UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

Annual Report Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934

For the fiscal year ended December 31, 2019

Commission file number 000-21129

AWARE, INC.
(Exact Name of Registrant as Specified in Its Charter)

Massachusetts	**04-2911026**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

40 Middlesex Turnpike, Bedford, Massachusetts 01730
(Address of Principal Executive Offices)
(Zip Code)

(781) 276-4000
(Registrant's Telephone Number, Including Area Code)

Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, par value $.01 per share	**The Nasdaq Global Market**

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act.
Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer", "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.:

Large Accelerated Filer ☐ Accelerated Filer ☐ Non-Accelerated Filer ☒ Smaller Reporting Company ☒ Emerging Growth Company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of June 30, 2019 the aggregate market value of the registrant's common stock held by non-affiliates of the registrant, based on the closing sale price as reported on the Nasdaq Global Market, was approximately $43,519,131.

The number of shares outstanding of the registrant's common stock as of February 12, 2020 was 21,521,866.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive Proxy Statement to be delivered to shareholders in connection with the registrant's Annual Meeting of Shareholders to be held on May 20, 2020 are incorporated by reference into Part III of this Annual Report on Form 10-K.

AWARE, INC.
FORM 10-K
FOR THE YEAR ENDED DECEMBER 31, 2019

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ITEM 1. BUSINESS

Company Overview

Aware, Inc. (“Aware”, “we”, “us”, “our”, or the “Company”) is an industry leading provider of biometrics software products, solutions and services to governments, system integrators, and commercial organizations and solution providers globally. We have been engaged in this business since 1993. Our comprehensive portfolio of biometric solutions are based on innovative, robust products designed explicitly for ease of integration, including customer-managed and integration ready biometric frameworks, platforms, software development kits (SDKs) and services. Our software products are used in government and commercial systems and applications and fulfill a broad range of functions critical to secure biometric enrollment, authentication, identity and transactions. Principal government applications of biometrics systems include border control, visa applicant screening, law enforcement, national defense, intelligence, secure credentialing, access control, and background checks. Principal commercial applications include: i) user enrollment and authentication used for login to mobile devices, computers, networks, and software programs; ii) user authentication for financial transactions and purchases (online and in-person); iii) physical access control to buildings; and iv) identity proofing of prospective employees and customers.

Our solutions and products provide interoperable, standards-compliant, field-proven biometric functionality and are used to capture, verify, format, compress and decompress biometric images as well as aggregate, analyze, process, match and transport those images and templates within biometric systems. We provide a broad range of software products for fingerprint, facial, iris and voice modalities. We also offer a variety of program management and software engineering services, including: i) project planning and management; ii) system and architecture design; iii) software design, development, customization, configuration, and testing; and iv) software integration and installation. We sell our biometrics software products and services globally through a multifaceted distribution strategy using systems integrators, original equipment manufacturers (OEMs), value added resellers (VARs), partners, and directly to end user customers.

Aware was incorporated in Massachusetts in 1986. We are headquartered at 40 Middlesex Turnpike in Bedford, Massachusetts, and our telephone number at this address is (781) 276-4000. Our website address is *www.aware.com*. The information on our website is not part of this Form 10-K, unless expressly noted. Our stock is traded on the Nasdaq Global Market under the symbol AWRE.

Industry Background

Biometrics is the measurement of unique, individual physiological characteristics, such as fingerprints, faces, irises and voices, that can be used to determine or verify an individual’s identity. The biometrics industry offers technology that digitally captures and encodes biometric characteristics and then compares those characteristics against previously encoded biometric data to determine or verify an individual’s identity, thereby enabling trusted transactions. Biometrics addresses the limitations inherent in traditional identification and authentication processes, such as biographic data, tokens, paper credentials, passwords, PIN codes, magnetic access cards, and multifactor authentication. Biometrics technology and products require algorithms for multiple distinct functions, such as feature finding, feature optimization, feature extraction, feature encoding, feature matching, and presentation attack detection (“PAD”), which is also referred to as liveness detection and spoof detection.

Application Areas: Identification and Authentication

Applications for biometrics typically fall into two primary areas: identification and authentication. Generally speaking, biometric identification attempts to answer the question “who are you?”, while biometric authentication attempts to answer the question “are you the person we know?”

<u>Biometric Identification</u>

Biometric identification involves the “one-to-many” comparison of a “probe” sample to thousands or even millions of biometric samples in a database, comprising a search to determine which samples, if any, are associated with the individual that belongs to the probe. Biometric identification systems typically operate in a client/server architecture, with some systems migrating to web-based, thin-client architectures. Enrollment workstations with peripheral capture devices are used to enroll individuals into biometrics systems. Enrollment involves the capture, processing, and formatting of “biometric samples.” A biometric sample consists of biometric data which may include: i) images of fingerprints, faces, or irises; ii) digital voice signals; or iii) some other electronic representation of a biometric characteristic. Examples of capture peripherals include: i) scanners for fingerprint images, ii) cameras for iris and facial images, iii) handheld devices for mobile capture of fingerprint, iris, and facial images, or iv) mobile phones and/or microphones for voice signals.

After biometric samples are captured, they are transported in digital form to centralized or distributed matching systems for identification. Equipment used to perform these functions includes: i) servers to process and transport biometric samples; and ii) mainframe computers and servers to store and match those samples. In addition, military applications may employ handheld devices that are capable of capturing samples and matching those samples against sample databases that reside on the devices.

"Identity proofing" is a term used to describe a process by which identity information provided by an individual, such as a prospective customer or job applicant, is corroborated between multiple identity sources. Biometric identification can be used as part of identity proofing.

Biometric Authentication

Biometric authentication involves a "one-to-one" biometric comparison that serves to verify that a live biometric sample belongs to the same individual associated with a trusted stored sample within a system of record. In this way, biometrics can be used to authenticate identity. Computing devices such as PCs, smartphones and tablets, are capable of: i) capturing biometric samples (e.g., fingerprints, facial and iris images, and voices); ii) processing and storing those samples in a secure area on a device, server, or secure identity credential (e.g. a driver's license or passport), and/or printing the samples on the credential; and iii) matching new live samples against trusted stored or printed samples. Once a biometric match is achieved, the subsequent software functions are analogous to password-based authentication. Mobile authentication can be implemented in either a device- or server-centric architecture, with biometric data analysis, matching, and storage occurring either on the device or on a central server, respectively. "Tokens" are often used as an alternative or enhancement to passwords. An authentication token may be a hardware device that the user must have possession of to authenticate. Examples are a USB dongle, smart phone, or smart card. In the case of multifactor authentication, a device such as a smart phone or PC may be considered as a token providing the primary authentication factor, with biometric authentication serving as a second authentication factor. Mobile authentication can be incorporated into a mobile app such as a banking application as a password-free security mechanism. It may also be employed in an "out-of-band" fashion to secure access on a PC through a browser.

As biometric authentication is most typically an unattended process, some form of presentation attack detection ("PAD") is an important feature of biometric authentication solutions. PAD features are designed to prevent "spoofing", whereby a fraudster attempts to defeat a biometric security feature by impersonating the rightful user.

The rapid advance and adoption of mobile devices has had a substantial impact on the adoption of biometrics for authentication. Many leading mobile devices incorporate native biometric security sensors and technology, in which case third-party mobile applications are granted access to authentication results but not the raw biometric samples used to authenticate.

In contrast, third party application providers can incorporate authentication functionality that makes use of multipurpose sensors such as the camera, microphone, and touchscreen. There are use cases where it is desirable to implement biometric security features that are independent of those provided natively by the device. Advantages include more control over the security level, security features, and user experience, as well as uniform functionality across different device models. Biometric authentication implemented on a mobile device may be used to gain access to online networks, systems, services, or accounts.

User authentication enabled by smartphones continues to evolve, and we expect to see further advances in smartphone security features and functionality. In the past few years, the FIDO® (Fast IDentity Online) Alliance, an industry consortium, has emerged to take a leading role in authoring and promoting technical standards for password-free multifactor authentication on mobile devices and desktops. The FIDO Alliance has developed specifications that define an open, scalable, interoperable set of mechanisms that supplant reliance on passwords to securely authenticate users of online services. The new standard for devices and browser plugins will allow any website or cloud application to interface with a broad variety of existing and future FIDO-enabled devices that the user has for online security. The FIDO Alliance has also established processes for accreditation of independent labs that will be able to analyze and identify products as "FIDO® Certified" in terms of interoperability, biometric matching performance, and security level.

Market Sectors: Government and Commercial

The market for biometrics may be segmented into government and commercial sectors. Principal government biometrics applications include border control, visa applicant screening, law enforcement, national defense, intelligence, secure credentialing, access control, and background checks. Principal commercial applications include: i) user enrollment and authentication used for login to mobile devices, computers, networks, and software programs; ii) user authentication for financial transactions and purchases (online and in-person); iii) physical access control to buildings; and iv) identity proofing of prospective employees and customers.

We believe that government and commercial entities will continue to adopt and expand the use of biometrics-enabled solutions to address the limitations and vulnerabilities of traditional identification and authentication processes. We believe the following factors, among others, will contribute to the growth of biometrics solutions: i) government-mandated implementation of identification for employees, citizens, and foreign nationals to enhance national security; ii) military implementations for the identification of terrorists and other hostile persons; iii) increasing threats to personal security encountered in areas such as transportation; iv) increasing threats to government buildings and installations; v) government and commercial efforts to detect and reduce fraud and cybercrime on computer systems as well as the internet; vi) adoption of biometrics on mobile devices; and vii) the emergence and adoption of international biometrics standards.

There is commonality between how biometric technologies are used across government and commercial sectors. The primary consumers of biometric identification systems are government agencies, while the primary users of biometric authentication technology are consumers owning mobile devices. We believe that these sector-based distinctions are important to an understanding of Aware's business as the vast majority of our revenue is currently derived from government customers.

<u>Government Sector</u>
Local, state, and national governments throughout the world were early adopters of biometrics technology and continue to be the largest consumers of the technology. At the local and state level, biometrics technology is used in the following applications:

- Law enforcement applications that enable officers in the field to correctly identify potential suspects more reliably and efficiently by submitting live (suspect is known) or latent (suspect is unknown) biometrics samples to state or federal biometric search services;
- Background checks for employment screening;
- Driver's licenses and identification cards; and
- Benefits issuance.

At the national level, biometrics technology is used in the following applications:

- <u>Border control</u>
  National governments throughout the world have mandated increased spending on security measures, implemented new regulations and placed greater emphasis on technology to address growing security concerns. Immigration and border control agencies have taken steps to improve security in response to heightened concerns over public safety from the threat of terrorism. They use biometrics to help establish the identity of visitors upon application for a visa or upon arrival at border checkpoints. For example, the U.S. Office of Biometric Identity Management currently requires foreign visitors entering the United States to have their ten fingers scanned and a facial photograph taken to determine if they are present on a watch list. The European Union now mandates that e-passports include fingerprint data in addition to a digital photograph.

- <u>Defense</u>
  Within military organizations, key applications of biometrics include: i) background checks of military personnel and contractors; ii) access control to physical and digital assets; and iii) identification of unknown and potentially hostile persons by a comparison of their biometric sample against a watch list.

- <u>Law enforcement and background checks</u>
  Law enforcement agencies perform background checks that use biometrics to help confirm the identity of individuals who might be present in a biometric database. Background checks might also be provided as a service to other agencies within the government.

- Access control
  Governments also use biometrics for physical access control by storing biometric data on a digital ID card or smart phone and performing a match to verify that the holder of the card is the same person who was issued the card. Biometrics are also used for securing access to digital assets, where a biometric match might be required in addition to or in place of a password to gain access to a computer system.

Due to the nature of government applications, particularly those involving security and defense, government biometrics systems must be capable of accurately and rapidly searching large databases of stored samples. The ability to accurately and rapidly match samples against databases of millions of samples is critical because incorrect or delayed results could have severe adverse consequences. These requirements are an important distinguishing characteristic of the government market as compared to the commercial market.

Commercial Sector

The principal applications of biometrics in commercial markets are user enrollment and user authentication, with identity proofing also emerging as an application. The types of users that may need to be authenticated or identified in commercial applications include customers, employees, contractors, visitors, healthcare patients, or other parties wishing to establish their identity towards gaining access to information, systems, bank accounts, credit card accounts, events, devices, or buildings or performing trusted transactions.

In commercial markets, biometrics-based solutions compete with more traditional security methods including keys, cards, tokens, passwords, personal identification numbers (“PINs”) and security personnel. The adoption of biometrics by leading vendors of smartphones and other popular consumer products has increased users’ confidence and comfort with biometrics as a convenient and secure means of authentication in place of or in addition to passwords. Biometrics solutions are also being used in commercial markets as a means to enhance identity proofing, sometimes referred to “know-your-customer” (“KYC”) and “know-your-employee” (“KYE”) efforts. KYC and KYE processes are designed to corroborate the identity data claimed by prospective customers and employees with multiple independent sources.

An example of biometrics being used in a KYC process is where a prospective customer uses their mobile phone to apply for a new account. As part of the process, a mobile app or browser is used to collect an image of their face along with an image of their driver’s license (or some other trusted credential). The facial image is analyzed for liveness to detect spoof attempts, and the driver’s license is authenticated to be genuine. The facial image is biometrically matched against the facial image on the driver’s license to corroborate the identity data in the application with that on the trusted credential. The facial image might also be searched against a central biometric database, such as one containing biometric facial images of known fraudsters. It could also be searched against the database of existing account holders. In this way, biometrics can be used to enhance the effectiveness of a KYC process by verifying that the applicant is: i) a live person; ii) the true owner of a trusted, valid credential; iii) not a known fraudster; and iv) not an existing account holder (with either the same or different identity data).

The commercial market for biometrics technology remains nascent. The rate of adoption of biometrics in commercial markets depends upon a number of factors, including: i) performance and introduced levels of friction; ii) reliability of biometric solutions; iii) costs involved in adopting and integrating biometric solutions; iv) public concerns regarding privacy, including potential privacy legislation; and v) standardization efforts by various industry consortia and standards bodies.

Examples of commercial market applications include:

- Trusted enrollment and authentication processes.
- User authentication for login and access to mobile devices, mobile apps, desktop computers, networks, and web-based software programs.
- User authentication for financial transactions in the financial services industry.
- User authentication for in-person or online purchases in the retail industry.
- User authentication for physical access to secured buildings and perimeters.
- User authentication of employees to access private patient information in the healthcare industry.
- Identity verification of patients in hospital and surgical settings.
- Identity verification of test takers in the educational testing industry.
- Identity proofing of prospective customers in the financial services industry.
- Identity proofing of candidates for pre-employment screening and background checks.
- Identification of undesirable customers in the gaming industry.

Market Segments: Consumer-Facing and Employee-Facing

The biometrics market may be further segmented into: i) a consumer-facing segment; and ii) an employee-facing segment.

Consumer-Facing segment – The primary applications in the consumer-facing segment are biometric identity proofing and authentication for the purpose of enrollment, onboarding and authentication of customers of commercial organizations, and also for citizens by governments. Adoption of biometrics is stronger where the convenience of a password-free user experience is valued but there is also risk of fraud. Industries that fall into this category include financial services, retail, and healthcare. Healthcare organizations use biometrics in a safety context to prevent patient misidentification and care delivery errors. Government agencies similarly employ citizen-facing biometric identity proofing and authentication solutions in situations where there is potential risk of fraud, such as benefits disbursement and voting.

Employee-Facing segment – The primary applications in the employee-facing segment are enrollment and identity proofing and authentication of employees as a means for screening of new employees, and for user authentication towards securing access for employees and contractors to digital assets against a breach. Applications for employee-facing biometrics are found in both the government and commercial sectors.

Delivery Models: Tools and Services, Solutions, Software as a Service

As with other technology products and services, there are different models for product and service delivery in the biometrics arena, including tools and services, solutions, and Software as a Service.

1. Tools and Services – Customers can choose to build their own biometric system using off-the-shelf subcomponents purchased a la carte and used to design, develop, and operate their own bespoke system. In doing so, a customer may or may not decide to also receive services to help with that process. Those services might come from a software provider or a third-party system integrator. These customers tend to have highly specific requirements and the scale to justify the cost of acquiring a custom-configured biometric system. Government agencies tend to be an example of this class of customer.

2. Solutions – Some organizations prefer a more complete and comprehensive solution that sources most or all system capability and services from a single supplier and requires less customization. Companies that offer identification/access solutions or biometric smart cards tend to be an example of this class of customer.

3. Software as a Service – Advances in cloud computing and browser technology have made Software as a Service, or “SaaS” an increasingly common delivery model of enterprise software. Benefits derived include lower up-front costs as well as lower maintenance and support risk. Biometric solutions can be provided as SaaS. Commercial enterprises tend to be an example of this class of customer.

Biometrics Industry Participants

There are a large number of vendors that serve government and commercial biometrics markets. In order to provide an understanding of the biometrics industry and our role in it, we have categorized industry participants into categories that have been defined by us. While we believe our categorization is a reasonable representation of the industry, we acknowledge that: i) knowledgeable industry participants may define categories differently or classify vendors differently; and ii) not all companies involved in the industry were included. Accordingly, the classification that follows represents our perspective on the industry.

We believe that biometrics industry participants may be classified into the following categories:

1) Core technology suppliers
2) System integrators
3) Fully integrated solution suppliers
4) Biometrics-as-a-service providers
5) Vendors of biometrically-enabled solutions

Category descriptions and companies that offer products and services in each category are provided below. It should be noted that some companies appear in multiple categories.

1) Core technology suppliers

Core biometrics technology includes hardware and software products that enable: i) traditional biometrics systems used by government and commercial customers; ii) new biometric service offerings; and iii) biometrically-enabled functionality embedded in other products and solutions. Core biometrics technology includes three types of products: i) sensor products, ii) biometric capture devices, and iii) software products.

Sensor products

Biometrics sensors are primarily silicon-based devices that capture biometrics samples, such as fingerprints. Sensors are typically embedded in other devices, such as smartphones or biometric capture devices.

Examples of companies that offer biometric sensor products include: 1) Qualcomm Technologies, Inc.; 2) Sonavation, Inc.; 3) Synaptics, Inc.; 4) Fingerprint Cards AB; 5) Integrated Biometrics, LLC; 6) Next Biometrics AS and 7) Idemia.

Biometric capture devices

Biometric capture devices are designed to capture and process biometric samples as their primary function. These products may be strictly hardware products or hardware products that also incorporate biometrics software.

Examples of companies that offer biometric capture devices include: 1) Cross Match Technologies, Inc. which was acquired by HID Global Corporation in 2018; 2) Suprema, Inc.; 3) Iris ID Systems, Inc. ("Iris ID"); 4) Precise Biometrics AB ("Precise Biometrics"); 5) Credence ID, LLC; 6) SecuGen Corporation; 7) IrisGuard, Inc. ("IrisGuard"); 8) Aurora Biometrics, Inc. ("Aurora Biometrics"); 9) EyeLock LLC ("EyeLock"); 10) Tascent, Inc.; 11) Idemia; and 12) Iritech, Inc. ("Iritech").

Software products

Biometrics software products provide functionality that captures, formats, stores, processes, or matches samples of fingerprints, faces, iris, voices and other modalities. Biometrics software is capable of operating on a variety of equipment platforms, including personal computers, smartphones, biometric capture devices, hand-held devices, servers, and mainframe computers.

Examples of companies that offer biometrics software products include: 1) Aware, Inc.; 2) Idemia; 3) Thales Group ("Thales"); 4) NEC Corporation ("NEC"); 5) Cognitec Systems GmbH ("Cognitec"); 6) Neurotechnology; 7) Iritech; 8) Innovatrics s.r.o. ("Innovatrics"); 9) Nuance Communications, Inc.; 10) Precise Biometrics; 11) VoiceTrust GmbH.; 12) Eyelock; 13) BIO-key International, Inc.; 14) Zoloz (formerly known as EyeVerify, Inc.); 15) Iris ID; 16) Dermalog Identification Systems GmbH ("Dermalog"); 17) FacePhi Biometria; and 18) Sensory, Inc.

2) System integrators

System integrators purchase hardware and software technology and solutions from core biometrics technology vendors and incorporate those components into customized and optimized biometrics systems that they deliver to end-user customers. Historically those end-user customers have been governments, but in recent years system integrators have begun to serve commercial enterprise customers as well. System integrators include large multinationals with a broad range of expertise and the capacity to execute very large projects, as well as smaller system integrators that have more focused expertise on a particular market sector, technology, or geography. Some system integrators have developed their own biometric technologies that they deliver as part of their solutions.

Examples of companies that offer systems integration services and act as a prime contractor include: 1) Northrop Grumman Corporation; 2) Science Applications International Corporation; 3) Hewlett-Packard Enterprise Services; 4) International Business Machines Corporation; 5) Fujitsu Limited; 6) Accenture plc; 7) Unisys Corporation; 8) Leidos, Inc.; and 9) ManTech International Corporation.

3) Fully integrated solutions suppliers

Fully integrated solutions suppliers are similar to systems integrators in that they deliver customized and optimized biometrics systems to government and commercial enterprise end-user customers. They differ from system integrators in that they use and consume core hardware and software technologies that they developed in-house or acquired from others. Vendors in this category may purchase additional third-party software, but we believe such purchases represent a minor component of the overall systems they deliver.

There are three large global suppliers of fully integrated biometric solutions, including: 1) Idemia; 2) Thales; and 3) NEC. We believe these companies supply a large percentage of the biometric systems that are delivered to government customers around the world.

In addition to these three large suppliers, we would categorize Dermalog and Daon as fully integrated solution providers, but ones that operate on a smaller scale. Aware also has a product and solution portfolio and services capability that enables us to deliver fully integrated solutions. We have acted in this capacity on a limited basis in the past and an element of our strategy is to grow this part of our business in the future.

4) Biometrics-as-a-service providers

Biometrics service providers have begun to offer a pay-per-transaction biometrics service offering. This service allows organizations to biometrically identify or verify employees, customers, or other individuals relevant to their business. A pay-per-transaction model may be more financially attractive for some organizations as compared to the cost of purchasing, installing and maintaining internal biometrics systems.

Examples of companies offering biometrics services include: 1) Certibio Identidade Biometrica, a wholly-owned subsidiary of Certisign Certificadora Digital S.A. ("Certisign"); 2) Idemia; 3) RightPatient, Inc.; 4) Microsoft Corporation; 5) SkyBiometry (a spin-off from Neurotechnology); 6) BioID GmbH; 7) VoiceIt Technologies, LLC; and 8) Jumio.

5) Vendors of biometrically-enabled solutions

Vendors of biometrically-enabled solutions provide products that are not principally marketed as biometrics products but include biometric functionality. Biometrics capability is a feature, but not the chief function of these products. Such vendors represent a potential opportunity for core biometrics technology providers as some of them do not own core biometrics technology.

Examples of companies that offer biometrically-enabled smartphone products include: 1) Apple, Inc.; 2) Samsung Electronics Co., Ltd.; and 3) Google, Inc.

Examples of companies that offer secure identification/access solutions that incorporate biometrically-enabled components include: 1) Thales; 2) HID; 3) Entrust Datacard Corporation; and 4) Idemia.

Examples of companies that offer physical access control solutions that may incorporate biometrics include: 1) Honeywell International, Inc.; 2) Tyco International Ltd.; 3) LenelS2 (formed by combination of Lenel and S2 Security both of which were acquired by United Technologies Corp.); 4) Stanley Security Limited; 5) Johnson Controls International Plc; and 6) HID.

Solutions, Services and Products

We sell a broad range of biometrics software products and solutions that perform functions to address our customers' desired use cases where they are addressing improved security, data protection compliance, improved ROI and efficiencies including:

1. Enrollment of their workforce for benefits and background checks
2. Enrollment of their customers for a better experience or improved customer service and security
3. Law enforcement processing and forensic analysis
4. Trusted remote enrollment where travel or direct contact is not viable
5. Trusted transactions and access control

Our biometrics software solutions are built upon robust componentized products that are customer configurable to give them control so they can uniquely address their specific customers' expectations. These solutions and services facilitate customers with an opportunity for a faster go-to-market process to help reduce their development times and exposure to software support and maintenance risks. Our Solutions and Services are described below.

1) Integrated Framework and Platform Solutions and Services

1a. Knomi® Mobile Framework

In 2017, we introduced Knomi, a mobile biometric authentication framework offering face, voice and keystroke dynamics. The Knomi mobile biometric authentication framework is built on our hardened biometric component SDK, which is optimized to operate or run on mobile devices, and a server that together enable strong, multi-factor, password-free authentication from a mobile device using biometrics. Knomi offers multiple biometric modality options, including facial recognition, keystroke dynamics, and voice authentication as means to enroll, onboard or authenticate. Banks or any other commercial enterprise can deploy Knomi to enhance their password-based authentication mechanisms, making login to their mobile applications more secure and convenient for their customers and employees. Knomi software components can be used in different combinations and configurations to enable either a server-centric architecture or a device-centric, FIDO® Certified implementation. Knomi is provided as a solution that is available as: 1) a license for a fixed term and price; 2) a subscription-based solution that is available as an enterprise-based, user-based or transaction-based solution or 3) as part of our Indigo™ services solution.

1b. AwareABIS™ Platform

AwareABIS is an Automated Biometric Identification System ("ABIS") used for large-scale biometric identification and deduplication using fingerprint, face, and iris recognition. It is a highly scalable platform that performs one-to-many search or one-to-one match against large stores of biometrics and other identity data. It does so by deploying biometric data and matching algorithms across a cluster of multiple computing nodes. Extremely large biometric databases (tens of millions of records) cannot be effectively stored or efficiently searched on a single computer. Distributing the data and biometric comparison tasks across multiple machines enables even extremely large databases to be searched in only seconds. AwareABIS enables not only massive biometric search tasks but complex filter, search, match, and link operations critical to data preparation and quality assurance functions such as identity resolution and data deduplication. AwareABIS is built upon several mature, high-performance, field-proven applications, platforms, and algorithms from Aware. AwareABIS is provided as a solution that is available as: 1) a license for a fixed term and price; 2) a subscription-based solution that is available as an enterprise-based, user-based or transaction-based solution; or 3) as part of our Indigo™ services solution.

1c. BioSP™ - Biometric Services Platform

Our Biometric Services Platform solution is called BioSP. BioSP is a service-oriented platform used to enable a biometric system with advanced biometric data processing and management functionality in a web services architecture. It provides workflow, data management and formatting, and other important utilities for large-scale fingerprint recognition, face recognition, and iris recognition systems. BioSP is well suited for applications that require the collection of biometrics throughout a distributed network, and subsequent aggregation, analysis, processing, distribution, matching, and sharing of data with other system components. BioSP is modular, programmable, scalable, and secure, capable of managing all aspects of transaction workflow including messaging, submissions, responses, and logging. BioSP makes extensive use of open-source components and is J2EE-compliant. BioSP is provided as a solution that is available as: 1) a license for a fixed term and price; 2) a subscription-based solutions that is available as an enterprise-based, user-based or transaction-based solution; or 3) as part of our Indigo™ services solution.

1ci. BioSP™ Biometric Services Platform - WebEnroll

WebEnroll is a browser-based biometric enrollment and data management solution available as an enhanced version of BioSP™ (Biometric Services Platform) that utilizes BioComponents for capture of biographic data, fingerprints and facial images in a browser. Each BioComponent performs advanced biometric image autocapture as well as capture device hardware abstraction. Once images are captured, they are submitted to BioSP, where configurable workflows and modular software applications are used for processing, routing, and storage of each transaction. Biometric verification or identification can be added with Nexa or one of several third-party matchers integrated with BioSP, or an external matching service.

1d. Astra™ - Cluster-Based Matching Platform

Our cluster-based matching platform product offering is called Astra. Astra is used for large-scale fingerprint recognition, face recognition, iris recognition, and text-based name matching and identity resolution. It is a highly scalable biometric identification and authentication platform that performs one-to-many search or one-to-one match against large stores of biometrics and other identity data. It does so by deploying biometric and text data and matching algorithms across a cluster of multiple computing nodes ASTRA is available as a subcomponent to the AwareABIS or BioSP platforms.

1e. Indigo™

Indigo™ is Aware's family of cloud-based biometric application programming interfaces (APIs) and turnkey services, each provided as a subscription-based software-as-a-service (SaaS). Indigo|API provides biometric face and fingerprint image analysis, matching, and enrollment functionality; all as granular REST services that can enhance identity systems with biometric functionality. These functions include quality scoring, liveness detection, enrollment, verification, comparison and matching, and searching for fingerprint and face modalities. Indigo turnkey solutions deliver biometric capabilities accessible from a browser on a subscription basis. Indigo is provided as a subscription-based solution that is available as an enterprise-based, user-based or transaction-based solution.

Software products

We additionally sell a broad range of biometrics software products that enable important functions in biometrics systems, including:

1. Enrollment, analysis, and processing of biometric images and data on workstations or mobile devices.
2. Integration of peripheral biometric capture devices.
3. Centralized workflow, transaction processing, and subsystem integration.
4. Matching of biometric samples against biometric databases to authenticate or verify identities;
5. Analysis and processing of text-based identity data.

Our biometrics software products range from discrete "building blocks", such as SDKs, APIs and applications that customers can use to develop their own systems to more complete solutions that customers can use to reduce or eliminate their development times and exposure to software support and maintenance risks. Our products are described below.

2) Building Blocks: SDKs, APIs, Applications, and Subsystems

2a. Biometric Search & Matching SDKs

Our SDKs consist of: i) multiple software libraries; ii) sample applications that show customers how to use the libraries; and iii) documentation. Customers use our SDKs to design and develop biometrics applications. Our line of biometric search and match SDKs is called Nexa™ and it includes Nexa|Fingerprint™, Nexa|Face™, Nexa|Iris™ and Nexa|Voice™. These products provide high-performance biometric algorithms for fingerprint, facial, iris and voice identification or authentication. The algorithms in these products convert images into biometric templates, which can then be compared to templates stored in databases to find matches.

Each Nexa SDK can be deployed on a workstation or a server, either as a standalone biometric search/match API, or in combination with our other SDKs, applications, BioSP, or Astra products. Our SequenceCheck, PreFace, and IrisCheck SDKs may be used in concert with Nexa libraries to perform optional quality assurance and preprocessing for enhanced fingerprint, face, and iris search and match functionality.

In addition to the Nexa line of biometric search and match SDKs, we also offer AwareXM™, an interoperable fingerprint matching SDK. Aware XM is an SDK that provides MINEX-certified, INCITS 378-compliant fingerprint minutiae extraction, template generation, and fingerprint authentication.

2b. Biometric Enrollment SDKs and APIs

Our suite of enrollment SDKs and APIs performs a variety of functions that are critical to biometric enrollment, including image capture, image quality assurance, image formatting, image compression and liveness verification. Our enrollment SDK and API products include:

- *Image Capture and Hardware Abstraction* – This group of products includes: i) LiveScan API; ii) PreFace™; iii) IrisCheck™; and iv) SequenceCheck™.

- *Mobile Enrollment and Matching* – Aware offers versions of several of our Windows-based products designed to operate on Android and iOS platforms. Our family of mobile SDKs includes: i) Nexa|Face™ Mobile; ii) Nexa|Fingerprint™ Mobile; iii) PreFace™ Mobile; iv) LiveScan API Mobile; v) NISTPack Mobile; vi) WSQ1000 Mobile; vii) AwareXM™ Mobile; and viii) FIDO® Suite. FIDO® Suite is a family of products that are certified by the FIDO Alliance and are interoperable with other FIDO-certified products. Our FIDO Suite includes: i) Aware FIDO® Face Authenticator; ii) Aware FIDO® Face+Voice Authenticator; iii) Aware FIDO® Client; and iv) Aware FIDO® Server. These products are available for Android and iOS devices.

- *Data Formatting and Validation* – This group of products includes: i) NISTPack; ii) ICAOPack; and iii) PIVPack™.

- *Fingerprint Cards* – This group of products includes: i) AccuScan™; and ii) AccuPrint™, used for scanning and printing of fingerprint cards in accordance with FBI fingerprint image quality standards.

- *Image Compression* – This group of products includes: i) Aware WSQ1000; and ii) Aware JPEG2000 for standards-compliant compression and decompression of biometric images.

2c. Identity Text Analytics SDK - Inquire™

Inquire is a SDK that performs fuzzy text-based filtering, searching, matching, and linking functions towards discovery of useful information in identity data. Analysis of text-based identity data is naturally complementary to biometric verification and identification and Inquire is optimized for processing and analysis of data that includes biometrics.

2d. Biometric Applications

Our products in this category combine user interfaces with multiple Aware software products to create more complete applications that operate on client workstations or mobile devices.

Enrollment Applications

- Our enrollment application products include Universal Registration Client (“URC™”). URC is a configurable Windows-based enrollment application that performs a variety of biometric data capture, analysis, matching, formatting, and hardware abstraction functions.

- URC|Mobile™ is a software application for capturing fingerprint and facial images on an Android smart phone or tablet using its onboard camera and a tethered fingerprint capture device. It is designed to be used by an enrollment attendant for rapid capture and quality assurance of biometric data and submission to a centralized biometric database for enrollment, search, or authentication.

Our fingerprint card products include FormScannerSE™ and FormScannerMB™. The two products are independent applications that may be used for scanning and processing of inked fingerprint cards.

- FormScannerSE is designed for one-at-a-time, assisted “scan and entry” processing of fingerprint cards, such as for manual data entry of previously scanned card batches. It can also be used for manual “rework” such as crop region adjustments.

- FormScannerMB is designed for “multi-batch” scanning of large volumes of cards in an automated fashion and provides features useful for high-volume processing such as support for automatic document feeding and real-time image quality feedback.

Forensic Workstations

Our forensic analysis and quality assurance products include WorkbenchSuite™. WorkbenchSuite is a family of ..NET workstation applications that are designed to be used by an operator to analyze and repair or otherwise process digital records containing biometric images and data. Each targets a particular use case and implements workflow carefully designed to best assist analysts in their task. The suite comprises:

- FingerprintWorkbench, which is used for forensic analysis, processing, and reporting of biometric fingerprint evidence comparison and search results.

- ForensicWorkbench, which is used for the categorization, processing, and standards-compliant formatting of biometric images and demographic data.

- SequenceWorkbench, which is used for the detection and assisted repair of fingerprint records containing sequence errors.

- CrosslinkWorkbench, which is used for assisting with identifying and repairing of crosslink errors in ANSI/NIST ITL transactions. Crosslinks are biometric records that erroneously contain data from different individuals.

- FaceWorkbench, which enables an analyst to analyze and process candidates returned from a biometric face search.

Application Components

This group of products consists of our BioComponents™ line of products. Our BioComponents products allow customers to develop biometric enrollment applications and solutions more quickly than if they purchased our SDKs. Each product in the group includes a user interface and one or more software libraries that perform a discrete set of functions, such as automated image capture, quality assurance, and capture hardware integration. BioComponents comprise modular, independent, self-contained software components that can operate either independently or in concert with one another. Specific BioComponents products and the functions they perform are:

- FingerprintComponent, which is used to capture, verify image quality, and compress fingerprint images.
- PhotoComponent, which is used to capture, verify image quality, and manipulate facial images.
- ScanningComponent, which is used to scan forms such as inked fingerprint cards.
- PrintingComponent, which is used for printing FBI-quality fingerprint images on cards and forms.
- NISTComponent, which is used for biographic and textual data entry and formatting, NIST compliance checking, and submission.

3) Imaging products

In addition to our biometrics software products, we also sell products used in applications involving medical and advanced imaging. Our principal imaging product is Aware JPEG 2000, which is based on the JPEG2000 standard. The JPEG2000 standard is an image compression standard and coding system that was created by the Joint Photographic Experts Group committee in 2000. Our JPEG2000 product is used to compress, store, and display images. Those images are typically medical images.

Software maintenance

We also sell software maintenance to many of our customers who purchase our software products and solutions. Software maintenance has historically been made available by contracts that typically have a one-year term during which customers have the right to receive technical support and software updates, if and when they become available for a fixed fee. Software maintenance is also available as part of a subscription-based solution under which customers receive standard software maintenance plus access to upgrades and product enhancements.

Services

We offer a variety of program management and software engineering services, including: i) project planning and management; ii) system and architecture design; iii) software design, development, customization, configuration, and testing; and iv) software integration and installation. Services are typically, but not always, sold in conjunction with our products and solutions and are provided for a fixed fee or as part of a subscription-based fee.

Service engagement deliverables may include: i) complete customer software solutions; ii) one or more subsystems comprised of software products that are integrated within a larger system; iii) custom-configured versions of existing software products; or iv) custom-designed software products. In some cases, the software resulting from service engagements may form the basis for new or improved Aware software solutions and/or products.

Our customers for services include: i) government agencies; ii) large multinational systems integrators; iii) smaller systems integrators with a particular market, technology or geographic focus; and iv) commercial providers of products, solutions, and services for themselves or to their end customers. We provide services directly to end-users or indirectly to end-users through systems integrators or commercial entities. When we provide services to systems integrators, they are often engaged with the end-user as a prime contractor and are responsible for delivery of a complete solution, in which case we typically serve as a subcontractor assigned a subset of the total scope of work.

The scope of our services projects varies. A small project might involve configuration and testing of a single software product, taking a small team one month or less. A large project might involve delivery of a more complex solution comprised of multiple products and subsystems, requiring a larger team to conduct program and project management, system design, software customization and integration, and taking up to one year or more. Some projects are followed by subsequent follow-on projects that serve to change or extend the features and functionality of the initial system.

Sales and Marketing

As of December 31, 2019, we had a total of 13 employees in our sales and marketing organization. In addition to our employee sales staff, we also engage third party sales agents and representatives to sell our products and services in foreign countries.

We sell our products, solutions and services through three principal channels of distribution:

i) Systems integrator channel – we sell to systems integrators that incorporate our software products and solutions into biometric systems that are delivered primarily to government end users.

ii) Direct channel – we sell directly to government, as well as commercial customers.

iii) OEM and VAR channel – we sell to hardware and software solution providers that incorporate our software products into their products for resale or use in their solution offerings.

All of our revenue in 2019, and 2018 was derived from unaffiliated customers. In 2019, one customer represented 16% of total revenue. In 2018, two customers represented 20% and 13%, respectively, of total revenue. No other customer represented 10% or more of total revenue in any of those years.

Competition

The markets for our products, solutions and services are competitive and uncertain. We compete against: i) other companies that provide biometric software solutions; and ii) fully diversified companies that provide biometric software solutions and also act as systems integrators. We can give no assurance that: i) our products and services will succeed in the market; ii) that we will be able to compete effectively; or iii) that competitive pressures will not seriously harm our business.

Many of our competitors are larger than us and have significantly greater financial, technological, marketing and personnel resources than we do. At the other end of the competitive spectrum, we have seen increasing competition from smaller biometrics companies in foreign countries. These smaller foreign competitors have demonstrated a willingness to sell their biometrics software products at low prices.

We can give no assurance that our customers will continue to purchase products from us or that we will be able to compete effectively in obtaining new customers to maintain or grow our business.

Aware's Strategy

Our strategy is to capitalize on our strong brand, technology, and expertise to sell biometrics software solutions, products and services into government and commercial markets. We intend to continue to offer a broad portfolio of high-quality, innovative biometrics software solutions, products and services that are coupled with expert technical support and services. We expect to continue to employ a multifaceted distribution strategy using systems integrators, OEMs, VAR's, partners, and direct and indirect sales to reach end users. We expect to continue to market and sell our products globally.

Our strategy for growing our biometrics business may include one or more of the following elements:

i) *Solutions and Products strategy* – An important tenet of our strategy is to offer more complete biometrics solutions. We believe this strategy will allow us to sell more software and services into biometrics projects with additional value add. We recognized the need to make this transition several years ago and developed new products to enable this strategy. We intend to increase our focus on enabling partners and OEMs to utilize our more complete biometric solutions.

Our strategy to offer complete solutions involves:

· Product line expansion - We have developed solutions based on our robust and advanced components and products. Our aim is to expand our product portfolio by adding new products and increasing the functionality of existing products using our internal engineering teams. This means we may add resources to our engineering staff. To the extent we are unable to develop critical new technologies internally, we may purchase or license such technologies from third parties. Alternatively, we may also acquire biometrics companies if we believe the acquisition cost is reasonable relative to the estimated future revenue and profits the acquired company may produce.

· Engineering services – We believe that services are an important element of our strategy to sell complete solutions into our customers' environments. We intend to have adequate engineering resources on hand to ensure that we can staff projects with the technical expertise we need to win new projects.

ii) *Market strategy* – Our market strategy is to continue efforts on our legacy government biometrics market and to expand further into new commercial biometrics markets. Historically, our revenue has been primarily derived from the federal government biometrics market. We intend to increase our focus on state and local government opportunities within the United States and internationally. We are also seeing increasing opportunities in commercial markets including financial services and retail globally, as well as other emerging opportunities in automotive, healthcare and network security.

We believe the evolution of commercial markets over the past few years may present additional mobile authentication and enterprise opportunities. To that end, we have enhanced our solution and product portfolio to enable us to participate in these markets.

iii) Sales strategy – While the United States remains a large market, we believe there are attractive growth opportunities in international markets. We intend to continue our focus on international markets and pursue opportunities in those markets through our sales staff and third-party sales agents and representatives.

As we attempt to grow our biometrics business, we may make investments in growth initiatives, such as those described above, that may cause our profitability to decline in the near term.

Backlog

We had $5.1 million of backlog on December 31, 2019. We define backlog as revenue items in deferred revenue and undelivered orders in our backlog report. Total backlog of $5.1 million included: i) $4.6 million of software maintenance revenue of which approximately $3.2 million is expected to be recognized during 2020; ii) $0.1 million of software license revenue that we anticipate will be recognized during 2020 and iii) $0.4 million of services revenue of which approximately $0.2 million is expected to be recognized during 2020.

Research and Development

Our US-based research and development activities are focused on enhancing our existing products, solutions and services. Our engineering organization is based in Bedford, Massachusetts. As of December 31, 2019, we had an engineering and research staff of 46 employees, representing 65% of our total employee staff.

Patents and Intellectual Property

We rely on a combination of nondisclosure agreements and other contractual provisions, as well as patent, trademark, trade secret and copyright law to protect our proprietary rights. We have an active program to protect our proprietary technology through the filing of patents. As of December 31, 2019, we had approximately 104 U.S. and foreign patents and approximately 35 pending patent applications. Our patents and patent applications pertain primarily to biometrics and imaging compression.

Although we have patented certain aspects of our technology, we rely primarily on trade secrets to protect our intellectual property. We attempt to protect our trade secrets and other proprietary information through agreements with our customers, suppliers, employees and consultants, and through security measures. Each of our employees is required to sign a non-disclosure agreement. Although we intend to protect our rights vigorously, we cannot assure you that these measures will be successful. In addition, effective intellectual property protection may be unavailable or limited in certain foreign countries.

Third parties may assert exclusive patent, copyright and other intellectual property rights to technologies that are important to us. From time to time, we receive claims from third parties suggesting that we may be obligated to license such intellectual property rights. If we were found to have infringed any third party's patents, we could be subject to substantial damages or an injunction preventing us from conducting our business.

Manufacturing & Systems Integration

We do not design or manufacture hardware products, however we have provided systems integration services for one U.S. government customer and are equipped to provide added value solutions to future customers. Our systems integration activities include: i) procuring hardware and software components from third party suppliers; ii) installing and integrating Aware and third-party software on the purchased or supplied hardware; and iii) testing products and solutions for quality assurance prior to shipment.

To the extent we receive any more orders for hardware or integrated systems or solutions revenue in the future, we expect to be dependent on suppliers for certain critical hardware and software components. Our dependence on potential single source suppliers involves several risks, including limited control over availability, quality, and delivery schedules. Any delays in delivery or shortages of such components could cause delays in the shipment of our products, which could harm our business.

Employees

At December 31, 2019, we employed 71 people, including 46 in engineering and research, 13 in sales and marketing, and 12 in finance and administration. Of these employees, 67 were based in Massachusetts. None of our employees are represented by a labor union. We consider our employee relations to be good.

We believe that our future success will depend in large part on the service of our technical, sales, marketing and senior management personnel and upon our ability to retain highly qualified technical, sales and marketing and managerial personnel. We cannot assure you that we will be able to retain our key managers and employees or that we will be able to attract and retain additional highly qualified personnel in the future.

Available Information

Our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, proxy statements, and amendments to reports filed pursuant to Sections 13(a) and 15(d) of the Securities Exchange Act of 1934, as amended, are made available free of charge on or through our website at *www.aware.com* as soon as reasonably practicable after such reports are filed with, or furnished to, the Securities and Exchange Commission (the SEC). The SEC also maintains a website, *www.sec.gov*, that contains reports and other information regarding issuers that file electronically with the SEC.

Copies of our (i) Corporate Governance Principles, (ii) charters for the Audit Committee, Compensation Committee, and Nominating Committee, and (iii) Code of Ethics are available in the Investor Relations section of our website at *www.aware.com*.

ITEM 1A. RISK FACTORS

Our operating results may fluctuate significantly from period-to-period and are difficult to predict.

Individual orders can represent a meaningful percentage of our revenues and operating results in any single quarter and the timing of the receipt of those orders is difficult to predict. The failure to close an order or the deferral or cancellation of an order can result in revenue and net income shortfalls for that quarter. We base our current and future expense levels on our internal operating plans and sales forecasts, and our operating costs are to a large extent fixed. As a result, we may not be able to sufficiently reduce our costs in any quarter to adequately compensate for an unexpected near-term shortfall in revenues, and even a small shortfall could disproportionately and adversely affect financial results for that quarter.

Our financial results may be negatively affected by a number of factors, including the following:

- the lack or reduction of government funding and the political, budgetary and purchasing constraints of government customers who purchase products and services directly or indirectly from us;
- the terms of customer contracts that affect the timing of revenue recognition;
- the size and timing of our receipt of customer orders;
- significant fluctuations in demand for our products and services;
- the loss of a key customer or one of its key customers;
- new competitors, or the introduction of enhanced solutions from new or existing competitors;
- competitive pressures on selling prices;
- cancellations, delays or contract amendments by government customers;
- higher than expected costs, asset write-offs, and other one-time financial charges; and
- general economic trends and other factors

As a result of these factors, we believe that period-to-period comparisons of our revenue levels and operating results are not necessarily meaningful. You should not rely on our quarterly revenue and operating results to predict our future performance.

We derive a significant portion of our revenue directly or indirectly from government customers, and our business may be adversely affected by changes in the contracting or fiscal policies of those governmental entities.

We derive a significant portion of our revenue directly or indirectly from federal, international, state and local governments. We believe that the success and growth of our business will continue to depend on government customers purchasing our products and services either directly through us or indirectly through our channel partners. Changes in government contracting policies or government budgetary constraints may adversely affect our financial performance. Among the factors that could adversely affect our business are:

- changes in fiscal policies or decreases in available government funding,
- changes in government funding priorities;
- changes in government programs or applicable requirements;
- the adoption of new laws or regulations or changes to existing laws or regulations;
- changes in political or social attitudes with respect to security and defense issues;
- changes in audit policies and procedures of government entities;
- potential delays or changes in the government appropriations process; and
- delays in the payment of our invoices by government payment offices.

These and other factors could cause government customers or our channel partners to reduce purchases of products and services from us which would have a material adverse effect on our business, financial condition and operating results.

A significant commercial market for biometrics technology may not develop, and, even if it does, there can be no assurance our biometrics technology will be successful.

A component of our strategy to grow revenue includes expansion into commercial markets. To date, biometrics technology has received only limited acceptance in such markets. Although the recent appearance of biometric readers on popular consumer products, such as smartphones, has increased interest in biometrics as a means of authenticating and/or identifying individuals, commercial markets for biometrics technology are still in the process of developing and evolving. Biometrics-based solutions compete with more traditional security methods including keys, cards, personal identification numbers, passwords and security personnel. Acceptance of biometrics as an alternative to such traditional methods depends upon a number of factors including: i) the performance and reliability of biometric solutions; ii) costs involved in adopting and integrating biometric solutions; iii) public concerns regarding privacy; and iv) potential privacy legislation.

For these reasons, we are uncertain whether there will be significant demand for biometrics technology from commercial markets. Moreover, even if there is significant demand, there can be no assurance that our biometrics products will achieve market acceptance.

We derive a significant portion of our revenue from third party channel partners.

Our future results depend upon the continued successful distribution of our products through a channel of systems integrators and OEM partners. Systems integrators, including VARs, use our software products as a component of the biometrics systems they deliver to their customers. OEMs embed our software products in their technology devices or software products. These channel partners typically sell their products and services to government customers.

Our failure to effectively manage our relationships with these third parties could impair the success of our sales, marketing and support activities. Moreover, the activities of these third parties are not within our direct control. The occurrence of any of the following events could have a material adverse effect on our business, financial condition and operating results:

- a reduction in sales efforts by our partners;
- the failure of our partners to win government awards in which our products are used;
- a reduction in technical capabilities or financial viability of our partners;
- a misalignment of interest between us and them;
- the termination of our relationship with a major systems integrator or OEM; or
- any adverse effect on a partner’s business related to competition, pricing and other factors.

If the biometrics market does not experience significant growth or if our products do not achieve broad acceptance both domestically and internationally, we may not be able to grow our business.

Our revenues are derived primarily from sales of biometrics products and services. We cannot accurately predict the future growth rate or the size of the biometrics market. The expansion of the biometrics market and the market for our biometrics products and services depend on a number of factors, such as:

- the cost, performance and reliability of our products and services and the products and services offered by our competitors;
- the continued growth in demand for biometrics solutions within the government and law enforcement markets as well as the development and growth of demand for biometric solutions in markets outside of government and law enforcement;
- customers’ perceptions regarding the benefits of biometrics solutions;
- public perceptions regarding the intrusiveness of these solutions and the manner in which organizations use the biometric information collected;
- public perceptions regarding the confidentiality of private information;
- proposed or enacted legislation related to privacy of information;
- customers’ satisfaction with biometrics solutions; and
- marketing efforts and publicity regarding biometrics solutions.

Even if biometrics solutions gain wide market acceptance, our solutions may not adequately address market requirements and may not continue to gain market acceptance. If biometrics solutions generally or our solutions specifically do not gain wide market acceptance, we may not be able to achieve our anticipated level of growth and our revenues and results of operations would be adversely affected.

We face intense competition from other biometrics solutions providers.

A significant number of established companies have developed or are developing and marketing software and hardware for biometrics products and applications that currently compete with or will compete directly with our offerings. We believe that additional competitors will enter the biometrics market and become significant long-term competitors, and that, as a result, competition will increase. Companies competing with us may introduce solutions that are competitively priced, have increased performance or functionality or incorporate technological advances we have not yet developed or implemented. Our current principal competitors include:

- Diversified technology providers that offer integrated biometrics solutions to governments, law enforcement agencies and other organizations. This group of competitors includes companies such as Idemia, Thales, and NEC.

- Component providers that offer biometrics software and hardware components for fingerprint, facial, iris and voice biometric identification. This group of competitors includes companies such as Cognitec, Neurotechnology, Iritech, FaceTec, Dermalog, DataWorksPlus, Nuance Communications, Inc. and Innovatrics.

We expect competition to intensify in the near term in the biometrics market. Many current and potential competitors have substantially greater financial, marketing, and research resources than we have. Moreover, low cost foreign competitors from third world and other countries have demonstrated a willingness to sell their products at significantly reduced prices. To compete effectively in this environment, we must continually develop and market new and enhanced solutions and technologies at competitive prices and must have the resources available to invest in significant research and development activities. Our failure to compete successfully could cause our revenues and market share to decline.

The biometrics industry is characterized by rapid technological change and evolving industry standards, which could render our existing products obsolete.

Our future success will depend upon our ability to develop and introduce a variety of new capabilities and enhancements to our existing products in order to address the changing and sophisticated needs of the marketplace. Frequently, technical development programs in the biometrics industry require assessments to be made of the future direction of technology, which is inherently difficult to predict. Delays in introducing new products and enhancements, the failure to choose correctly among technical alternatives or the failure to offer innovative products or enhancements at competitive prices may cause customers to forego purchases of our products and purchase our competitors' products. We may not have adequate resources available to us or may not adequately keep pace with appropriate requirements in order to effectively compete in the marketplace.

Our software products may have errors, defects or bugs, which could result in delayed or lost revenue, expensive correction, liability to our customers, and claims against us.

Complex software products such as ours may contain errors, defects or bugs. Defects in the products that we develop and sell to our customers could require expensive corrections and result in delayed or lost revenue, adverse customer reaction and negative publicity about us or our products and services. Customers who are not satisfied with any of our products may also bring claims against us for damages, which, even if unsuccessful, would likely be time-consuming to defend, and could result in costly litigation and payment of damages. Such claims could harm our reputation, financial results and competitive position.

Our business may be adversely affected by our use of open source software.

The software industry is making increasing use of open source software in the development of products. We also license and integrate certain open source software components from third parties into our software. Open source software license agreements may require that the software code in these components or the software into which they are integrated be freely accessible under open source terms. Many features we may wish to add to our products in the future may be available as open source software and our development team may wish to make use of this software to reduce development costs and speed up the development process. While we carefully monitor the use of all open source software and try to ensure that no open source software is used in such a way as to require us to disclose the source code to the related product, such use could inadvertently occur. If we were required to make our software freely available, our business could be seriously harmed.

We rely on third-party software to develop and provide our solutions and significant defects in third-party software could harm our business.

We rely on software licensed from third parties to develop and offer some of our solutions. In addition, we may need to obtain future licenses from third parties to use software or other intellectual property associated with our solutions. We cannot assure you that these licenses will be available to us on acceptable terms, without significant price increases or at all. Any loss of the right to use any such software or other intellectual property required for the development and maintenance of our solutions could result in delays in the provision of our solutions until equivalent technology is either developed by us, or, if available from others, is identified, obtained, and integrated, which could harm our business. Any errors or defects in third-party software could result in errors or a failure of our solutions, which could harm our business.

Part of our future business is dependent on market demand for, and acceptance of, the cloud-based model for the use of software

We expect to derive a growing percentage of our revenue from the sale of cloud-based services. As a result, widespread acceptance and use of the cloud-based business model is critical to our future growth and success. Under the perpetual or periodic license model for software procurement, users of the software typically run applications on their hardware. Because companies are generally predisposed to maintaining control of their IT systems and infrastructure, there may be resistance to the concept of accessing the functionality that software provides as a service through a third party. If the market for cloud-based, software solutions ceases to grow or grows slower than we currently anticipate, demand for our services could be negatively affected.

Our operational systems and networks and products may be subject to an increasing risk of continually evolving cybersecurity or other technological risks, which could result in the disclosure of company or customer confidential information, damage to Aware's reputation, additional costs to Aware, regulatory penalties and financial losses.

The company's products, services and systems may be used in critical company, customer or third-party operations, or involve the storage, processing and transmission of sensitive data, including valuable intellectual property, other proprietary or confidential data, regulated data, and personal information of employees, customers and others. Successful breaches, employee malfeasance, or human or technological error could result in, for example, unauthorized access to, disclosure, modification, misuse, loss, or destruction of company, customer, or other third party data or systems; theft of sensitive, regulated, or confidential data including personal information and intellectual property; the loss of access to critical data or systems through ransomware, destructive attacks or other means; and business delays, service or system disruptions or denials of service.

If we or third parties with which we do business were to fall victim to successful cyber-attacks or experience other cybersecurity incidents, including the loss of individually identifiable customer or other sensitive data, we may incur substantial costs and suffer other negative consequences, which may include remediation costs, such as liability for stolen assets or information, repairs of system damage, and incentives to customers or business partners in an effort to maintain relationships after an attack as well as litigation and legal risks, including regulatory actions by state and federal regulators.

Our intellectual property is subject to limited protection.

Because we are a technology provider, our ability to protect our intellectual property and to operate without infringing the intellectual property rights of others is critical to our success. We regard our technology as proprietary. We rely on a combination of U.S. and worldwide patent, trade secret, copyright, and trademark law as well as confidentiality agreements to protect our proprietary technology and cannot assure you that we will be able to enforce the patents we own against third parties. Some foreign countries do not currently provide effective legal protection for intellectual property and our ability to prevent the unauthorized use of our products in those countries is therefore limited. Despite our efforts, these measures can only provide limited protection. Unauthorized third parties may try to copy or reverse engineer portions of our products or otherwise obtain and use our intellectual property. If we fail to protect our intellectual property rights adequately, our competitors may gain access to our technology, and our business would thus be harmed.

In the future, we may be involved in legal action to enforce our intellectual property rights relating to our patents, copyrights or trade secrets. Any such litigation could be costly and time-consuming for us, even if we were to prevail. Moreover, even if we are successful in protecting our proprietary information, our competitors may independently develop technologies substantially equivalent or superior to our technology. Accordingly, despite our efforts, we may be unable to prevent third parties from infringing upon or misappropriating our intellectual property or otherwise gaining access to our technology. The misappropriation of our technology or the development of competitive technology could seriously harm our business.

***We may be sued by third parties for alleged infringement of their proprietary rights*.**

Our technology and products may infringe the intellectual property rights of others. A large and increasing number of participants in the technology industry, including companies known as non-practicing entities, have applied for or obtained patents. Some of these patent holders have demonstrated a readiness to commence litigation based on allegations of patent infringement. Third parties have asserted against us in the past and may assert against us in the future patent, copyright and other intellectual property rights to technologies that are important to our business.

Intellectual property rights can be uncertain and involve complex legal and factual questions. Moreover, intellectual property claims, with or without merit, can be time-consuming and expensive to litigate or settle, and could divert management attention away from the execution of our business plan. If we were found to have infringed the proprietary rights of others, we could be subject to substantial damages or an injunction preventing us from conducting our business.

If we are unable to attract and retain key personnel, our business could be harmed.

If any of our key employees were to leave, we could face substantial difficulty in hiring qualified successors and could experience a loss in productivity while any successor obtains the necessary training and experience. Our employment relationships are at-will and we have had key employees leave in the past. We cannot assure you that one or more key employees will not leave in the future. We intend to continue to hire additional highly qualified personnel, including software engineers and sales personnel, but may not be able to attract, assimilate or retain qualified personnel in the future. Any failure to attract, integrate, motivate and retain these employees could harm our business.

Our business may be affected by government regulations.

Extensive regulation by federal, state, and foreign regulatory agencies could adversely affect us in ways that are difficult for us to predict. More specifically, we are subject to regulatory environment changes regarding privacy and data protection that could have a material impact on our results of operations. These regulatory changes may potentially involve new regulatory issues/requirements such as the EU General Data Protection Regulation (GDPR), the California Consumer Privacy Act (CCPA), the Illinois Biometric Privacy Act, Texas Statute on the Capture or Use of Biometric Identifier, State of Washington H.B. 1493, and any other state or federal regulations governing the collection, use and storage of biometric data. The potential costs of compliance with or imposed by new/existing regulations and policies that are applicable to us may affect the use of our products and services and could have a material adverse impact on our results of operations.

In addition, our business may also be adversely affected by: i) the imposition of tariffs, duties and other import restrictions on goods and services we purchase from non-domestic suppliers; or ii) by the imposition of export restrictions on products we sell internationally. Changes in current or future laws or regulations, in the United States or elsewhere, could seriously harm our business.

Adverse economic conditions could harm our business.

Unfavorable changes in economic conditions, including recessions, inflation, turmoil in financial markets, or other changes in economic conditions, could harm our business, results of operations, and financial conditions as a result of:

- reduced demand for our products;
- increased risk of order cancellations or delays;
- increased pressure on the prices for our products;
- greater difficulty in collecting accounts receivable; and
- risks to our liquidity, including the possibility that we might not have access to our cash when needed.

We are unable to predict the timing, duration, and severity of any such adverse economic conditions in the U.S. and other countries, but the longer the duration, the greater the risks we face in operating our business.

We may make acquisitions of companies.

We may make acquisitions of companies that offer complementary products, services and technologies. Any acquisitions we complete may involve a number of risks, including the risks of assimilating the operations and personnel of acquired companies, realizing the value of the acquired assets relative to the price paid, distraction of management from our ongoing businesses and potential product disruptions associated with the sale of the acquired company's products. These factors could have a material adverse effect on our business, financial condition, operating results and cash flows. The consideration we pay for any future acquisitions could include our stock. As a result, future acquisitions could cause dilution to existing shareholders and to earnings per share.

We may have additional tax liabilities.

We are subject to income taxes in the United States. Significant judgments are required in determining our provisions for income taxes. In the course of preparing our tax provisions and returns, we must make calculations where the ultimate tax determination may be uncertain. Our tax returns are subject to examination by the Internal Revenue Service ("IRS") and state tax authorities. There can be no assurance as to the outcome of these examinations. If the ultimate determination of taxes owed is for an amount in excess of amounts previously accrued, our operating results, cash flows, and financial condition could be adversely affected.

The market price of our common stock has been and may continue to be subject to wide fluctuations, and this may make it difficult for shareholders to resell the common stock when they want or at prices they find attractive.

The market price of our common stock, like that of other technology companies, is volatile and is subject to wide fluctuations in response to a variety of factors, including:

- quarterly variations in operating results;

- announcements of technological innovations or new products by us or our competitors,

- changes in customer relationships, such as the loss of a key customer;

- recruitment or departure of key personnel;

- corporate actions we may initiate, such as acquisitions, stock sales or repurchases, dividend declarations, or corporate reorganizations; and

- other events or factors.

Our stock price may also be affected by broader market trends unrelated to our performance. As a result, purchasers of our common stock may be unable at any given time to sell their shares at or above the price they paid for them. Moreover, companies that have experienced volatility in the market price of their stock often are subject to securities class action litigation. If we were the subject of such litigation, it could result in substantial costs and divert management's attention and resources.

If we are unable to maintain effective internal controls over financial reporting, investors could lose confidence in the reliability of our financial statements, which could result in a decline in the price of our common stock.

As a public company, we are required to enhance and test our financial, internal and management control systems to meet obligations imposed by the Sarbanes-Oxley Act of 2002. Consistent with the Sarbanes-Oxley Act and the rules and regulations of the SEC, management's assessment of our internal controls over financial reporting is required in connection with our filing of our Annual Report on Form 10-K. If we are unable to identify, implement and conclude that we have effective internal controls over financial reporting, investors could lose confidence in the reliability of our financial statements, which could result in a decrease in the value of our common stock. Our assessment of our internal controls over financial reporting may also uncover weaknesses or other issues with these controls that could also result in adverse investor reaction.

We must make judgments in the process of preparing our financial statements.

We prepare our financial statements in accordance with generally accepted accounting principles and certain critical accounting policies that are relevant to our business. The application of these principles and policies requires us to make significant judgments and estimates. In the event that our judgments and estimates differ from actual results, we may have to change them, which could materially affect our financial position and results of operations.

Moreover, accounting standards have been subject to rapid change and evolving interpretations by accounting standards setting organizations over the past few years. The implementation of new accounting standards requires us to interpret and apply them appropriately. If our current interpretations or applications are later found to be incorrect, we may have to restate our financial statements and the price of our stock could decline.

ITEM 1B. UNRESOLVED STAFF COMMENTS

Not applicable.

ITEM 2. PROPERTIES

We believe that our existing facilities are adequate for our current needs and that additional space sufficient to meet our needs for the foreseeable future will be available on reasonable terms. We currently occupy approximately 72,000 square feet of office space in Bedford, Massachusetts, which serves as our headquarters. This site is used for our research and development, sales and marketing, and administrative activities. We own this facility.

ITEM 3. LEGAL PROCEEDINGS

From time to time we are involved in litigation incidental to the conduct of our business. We are not party to any lawsuit or proceeding that, in our opinion, is likely to materially impact us or our business.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Our common stock is the only class of stock we have outstanding, and it trades on the Nasdaq Global Market under the symbol AWRE.

As of February 11, 2020, we had approximately 80 shareholders of record. This number does not include shareholders from whom shares were held in a "nominee" or "street" name. We paid no dividends in 2019 or 2018. We anticipate that we will continue to reinvest any earnings to finance future operations although we may also pay special cash dividends if our board of directors deems it appropriate.

We did not sell any equity securities that were not registered under the Securities Act of 1933 during the three months ended December 31, 2019.

Issuer Purchases of Equity Securities

Period	(a) Total Number of Shares Purchased	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (1)	(d) Maximum Number (or Approximate Dollar Value) of Shares That May Yet Be Purchased Under the Plans or Programs
October 1 through 31, 2019	-	-	-	9,027,008
November 1 through 30, 2019	20,709	$ 3.25	20,709	8,959,777
December 1 through 31, 2019	32,334	$ 3.61	32,334	-

(1) On April 24, 2018, we issued a press release announcing that our board of directors had approved the repurchase of up to $10,000,000 of our common stock from time to time through December 31, 2019. During the three months ended December 31, 2019, we purchased 53,043 shares under this plan at an aggregate purchase price of $184,022.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

RESULTS OF OPERATIONS

The following table sets forth, for the years indicated, certain line items from our consolidated statements of income and comprehensive income stated as a percentage of total revenue:

	Year ended December 31,	
Revenue:	2019	2018
Software licenses	38%	50%
Software maintenance	43	33
Services	19	17
Total revenue	100	100
Costs and expenses:		
Cost of services	10	8
Research and development	65	44
Selling and marketing	30	26
General and administrative	29	20
Total costs and expenses	134	98
Patent related income	-	1
Operating income (loss)	(34)	3
Interest income	8	5
Income (loss) before provision for (benefit from) income taxes	(26)	8
Provision for (benefit from) income taxes	42	-
Net income (loss)	(68)%	8%

Summary of Operations

We are primarily engaged in the development and sale of biometrics products, solutions and services. Our software products are used in government and commercial systems and applications and fulfill a broad range of functions critical to secure biometric enrollment, authentication, identification and transactions. Principal government applications of biometrics systems include border control, visa applicant screening, law enforcement, national defense, intelligence, secure credentialing, access control, and background checks. Principal commercial applications include: i) user enrollment and authentication used for login to mobile devices, computers, networks, and software programs; ii) user authentication for financial transactions and purchases (online and in-person); iii) physical access control to buildings; and iv) identity proofing of prospective employees and customers. We sell our biometrics software products and services globally through a multifaceted distribution strategy using systems integrators, OEMs, VARs, partners, and directly to end user customers. We also derive a portion of our revenue from the sale of imaging software licenses to OEMs and systems integrators that incorporate our software into medical imaging products and medical systems.

Effective January 1, 2018, we adopted Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC"), Topic 606, Revenue from Contracts with Customers ("ASC 606"), using the full retrospective transition method.

Summary of Financial Results

We used revenue and operating income (loss) to summarize financial results over the past two years as we believe these measurements are the most meaningful way to understand our operating performance.

<u>2019 compared to 2018</u>

Revenue and operating loss in 2019 were $12.2 million and $4.1 million, respectively, which compared to revenue and operating income in 2018 of $16.1 million and $0.4 million, respectively.

Lower revenue in 2019 as compared to 2018 was primarily due to lower biometrics software license revenue and to a lesser extent lower biometrics services, biometric maintenance and imaging software license revenue. This was partially offset by higher imaging maintenance revenue. Lower operating income in 2019 as compared to 2018 was primarily due to: i) lower revenue in 2019; and ii) higher total costs and expenses in 2019.

Software Licenses

Software licenses consist of revenue from the sale of biometrics and imaging software products. Sales of software products depend on our ability to win proposals to supply software for biometrics systems projects either directly to end user customers or indirectly through channel partners.

Software license revenue decreased 43% from $8.0 million in 2018 to $4.6 million in 2019. As a percentage of total revenue, software license revenue decreased from 50% in 2018 to 38% in 2019. The $3.4 million decrease in software license revenue was primarily due to a $3.3 million decrease in biometrics software license sales and a $0.1 million decrease in imaging software license sales. The reasons for the changes in biometrics and imaging software licenses were:

i) Biometrics software licenses – Biometrics software license sales were $3.8 million in 2019 versus $7.1 million in 2018. The dollar decrease was primarily due to: i) the impact of a software license agreement we entered into with a large commercial customer during the third quarter of 2018, whereas we had no such license sale in 2019; and ii) lower revenue from the software license agreement we entered into with a systems integrator in the second quarter of 2018. We recognized $0.6 million of software license revenue from this agreement in 2019 as compared to $1.8 million in 2018. We also provide engineering services to this systems integrator pursuant to this arrangement. We expect our development effort on this project to continue for approximately one more quarter.

ii) Imaging software licenses – Imaging software license sales were $0.8 million in 2019 versus $0.9 million in 2018. The dollar decrease was primarily due to lower imaging license sales to our systems integrator customers in 2019.

Software Maintenance

Software maintenance consists of revenue from the sale of software maintenance contracts. Software maintenance contracts entitle customers to receive software support and software updates, if and when they become available, during the term of the contract.

Software maintenance revenue decreased 3% from $5.4 million in 2018 to $5.3 million in 2019. As a percentage of total revenue, software maintenance revenue increased from 33% in 2018 to 43% in 2019. The dollar decrease in software maintenance was primarily due to lower software maintenance revenue from lower initial software license sales.

A majority of our customers purchase software maintenance contracts when they initially purchase software licenses. Since our software is used in active biometrics systems, many of our customers continue to renew their maintenance contracts in subsequent years while systems remain operational.

Services

Services consist of fees we charge to perform software development, integration, installation, and customization services. Similar to software license revenue, services revenue depends on our ability to win biometrics systems projects either directly with end user customers or in conjunction with channel partners. Services revenue will fluctuate when we commence new projects and/or when we complete projects that were started in previous periods.

Services decreased 13% from $2.7 million in 2018 to $2.3 million in 2019. As a percentage of total revenue, services increased from 17% in 2018 to 19% in 2019. The dollar decrease in services revenue was primarily due to: i) lower services revenue from our direct US government customers; and ii) lower services revenue related to the software license agreement we entered into with a systems integrator in the second quarter of 2018 for a large project. We expect our development effort on this large project to continue for approximately one more quarter.

Services backlog was $0.4 million as of December 31, 2019.

Cost of Software Licenses

Cost of software licenses consists primarily of the cost of third party software included in certain software products delivered to the U.S. Navy (the "Navy").

Cost of software licenses decreased from $20,000 in 2018 to zero in 2019. The dollar decrease in cost of software licenses was primarily due to our having no sales of software to the Navy in 2019.

Cost of Services

Cost of services consists of engineering costs to perform customer services projects. Such costs primarily include: i) engineering salaries, stock-based compensation, fringe benefits, and facilities; and ii) engineering consultants and contractors.

Cost of services increased 3% from $1.2 million in 2018 to $1.3 million in 2019. Cost of services as a percentage of services revenue increased from 45% in 2018 to 54% in 2019, which means that gross margins decreased from 55% to 46%. The dollar increase in cost of services was primarily due to a large project with a systems integrator that we signed in the second quarter of 2018. The increase was partially offset by lower cost of services due to lower services revenue from our direct US government customers. We anticipate further cost of services from this large project to continue for approximately one more quarter.

Gross margins on services of 46%, and 55%, in 2019 and 2018, respectively, were a function of: i) the nature of the projects; ii) the level of engineering difficulty and labor hours required to complete project tasks; and iii) how much we were able to charge. Gross margins in these years reflect the profitability mix of customer projects. We expect that gross margins on services will continue to fluctuate in future periods based on the nature, complexity, and pricing of future projects.

Research and Development Expense

Research and development expense consists of costs for: i) engineering personnel, including salaries, stock-based compensation, fringe benefits, and facilities; ii) engineering consultants and contractors, and iii) other engineering expenses such as supplies, equipment depreciation, dues and memberships and travel. Engineering costs incurred to develop our technology and products are classified as research and development expense. As described in the cost of services section, engineering costs incurred to provide engineering services for customer projects are classified as cost of services, and are not included in research and development expense.

The classification of total engineering costs to research and development expense and cost of services was (in thousands):

	Years ended December 31,	
	2019	2018
Research and development expense	$ 7,928	$ 7,105
Cost of services	1,261	1,220
Total engineering costs	$ 9,189	$ 8,325

Research and development expense increased 12% from $7.1 million in 2018 to $7.9 million in 2019. As a percentage of total revenue, research and development expense increased from 44% in 2018 to 65% in 2019.

As the table above indicates, total engineering costs increased by $0.9 million in 2019 as compared to 2018. The spending increase was primarily due to higher spending on third-party development costs and to a lesser extent higher employee costs. The increase was partially offset by lower other costs. Higher spending on third-party development costs was primarily due to third-party vendors that were engaged to assist in our software development. Our engineering headcount decreased by one in 2019. We believe our engineering organization was adequately staffed as of December 31, 2019.

As we described in the Part I—Business of this Form 10-K, we intend to introduce new products that will allow us to offer more complete biometrics solutions. We believe this strategy will allow us to sell more software into biometrics systems projects in order to grow our revenue. Our preference is to develop such products internally, however to the extent we are unable to do that, we may purchase or license technologies from third parties. We anticipate that we will continue to focus our future research and development activities on enhancing existing products and developing new products.

Selling and Marketing Expense

Selling and marketing expense primarily consists of costs for: i) sales and marketing personnel, including salaries, sales commissions, stock-based compensation, fringe benefits, travel, and facilities; and ii) advertising and promotion expenses.

Sales and marketing expense decreased 14% from $4.2 million in 2018 to $3.6 million in 2019. As a percentage of total revenue, sales and marketing expense increased from 26% in 2018 to 30% in 2019. The dollar decrease in selling and marketing expense was primarily due: i) to lower sales commissions due to lower revenue, and ii) lower employee costs due to lower headcount. This decrease was slightly offset by higher stock-based compensation expense and higher other costs.

General and Administrative Expense

General and administrative expense consists primarily of costs for: i) officers, directors and administrative personnel, including salaries, bonuses, director compensation, stock-based compensation, fringe benefits, and facilities; ii) professional fees, including legal and audit fees; iii) public company expenses; and iv) other administrative expenses, such as insurance costs and bad debt provisions.

General and administrative expense increased 9% from $3.3 million in 2018 to $3.6 million in 2019. As a percentage of total revenue, general and administrative expense increased from 20% in 2018 to 29% in 2019. The increase in general and administrative expense in 2019 was primarily due to: i) higher employee costs due to higher headcount; ii) higher legal fees; iii) higher stock-based compensation expense; and iv) higher consultant fees. The increases were partially offset by lower audit fees and lower bonus expense.

Patent Related Income

The composition of patent related income in 2019 and 2018 was as follows:

We had $49,000 and $69,000 of income from a patent arrangement in the years ended December 31, 2019 and 2018, respectively. We entered into an arrangement with an unaffiliated third party in 2010 under which we assigned certain patents in return for royalties on proceeds from patent monetization efforts by the third party. Such third party has engaged in various patent monetization activities, including enforcement, litigation and licensing. The party reported and we recorded $49,000 and $69,000 of income from this arrangement in the years ended December 31, 2019 and 2018, respectively.

We continue to have a contractual relationship with this third party. However, we are unable to predict how much more income we might receive from this arrangement, if any, because we do not know whether any patent monetization efforts by the third party will be successful.

Future patent sales are likely to be minimal as our remaining patents and patent applications pertain primarily to biometrics and imaging compression. Our current intent is to retain these patents for use in the business.

Interest Income

Interest income increased 18% from $844,000 in 2018 to $1.0 million in 2019. The dollar increase was primarily due to higher interest rates within our money market accounts.

Income Taxes

We are subject to income taxes in the United States and we use estimates in determining our provisions for income taxes. We account for income taxes using the asset and liability method for accounting and reporting income taxes. Deferred tax assets and liabilities are recognized based on temporary differences between the financial reporting and income tax bases of assets and liabilities using statutory rates.

A discussion of income taxes for the years ended December 31, 2019, and 2018 follows:

Year ended December 31, 2019. Total income tax provision for the year ended December 31, 2019 was $5.2 million. The increase in the income tax provision for 2019 was primarily due to the change in valuation allowance for our deferred tax assets.

As of December 31, 2019, we had a total of $6.3 million of deferred tax assets, of which $5.0 million relates to research credit carryforwards. We have assessed the need for a valuation allowance on our deferred tax assets. We evaluated and considered all available evidence, both positive and negative, to determine whether, based on the weight of that evidence, a valuation allowance for deferred tax assets was needed. As part of this analysis we have given more weight to recent, historical evidence than future projections as we consider the past more objective. As of the fourth quarter of 2019, we have a cumulative pretax loss over the most recent three-year period including a pretax loss of $3.1 million in 2019. We considered the cumulative loss as of the end of the fourth quarter of 2019 to be significant negative evidence in the overall analysis. Prior to this quarter, we have incurred pretax income cumulatively when calculating it for the twelve most recent quarters, however, the levels of pretax income have been declining in recent periods, most notably as of the fourth quarter of 2019 as a result of certain internal changes.

In September 2019, we appointed a new Chief Executive Officer and, as a result, we reviewed and made changes to our strategy and business plans. As a result, we will be making additional investments in research, product development and sales and marketing including additional headcount. These changes in strategy and additional investment started in the fourth quarter of 2019 and will continue over the proceeding years. Our pretax income forecasts are highly predicated upon new product development and penetrating new markets. Therefore, this evidence is given nominal weight in the analysis compared to the recent history of losses and anticipated investment.

Further, a significant portion of our deferred tax assets relates to federal and state research credits. These credits may only offset 75% of the tax liability after net operating loss carryforwards are utilized and thus, we have the risk that the credits could expire before utilization if sufficient taxable income in the carryforward periods doesn’t exist.

Based upon the information available to us at this time, the above analysis of evidence represents our best estimate regarding the utilization of the deferred tax assets, and we have concluded that it is more likely than not that the deferred tax assets of $6.3 million will not be realized. Therefore, we have recorded a full valuation allowance of $6.3 million against our deferred tax assets during the fourth quarter of 2019. We will continue to monitor the evidence and the realizability of our deferred tax assets in future periods. Should evidence regarding the realizability of our deferred tax assets change at a future point in time, we will adjust the valuation allowance as required.

Year ended December 31, 2018. Total income tax benefit for the year ended December 31, 2018 was $8,000. Income tax benefit for 2018 was based on: i) the U.S. statutory rate of 21%, ii) increased by state income taxes; and iii) reduced by permanent adjustments and research tax credits.

LIQUIDITY AND CAPITAL RESOURCES

In recent years, we have financed the company with our cash balances, cash generated from operations, and cash received from the sale of patent assets. Equity financing has not been a meaningful source of financing for us in recent years. Cash flows from operating, investing and financing activities are described below.

<u>Cash flow from operating activities</u>
In the year ended December 31, 2019, our operating activities used net cash of $2.9 million. In the year ended December 31, 2018, our operating activities provided net cash of $0.7 million. A discussion of cash flow from operating activities for each of the last two years follows:

Year ended December 31, 2019. Cash used by operating activities was $2.9 million in 2019. Cash used by operations was primarily the result of $8.3 million of net loss, and $0.9 million of changes in assets and liabilities. This was partially offset by the add back of $6.3 million of non-cash items for depreciation, amortization, stock-based compensation and deferred tax assets.

Year ended December 31, 2018. Cash provided by operating activities was $0.7 million in 2018. Cash provided by operations was primarily the result of $1.2 million of net income and the add back of $1.0 million of non-cash items for depreciation, amortization and stock-based compensation. Cash from these sources was partially offset by $1.5 million of changes in assets and liabilities.

<u>Cash flow from investing activities</u>
In the years ended December 31, 2019 and 2018, our investing activities used net cash of $0.1 million and $0.2 million, respectively. A discussion of cash flow from investing activities for each of the last two years follows:

Year ended December 31, 2019. Cash used by investing activities of $0.1 million in 2019 consisted of purchases of property and equipment.

Year ended December 31, 2018. Cash used by investing activities of $0.2 million in 2018 consisted of purchases of property and equipment.

We have no material commitments for capital expenditures.

<u>Cash flow from financing activities</u>
In the years ended December 31, 2019 and 2018, our financing activities used net cash of $0.8 million and $0.5 million, respectively. A discussion of cash flow from financing activities for each of the last three years follows:

Year ended December 31, 2019. Cash used in financing activities was $0.8 million in 2019. Financing activity cash usage was primarily the result of $765,000 used to buy back stock under our stock repurchase program and $93,000 used to pay income taxes for employees who surrendered shares in connection with stock grants. Cash used for these purposes was partially offset by $43,000 of cash received from the issuance of stock under our ESPP program.

Year ended December 31, 2018. Cash used in financing activities was $0.5 million in 2018. Financing activity cash usage was primarily the result of $392,000 used to buy back stock under our stock repurchase program and $107,000 used to pay income taxes for employees who surrendered shares in connection with stock grants. Cash used for these purposes was partially offset by $50,000 of cash received from the issuance of stock under our ESPP program.

At December 31, 2019, we had cash and cash equivalents of $47.7 million. While we cannot assure you that we will not require additional financing, or that such financing will be available to us, we believe that our cash and cash equivalents will be sufficient to fund our operations for at least the next twelve months from the filing date.

To date, inflation has not had a material impact on our financial results. There can be no assurance, however, that inflation will not adversely affect our financial results in the future.

OFF-BALANCE SHEET ARRANGEMENTS

We do not currently have any arrangements with unconsolidated entities, such as entities often referred to as structured finance, special purpose entities, or variable interest entities which are often established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. Accordingly, we are not exposed to any financing, liquidity, market or credit risk if we had such relationships.

CRITICAL ACCOUNTING POLICIES

We consider certain accounting policies related to revenue recognition, stock-based compensation, income taxes, and the allowance for doubtful accounts to be critical policies.

Revenue recognition. Effective January 1, 2018, we adopted Accounting Standards Codification ("ASC"), Topic 606, Revenue from Contracts with Customers ("ASC 606"), using the full retrospective transition method.

In accordance with ASC 606, revenue is recognized when a customer obtains control of promised goods and services. The amount of revenue recognized reflects the consideration to which we expect to be entitled to receive in exchange for these goods and services. In addition, ASC 606 requires disclosures of the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers.

The core principle of the standard is that we should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services. To achieve that core principle, we should apply the following five step model:

1. Identify the contract with the customer;
2. Identify the performance obligations in the contract;
3. Determine the transaction price;
4. Allocate the transaction price to the performance obligations in the contract; and
5. Recognize revenue when (or as) each performance obligation is satisfied.

1) Identify the contract with the customer

A contract with a customer exists when (i) we enter into an enforceable contract with a customer that defines each party's rights regarding the goods or services to be transferred and identifies the related payment terms, (ii) the contract has commercial substance, and (iii) we determine that collection of substantially all consideration for goods and services that are transferred is probable based on the customer's intent and ability to pay the promised consideration. We apply judgment in determining the customer's intent and ability to pay, which is based on a variety of factors including the customer's historical payment experience, or in the case of a new customer, published credit and financial information pertaining to the customer.

We evaluate contract modifications for the impact on revenue recognition if they have been approved by both parties such that the enforceable rights and obligations under the contract have changed. Contract modifications are either accounted for using a cumulative effect adjustment or prospectively over the remaining term of the arrangement. The determination of which method is more appropriate depends on the nature of the modification, which we evaluate on a case-by-case basis.

We combine two or more contracts entered into at or near the same time with the same customer and account for them as a single contract if (i) the contracts are negotiated as a package with a common commercial objective, (ii) the amount of consideration to be paid in one contract depends on the price or performance of the other contract, or (iii) some or all of the goods or services in one contract would be combined with some or all of the goods and services in the other contract into a single performance obligation. If two or more contracts are combined, the consideration to be paid is aggregated and allocated to the individual performance obligations without regard to the consideration specified in the individual contracts.

2) Identify the performance obligations in the contract

Performance obligations promised in a contract are identified based on the goods and services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the good or service either on its own or together with other available resources, and are distinct in the context of the contract, whereby the transfer of the good or service is separately identifiable from other promises in the contract. To the extent a contract includes multiple promised goods and services, we apply judgment to determine whether promised goods and services are capable of being distinct and distinct in the context of the contract. If these criteria are not met, the promised goods and services are accounted for as a combined performance obligation. To identify performance obligations, we consider all of the goods or services promised in a contract regardless of whether they are explicitly stated or are implied by customary business practices.

3) Determine the transaction price

The transaction price is determined based on the consideration we expect to be entitled in exchange for transferring promised goods and services to the customer. Determining the transaction price requires significant judgment. To the extent the transaction price includes variable consideration, we estimate the amount of variable consideration that should be included in the transaction price utilizing either the expected value method or the most likely amount method depending on the nature of the variable consideration. Variable consideration is included in the transaction price if, in our judgment, it is probable that a significant future reversal of cumulative revenue recognized under the contract will not occur. Any estimates, including the effect of the constraint on variable consideration, are evaluated at each reporting period. The amount of consideration is not adjusted for a significant financing component if the time between payment and the transfer of the related good or service is expected to be one year or less under the practical expedient in ASC 606-10-32-18. Our revenue arrangements are typically accounted for under such expedient, as payment is typically due within 30 to 60 days. As of December 31, 2019 and 2018, none of our contracts contained a significant financing component.

4) Allocate the transaction price to performance obligations in the contract

If the contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation based on a relative standalone selling price ("SSP") basis unless the transaction price is variable and meets the criteria to be allocated entirely to a performance obligation or to a distinct service that forms part of a single performance obligation. The consideration to be received is allocated among the separate performance obligations based on relative SSPs. The SSP is the price at which we would sell a promised good or service separately to a customer. The best estimate of SSP is the observable price of a good or service when we sell that good or service separately. A contractually stated price or a list price for a good or service may be the SSP of that good or service. We use a range of amounts to estimate SSP when we sell each of the goods and services separately and need to determine whether there is a discount that needs to be allocated based on the relative SSP of the various goods and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we typically determine the SSP using an adjusted market assessment approach using information that may include market conditions and other observable inputs. We typically have more than one SSP for individual goods and services due to the stratification of those goods and services by customers and circumstances. In these instances, we may use information such as the nature of the customer and distribution channel in determining the SSP.

5) Recognize revenue when or as we satisfy a performance obligation

We satisfy performance obligations either over time or at a point in time as discussed in further detail below. Revenue is recognized over time if 1) the customer simultaneously receives and consumes the benefits provided by our performance, 2) our performance creates or enhances an asset that the customer controls as the asset is created or enhanced, or 3) our performance does not create an asset with an alternative use to us and we have an enforceable right to payment for performance completed to date. If we do not satisfy a performance obligation over time, the related performance obligation is satisfied at a point in time by transferring the control of a promised good or service to a customer.

We categorize revenue as software licenses, software maintenance, services, or royalties. In addition to the general revenue recognition policies described above, specific revenue recognition policies apply to each category of revenue.

<u>Software licenses</u>

Software licenses consist of revenue from the sale of software licenses for biometrics and imaging applications. Our software licenses are functional intellectual property and typically provide customers with the right to use our software in perpetuity as it exists when made available to the customer. We recognize revenue from software licenses at a point in time upon delivery, provided all other revenue recognition criteria are met.

Software maintenance

Software maintenance consists of revenue from the sale of software maintenance contracts for biometrics and imaging software. Software maintenance contracts entitle customers to receive software support and software updates, if and when they become available, during the term of the maintenance contract. Software support and software updates are considered distinct services. However, these distinct services are considered a single performance obligation consisting of a series of distinct services that are substantially the same and have the same pattern of transfer to the customer. We recognize software maintenance revenue over time on a straight-line basis over the contract period.

Services

Service revenue consists of fees from biometrics customers for software engineering services we provide to them. We recognize services revenue over time as the services are delivered using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted), provided all other revenue recognition criteria are met.

Refer to Note 8 – Business Segments and Major Customers for further information on the disaggregation of revenue, including revenue by geography and category.

Arrangements with multiple performance obligations

In addition to selling software licenses, software maintenance and software services on a standalone basis, a significant portion of our contracts include multiple performance obligations. The various combinations of multiple performance obligations and our revenue recognition for each are described as follows:

- Software licenses and software maintenance. When software licenses and software maintenance contracts are sold together, the software licenses and software maintenance are generally considered distinct performance obligations. The transaction price is allocated to the software licenses and the software maintenance based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery, provided all other revenue recognition criteria are met. Revenue allocated to the software maintenance is recognized over time on a straight-line basis over the contract period.

- Software licenses and services. When software licenses and significant customization engineering services are sold together, they are accounted for as a combined performance obligation, as the software licenses are generally highly dependent on, and interrelated with, the associated services and therefore are not distinct performance obligations. Revenue for the combined performance obligation is recognized over time as the services are delivered using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). When software licenses and standard implementation or consulting-type services are sold together, they are generally considered distinct performance obligations, as the software licenses are not dependent on or interrelated with the associated services. The transaction price in these arrangements is allocated to the software licenses and services based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery, provided all other revenue recognition criteria are met. Revenue allocated to the services is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). In arrangements with both software licenses and services, the software license portion of the arrangement is classified as software license revenue and the services portion is classified as services revenue in our consolidated statements of operations.

- Software licenses, software maintenance and services. When we sell software licenses, software maintenance and software services together, we account for the individual performance obligations separately if they are distinct. The transaction price is allocated to the separate performance obligations based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery. Revenue allocated to the services is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). Revenue for the software maintenance is recognized over time on a straight-line basis over the contract period. However, if the software services are significant customization engineering services, they are accounted for with the software licenses as a combined performance obligation, as stated above. Revenue for the combined performance obligation is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted).

Returns

We do not offer rights of return for our products and services in the normal course of business.

Customer Acceptance

Our contracts with customers generally do not include customer acceptance clauses.

Contract Balances

When the timing of our delivery of goods or services is different from the timing of payments made by customers, we recognize either a contract asset (performance precedes contractual due date) or a contract liability (customer payment precedes performance). Customers that prepay are represented by the deferred revenue below until the performance obligation is satisfied. Contract assets represent arrangements in which the good or service has been delivered but payment is not yet due. Our contract assets consist of unbilled receivables. Our contract liabilities consisted of deferred (unearned) revenue, which is generally related to software maintenance contracts. We classify deferred revenue as current or noncurrent based on the timing of when we expect to recognize revenue.

The following table presents changes in our contract assets and liabilities during the years ended December 31, 2018 and 2019 (in thousands):

	Balance at Beginning of Period	Revenue Recognized In Advance of Billings	Billings	Balance at End of Period
Year ended December 31, 2018				
Contract assets:				
Unbilled receivables	$ 1,429	$ 3,278	$ (1,428)	$ 3,279
Year ended December 31, 2019				
Contract assets:				
Unbilled receivables	$ 3,279	$ 2,638	$ (2,602)	$ 3,315

	Balance at Beginning of Period	Billings	Revenue Recognized	Balance at End of Period
Year ended December 31, 2018				
Contract liabilities:				
Deferred revenue	$ 2,932	$ 5,564	$ (5,397)	$ 3,099
Year ended December 31, 2019				
Contract liabilities:				
Deferred revenue	$ 3,099	$ 5,006	$ (5,268)	$ 2,837

Remaining Performance Obligations

Remaining performance obligations represent the transaction price from contracts for which work has not been performed or goods and services have not been delivered. We expect to recognize revenue on approximately 67% of the remaining performance obligations over the next 12 months, with the remainder recognized thereafter. As of December 31, 2019, the aggregate amount of the transaction price allocated to remaining performance obligations for software maintenance contracts with a duration greater than one year was $1.4 million.

Contract Costs

We recognize an other asset for the incremental costs of obtaining a contract with a customer if we expect the benefit of those costs to be longer than one year. We have determined that certain sales commissions meet the requirements to be capitalized, and we amortize these costs on a consistent basis with the pattern of transfer of the goods and services in the contract. Total capitalized costs to obtain a contract were immaterial during the periods presented and are included in other current and long-term assets on our consolidated balance sheets.

We apply a practical expedient to expense costs as incurred for costs to obtain a contract when the amortization period is one year or less. These costs include sales commissions on software maintenance contracts with a contract period of one year or less as sales commissions paid on contract renewals are commensurate with those paid on the initial contract.

Stock-Based Compensation. We grant stock and stock options to our employees and directors. We measure stock-based compensation cost at the grant date based on the fair value of the award and recognize it as expense over the applicable vesting period of the award using the straight-line basis.

For stock awards, we determine the fair value of the award by using the fair market value of our stock on the date of grant; provided the number of shares in the grant is fixed on the grant date.

For stock options, we use the Black-Scholes valuation model to estimate the fair value of the award. This valuation model takes into account the exercise price of the award, as well as a variety of significant assumptions. The assumptions used to estimate the fair value of stock options include the expected term, the expected volatility of our stock over the expected term, the risk-free interest rate over the expected term, and our expected annual dividend yield.

Income taxes. As part of the process of preparing our consolidated financial statements we are required to estimate our actual current tax expense. We must also estimate temporary and permanent differences that result from differing treatment of certain items for tax and accounting purposes. These differences result in deferred tax assets and liabilities, which are included in our consolidated balance sheet. We must then assess the likelihood that our deferred tax assets will be recovered from future taxable income and to the extent we believe recovery is not likely, we must establish a valuation allowance. To the extent we establish a valuation allowance or increase this allowance in a period for deferred tax assets, which have been recognized, we must include an expense with the tax provision in the statement of operations. Conversely, to the extent we decrease our valuation allowance in a period for deferred tax assets, which have been previously reserved, we must include a tax benefit with the tax provision in the statement of operations.

Significant management judgment is required in determining our provision for income taxes, our deferred tax assets, and any valuation allowance recorded against our net deferred tax assets. Our deferred tax assets primarily relate to: i) research and development tax credit carryforwards related to excess stock compensation benefits, that are now recorded as tax assets as a result of the adoption of ASU 2016-09, that was effective on January 1, 2017; ii) net operating loss carryforwards; and iii) temporary differences that result from differing treatment of certain items for tax and accounting purposes. As of December 31, 2019, we had a total of $6.3 million of deferred tax assets for which we have recorded a $6.3 million valuation allowance.

We will continue to assess the level of valuation allowance required in future periods. Should evidence regarding the realizability of tax assets change at a future point in time, the valuation allowance will be adjusted accordingly.

Allowance for doubtful accounts. We make judgments as to our ability to collect outstanding receivables and provide allowances for receivables when collection becomes doubtful. Provisions are made based upon a specific review of all significant outstanding invoices. If the judgments we make to determine the allowance for doubtful accounts do not reflect the future ability to collect outstanding receivables, additional provisions for doubtful accounts may be required.

RECENT ACCOUNTING PRONOUNCEMENTS

Recently Adopted Accounting Pronouncements

None.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Aware, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Aware, Inc. and its subsidiary (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations, stockholders' equity and cash flows for the years then ended, and the related notes to the consolidated financial statements (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ RSM US LLP

We have served as the Company's auditor since 2012.

Boston, Massachusetts
February 18, 2020

AWARE, INC.
CONSOLIDATED BALANCE SHEETS
(in thousands, except share data)

	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 47,742	$ 51,612
Accounts receivable (less allowance for doubtful accounts of $20 at December 31, 2019 and 2018)	2,487	2,010
Unbilled receivables	3,315	3,279
Prepaid expenses and other current assets	256	284
Total current assets	53,800	57,185
Property and equipment, net	3,755	4,085
Deferred tax assets	-	5,171
Total assets	$ 57,555	$ 66,441
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 187	$ 126
Accrued expenses	1,096	1,319
Deferred revenue	2,777	3,024
Total current liabilities	4,060	4,469
Long-term deferred revenue	60	75
Commitments and contingent liabilities (Note 7)		
Stockholders' equity:		
Preferred stock, $1.00 par value; 1,000,000 shares authorized, none outstanding	-	-
Common stock, $.01 par value; shares authorized, 70,000,000 in 2019 and 2018; issued and outstanding 21,442,781 as of December 31, 2019 and 21,515,872 as of December 31, 2018	214	215
Additional paid-in capital	96,255	96,376
Accumulated deficit	(43,034)	(34,694)
Total stockholders' equity	53,435	61,897
Total liabilities and stockholders' equity	$ 57,555	$ 66,441

The accompanying notes are an integral part of the consolidated financial statements.

AWARE, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years ended December 31, 2019	Years ended December 31, 2018
Revenue:		
Software licenses	$ 4,599	$ 8,038
Software maintenance	5,262	5,397
Services	2,343	2,696
Total revenue	12,204	16,131
Costs and expenses:		
Cost of software licenses	-	20
Cost of services	1,261	1,220
Research and development	7,928	7,105
Selling and marketing	3,610	4,178
General and administrative	3,583	3,296
Total costs and expenses	16,382	15,819
Patent related income	49	69
Operating income (loss)	(4,129)	381
Interest income	1,000	844
Income (loss) before provision (benefit) for income taxes	(3,129)	1,225
Provision (benefit) for income taxes	5,211	(8)
Net income (loss)	$ (8,340)	$ 1,233
Net income (loss) per share – basic	$ (0.39)	$ 0.06
Net income (loss) per share – diluted	$ (0.39)	$ 0.06
Weighted-average shares - basic	21,523	21,544
Weighted-average shares - diluted	21,523	21,605

The accompanying notes are an integral part of the consolidated financial statements.

AWARE, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years ended December 31,	
	2019	**2018**
Cash flows from operating activities:		
Net income (loss)	$ (8,340)	$ 1,233
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation	441	443
Stock-based compensation	692	580
Deferred tax assets	5,171	(100)
Increase (decrease) from changes in assets and liabilities:		
Accounts receivable	(477)	379
Unbilled receivables	(36)	(1,850)
Prepaid expenses and other current assets	28	(68)
Accounts payable	61	(40)
Accrued expenses	(223)	(82)
Accrued income taxes	-	(2)
Deferred revenue	(262)	167
Net cash provided by (used in) operating activities	(2,945)	660
Cash flows from investing activities:		
Purchases of property and equipment	(111)	(206)
Net cash used in investing activities	(111)	(206)
Cash flows from financing activities:		
Proceeds from issuance of common stock	43	50
Payments made for taxes of employees who surrendered shares related to unrestricted stock	(92)	(107)
Repurchase of common stock	(765)	(393)
Net cash used in financing activities	(814)	(450)
Increase/(decrease) in cash and cash equivalents	(3,870)	4
Cash and cash equivalents, beginning of year	51,612	51,608
Cash and cash equivalents, end of year	$ 47,742	$ 51,612
Supplemental disclosure:		
Cash paid for income taxes	$ 43	$ 96

The accompanying notes are an integral part of the consolidated financial statements.

AWARE, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock Shares	Common Stock Amount	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	(Accumulated Deficit)	Total Stockholders' Equity
Balance at December 31, 2017	21,493	$ 215	$ 96,246	$ -	$ (35,927)	$ 60,534
Issuance of unrestricted stock	136	1	(1)			-
Shares surrendered by employees to pay taxes related to unrestricted stock	(25)	-	(107)			(107)
Issuance of common stock under employee stock purchase plan	14	-	50			50
Stock-based compensation expense			580			580
Repurchase of common stock	(102)	(1)	(392)			(393)
Net income					1,233	1,233
Balance at December 31, 2018	21,516	215	96,376	-	(34,694)	61,897
Exercise of common stock options	4	-	-			-
Performance share award	30	-	-			-
Issuance of unrestricted stock	140	1	(1)			-
Shares surrendered by employees to pay taxes related to unrestricted stock	(27)	-	(92)			(92)
Issuance of common stock under employee stock purchase plan	14	-	43			43
Stock-based compensation expense			692			692
Repurchase of common stock	(234)	(2)	(763)			(765)
Net loss					(8,340)	(8,340)
Balance at December 31, 2019	21,443	$ 214	$ 96,255	$ -	$ (43,034)	$ 53,435

The accompanying notes are an integral part of the consolidated financial statements.

1. NATURE OF BUSINESS

We are primarily engaged in the development and sale of biometrics products, solutions and services. Our software products are used in government and commercial systems and applications and fulfill a broad range of functions critical to secure biometric enrollment, authentication, identity and transactions. Principal government applications of biometrics systems include border control, visa applicant screening, law enforcement, national defense, intelligence, secure credentialing, access control, and background checks. Principal commercial applications include: i) user enrollment and authentication used for login to mobile devices, computers, networks, and software programs; ii) user authentication for financial transactions and purchases (online and in-person); iii) physical access control to buildings; and iv) identity proofing of prospective employees and customers. We sell our biometrics software products and services globally through a multifaceted distribution strategy using systems integrators, original equipment manufacturers ("OEMs"), value added resellers ("VARs"), partners, and directly to end user customers. We also derive a portion of our revenue from the sale of imaging software licenses to OEMs and systems integrators that incorporate our software into medical imaging products and medical systems.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation - The consolidated financial statements include the accounts of Aware, Inc. and its subsidiary ("the Company"). All significant intercompany transactions have been eliminated.

Use of Estimates – The preparation of our financial statements in conformity with accounting principles generally accepted in the United States of America requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amount of revenues and expenses during the reporting period. The most significant estimates included in the financial statements pertain to revenue recognition, reserves for doubtful accounts, useful lives of fixed assets, valuation allowance for deferred income tax assets, and accrued liabilities. Actual results could differ from those estimates.

Fair Value Measurements - The Financial Accounting Standards Board ("FASB") Codification defines fair value, and establishes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to the unadjusted quoted prices in active markets for identical assets or liabilities (level 1 measurements) and the lowest priority to unobservable inputs (level 3 measurements). The three levels of the fair value hierarchy under the FASB Codification are: i) Level 1 – valuations that are based on quoted prices (unadjusted) in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date; ii) Level 2 – valuations that are based on quoted prices in markets that are not active or for which all significant inputs are observable, either directly or indirectly; and iii) Level 3 – valuations that require inputs that are both significant to the fair value measurement and unobservable.

Cash and cash equivalents, which primarily include money market mutual funds, were $47.7 million and $51.6 million at December 31, 2019 and December 31, 2018, respectively. We classified our cash equivalents of $46.2 million and $47.9 million as of December 31, 2019 and 2018, respectively, within Level 1 of the fair value hierarchy because they are valued using quoted market prices.

As of December 31, 2019, our assets that are measured at fair value on a recurring basis and whose carrying values approximate their respective fair values include the following (in thousands):

	Fair Value Measurement at December 31, 2019 Using:		
	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds (included in cash and cash equivalents)	$ 46,174	$ -	$ -
Total	$ 46,174	$ -	$ -

As of December 31, 2018, our assets that are measured at fair value on a recurring basis and whose carrying values approximate their respective fair values include the following (in thousands):

	Fair Value Measurement at December 31, 2018 Using:		
	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Money market funds (included in cash and cash equivalents)	$ 47,939	$ -	$ -
Total	$ 47,939	$ -	$ -

Cash and Cash Equivalents – Cash and cash equivalents, which consist primarily of money market funds and demand deposits, are stated at fair value. All highly liquid investments purchased with an original maturity of three months or less are considered cash equivalents. Our cash balances exceed the Federal Deposit Insurance Corporation limits. The Company does not believe it is exposed to significant credit risk related to cash and cash equivalents.

Allowance for Doubtful Accounts – Accounts are charged to the allowance for doubtful accounts as they are deemed uncollectible based on a periodic review of the accounts.

For the years ended December 31, 2019 and 2018, changes to and ending balances of the allowance for doubtful accounts were as follows (in thousands):

	Years ended December 31,	
	2019	2018
Allowance for doubtful accounts balance - beginning of year	$ 20	$ 20
Additions to the allowance for doubtful accounts	-	-
Deductions against the allowance for doubtful accounts	-	-
Allowance for doubtful accounts balance - end of year	$ 20	$ 20

Property and Equipment – Property and equipment is stated at cost. Depreciation and amortization of property and equipment is provided using the straight-line method over the estimated useful lives of the assets. Upon retirement or sale, the costs of the assets disposed of and the related accumulated depreciation are removed from the accounts and any resulting gain or loss on disposal is included in the determination of income or loss. Expenditures for repairs and maintenance are charged to expense as incurred.

The estimated useful lives of assets used by us are:

Building	30 years
Building improvements	5 to 20 years
Furniture and fixtures	5 years
Computer, office& manufacturing equipment	3 years
Purchased software	3 years

Impairment of Long-Lived Assets – We review long-lived assets for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable or that the useful lives of these assets are no longer appropriate. Each impairment test is based on a comparison of the undiscounted cash flows estimated to be generated by those assets over their estimated economic life to the related carrying value of those assets to determine if the assets are impaired. If an impairment is indicated, the asset is written down to its estimated fair value. The cash flow estimates used to identify the potential impairment reflect our best estimates using appropriate assumptions and projections at that time. We believe that no significant impairment of our long-lived assets has occurred as of December 31, 2019 and 2018.

Revenue recognition. Effective January 1, 2018, we adopted Accounting Standards Codification ("ASC"), Topic 606, Revenue from Contracts with Customers ("ASC 606"), using the full retrospective transition method.

In accordance with ASC 606, revenue is recognized when a customer obtains control of promised goods and services. The amount of revenue recognized reflects the consideration to which we expect to be entitled to receive in exchange for these goods and services. In addition, ASC 606 requires disclosures of the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers.

The core principle of the standard is that we should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services. To achieve that core principle, we should apply the following five step model:

1. Identify the contract with the customer;
2. Identify the performance obligations in the contract;
3. Determine the transaction price;
4. Allocate the transaction price to the performance obligations in the contract; and
5. Recognize revenue when (or as) each performance obligation is satisfied.

1) Identify the contract with the customer

A contract with a customer exists when (i) we enter into an enforceable contract with a customer that defines each party's rights regarding the goods or services to be transferred and identifies the related payment terms, (ii) the contract has commercial substance, and (iii) we determine that collection of substantially all consideration for goods and services that are transferred is probable based on the customer's intent and ability to pay the promised consideration. We apply judgment in determining the customer's intent and ability to pay, which is based on a variety of factors including the customer's historical payment experience, or in the case of a new customer, published credit and financial information pertaining to the customer.

We evaluate contract modifications for the impact on revenue recognition if they have been approved by both parties such that the enforceable rights and obligations under the contract have changed. Contract modifications are either accounted for using a cumulative effect adjustment or prospectively over the remaining term of the arrangement. The determination of which method is more appropriate depends on the nature of the modification, which we evaluate on a case-by-case basis.

We combine two or more contracts entered into at or near the same time with the same customer and account for them as a single contract if (i) the contracts are negotiated as a package with a common commercial objective, (ii) the amount of consideration to be paid in one contract depends on the price or performance of the other contract, or (iii) some or all of the goods or services in one contract would be combined with some or all of the goods and services in the other contract into a single performance obligation. If two or more contracts are combined, the consideration to be paid is aggregated and allocated to the individual performance obligations without regard to the consideration specified in the individual contracts.

2) Identify the performance obligations in the contract

Performance obligations promised in a contract are identified based on the goods and services that will be transferred to the customer that are both capable of being distinct, whereby the customer can benefit from the good or service either on its own or together with other available resources, and are distinct in the context of the contract, whereby the transfer of the good or service is separately identifiable from other promises in the contract. To the extent a contract includes multiple promised goods and services, we apply judgment to determine whether promised goods and services are capable of being distinct and distinct in the context of the contract. If these criteria are not met, the promised goods and services are accounted for as a combined performance obligation. To identify performance obligations, we consider all of the goods or services promised in a contract regardless of whether they are explicitly stated or are implied by customary business practices.

3) Determine the transaction price

The transaction price is determined based on the consideration we expect to be entitled in exchange for transferring promised goods and services to the customer. Determining the transaction price requires significant judgment. To the extent the transaction price includes variable consideration, we estimate the amount of variable consideration that should be included in the transaction price utilizing either the expected value method or the most likely amount method depending on the nature of the variable consideration. Variable consideration is included in the transaction price if, in our judgment, it is probable that a significant future reversal of cumulative revenue recognized under the contract will not occur. Any estimates, including the effect of the constraint on variable consideration, are evaluated at each reporting period. The amount of consideration is not adjusted for a significant financing component if the time between payment and the transfer of the related good or service is expected to be one year or less under the practical expedient in ASC 606-10-32-18. Our revenue arrangements are typically accounted for under such expedient, as payment is typically due within 30 to 60 days. As of December 31, 2019 and 2018, none of our contracts contained a significant financing component.

4) Allocate the transaction price to performance obligations in the contract

If the contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price to each performance obligation based on a relative standalone selling price (“SSP”) basis unless the transaction price is variable and meets the criteria to be allocated entirely to a performance obligation or to a distinct service that forms part of a single performance obligation. The consideration to be received is allocated among the separate performance obligations based on relative SSPs. The SSP is the price at which we would sell a promised good or service separately to a customer. The best estimate of SSP is the observable price of a good or service when we sell that good or service separately. A contractually stated price or a list price for a good or service may be the SSP of that good or service. We use a range of amounts to estimate SSP when we sell each of the goods and services separately and need to determine whether there is a discount that needs to be allocated based on the relative SSP of the various goods and services. In instances where SSP is not directly observable, such as when we do not sell the product or service separately, we typically determine the SSP using an adjusted market assessment approach using information that may include market conditions and other observable inputs. We typically have more than one SSP for individual goods and services due to the stratification of those goods and services by customers and circumstances. In these instances, we may use information such as the nature of the customer and distribution channel in determining the SSP.

5) Recognize revenue when or as we satisfy a performance obligation

We satisfy performance obligations either over time or at a point in time as discussed in further detail below. Revenue is recognized over time if 1) the customer simultaneously receives and consumes the benefits provided by our performance, 2) our performance creates or enhances an asset that the customer controls as the asset is created or enhanced, or 3) our performance does not create an asset with an alternative use to us and we have an enforceable right to payment for performance completed to date. If we do not satisfy a performance obligation over time, the related performance obligation is satisfied at a point in time by transferring the control of a promised good or service to a customer.

We categorize revenue as software licenses, software maintenance, or services. In addition to the general revenue recognition policies described above, specific revenue recognition policies apply to each category of revenue.

Software licenses

Software licenses consist of revenue from the sale of software licenses for biometrics and imaging applications. Our software licenses are functional intellectual property and typically provide customers with the right to use our software in perpetuity as it exists when made available to the customer. We recognize revenue from software licenses at a point in time upon delivery, provided all other revenue recognition criteria are met.

Software maintenance

Software maintenance consists of revenue from the sale of software maintenance contracts for biometrics and imaging software. Software maintenance contracts entitle customers to receive software support and software updates, if and when they become available, during the term of the maintenance contract. Software support and software updates are considered distinct services. However, these distinct services are considered a single performance obligation consisting of a series of distinct services that are substantially the same and have the same pattern of transfer to the customer. We recognize software maintenance revenue over time on a straight-line basis over the contract period.

Services

Service revenue consists of fees from biometrics customers for software engineering services we provide to them. We recognize services revenue over time as the services are delivered using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted), provided all other revenue recognition criteria are met.

Refer to Note 8 – Business Segments and Major Customers for further information on the disaggregation of revenue, including revenue by geography and category.

Arrangements with multiple performance obligations

In addition to selling software licenses, software maintenance and software services on a standalone basis, a significant portion of our contracts include multiple performance obligations. The various combinations of multiple performance obligations and our revenue recognition for each are described as follows:

- Software licenses and software maintenance. When software licenses and software maintenance contracts are sold together, the software licenses and software maintenance are generally considered distinct performance obligations. The transaction price is allocated to the software licenses and the software maintenance based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery, provided all other revenue recognition criteria are met. Revenue allocated to the software maintenance is recognized over time on a straight-line basis over the contract period.

- Software licenses and services. When software licenses and significant customization engineering services are sold together, they are accounted for as a combined performance obligation, as the software licenses are generally highly dependent on, and interrelated with, the associated services and therefore are not distinct performance obligations. Revenue for the combined performance obligation is recognized over time as the services are delivered using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). When software licenses and standard implementation or consulting-type services are sold together, they are generally considered distinct performance obligations, as the software licenses are not dependent on or interrelated with the associated services. The transaction price in these arrangements is allocated to the software licenses and services based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery, provided all other revenue recognition criteria are met. Revenue allocated to the services is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). In arrangements with both software licenses and services, the software license portion of the arrangement is classified as software license revenue and the services portion is classified as services revenue in our consolidated statements of operations.

- Software licenses, software maintenance and services. When we sell software licenses, software maintenance and software services together, we account for the individual performance obligations separately if they are distinct. The transaction price is allocated to the separate performance obligations based on relative SSP. Revenue allocated to the software licenses is recognized at a point in time upon delivery. Revenue allocated to the services is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted). Revenue for the software maintenance is recognized over time on a straight-line basis over the contract period. However, if the software services are significant customization engineering services, they are accounted for with the software licenses as a combined performance obligation, as stated above. Revenue for the combined performance obligation is recognized over time using an input method (i.e., labor hours incurred as a percentage of total labor hours budgeted).

Returns

We do not offer rights of return for our products and services in the normal course of business.

Customer Acceptance

Our contracts with customers generally do not include customer acceptance clauses.

Contract Balances

When the timing of our delivery of goods or services is different from the timing of payments made by customers, we recognize either a contract asset (performance precedes contractual due date) or a contract liability (customer payment precedes performance). Customers that prepay are represented by the deferred revenue below until the performance obligation is satisfied. Contract assets represent arrangements in which the good or service has been delivered but payment is not yet due. Our contract assets consist of unbilled receivables. Our contract liabilities consisted of deferred (unearned) revenue, which is generally related to software maintenance contracts. We classify deferred revenue as current or noncurrent based on the timing of when we expect to recognize revenue.

The following table presents changes in our contract assets and liabilities during the years ended December 31, 2018 and 2019 (in thousands):

	Balance at Beginning of Period	Revenue Recognized In Advance of Billings	Billings	Balance at End of Period
Year ended December 31, 2018				
Contract assets:				
Unbilled receivables	$ 1,429	$ 3,278	$ (1,428)	$ 3,279
Year ended December 31, 2019				
Contract assets:				
Unbilled receivables	$ 3,279	$ 2,638	$ (2,602)	$ 3,315

	Balance at Beginning of Period	Billings	Revenue Recognized	Balance at End of Period
Year ended December 31, 2018				
Contract liabilities:				
Deferred revenue	$ 2,932	$ 5,564	$ (5,397)	$ 3,099
Year ended December 31, 2019				
Contract liabilities:				
Deferred revenue	$ 3,099	$ 5,006	$ (5,268)	$ 2,837

Remaining Performance Obligations

Remaining performance obligations represent the transaction price from contracts for which work has not been performed or goods and services have not been delivered. We expect to recognize revenue on approximately 67% of the remaining performance obligations over the next 12 months, with the remainder recognized thereafter. As of December 31, 2019, the aggregate amount of the transaction price allocated to remaining performance obligations with a duration greater than one year, comprised of software maintenance contracts, was $1.4 million.

Contract Costs

We recognize an other asset for the incremental costs of obtaining a contract with a customer if we expect the benefit of those costs to be longer than one year. We have determined that certain sales commissions meet the requirements to be capitalized, and we amortize these costs on a consistent basis with the pattern of transfer of the goods and services in the contract. Total capitalized costs to obtain a contract were immaterial during the periods presented and are included in other current and long-term assets on our consolidated balance sheets.

We apply a practical expedient to expense costs as incurred for costs to obtain a contract when the amortization period is one year or less. These costs include sales commissions on software maintenance contracts with a contract period of one year or less as sales commissions paid on contract renewals are commensurate with those paid on the initial contract.

Income Taxes – We compute deferred income taxes based on the differences between the financial statement and tax basis of assets and liabilities using enacted rates in effect in the years in which the differences are expected to reverse. We establish a valuation allowance to offset temporary deductible differences, net operating loss carryforwards and tax credits when it is more likely than not that the deferred tax assets will not be realized.

We recognize the tax benefit from an uncertain tax position only if it is more-likely-than-not that the tax position will be sustained upon examination by the taxing authorities, based on the technical merits of the tax position. The evaluation of an uncertain tax position is based on factors that include, but are not limited to, changes in the tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, and changes in facts or circumstances related to a tax position. Any changes to these estimates, based on the actual results obtained and/or a change in assumptions, could impact our tax provision in future periods. Interest and penalty charges, if any, related to unrecognized tax benefits would be classified as a provision for income tax in the consolidated statements of operations.

Capitalization of Software Costs – We capitalize certain internally developed software development costs after technological feasibility of the product has been established. No software costs were capitalized during the years ended December 31, 2019 and 2018, because such costs incurred subsequent to the establishment of technological feasibility, but prior to commercial availability, were immaterial.

Research and Development Costs – Costs incurred in the research and development of our products are expensed as incurred.

Concentration of Credit Risk – At December 31, 2019 and 2018, we had cash and cash equivalents, in excess of federally insured deposit limits of approximately $47.5 million and $51.4 million, respectively.

Concentration of credit risk with respect to net accounts receivable and unbilled receivables consisted of amounts owed by the following customers that comprised more than 10% of net accounts receivable and unbilled receivables at December 31:

	2019	2018
Customer A	72%	46%
Customer B	3%	19%

Stock-Based Compensation – We grant stock and stock options to our employees and directors. We measure stock-based compensation cost at the grant date based on the fair value of the award and recognize stock-based compensation expense on a straight-line basis over the requisite service period of the award.

For stock awards, we determine the fair value of the award by using the fair market value of our stock on the date of grant; provided the number of shares in the grant is fixed on the grant date.

For stock options, we use the Black-Scholes option valuation model to estimate the fair value of the award. This valuation model takes into account the exercise price of the award, as well as a variety of significant assumptions. The assumptions used to estimate the fair value of stock options include the expected term, the expected volatility of our stock over the expected term, the risk-free interest rate over the expected term, and our expected annual dividend yield.

Computation of Earnings per Share – Basic earnings per share is computed by dividing income available to common shareholders by the weighted average number of common shares outstanding. Diluted earnings per share is computed by dividing income available to common shareholders by the weighted average number of common shares outstanding plus additional common shares that would have been outstanding if dilutive potential common shares had been issued. For the purposes of this calculation, stock options are considered common stock equivalents in periods in which they have a dilutive effect. Stock options that are antidilutive are excluded from the calculation.

Fair Value of Financial Instruments – The carrying amounts of cash and cash equivalents, accounts receivable, accounts payable and accrued expenses approximate fair value because of their short-term nature.

Advertising Costs **–** Advertising costs are expensed as incurred and were not material for 2019 and 2018.

Recent Accounting Pronouncements:

Recently Adopted Accounting Pronouncements

None.

Segments **–** We organize ourselves into a single segment reporting to the chief operating decision maker. We have sales outside of the United States, which are described in Note 8. All long-lived assets are maintained in the United States.

3. PATENT RELATED INCOME

The composition of patent related income in 2019 and 2018 was as follows:

Years ended December 31, 2019 and 2018. We entered into an arrangement with an unaffiliated third party in 2010 under which we assigned certain patents in return for royalties on proceeds from patent monetization efforts by the third party. The third party has engaged in various patent monetization activities, including enforcement, litigation and licensing. The party reported and we recorded $49,000 and $69,000 of income from this arrangement in the years ended December 31, 2019 and 2018, respectively.

4. PROPERTY AND EQUIPMENT

Property and equipment consisted of the following at December 31 (in thousands):

	2019	2018
Land	$ 1,056	$ 1,056
Building and improvements	9,071	9,060
Computer equipment	830	795
Purchased software	117	81
Furniture and fixtures	778	778
Office equipment	100	138
Total	11,952	11,908
Less accumulated depreciation	(8,197)	(7,823)
Property and equipment, net	$ 3,755	$ 4,085

Depreciation expense was $0.4 million for the years ended December 31, 2019 and 2018. In 2019 and 2018, we identified $0.1 million of assets no longer in use and retired the assets and related accumulated depreciation.

5. INCOME TAXES

We recorded a provision for income taxes in the year ended December 31, 2019 of $5.2 million. We recorded a benefit from income taxes of $8,000 in the year ended December 31, 2018. The components of the provision for income taxes are as follows (in thousands):

	Year ended December 31,	
	2019	2018
Current:		
Federal	8	54
State	32	38
	40	92
Deferred:		
Federal	4,965	(22)
State	206	(78)
	5,171	(100)
Provision for (benefit from) income taxes	$ 5,211	$ (8)

A reconciliation of the U.S. federal statutory rate to the effective tax rate is as follows:

	Year ended December 31,	
	2019	2018
Federal statutory rate	21%	21%
State rate, net of federal benefit	6	6
Tax credits	10	(26)
Permanent adjustments	(1)	1
FDII deduction	-	(4)
Change in valuation allowance	(202)	-
Other	(1)	1
Effective tax rate	(167)%	(1)%

Total income tax provision for the year ended December 31, 2019 was $5.2 million. The increase in the income tax provision for 2019 was primarily due to the change in valuation allowance for our deferred tax assets.

Total income tax benefit for the year ended December 31, 2018 was $8,000. Income tax benefit for 2018 was based on: i) the U.S. statutory rate of 21%, ii) increased by state income taxes and permanent adjustments; and iii) reduced by Foreign-Derived Intangible Income ("FDII") deduction and research tax credits.

As of December 31, 2019, we had deferred tax assets of $6.3 million for which we recorded a $6.3 million valuation allowance. As of December 31, 2018, we had deferred tax assets of $5.2 million for which we recorded no valuation allowance. The principal components of deferred tax assets were as follows at December 31 (in thousands):

	2019	2018
Depreciation	$ 354	$ 327
Stock compensation	115	87
Research and development credits	4,975	4,689
Net operating loss	789	-
Other	92	68
Total	6,325	5,171
Less valuation allowance	(6,325)	-
Deferred tax assets, net	$ -	$ 5,171

As of December 31, 2019, we had a total of $6.3 million of deferred tax assets, of which $5.0 million relates to research credit carryforwards. We have assessed the need for a valuation allowance on our deferred tax assets. We evaluated and considered all available evidence, both positive and negative, to determine whether, based on the weight of that evidence, a valuation allowance for deferred tax assets was needed. As part of this analysis we have given more weight to recent, historical evidence than future projections as we consider the past more objective. As of the fourth quarter of 2019, we have a cumulative pretax loss over the most recent three-year period including a pretax loss of $3.1 million in 2019. We considered the cumulative loss as of the end of the fourth quarter of 2019 to be significant negative evidence in the overall analysis. Prior to this quarter, we have incurred pretax income cumulatively when calculating it for the twelve most recent quarters, however, the levels of pretax income have been declining in recent periods, most notably as of the fourth quarter of 2019 as a result of certain internal changes.

In September 2019, we appointed a new Chief Executive Officer and, as a result, we reviewed and made changes to our strategy and business plans. As a result, we will be making additional investments in research, product development and sales and marketing including additional headcount. These changes in strategy and additional investment started in the fourth quarter of 2019 and will continue over the proceeding years. Our pretax income forecasts are highly predicated upon new product development and penetrating new markets. Therefore, this evidence is given nominal weight in the analysis compared to the recent history of losses and anticipated investment.

Further, a significant portion of our deferred tax assets relates to federal and state research credits. These credits may only offset 75% of the tax liability after net operating loss carryforwards are utilized and thus, we have the risk that the credits could expire before utilization if sufficient taxable income in the carryforward periods doesn't exist.

Based upon the information available to us at this time, the above analysis of evidence represents our best estimate regarding the utilization of the deferred tax assets, and we have concluded that it is more likely than not that the deferred tax assets of $6.3 million will not be realized. Therefore, we have recorded a full valuation allowance of $6.3 million against our deferred tax assets during the fourth quarter of 2019. We will continue to monitor the evidence and the realizability of our deferred tax assets in future periods. Should evidence regarding the realizability of our deferred tax assets change at a future point in time, we will adjust the valuation allowance as required.

A rollforward of the uncertain tax position that was primarily related to our research and development tax credits is as follows (in thousands):

Uncertain tax positions at December 31, 2017	$	998
Increase due to positions taken in prior periods		-
Uncertain tax positions at December 31, 2018		998
Increase due to positions taken in prior periods		10
Uncertain tax positions at December 31, 2019	$	1,008

Uncertain tax positions of $0.8 million will impact our tax rate if realized. The difference between this amount and the total uncertain tax positions in the table above is the federal tax effect on state tax credits.

The tax years from 2016 through 2019 are subject to examination by the IRS and the tax years 2003 through 2019 are subject to examination by state tax authorities.

6. EQUITY AND STOCK COMPENSATION PLANS

Fixed Stock Option Plan – We have one active fixed stock option plan which is our 2001 Nonqualified Stock Plan ("2001 Plan"). We are authorized to grant nonqualified stock options, stock appreciation rights and stock awards to our employees and directors for up to 8,000,000 shares of common stock under this plan. As of December 31, 2019, there were 3,976,443 shares available for grant under the 2001 Plan.

Options are granted at exercise prices as determined by the Board of Directors and have terms ranging from four to a maximum of ten years. Options generally vest over three to five years.

The following table presents stock-based employee compensation expenses included in our consolidated statements of income and comprehensive income (in thousands):

	Years ended December 31,	
	2019	**2018**
Cost of services	$ 18	$ 25
Research and development	117	101
Selling and marketing	57	13
General and administrative	500	441
Stock-based compensation expense	$ 692	$ 580

Stock-based compensation expense in the preceding table includes expenses associated with grants of: i) stock options, ii) unrestricted shares of our common stock; and iii) performance share awards. The methods used to determine stock-based compensation expense for each type of equity grant are described in the following paragraphs.

Stock Option Grants. For the years ended December 31, 2019 and 2018, we granted stock options for 435,000 and 0 shares of our common stock, respectively. We estimate the fair value of those stock options using the Black-Scholes valuation model.

The Black-Scholes valuation model takes into account the exercise price of the award, as well as a variety of significant assumptions. The assumptions used to estimate the fair value of stock options include the expected term, the expected volatility of our stock over the expected term, the risk-free interest rate over the expected term, and our expected annual dividend yield. We do not estimate our forfeiture rates as the actual forfeiture rate is known at the end of each reporting period due to the timing of our stock option vesting. We believe that the valuation technique and the approach utilized to develop the underlying assumptions are appropriate in calculating the fair values of stock options granted in the year ended December 31, 2019. Estimates of fair value are not intended to predict actual future events or the value ultimately realized by persons who receive equity awards.

Specific assumptions used to determine the fair value of options granted during the year ended December 31, 2019, using the Black-Scholes valuation model were:

	Year Ended December 31, 2019
Expected term (1)	6.08-6.18 years
Expected volatility factor (2)	35-46%
Risk-free interest rate (3)	1.51-1.66%
Expected annual dividend yield	n/a

(1) The expected term for each grant was determined based on the simplified method.

(2) The expected volatility for each grant is estimated based on an average of historical volatility over the expected term of the stock options.

(3) The risk-free interest rate for each grant is based on the U.S. Treasury yield curve in effect at the time of grant for a period equal to the expected term of the stock option.

Unrestricted Stock Grants. Our 2001 Plan permits us to grant shares of unrestricted stock to our directors, officers, and employees. Stock-based compensation expense for stock grants is determined based on the fair market value of our stock on the date of grant; provided the number of shares in the grant is fixed on the grant date. We granted 285,500, and 138,000 shares of unrestricted stock during the years ended December 31, 2019, and 2018, respectively.

The accounting treatment of unrestricted stock awards in 2019 and 2018 is described below:

Year ended December 31, 2019. In March 2019, we granted 143,000 shares of unrestricted stock to directors, officers and employees. The shares were issued in two equal installments shortly after June 30, 2019 and December 31, 2019. We expensed $547,000 of stock-based compensation expense related to this grant in the year ended December 31, 2019. There was no unamortized stock-based compensation charge associated with this stock grant as of December 31, 2019.

We issued shares of common stock related to the March 2019 grant as follows: i) 58,548 net shares of common stock were issued in early July 2019 after employees surrendered 12,952 shares for which we paid $43,000 of withholding taxes on their behalf; and ii) 56,605 net shares of common stock were issued in early January 2020 after employees surrendered 14,895 shares for which we paid $50,000 of withholding taxes on their behalf.

In September 2019, we granted 15,000 shares of unrestricted stock to an officer, the shares are to be issued in one installment shortly after December 31, 2019, provided the grantee is serving as a director, officer or employee on that date. The total stock-based compensation expense related to this grant was $41,000 and was expensed in 2019. We issued 15,000 shares of common stock related to this grant in early January 2020.

In September 2019, we granted 80,000 shares of unrestricted stock to an officer, the shares are to be issued in four equal installments shortly after September 19, 2020, September 19, 2021, September 19, 2022 and September 19, 2023, provided the grantee is serving as a director, officer or employee on those dates. The total stock-based compensation expense related to this grant is $220,000, of which $16,000 was charged to expense in 2019 and we anticipate the remaining $204,000 will be charged to expense ratably over the next fifteen quarters.

In October 2019, we granted 7,500 shares of unrestricted stock to an officer, the shares are to be issued in one installment shortly after December 31, 2019, provided the grantee is serving as a director, officer or employee on that date. The total stock-based compensation expense related to this grant was $22,000 and was expensed in 2019. We issued 7,500 shares of common stock related to this grant in early January 2020.

In October 2019, we granted 40,000 shares of unrestricted stock to an officer, the shares are to be issued in four equal installments shortly after October 1, 2020, October 1, 2021, October 1, 2022 and October 1, 2023, provided the grantee is serving as a director, officer or employee on those dates. The total stock-based compensation expense related to this grant is $117,000, of which $7,000 was charged to expense in 2019 and we anticipate the remaining $110,000 will be charged to expense ratably over the next fifteen quarters.

Year ended December 31, 2018. In March 2018, we granted 138,000 shares of unrestricted stock to directors, officers and employees. The shares were issued in two equal installments shortly after June 30, 2018 and December 31, 2018. We expensed $580,000 of stock-based compensation expense related to this grant in the year ended December 31, 2018. There was no unamortized stock-based compensation charge associated with this stock grant as of December 31, 2018.

We issued shares of common stock related to the March 2018 grant as follows: i) 57,592 net shares of common stock were issued in early July 2018 after employees surrendered 11,408 shares for which we paid $51,000 of withholding taxes on their behalf; and ii) 55,278 net shares of common stock were issued in early January 2019 after employees surrendered 13,722 shares for which we paid $50,000 of withholding taxes on their behalf.

Performance Share Awards. In September 2019, we granted 20,000 shares of stock to an officer as a performance share award under our 2001 Nonqualified Stock Plan. The shares were issued in September 2019 and will be forfeitable if the grantee is not serving as a director, officer or employee on March 19, 2020. Stock-based compensation expense for this stock grant was determined based on the fair market value of our stock on the date of grant, as the number of shares in the grant was fixed on the grant date. The total stock-based compensation expense related to this grant is $55,000, of which $31,000 was charged to expense in 2019 and we anticipate the remaining $24,000 will be charged in the first quarter of 2020.

In October 2019, we granted 10,000 shares of stock to an officer as a performance share award under our 2001 Nonqualified Stock Plan. The shares were issued in October 2019 and will be forfeitable if the grantee is not serving as a director, officer or employee on April 1, 2020. Stock-based compensation expense for this stock grant was determined based on the fair market value of our stock on the date of grant, as the number of shares in the grant was fixed on the grant date. The total stock-based compensation expense related to this grant is $29,000, of which $15,000 was charged to expense in 2019 and we anticipate the remaining $14,000 will be charged in the first and second quarter of 2020.

A summary of stock option transactions for our fixed stock option plan for the years ended December 31, 2019, and 2018 are presented below:

	2019		2018	
	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
Outstanding at beginning of year	18,000	$ 2.52	28,000	$ 2.97
Granted	435,000	$ 6.00	-	-
Exercised	18,000	$ 2.52	-	-
Forfeited or cancelled	-	-	(10,000)	3.77
Outstanding at end of year	435,000	$ 6.00	18,000	$ 2.52
Exercisable at year end	16,248	$ 6.00	18,000	$ 2.52

Total options outstanding at December 31, 2019 were 435,000. 16,248 of those options were vested and had a weighted average exercise price of $6.00.

Options to purchase up to 435,000 shares of our common stock were granted in the year ended December 31, 2019. No options were granted in the year ended December 31, 2018.

At December 31, 2019, the weighted average remaining contractual term for total options outstanding and total options exercisable was approximately 9.76 and 9.72 years, respectively.

At December 31, 2019, the aggregate intrinsic value of options outstanding and options exercisable was zero. The intrinsic value of a stock option is the amount by which the market value of the underlying stock exceeds the exercise price of the option.

The following table summarizes the stock options outstanding at December 31, 2019:

	Options Outstanding			Options Exercisable	
Exercise Price Range	Number	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Number	Weighted Average Exercise Price
$4 to $5	108,750	$ 4.50	9.7585	4,062	$ 4.50
$5 to $6	108,750	$ 5.50	9.7585	4,062	$ 5.50
$6 to $7	108,750	$ 6.50	9.7585	4,062	$ 6.50
$7 to $8	108,750	$ 7.50	9.7585	4,062	$ 7.50
	435,000	$ 6.00	9.7585	16,248	$ 6.00

At December 31, 2019, unrecognized compensation expense related to non-vested stock options was approximately $256,000, which is expected to be recognized over a weighted average period of 3.75 years.

We issue common stock from previously authorized but unissued shares to satisfy option exercises and purchases under our Employee Stock Purchase Plan.

Employee Stock Purchase Plan - In June 1996, we adopted an Employee Stock Purchase Plan (the "ESPP Plan") under which eligible employees could purchase common stock at a price equal to 85% of the lower of the fair market value of the common stock at the beginning or end of each six-month offering period. On November 29, 2005 we amended the ESPP Plan to provide that eligible employees may purchase common stock at a price equal to 95% of the fair market value of the common stock as of the end of each six-month offering period. There is no stock-based compensation expense related to our Employee Stock Purchase Plan because it is not considered a compensatory plan. The plan does not have a look-back feature, and has a minimal discount of 5% of the fair market value of the common stock as of the end of each six-month offering period. Participation in the ESPP Plan is limited to 6% of an employee's compensation, may be terminated at any time by the employee and automatically ends on termination of employment. A total of 350,000 shares of common stock have been reserved for issuance. As of December 31, 2019 there were 39,023 shares available for future issuance under the ESPP Plan. We issued 13,699, and 13,667 common shares under the ESPP Plan in 2019, and 2018, respectively.

Share Purchases - On April 24, 2018, we announced that our Board of Directors had approved a program authorizing the Company to purchase up to $10 million of our common stock. The shares may be purchased from time to time in the open market or through privately negotiated transactions at management's discretion, depending upon market conditions and other factors. Shares are retired upon repurchase. The authorization to repurchase our stock expires on December 31, 2019. We repurchased 234,494 shares of common stock under this program for a total cost of $0.8 million during the year ended December 31, 2019.

Since the program commenced in April 2018 and concluded in December 2019, we have repurchased 336,699 shares for a total cost of $1.2 million.

Dividends **–** We did not pay dividends in the years ended December 31, 2019 and 2018.

7. COMMITMENTS AND CONTINGENT LIABILITIES

Lease Commitments – We own our principal office and research facility in Bedford, Massachusetts, which we have occupied since November 1997. We have no real estate lease commitments and no equipment lease commitments.

Litigation - There are no material pending legal proceedings to which we are a party or to which any of our properties are subject which, either individually or in the aggregate, are expected to have a material adverse effect on our business, financial position or results of operations.

Guarantees and Indemnification Obligations – We enter into agreements in the ordinary course of business that require us: i) to perform under the terms of the contracts, ii) to protect the confidentiality of our customers' intellectual property, and iii) to indemnify customers, including indemnification against third party claims alleging infringement of intellectual property rights. We also have agreements with each of our directors and executive officers to indemnify such directors or executive officers, to the extent legally permissible, against all liabilities reasonably incurred in connection with any action in which such individual may be involved by reason of such individual being or having been a director or officer of the Company.

Given the nature of the above obligations and agreements, we are unable to make a reasonable estimate of the maximum potential amount that we could be required to pay. Historically, we have not made any significant payments on the above guarantees and indemnifications and no amount has been accrued in the accompanying consolidated financial statements with respect to these guarantees and indemnifications.

8. BUSINESS SEGMENTS AND MAJOR CUSTOMERS

We organize ourselves into a single segment that reports to the chief operating decision maker.

We conduct our operations in the United States and sell our products and services to domestic and international customers. Revenues were generated from the following geographic regions (in thousands):

	Year ended December 31, 2019	2018
United States	$ 6,091	$ 7,439
United Kingdom	2,334	4,004
Brazil	876	2,473
Rest of world	2,903	2,215
	$ 12,204	$ 16,131

Revenue by product group was (in thousands):

	Year ended December 31, 2019	2018
Biometrics	$ 11,170	$ 15,042
Imaging	1,034	1,089
	$ 12,204	$ 16,131

The portion of total revenue that was derived from major customers was as follows:

	Year ended December 31, 2019	2018
Customer A	16%	20%
Customer B	2%	13%

Revenue by timing of transfer of goods or services for the years ended December 31, 2019 and 2018 was (in thousands):

	Year ended December 31, 2019	2018
Goods or services transferred at a point in time	$ 3,812	$ 5,972
Goods or services transferred over time	8,392	10,159
	$ 12,204	$ 16,131

9. EMPLOYEE BENEFIT PLAN

In 1994, we established a qualified 401(k) Retirement Plan (the “Plan”) under which employees are allowed to contribute certain percentages of their pay, up to the maximum allowed under Section 401(k) of the Internal Revenue Code. Our contributions to the Plan are at the discretion of the Board of Directors. Our contributions were approximately $241,000, and $238,000 in 2019 and 2018, respectively.

10. NET INCOME (LOSS) PER SHARE

Net income (loss) per share is calculated as follows (in thousands, except per share data):

	Year ended December 31, 2019	Year ended December 31, 2018
Net income (loss)	$ (8,340)	$ 1,233
Shares outstanding:		
Weighted-average common shares outstanding	21,523	21,544
Additional dilutive common stock equivalents	-	61
Diluted shares outstanding	21,523	21,605
Net income (loss) per share – basic	$ (0.39)	$ 0.06
Net income (loss) per share - diluted	$ (0.39)	$ 0.06

11. OFF-BALANCE SHEET ARRANGEMENTS

We do not currently have any arrangements with unconsolidated entities, such as entities often referred to as structured finance, special purpose entities, or variable interest entities which are often established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. Accordingly, we are not exposed to any financing, liquidity, market or credit risk if we had such relationships.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we conducted an evaluation of our disclosure controls and procedures, as such term is defined under Rule 13a-15(e) promulgated under the Securities Exchange Act of 1934, as amended (the Exchange Act). Based on this evaluation, our chief executive officer and chief financial officer concluded that our disclosure controls and procedures were effective as of the end of the period covered by this annual report.

Evaluation of Changes in Internal Control Over Financial Reporting

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we concluded that there were no changes in our internal control over financial reporting that occurred during the quarterly period ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13(a)-15(f) under the Exchange Act. Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework in *Internal Control - Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. Based on our evaluation under the framework in *Internal Control — Integrated Framework*, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required by Item 10 of Form 10-K is incorporated by reference from the information contained in the sections captioned *"Directors and Executive Officers"*, *"Corporate Governance"* and *"Section 16(a) Beneficial Ownership Reporting Compliance"* in the Proxy Statement that will be delivered to our shareholders in connection with our May 20, 2020 Annual Meeting of Shareholders.

ITEM 11. EXECUTIVE COMPENSATION

The information required by Item 11 of Form 10-K is incorporated by reference from the information contained in the section captioned *"Executive Compensation"* in the Proxy Statement that will be delivered to our shareholders in connection with our May 20, 2020 Annual Meeting of Shareholders.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 12 of Form 10-K is incorporated by reference from the information contained in the section captioned *"Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters"* in the Proxy Statement that will be delivered to our shareholders in connection with our May 20, 2020 Annual Meeting of Shareholders.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information, if any, required by Item 13 of Form 10-K is incorporated by reference from the information contained in the sections captioned *"Corporate Governance"* and *"Certain Relationships and Related Transactions"* in the Proxy Statement that will be delivered to our shareholders in connection with our May 20, 2020 Annual Meeting of Shareholders.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by Item 14 of Form 10-K is incorporated by reference from the information contained in the section captioned *"Independent Accountants"* in the Proxy Statement that will be delivered to our shareholders in connection with our May 20, 2020 Annual Meeting of Shareholders.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULE

The following documents are filed as part of this report:

(a) Financial Statements and Exhibits**:**

	Page
(1) Consolidated Balance Sheets as of December 31, 2019 and 2018	37
Consolidated Statements of Operations for each of the two years in the period ended December 31, 2019	38
Consolidated Statements of Cash Flows for each of the two years in the period ended December 31, 2019	39
Consolidated Statements of Stockholders' Equity for each of the two years in the period ended December 31, 2019	40
Notes to Consolidated Financial Statements	41

(2) Exhibits:

The exhibits listed below are filed with or incorporated by reference in this report.

Exhibit No.	Description of Exhibit
3.1	Amended and Restated Articles of Organization, as amended (filed as Exhibit 3.1 to the Company's Form 10-K for the year ended December 31, 2008 and incorporated herein by reference).
3.2	Amended and Restated By-Laws (filed as Exhibit 3.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on December 10, 2007 and incorporated herein by reference).
4.1†	Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934, as amended
10.1*	1996 Employee Stock Purchase Plan, as amended and restated (filed as Exhibit 99.1 to the Company's Current Report on Form 8-K filed with the Securities and Exchange Commission on November 29, 2005 and incorporated herein by reference).
10.2*	Form of Indemnification Agreement for Directors and Officers of Aware, Inc. (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on February 22, 2011 and incorporated herein by reference).
10.3*	2001 Nonqualified Stock Plan (filed as Exhibit 99(d)(4) to the Company's Schedule TO filed with the Securities and Exchange Commission on March 3, 2003 and incorporated herein by reference).
10.4*	Form of Nonqualified Stock Option Agreement under the 2001 Nonqualified Stock Plan for options granted to executive officers and directors prior to May 21, 2008 (filed as Exhibit 10.6 to Company's Form 10-K for the year ended December 31, 2006 and incorporated herein by reference).
10.5*	Form of Nonqualified Stock Option Agreement under the 2001 Nonqualified Stock Plan for options granted to executive officers and directors from and after May 21, 2008 (filed as Exhibit 10.8 to Company's Form 8-K on May 22, 2008 and incorporated herein by reference)
10.6*	Form of Unrestricted Stock Award for outside directors of Aware under the 2001 Nonqualified Stock Plan (filed as Exhibit 10.1 to Company's Form 8-K filed with the Securities and Exchange Commission on July 28, 2010 and incorporated herein by reference).
10.7*	Form of Unrestricted Stock Award for officers of Aware under the 2001 Nonqualified Stock Plan (filed as Exhibit 10.2 to Company's Form 8-K filed with the Securities and Exchange Commission on July 28, 2010 and incorporated herein by reference).
10.8	Asset Purchase Agreement by and between Aware, Inc. and Lantiq Broadband Holdco, Inc. and Lantiq Deutschland GmbH dated October 14, 2009 (filed as Exhibit 10.8 to Company's Form 10-K for the year ended December 31, 2009 and incorporated herein by reference).

10.9*	Form of Unrestricted Stock Award for executive officers and directors of Aware, Inc. under the 2001 Nonqualified Plan (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on April 4, 2013 and incorporated herein by reference).
10.10*	Form of Change in Control Retention Agreement between Aware, Inc. and Kevin T. Russell (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on March 30, 2015 and incorporated herein by reference).
10.11*	Form of Change in Control Retention Agreement between Aware, Inc. and David J. Martin (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on March 1, 2017 and incorporated herein by reference).
10.12	Transaction between Aware, Inc. and Richard P. Moberg as described in Form 8-K as filed by Aware, Inc. with the Securities and Exchange Commission on March 9, 2017 and incorporated herein by reference.
10.13*	Aware, Inc. 2019 Executive Bonus Plan (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on March 27, 2019 and incorporated herein by reference).
10.14*	Employment Agreement between Aware, Inc. and Robert A. Eckel (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on September 19, 2019 and incorporated herein by reference).
10.15*	Performance Share Award Agreement between Aware, Inc. and Robert A. Eckel (filed as Exhibit 10.2 to the Company's Form 8-K filed with the Securities and Exchange Commission on September 19, 2019 and incorporated herein by reference).
10.16*	Employment Agreement between Aware, Inc. and Kevin T. Russell (filed as Exhibit 10.3 to the Company's Form 8-K filed with the Securities and Exchange Commission on September 19, 2019 and incorporated herein by reference).
10.17*	Employment Agreement between Aware, Inc. and Robert M. Mungovan (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on October 1, 2019 and incorporated herein by reference).
10.18*	Performance Share Award Agreement between Aware, Inc. and Robert M. Mungovan (filed as Exhibit 10.2 to the Company's Form 8-K filed with the Securities and Exchange Commission on October 1, 2019 and incorporated herein by reference).
10.19*	Employment Agreement between Aware, Inc. and Mohamed Lazzouni (filed as Exhibit 10.1 to the Company's Form 8-K filed with the Securities and Exchange Commission on November 19, 2019 and incorporated herein by reference).
10.20*	Aware, Inc. Q4 2019 Executive Bonus Plan (filed as Exhibit 10.2 to the Company's Form 8-K filed with the Securities and Exchange Commission on November 19, 2019 and incorporated herein by reference).
21.1	Subsidiaries of Registrant.
23.1	Consent of Independent Registered Public Accounting Firm.
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1	Certification of Chief Executive Officer and Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101	The following financial statements from Aware, Inc.'s Annual Report on Form 10-K for the year ended December 31, 2019, formatted in XBRL (eXtensible Business Reporting Language), as follows: (i) Consolidated Balance Sheets as of December 31, 2019 and December 31, 2018; (ii) Consolidated Statements of Operations for the Years Ended December 31, 2019 and December 31, 2018; (iii) Consolidated Statements of Cash Flows for the Years Ended December 31, 2019 and December 31, 2018; (iv) Consolidated Statements of Stockholders' Equity for the Years Ended December 31, 2019 and December 31, 2018; and (v) Notes to Consolidated Financial Statements.

*****Management contract or compensatory plan.
† Filed herewith

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

AWARE, INC.

By: /s/ Robert A. Eckel
Robert A. Eckel
Chief Executive Officer & President

By: /s/ David J. Martin
David J. Martin
Chief Financial Officer (Principal Financial and Accounting Officer)

Date: February 18, 2020

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated on the 18th day of February 2020.

Signature	Title
/s/ Robert A. Eckel Robert A. Eckel	Chief Executive Officer, President & Director (Principal Executive Officer)
/s/ David J. Martin David J. Martin	Chief Financial Officer (Principal Financial and Accounting Officer)
/s/ Kevin T. Russell Kevin T. Russell	Chief Legal and Administrative Officer & Director
/s/ Brent P. Johnstone Brent P. Johnstone	Chairman of the Board & Director
/s/ John S. Stafford, III John S. Stafford, III	Director
/s/ Adrian F. Kruse Adrian F. Kruse	Director
/s/ Brian D. Connolly Brian D. Connolly	Director
/s/ Richard P. Moberg Richard P. Moberg	Director

Exhibit 4.1

AWARE, INC.
DESCRIPTION OF SECURITIES
REGISTERED PURSUANT TO SECTION 12 OF THE
SECURITIES EXCHANGE ACT OF 1934

The following description sets forth certain material terms and provisions of our common stock, $.01 par value per share ("Common Stock"), which is registered under Section 12 of the Securities Exchange Act of 1934, as amended. This description also summarizes provisions of the Massachusetts Business Corporation Act (the "MBCA"). The following summary does not purport to be a complete summary of the terms and provisions of our Common Stock and is subject to, and is qualified in its entirety by reference to, the applicable provisions of the MBCA, our amended and restated articles of organization, as amended (the "Articles of Organization"), and our amended and restated by-laws (the "By-laws"). The Articles and By-laws are incorporated by reference as exhibits 3.1 and 3.2, respectively, to the Annual Report on Form 10-K of which this Exhibit 4.1 is a part. We encourage you to read the Articles, the By-laws and the applicable provisions of the MBCA for additional information.

The Articles authorize us to issue up to 70,000,000 shares of Common Stock and up to 1,000,000 shares of preferred stock, $1.00 par value per share ("Preferred Stock").

Fifty thousand shares of our Preferred Stock are designated Series A Participating Cumulative Preferred Stock ("Series A Preferred Stock"). The Series A Preferred Stock was authorized in connection with our adoption of a shareholder rights plan in October 2001, which expired in October 2011. No shares of Series A Preferred Stock had been issued or were outstanding as of December 31, 2019.

Dividend Rights

Subject to preferences that may apply to shares of Preferred Stock outstanding at the time, holders of outstanding shares of Common Stock will be entitled to receive dividends out of assets legally available at the times and in the amounts as our board of directors may from time to time determine. Any outstanding shares of Series A Preferred Stock would be entitled to receive quarterly dividends as set forth in the Articles, and if our board of directors declares a dividend or distribution on the Common Stock at a time when shares of Series A Preferred Stock are outstanding, we would be obligated to declare a dividend on the Series A Preferred Stock, as well.

Voting Rights; Classified Board of Directors

Holders of Common Stock are entitled to one vote for each share of Common Stock held on all matters submitted to a vote of shareholders, unless otherwise provided by the Articles of Organization. An election of directors by the our shareholders is determined by a plurality of the votes cast by the shareholders entitled to vote in the election. Other matters are decided by an affirmative vote of our shareholders having a majority in voting power of the votes cast by the shareholders present or represented and voting on such matter, except as otherwise disclosed below. Holders of shares of Common Stock do not have the right to cumulate their votes for directors.

Section 8.06(b) of the MBCA provides that the terms of directors of a public Massachusetts corporation shall be staggered by dividing the directors into three groups, as nearly equal in number as possible, with only one group of directors being elected each year to a three-year term. Sections 8.06(d) and (e) of the MBCA provide that when a board of directors is so classified, (i) stockholders may remove directors only for cause, (ii) the number of directors shall be fixed only by the vote of the board of directors, (iii) vacancies and newly created directorships shall be filled solely by the affirmative vote of a majority of the remaining directors and (iv) a decrease in the number of directors will not shorten the term of any incumbent director. Our board of directors may elect to opt out of Section 8.06(b).

No Preemptive Rights

The Common Stock is not entitled to preemptive or other similar subscription rights to purchase any of our securities.

Liquidation Rights

Upon our voluntary or involuntary liquidation, dissolution or winding up, the holders of Common Stock will be entitled to receive pro rata our net assets, if any, which are legally available for distribution, after payment of all of our debts and other liabilities and subject to the preferential rights of any holders of Preferred Stock then outstanding.

Conversion or Redemption Rights

The Common Stock is neither convertible nor redeemable.

Preferred Stock

The Articles of Organization provide that our board of directors may, without further action by our shareholders, from time to time, direct the issuance of shares of Preferred Stock in one or more series and may, at the time of issuance, determine the designations, powers, preferences, privileges, and relative participating, optional or special rights as well as the qualifications, limitations or restrictions thereof, including dividend rights, conversion rights, voting rights, terms of redemption and liquidation preferences, any or all of which may be greater than the rights of the Common Stock. Satisfaction of any dividend preferences of outstanding shares of Preferred Stock would reduce the amount of funds available for the payment of dividends on shares of Common Stock. Holders of Preferred Stock could be entitled to receive a preference payment in the event of our liquidation before any payment is made to the holders of Common Stock. Under certain circumstances, the issuance of shares of Preferred Stock may render more difficult or tend to discourage a merger, tender offer or proxy contest involving us, the assumption of control by a holder of a large block of our securities or the removal of our incumbent management.

Exhibit 21.1

SUBSIDIARIES OF REGISTRANT

Name of Organization	**Jurisdiction**
Aware Security Corporation	Massachusetts

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-15805, 333-45026, 333-62020, 333-106569, and 333-106570) of Aware, Inc. of our report dated February 18, 2020, relating to the consolidated financial statements of Aware, Inc. and its subsidiary, appearing in this Annual Report on Form 10-K of Aware, Inc. for the year ending December 31, 2019.

/s/ RSM US LLP
Boston, Massachusetts
February 18, 2020

Exhibit 31.1

CERTIFICATION OF CHIEF EXECUTIVE OFFICER

I, Robert A. Eckel, Chief Executive Officer of Aware, Inc., certify that:

1. I have reviewed this annual report on Form 10-K of Aware, Inc.;

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:

   a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

   b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this annual report based on such evaluation; and

   d) disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent function):

   a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 18, 2020

/s/ Robert A. Eckel
Robert A. Eckel
Chief Executive Officer & President

Exhibit 31.2

CERTIFICATION OF CHIEF FINANCIAL OFFICER

I, David J. Martin, Chief Financial Officer of Aware, Inc., certify that:

1. I have reviewed this annual report on Form 10-K of Aware, Inc.;

2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;

3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:

    a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;

    b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this annual report based on such evaluation; and

    d) disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent function):

    a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 18, 2020

/s/ David J. Martin
David J. Martin
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002
(18 U.S.C. SECTION 1350)

In connection with the Annual Report on Form 10-K of Aware, Inc. (the "Company") for the year ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned Chief Executive Officer and Chief Financial Officer of the Company, certifies, to the best knowledge and belief of the signatory, pursuant to 18 U.S.C. §1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

/s/ Robert A. Eckel	/s/ David J. Martin
Robert A. Eckel	David J. Martin
Chief Executive Officer & President	Chief Financial Officer
Date: February 18, 2020	Date: February 18, 2020

The certification set forth above is being furnished as an exhibit solely pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 and is not being filed as part of the Form 10-K or as a separate disclosure document of the Company or the certifying officers.