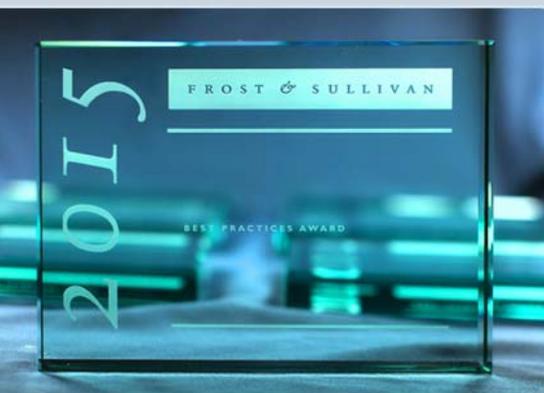




2015 Global Cloud-Based Virtualization in Industrial Automation New Product Innovation Award



FROST & SULLIVAN



50 Years of Growth, Innovation & Leadership

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Background and Company Performance

Industry Challenges

The highly automated infrastructure of modern industries has made event processing a matter of great importance, especially in the context of monitoring production units. Consequently, the demand for flexible tools capable of generating real-time status of machine performance; noting production status, and detecting anomalies, has become directly proportionate to enterprise resource planning, customer relationship management, supply chain management, and strategizing of manufacturing goals. Based on process monitoring and evaluation, businesses formulate plans to cut down unnecessary production time, machine down time, and maintenance cost, which, in turn, boost customers' return on investment (ROI). The increasing significance of Big Data and Internet of Things (IoT) has eased the process of industrial automation through in-depth monitoring of production units and generation of real-time analytical insights about machine performance and maintenance. However, inadequate number of efficient databases, characterized by data latency and erroneous data storage, are preventing companies from holistically reaping the key benefits of industrial automation.

The leading contenders within the industrial automation market through IoT, thus, are struggling to develop a holistic ecosystem that will play a proactive role in event processing without encountering data latency. In addition, solution providers need to ensure that applications can be scaled to the changing technological environment, either automatically or per demand.

Therefore, the suppliers of software middleware should focus on developing complete ecosystems that will provide end-to-end support, in terms of deploying, managing, and scaling business-critical applications on the cloud to stay ahead of the globally expansive IoT-based industrial automation market.

New Product Attributes and Customer Impact

Match to Needs

Founded in 2000, New York-based GigaSpaces Technologies Inc. (GigaSpaces), a world-class software middleware provider for managing, improving, and deploying business-critical applications on and off the Cloud, primarily follows a one-on-one interaction model to gather customer feedback and incorporate findings into its products, namely, XAP In-Memory Computing and Cloudify.

The spectrum of consulting services (both XAP and Cloudify) that GigaSpaces provides emphasizes on assessing customers' business requirements. GigaSpaces' Support Center, an important component of the extended services domain, also plays a vital role in gathering customer feedback and producing evolving solutions to meet customer needs. Through the XAP Self-Service Portal and the Cloudify Community, GigaSpaces encourages

its existing customers to report post-deployment technical issues to receive support and invites their suggestions for potential enhancements that will complement futuristic system architectures of its solutions. Consequently, the timely rolling out of new XAP (the latest is v10.1, started on 15 April, 2015) and Cloudify (3.2) versions is a strong testament to the company's commitment to deliver utmost customer satisfaction by addressing specific areas of unmet customer requirement. XAP v10.1 features extended support for advanced network performance monitoring, memory utilization and Java 8. Cloudify (3.2) open source orchestration, on the other hand, optimizes Topology and Orchestration Specification for Cloud Applications (TOSCA) support. In addition, it also features topology-based monitoring, new Docker plug-ins, improved support for OpenStack and VMware as well as enhanced security features.

GigaSpaces' ability to produce solutions that meet customers' needs is best demonstrated by its increasing deployment of XAP for event processing in different industrial verticals, such as finance, eCommerce, manufacturing, mining, oil and gas, healthcare, and transportation. Incorporation of customer feedback, willingness to work closely with customers, and commitment to produce cutting-edge solutions that match evolving technological trends have equipped GigaSpaces with the potential to deliver robust solutions that meet unique customer requirement, in terms of improved reliability, convenient monitoring, quicker data processing, and more freedom from data latency.

Reliability

GigaSpaces' XAP is a comprehensive software platform based on in-memory data grid architecture with all the tiers in a single container. Such architecture ensures consistent performance and availability while demonstrating the capability to deftly handle unprecedented volumes of data. While Not Only Structured Query Language (NoSQL) and Structured Query Language (SQL) compromise on data availability to guarantee performance and scalability, the company's in-memory computing platform, XAP, ensures consistency by handling part of the data in memory and synchronizing the rest with regular data stream. By effectively implementing an in-memory data grid in the front, XAP ensures robust data storage capacity while guaranteeing performance. The platform's caching mechanism plays a critical role in enhancing performance where, for the first time, the data is read directly from the database and then stored in cache from where consequent processing happens. This not only speeds up the processing paradigm by ensuring fast data access but also guarantees data availability, wherein if a company loses its cache, it has to deal only with performance loss without compromising on data availability. In addition, its robust real-time data replication mechanism between peer nodes in the data grid further adds to enhanced data availability. The company employs Flash to store data, as it reduces storage cost (Flash stores a greater volume of data than Random Access Memory (RAM) and demonstrated high-speed data storage).

The company's Cloudify platform also scores high on reliability. Its differentiating feature is the ability to ensure a deployed application's availability and service level after standing

up the deployment. The platform continuously monitors customer applications based on defined key performance indicators (KPIs). Its robust auto-healing technique is crucial in automatically healing crashed middleware or lost virtual machines (VMs). In addition, it demonstrates capabilities to automatically scale customer applications based on these KPIs, providing consistent service levels to application users even under ever growing loads. The platform also takes care of collecting and aggregating application logs so that they are easily consumable and understandable by administrators. It can alert an operator about specific errors, or even use the logs to generate new kinds of metrics (e.g. how many logins occurred in the last minute), which can then be used to trigger healing or scaling behaviors.

Positioning

Explosive growth in application and data volume has been witnessed since the introduction of the IOT concept. While this huge amount of data is growing at an exponential speed, organizations are trying to combat shortage of storage by adding more servers (usually at exceptionally high costs), only to deliver inadequate performance. Under such growing concerns, GigaSpaces rightly engineered its XAP in-memory computing platform to ensure robust performance while guaranteeing enhanced data storage capacity. In contrast to traditional computing platforms that are designed to deliver either performance or capacity, GigaSpaces' in-memory computing platform not only ensures efficient event processing and data streaming but also demonstrates the capability to handle massive amounts of data generated from diverse sources. For instance, in case of market analytics where data is collected through Web pages and logs, traditional databases prove to be incapable of handling such huge volumes of data. GigaSpaces' XAP carries out event processing efficiently, as it is versatile enough to either speed up the process of data streaming or to act as a consistency layer in case of NoSQL to ensure quick accessibility to data. In addition, it has the distinct capability to provide various Application Program Interfaces (APIs) under the same data. Such innovative functionalities not only ensure flexibility but also guarantee ease of use.

Growing usage of applications has companies focusing on deploying simple and efficient applications to the cloud. While this deployment significantly reduces the capital expenditure (CAPEX), deploying, managing, and scaling applications in the cloud require both expertise and time. However, GigaSpaces' Cloudify open-source orchestration platform aids customers in easy setup, deployment, monitoring, auto-repairing, and scaling of applications.

Most enterprises today have an on-going cloud initiative and various maturity levels. The main goal of these initiatives is to shorten the application development cycles and improve the utilization of the on-premise infrastructure. Cloudify is a key enabler of this, by allowing these enterprise to easily on-board any kind of application and automate its deployment, healing and scaling on a cloud environment.

Similarly in the Telco vertical, large carriers have strategic initiatives to virtualize large portions of their network services towards the same end of agility and utilization, and to a large extent to also avoid vendor lock-in. These initiatives are generally termed NFV (Network Functions Virtualization). Cloudify is the only open source orchestration solution that is capable of automating the deployment and management of the complex network functions required by the carriers.

Through capabilities that XAP in-memory computing and Cloudify pure-play orchestration offer, GigaSpaces has placed itself at the forefront of the competition.

Design

GigaSpaces' Cloudify functions as an open source, one-stop platform that helps migrate apps to Cloud and automate DevOps, including app deployment, monitoring, addressing issues of concern, and scaling. Though traditional databases are limited by the necessity to change codes before shifting the apps to Cloud, Cloudify does not cast any such restraint upon its users. Powered by its 'Blueprint Configuration', it automatically mitigates the issues raised by difference in application tiers and lifecycles, such as installation, app configuration, initiation, and uninstallation. The innovative 'Blueprint Configuration' also functions as a pre-defining factor in determining methodologies for monitoring, upgrading, managing, and scaling application tiers per the demand.

The 'Single-Click Installation' strongly testifies to GigaSpaces' intelligent product designing strategy. Based on 'Blueprint Configuration', the Cloudify Orchestrator provides end-to-end support (from virtual machine [VM] provisioning to deploying application code) to install an application on Cloud. GigaSpaces' exclusive Cloud Application Program Interface (API) plays the key role in completing end-to-end support processes, provided it is deployed through the Cloud Driver. The Cloud Driver initiates VM provisioning, along with installation of Cloudify agents that complete the app installation process on Cloud in the pre-defined path created by the blueprint.

In response to the evolving customer demand for real-time processing of apps and data, GigaSpaces designed XAP to ensure enhanced performance as well as linear scalability, and seamless availability of data. Due to its product design excellence, XAP assists an application in neatly storing its tiers in the form of a single container. It also allows for quick data access by creating a comprehensive in-memory data storage system. By creating in-memory backup for each container, XAP optimizes data availability, mitigates downtime, and expands the scope of multi-dimensional monitoring to swiftly detect operational anomalies in an application. XAP's capability to store data in separate processing units allows customers to enjoy flexibility in terms of scaling applications either automatically or on demand.

Price/Performance Value

In strict accord with the unique value proposition that it renders, GigaSpaces aspires to build user-friendly, cost-effective application monitoring and management solutions that will maintain the balance between performance and storage capacity, in addition to providing the company with a competitive advantage in the globally expansive industrial automation market. XAP In-Memory Computing Platform and Cloudify Cloud Orchestration from GigaSpaces reflect the company's innovative resourcefulness in terms of developing comprehensive platforms guaranteeing high performance, seamless scalability, and almost zero downtime.

GigaSpaces' drive for innovation is evident in its efforts to improve its solutions and provide customers optimal value. For instance, the latest version (v10.1) of XAP features over a hundred attributes and refinement, in terms of monitoring capacity, advanced memory utilization, more flexibility to the user interface, and extended support for Java 8. By including InfluxDB as a default reporting tool and Grafana (an open source query editor) for its dashboard front end, GigaSpaces has increased users' capacity to collect metrics of different resolutions. The goal of advanced memory utilization is achieved by using the outside storage space of a Java virtual machine. Noticeable changes in making the interface more user-friendly include centralized solid-state drive (SSD) support, Representational State Transfer (REST) Application Program Interface (API) for data, and Quiesce Mode. These strategic additions have made XAP the most feature-intense in-memory computing platform, giving GigaSpaces a distinct competitive edge over other participants in the market.

Cloudify, the Cloud Orchestration platform, on the other hand, extends its support to Topology and Orchestration Specification for Cloud Applications (TOSCA), OpenStack and other cloud platforms, such as VMware vSphere or SoftLayer. In addition, GigaSpaces' latest Cloudify platform (3.2) includes cross-cloud orchestration features, which offers support for built-in network, Docker orchestration, workflow engine, built-in policy and critical management and monitoring of applications. The attributes of open-source software frameworks (such as, Hadoop and STORM) that Cloudify contains, make it a unified platform in managing an array of applications, such as Software-as-a-Service (SaaS) activation, virtualizing network functions, personalizing Platform-as-a-Service (PaaS), disaster management, Big Data management, and space for frameworks testing. The latest improvements have enabled GigaSpaces' solutions to offer stiff competition to existing Cloud-based application automation platforms and abstraction layers.

In the industrial sector, GigaSpaces' In-Memory Data Grid and service-based architecture contribute in several ways, including superior resource-utilization, helping to host different topologies simultaneously on "virtual-desktop" bases, and also improving responsiveness and sophistication of solutions. XAP's real-time analytics functionality delivers the ability to perform complex calculations across large data sets with relatively inexpensive hardware. Such functionality is critical across industries, such as airlines, air freight &

logistics, road & rail, transportation infrastructure, marine technology, aerospace manufacturing, chemical industry, telecommunications and energy industries.

Particularly in the manufacturing space, processing market data is highly strenuous, mandating real-time processing to decide and execute on buy/sell activities. For such requirements, GigaSpaces offers an integration between its In-Memory Data Grid (IMDG) with a NoSQL DB/Flash Storage to perform such real-time analytics.

GigaSpaces lowers the dependency on legacy infrastructure (mainframe) and offers reduced testing and integration time. As a result, organizations are equipped to address rapid economy changes (perform better in the early stages of the business cycle) and to handle growth associated with the global need for infrastructure replacement and upgrade. Therefore, GigaSpaces' XAP In-Memory Computing Platform and Cloudify Cloud Orchestration have helped in the creation of a comprehensive ecosystem that not only solves issues with data storage but also guarantees real-time big data processing, in addition to high-availability of the processed data. In a marketplace where aforesaid factors are absolutely essential for successful IoT deployment in industrial automation, GigaSpaces' products are distinctly ahead of the competition due to their ability to offer best value for money.

Brand Equity

GigaSpaces displays strong focus in enhancing its brand visibility by expanding its partner ecosystem, continuously updating the news section of its website, and attending international industry events. The company boasts a strong network of partners, which includes solution partners, technology partners, cloud partners, and Original Equipment Manufacturers (OEMs). Some of its more prominent partners are VMware vCloud, IBM SoftLayer, HP, SanDisk, Magic Software, among others. Association with such well-known business leaders not only enhances GigaSpaces' credibility in the market but also assists it in reaching out to a wider customer base than before. In addition, the company leverages its partners' extensive technical know-how to continually broaden its offerings and align them to address unmet customer needs.

Furthermore, in its bid to keep customers informed of the latest developments in the industrial automation industry and strengthen its brand presence, GigaSpaces regularly publishes blogs, whitepapers, and case studies. Such branding initiatives have been further supported by the company's significant presence in social media platforms, such as twitter, Facebook, LinkedIn, tumblr, and You Tube.

The company regularly attends prominent trade shows and events to enhance its brand reputation on a global scale. While it allows GigaSpaces to understand unmet industry needs, such tradeshow and events also provide the company an appropriate platform to demonstrate its solutions' capabilities in front of a wider audience. Some of the events that the company has recently attended and expects to attend include OpenStack Summit (Vancouver, May 2015), Internet Retailer Conference and Exhibition (Chicago, June 2015),

VMworld (San Francisco, August 2015) and OpenStack Summit (Tokyo, October 2015). It also conducts several free workshops to offer its potential customers a hands-on experience of its technology's capabilities.

Conclusion

Leveraging its expertise in the industrial automation industry, GigaSpaces created its XAP in-memory computing platform and Cloudify pure-play orchestration platform for application deployment. While XAP demonstrates the capability to guarantee unparalleled performance by ensuring robust data management, efficient event processing and extensive data storage capabilities, the solution is also highly reliable in terms of data availability. Cloudify, on the other hand, displays superior performance in automating the deployment and management of applications on the cloud. By seeking timely feedback from customers and implementing it in its product portfolio, GigaSpaces strives to effectively address unmet customer needs and positions itself at the forefront of competition.

With its strong overall performance, GigaSpaces Technologies, Inc., has earned Frost & Sullivan's 2015 New Product Innovation Award.

Significance of New Product Innovation

Ultimately, growth in any organization depends upon continually introducing new products to the market, and successfully commercializing those products. For these dual goals to occur, a company must be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding New Product Innovation

Innovation is about finding a productive outlet for creativity—for consistently translating ideas into high quality products that have a profound impact on the customer.

Key Benchmarking Criteria

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

New Product Attributes

- Criterion 1: Match to Needs
- Criterion 2: Reliability
- Criterion 3: Quality
- Criterion 4: Positioning
- Criterion 5: Design

Customer Impact

- Criterion 1: Price/Performance Value
- Criterion 2: Customer Purchase Experience
- Criterion 3: Customer Ownership Experience
- Criterion 4: Customer Service Experience
- Criterion 5: Brand Equity

Best Practice Award Analysis for GigaSpaces Technologies, Inc.

Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows our research and consulting teams to objectively analyze performance, according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are illustrated below.

The Decision Support Scorecard is organized by New Product Attributes and Customer Impact (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criteria are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players as Competitor 2 and Competitor 3.

DECISION SUPPORT SCORECARD FOR NEW PRODUCT INNOVATION AWARD

<i>Measurement of 1-10 (1 = poor; 10 = excellent)</i>			
New Product Innovation	New Product Attributes	Customer Impact	Average Rating
GigaSpaces Technologies, Inc.	8	9	8.5
Competitor 2	6	8	7
Competitor 3	4	5	4.5

New Product Attributes

Criterion 1: Match to Needs

Requirement: Customer needs directly influence and inspire the product’s design and positioning

Criterion 2: Reliability

Requirement: The product consistently meets or exceeds customer expectations for consistent performance during its entire life cycle

Criterion 3: Quality

Requirement: Product offers best-in-class quality, with a full complement of features and functionality

Criterion 4: Positioning

Requirement: The product serves a unique, unmet need that competitors cannot easily replicate

Criterion 5: Design

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

Customer Impact

Criterion 1: Price/Performance Value

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

Criterion 2: Customer Purchase Experience

Requirement: Customers feel like they are buying the most optimal solution that addresses both their unique needs and their unique constraints

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company’s product or service, and have a positive experience throughout the life of the product or service

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality

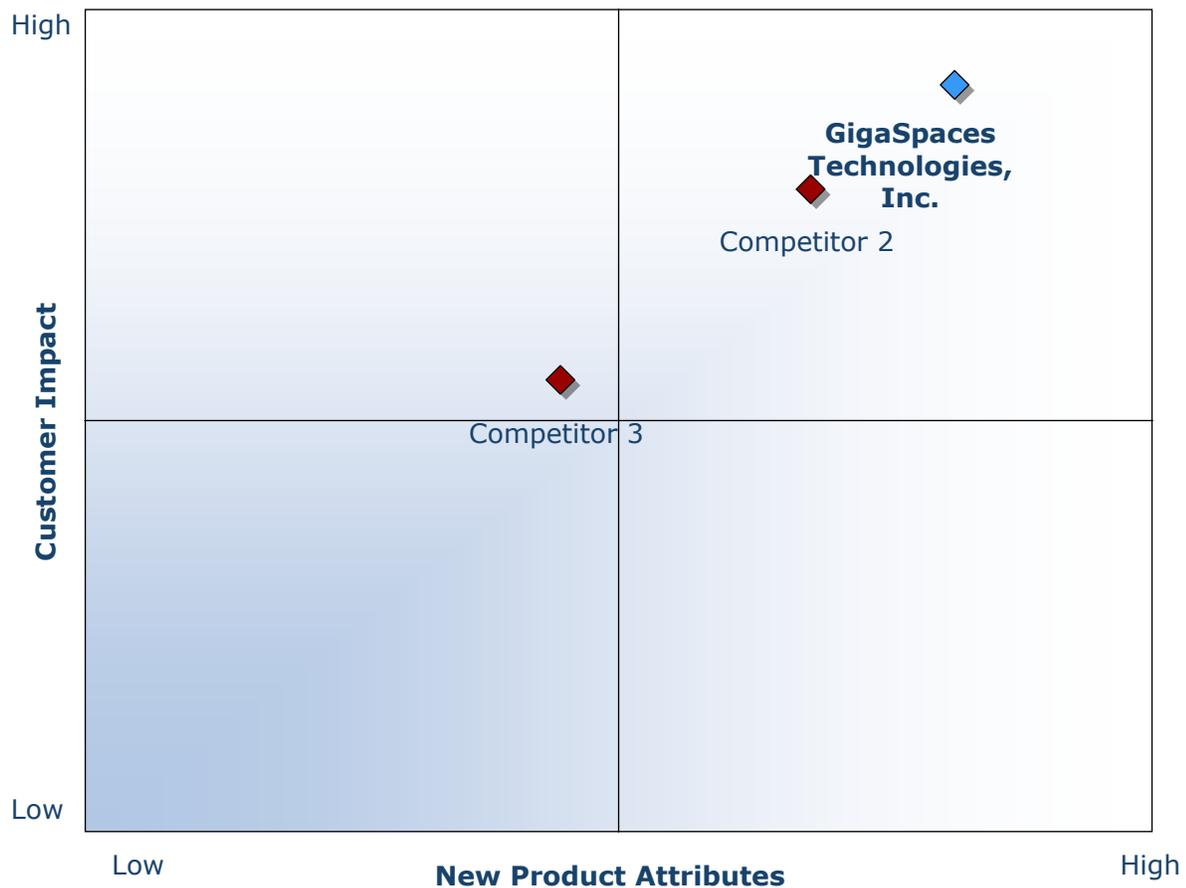
Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts can then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.

DECISION SUPPORT MATRIX FOR NEW PRODUCT INNOVATION AWARD



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, leading to 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 players and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



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

Frost & Sullivan Awards follow a 10-step process to evaluate award candidates and assess their fit with select best practice 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 globe	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies 	Pipeline of candidates who 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-practice criteria • Rank all candidates 	Matrix positioning 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-practice 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-practice 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-practice award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select winner 	Decision on which company performs best against all best-practice criteria
9 Communicate recognition	Inform award recipient of award 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 may 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 future strategic planning 	Widespread awareness of recipient's award status among investors, media personnel, and employees

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to 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 practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages almost 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from 31 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.