



**2017 Global
Biometric Authentication Solutions
Company of the Year Award**

FROST & SULLIVAN

BEST
2017 **PRACTICES**
AWARD

**GLOBAL
BIOMETRIC AUTHENTICATION SOLUTIONS
COMPANY OF THE YEAR AWARD**

Contents

Background and Company Performance	3
<i>Industry Challenges</i>	3
<i>Visionary Innovation & Performance and Customer Impact of IDEMIA</i>	3
<i>Conclusion</i>	10
Significance of Company of the Year	11
Understanding Company of the Year	11
<i>Key Benchmarking Criteria</i>	12
Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices	13
The Intersection between 360-Degree Research and Best Practices Awards.....	14
<i>Research Methodology</i>	14
About Frost & Sullivan	14

Background and Company Performance

Industry Challenges

Organizations across all verticals need access control systems to secure multiple environments within the organization—e.g., data centers, financial institutions, and airports. Many legacy access control systems require the input of a personal identification number (PIN) or presentation of proximity or magnetic stripe card. Organizations issue user-specific entry mechanisms to employees to assign pertinent clearance level information; however, PINs and cards are easy to steal, share, or damage—adding risk, providing admission to the wrong people, and potentially creating dangerous situations.

Enterprises demonstrate a growing need for safety and security as a result of the exponential growth of the Internet of Things (IoT) and Internet accessibility. Organizations attempting to prevent identity theft need to provide better security because hackers constantly evolve their tactics against standard security solutions. Hackers access passwords, PINs, names, birthdates, and other identification data through passive viruses that screen-scrape or key-log information sent via Internet-connected devices. Moreover, hackers install more aggressive viruses, such as ransomware, that leave end-users feeling vulnerable and diminishing consumer trust in breached companies. The omnipresent danger of damaging and malicious hacks means that organizations need to shift towards more robust and comprehensive solutions to protect against attacks.

Enterprises recognize the benefits of biometric authentication solutions; however, many organizations utilize mediocre technology or incorrectly deploy solutions, and thus pollute future opinions of biometric authentication tools collectively. For example, many biometric identity technologies are incapable of keeping pace with real-world applications, thereby creating a frustrating and time-consuming experience for end-users.

Finally it is important to keep in mind that however strong an authentication solution may be it is only valid if it relies on accurate identification of the person at the beginning of the journey.

Visionary Innovation & Performance and Customer Impact of IDEMIA

IDEMIA (formerly OT-Morpho) is the trusted global leader in the biometric technology market; leveraging over 40 years of experience in developing law enforcement, forensic, and civil ID systems serving more than 500 Government agencies worldwide. IDEMIA also has nearly 20 years of experience in biometric access control solutions, providing reliably secure technologies to thousands of enterprises globally, including an impressive percentage of companies on the Fortune 50 list.

The company's long-term interaction with the world's largest users of biometrics, such as the Federal Bureau of Investigation (FBI) in the US, contributes to its fast and accurate biometric matching algorithms. IDEMIA also leverages its rich background in ID management systems to provide superior and reliable biometric authentication solutions for large and small organizations, ensuring that each individual is provided with a unique trusted identity. The best example for this is the Aadhaar program conducted by the company in India, the most ambitious identity program in the world—so far it has delivered more than 1.2 billion identities in India, based on tri-modal biometric enrollment (fingerprint, iris, and face). This program now allows banks and telecom companies to strongly authenticate customers to open new accounts, with the assurance that this authentication process is based on reliable identities.

Frost & Sullivan recognized IDEMIA with the 2015 North America Company of the Year Award in the fingerprint biometrics industry and continues to be impressed by its latest technology innovations based on customer needs and market trends.

Best-in-Class Biometric Technology

Fingerprint Validation

IDEMIA provides quick, effortless, and accurate fingerprint authentication solutions via its innovative, patented MorphoWave™ touchless sensor technology; it is recognized globally as the first and leading technology of its caliber—available in three variations, MorphoWave™ Desktop, MorphoWave™ Tower and MorphoWave™ original equipment manufacturer (OEM) integration kit (used for direct integration into industry leading gates/turnstiles). The technology simultaneously evaluates four fingers multiple times during one pass through the reader in any direction, enabling superior accuracy and unmatched speed. The sensor uses two different types of light to detect the three-dimensional shape and orientation of fingers in space and the friction ridges on fingers as a hand passes through the sensor area—this obtains considerably more surface coverage and data than two-dimensional contact-based capture.

IDEMIA extensively tested its MorphoWave™ sensor technology in different industries and environments, resulting in a leading lab and field-proven biometric technology. IDEMIA reports MorphoWave™ is capable of scanning and verifying at a rate of over 45 people per minute with industry leading accept/reject rates as verified in recent National Institute of Standards and Technology (NIST) benchmarks performed on its algorithms. Depending on a client's requirements and priorities, the technology can be tuned to achieve the perfect balance of convenience and accuracy, whilst maintaining maximum throughput.

The company realizes the necessity of working with gate and access control system manufacturers to improve interoperability with its biometric technologies. The speed of MorphoWave™ has driven substantial innovation in the gate and turnstile sector to ensure customers can benefit from the high throughput made possible by the technology.

Additionally, IDEMIA offers an extensive line of complementary fingerprint readers to satisfy any enterprise's identification needs, from small OEM readers to extreme ruggedized solutions for high risk applications—the technology is certified to the highest level by internationally-recognized organizations—e.g., FBI (IQS), Indian STQC, and BSI. IDEMIA offers fingerprint solutions in a variety of options, such as touch, contactless, and multimodal readers combining simultaneous fingerprint and vein scanning. The company specializes in overcoming typical fingerprint reader challenges, such as capturing and verifying wet, dry, or dirty fingers, even when the sensor plate is not clean.

Another innovation is IDEMIA's F-Code smartcard with integrated fingerprint sensor. The F-Code card is designed for biometric payment and identity verification, leveraging existing banking, retail and government infrastructure. The technology allows users to biometrically authenticate themselves directly on the smartcard, ensuring transactions are only made when the true owner of the card is present and identified.

Frost & Sullivan's independent analysis confirms IDEMIA provides revolutionary technology that is ahead of its time, supported by its future-facing innovations.

Facial Recognition

IDEMIA's facial terminals provide hands-free access to offices and sensitive areas. These "on-the-move" biometric solutions ensure a high level of accuracy while ensuring high throughput. Morpho 3D Face Reader™ and MorphoFACE provide end-users with an accurate, minimally invasive method of identity verification using real time face acquisition and matching. IDEMIA's 3D facial recognition technology analyzes over 40,000 facial structure markers to confirm identity, making it superior to competing technologies.

IDEMIA also offers facial recognition technology for device access—e.g., smart phones, tablets, and laptops—and e-banking and e-payment authorization solutions via selfie. By requesting random head movements, IDEMIA's Selfie-Check solution ensures that the user is a real and a live person. With this solution, users can remotely and securely confirm their identity from their mobile devices, either against a central biometric database or against an identity document, e.g. a passport.

Iris Recognition

IDEMIA's iris at a distance solution simultaneously performs two irises and portrait acquisition in less than 1 second. The solution has been designed for border control, airport passenger flow management, and secure site management applications, where throughput, security and accuracy are key requirements. It provides non-intrusive acquisition and effortless capture, processing more people thanks to wide height detection range (1 to 2 meters).

Extending its expertise in iris recognition to mobile devices, IDEMIA developed BioNetra, an advanced iris solution for mobile devices. Developed as part of the Aadhaar program, this solution is certified by the Indian government. It enables online service providers to accurately and reliably verify a subject's identity relying on high-speed iris acquisition and processing capability (less than 500ms), under a broad range of lighting and environmental conditions. Including liveness detection, this solution is robust against duplication and spoofing. Very convenient for end-users, it can be used for assisted capture (via the rear camera) and/or self-capture (via the front camera) and it works even with glasses.

Superior Features and Functionalities

IDEMIA's MorphoWave™ technology surmounts difficulties where other biometric solutions falter with environmental lighting. Many biometric technologies are light-sensitive and do not operate correctly under suboptimal lighting conditions related to location, such as indoors, outdoors, bright lights, complete darkness, and light changes throughout the day—e.g. a sensor located in a lobby that receives more light at a particular time of day. IDEMIA engineers its technology to operate faultlessly in different lighting settings without the need to adjust the configuration, whereas competitors' solutions require controlled lighting around the device.

IDEMIA's seamless integration with other technologies allows customers to utilize two-factor verification processes—one biometric modality coupled with a proximity/smartcard or PIN. Alternatively, clients can use two biometric scans, such as fingerprint with a face or iris scan. IDEMIA's MorphoAccess® VP provides an integrated two-factor biometric authentication process, allowing end-users to verify fingerprint and finger vein patterns with a single scan. Fingerprint scan is the most accurate modality across the widest range of applications because it is unchanging, completely unique, and is repeatable in its usage. Finger vein scans provide a secondary identification factor to a verification process that does not leave a visible mark, like fingerprints, by registering veins as dark lines to the sensor and only accepting an image if there is constant blood flow. Due to IDEMIA's reputation as the world's most innovative and leading biometric solution provider, it is not surprising that the company is the first to create a reader capable of detecting and confirming these two modalities simultaneously.

Finally, ensuring technology compliance for clients worldwide, IDEMIA upholds all local security standards and regulations in spaces such as government, industry-specific, profile security, and legacy to future technologies for interoperability. The company maintains its market leading performance through meeting and exceeding NIST benchmarks by regularly submitting its algorithms for testing. Additionally, IDEMIA's biometric technology is certified by the FBI for meeting Personal Identity Verification and Image Quality Specifications (PIV-IQS) standards. IDEMIA meets standards pertaining to proximity, DESFire, and iClass cards, for two-factor verification, and meets other standards, such as industry standard open protocol (OSDP) and data protection standards like SSL and TLS.

Customizable Application for Diverse Deployments

Customers exhibit high levels of satisfaction and commitment to IDEMIA's products for their game-changing adaptability, superior ease-of-use, and best-in-class security. For example, many MorphoWave™ clients utilize the technology for high-traffic and secure access control locations, e.g., most of the major banks in the US use the solution for employee entrance points and customer verification in the U.S.

A recent trial at Southern India's most active airport, Kempegowda International Airport in Bengaluru, allowed passengers to authenticate using MorphoWave™, saving travelers the hassles of time-consuming check-in processes, saving airport labor costs, and providing a more secure environment for all airport occupants. MorphoWave™ biometric profile creation works in two different ways: 1) requiring volunteers to register in the biometric system with in-person fingerprint information that is compared to the fingerprints in their passport 2) leveraging existing records from large scale databases—such as law enforcement-level background checks—eliminating the need to enroll. Once verified, passengers check in with a wave of either hand.

MorphoWave™ sensors have also been used to scan fingerprints of passengers as part of the entry/exit control system at the Cotonou airport (Benin) in operation since May 2017, with so far more than 300K passengers have gone through this system.

Universities implementing IDEMIA's technology use it as a selling point because it protects and secures popular environments for students, such as athletic facilities and cafeterias. The solutions are reliable and convenient alternatives to typical access cards; allowing students to access secure areas without the constant need to carry a card to access basic services. Furthermore, biometric registration can easily occur during student orientation, streamlining the initial university assimilation processes.

At 24-Hour-Fitness gym locations, members can opt in to use biometric authentication for access rather than carry a membership card or show an identification card, ultimately allowing members to discontinue bringing wallets and purses to the gym and conveniently gain access without worrying about leaving an access card at home. IDEMIA's technology seamlessly integrates with access control systems, allowing 24-Hour-Fitness to secure members' fingerprint information by translating it into a series of numbers rather than retaining images of fingerprints in order to ensure the privacy of users.

Furthermore, MorphoWave™ empowers organizations to control and simplify time/attendance and payroll processes accurately by utilizing the technology as a biometric time clock and exporting data to payroll software. Companies using MorphoWave™ for time and attendance tracking immediately see a return on investment, with 5-20% in payroll savings, as the technology significantly reduces opportunities for fraudulent time clock punches, e.g. changing in/out times manually and buddy punching. The company offers the sensor for integration with a client's new or existing time clock or a complete biometric time clock unit. It provides flexible and customizable technology for any market in any region—for example, in Brazil the law states that time clocks must provide a receipt with each time clock punch; IDEMIA makes this possible with its unmatched ability to fuse its biometric solutions with other technologies. Frost & Sullivan research shows IDEMIA is the leading provider of biometric time and attendance technology, globally.

At the governmental level, IDEMIA provides comprehensive and unified systems to manage biometric services (enrollment, identification, and verification) for all national systems involved in ensuring the security of the state. For instance the Sultanate of Oman uses IDEMIA's ABIS (Automated Biometric Information System) multi-biometric system platform, managing fingerprints, facial & iris, for different purposes: public security, civil identity, border control and criminal identification.

IDEMIA also very recently announced that they provide a complete passenger processing biometric system at Changi Airport Terminal 4 in Singapore opened on October 31, 2017, powering a world premiere free passenger flow.

Lastly, IDEMIA realizes the need for small organizations to utilize biometric identification technologies, such as local police departments; therefore, it offers cloud-based solutions, with a lower price point to accommodate limited budgets, through government-certified cloud providers. Moreover, IDEMIA offers an extensive line of biometric readers, e.g. fingerprints, face, and iris scanners enabling clients to incorporate the technology with desktop stations, laptops, tablets, and mobile phones. Frost & Sullivan is impressed with IDEMIA's complete identity and access product line and industry solutions that include:

- shipping over 690 million payment cards and 1.2 billion SIM cards in 2016
- issuing over 3 billion identity documents, globally
- creating 1.3 billion digital identities for Indian citizens
- providing 80% of driver licenses in the US
- securing millions of digitized cards for Android Pay, Samsung Pay, and Apple Pay; smart phone fingerprint readers

Superior Customer Value and Service

Following a “knowledge is power” approach, IDEMIA explains biometric technology to clients to create awareness and understanding of how the technology operates and what to pursue, such as the importance of sensor materials, image quality standards, and algorithm performance. The company assists customers in product selection and utilization; encouraging clients to benchmark and compare IDEMIA’s technology to competing technologies and by offering trials so customers can view the concepts in real-world applications within their environment. Trial periods allow IDEMIA and a client to work through customizing the product for a specific ecosystem, ensuring the client’s confidence that the solutions work from day one of implementation.

IDEMIA educates clients on its biometric solutions and on how to introduce and train their users. The company sells its access control solutions through a global network of channel partners; however, it spends a substantial amount of time acquiring and analyzing feedback, leveraging it to make technology improvements. Additionally, the company sends clients an annual 10 to 15-minute survey on topics such as innovation, product features, training, the reliability of materials, and product speed.

The company’s price point is marginally higher than competitors; however, for a one-time product purchase, IDEMIA’s customers are proposed with software updates throughout the lifecycle of deployment. Frost & Sullivan believes the company’s price and performance value is higher than competitors because its solutions improve over time with each revision, e.g. algorithm enhancements and innovative features.

Finally, IDEMIA provides customer support remotely or sends an engineer to a client’s site for anything from installation to post-deployment follow-ups—walking clients through the entire relationship lifecycle and quickly responding to issues. The company consistently receives excellent feedback for its customer engagement efforts and empowering solutions.

Conclusion

Many enterprises view biometric solutions in a distorted light as a result of utilizing inferior products or incorrect usage; however, the growing need for safety and security requires organizations to adopt future-facing innovations. IDEMIA biometric solutions' intelligent design and powerful algorithms prevent acceptance of fake fingers, 2-D images, and other modality-spoofing techniques that imposters exploit to deceive second-rate technologies.

Offering a broad range of biometric solutions—fingerprint, finger vein, iris, and face verification—IDEMIA provides innovative, customer-focused technology to fulfill any customer needs while ensuring compliance with all relevant regulations and standards. IDEMIA is the first-to-market with biometric solutions that address identification needs across markets and applications, setting the pace of innovation in the industry.

IDEMIA educates clients on biometric technology as a whole, offers training in the utilization of its solutions, and provides unrivaled customer support—allowing any client, even without prior biometric technology experience, to benefit from IDEMIA's identity solutions.

With its future-facing technology, customer-centric support, industry-driving innovations, and superior overall performance, Frost & Sullivan is proud to present IDEMIA with the 2017 Global Company of the Year Award for its biometric authentication solutions.

Significance of Company of the Year

To win the Company of the Year Award (i.e., to be recognized as a leader not only in your industry, but among your non-industry peers as well) requires a company to demonstrate excellence in growth, innovation, and leadership. This kind of excellence typically translates into superior performance in three key areas: demand generation, brand development, and competitive positioning. These areas serve as the foundation of a company's future success and prepare it to deliver on the two criteria that define the Company of the Year Award (Visionary Innovation & Performance and Customer Impact).



Understanding Company of the Year

As discussed above, driving demand, brand strength, and competitive differentiation all play a critical role in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on Visionary Innovation & Performance to enhance Customer Impact.

Key Benchmarking Criteria

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated two key factors—Visionary Innovation & Performance and Customer Impact—according to the criteria identified below.

Visionary Innovation & Performance

- Criterion 1: Addressing Unmet Needs
- Criterion 2: Visionary Scenarios through Mega Trends
- Criterion 3: Implementation Best Practices
- Criterion 4: Blue Ocean Strategy
- Criterion 5: Financial Performance

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 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	<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 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-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 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 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>.