

F R O S T & S U L L I V A N

BEST PRACTICES

AWARDS

F R O S T & S U L L I V A N

2020 BEST PRACTICES AWARD

nok
nok

**2020 NORTH AMERICAN
PASSWORDLESS CONSUMER AUTHENTICATION
NEW PRODUCT INNOVATION AWARD**

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Background and Company Performance

Industry Challenges

In today's digital world, consumers expect to conduct nearly all business online, from purchasing concert tickets to accessing internal systems at the workplace; and they also expect constant access from their smartphone, laptop, or even wearable device. Concurrently, the significance of authentication has increased considerably as several industries have already started their digital transformation journey. The outstanding challenge, however, is passwords. Passwords have been used as a key authentication method for ages, yet consumers face difficulty in remembering passwords and tend to reuse one password for various applications, making it vulnerable and prone to data theft. According to Verizon's 2020 Data Breach Investigations Report, stolen credentials accounted for nearly 80% of data/identity thefts globally.¹

In the growing platform economy, Frost & Sullivan points out that the main challenge for organizations using passwords is the effort required to securely store and manage them in addition to the financial ramifications that occur when there has been a data breach. To put it into context, the cost of password management ranges from \$10 to \$100 per user per year, and each password reset request costs companies approximately \$70. To more intelligently adjust to the current digital landscape, Frost & Sullivan notes that organizations must adopt multi-factor authentication solutions, incorporating technologies such as physical and behavioral biometrics and tokens.

Furthermore, Frost & Sullivan analysts observe how growing volumes of smartphones are driving newer business and payment models, especially in consumer-facing applications such as eCommerce. The need for strong user authentication on mobile devices is increasingly becoming standard. Additionally, global authentication regulations are expected to further drive passwordless authentication.

New Product Attributes and Customer Impact

Established in 2011, Nok Nok Labs (Nok Nok) offers next-generation authentication for cloud, mobile, and Internet of Things (IoT) applications. Through significantly simplifying authentication, the company provides intelligent, adaptive authentication, enabling compliance with standards (e.g., PSD2, GDPR) and movement away from passwords. Frost & Sullivan points out that Nok Nok properly addresses the challenges related to using passwords by providing an innovative passwordless authentication platform.

Delivering Enhanced Customer Value through Deep Domain Expertise

In July 2012, Nok Nok co-founded the Fast Identity Online (FIDO) Alliance, an open industry association with a focused mission: authentication standards to help reduce the world's over-reliance on passwords. Currently, the FIDO Alliance consists of over 250 members that include industry leading organizations around the world such as Alibaba Group, Apple, Google, Intel, Mastercard, Microsoft, Oberthur Technologies, Qualcomm, RSA, and Samsung. As a board member and leader of technology working groups in the FIDO

¹ Verizon 2020 Data Breach Investigations Report, May 2020, <https://spycloud.com/a-deep-dive-into-the-verizon-2020-data-breach-investigations-report/>

Alliance, Nok Nok has contributed to the development of several industry standards, such as FIDO Universal Authentication Framework (FIDO UAF), FIDO Universal Second Factor (FIDO U2F), WebAuthn, and FIDO2, all of which accelerate the path to passwordless authentication and address the current problems caused by reliance on passwords.

Frost & Sullivan research reveals that Nok Nok and its contributions to the FIDO Alliance have been instrumental to the Alliance's success in streamlining customer authentication. As a founding member of the Alliance, Nok Nok shared key intellectual property related to the FIDO specifications, and has been a key contributor to the development of all FIDO protocols. Through the convergence of regulations and industry support, Nok Nok has created a plugin-based approach to customer authentication that has resulted in a scalable and interoperable ecosystem.

Frost & Sullivan identifies 4 key value propositions offered by Nok Nok that significantly enhance customer value:

1. **Accelerate path to making passwords obsolete:** Unlike competing solutions in the market that do not address all use cases or "build-it-yourself" models, Nok Nok's solution enables customers to deploy a practical passwordless authentication solution in less time.
2. **Platform-agnostic support:** Nok Nok provides support for the entire passwordless user lifecycle on any platform, enabling the broadest spectrum of passwordless authentication use cases, = including frictionless on-boarding and progressive profiling, easy bootstrapping of new devices, account recovery, and suspension and de-provisioning of users. Other competing solutions in the market often only address a small subset of customer use cases.
3. **Proven and low risk:** Having implemented many large-scale passwordless deployments across the globe at scale for 10's of millions of users each, Nok Nok has significant experience in successful commercial deployments for major authentication projects and is seen in the market as a low-risk option by new customers.
4. **Scalable and future-proof platform:** By leveraging a FIDO-based platform, organizations can take advantage of an industry standard that is supported by platform vendors. This ensures that customers can easily and cost effectively take advantage of ongoing innovation as new devices and authenticators are released into the market.

With respect to pricing, Nok Nok offers flexible options, including:

1. **Subscription model:** Customers are charged per user, per year regardless of applications, devices, and authenticators.
2. **Transaction model:** Customers are charged per transaction.
3. **Other Models:** Depending on a partner's pricing model with their customer, Nok Nok is able to develop a mutually effective pricing model that creates a "win win" opportunity for its partners and their customers.

These options demonstrate how Nok Nok is able to offer pricing flexibility for its customers and partners to address use case and deployment strategy. In addition to its attractive value proposition, the pricing of Nok Nok's solution is comparatively less than that of the top competition.

In 2019, Nok Nok expanded passwordless authentication to IoT devices by introducing a software development kit (SDK) to enable passwordless authentication for both stand-alone edge devices and devices connected to the cloud. Unlike its competition, Nok Nok extends the benefits of FIDO authentication to the IoT world, simplifying compliance with upcoming IoT regulations that ban the use of shared default passwords. Nok Nok's SDKs combined with the S3 Authentication Suite, offers organizations a one-stop solution for all their authentication needs across mobile applications, mobile and pc web applications, wearables, and IoT devices. In addition, as newer devices are added to the network, the cost and complexity of integrating new use cases remains low.

While Nok Nok currently has very strong support for passwordless authentication across devices, the company's roadmap includes realizing its technology's potential by constantly expanding its offerings. In 2019, for instance, Nok Nok introduced new features such as "context aware" and "quick authentication" to its S3 Authentication Suite v7. These features enable context-based authentication, which are custom-defined risk policies based on various parameters (e.g., purchase amount), user location, and device signals prior to triggering the FIDO authentication protocol on the S3 Authentication server. These features also enable simple integration of risk signals from third-party intelligent sources and third-party behavioral biometrics. As such, FIDO authentication flows prove more secure and convenient than traditional password authentication flows.

Frost & Sullivan recognizes how Nok Nok's powerful partnership strategy is quite instrumental to its success in the consumer authentication market. The company partnered with leading cybersecurity, digital identity management, and other technology companies (e.g., OneSpan, Jumio, Yubico, ForgeRock, and Sensory) in the United States; it leverages this powerful network to offer comprehensive account recovery, fraud mitigation, and identity relationship management to safeguard consumers from digital threats.

Best Practice Example

Intuit, a technology company offering software for finance and accounting customers, was looking for a seamless yet secure mobile authentication solution to enhance user experience and reduce existing issues with personal identification numbers (PINs) and passwords. Initially, several challenges were presented: from migrating to passwordless authentication, to issues of latency in different network conditions. As Intuit's strategy for identity management was a standards-based approach, - Nok Nok was a perfect fit to leverage device biometrics for passwordless mobile authentication.

Intuit's Nok Nok rollout to its millions of users resulted in a 20% reduction in authentication time and 99.9% authentication success when compared to SMS/OTP, which ranged from 80 to 85% success. Another major advantage of using Nok Nok over retaining Intuit's proprietary solution was having confidence in a platform that is future-ready.

Strong Brand Equity and Customer Ownership Pride Built through Strategic Business Focus

Passwordless authentication is extraordinarily relevant. The current market need in the COVID-19 pandemic scenario has resulted in a sudden surge in a vast remote workforce with employees connecting virtually by using their own devices, as well as an increase in online customer transactions. With a significant increase in phishing attacks since the start of 2020, organizations are now even more receptive to the idea of adopting multi-factor authentication solutions using biometrics. With FIDO-based authentication, credentials are stored locally on the device, and hence negate the challenge of employees and consumers feeling uncomfortable about sharing their biometric information with an employer or any organization.

Empowered by a team of security industry veterans from organizations such as PGP, Symantec and Oracle, Nok Nok delivers robust and highly scalable authentication server platform and SDKs. The product development team at Nok Nok constantly interacts with device manufacturers, security vendors, identity service providers, and mobile network operators at various forums to understand new and evolving security challenges that span the market. This ground-level feedback aligns directly with the company's security standardization, SDK, software, and systems to meet customer and market requirements and optimize customer retention strategies.

The industry was quick to adopt Nok Nok's passwordless authentication; in 2019, Nok Nok witnessed increased customer deployments and existing customer renewals. With Apple Inc. joining the FIDO Alliance earlier this year, Nok Nok's customer base is expected to increase to at least twice its current size. Moreover, Nok Nok was already providing FIDO support to Google Android and Chrome, Microsoft Windows and Edge, and Mozilla Firefox. The addition of Apple Inc. to the FIDO Alliance will enhance the capabilities of the FIDO community and enable the development of solutions that fit Apple's ecosystem. Nok Nok had previously offered support for iOS apps, Apple smart watches, and implemented support for FIDO CTAP and WebAuthn in Safari. In addition to support for web authentication, Nok Nok offers a strong mobile and wearables authentication solution and has introduced the industry's first authentication SDK for IoT devices.

Frost & Sullivan notes that Nok Nok has strong innovation capabilities and expects the company to further grow its share of the consumer authentication market. In 2019, Nok Nok's S3 Authentication Suite was awarded the "Best Mobile Authentication & Security Solution" at Mobile World Congress. The Global Mobile (GLOMO) Award is a testament of innovation and the recognition of Nok Nok's strengths in providing multi-factor authentication to mobile network operators (MNO).

Conclusion

Authentication has become a cornerstone of today's ever-more digital world, and the use of passwords by consumers for identity authentication poses a massive challenge for organizations of all kinds. Driven by an impetus to deliver passwordless consumer authentication solutions, Nok Nok has led this market since co-founding the FIDO Alliance in 2012, and since has contributed to the development of the core FIDO specifications.

Moreover, global authentication regulations have led to increased interest in adoption of passwordless consumer authentication solutions. Nok Nok leverages powerful industry collaboration to streamline authentication and pioneer FIDO implementations. By leveraging a FIDO-based platform, organizations can take advantage of a standard that is supported by platform vendors, making it scalable and future-proof. Alongside its strong mobile, wearables, and web authentication, Nok Nok has introduced the industry's first authentication SDK for IoT devices.

With its strong overall performance, Nok Nok Labs has earned the 2020 Frost & Sullivan New Product Innovation Award.

Significance of New Product Innovation

Ultimately, growth in any organization depends on 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 2 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

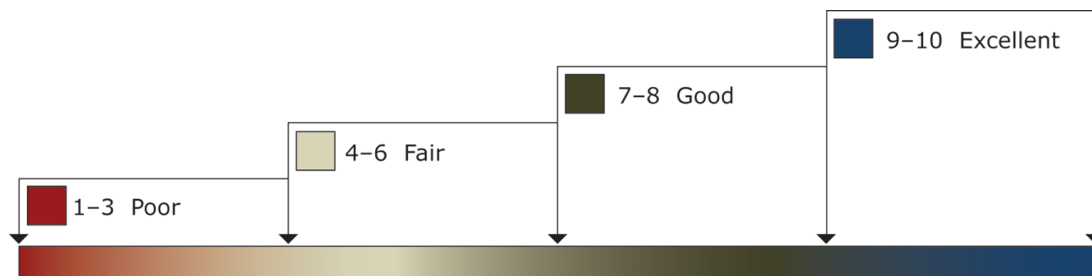
- Criterion 1: Price/Performance Value
- Criterion 2: Customer Purchase Experience
- Criterion 3: Customer Ownership Experience
- Criterion 4: Customer Service Experience
- Criterion 5: Brand Equity

Best Practices Award Analysis for Nok Nok Labs

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 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.

RATINGS GUIDELINES



The Decision Support Scorecard considers New Product Attributes and Customer Impact (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criterion 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, Frost & Sullivan has chosen to refer to the other key participants as Competitor 2 and Competitor 3.

<i>Measurement of 1-10 (1 = poor; 10 = excellent)</i>			
New Product Innovation	New Product Attributes	Customer Impact	Average Rating
Nok Nok Labs	9.0	9.0	9.00
Competitor 2	9.0	8.0	8.50
Competitor 3	8.5	8.0	8.25

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 functionalities.

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 they are buying the 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 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.



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

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

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

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the 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>.