using a laptop or tablet, all from the comfort of their home. Andrew Alliance has designed its Andrew+ pipetting robot as a lightweight and affordable solution. Moreover, its capability to integrate a wide range of products such as Shaker+, Peltier+, and Magnet+ using the cloud-based OneLab platform makes Andrew Alliance a pioneer in the development of an open, connected lab ecosystem of the future. Frost & Sullivan recognizes the benefits offered by Andrew Alliance's pipetting robot and OneLab software platform, particularly amid the ongoing COVID-19 pandemic.

For its strong overall performance, Andrew Alliance is recognized with Frost & Sullivan's 2020 Product Leadership Award for pipetting robots in the life sciences industry in North America.

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 are 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 2 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.

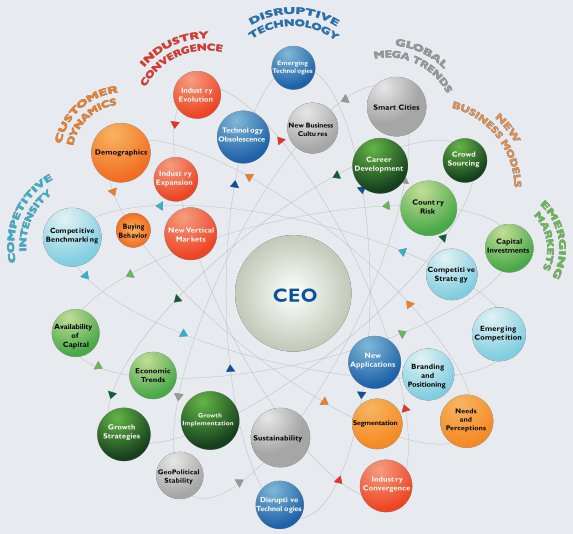
STEP		OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	**Monitor, target, and screen**	Identify award recipient candidates from around the world	• Conduct in-depth industry research • Identify emerging industries • Scan multiple regions	Pipeline of candidates that potentially meet all best-practice criteria
2	**Perform 360-degree research**	Perform comprehensive, 360-degree research on all candidates in the pipeline	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• Announce 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	• 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.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



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.