

# Mobile Biometrics Market Analysis



**BIOMETRIC**  
UPDATE.COM

This report by Biometrics Research Group, Inc. examines the growing drivers for mobile biometric authentication and a primary mode of biometric standardization.

Rawlson O'Neil King Lead Researcher, Biometrics Research Group.

All information, analysis, forecasts and data provided by Biometrics Research Group, Inc. is for the exclusive use of subscribing persons and organizations (including those using the service on a trial basis). All such content is copyrighted in the name of Biometrics Research Group, and as such, no part of this content may be reproduced, repackaged, copied or redistributed without the express consent of Biometrics Research Group. All content, including forecasts, analysis and opinion, has been based on information and sources believed to be accurate and reliable at the time of publishing. Biometrics Research Group makes no representation, or warranty, of any kind as to the accuracy or completeness of any information provided, and accepts no liability whatsoever for any loss or damage resulting from opinion, errors, inaccuracies or omissions affecting any part of the content. Cover image courtesy of M2SYS Technology; used with permission. © 2015, Biometrics Research Group



# The face recognition company

Cognitec develops market-leading face recognition technologies for enterprise and government customers around the world.

Face recognition technologies are constantly evolving in response to new applications and quickly changing biometric markets.

Cognitec's leading-edge products efficiently implement the different processes involved in today's identity management systems using facial data:

- identity verification
- duplicate check
- background check
- management of identity information
- real-time identification in video streams
- acquisition of biometric facial photographs

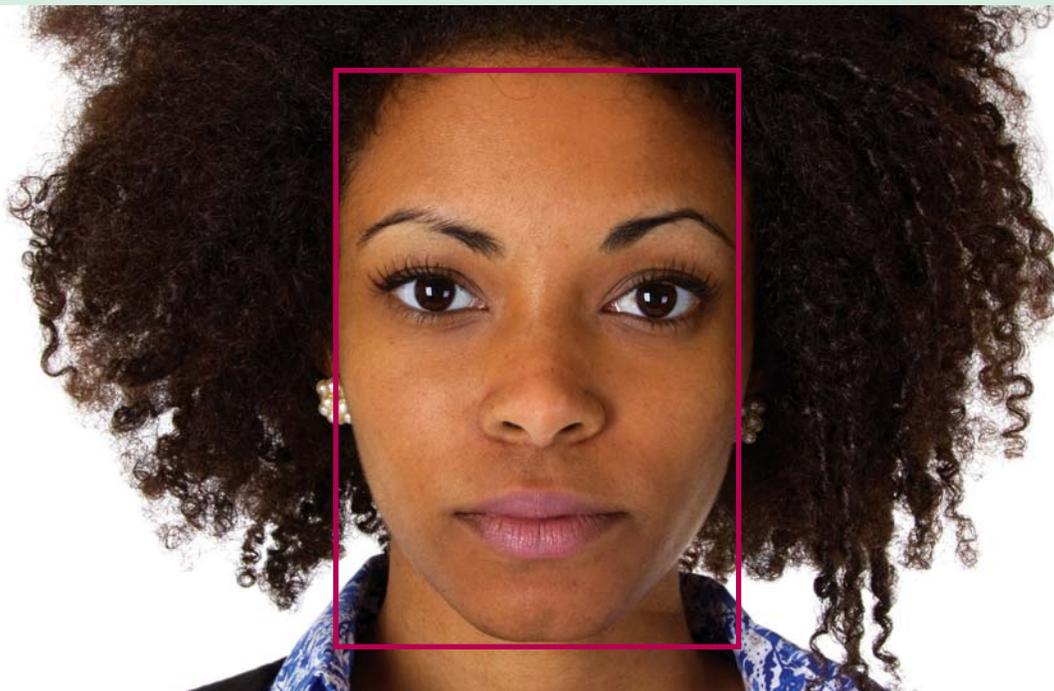
At the same time, Cognitec's products enable new commercial and consumer applications using facial data:

- analyzing people flow by count, age, gender and other measures
- recognizing VIP customers
- enabling digital signs to tailor advertisements
- logging in to computers, phones and banking machines
- indexing and sorting photographs in digital photo albums
- automotive applications for convenience and safety
- allowing humanoid/service robots to recognize faces and interact with people

Biometric performance has always been the focus of Cognitec's research and development.

Continued tests by government authorities and industry have validated Cognitec's leadership position within the face recognition market since 2002, resulting in a track record of successful reference projects worldwide.

With a clear focus on face recognition technology, we are committed to deliver the best performance available on the market.



# About the Biometrics Research Group

Biometric Research Group, Inc. (BRGI) provides proprietary research, consumer and business data, custom consulting and industry intelligence to help companies make informed business decisions.

We provide news, research and analysis to companies ranging from Fortune 500 to small startups through market reports, primary studies, consumer research, custom research, consultation, workshops, executive conferences and our free daily BiometricUpdate.com news service.

BRGI supplies pure-play market research and consultancy services focused on the biometric marketplace, which has a particular focus on

the law enforcement and national security sectors. Our portfolio of white papers and research reports is based upon high-quality quantitative analysis, allowing our clients to gain a deeper understanding of the marketplace.

We customize our research design, data collection and statistical reporting using proprietary micro- and macroeconomic modeling and regression analysis.

We also provide actionable business analysis by integrating our research results with qualitative analysis from our BiometricUpdate.com news service.

## Disclaimer

Biometrics Research Group, Inc. takes no responsibility for incorrect information supplied to us by industry participants or users. Qualitative and quantitative market information is based primarily on interviews and secondary sources referenced at the research phase and; therefore, is subject to fluctuations. The scope of this research does not include quantitative market sizing or projections.

Biometric technologies and processes evaluated in the report are representative of the market, but not comprehensive, and inclusion in the study does not imply endorsement. Research evaluations are aligned with the agreed scope of work of this project and findings are subject to best-effort analysis and availability of information.

All directional statements about the expected future state of the industry are based on consensus-based industry dialogue with key stakeholders, anticipated trends, and best-effort understanding of the future course of the industry.

The views expressed in this report accurately reflect Biometrics Research Group's views based on primary and secondary research with industry participants, industry experts, end users, standards bodies, industry organizations, and other related sources.

In addition to the above, Biometrics Research Group's robust in-house research models and processes, along with the repository of its industry research databases have been instrumental in the completion of this report.

The trends identified in this report are based on discussions with industry participants and Biometrics Research Group's ongoing research in biometric technology, services, and related markets. Conclusions drawn are anticipated only and do not imply prediction of events in the future. These conclusions are based on best judgment of exhibited trends, expected direction the industry may follow, and consideration of a host of industry drivers, restraints, and challenges, which represent the possibility for such trends to occur over a time frame. All supporting analyses and data are provided to the best of ability.

Information provided in all segments is based on availability and the willingness of participants in sharing these within the scope, budget, and allocated time frame of the project, and reflects the views of industry participants.

While the document is believed to contain correct information, Biometrics Research Group Inc. does not make any warranty, expressed or implied, or assume any legal responsibility for the accuracy, completeness, or usefulness of the information, product, technology, solution,

company name, or process discussed in the report, or claims that its use would not infringe any privately-owned rights.

References made to products, technology, solutions, trade names, vendors, or otherwise, do not necessarily constitute or imply endorsement or recommendation.

No part of our analyst compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed in this service.

No part of this report may be given, lent, resold, or disclosed to non-customers without written permission of the Biometric Research Group, Inc. Furthermore, no part may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the permission of the above party.

© 2015 Biometrics Research Group, Inc. All rights reserved.

## Methodology and Research Design

Biometrics Research Group, Inc. used a combination of primary and secondary research methodologies to compile the necessary information for this project. Information provided in all segments is based on availability and the willingness of participants in sharing these within the scope, budget, and allocated time frame of the project. The trends identified in this report are based on discussions with industry participants and Biometrics Research Group's ongoing research in biometrics and related markets.

The conclusions drawn are based on our best judgment of exhibited trends, the expected direction the industry may follow, and consideration of a host of industry drivers, restraints, and challenges that represent the possibility for such trends to occur over a specific time frame. All supporting analyses and data, as permissible within the contractual time and budget, are provided to the best of ability.

### Primary Research

Primary research formed the basis of this project. Interviews were conducted with technology providers, clients, and other organizations, as well as stakeholders in each of the technology segments, standards organizations, privacy commissions, and other influential agencies. To provide balance to these interviews, industry thought leaders who track the implementation of the outlined technologies were also interviewed to get their perspective on the issues of market acceptance and future direction of the industry.

### Secondary Research

Secondary research comprised the balance of the research effort and included published sources such as those from government bodies, think tanks, industry associations, Internet sources, and Biometrics Research Group, Inc.'s own repository of news items. This information was used to enrich and externalize the primary data. Data sources are cited where applicable.

# Mobile Biometrics Market Forecasts

- Biometrics Research Group, Inc. projects that the inclusion of biometrics in mobile devices will generate about US\$9 billion worth of revenue by 2018 for the biometrics industry, not just through mobile device unlocking, but also through multi-factor authentication services and the approval of instant electronic payments.
- Our research firm predicts that worldwide revenues within the mobile biometrics sector will total US\$45 billion by 2020.
- We also project that 650 million people will be using biometrics on mobile devices by the end of 2015.
- Biometric smartphones will increase tenfold, from 200 million users in 2015, to 2 billion users by 2020.
- The overall biometric market is increasing with a CAGR of 20.1 percent until 2020.

## Mobile Biometrics Market Trajectory

Biometrics Research Group, Inc. believes that IT consumerization will ultimately act as a catalyst for total industry revenue growth for mobile biometrics. A major contributing factor to mobile biometrics growth will be increasing demand for personal devices that can conduct safe financial transactions, along with accommodating growth of the “bring your own device” trend to the enterprise. These factors will lead to biometric authentication standardization, such as that being offered by FIDO Alliance, on mobile devices.

Mobile biometrics refers to the deployment of biometric authentication methods on mobile devices such as smartphones and tablets. The rich set of input sensors on mobile devices, including cameras, microphones, and touchscreens enable sophisticated multimedia interactions. Biometric authentication methods using these sensors provide a natural alternative to passwords, since such sensors are familiar and already are used for a variety of mobile tasks. Biometrics on mobile phones

facilitate trustworthy authentication methods for both mobile commerce and financial transactions.

Technologies built into mobile devices enable not only explicit authentication (which requires the user to perform actions) but also implicit authentication (which automatically occurs through a device without any effort by the user, such as a risk-based fraud system).

In addition to biometric technologies, smartphones and other mobile devices can include a wide array of on-device sensors, including: GPS chips, temperature sensors, humidity sensors, barometers, and accelerometers, which can be used to augment explicit authentication with implicit or risk-based authentication techniques. Wi-Fi interfaces can even play a role in determining whether the user is possibly being impersonated. Mobile devices themselves can act as a token to authenticate to off-device applications and services. Such devices include several short-range communication interfaces,

# New, simple & secure, multichannel **voice authentication**



**VoicePIN** is the easiest tool in voice biometric technology for data protection. It simply enhances the customer experience - your clients and users can log on in a convenient way, without the need to remember PINs or passwords.

Thanks to our API, connecting **VoicePIN** to any mobile application, website, Call Center system, or an IVR is **as simple as never!**

#### **VoicePIN:**

- is not affected by situations such as: illness, hoarseness or temporary indisposition
- works without storing voice recordings, so they cannot be reused
- recognizes attempts at logging in with recordings, thanks to Playback Activity Detection function
- generates voiceprints from the previously recorded data
- verifies the biometric lexical password, regardless of the language or dialect



such as WiFi, Bluetooth low energy (BLE), and near field communication (NFC), which can be used to securely provide authentication credentials to other applications.

By incorporating biometric technology solutions (and ancillary on-device sensors) into mobile devices, manufacturers have eliminated many of the inefficiencies and insecurities that are associated with passcodes and passwords. Passwords are not trustworthy authentication tools because they can typically be easily guessed or stolen. If a password is shared, there is no credible process to verify the identity of a person accessing the device. In contrast, biometric technology ensures that only the authorized user of the device can access it vis-a-vis their unique characteristics. Smartphone and tablet biometrics allow for individual authentication that is quick and that can instantly verify a mobile device user within a matter of seconds.

BBVA Compass released a report entitled “Biometrics: the Future of Mobile Payments,” in July 2015 that found that a new wave of intellectual capital and technology based on biometrics, along with physiological and behavioral authentication, is quickly replacing PINs and passwords. Smartphone users are rapidly adopting biometric authentication technology in order to accommodate commercial transactions, according to the BBVA Compass report.

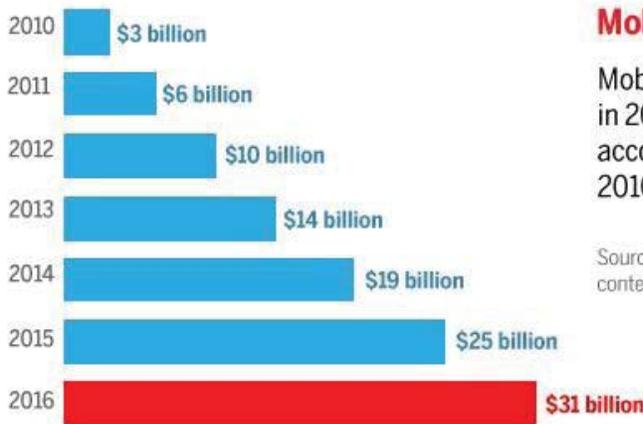
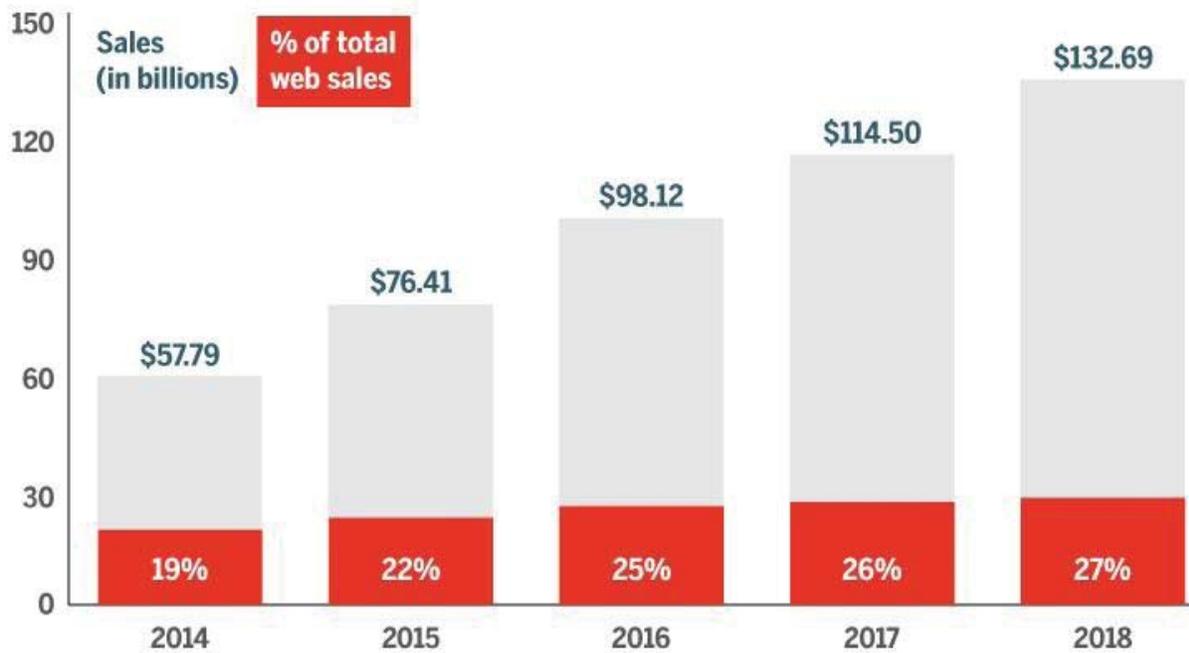
“Biometric authentication is growing at a fast pace and shows great potential to protect individual data and enhance customer experience, particularly in the banking industry,” Nathaniel Karp, BBVA Compass chief economist said. The global biometrics technology market in the financial sector alone is estimated to reach billions of dollars by 2020, which includes biometric sensors, biometric app downloads, direct purchase and software development fees and authentication fees from biometrically secured payment and non-payment transactions.

A previous report by Biometrics Research Group, Inc. on Banking and Biometrics notes that revenue streams for biometrics utilized in the global banking sector will rise from US\$900 million in 2012 to US\$1.8 billion by the end of 2015. Biometrics Research Group also expects that mobile commerce adoption will accelerate due to impending wide-scale integration of biometric technology into smartphones.

The research consultancy also predicts that worldwide mobile payment transactions reached US\$250 billion in 2014, and will reach US\$750 billion in annual transactions with more than 700 million users by 2020. As a consequence, we see biometrics as a transformative force that will speed mobile commerce, especially in North America, because the technology can offer a higher level of security, while providing an intuitive customer experience.

In the United States, retail mobile commerce sales via smartphones and tablets will be estimated to grow from US\$57.79 billion in

2014 to US\$132.69 billion by 2018, according to Forrester Research.



### Mobile Commerce Sales: 2010-2016

Mobile commerce sales will grow from \$3 billion in 2010 to \$31 billion in 2016. M-commerce sales accounted for only 1% of e-commerce sales in 2010, but will increase to 7% in 2016.

Source: Forrester Research Inc., sales of merchandise excluding digital content such as ring tones and mobile games.

In terms of mobile commerce sales, Forrester Research notes that mobile sales will grow from US\$3 billion in 2010 to US\$31 billion by 2016.

Goode Intelligence forecasts that there will be over one billion users accessing banking services through biometric systems by 2017. Goode Intelligence also predicts that by 2020, bank customers will use biometrics as the predominant identity authorization method to access bank services. By the end of 2015, there will be approximately 450 million bank

customers using biometrics in various bank scenarios including withdrawing cash from ATMs, proving identity when telephone banking, and authenticating into mobile bank apps using fingerprint sensors. As more banks, financial organizations, enterprises and governments become aligned with tech providers on the topic of security innovation, we will continue to see a shift away from traditional passwords and passcodes toward biometric authentication.

Biometrics Research Group estimates that at

least three-quarters of current smartphone users do not secure their devices with a passcode. The use of instinctive technology such as fingerprint recognition will allow consumers to easily secure their devices and make payments. The integrity of a payment process without a physical payment card is quickly compromised if a device is not secured. One goal of mobile biometrics will therefore be to secure the user login process in order to enable more dependable user identification.

BBVA Compass however argues that the advantages of biometrics go beyond strengthening proof of identity and improving fraud detection. "As biometrically-enabled devices become standard, critical industries such as banking will be able to offer better customer experience, faster processing times, lower costs and facilitate a multi-channel environment across industries in a seamless fashion," Karp said.

## Mobile Biometrics Market Adoption Shift

Biometrics Research Group believes mobile biometrics will transition between 2015 to 2020 from a consumer adoption phase to full maturity, enabling the technology to overtake existing authentication technologies. By 2020, we estimate that biometrics will be ubiquitous, installed in 100 percent of mobile devices. This transition would meet IBM's 2010 prediction that biometrics would ultimately provide all security authentication capabilities for individuals using mobile devices within five years. A driving force for the wide implementation of mobile biometrics will be the continued: rapid expansion of smartphone users.

Biometrics Research Group, Inc. estimates that smartphone manufacturer shipments in the U.S. were 79 million in 2011, rising to 155 million units in 2014, and will grow to 175 million units by 2018. Sales of smartphones in the U.S. were nearly 60 million in 2011, will be 120.5 million in 2014 and will grow to be relatively flat at 121 million in 2018. Active subscribers (otherwise referred to as the "installed base") was 115 million in 2011, is estimated to be 240 million in 2014 and will grow to be 279 million in 2018. Some analysts estimate the number of U.S. subscribers will exceed 300 million in 2018, but these usually include a number of inactive units, units being retired and other units being recycled and distributed elsewhere (typically in other developing markets).

Worldwide we estimate that the number of total smartphone users worldwide will surpass 2.5 billion in 2016. Continuing growth of the global smartphone user base along with the consumerization of biometrics will drive the growth of mobile biometric authentication. We project that inexpensive smartphones will open

new opportunities for marketing and commerce in emerging markets, where many consumers previously had no access to the Internet. Meanwhile, in mature, established markets, smartphones will rapidly shift the paradigm to more consumer media usage and toward more enterprise-centric mobile usage.

ABI Research forecasts that global revenues in 2015 for biometrics in the consumer and enterprise segments will reach US\$3.1 billion in the United States, driven by smartphone solutions. TechNavio, in a recent study has emphasized that several companies have a significant presence in the global mobile biometric market. The top 10 companies that TechNavio expects to fuel market growth for the 2015-2019 period are:

### 3M Cogent

3M Cogent is a leading biometric identification solutions provider to governments, legal and commercial enterprises. The company provides high quality identification systems, products, and services with the leading technology, speed, and accuracy at over 99.9 percent. The products offered by 3M Cogent are used for biometric access control, passenger check-in, product security, and border management. It has partnership networks with the leading companies from different domains, such as Accenture, BlackBerry, Lockheed Martin, Siemens, Northrop Grumman, and Sun Microsystems. The company offers a wide product portfolio, which includes facial identification management solutions, biometric enrollment solutions, mobile identification solutions, fingerprint/palm print card conversion systems, mobile identification products, physical access control solutions, ID

management and credentialing solutions, and logical access control solutions.

### Apple

Apple is the global leader in the designing and manufacturing of mobile devices, software, PCs, and mobile communication. It has a wide range of product offerings such as iPhone, iPad, Mac, iTunes, Software, and Services, Accessories, and iPod segments. It offers its own operating systems, iOS and OS X, various application software services including iWork and iLife, and Apple TV. It was the first company to launch fingerprint recognition technology in smartphones, which is now being followed by other mobile device vendors such as Samsung, HTC, and Motorola. Apple leverages biometric patents that it obtained when it acquired Authentec in 2012.

### Fujitsu

Fujitsu is one of the largest IT services providers with the majority of its revenue being drawn from the Asian-Pacific region. The company carries on its operations in three segments; Industry Solution; Business and Technology solution; and Fujitsu Cloud. Fujitsu provides a wide range of products to its customers such as computing products, software, network, and electronic device. The company is known for its PalmSecure product, a hand geometry biometrics solution. This biometrics technology is witnessing slow growth. PalmSecure has an extremely low FRR of 0.01 percent and an FAR of less than 0.00008 percent.

### NEC

NEC is a global leader in the integration of IT and network technologies. The company delivers tailored solutions in the key fields of computer, networking, and electronic devices. It has a very strong presence and acceptance in the APAC region. The company operates in five major segments: public sector, enterprise, telecom carrier, system platform, and others. NEC has more than 1,000 customers in over 30 countries worldwide and operates in more than 140 countries. The company focuses on innovations in information and communication technology. Its R&D domains include knowledge discovery, cloud system, smart energy, information and media processing, green platforms, and innovations in computers and communications.

### BioEnable Technologies

BioEnable Technologies Pvt. Ltd. is a leading Indian company working in the field of advanced electronic identification, automation and tracking products and services. Founded in 2001, the

firm has over 100 employees and customers in over 50 countries worldwide. The firm designs and develops innovative products based on complex set of technologies. This has given Bio-Enable Technologies experience on a wide range of platforms, including: web, mobile, desktop and embedded.

### ImageWare Systems

ImageWare Systems, Inc. is a leading provider of identity management solutions driven by multi-modal biometrics. ImageWare delivers multi-modal biometric identity management solutions for user authentication on premises and in the cloud. The firm's patented, agnostic, plug-and-play technology promotes interactive communication and out-of-band authentication on mobile platforms and brings security to an all new level. The firm's innovative products, such as GoCloudID and GoMobile Interactive, enable modular, flexible, and scalable identity solutions across a variety of markets, including mobile, wireless, financial services, and healthcare. ImageWare's identity management system allows customers to easily add a secure layer of biometric authentication to a variety of platforms and services.

### M2SYS

With over a decade of experience and millions of end users in more than 100 countries worldwide, M2SYS Technology delivers innovative, scalable, and practical identity management solutions that increase security and convenience while saving money, building accountability and establishing trust for governments and businesses around the world. The company continues to innovate, build, and deliver leading-edge enterprise biometric solutions that transform the industry and expand the applicability of biometric technology in the marketplace.

M2SYS has been recognized for numerous industry accolades, including Frost & Sullivan's 2007 North American Biometrics Technology Innovation of the Year, the 2011 New Product Innovation Award, and the Atlanta Metro Chamber of Commerce 2014 Global Impact Award for Innovation.

### Mobbeel

Mobbeel is a mid-stage firm which products include: MobbID, a biometric authentication solution capable of providing user identification through a mobile device using one or more unique features from user (voice, face, signature, iris, fingerprint). The product uses standard smartphone or tablet equipment, with no external hardware needed. The firm also offers its

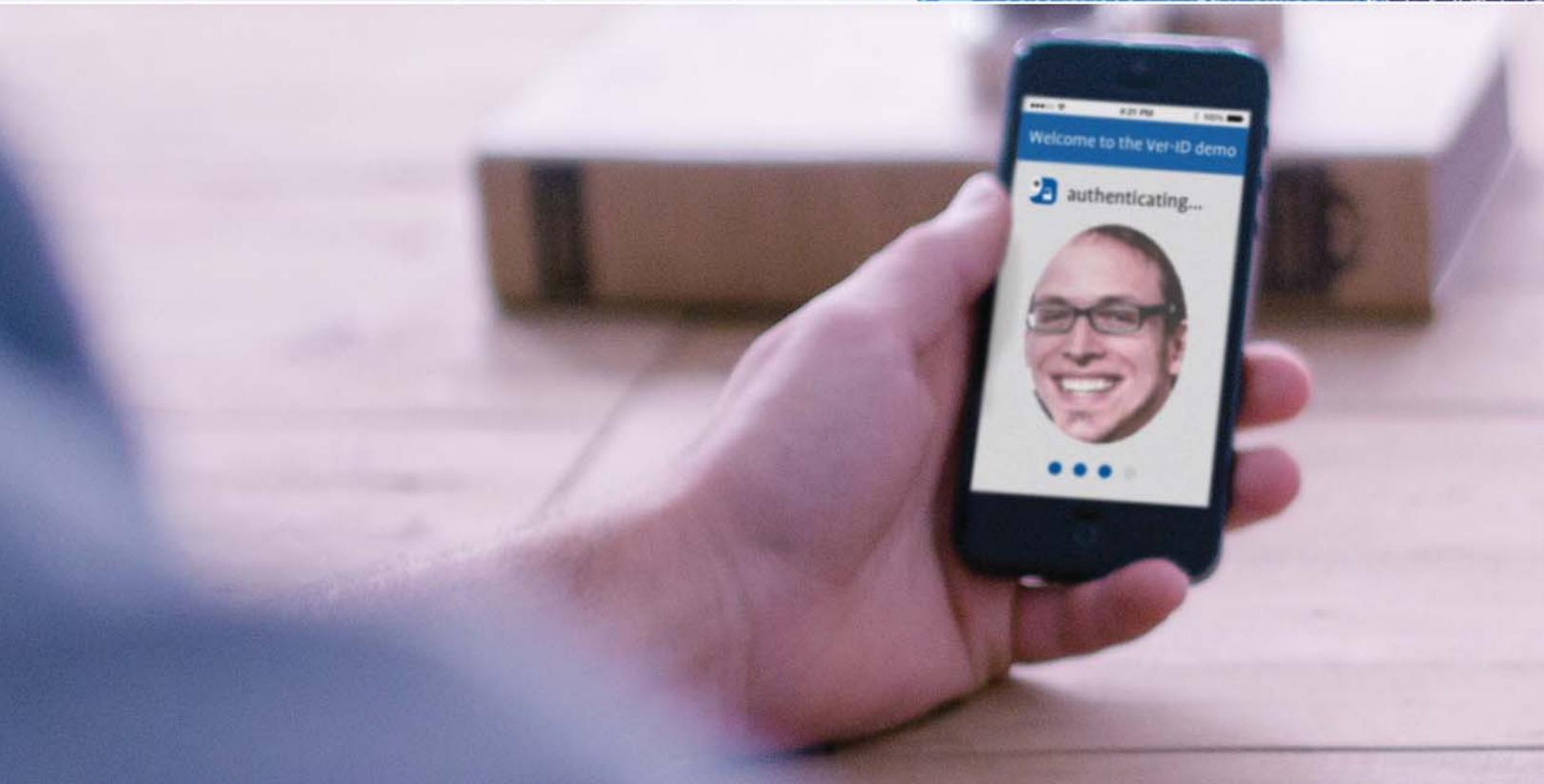


# Ver-ID

Biometric security for everyday devices.

Why is *face authentication* our preferred method of personal data security?

	Persistent Authentication	Photo ID Validation	Visible "Who" Proof	Extra Hardware Required	Anti-spoofing
<b>Ver-ID Face Authentication</b>	✓	✓	✓	X	✓
IRIS	X	X	X	X	✓
Fingerprint	X	X	X	✓	X
Voice	X	X	X	X	X
Password	X	X	X	X	n/a
Dongle / Card	X	X	X	✓	n/a
One Time Password	X	X	X	✓	n/a
Out of Band	X	X	X	✓	n/a



## Try the Ver-ID demo now!

[www.ver-id.com](http://www.ver-id.com)



[info@appliedrec.com](mailto:info@appliedrec.com)

901 Guelph Line, Burlington ON, Canada

+1 (905) 363-7701



MobbSign product, which allows users to sign electronic format documents using a handwritten signature, with legal validity, from a digital device (iPad, tablet, smartphone, pen tablet) without paper.

#### Precise Biometrics

Precise Biometrics is a market-leading provider of solutions for fingerprint recognition to prove people's identities. With top-of-the-line expertise in fingerprint verification, Precise Biometrics offers fast, accurate and secure authentication of a person. The technology adds value to ID, enterprise and bank cards as well as access to mobile solutions (smart phones and tablets), computers and networks. Precise Biometrics serves business and government organizations throughout the world and its technology is licensed to close to 160 million users.

#### SIC Biometrics

Since 2009, S.I.C. Biometrics has developed innovative fingerprint biometric technologies for commercial mobile devices to help organizations monitoring personnel's movement, enabling easy and secure data access and facilitating personnel's identification; thus, greatly enhancing Security both on the premises and of IT assets. The firm's biometric identity authentication management solutions can help organizations in meeting these new challenges; adding security, convenience, and productivity to their operations.

While TechNavio has identified the previous companies as top-tier, the firm anticipates that many of the small to mid-sized firms within this segment will either be acquired or being ap-

proached for acquisition by larger firms in order to integrate security solutions.

This trend is expected to continue during their forecast period, since large firms will want to capitalize on significant growth opportunities and trends in the global mobile biometrics market. Many will want to integrate innovative software offerings into their hardware solutions.

While existing smartphone hardware provides a stable position for some authentication modalities, new advances in the biometrics field will continue to drive further smartphone hardware upgrades. Additionally, pioneering algorithm design and cloud computing services will continue to enhance user authentication. A driving force for this market segment is the bring-your-own-device market.

Bring your own device (BYOD) -- also called bring your own technology (BYOT) -- refers to the policy of permitting employees to bring personally owned mobile devices (laptops, tablets and smartphones) to their workplace, and to use those devices to access privileged company information and applications. The phenomenon is commonly referred to as IT consumerization. With such a policy, security becomes a major concern. Biometrics is seen as a core function that assists with securing corporate data. As a result, a tremendous amount of investment is taking place to completely eliminate insecure password and passcode standards through a new, open authentication standard.

# FIDO Alliance Standard

Combined corporate efforts have been made to meet the need for mobile authentication standards. Standardization helps applications, devices, and authentication mechanisms to interoperate with each other, thereby reducing cost, complexity, and risk for mobile authentication deployments. Standardization allows vendors to bring new authentication innovations to market faster, so the authentication experience can keep pace with innovations in other aspects of mobile devices. An important standardiza-

tion effort emerging in the mobile space is being championed by the Fast Identity Online (FIDO) Alliance.

The FIDO Alliance, a non-profit consortium comprised of several big companies including Microsoft, Google, Visa, MasterCard, PayPal, Bank of America and more, recently published its final specifications to eliminate traditional passwords.



The organization's aim is to establish a de facto open standard for online authentication in order to create an open, scalable, interoperable, seamless and strong authentication system for end users. FIDO Alliance's focus on leveraging existing biometric capabilities within mobile devices such as fingerprint sensors, iris scan, voice recognition and facial detection.

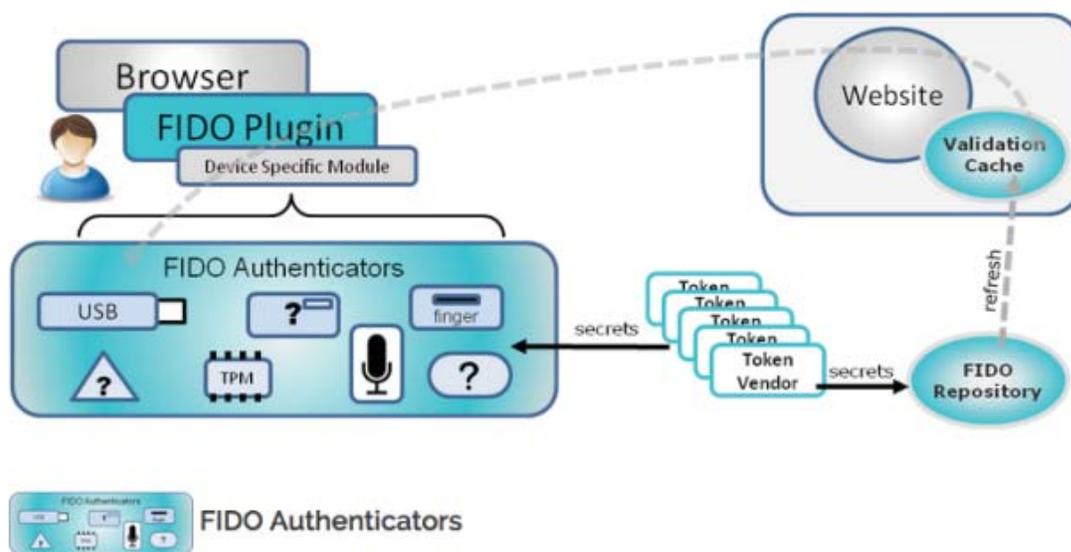
Biometric Research Group, Inc. projects that the FIDO Alliance standard will ultimately be adopted by more than 90 percent of mobile device manufacturers for their embedded bio-

metric systems.

FIDO standards will allow organizations to deploy a unified authentication infrastructure and support any authentication method on any device. In effect, FIDO unifies current authentication silos with an agile and simplified architecture. The FIDO architecture reduces the cost and complexity of deploying authentication and future-proofs organizations, enabling them to easily support new devices and authentication technologies.

## How FIDO Works

FIDO combines hardware, software and internet services to provide a secure user experience.



FIDO is not a third-party service or a separate proprietary approach to the authentication problem. FIDO standardizes a generic authentication protocol, allowing devices to interoperate with different authentication methods. The

FIDO architecture decouples applications from the details of each authentication method and allows applications to support virtually any authentication method on those devices that implement the protocol, using a single integration.

# Conclusion

The move by more smartphone manufacturers to embed biometric capabilities into their devices alongside interoperable authentication standards such as FIDO will contribute to the rapid and widespread adoption of mobile biometrics authentication technologies. Mobile biometric modalities will propagate due to increased smartphone sales and will mainly be used to protect mobile commerce and banking transactions. A survey commissioned by Unisys in July 2015 found that about one-third of U.S. consumers view biometrics as an effective security feature. Enterprises will leverage both consumer confidence and the rapid adoption of embedded mobile biometrics to protect computing resources as “bring your own device” (BYOD) corporate policies become more prevalent.

