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FROST & SULLIVAN BEST PRACTICES AWARD

SMART DATA ANALYTICS SOLUTIONS - GLOBAL

Enabling Technology Leadership 2019

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2019   BEST PRACTICES AWARD

guavus

a Thales company

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The advent of new data generation sources such as the Internet of Things (IoT) devices and sensors, analytics, as well as artificial intelligence (AI) and machine learning (ML) drives Big Data technology evolution. According to Frost & Sullivan, the number of devices connected to the Internet will reach 80 billion in 2025, and data storage will rise to 44 zettabytes in 2020, of which only 37% will be analyzed.[1] The massive surge in the data produced by Internet usage, social networks, mobile devices, sensors, embedded systems, and enterprise information technology (IT) requires more computational resources and scale. However, traditional computing systems cannot handle the data diversity and complexity turning out at such a fast rate. Inconsistent or unreliable data content (i.e., hashtags, typos, speeches, etc.) also carries the risk of inaccurate output.

Smart data surfaces by filtering out noise from Big Data. Its value derives from addressing the critical factors of Big Data, namely the volume, variety, velocity, and veracity. Applying advanced analytics to raw data helps to detect fraud, predict risk, and discover patterns. Cleaning, filtering, labeling, and eliminating irrelevant data, enables enterprises to access valuable data that facilitates intelligent decision-making and contributes to advanced product development, predictive maintenance, customer experience, operational efficiency, and innovation.

Machine learning algorithms increase the speed, accuracy, and intelligence of screening Big Data, and by leveraging these insights, the technology continuously learns and refines the data filtering process. Therefore, machine learning algorithms enable data scientists to perform data analytics tasks more quickly, allowing them to put more effort into decision-making. It also equips businesses to filter data lakes and data warehouses while creating smart data. Hence, AI enhances the business workflow capabilities of enterprises by empowering them to address the business requirements of personalization and customer experience more efficiently.

When Big Data is turned into actionable insights using analytics and combined with AI/ML capabilities, it unveils immense opportunities to drive productivity and innovations across organizations. Moreover, businesses are exploring open data initiatives, to bring value at every point in the value chain. As enterprises add new data analytics services to existing offerings, they develop new business models to monetize their data. Furthermore, data partnerships allow companies to enhance their implementation capabilities by leveraging open source smart data solutions. These partnerships also enable service providers across industrial sectors to easily integrate smart data into their existing business infrastructure.

Organizations invest heavily in smart data analytics solutions to extract valuable insights from heterogeneous data sources with multiple interrelations to leverage data in new ways, drive efficiency, and find new revenue streams. As a result, the market sees the evolution of self-service analytics platforms that provide automated analysis—saving time

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[1] *Turning Big Data to Smart Data: Emerging Opportunities: Businesses Tapping the Intelligence Out of Big Data,* (Frost & Sullivan, December 2018).

for the organization's business intelligence teams. According to Frost & Sullivan analysts, the smart data market size is expected to grow at a compound annual growth rate (CAGR) of 14.2%, from $16.20 billion to $31.50 billion, between 2017 and 2022.[2] Despite accelerated growth in the sector, companies need to align their business strategies and manage some prerequisites, which include a proper setup of business infrastructure, quality data, efficient systems and tools, as well as analytical skills to derive value from smart data transformation. However, Frost & Sullivan acknowledges that a lack of skills and expertise slows the adoption of the technology.

Technology Leverage and Customer Impact of Guavus

Founded in 2006 as a pioneer in AI-based Big Data analytics (BDA) and machine learning (ML) innovation, Guavus drives digital transformation in major telecom service providers. Acquired by Thales in 2017, Guavus now extends its out-of-the-box analytics products and the Reflex platform on which they're built to global customers in aeronautics, space, rail signaling, defense, and security. The intelligent decision-making capabilities of its Reflex-based solutions target explicitly areas such as mobile subscriber behavior segmentation and telecom network operations optimization, as well as predictive maintenance, cybersecurity, and critical infrastructure monitoring. Guavus is headquartered in San Jose, California, United States, and has regional offices in Montreal, Canada; and Gurgaon and Ahmadabad, India.

Cutting-edge Technology Provides Real-time Insights and Right-time Decisions

Guavus recently acquired SQLstream for its high-performance, low-latency, and low-cost edge data collection and smart mediation technology. Guavus now has the unique capability to analyze, filter, and aggregate data at the network edge in real time and forward the information to the network core where its Reflex platform incorporates data processing and analytics layers. Reflex makes the development, deployment, and operation of AI/ML-based analytics applications fast and straightforward.

The platform supports the following products:

- Marketing Insight: subscriber behavior segmentation for new revenue growth

- LiveOps: customer experience driving operational efficiencies and expense reduction

- OpsIQ: automated network operations problem detection and root-issue remediation

- AlarmIQ: automated trouble resolution for network operators

- VoiceIQ: automated voice service quality scoring and remediation

- DataIQ: automated data service quality scoring and remediation

- SecurityIQ: network security insights

- Edge Analytics: IoT operations analysis

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[2] *Turning Big Data to Smart Data: Emerging Opportunities: Businesses Tapping the Intelligence Out of Big Data,* (Frost & Sullivan, December 2018).

With rich expertise in the telecommunications and cable network operators market, Guavus built an open big data platform that is designed to ingest, process, and analyze large datasets that are particular to communications service providers (CSP). Its architecture handles massive scale effortlessly (petabytes of data per day at high speed) and easily integrates into CSP networks. Designed to integrate with legacy systems and co-exist with existing data warehouses, the Reflex platform minimizes duplicate technologies and avoids multiple collection scenarios. Therefore, Guavus's edge-to-core platform and product portfolio are exceptionally flexible and scalable.

Furthermore, its agile application operationalization streamlines application evolution, maintenance, continuous delivery across multi-environments, and lifecycle management. Most importantly, Reflex allows customers to leverage both customizable self-service analytics applications and out-of-the-box analytics products for advanced systems planning and operations, mobile traffic analytics, marketing, customer care, security, and IoT. Other differentiators are the company's streaming data collection systems that are highly available with local redundancy and replay data in the event of system failures, and the flexible-binning methodology which enables it to intelligently and automatically handle data delays or mismatched speeds when aggregating data from multiple sites. As the platform runs analytics early in the data lifecycle, it discards redundant or unreliable raw data quickly.

The Pillars of Success: Subscriber Intelligence and Operational Intelligence

Guavus offers its customers a widely distributed and scalable architecture, which enables them to elevate their operational efficiency and improve their subscribers' quality of experience, resulting in better price/performance and a reduced total cost of ownership. Deeply rooted in its domain expertise, Guavus develops software that brings highly instrumented analytics and use cases to specific focus areas.

For example, Guavus's unique lens on network interactions with subscribers empowers companies to refine their target marketing to increase and expand their revenue streams. Its solutions help customers to analyze data in real time and consists of five continuously repeated steps: 1) identify service quality issues; 2) score or quantify subscriber impact; 3) analyze root issues; 4) fix root causes; and 5) improve the ML model. With this approach, Guavus knocks down the silos that typically occur, thereby providing a holistic view of the customer experience—integrating network health key performance indicators (KPIs), care KPIs, as well as granular detail about customer equipment. By using the Guavus marketing analytics solution, Marketing Insight, mobile network operators understand subscriber behavior better. Measuring user behavior is fundamental to gaining subscriber intelligence, which drives revenue opportunities. Ultimately, Guavus aids customers to improve the end-user experience which translates directly to a significant benefit in profitability.

Cable and mobile carriers, on the other hand, use Guavus's operational intelligence products to solve network monitoring and service level agreement (SLA) management for their network operations and customer care teams. Fundamentally, unintended service

degradations from network maintenance and service activities impact negatively on both subscriber experience and operational expenses. In one case, one of the world's largest CSPs needed to reduce the scope, frequency, and duration of both its service degradations and outages. Using Guavus's products, the enterprise achieved cost savings of $70 million in the first year. In another case, Guavus's products helped a large European operator reduce its annual care calls by 4-7% and trouble tickets by 5-8% while significantly boosting its Net Promoter Score and generating a 7-digit annual savings.

Partnerships: A Key Success Factor

Guavus's partnership with the India-based service provider, Jio, showcases how its product suite helps enhance service to customers and addresses critical service operations. As one of the world's largest and fastest-growing data service operators, Jio's networks generate 4 to 5 petabytes of data daily. Gathering all the data in one place and normalizing it for a holistic network view on the subscriber service is quite a challenge. Guavus's solution automates the analytics process by integrating the data science platforms with Jio's data lake, which accelerates right-time-and-place decisions and closed-loop actions for operational efficiency and enhanced customer experiences. For instance, Guavus provided end-to-end visibility on aspects relating to Jio's performance degradation. By pulling in performance metrics from the network, Jio could further determine factors causing poor Voice over LTE (VoLTE) calls. As a result, these insights helped Jio reduce its operational costs and enhance customer experience.

Conclusion

The advent of new data generation sources such as the Internet of Things (IoT) devices and sensors, analytics, as well as artificial intelligence (AI) and machine learning (ML), drive the evolution of Big Data technologies. Organizations invest heavily in smart data analytics solutions to extract valuable insights from heterogeneous data sources with multiple interrelations to leverage data in new ways, drive efficiency, and find new revenue streams. Thus, the market sees the evolution of self-service analytics platforms that provide automated analysis—saving time for the business intelligence teams.

Guavus provides a new generation of AI/ML-powered Big Data analytics applications to address specific business problems for next-generation network operations and customer experience management. Its Reflex platform allows customers to analyze, filter, and aggregate data at the network edge in real time and forward the information to the network core where the platform incorporates data processing and analytics layers. With its ML-based products, Guavus uniquely breaks down barriers between operations and business support systems to provide impact and opportunity analysis which empowers enterprises to plan network capacity, improve service operations, and drive down costs more efficiently while delivering enhanced customer experience and new revenue generation.

With its trailblazing digital technology, unparalleled customer-centric commitment, and leadership excellence, Guavus earns Frost & Sullivan's 2019 Global Enabling Technology Leadership Award in the smart data analytics solutions industry.

Significance of Enabling Technology Leadership

Ultimately, growth in any organization depends on customers purchasing from a company and then making the decision to return time and again. In a sense, then, everything is truly about the customer. Making customers happy is the cornerstone of any successful, long-term growth strategy. To achieve these goals through enabling technology leadership, an organization must be best in class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.

Understanding Enabling Technology Leadership

Product quality (driven by innovative technology) is the foundation of delivering customer value. When complemented by an equally rigorous focus on the customer, companies can begin to differentiate themselves from the competition. From awareness, to consideration, to purchase, to follow-up support, organizations that demonstrate best practices deliver a unique and enjoyable experience that gives customers confidence in the company, its products, and its integrity.

Key Benchmarking Criteria

For the Enabling Technology Leadership Award, Frost & Sullivan analysts independently evaluated Technology Leverage and Customer Impact according to the criteria identified below.

Technology Leverage

Criterion 1: Commitment to Innovation

Requirement: Conscious, ongoing adoption of emerging technologies that enables new product development and enhances product performance

Criterion 2: Commitment to Creativity

Requirement: Technology leveraged to push the limits of form and function in the pursuit of "white space" innovation

Criterion 3: Stage Gate Efficiency

Requirement: Adoption of technology to enhance the stage gate process for launching new products and solutions

Criterion 4: Commercialization Success

Requirement: A proven track record of taking new technologies to market with a high rate of success

Criterion 5: Application Diversity

Requirement: The development and/or integration of technologies that serve multiple applications and can be embraced in multiple environments

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 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.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices
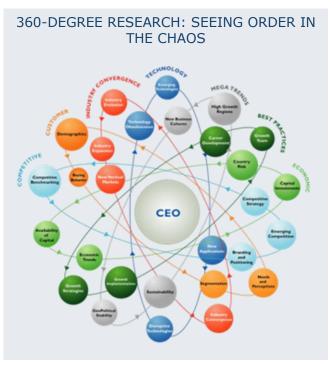
Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP		OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	Monitor, target, and screen	Identify Award recipient candidates from around the globe	• 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	• Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice 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-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	• 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	• 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-practice Award recipient	• Review analysis with panel • Build consensus • Select recipient	Decision on which company performs best against all best-practice criteria
9	Communicate recognition	Inform Award recipient of Award recognition	• 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	• 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

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 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, 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 more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.