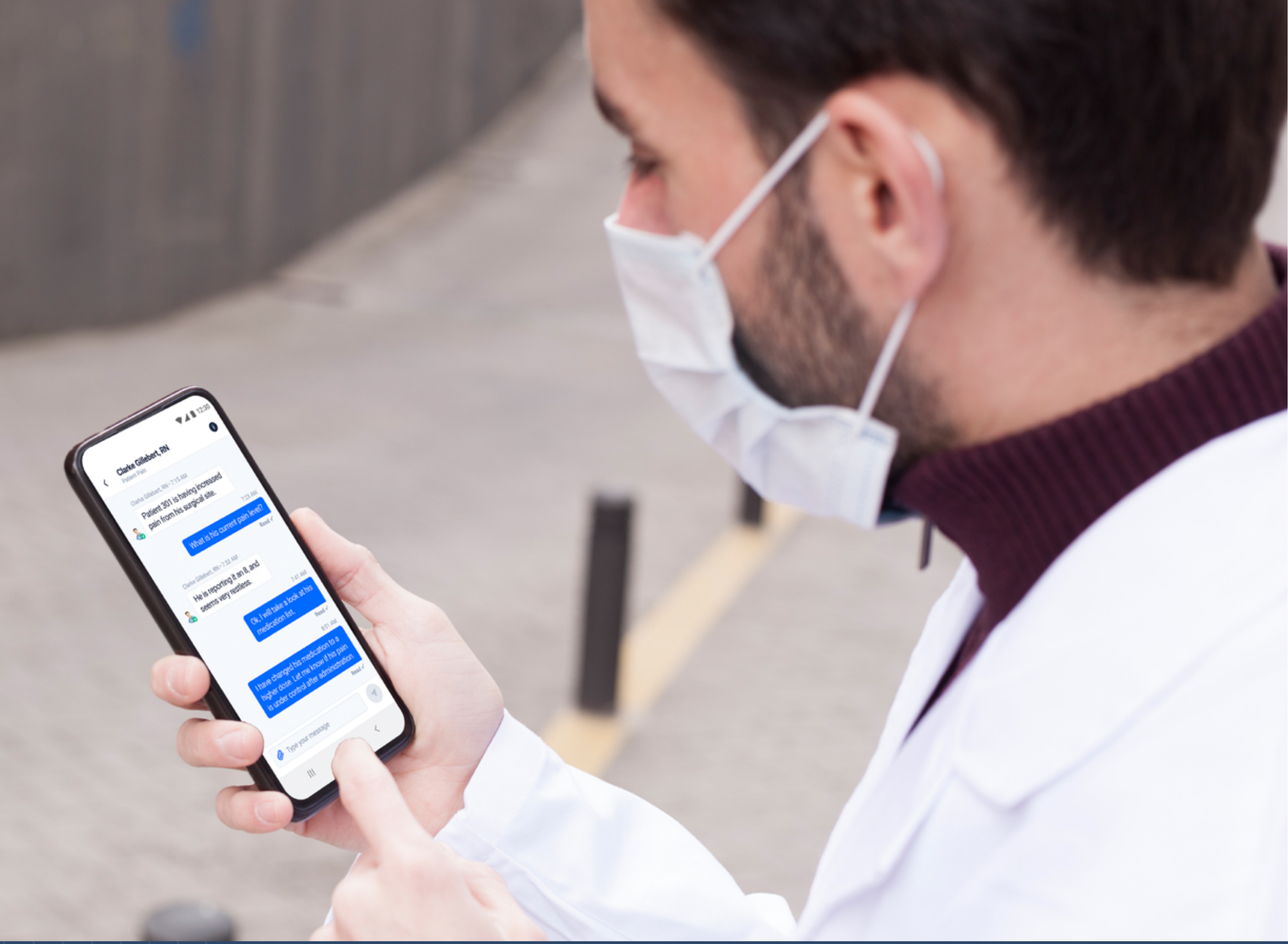
Healthcare has changed.

The importance of care team collaboration hasn't.

2020 Annual Report



2020 At-A-Glance:

- Sold our first five Spok Go® platform deals in the second half of the year
- Generated 79 six-figure customers
- Placed 104,000 new pager units and saw record-low wireless revenue attrition
- Generated $26.2 million in net cash provided by operating activities
- Primarily offset the negative impacts of COVID-19 through focused expense management to align our operations with market conditions
- Continued to provide solutions to all of the U.S. News & World Report Best Adult and Children’s Hospitals
- Rated #1 secure communications platform for hospitals and health systems by Black Book Market Research for the fourth consecutive year

A Message from the President and Chief Executive Officer

To Our Stockholders

During 2020 Spok made substantial progress. We accelerated the development of our Spok Go® platform, and further aligned our resources to focus on increasing the Company's long-term growth potential and creating value for our stockholders. We were highly encouraged by our performance in the second half of the year and believe that this momentum positions Spok for continued improvement in 2021.

When I wrote this letter last year, we were in the beginning stages of the COVID-19 pandemic and the resulting major disruption to our lives and to world economies. Many of us have been sick, lost loved ones, or have been otherwise adversely impacted. We know the pressure and stress have fallen disproportionally on healthcare clinicians and staff. Fortunately, we are now seeing wide-spread distribution of vaccines and the world is returning to some sense of normalcy.

Despite the many challenges that we encountered last year as a result of the pandemic, our team was able to stay focused and in fact broke a five-year record for selling new console licenses. This involved helping our existing customers set up remote call center capability during the initial onset of COVID-19 and booking Spok Go deals in the second half of the year, while building the pipeline for 2021.

While the situation remains fluid, and no one can predict the impact that new virus variants might have on global infection levels, let me assure our stockholders that the fundamentals that drove our ability to weather the impacts last year remain in place.

We continue to take the necessary steps to provide for the safety of employees and to ensure the continuity of our operations and product development.

In 2020, more than 82% of our revenues were recurring in nature, coming from either wireless usage or software maintenance contracts. This mix is somewhat protective of our top line, and we expect it to continue through 2021. We provide a critical function that is even more important in this environment – delivering reliable communications and clinical information to care teams when and where it matters most to improve patient outcomes.

Before we get into the details of the full year, I want to highlight where we are strategically with respect to our business plan and outlook.

One of the key drivers of our success will be the Spok Go platform, announced early last year, which is developed on a foundation of a single, best-in-class architecture, built on a cloud-based Software as a Service (SaaS) delivery model.

Specifically, Spok Go offers:

- **Scalable enterprise solution** – The Amazon Web Services, or AWS, backed cloud architecture removes barriers and connects the entire care network.
- **Intelligent routing & escalation** – We can deliver actionable clinical information to expedite communications.
- **Powerful directory & native on-call** – This reduces errors and wasted time with one source of truth for all roles, departments, and locations.
- **Flexible & open architecture** – We empower hospital staff to use the best devices for their roles, including pagers.

Clearly, it was challenging to roll out a new platform right as the pandemic struck. The timing really could not have been worse. However, the long-term potential for Spok Go remains unchanged. Bookings and revenue will ramp up over time as the impacts from the pandemic recede, our customers open back up for in-person visits, and our sales and services teams can travel more freely. Based on customer feedback and our evaluation of the competitive environment, we believe we are on track for long-term success and value creation that will reward all our constituents.

Spok also continues to remain focused on the efficient and effective operation of our wireless infrastructure and support systems. We maintain a source of strong recurring revenue in our paging service line. We run the largest paging network in the U.S. and have integrated its operations deeply with our software operations, while continuing to enhance our paging platform and user devices. Our wireless subscribers provide the base that allows for our investment in product development as well as support for our capital allocation plan. Over time, we expect software revenue to exceed wireless revenue on a quarterly basis. However, despite this projected transition, our wireless business will continue to be a significant driver of our success as an organization for many years to come.

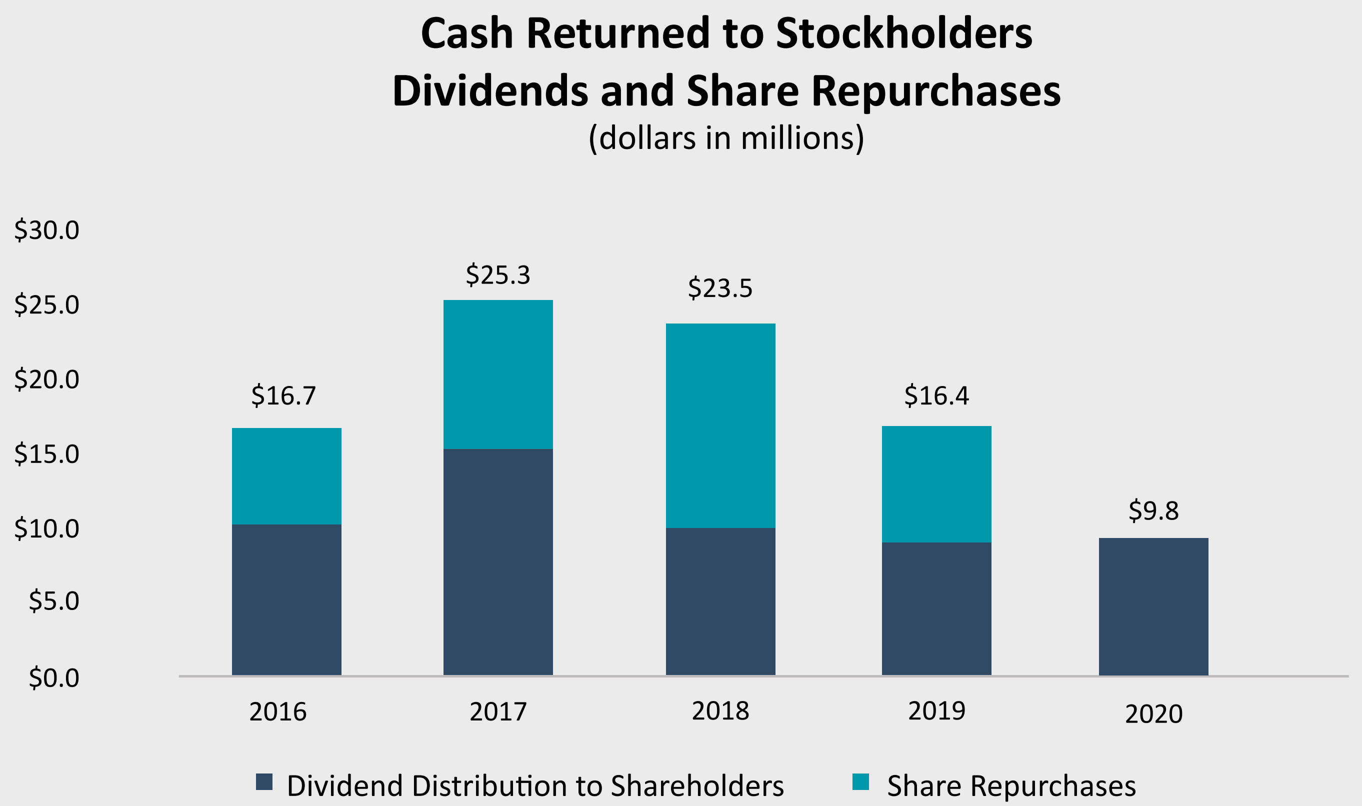
We believe the overall market opportunity is large. The feedback we receive from customers and industry CIOs, as well as the historical level of annual sales made with our legacy Spok Care Connect® products, serves as the foundation for the market opportunity we have with Spok Go. We have looked at the market closely, including our competitors, and believe, once recovered from the pandemic, it will more than support our strategy based on scale and needs. Our recently announced partnership with one of the largest academic health systems in the U.S. is just one more data point in support of our plan.

Spok has many loyal, satisfied customers and strengths as an organization. This is evidenced by a customer list of over 2,200 hospitals, strong industry endorsements, strong recurring wireless and software maintenance revenue, and positive customer feedback.

Prior to the pandemic, the healthcare market had experienced significant change and consolidation. COVID-19 is only accelerating that. Hospitals now face a tremendous amount of pressure to reduce and rationalize vendors, while regionalizing healthcare delivery and also generating profit margins. We believe our strategy around Spok Go aligns perfectly with these mandates and our vision to become ***the strategic partner of choice for enterprise-grade clinical communications and patient care coordination.***

To that end, we are in the midst of a complex pivot from a traditional communications company, historically selling premise-based point solutions, targeting communications managers, to a clinical communication company, selling highly integrated, SaaS solutions, targeting C-suite executives and purchasing committees with deep clinical expertise. We continue to bring in the clinical talent necessary to be successful in this transition. We have been moving in that direction and will continue to focus on further improving our go-to-market strategy.

As always, creating stockholder value over the long-term remains a key driver of our strategy, along with our focus on all constituents, including customers, employees, and the communities in which we live and work. It is why we made the pivot in the first place. We believe our constituents will ultimately be rewarded as our investments and efforts create a unique and powerful clinical communication platform, yielding future revenue, EBITDA, and operating cash flow growth.



The dividend distribution to shareholders for 2017 includes the $5.2 million special dividend that was declared in December 2016 and paid in January 2017.

Business Review

Spok consolidated 2020 revenue totaled $148.2 million, down approximately 7.6% from 2019, reflecting continued, planned erosion in our paging base and a year-over-year decline in software revenue, as we felt the impact of the pandemic has had on our customers' investment decisions and as we continued our focus on developing and introducing our new cloud-native and integrated communication platform. During the year, we continued to invest in our business to enhance our product offerings and maintain a strong balance sheet. At year end, our cash, cash equivalents and short-term investments balance was $78.7 million with no debt. Our ability to generate cash allowed us to make key strategic investments for long-term growth and execute against our capital allocation plan. In 2020, Spok returned $9.8 million to stockholders in the form of our regular quarterly dividend. Spok also generated nearly $26.2 million in net cash provided by operating activities during 2020 that offset cash returned to stockholders, capital expenditures, and capitalized software development costs during the year.

In 2020, we continued our investments to grow our software solutions capability, while maintaining our valuable wireless revenue stream. Software revenue totaled a little over $64.6 million, down from 2019. The decline in year-over-year software revenue was primarily caused by the global pandemic in the first half of the year, as customers were delaying their investment decisions for our Spok Care Connect and Spok Go products. Also negatively impacting 2020 software revenue was lower license revenue, and associated equipment revenue, due to a decline in software operations bookings and a shift in the mix of software bookings being more heavily skewed towards services. While this had the positive impact of increasing our software backlog, it does not have the immediate revenue recognition of license and equipment bookings.

I am pleased to report that in the second half of the year software bookings increased more than 22% from the first half of the year, as health organizations started to accelerate their investment decisions, and we saw elective procedures, the key driver of profitability margins, come back to 70% - 80% of pre-pandemic levels for large hospitals by the end of the year.

Wireless subscriber and revenue trends continued to improve in 2020 as we again exceeded our expectations for gross additions, net unit churn, revenue, and ARPU. Of note in 2020 were the 104,000 new units that were added to our subscriber base. We were particularly pleased to see many of the gross placements come from takeaways from a key competitor in this space resulting in increased market share for Spok.

Our year-over-year rate of paging unit erosion was consistent with prior year levels, as the net number of units lost during the year totaled 53,000, down 1.9% from the prior year. Our year-over-year rate of wireless revenue erosion was a new record-low of 5.2% for 2020, a 120-basis point improvement from the prior year and a sharp reduction from the double-digit declines we saw prior to 2016. We were especially pleased to see these positive trends continue in our top-performing healthcare segment with the highest rate of gross placements and lowest rate of unit disconnects.

“The beauty of Spok remote console workstation software is that it’s a simple process and easy to set up,” explains Beardsley. “The software functions the same as it does for the on-site application.”

Adjusting care delivery during COVID-19

Without question, COVID-19 demonstrated the need for a well-planned disaster recovery business continuity plan that includes remote work-from-home policies. The existing disaster recovery plan at UW Health planned for numerous catastrophic scenarios, however it did not fully outline a pandemic scenario like COVID-19.

According to Chris Beardsley, senior business systems analyst at UW Health, the biggest obstacle was moving all of their agents to a remote-work posture. “We had five laptops prepared for such a scenario, yet we had 27 agents we needed working at home.”

During the early stages of the pandemic, Spok offered its customers like UW Health remote console workstation licenses to support work-from-home initiatives related to COVID-19 (at no charge during the COVID-19 crisis).

According to Beardsley, moving all their agents to remote work took approximately one week to become fully operational and to reconfigure at-home workstations.

“The beauty of Spok remote console workstation software is that it’s a simple process and easy to set up,” explains Beardsley. “The software functions the same as it does for the on-site application.”

At UW Health, remote at-home operators have proven just as efficient as when operators are on-site. “The numbers don’t lie,” explains Beardsley. “Our reporting has shown no drop or difference in talk time or speed of answer—operators are truly just as efficient at home.”

Increase/(Decrease) in R&D Expense

2016	2017	2018	2019	2020
31%	39%	31%	13%	-2%

*Includes $11.3 million of capitalized software development costs.

Last year, Spok also maintained focus on expense management and implementing efficiencies across the organization. For the full year 2020, operating expenses decreased to $170.8 million, down from $176.1 million in 2019. Adjusted 2020 operating expenses, which excludes goodwill impairment, depreciation, amortization, and accretion, and impairment and includes capitalized software development costs, totaled more than $148.0 million, down more than 6% from 2019. This performance primarily reflects increased efficiencies and expense reductions in general and administrative costs, as well as the impact of employee furloughs to mitigate the financial effects from the global pandemic. Year-over-year reductions in all expense categories allowed us to generate cash provided from operations in an extraordinary year by all measures, while continuing our Spok Go development spend at levels expected prior to the pandemic. We continue to manage operating expenses closely, and the efficiencies we have been able to implement across our cost structure provide a solid financial platform as we continue to make investments in areas that support our strategy for long-term growth.

Other key operating and financial metrics include:

- Software backlog totaled $50.5 million at December 31, 2020, compared to $50.6 million at the end of 2019.
- Re-occurring software maintenance revenue stream of $38.6 million in 2020.
- Paging units in service at December 31, 2020 totaled 885,000, compared to 938,000 at the end of the prior year.
- Total paging ARPU, or average revenue per unit, was $7.30 in 2020, compared to $7.34 in 2019.
- For 2020, capital expenses totaled $3.5 million, compared to $4.8 million in 2019.
- The number of full-time equivalent employees at December 31, 2020 totaled 602, down from 638 at year-end 2019.
- The Company's cash, cash equivalents, and short-term investments balance at December 31, 2020, was $78.7 million, up from $77.3 million at December 31, 2019.

2020 Accomplishments

Last year we had several organizational goals, and they are continuing into 2021:

The first was to put a product lead in place to work with our engineering leadership team to manage Spok's portfolio of solutions through a market-driven approach, consequently driving value for customers and the company. That has been accomplished with the addition in late November 2020 of Kristen Lalowski as our Spok Chief Product Officer. Kristen brings over 20 years of experience in healthcare and healthcare IT, specifically in the areas of nursing, product management, marketing, operations, sales, and client services. She will play a key role in executing our long-term strategy as we continue to support hospitals and health systems with reliable communication solutions.

Additionally, in 2020 Spok continued to build an industry-leading reputation in the marketplace. Below is a brief overview of some of our accomplishments in this area:

- First, for the full year 2020, we completed more than 79 new six-figure deals, primarily in the healthcare and government sectors. During the second half of the year, we completed five new Spok Go deals and the momentum continues into 2021.
- Next, Spok received recognition as the #1 secure communications platform for hospitals and health systems by Black Book Market Research for the fourth consecutive year.
- Also, we continue to provide solutions to all of the U.S. News & World Report Best Adult and Children's Hospitals.
- Next, in the late summer, Spok earned System and Organization Controls (SOC) 2 Type II Compliance for Spok Go, along with Spok paging solutions.
- And finally, in October, we welcomed more than 600 attendees to Connect 20 Virtual, our Company's annual user conference for healthcare professionals. The virtual event provided healthcare clinicians, IT experts, and C-suite executives a chance to learn from one another about the future of care team communication and share insights about how the COVID-19 pandemic has changed how they use health IT.

We intend to carry all this momentum into 2021 to stimulate long-term growth.

2021 Business Objectives

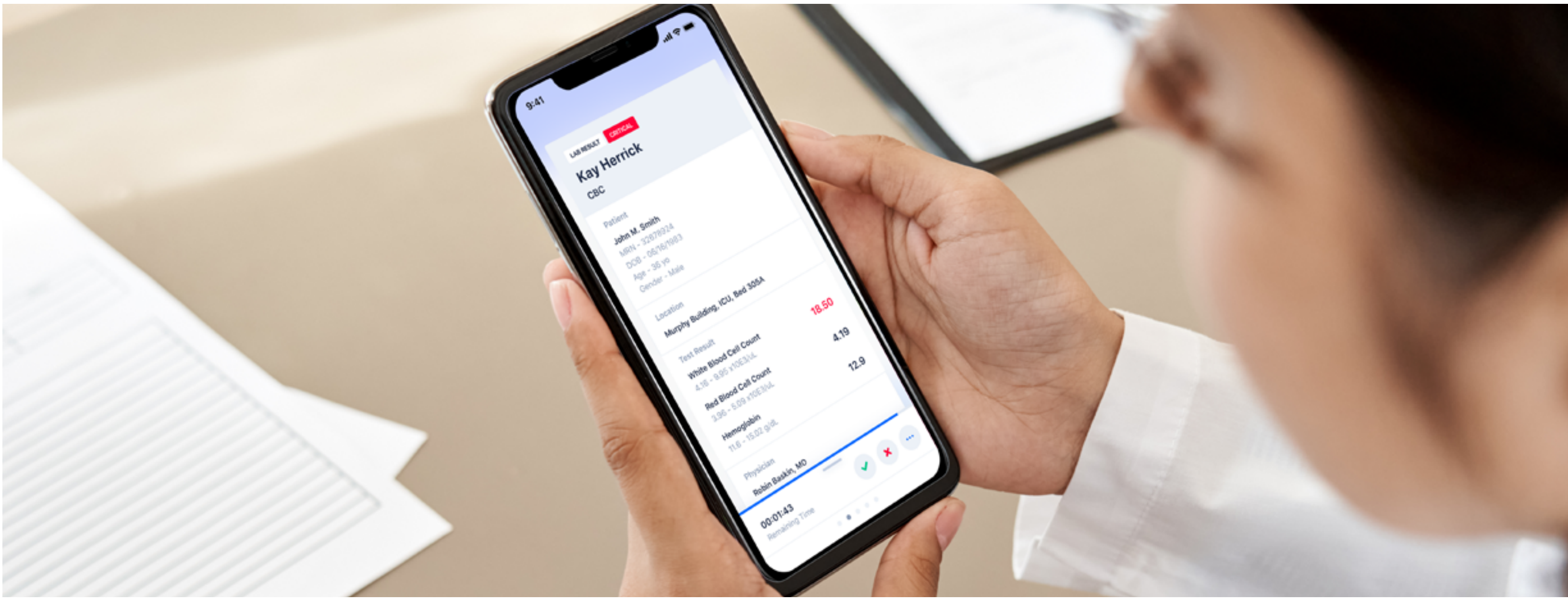
Approximately five years ago, Spok embarked on a transformation that was a tidal shift in our strategic direction for healthcare, our largest customer segment. That strategy pivot was presented as a five-year plan that signaled a very intentional move from offering our customers "point" solutions, or single-product solutions, for call center software, alarm management, and secure messaging, to offering them a cloud-based, single, integrated clinical communication and collaboration platform called Spok Go.

We decided to make this shift and focus on the Spok Go platform for many reasons, including:

- **Customer needs** – as our healthcare customers were telling us they needed a more unified approach to communications across their enterprise.
- **Large potential market opportunity** – as we further penetrate the multi-billion-dollar healthcare IT communications market.
- **Business simplification** – as we had been offering our customers too many different products in multiple versions on several different platforms.
- **Competitive positioning** – as we concluded that no one else offers a single, integrated cloud-native platform for healthcare communications.

Our core foundation of clinical communication is strong, and we are proud of the work our employees have done in support of this mission. We have accomplished so much together since we became Spok. We are laser focused on making Spok Go the leading clinical communication and collaboration platform for the healthcare industry.

In many respects, 2020 was the most challenging year for Spok in our history from both a management and operational perspective. The impact of the global pandemic on our customers has been profound, both in terms of the stress that it has put on the doctors, nurses, and hospital administrators, as well as the financial impact on the healthcare industry in general. Already thin margins at these organizations were further challenged by shifting resources to deal with COVID-19, thus altering investment decisions.



This has clearly impacted our customers' spending priorities and ability to focus on a new platform solution over the short term. However, we expect that to change over the course of this year, and we believe we will exit 2021 on solid footing. I am particularly proud of our Spok team and their ability to adapt and change under these circumstances.

With that as background, and with respect to our 2021 business goals this year, we continue our commitment to investing to address near-term opportunities and to achieve long-term organic growth. We believe these investments are critical to support our strategy to enhance our industry-leading clinical communication and collaboration platform and drive long-term stockholder value. We believe that R&D expenses, including the impact of capitalized software development costs, will continue to flatten in 2021 and approach a more steady-state level. For 2021, we expect a relatively small portion of our R&D spend to be for our legacy solutions and the majority to be on our new Spok Go platform, reflecting our continued investment in our future.

Regarding our capital allocation strategy, our overall goal has been to achieve sustainable business growth, while maximizing long-term stockholder value through our multi-faceted capital allocation strategy, which has included both dividends and share repurchases as well as key strategic investments to improve our operating platform and infrastructure in order to drive long-term organic growth. We are also open-minded to potential acquisitions and partnerships that could provide additional revenue streams.

While all these options remain under consideration by our Board of Directors, for 2021, we expect to continue paying our 12.5 cents per share quarterly dividend while keeping an eye on profitability. Our Board of Directors will continue to evaluate our capital allocation strategy on a quarterly basis and communicate our plans to you with respect to dividends, share repurchases, and other uses of capital each quarter when we report earnings.

"

In most respects, 2020 was the most challenging year in our history from both a management and operational perspective. However, in the face of a 100-year global pandemic that impeded the many customer meetings we had set up early in the year to introduce Spok Go, our new cloud-native platform, our team was able to stay focused, delivering the first new customer relationships for our new platform in the second half of the year, while significantly building the pipeline for 2021. We continue to believe Spok Go is set to meet a significant need in the healthcare marketplace and will create value for our stockholders in the coming years."

Finally, we are focused on the huge opportunity in front of us in clinical communication. From a business configuration and strategy perspective, we believe we are well-positioned. We have created a long-term organic growth engine in Spok Go. We maintain a source of strong recurring revenue in our paging service line. We run the largest paging offering in the U.S. and have integrated its operations deeply with our software operations, while continuing to enhance our paging platform and user devices. We believe with these two assets, our best financial results are ahead of us, and the future of Spok is bright.

In conclusion, we remain committed to our core values of putting the customer first, providing solutions that matter, innovation, and accountability. We believe our past results and future plans reflect these values.

I want to take this opportunity to thank our talented team of employees and our loyal customers and strategic partners. Together, we made enormous progress in 2020. We also want to thank our stockholders for your continued support as we take this journey together.

Vincent D. Kelly
President and Chief Executive Officer
June 2021

This letter includes references to adjusted operating expenses, which is a non-GAAP financial measure. For reconciliations between our non-GAAP measures and the nearest GAAP measures, please refer to the page preceding the back cover of this Annual Report. As non-GAAP financial measures are not intended to be considered in isolation or as a substitute for GAAP financial measures, you should carefully read the Form 10-K included in this Annual Report, which includes our consolidated financial statements prepared in accordance with GAAP. Additionally, this letter includes statements that, to the extent they are not recitations of historical fact, constitute forward-looking statements within the meaning of the federal securities laws, and are based on Spok's current expectations and assumptions. For a discussion identifying important factors that could cause actual results to vary materially from those anticipated in the forward-looking statements, see the corporation's filings with the SEC, including "Risk Factors" in the Form 10-K portion of this Annual Report.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Fiscal Year Ended December 31, 2020

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number 001-32358

SPOK HOLDINGS, INC.

(Exact name of registrant as specified in its charter)

Delaware	**16-1694797**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
6850 Versar Center, Suite 420 Springfield, Virginia	**22151-4148**
(Address of principal executive offices)	**(Zip Code)**

(800) 611-8488

(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value $0.0001 per share	SPOK	NASDAQ

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 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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

The aggregate market value of the common stock held by non-affiliates of the registrant was $178 million based on the closing price of $9.35 per share on the NASDAQ National Market® on June 30, 2020.

The number of shares of registrant's common stock outstanding on February 12, 2021, was 19,369,436.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for the 2021 Annual Meeting of Stockholders of the registrant, which will be filed with the Securities and Exchange Commission pursuant to Regulation 14A no later than April 30, 2021, are incorporated by reference into Part III of this Report.

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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements and information relating to Spok Holdings, Inc. and its subsidiaries ("Spok" or the "Company") that set forth anticipated results based on management's current plans, known trends and assumptions. These statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Statements that are predictive in nature, that depend upon or refer to future events or conditions, or that include words such as "anticipate," "believe," "estimate," "expect," "intend," "will," "target," "forecast" and similar expressions, as they relate to Spok, are forward-looking statements.

Although these statements are based upon current plans, known trends and assumptions that management considers reasonable, they are subject to certain risks, uncertainties and assumptions, including but not limited to the following:

- Risks related to the COVID-19 pandemic and its effect on our business and the economy;
- Other economic conditions such as recessionary economic cycles, higher interest rates, inflation and higher levels of unemployment;
- Our ability to effectively develop, introduce and deploy our integrated communications platform and collaboration platform, Spok Go®;
- Continuing decline in the number of paging units we have in service with customers, commensurate with a continuing decline in our wireless revenue;
- Our dependence on the U.S. healthcare industry;
- The sales cycle of our software solutions and services can run from six to eighteen months, making it difficult to plan for and meet our sales objectives and bookings on a steady basis quarter-to-quarter and year-to-year;
- Our ability to manage wireless network rationalization to lower our costs without causing disruption of service to our customers;
- Our ability to address changing market conditions with new or revised software solutions;
- Our ability to retain key management personnel and to attract and retain talent within the organization;
- Our ability to manage change related to regulation, including laws and regulations affecting hospitals and the healthcare industry generally;
- Competition for our services and products from new technologies or those offered and/or developed from firms that are substantially larger and have much greater financial and human capital resources;
- The reliability of our networks and servers and our ability to prevent cyber-attacks and other security issues and disruptions
- We may experience litigation claiming intellectual property infringement by us, and we may not be able to protect our rights in intellectual property that we own and develop;
- Unauthorized breaches or failures in cybersecurity measures adopted by us and/or included in our products and services;
- Our ability to realize the benefits associated with our deferred income tax assets;
- Future impairments of our long-lived assets, amortizable intangible assets or goodwill; and
- Those matters that are discussed in this Annual Report under Item 1A "Risk Factors."

Should known or unknown risks or uncertainties materialize, known trends change, or underlying assumptions prove inaccurate, actual results or outcomes may differ materially from past results and those described herein as anticipated, believed, estimated, expected, intended, targeted or forecasted. Investors are cautioned not to place undue reliance on these forward-looking statements.

The Company undertakes no obligation to update forward-looking statements. Investors are advised to consult all further disclosures the Company makes in its subsequent reports on Form 10-Q and Form 8-K that it will file with the United States Securities and Exchange Commission ("SEC"). Also note that, in the risk factors section, the Company provides a cautionary discussion of risks, uncertainties and possibly inaccurate assumptions relevant to its business. These are factors that, individually or in the aggregate, could cause the Company's actual results to differ materially from past results as well as those results that may be anticipated, believed, estimated, expected, intended, targeted or forecasted. It is not possible to predict or identify all such risk factors. Consequently, investors should not consider the risk factor discussion to be a complete discussion of all of the potential risks or uncertainties that could affect Spok's business, statement of operations or financial condition, subsequent to the filing of this Annual Report.

PART I

The terms "we," "us," "our," "Company" and "Spok" refer to Spok Holdings, Inc. and its direct and indirect wholly owned subsidiaries.

ITEM 1. *BUSINESS*

Overview

Spok, Inc., a wholly owned subsidiary of Spok Holdings, Inc. (NASDAQ: SPOK), is proud to be the global leader in healthcare communications. We deliver clinical information to care teams when and where it matters most to improve patient outcomes. Top hospitals rely on Spok products and services to enhance workflows for clinicians, support administrative compliance, and provide a better experience for patients.

Our headquarters is located at 6850 Versar Center, Suite 420, Springfield, Virginia 22151, and our telephone number is 800-611-8488. We maintain an Internet website at http://www.spok.com. (This website address is for information only and is not intended to be an active link or to incorporate any website information into this 2020 Annual Report on Form 10-K ("2020 Form 10-K").)

We deliver smart, reliable clinical communication and collaboration solutions to help protect the health, well-being, and safety of people in the United States and abroad, on a limited basis, in Europe, Canada, Australia, Asia and the Middle East. Our customers rely on Spok for workflow improvement, secure texting, paging services, contact center optimization, and public safety response. We develop, sell, and support enterprise-wide systems primarily for healthcare and other organizations needing to automate, centralize, and standardize their approach to clinical communications. Our solutions can be found in prominent hospitals, large government agencies, leading public safety institutions, colleges and universities; large hotels, resorts and casinos; and well-known manufacturers. We offer our services and products to three major market segments: healthcare, government, and large enterprise, with a greater emphasis on the healthcare market segment.

Industry Overview

In March 2020, the World Health Organization declared Coronavirus disease 2019 ("COVID-19") a global pandemic. The pandemic has had a severe impact on the global economy and has caused a significant strain on the healthcare industry. As hospitals struggled to maintain capacity within their intensive care units, most stopped performing elective procedures in order to free up bed capacity to meet the surge of critical COVID-19 patients. Simultaneously, there was a significant decrease in non-emergency clinic visits, resulting in a marked decrease in total clinic visits and hospitalizations. This placed a significant burden on hospital cash flow and revenue, which many were still recovering from towards the end of the year.

While the impact of COVID-19 varies greatly from one organization or region to the next, in general, reducing costs was a critical theme for the healthcare provider industry in 2020. Initially, many organizations furloughed employees or significantly slowed the contracting process for new products or services as they braced for the unknown impacts of this virus. For some, there was a complete moratorium on renewals and new purchases. As hospitals began to better manage their admissions process and capacity constraints, they began to resume performing elective procedures in the second half of 2020. As a result, we began to see improved operating levels during this period. While we expect to see lingering effects in the healthcare provider industry from COVID-19 during 2021, we believe they will continue to diminish throughout 2021 as vaccination programs are implemented and administered.

Aside from the serious impact that COVID-19 has had on the healthcare industry, the United States healthcare market continues to experience significant change. Healthcare costs continue to rise, reimbursements from Centers for Medicare and Medicaid Services are being reduced in certain areas, digitization of healthcare information continues and the industry continues to shift towards a value-based purchasing model and away from the traditional fee-for-service model. The value-based purchasing model places an emphasis on incentivizing value and quality at an individual patient level in order to provide better patient outcomes and reduce 30-day readmissions.

In response, healthcare providers will require greater communication and better collaboration between clinicians in order to generate improvements in the quality, safety, satisfaction and efficiency of patient care delivery. Improvements in these areas are necessary for healthcare providers to successfully navigate many of these issues. Many providers are seeking improvement through the adoption of technology, looking to take advantage of workflow automation, process improvement and, in limited circumstances, machine learning and artificial intelligence. Providers also look to increase efficiencies through consolidation as larger health systems continue to acquire smaller hospitals for the primary purpose of gaining regional market share amongst tough competition.

We believe these changes and continued pressure for organizations to provide better services with less resources place an even greater emphasis on the need for improved clinical communication and collaboration tools to meet the increasing requirements demanded by the healthcare industry in today's marketplace. Our solutions help hospitals significantly increase the quality and safety of patient care delivery, while increasing patient and provider satisfaction and simultaneously increasing employee productivity, reducing costs and clinician burnout. This is accomplished through workflow enhancement; secure, reliable and integrated communication tools; and mobile accessibility.

Sales and Marketing

Sales

We market and distribute our clinical communication and collaboration solutions through a direct sales force and an indirect sales channel.

The direct sales force contracts or sells products, solutions, messaging services and other services directly to customers ranging from small and medium-sized businesses to companies in the Fortune 1000, healthcare and related businesses, and federal, state, and local government agencies. We will continue to market primarily to commercial enterprises, with a focus on healthcare organizations, interested in our communication solutions. We maintain a sales presence in key markets throughout the United States, and in limited markets internationally including our Asia-Pacific sales team, in an effort to gain new customers and to retain and increase sales to existing customers. The direct sales force targets leadership responsible for the procurement of clinical communication and collaboration solutions such as chief information officers, chief technology officers, chief medical officers, chief nursing officers, information technology directors, telecommunications directors, and contact center managers. The timing for a direct sale varies but may take from 6 to 18 months depending on the type and scope of software solution.

In late 2020, as part of our continued transition to a Software as a Service ("SaaS") provider, we undertook a reorganization of our direct sales force. These changes are necessary in order to improve alignment between our direct sales force and our Land, Adopt, Expand, Renew ("LAER") selling methodology. The LAER selling methodology is widely considered fundamental to the success of SaaS organizations. This reorganization will see our direct sales force bifurcated into two teams; one focused solely on the addition of new customers and the other focused on the expansion of existing customers. The LAER model places significant emphasis on landing new customers which requires the direct focus, attention and coordinated efforts of a specific team. Once new customers have been obtained, a second team is responsible for establishing relationships with our existing customers and creating expansion opportunities within those relationships for additional service lines and other products or services. Finally, our Customer Success organization helps to create expansion opportunities through driving successful adoption of our products and services as well as the retention of our existing customers. These changes will largely be made by reorganizing existing resources and, as a result, we do not expect to incur significant additional costs. We expect this reorganization will be completed in the first half of 2021.

The indirect sales force complements our direct sales force. Through relationships with alliance partners we are able to sell our solutions to a wider customer base. For paging services that we do not provide directly, we contract with and invoice an intermediary for airtime services. For our software sales, relationships with alliance partners assist us in broadening the distribution of our products and further diversifying into markets outside of the healthcare provider vertical. We are expanding partnership efforts in 2021.

While we continue to identify hospitals with 200 or more beds as the primary targets for our software solutions as well as our paging services, we have recently expanded our focus to include smaller hospitals with shorter sales cycles, including academic medical centers. Within our target market, we have identified and focused our efforts to address the following dynamics:

- A heightened awareness of the ubiquitous, critical role of communications in healthcare;
- An increased focus within hospitals on quality of care and patient safety initiatives;
- The importance of confidentiality when sharing information;
- Increased regulations that may result in process changes, increased documentation and reporting and increased costs;
- A continuing focus within hospitals to reduce labor and administrative costs while increasing productivity; and
- A broader proliferation of information technology in healthcare as hospitals strive to apply technology to solve their business problems.

Marketing

We have a centralized marketing function, which is focused on supporting our solutions and sales efforts by strengthening our corporate brand, generating sales leads, and facilitating the sales process. Our principal marketing programs include:

- Content marketing (eBriefs, case studies, brochures, videos, infographics, and more) as an underlying foundation of all marketing campaigns or initiatives;
- Website development and maintenance, which provides product and Company information, customer support options, paging capabilities, as well as thought leadership and engagement;
- Participation at trade shows and industry events, such as Healthcare Information and Management Systems Society, College of Healthcare Information Management Executives, Association of Medical Directors of Information Systems, American Organization of Nurse Leaders, and other Healthcare Information technology related shows and conferences;
- Webinars about customer successes, current industry trends, and our solutions;
- Social media involvement to provide information regarding upcoming educational events or new product offerings;
- Industry analyst relationships;
- Newsletters and blog posts to provide information about industry trends and our solutions to customers, prospects, and alliances; and
- Annual customer conferences that solicit feedback on our solutions and services.

Licenses and Messaging Networks

In order to provide our wireless services, we hold licenses to operate on various frequencies in the 900 MHz narrowband. We are licensed by the United States Federal Communications Commission (the "FCC") to operate Commercial Mobile Radio Services ("CMRS"). These licenses are required to provide one-way and two-way messaging services over our networks.

We operate local, regional and nationwide one-way networks, which enable subscribers to receive messages over a desired geographic area. One-way networks operating in 900 MHz frequency bands utilize the FLEX™ protocol developed by Motorola Mobility, Inc. ("Motorola"). The FLEX™ protocol has advantages of functioning at higher network speeds (which increases the volume of messages that can be transmitted over the network) and of having more robust error correction (which facilitates message delivery to a device with fewer transmission errors).

Our two-way networks utilize the ReFLEX 25™ protocol, also developed by Motorola. ReFLEX 25™ promotes spectrum efficiency and high network capacity by dividing coverage areas into zones and sub-zones. Messages are directed to the zone or sub-zone where the subscriber is located, allowing the same frequency to be reused to carry different traffic in other zones or sub-zones. As a result, the ReFLEX 25™ protocol allows the two-way network to transmit substantially more messages than a one-way network using the FLEX™ protocols. The two-way network also provides for assured message delivery. The network stores, for a limited amount of time, messages that could not be delivered to a device that is out of coverage for any reason, and when the unit returns to service, those messages are delivered. The two-way paging network operates under a set of licenses called narrowband Personal Communications Service, which uses 900 MHz frequencies. These licenses require certain minimum five and ten-year build-out commitments established by the FCC, which have been satisfied.

Although the capacities of our networks vary by geographic area, we have excess capacity at a consolidated level. We have implemented a plan to manage network capacity and to improve overall network efficiency by consolidating subscribers onto fewer, higher capacity networks with increased transmission speeds. This plan is referred to as network rationalization. Network rationalization will result in fewer networks and therefore fewer transmitter locations, which we believe will result in lower operating expenses due primarily to lower site rent expenses.

As we continue to implement our network rationalization plan, we expect to have fewer transmitters that can be removed efficiently from our networks and still maintain the level of service required for our customers, and thus the benefits of network rationalization will decline. Cost savings began to slow in 2019 and 2020 as compared to historical cost savings, and we expect this trend to continue in the future. As we reach certain minimum frequency commitments, as outlined by the FCC, we will be limited in our ability to continue our efforts to rationalize and consolidate our networks. Our messaging networks and related infrastructure are located exclusively in the United States.

Generally, our software solutions do not require licenses or permits from federal, state and/or local government agencies in order to be sold to customers. However, certain of our software products are subject to regulation by the United States Food and Drug Administration ("FDA") and are subject to certification by the Joint Interoperability Test Command to be sold to the branches of the armed services of the United States and the United States government. (see "Regulation" below).

Our Strategy

We intend to drive growth in our business by building on our position as a global provider of healthcare communications, while operating an efficient and profitable business strategy.

Critical aspects of our strategy include:

Acquiring new customers - We will continue to focus our sales and marketing efforts in the healthcare market in order to identify opportunities for sales and close those opportunities in the form of bookings. We have an ongoing initiative to further penetrate the hospital segment in the United States, and while we believe there is a significant opportunity to sell clinical communication and collaboration solutions to hospitals located outside the United States, our near-term focus is on the domestic market. We intend to leverage the strength of our market presence and the breadth of our product offerings to further expand our customer base in healthcare.

The introduction of Spok Go in early 2020 is a key initiative that we believe is the basis for future growth of our software revenue and bookings. Further details on Spok Go can be found under "Spok Go platform."

Promoting strong customer adoption - We look to promote strong adoption of Spok Go through a dedicated Customer Success organization, established in 2021. Effective customer adoption is the foundation of strong customer retention and is critical to our long-term growth. We intend to drive strong adoption through the achievement of measurable outcomes which in-turn will create value for our customers.

Expanding relationships within our existing customer base - We have a significant presence in the healthcare marketplace, and we anticipate leveraging our existing customer relationships as an opportunity to transition those customers from our on-premise software solutions to Spok Go over the next several years.

Minimizing customer attrition - We continue to have a valuable wireless presence in the healthcare market, particularly in larger hospitals. We offer a comprehensive suite of wireless messaging products and services focused on healthcare and "campus" type environments and critical mission notification. We will continue to focus on network reliability and customer service to help minimize the rate of revenue attrition.

We recognize that the number of wireless subscribers, units in service, and the related revenue will continue to decline. We intend to continue reducing our underlying cost structure impacting this declining wireless revenue stream by reducing payroll and related expenses as well as network related expenses where possible. We will integrate and consolidate operations as necessary to ensure the lowest cost operational platform for our consolidated business.

Developing new applications and capabilities - As we did with the introduction of Spok Go in early 2020, we will continue to invest significantly in the research and development of new products and services as well as the expansion of Spok Go and the maintenance of existing software solutions.

Returning capital to our stockholders - We understand that our primary objective is to create long-term stockholder value. We will continue to evaluate how best to deploy our capital resources to support sustainable business growth and maximize stockholder value. We expect to continue to pay a quarterly dividend of $0.125 per share of common stock, or $0.50 annually, in 2021. We will continue to evaluate both market and Company factors to determine whether a common stock repurchase program is an appropriate method to return capital to our stockholders.

Products and Services

Wireless Products and Related Services

We offer subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semi-annual, or annual) service fee. The level of service fees is generally based upon the type of service provided, the geographic area covered, the number of devices provided to the customer and the period of commitment. A subscriber to one-way messaging services may select coverage on a local, regional, or nationwide basis to best meet their messaging needs. Two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract for a messaging device from us for an additional fixed monthly fee or they own a device, having purchased it either from us or from another vendor. We also sell devices to resellers who lease or resell them to their subscribers and then sell messaging services utilizing our networks. We offer ancillary services, such as voicemail and equipment loss or maintenance protection, which help increase the monthly recurring revenue we receive along with these traditional messaging services. We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers which are configurable to support unencrypted or encrypted operation. When configured for encryption, they utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption enabled these secure paging devices enhance our service offerings to the healthcare community by adding Health Insurance Portability and Accountability Act ("HIPAA") security capabilities to the low cost, highly reliable and availability benefits of paging.

The demand for one-way and two-way messaging services declined during the years ended December 31, 2020, 2019 and 2018, and we believe demand will continue to decline for the foreseeable future. Wireless products and services revenue represented 56%, 55% and 56% of total consolidated revenue for the years ended December 31, 2020, 2019 and 2018, respectively. As demand for one-way and two-way messaging has declined, we have developed or added service offerings in order to increase our revenue potential and mitigate the decline in our wireless revenues. We will continue to evaluate opportunities to provide customers the highest value possible.

Software

Dependable clinical communications are paramount for individuals in healthcare and a host of other industries. We offer a number of solutions, providing our customers with the ability to communicate anywhere, anytime across a number of situations. Our solutions are used for contact centers, clinical alerting and notification, mobile communications and messaging, and for public safety notifications.

Spok Go Platform

Spok Go is an enterprise solution that includes secure messaging, global directory, on-call scheduling and workflow automation. While Spok Go was first made available to customers in early 2020, we continue to focus our product development activities on enhancing this clinical communication and collaboration platform. Spok Go was created as an integrated cloud-native platform built on the foundation of a single, best-in-class architecture. Building Spok Go from the ground up has allowed us to place an emphasis on mobile accessibility from the beginning. Mobile accessibility is a core component of the platform and developing Spok Go with a focus on mobile application ensures that users will experience seamless transitions between mobile technologies and integrated applications, whether they are in the hospital or "on the go." Because Spok Go is a cloud-based solution, our customers are able to receive updates and enhancements seamlessly as they are released by the Company. Hosting and security are handled through our partnership with Amazon Web Services® ("AWS"). AWS provides the core infrastructure for Spok Go through AWS hosting, ensuring that customers have access to the most current and secured technologies with respect to a hosted environment where security is critical to our customers. Within Spok Go, the following applications provide optional functionality and feature sets that can enhance our customers' clinical communication experience:

- **Clinical Care:** Clinical Care allows customers to optimize patient care coordination and improve the patient experience by connecting clinical teams with the individuals and information needed most. The application allows for rapid response by clinical teams to urgent patient needs, providing notifications of information to any device, and also allows customers to standardize communication protocols with flexible workflow templates.
- **Clinical Diagnostics:** Clinical Diagnostics increases the efficiency and delivery speed of radiology and laboratory results. The removal of manual processes allows for the automation of critical test result communications. Clinical Diagnostics can also escalate critical results so that communications are not lost or inadvertently ignored. Patient safety is improved by decreasing communication failures and delays, which can result in lower cost of care and improved patient outcomes.

We anticipate future development of new functionality and enhancements will be driven by specific market needs along with our desire to expand into other service lines such as radiology, contact centers and emergency departments. We expect our close and trusted relationships with our customers will be sources for new use cases, features and solutions. Our product strategy team assesses these customer needs, conducts industry-based research and helps to ensure new releases are designed to have immediate, broad applicability, a strong value proposition and a high return on investment for both Spok and our customers.

As previously mentioned, the shift to value-based healthcare, unsustainable growth in healthcare costs and the general move towards a digital world has driven the healthcare industry toward technology in hopes of creating more efficiencies that will reduce pressure on their bottom line and increase patient care quality, safety and satisfaction. Spok Go will provide a significant value proposition for potential customers by delivering efficiencies in clinical communication and collaboration through improvements in secure messaging, workflow and automation which will ultimately lead to improvements in clinical and quality outcomes.

As we look beyond our initial 2020 release of Spok Go, we continue to expect that, through 2021, sales will largely be driven by new customers, as opposed to the transition of existing customers. We plan to continue investing in our development of Spok Go, however, we believe costs will continue to normalize through 2021. We expect growth in development costs related to Spok Go will continue to decline relative to the growth rates we have seen over the past several years. As revenues from Spok Go begin to materialize over the next several years, we anticipate improvement in our development costs relative to total software revenues.

Spok Care Connect® Suite ("CCS")

Contact Center

- **Spok® Healthcare Console:** Provides operators with the information needed to process calls using their computers with just a few keystrokes. This solution integrates with the customers' existing phone systems and is used by the operator group to answer incoming calls to the contact center. Operators can quickly and accurately perform directory searches and code calls, as well as messaging and paging by individuals, groups, and roles using the Spok Healthcare Console's computer telephony integration and directory capabilities.
- **Spok® Web-Based Directory:** Makes employee contact information more accessible and enables staff to send messages quickly right from the directory. Authenticated users can log on anywhere, anytime to perform a variety of important updates to contact information and on-call schedules, search the directory, and send important messages.
- **Spok® Web-Based On-Call Scheduling:** Keeps personnel, calendars and on-call scheduling information updated, even with thousands of staff, using a secure web portal to maintain and allow password-protected access to the latest on-call schedules and personnel information.
- **Spok® Speech:** Enables the organization to process routine phone requests, including transfers, directory assistance, messaging and paging without live operators and with more ease-of-use than touchtone menus.
- **Spok® Call Recording and Quality Management:** Records, monitors, and scores operators' conversations to allow for better management of calls, helping improve customer service.

Clinical Alerting

- **Spok® Messenger:** Provides an intelligent, FDA, 510(k)-cleared solution that connects virtually all crucial alert systems, including nurse call, fire, security, patient monitoring, and building management to mobile staff via their wireless communication devices. This solution provides the ability to reach mobile team members within seconds of an alert, improving overall workflow, staff productivity, and the comfort and safety of everyone in the facility.
- **Spok® e.Notify:** Enables organizations to quickly and reliably notify and confirm team member availability during emergency situations without relying on calling trees, thereby reducing confusion that may arise in an emergency situation. This solution automatically delivers messages, collects responses, escalates issues to others, and logs all activities for reporting and analysis purposes.
- **Spok® Critical Test Results Management:** Automates and streamlines the process of delivering critical test results to the appropriate clinicians to help ensure patient safety. This solution can send messages from the cardiology, laboratory and radiology departments by means of encrypted smartphone communications, two-way paging, secure email, secure text, images, annotations, and voice to a variety of endpoints such as workstations, laptops, tablets, smartphones, pagers, and other wireless devices.

Mobile Communications

- **Spok Mobile®:** Simplifies communications and strengthens care by using smartphones and tablets for secure code alerts, patient updates, results, consult requests, and much more. Allows users to access the full directory of accurate contact information to send messages/photos/videos to smartphones and other devices, and to ensure clinical communications are logged, all with security, traceability, and reliability.
- **Spok® Device Preference Engine:** Facilitates voice conversations among doctors and caregivers by enabling users to choose the desired communication method based on factors such as message priority.

Public Safety

- **Spok® pc/psap:** Speeds emergency dispatch by giving Public Safety Answering Point call-takers an easy-to-use, standards-based, graphical interface that integrates the underlying phone system, mapping systems, and other resources for critical information availability. 9-1-1 call-takers are able to instantly involve police, fire, EMT, and hazardous material personnel with a single click of the mouse or touch of the screen.
- **Spok® Enterprise Alert:** Directs emergency personnel to a 9-1-1 caller's exact location (building, floor, room), helping to ensure speed, accuracy, and reliability of response. The E9-1-1 software provides real-time, onsite notification when 9-1-1 is dialed, and works to decrease emergency response time.

Services

We offer a variety of professional services to assist our customers in the successful implementation of, and to maximize the benefits obtained from the use of, our software solutions. We also offer support services to enhance and refine the customer's experience throughout their relationship with Spok.

- **Professional Services:** We offer a full suite of professional services that are provided by a dedicated group of professional service employees. Our professional services include consultation, implementation, and training services. For both our on-premise and SaaS based software solution implementations, our professional services staff uses a branded, consistent methodology that provides a comprehensive phased work plan for both new software installations and/or upgrades. In support of our implementation methodology, we manage the various aspects of the process through a professional services automation tool. We may also use third-party professional services firms as supplemental resources to implement our solutions for customers as needed. Professional services revenue represented 12% of total consolidated revenue for the years ended December 31, 2020 and December 31, 2019, and 11% for the year ended December 31, 2018.
- **Software License Updates and Product Support (Maintenance):** Software license updates and product support, which is generally referred to as maintenance when sold to customers, is an important offering to customers who utilize our on-premise software solutions. In order to support our products that provide clinical communication and collaboration solutions to our customer’s organizations, we have a dedicated customer support organization. The customer support organization provides support 24 hours a day, 7 days a week, 365 days a year and the service can be accessed via telephone, email or the Internet via the Spok webpage. The Spok support service is augmented by third-party services where needed. Software license updates and product support are generally priced together as a percentage of the software licenses for which these services will be provided. Largely all of our customers purchase maintenance when they purchase new software licenses, after which renewals generally occur on an annual basis and are paid in advance. Software license updates provide customers with rights to unspecified product upgrades as well as maintenance and patch releases that are released during the term of the support period. Software license updates and product support revenue (i.e. Maintenance revenue) represented 26% of total consolidated revenue for the year ended December 31, 2020, 25% for the year ended December 31, 2019, and 23% for the year ended December 31, 2018.

Future sales of Spok Go are expected to generate less implementation revenue relative to legacy CCS solution sales. We anticipate that the initial implementation time for a new installation of Spok Go will be significantly less as compared to our on-premise legacy CCS solutions. Similar to historical maintenance practices, a customer's subscription to Spok Go is renewed on a recurring basis according to the service terms and is generally expected to be from one to five years. This Subscription revenue stream is inclusive of hosting, access to the Company's software platform and update and support services. We do not expect to transition a significant number of existing customers to Spok Go in 2021. However, when customers do begin to transition from our on-premise solutions to Spok Go, the license and maintenance revenue streams are expected to decrease with a corresponding increase in our Subscription revenue stream.

Sources of Equipment

We do not manufacture the messaging devices our customers need to make use of our wireless services or the network equipment we use to provide wireless messaging services. We have relationships with several vendors to purchase new messaging devices. Used messaging devices are available in the secondary market from various sources. We believe existing inventory, returns of devices from customers that canceled wireless services, and purchases from other available sources of new and reconditioned devices will be sufficient to meet expected messaging device requirements for the foreseeable future. We negotiate contractual terms with our vendors that do not directly relate to the manufacturing of the network equipment or messaging devices. The network equipment and messaging devices on which we may place our logo or label are generic.

We sell third-party equipment for use with our software solutions. The third-party equipment that we sell is generally available and does not require any specialty manufacturing to accommodate our software solutions.

We currently have inventory and network equipment on hand that we believe will be sufficient to meet our wireless and software equipment requirements for the foreseeable future.

Intellectual Property

As of December 31, 2020, we held 87 trademarks and seven patents, as well as one pending patent and various pending trademarks, which we believe are important to protect our intellectual property. We believe our intellectual property distinguishes our business from our competition and is integral to our continued success in the area of clinical communication and collaboration solutions. The expiration dates of these trademarks range from 2021 to 2033 and can be extended for ten-year periods upon renewals.

Customers

Our customers include businesses and their employees who need to be accessible to their offices or customers, first responders who need to be accessible in emergencies, and third parties, such as other telecommunication carriers and resellers that pay us to use our networks. Customers include businesses, professionals, management personnel, medical personnel, field sales personnel and service forces, members of the construction industry and construction trades, real estate brokers and developers, sales and services organizations, specialty trade organizations, manufacturing organizations and government agencies.

Our wide-ranging customer base allows for low customer revenue concentration and as a result, no single customer accounted for more than 10% of our total revenues in 2020, 2019 or 2018.

We pursue close, long-term relationships with our customers because we believe strong customer relationships enable us to retain our current customer base and expand our services and revenue to that customer base.

Competition

The competitors and degree of competition vary among our various product categories. Competition is particularly strong for our wireless messaging services. Within the wireless industry, companies compete on the basis of price, coverage area, services offered, transmission quality, network reliability and customer service. We compete by maintaining competitive pricing for our products and services, by providing broad coverage options through high-quality, reliable messaging networks and by providing quality customer service. Direct competitors for wireless messaging services include American Messaging Service, LLC and a variety of other regional and local providers. We also compete with a broad array of wireless messaging services provided by mobile telephone companies, including AT&T Mobility LLC, Sprint Nextel Corporation, T-Mobile USA, Inc., and Verizon Wireless, Inc. This competition has intensified as prices for the services of mobile telephone companies have declined and as those companies have incorporated messaging capabilities into their mobile phone devices. Many of these companies possess far greater financial, technical and other resources than we do.

Most personal communications service and other mobile phone devices currently sold in the United States are capable of sending and receiving one-way and two-way messages. Most subscribers that purchase these services no longer need to subscribe to a separate messaging service. As a result, many one-way and two-way messaging subscribers can readily switch to cellular, personal communications service and other mobile telephone services. The decrease in prices and increase in capacity and functionality for cellular, personal communications service, WiFi, and other mobile telephone services have led many subscribers to select combined voice and messaging services from mobile telephone companies as an alternative to our stand-alone messaging services.

We also have a number of competitors whose software products compete with one or more modules of our clinical communication and collaboration solutions. These competitors are a mix of privately held and public companies that offer a number of call center, alerting and mobile communication products. Our primary competitive advantages include having:

- An integrated product suite;
- A communication-driven workflow;
- Certifications, such as those through the Joint Interoperability Test Command (see "Joint Interoperability Test Command" below) and the FDA; and
- A complete directory of contacts throughout the customer enterprise.

Although there are no competitors that offer a similar comprehensive set of software modules that match our product offerings, there are several competitors who offer software similar to many of our solutions. As we continue our transition to a software company, our competitive landscape will continue to evolve. Selected competitors for portions of our product portfolio include:

- Alaska Communications Systems Group, Inc. - Mobile communications solutions;
- Appfolio, Inc. - Cloud-based software solutions;
- Boingo Wireless, Inc. - Mobile communications solutions;
- Castlight Health, Inc. - Software as a service health benefits platform;
- Computer Programs and Systems, Inc. - Healthcare IT solutions;
- Everbridge, Inc. - Clinical alerting solutions;
- Evolent Health, Inc. - Healthcare delivery and payment solutions;
- Five9, Inc. - Cloud-based solutions;
- Globalstar, Inc. - Mobile communications solutions;
- HealthStream, Inc. - healthcare development solutions;
- LivePerson, Inc. - Mobile and online messaging solutions;
- MobileIron, Inc. - Mobile communications solutions;
- Model N, Inc. - Revenue management cloud-based solutions;
- NextGen Healthcare, Inc. - Medical and Dental software, services, and analytic solutions;
- ORBCOMM Inc. - Network connectivity and device management solutions; and
- Vocera Communications, Inc. - Mobile communications solutions.

In addition, substantially larger companies in the electronic medical records space such as Epic Systems Corporation, Cerner Corporation, Athenahealth, Inc. and Allscripts Healthcare Solutions, Inc. may choose to offer software-related solutions similar to our clinical communication and collaboration solutions or may acquire one of our competitors.

Research and Development

We maintain a product development group, a substantial portion of which is focused on developing new software products, especially with respect to developing the Spok Go platform and additional enhancements. Within our research and development group is a separate task force focused on ongoing maintenance and enhancement of existing point-solution products. Our product development group uses a methodology that balances enhancement requests from a number of sources including customers, regulatory requirements, the professional services staff, customer support incidents, known defects, market and technology trends, and competitive requirements. These requests are reviewed and prioritized based on criteria that include the potential for increased revenue, customer/employee satisfaction, possible cost savings, and development time and expense.

Human Capital

At December 31, 2020, and 2019, we had 602 and 638 full time equivalent ("FTE") employees, respectively. Our employees are not represented by labor unions or covered by a collective bargaining agreement.

Employee Health, Safety and Well-Being

Spok is committed to conducting its business operations in a manner that protects the health and safety of its employees, visitors, contractors and the public, and to the reduction of risks within our work centers. Spok believes that no job is so important that our employees cannot take the time to ensure the work is performed safely and in an environmentally conscious manner. Spok's policies and procedures are intended to provide employees with the information needed to meet all federal, state and local guidelines for occupational health and safety.

The COVID-19 pandemic continues to affect our policies with regard to our employees, whose health and safety is our highest priority. Following strategies recommended by the Centers for Disease Control and Prevention, we have continued to implement enhanced safety measures, including restrictions on business travel, the implementation of remote work arrangements for our office-based employees, and liberal leave policies for employees who may be affected by illness, quarantines or childcare obligations.

Diversity and Inclusion

As a global company, Spok strives to create an environment that embraces diversity and fosters inclusion. We recognize the value and contributions of individuals with a wide range of capabilities, experience, and perspectives, and draws upon this diversity to create value for our customers and maintain an effective and engaged workforce. Spok is committed to maintaining a work environment free from discrimination and harassment, and one where employees are treated with dignity and respect. We refuse to accept or tolerate harassment or discrimination against any employee or applicant for employment.

In 2020, Spok formed a council composed of employees and executive sponsors to provide feedback and make recommendations regarding our diversity and inclusion policies and practices. We believe that by promoting and supporting inclusiveness and by leveraging our organization's diversity, we have a competitive advantage that allows us to innovate and draw from our workforce's differing perspectives. By bringing together employees from diverse backgrounds and providing each an opportunity to develop their skills and actively contribute to our mission, we cultivate an engaged workforce which in turn helps us deliver value to our customers.

Ethical Standards

Integrity is a core tenet of Spok's culture, and we have measures and controls in place to regularly ensure that our work and organization are held to the highest ethical standards. We provide numerous resources to our employees, including regular, annual training on maintaining these standards. We also maintain employee guidelines and policies that align with Spok's Code of Business Conduct and Ethics.

Regulation

Federal Regulation

The FCC issues licenses to use radio frequencies necessary to conduct our business and regulate many aspects of the operations that support our wireless revenue. Licenses granted to us by the FCC have varying terms, generally of up to ten years, at which time the FCC must approve renewal applications. In the past, FCC renewal applications generally have been granted upon showing compliance with FCC regulations and adequate service to the public. Other than those still pending, the FCC has thus far granted each license renewal that we have requested.

The Communications Act of 1934, as amended (the "Communications Act"), requires radio licensees, including us, to obtain prior approval from the FCC for the assignment or transfer of control of any construction permit or station license or authorization of any rights thereunder. The FCC has thus far granted each assignment or transfer request we have made in connection with a change of control.

The Communications Act also places limitations on foreign ownership of CMRS licenses, which constitute the majority of our licenses. These foreign ownership restrictions limit the percentage of stockholders' equity that may be owned or voted, directly or indirectly, by non-United States citizens or their representatives, foreign governments or their representatives, or foreign corporations. Our Amended and Restated Certificate of Incorporation permits the redemption of our equity from stockholders where necessary to ensure compliance with these requirements.

The FCC's rules and regulations require us to pay a variety of fees that otherwise increase our costs of doing business. For example, the FCC requires licensees, including Spok, to pay levies and fees, such as universal service fees, to cover the costs of certain regulatory programs and to promote various other societal goals. These requirements increase the cost of the services we provide. By law, we are permitted to bill our customers for these regulatory costs and we typically do so.

Additionally, the Communications Assistance to Law Enforcement Act of 1994, ("CALEA") and certain rules implementing CALEA require some telecommunication companies, including Spok, to design and/or modify their equipment in order to allow law enforcement personnel to "wiretap" or otherwise intercept messages. Other regulatory requirements restrict how we may use customer information and prohibit certain commercial electronic messages, even to our own customers.

In addition, the FCC's rules require us to pay other carriers for the transport and termination of some telecommunication traffic. As a result of various FCC decisions over the last few years, we no longer pay fees for the termination of traffic originating on the networks of local exchange carriers providing wireline services interconnected with our services. In some instances, we received refunds for prior payments to certain local exchange carriers. We have entered into a number of interconnection agreements with local exchange carriers in order to resolve various issues regarding charges imposed by local exchange carriers for interconnection.

Failure to follow the FCC's rules and regulations can result in a variety of penalties, ranging from monetary fines to the loss of licenses. Additionally, the FCC has the authority to modify licenses, or impose additional requirements through changes to its rules.

The FDA has determined software systems that connect to medical devices are subject to regulation as medical devices as defined by the federal Food, Drug and Cosmetic Act (the "FDC Act"). Since our middleware software products connect to medical devices, we are required to comply with the FDC Act's requirements, including but not limited to: registration and listing, labeling, medical device reporting (reporting of medical device-related adverse events), removal and correction, and good manufacturing practice requirements. We have complied with the regulatory requirements of the FDC Act, and registered and received the necessary clearances for our products. As we modify and/or enhance our software products (including our middleware product), we may be required to request FDA clearance before we are permitted to market these products.

In addition, our software solutions may handle or have access to personal health information subject in the United States to the HIPAA, the Health Information Technology for Economic and Clinical Health Act ("HITECH"), and related regulations. These statutes and related regulations impose numerous requirements regarding the use and disclosure of personal health information with which we help our customers comply. Our failure to accurately anticipate or interpret these complex and technical laws could subject us to civil and/or criminal liability. We believe that we are in compliance with these laws and their related regulations.

Although these and other regulatory requirements have not, to date, had a material adverse effect on our operating results, such requirements could have a material impact on our operating results in the future. We monitor discussions at the FCC and FDA on pending changes in regulatory policy or regulations; however, we are unable to predict what changes, if any, may occur in 2021 to regulatory policy or regulations.

State Regulation

As a result of the enactment by the United States Congress of the Omnibus Budget Reconciliation Act of 1993 ("OBRA") in August 1993, states are now generally preempted from exercising rate or entry regulation over any of our operations. States are not preempted, however, from regulating "other terms and conditions" of our operations, including consumer protection and similar rules of general applicability. Zoning requirements are also generally permissible, however, provisions of the OBRA prohibit local zoning authorities from unreasonably restricting wireless services. States that regulate our services also may require us to obtain prior approval of (1) the acquisition of controlling interests in other paging companies and (2) a change of control.

At this time, we are not aware of any proposed state legislation or regulations that would have a material adverse impact on our business.

Joint Interoperability Test Command ("JITC") Certification

JITC is a military organization that tests technology for use by the branches of the armed services of the United States and the United States government. JITC certification is required of all systems with joint interfaces or joint information exchanges with other systems used by these organizations and is done to ensure all systems operate effectively together. All information technology and national security systems that exchange and use information to enable units or forces to operate effectively in joint, combined, coalition and interagency operations and simulations must be certified. Once a system has been certified under this program, the certification must be renewed every four years or after any changes that may affect interoperability. The interoperability certification process consists of four basic steps, which are:

- Identify (interoperability) requirements;
- Develop certification approach (planning);
- Perform interoperability test and evaluation; and
- Report certifications and statuses.

We submit and receive JITC certification for certain of our products through the Defense Information Systems Agency, which allows us to sell and implement our solutions at federal government agencies. We currently certify a console, web, speech, mass notification, public safety answering point, call recording and campus 911 product with JITC. We have a roadmap to renew the existing certifications with new releases of existing products and to bring additional products to JITC to increase the products that can be sold to federal agencies.

Available Information

We make available on our website at http://www.spok.com, free of charge, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports as soon as reasonably practicable after such reports are electronically filed with, or furnished to, the SEC. The SEC also maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at http://www.sec.gov. We also make available on our website, and in print, if any stockholder or other person so requests, our code of business conduct and ethics entitled "Code of Ethics" which is applicable to all employees and directors, our "Corporate Governance Guidelines" and the charters for all committees of our Board of Directors, including Audit, Compensation and Nominating and Governance. Any changes to our Code of Ethics or waiver, if any, of our Code of Ethics for executive officers or directors will be posted on that website.

ITEM 1A. *RISK FACTORS*

The following important factors, among others, could cause our actual operating results to differ materially from those indicated or suggested by forward-looking statements made in this 2020 Form 10-K or presented elsewhere by management from time to time.

Risks Related to the COVID-19 Pandemic and the Economy

Our business, financial condition and operating results have been, and will continue to be, adversely affected by the recent COVID-19 pandemic.

The COVID-19 pandemic has resulted in a widespread health crisis that has adversely affected businesses, economies and financial markets worldwide, and has caused significant volatility in U.S. and international debt and equity markets. In particular, healthcare organizations have faced, and will continue to face, substantial challenges in treating patients with COVID-19, such as the diversion of hospital staff and resources from ordinary functions to the treatment of COVID-19, supply, resource and capital shortages and the overburdening of staff and resource capacity.

Our business, financial condition and operating results have been, and will continue to be, adversely affected by the COVID-19 pandemic. For example, the COVID-19 pandemic has caused, and will continue to cause, delays in or the loss of revenue from services that require onsite implementation as well as delays in or the loss of software bookings, which directly impacts license and equipment revenues, as healthcare organizations are putting these projects on hold to focus limited resources and personnel capacity toward the treatment of COVID-19. We also may be affected by the cancellation of or delay in healthcare information technology and management systems conferences and exhibitions, which may further delay our growth in Spok Go revenues.

The extent to which COVID-19 impacts our results will depend on future developments, which are highly uncertain and cannot be predicted. These developments may include actions taken to contain COVID-19 or treat its impact and the length of time any government restrictions will remain in place, whether additional restrictions will be implemented in certain locations, uncertainties regarding the acceptance, availability, timing, distribution and effectiveness of vaccines to prevent the spread of COVID-19, the time it will take for the general economy to recover and the time it will take hospitals to return to a more normal operating state.

Economic conditions that are largely out of our control may adversely affect our financial condition and statement of operations.

Our business is sensitive to recessionary economic cycles, higher interest rates, inflation, higher levels of unemployment, higher tax rates and other changes in tax laws, or other economic factors that may affect business spending or buying habits that could adversely affect the demand for our services. This adverse impact could increase the rate of gross subscriber cancellations and/or the level of revenue erosion for our wireless business and could cause delays in or the loss of software revenue or bookings, which impacts license, professional services, equipment and subscription revenues.

A significant portion of our revenue is derived from healthcare customers, and we are impacted by changes in the healthcare economic environment. The healthcare industry is highly regulated and is subject to changing political, legislative, regulatory, and other economic developments. These developments can have a dramatic effect on the decision-making and spending by our customers for information technology and software. This economic uncertainty can add to the unpredictability of decision-making and lengthen our sales cycle.

Further, the uncertainty created by the possibility of additional healthcare reform legislation is impacting customer decision making and information technology plans in our key healthcare market. We are unable to predict the full consequences of this uncertainty on our operations. Adverse changes in the economic environment could adversely impact our ability to market and sell our wireless and software solutions to healthcare customers.

Risks Related to our Products and Services

We may be unable to effectively develop, introduce and deploy our integrated communications and collaboration platform, Spok Go, which is the basis for our future growth.

Our future revenue growth depends on our ability to develop, introduce and effectively deploy our Spok Go platform. This multi-year effort will require the coordination of multiple development teams dedicated to this task. Simultaneously with this new development effort, we must continue to improve and support our existing suite of products to transition them to Spok Go. We foresee the following risks inherent in this process:

- **Requirements Definition:** Our plans for Spok Go may not meet the market's needs or customer expectations and could result in low market demand and/or acceptance.
- **Product Scope and Schedule:** Our product scope may be subject to development from market-led requirements, new technologies or competitors expanding product capabilities or entering into adjacent markets. We may fail to manage the scope of our software development activities effectively, resulting in delays in meeting key milestones, achieving network solutions on a fully integrated basis, or solving coding problems in a timely and efficient manner. In addition, the continuing software development efforts on our existing products could distract management time and focus from developing Spok Go.
- **Staffing and Organization:** The development of Spok Go requires the hiring of new personnel. We may be unable to attract, in a timely manner, the qualified staff to meet our requirements. In addition the organizational changes and new hires necessary to address our development requirements could create attrition risk for our current staff.
- **Operational Readiness:** Even if the development of Spok Go occurs as we have planned, we may not be prepared or ready to sell, deliver and support the new platform technology.

The rate of wireless subscriber and revenue erosion could exceed our ability to reduce wireless operating expenses in order to maintain overall positive operating cash flow.

Our wireless revenue is dependent on the number of subscribers that use our paging devices. Our customers may not renew their subscriptions after the expiration of their subscription agreements. In addition, our customers may opt for one of our lower-priced offerings or for fewer subscriptions. Our customers' renewal rates may decline or fluctuate as a result of a number of factors, including their level of satisfaction with our offerings and their ability to continue their operations and spending levels. Increasing awareness and concern over HIPAA/HITECH compliance is causing healthcare organizations, our largest customer segment, to re-evaluate paging subscriptions for clinical use cases when users are not equipped with our encrypted pager offerings.

We face intense competition for subscribers from other paging service providers and alternate wireless communications providers such as mobile phone and mobile data service providers. There is a risk that our competitors' products may provide better performance or include additional features when compared to our offerings. Competitive pressures could also affect the prices we may charge or the demand for our offerings, resulting in reduced profit margins and loss of market share. Our efforts to compete effectively may not be sufficient, which may adversely affect our business, financial condition, operating results and cash flows.

In addition to competition, our customer base may be impacted by the introduction of new technologies. As mobile communications technology evolves, competitors that provide wireless broadband data services may lower their prices to customers that approach, meet or undercut our prices for paging services. We are unable to predict how customer perceptions of the value of our wireless services will be impacted by the development of new wireless technologies. Our continued success will depend on our ability to adapt to rapidly changing technologies and user preferences, to adapt our offerings to evolving industry standards, to predict user preferences and industry changes in order to continue to provide value to our customers and to improve the performance and reliability of our offerings. Our failure to adapt to such changes could harm our business, and our efforts to adapt to such changes could require substantial expenditures on our part to modify our offerings or infrastructure. Delays in developing, completing or delivering new or enhanced offerings and technologies could result in delayed or reduced revenue for those offerings and could also adversely affect customer acceptance of those offerings and technologies. Even if we are able to enhance our existing offerings or introduce new offerings that are well perceived by the market, if our marketing or sales efforts do not generate interest in or sales for these offerings, they may be unsuccessful.

We expect our wireless subscriber results, units in service and revenue will continue to decline for the foreseeable future. As this revenue erosion continues, maintaining positive cash flow is dependent on substantial and timely reductions in selected wireless operating expenses. Reductions in wireless operating expenses require both the reduction of internal costs and negotiation of lower costs from outside vendors. As we require fewer services and products from our vendors, our negotiating leverage to lower our costs is diminished. There can be no assurance that we will be able to reduce our wireless operating expenses commensurate with the level of revenue erosion. The inability to reduce wireless operating expenses would have a material adverse impact on our business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow, continue our research and development investment in Spok Go and pay cash dividends to stockholders.

If we are unable to enhance and deploy our cloud-based offerings while continuing to effectively support our on-premise offerings, our business and operating results could be adversely affected.

Historically, our revenue has been driven predominately by our on-premise offerings. However, we have responded to the increasing market shift toward cloud-based offerings by developing cloud-based solutions that we began offering to our customers in the current year. Despite the launch of our cloud-based offerings, we expect our customers to continue to require substantial on-premise offerings through a transition period while gradually adopting our cloud-based offerings. To support deployment of both our on-premise and cloud-based offerings, our developers and support team must learn multiple environments in which our platform is deployed, which is more expensive than training such individuals on a single environment. Furthermore, we cannot ensure that the market for cloud-based offerings will develop at a rate or in the manner we expect, or that our cloud-based offerings will be competitive with those of more established cloud-based providers or other new market entrants. Customers may require features and capabilities that our current solutions do not have and that we may be unable to develop. If we are unable to develop and deploy cloud-based offerings alongside on-premise offerings that satisfy customer preferences in a timely and cost-effective manner, it may harm our ability to retain existing customers and to attract new customers, which could have a material adverse impact on our business, financial condition and operating results.

Technical problems and higher costs may affect our product development initiatives.

Our future software revenue growth depends on our ability to develop, introduce and effectively deploy new solutions and features to our existing software solutions. These new features and functionalities are designed to address both existing and new customer requirements. We may experience technical problems and additional costs as these new features are tested and deployed. Failure to effectively develop new or improved software solutions could adversely impact software revenue growth and could have a material adverse effect on our business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

Undetected defects, bugs, or security vulnerabilities in our products could adversely affect the market acceptance of new products, damage our reputation with current or prospective customers, and materially and adversely affect our operating costs.

Software products, such as those we offer, may contain defects and bugs when they are first introduced or as new versions are released, or their release may be delayed due to unforeseen difficulties during product development. If any of our products, including products of companies we have acquired, or third-party components used in our products, contain defects or bugs, or have reliability, quality or compatibility problems, we may not be able to successfully design workarounds. Any defects we do not detect and fix in pre-release testing could cause reduced sales and revenue, damage to our reputation, repair or remediation costs, delays in the release of new products or versions, or legal liability. There can be no assurance that provisions in our license agreements that limit our exposure to liability will be sufficient or withstand legal challenge. Computer programmers and hackers also may be able to develop and deploy viruses, worms, and other malicious software programs that attack our products or otherwise exploit any security vulnerabilities of our products.

We are dependent on the U.S. healthcare provider industry for most of our revenue.

Over 75% of our revenue for wireless services and software products comes from sales to hospitals and other healthcare provider organizations in the United States. These customers, both non-profit and for-profit, are greatly affected by the COVID-19 pandemic, healthcare reform legislation and the reimbursement policies of federal and state governments and health insurance companies, and any decline in revenue received by our customers due to adverse economic conditions or legislative or regulatory changes could significantly affect the type and amount of services and products they order from us. We do not anticipate any flexibility in increasing prices for our wireless services notwithstanding general inflation due to an unrelenting focus by our customers on their cost structures, and our customers could be slow to invest in our software products and professional services due to budgetary pressures.

We may experience a long sales cycle for our software products.

Our software revenue growth results from a long sales cycle that from initial contact to final sales order may take 6 to 18 months, depending on the type of software solution. Our software sales and marketing efforts involve educating our customers on the technical capabilities of our software solutions and the potential benefits from the deployment of our software, as well as educating ourselves as to the clinical needs of our customers. The inherent unpredictability of decision making in our target market segment of healthcare resulting from customer budget constraints, multiple approvals and administrative issues may result in fluctuating bookings and revenue from month to month, quarter to quarter and year to year. Our bookings and corresponding revenue are dependent on actions that have occurred in the past. Each month we need to spend substantial time, effort, and expense on our marketing and sales efforts that may not result in future revenue.

We may be unable to find vendors able to supply us with wireless paging equipment based on future demands.

We purchase paging equipment from third-party vendors. This equipment is sold or leased to customers in order to provide wireless messaging services. The reduction in industry demand for paging equipment has caused various suppliers to cease manufacturing this equipment or increase prices for devices. There can be no assurance that we will continue to find vendors to supply paging equipment, or that the vendors will supply equipment at costs that allow us to remain a competitive alternative in the wireless messaging industry. A lack of paging equipment could impact our ability to provide certain wireless messaging services and could have a material adverse effect on our business, leading to further wireless revenue erosion.

We may be unable to maintain successful relationships with our channel partners.

We use channel partners such as resellers, consulting firms, original equipment manufacturers, and technology partners to license and support our products. We rely, to a significant degree, on each of our channel partners to select, screen and maintain relationships with its distribution network and to distribute our offerings in a manner that is consistent with applicable law and regulatory requirements and our quality standards. Contract defaults by any of these channel partners or the loss of our relationships with them may materially adversely affect our ability to develop, market, sell, or support our communication solution offerings. If our indirect distribution channel is disrupted, we may be required to devote more resources to distribute our offerings directly and support our customers, which may not be as effective and could lead to higher costs, reduced revenue and growth that is slower than expected.

Recruiting and retaining qualified channel partners and training them in the use of our enterprise technologies requires significant time and resources. If we fail to devote sufficient resources to support and expand our network of channel partners, our business may be adversely affected. In addition, because we rely on channel partners for the indirect distribution of our enterprise technologies, we may have little or no contact with the ultimate end-users of our technologies, thereby making it more difficult for us to establish brand awareness, ensure proper delivery and installation of our software, support ongoing customer requirements, estimate end-user demand, respond to evolving customer needs and obtain subscription renewals from end users.

We may experience litigation claiming intellectual property infringement by us, and we may not be able to protect our rights in intellectual property that we own and develop.

Intellectual property infringement litigation has become commonplace, particularly in the wireless and software industries in which we operate. Litigation can be protracted, expensive, and time consuming. There is no assurance that we will remain immune to this litigation. Any such claims, whether meritorious or not, could be time consuming and costly in terms of both resources and management time.

We may receive claims that we have infringed the intellectual property rights of others, including claims regarding patents, copyrights, and trademarks. The number and types of these claims may grow as a result of constant technological change in the segments in which our wireless services and software products compete, the extensive patent coverage of existing technologies, and the rapid rate of issuance of new patents.

Our patents, trademarks, copyrights and trade secrets relating to our wireless services and networks, and our software solutions, are important assets. The efforts we undertake to protect our proprietary rights may not be sufficient or effective. Any significant impairment to our intellectual property rights could harm our business and our ability to compete effectively. Protecting our intellectual property rights can be costly and time consuming.

We seek to maintain certain of our intellectual property rights as trade secrets, including the source code for many of our software solutions and innovations. Our source code and system architecture may be reverse engineered by our competitors, or the secrecy of our solutions and designs could be compromised through a security breach or otherwise, or by our employees or former employees, intentionally or accidentally. Any compromise of our trade secrets could cause us to lose any competitive advantage our software solutions have and the investment we have made in developing our products and services.

Our portfolio of issued patents and copyrights may be insufficient to defend ourselves against intellectual property infringement claims, and the validity and scope of our patents could be challenged by third parties were we to seek to enforce them.

Risks Related to our Business and Operations

Our transition to a SaaS based business model may negatively impact our revenue, and if we fail to successfully manage the transition, our business, financial condition and operating results may be adversely affected.

We are currently transitioning to a SaaS based business model and may undergo additional business model changes in the future in order to adapt to changing market demands. Such business model changes entail significant known and unknown risks and uncertainties, and we cannot provide assurance that we will be able to complete or manage the transition successfully and in a timely manner. If we do not successfully complete the transition, or fail to do so in a timely manner, our revenues, business and operating results may be adversely affected. The transition to a SaaS business model also means that our historical results, especially those achieved before we began the transition, may not be indicative of our future results.

Regardless of how we manage the transition, our total bookings and revenue may be adversely impacted by the transition, particularly when compared to our historical performance. If we are unable to increase the volume of our SaaS sales in any given period to make up for the lower selling price of certain subscription-based offerings compared to the selling price of on-premise offerings, our total bookings and revenue for such period will be negatively impacted. Additionally, the revenue associated with certain SaaS subscription purchases will be recognized ratably over the term of the subscription, resulting in less upfront revenue as compared to our perpetual and term-based licenses. This may result in increased volatility in our reported revenues and operating results if demand for our subscription-based offerings increases in the future.

These factors may also make it difficult to increase our revenue in a given period even with additional sales in the same period. In addition, maintaining our historically high customer renewal rates will become increasingly important. Our SaaS customers have no obligation to renew their subscriptions for our solutions after the expiration of the subscription term, and may decide not to renew, renew only for a portion of our solutions, or renew with pricing terms that are less favorable to us. Customer renewal rates may decline or fluctuate due to a number of factors, including their level of satisfaction with our solutions, their ability to continue their operations and spending levels, the pricing of our solutions and the availability of competing solutions. If our renewal rates decline, our total bookings and revenue will fluctuate or decline, and our business and financial results will be negatively affected.

Additional risks associated with our transition to a SaaS business model include, but are not limited to:

- If current or prospective end customers prefer our on-premise licenses, adoption of our subscription-based model may not meet our expectations, or may take longer than anticipated to achieve;
- Potential confusion or concerns among current or prospective end customers and channel partners, including concerns regarding changes to our pricing models;
- We may be unsuccessful in implementing or maintaining subscription-based pricing models, which could negatively affect adoption, renewal rates and our business results;
- If we are unsuccessful in implementing our go-to-market cost structure in a timely or cost-effective manner, we may incur sales compensation costs at a higher than forecasted rate, particularly if the pace of our subscription transition is faster than anticipated; and
- Investors, industry and financial analysts may have difficulty understanding the shift in our business model, resulting in changes in financial estimates or perceived failure to meet investor expectations.

Finally, as we transition to a SaaS business model, there are many risks or uncertainties that may remain unknown to us until we have gathered more information as part of the transition. If we fail to anticipate these unknowns, whether due to a lack of information, precedent, or otherwise, or if we fail to properly manage expected risks and/or execute our transition to a subscription-based business model, our business and operating results, and our ability to accurately forecast our future operating results, may be adversely affected.

We have investigated potential acquisitions and may not be able to identify an opportunity at favorable terms or have the ability to close on the financing necessary to consummate the transaction.

We cannot provide any assurances that we will be successful in finding such acquisitions or consummating future acquisitions on favorable terms. We anticipate that our acquisitions will be financed through a combination of methods, including but not limited to the use of available cash on hand, and, if necessary, borrowings from third-party financial institutions. Disruptions in credit markets and an unwillingness to lend may limit our ability to finance acquisitions.

We have investigated potential acquisitions and may be unable to successfully integrate such acquisitions into our business and may not achieve all or any of the operating synergies or anticipated benefits of those acquisitions.

We continue to evaluate acquisitions of other businesses where we believe such acquisitions will yield increased cash flows, improved market penetration and/or identified operating efficiencies and synergies. We may face various challenges with our integration efforts, including the combination and simplification of product and service offerings, sales and marketing approaches and establishment of combined operations.

We may have limited or no history of owning and operating any business that we acquire. If we were to acquire these businesses, there can be no assurance that:

- Such businesses will perform as expected;
- Such businesses will not incur unforeseen obligations or liabilities;
- Such businesses will generate sufficient cash flow to support the indebtedness, if incurred, to acquire them or the expenditures needed to develop them; and
- The rate of return from such businesses will justify the decision to invest the capital to acquire them.

There can be no assurance that we will manage these challenges and risks successfully. Moreover, if we are not successful in completing transactions that we have pursued or may pursue, our business may be adversely affected, and we may incur substantial expenses and divert significant management time and resources. In addition, in pursuing and completing such transactions, we could use substantial portions of our available cash to pay for all or a portion of the purchase price for these transactions or retention incentives to employees of the acquired business, or we may incur substantial debt. We could also issue additional securities to finance all or a portion of the purchase price for these transactions or as retention incentives to employees of the acquired business, which could cause our stockholders to suffer significant dilution. Any of such transactions may not generate additional revenue or profit for us, or may take longer to do so than expected, which may adversely affect our business, financial condition, operating results and cash flows.

Wireless service to our customers could be adversely impacted by network rationalization.

We have an active program to consolidate the number of networks and related transmitter locations, which is referred to as network rationalization. Network rationalization is necessary to match our technical infrastructure to our smaller subscriber base and to reduce both site rent and telecommunication costs. The implementation of the network rationalization program could adversely impact service to our existing subscribers, and there can be no assurance that any efforts to minimize that impact would be successful. This adverse impact could increase the rate of gross subscriber cancellations and/or the level of wireless revenue erosion. Adverse changes in gross subscriber cancellations and/or revenue erosion could have a material adverse effect on our business, financial condition and operating results.

We depend on highly skilled personnel and, if we are unable to retain or hire additional qualified personnel, we may not be able to achieve our strategic objectives.

To execute our growth plan and achieve our strategic objectives, we must continue to attract and retain highly qualified and motivated personnel across our organization. In particular, to continue to enhance our software solutions, add new and innovative core functionality and services, as well as develop new products, it will be critical for us to increase the size of our research and product development organization, including hiring highly skilled software engineers. Competition for software engineers is intense within our industry, and there continues to be upward pressure on the compensation paid to these professionals. In addition, for us to achieve broader market acceptance of our software solutions, grow our customer base, and pursue adjacent markets, we will need to continue to increase the size of our sales and marketing and customer support organizations. Identifying and recruiting qualified personnel, training them in the use of our software solutions and ensuring they are well-equipped to serve our customers requires a significant investment of time and resources, and it can be particularly difficult to retain these individuals.

Many of the companies with which we compete for experienced personnel have greater name recognition and financial resources than we have. If we hire employees from competitors or other companies, their former employers may attempt to assert that we or these employees have breached their legal obligations to the former employer, resulting in a diversion of our time and resources. In addition, the job market in the Minneapolis-St. Paul area, where the majority of our software developers are located, has historically been very competitive, and existing employees often consider the value of the equity awards they receive in connection with their employment. If the perceived value of our equity awards declines, or if the price of our common stock experiences significant volatility, this may adversely affect our ability to recruit and retain highly skilled employees. As a result, we have greater difficulty hiring and retaining skilled personnel than some of our competitors. If we are unable to attract and retain the personnel necessary to execute our growth plan, we may be unable to achieve our strategic objectives and our business, financial condition and operating results may be adversely affected.

The effects of COVID-19 on the economy and our recent measures to prudently manage operating expenses as a result of the pandemic may limit our ability to hire new employees and may also contribute to unplanned employee attrition. Continued reductions in work schedules and compensation may result in the loss of high-potential employees and impact our ability to recruit talent. Furthermore, certain employees in sales or customer service may become less engaged as a result of project delays or other events resulting from the pandemic.

Growth in our software revenue and bookings, and maintenance of our wireless revenue and subscriber base is dependent on the productivity of our sales organization.

Our ability to achieve revenue growth will depend, in large part, on our success in recruiting, training and retaining sufficient numbers of sales personnel to support our growth. New hires require significant training and may take significant time before they achieve full productivity. Based on past experience, we expect new sales team members to reach full productivity after nine months of employment. However, our recent hires and planned hires may not become productive as quickly as we expect, or at all, and we may be unable to hire or retain a sufficient number of qualified individuals in the markets where we do business or plan to do business. Moreover, as we commence our transition to a subscription-based business model, we are also re-training our experienced sales employees, who have historically focused on wireless and on-premise sales.

From time to time it may be necessary to reorient our sales representatives to focus on specific market segments, product lines or new software solutions or to remove underperforming individuals, which may require additional resources to maintain productivity. The impact of these changes could adversely impact our ability to achieve our sales productivity goals. We have also identified the following risks that could impact our sales productivity:

- **Customer Dissatisfaction and Reputational Harm.** We may experience customer dissatisfaction with our solutions that could result in lost opportunities for sales. Potential low ratings of our solutions may result in us being excluded from consideration by current and prospective customers with respect to future opportunities. In addition, fewer customer references for our solutions could impact our ability to prospect new sales.
- **Training.** Training of our marketing and sales personnel as to the clinical requirements of our healthcare customers and the complexity of our service offerings, takes time and requires a substantial, continuing investment in new hires as well as long-term employees.
- **Competitive Speed.** Sales productivity can be impacted by the capabilities of our competitors. There is a risk that competitors may innovate, or partner faster than we do to deliver a unified communications platform.
- **Employee Retention.** The impact of the elements noted above may challenge the ability of employees to make sales, which may affect morale and employee retention.

If we are unable to deliver effective customer support, it could harm our relationships with our existing customers and adversely affect our ability to attract new customers.

Our revenue growth depends, in part, on our ability to satisfy our customers, including by providing continued customer support, which may contribute to increased customer retention and adoption and utilization of our wireless services and software solutions. Once our wireless services and software solutions are deployed, our customers depend on our customer support group to resolve technical issues relating to their use of our solutions. We may be unable to respond quickly to accommodate short-term increases in customer demand for support services or may otherwise encounter a customer issue that is difficult to resolve. If a customer is not satisfied with the quality of our customer support, we may need to incur additional costs to remedy the situation or a customer may choose to terminate, or not to renew, their relationship with us.

Our sales process is highly dependent on the ease of use of our wireless services and software solutions, our reputation and positive recommendations from our existing customers. Any failure to maintain high-quality or responsive customer support, or a market perception that we do not maintain high-quality or responsive customer support, could harm our reputation, cause us to lose customers and adversely impact our ability to sell our wireless services and software solutions to prospective customers.

Risks Related to Technology

Our use of open source software, third-party software and other intellectual property may expose us to risks.

We license and integrate certain software components from third parties into our software, and we expect to continue to use third-party software in the future. Some open source software licenses require users who distribute or make available as a service open source software as part of their own software product to publicly disclose all or part of the source code of the users' developed software or to make available any derivative works of the open source code on unfavorable terms or at no cost. Our efforts to use the open source software in a manner consistent with the relevant license terms that would not require us to disclose our proprietary code or license our proprietary software at no cost may not be successful. We may face claims by third parties seeking to enforce the license terms applicable to such open source software, including by demanding the release of the open source software, derivative works or our proprietary source code that was developed using such software. In addition, if the license terms for the open source code change, we may be forced to re-engineer our software or incur additional costs.

Some of our products and services include other software or intellectual property licensed from third parties, and we also use software and other intellectual property licensed from third parties in our business. This exposes us to risks over which we may have little or no control. For example, a licensor may have difficulties keeping up with technological changes or may stop supporting the software or other intellectual property that it licenses to us. There can be no assurance that the licenses we use will be available on acceptable terms, if at all. In addition, a third party may assert that we or our customers are in breach of the terms of a license, which could, among other things, give such third party the right to terminate a license or seek damages from us, or both. Our inability to obtain or maintain certain licenses or other rights or to obtain or maintain such licenses or rights on favorable terms, or the need to engage in litigation regarding these matters, could result in delays in releases of new products, and could otherwise disrupt our business, until equivalent technology can be identified, licensed or developed. In addition, sophisticated hardware and operating system software and applications that we procure from third parties may contain defects in design or manufacture, including "bugs," security vulnerabilities, and other problems that could unexpectedly interfere with the expected operation of our products and services.

System disruptions and security threats to our computer networks, satellite control or telecommunications systems could have a material adverse effect on our business.

The performance and reliability of our computer network and telecommunications systems infrastructure, as well as the technology infrastructure of third parties, is critical to our operations. This technology infrastructure may be vulnerable to damage or interruption from natural disasters, power loss, telecommunication failures, terrorist attacks, software errors and other events. Any computer system or satellite network error or failure, regardless of cause, could result in a substantial outage that materially disrupts our operations. In addition, we face the threat to our computer systems of unauthorized access, computer hackers, computer viruses, malicious code, organized cyber-attacks and other security problems and system disruptions. Our satellite network connections for our wireless services depend upon very small aperture terminals, many of which are based on decades-old technology or equipment that could fail and result in a loss of service to our customers. With respect to our Enterprise Reporting and Management systems and data storage, we rely on third party data centers and services for maintaining accessibility, reliability and uninterrupted connectivity.

A significant number of the systems making up this infrastructure are not redundant, and our disaster recovery planning may not be sufficient for every eventuality. We may not carry business interruption insurance sufficient to protect us from all losses that may result from interruptions in our services as a result of technology infrastructure failures or to cover all contingencies. We may be required to expend significant resources to protect against the threat of these system disruptions or to alleviate problems caused by these disruptions. Any interruption in the availability of our websites and online interactions with customers or partners may cause a reduction in customer or partner satisfaction levels, which in turn could cause additional claims, reduced revenue or loss of customers or partners. There can be no assurance that any precautions we take will prove successful, and such problems could result in, among other consequences, a loss of data, a loss of confidence in the stability and reliability of our offerings, damage to our reputation, and legal liability, all of which may adversely affect our business, financial condition, operating results and cash flows.

We rely on a single third-party provider, Amazon Web Services, for computing infrastructure, secure network connectivity, and other technology-related services needed to deliver our cloud-based solutions. Any disruption in the services provided by such third-party provider could adversely affect our business.

Our cloud-based solutions are hosted from, and use computing infrastructure, secure network connectivity, and other technology-related services provided by AWS. We do not control the operations of this third-party provider or own the equipment used to provide such services. Because we cannot easily switch our AWS-serviced operations to another cloud provider, any disruption of or interference with our use of AWS, for example, due to natural disasters, cyber-attacks, terrorist attacks, power losses, telecommunications failures, or similar events, would impact our operations and may adversely affect our business, financial condition, operating results and cash flows.

In addition, AWS has no obligation to renew its agreement with us on commercially reasonable terms or at all. If we are unable to renew our agreement on commercially reasonable terms, we may be required to transition to a new provider, and we may incur significant costs and possible service interruption in connection with doing so.

Unauthorized breaches or failures in cybersecurity measures adopted by us and/or included in our products and services could have a material adverse effect on our business.

Our security systems are designed to maintain the physical security of our facilities and protect our customers', suppliers' and employees' confidential information, as well as our own proprietary information. However, we are also dependent on a number of third-party providers of critical corporate infrastructure services relating to, among other things, human resources, electronic communication services and certain finance functions, and we are, of necessity, dependent on the security systems of these providers. Accidental or willful security breaches or other unauthorized access by third parties or our employees or contractors to our facilities, our information systems or the systems of our third-party providers, or the existence of computer viruses or malware in our or their data or software could expose us to risks of information loss and misappropriation of proprietary and confidential information, including information relating to our products or customers and the personal information of our employees. We utilize a costly, multilayered security framework including detailed security policies and procedures, security appliances and software, third-party vulnerability testing and detailed business continuity plans that could be disrupted at any time.

In addition, we have, from time to time, been subject to unauthorized network intrusions and malware on our own IT networks. Any theft or misuse of confidential, personal or proprietary information as a result of such activities could result in, among other things, unfavorable publicity, damage to our reputation, loss of our trade secrets and other competitive information, difficulty in marketing our products, allegations by our customers that we have not performed our contractual obligations, litigation by affected parties and possible financial obligations for liabilities and damages related to the theft or misuse of such information, as well as fines and other sanctions resulting from any related breaches of data privacy regulations, any of which could have a material adverse effect on our reputation, business, profitability and financial condition. Furthermore, the techniques used to obtain unauthorized access or to sabotage systems change frequently and are often not recognized until launched against a target, and we may be unable to anticipate these techniques or to implement adequate preventative measures.

Risks Related to our Financial Results

We may be unable to realize the benefits associated with our deferred income tax assets.

We have significant deferred income tax assets that are available to offset future taxable income and increase cash flows from operations. The use of these deferred income tax assets is dependent on the availability of taxable income in future periods. The availability of future taxable income is dependent on our ability to profitably manage our operations to support a growing base of software revenue offset by declining wireless subscribers and revenue. To the extent that anticipated reductions in wireless operating expenses do not occur or sufficient revenue is not generated, we may not achieve sufficient taxable income to allow for use of our deferred income tax assets. The accounting for deferred income tax assets is based upon an estimate of future results, and any valuation allowance we may apply to our deferred tax assets may be increased or decreased as conditions change or if we are unable to implement certain tax planning strategies. If we are unable to use these deferred income tax assets, our financial condition and statement of operations may be materially affected. In addition, a significant portion of our deferred income tax assets relate to net operating losses. If our ability to utilize these losses is limited, due to Internal Revenue Code ("IRC") Section 382, our financial condition and statement of operations may be materially affected. In the fourth quarter of 2020 we recorded a valuation allowance of $22.1 million to reduce net deferred income tax assets as their realization did not meet the applicable more-likely-than-not criterion.

If our long-lived assets, intangible assets subject to amortization or goodwill become impaired, we may be required to record a significant charge to earnings.

We are required to evaluate the carrying value of our long-lived assets, amortizable intangible assets and goodwill. For long-lived and amortizable intangible assets, we assess quarterly whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets may not be recoverable. We evaluate goodwill for impairment at least annually, or when events or circumstances suggest a potential impairment has occurred. We generally perform this annual goodwill impairment test in the fourth quarter of the fiscal year.

If our long-lived assets, intangible assets subject to amortization or goodwill are deemed to be impaired, an impairment loss equal to the amount by which the carrying amount exceeds the fair value of the assets would be recognized. We may be required to record a significant charge in our financial statements during the period in which any impairment of our long-lived assets, intangible assets subject to amortization or goodwill is determined, which would negatively affect our results of operations. For example, in the fourth quarter of 2020 and 2019 we recognized non-cash pre-tax goodwill impairment charges of $25.0 million and $8.8 million, respectively.

Our estimates of market opportunity for our software solutions are subject to significant uncertainty and, even if the markets in which we compete meet or exceed our size estimates, we could fail to increase our revenue or market share.

Market opportunity estimates are based on assumptions and estimates, and our internal analysis and industry experience. However, assessing the market for clinical communication and collaboration solutions, particularly cloud-based, SaaS solutions, is difficult due to several factors, such as limited available information and rapid evolution of the market. Our estimates of market opportunity depend on the assumptions we made, and the estimated market opportunity could be materially different with different assumptions. Even if the markets in which we compete meet or exceed our size estimates, our software solutions may fail to gain market acceptance and our business may not grow in line with our forecasts. In addition, an increase in the prevalence of cloud-based offerings by us and our competitors could also unfavorably impact the pricing of our on-premise offerings and have a dampening impact on overall demand for our on-premise offerings, which could have a material adverse impact on our business, financial condition and operating results.

Risks Related to Regulatory Matters

We are subject to data privacy and protection-related laws and regulation, and we may encounter issues with privacy and security of personal information.

A substantial portion of our revenue comes from healthcare customers. As part of our business, we (or third parties with whom we contract) may receive, store and process our data, as well as our customers' and partners' private data and personal information. As such, our business is subject to a variety of federal, state and international laws and regulations that apply to the collection, use, retention, protection, disclosure, transfer and processing of personal data.

Our software solutions may handle or have access to personal health information subject in the United States to HIPAA, HITECH and related regulations as well as legislation and regulations in foreign countries. These statutes and related regulations impose numerous requirements regarding the use and disclosure of personal health information with which we and our software solutions must comply. Our failure to accurately anticipate or interpret these complex and technical laws and regulations could subject us to civil and/or criminal liability. Such failure could adversely impact our ability to market and sell our software solutions to healthcare customers, and have a material adverse impact on our software sales.

In addition to personal health information, the Company may handle or have access to personal information in the European Union subject to the General Data Protection Regulation (the "GDPR"). The GDPR imposes several stringent requirements for controllers and processors of personal data and increases our obligations, including, for example, by requiring more robust disclosures to individuals, strengthening the individual data rights regime, shortening timelines for data breach notifications, limiting retention periods and secondary use of information, and imposing additional obligations when we contract third-party processors in connection with the processing of personal data.

The GDPR could limit our ability to use and share personal data or could cause our costs to increase and harm our business, financial condition, operating results and cash flows. Failure to comply with the requirements of the GDPR and the applicable European Union member states may result in fines of up to €20,000,000 or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties. To comply with the data protection rules imposed by the GDPR, we may be required to put in place additional mechanisms that could be onerous and adversely affect our business, financial condition, and results of operations.

Existing privacy-related laws and regulations in the United States and other countries are evolving and are subject to potentially differing interpretations, and various federal and state or other international legislative and regulatory bodies may expand or enact laws regarding privacy and data security-related matters. In the U.S., the state of California enacted the California Consumer Privacy Act, which came into effect on January 1, 2020, and which also imposes heightened transparency obligations and requirements to make available data collected about California residents and to provide them the ability to object to the sale, or request deletion of, their personal data in certain instances. If other states in the U.S. adopt similar laws or if a comprehensive federal data privacy law is enacted, we may expend considerable resources to meet these requirements.

In addition, customers may use our wireless services to transmit patient health information subject to HIPAA and other regulatory requirements. While we offer encrypted pagers to our customers, many customers use wireless devices provided by us that do not encrypt text messages. While we disclaim liability for customer non-compliance with HIPAA and other privacy requirements, there remains some risk we could be held responsible for privacy violations by our customers.

There can be no assurance that the security and testing measures we take relating to our offerings and operations will prevent all security breaches and data loss that could harm our business or the businesses of our customers and partners. These risks may increase as we continue to grow our services and offerings and as we receive, store and process more of our customers' data. Actual or perceived vulnerabilities may lead to regulatory investigations, claims against us by customers, partners or other third parties, or costs, such as those related to providing customer notifications and fraud monitoring. There can be no assurance that any provisions in our customer agreements limiting our liability will be enforceable or effective under applicable law. In addition, the cost and operational consequences of implementing further data protection measures could be significant.

The data privacy and protection-related laws and regulations to which we are subject are evolving, with new or modified laws and regulations proposed and implemented frequently, and existing laws and regulations subject to new or different interpretations. Any failure by us to comply with data privacy- and protection-related laws and regulations could result in enforcement actions, significant penalties or other legal actions against us or our customers or suppliers. An actual or alleged failure to comply, which could result in negative publicity, reduce demand for our offerings, increase the cost of compliance, require changes in business practices that result in reduced revenue, restrict our ability to provide our offerings in certain locations, result in our customers' inability to use our offerings and prohibit data transfers or result in other claims, liabilities or sanctions, including fines, and could have an adverse effect on our business, financial condition, operating results and cash flows.

Our wireless products are regulated by the FCC and, to a lesser extent, state and local regulatory authorities. Changes in regulation could result in increased costs to us and our customers.

We are subject to regulation by the FCC and, to a lesser extent, by state and local authorities. Changes in regulatory policy could increase the fees we must pay to the government or to third parties, and could subject us to more stringent requirements that could cause us to incur additional capital and/or operating costs. To the extent additional regulatory costs are passed along to customers, those increased costs could adversely impact subscriber cancellations.

For example, the FCC issued an order in October 2007 that mandated paging carriers (including the Company) along with all other CMRS providers serving a defined minimum number of subscribers to maintain an emergency back-up power supply at all cell sites to enable operation for a minimum of eight hours in the event of a loss of commercial power (the "Back-up Power Order"). Ultimately, after a hearing by the U.S. Court of Appeals for the DC Circuit and disapproval by the Office of Management and Budget (the "OMB") of the information collection requirements of the Back-up Power Order, the FCC indicated that it would not seek to override the OMB's disapproval. Rather the FCC indicated that it would issue a Notice of Proposed Rulemaking with the goal of adopting revised back-up power rules. To date, there has been no Notice of Proposed Rulemaking by the FCC and we are unable to predict what impact, if any, a revised back-up power rule could have on our business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

As a further example, the FCC continues to consider changes to the rules governing the collection of universal service fees. The FCC is evaluating a flat monthly charge per assigned telephone number as opposed to assessing universal service contributions based on telecommunication carriers' interstate revenue. There is no timetable for any rulemaking to implement this numbers-based methodology. If the FCC adopts a numbers-based methodology, our attempt to recover the increased contribution costs from our customers could significantly diminish demand for our services, and our failure to recover such increased contribution costs could have a material adverse impact on our business, financial condition and results of operations.

Certain of our software products are regulated by the FDA. The application of or changes in regulations could impact our ability to market new or revised software products to our customers.

Certain of our software products are regulated by the FDA as medical devices. The classification of our software products as medical devices means that we are required to comply with certain registration and listing, labeling, medical device reporting, removal and correction, and good manufacturing practice requirements. Updates to these products or the development of new products could require us to seek clearance from the FDA before we are permitted to market or sell these software products.

In addition, changes to FDA regulations could impact existing software products or require updates to existing products. The impact of delays in FDA clearance or changes to FDA regulations could impact our ability to market or sell our software products and could have a material adverse effect on our business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

ITEM 1B. ***UNRESOLVED STAFF COMMENTS***

We had no unresolved SEC staff comments as of February 18, 2021.

ITEM 2. ***PROPERTIES***

Our corporate headquarters is located in Springfield, Virginia, and consists of approximately 18,000 square feet of space under a lease that expires on March 31, 2021. At December 31, 2020, we leased facility space, including our executive headquarters, sales offices, technical facilities, warehouse and storage facilities in 56 locations in 28 states in the United States, one facility in Australia and one facility in the Middle East. The total leased space is approximately 162,000 square feet. At December 31, 2020, we owned three small parcels of land in three states in the United States.

At December 31, 2020, we leased transmitter sites on commercial broadcast towers, buildings and other fixed structures, some of which are free of charge, in approximately 2,964 locations throughout the United States. These leases are for our active transmitters and are for various terms and provide for periodic lease payments at various rates.

At December 31, 2020, we had 3,646 active transmitters on leased sites which provide service to our customers.

ITEM 3. ***LEGAL PROCEEDINGS***

Refer to Note 10, "Commitments and Contingencies" in the Notes to Consolidated Financial Statements for information regarding legal proceedings in which we are involved.

PART II

ITEM 4. ***MINE SAFETY DISCLOSURES***

Not applicable.

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

Market Information

Our sole class of common equity is our $0.0001 par value common stock, which is listed on the NASDAQ National Market® and is traded under the symbol "SPOK."

Holders of Common Stock

As of February 12, 2021, there were 3,108 holders of record of our common stock.

Dividends

The Company declared dividends totaling $10.0 million and $9.9 million during 2020 and 2019, respectively, and expects to pay dividends of $0.125 per common share each quarter, subject to declaration by the Board of Directors, in 2021. Cash dividends declared for the years ended December 31, 2020, and 2019, respectively, include dividends related to unvested restricted stock units ("RSUs") and shares of unvested restricted common stock ("restricted stock") granted under the Company's Equity Plans (as defined below) to executives and non-executive members of our Board of Directors. Cash distributions on RSUs and restricted stock are accrued and paid when the applicable vesting conditions are met. Accrued cash distributions on forfeited RSUs and restricted stock are also forfeited.

The following table details information on our dividends declared and cash distributions since the formation of the Company in 2005 through the year ended December 31, 2020:

(Dollars in Thousands) Year	Dividends Declared Per Share Amount	Total Payment[1]
Prior to 2016	$ 17.525	$ 441,746
2016[2]	0.750	10,287
2017	0.500	15,234
2018	0.500	10,064
2019	0.500	9,819
2020	0.500	9,771
Total	$ 20.275	$ 496,921

(1) The total payment reflects the cash distributions paid in relation to common stock, vested RSUs and vested shares of restricted stock.
(2) The per share amount includes a special one-time dividend of $0.25 per share of common stock declared in 2016 but payable to stockholders in 2017.

We expect to pay dividends of $0.125 per common share each quarter in 2021, subject to declaration by the Board of Directors. On February 17, 2021, the Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2021, and a payment date of March 30, 2021. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

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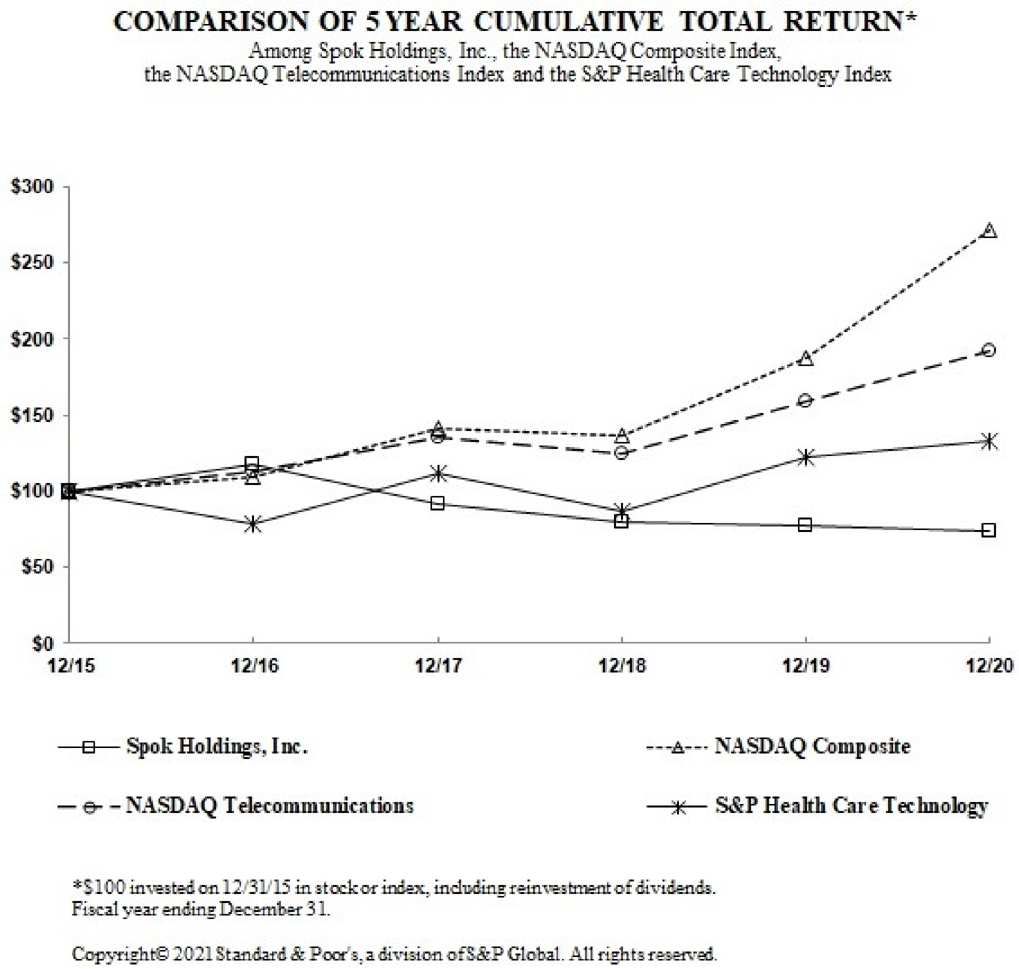
Performance Graph

We began trading on the NASDAQ National Market® on November 17, 2004. The chart below compares the relative changes in the cumulative total return of our common stock for the period of December 31, 2015, to December 31, 2020, against the cumulative total return of the NASDAQ Composite Index®, the NASDAQ Telecommunications Index® and the S&P Health Care Technology Index for the same period.

The chart below assumes that on December 31, 2015, $100 was invested in our common stock and in each of the indices. The comparisons assume that all cash distributions were reinvested. The chart indicates the dollar value of each hypothetical $100 investment based on the closing price as of the last trading day of each fiscal year from December 31, 2015, to December 31, 2020.



	December 31,					
	2015	2016	2017	2018	2019	2020
Spok Holdings, Inc.	$ 100.00	$ 118.11	$ 91.73	$ 80.36	$ 77.01	$ 73.66
NASDAQ Composite	100.00	108.87	141.13	137.12	187.44	271.64
NASDAQ Telecommunications	100.00	112.56	135.96	125.10	158.73	192.30
S&P Health Care Technology	100.00	78.73	112.00	87.15	122.90	132.86

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

No common stock was repurchased by the Company (excluding the purchase of common stock for tax withholdings) during the three months ended December 31, 2020.

Transfer Restrictions on Common Stock

In order to reduce the possibility that certain changes in ownership could impose limitations on the use of our deferred income tax assets, our Amended and Restated Certificate of Incorporation contains provisions that generally restrict transfers by or to any 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of our common stock. After a cumulative indirect shift in ownership of more than 45% since our emergence from bankruptcy proceedings in May 2002 through a transfer of our common stock, any transfer of our common stock by or to a 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of such common stock, will be prohibited unless the transferee or transferor provides notice of the transfer to us and our Board of Directors determines in good faith that the transfer would not result in a cumulative indirect shift in ownership of more than 47%.

Prior to a cumulative indirect ownership change of more than 45%, transfers of our common stock will not be prohibited, except to the extent that they result in a cumulative indirect shift in ownership of more than 47%, but any transfer by or to a 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of our common stock requires notice to us. Similar restrictions apply to the issuance or transfer of an option to purchase our common stock, if the exercise of the option would result in a transfer that would be prohibited pursuant to the restrictions described above. These restrictions will remain in effect until the earliest of (1) the repeal of IRC Section 382 (or any comparable successor provision) and (2) the date on which the limitation amount imposed by IRC Section 382 in the event of an ownership change would not be less than the tax attributes subject to these limitations. Transfers by or to us and any transfer pursuant to a merger approved by our Board of Directors or any tender offer to acquire all of our outstanding stock where a majority of the shares have been tendered will be exempt from these restrictions.

Based on publicly available information and after considering any direct knowledge we may have, our combined cumulative change in ownership was an insignificant amount as of December 31, 2020 and 2019.

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

The following discussion and analysis should be read in conjunction with our consolidated financial statements and related notes and the discussion under "Organization and Significant Accounting Policies" (refer to Note 1 in the Notes to the Consolidated Financial Statements), which describes key estimates and assumptions we make in the preparation of our consolidated financial statements; the cautionary language that appears under the title "Forward Looking Statements" immediately following the Table of Contents; "Item 1. Business," which describes our operations; and "Item 1A. Risk Factors," which describes key risks associated with our operations and markets in which we operate. A reference to a "Note" in this section refers to the accompanying Notes to Consolidated Financial Statements.

Overview and Highlights

We are a comprehensive provider of clinical communication and collaboration solutions for enterprises. We offer a suite of unified clinical communication and collaboration solutions that include call center operations, clinical alerting and notifications, one-way and advanced two-way wireless messaging services, mobile communications and public safety response. Our customers rely on Spok for workflow improvement, secure texting, paging services, contact center optimization and public safety response. Our product offerings are capable of addressing a customer's clinical communications needs. We develop, sell and support enterprise-wide systems for healthcare and other organizations needing to automate, centralize and standardize their approach to clinical communications. While our primary market has been the healthcare industry with a focus on prominent hospitals, our solutions can also be found in large government agencies; leading public safety institutions; colleges and universities; large hotels, resorts and casinos; and well-known manufacturers.

Revenue generated by wireless messaging services (including voice mail, personalized greetings, message storage and retrieval) and equipment loss and/or maintenance protection to both one-way and two-way messaging subscribers is presented as wireless revenue in our statements of operations. Revenue generated by the sale of our software solutions, which includes software license, professional services (installation, consulting and training), equipment procured by us from third parties (to be used in conjunction with our software) and post-contract support (on-going maintenance), is presented as software revenue in our statements of operations. Our software is licensed to end users under an industry standard software license agreement.

COVID-19

In March 2020, the World Health Organization declared COVID-19 a global pandemic, and the virus has significantly impacted the global economy. Although federal and state restrictions were not widely adopted until late in the first quarter of 2020, we began to experience a direct impact on our sales cycle in late February 2020 as hospitals began to delay purchasing decisions and deal with staff reductions. These delays have continued to affect our software bookings, which directly impact license and equipment revenues. We have also experienced delays in our ability to deliver on-site implementation services, which continued to impact our services revenue throughout 2020. While much of our implementation process can be performed remotely, the on-premise nature of certain of our solutions require some level of on-site availability to complete and finalize customer software solutions, and we believe we will continue to see weaker professional services revenue in comparison to normal operating levels that will continue into 2021.

Our ability to return to normal operating levels is largely driven by our customers and their ability to bring operations back to levels beyond just critical needs and emergency services. Many hospitals initially reduced the providing of elective surgeries as a result of government restrictions, as well as patients delaying or canceling elective procedures during the pandemic. While these organizations began to see improved operating levels during the second half of 2020 as they better managed their admissions process and capacity constraints, the timing of vaccine distributions as well as any significant spikes in U.S. virus cases could further delay progress towards returning to normal operational levels. As previously discussed, we believe that we are likely to see some lingering and continued effects from COVID-19 throughout 2021, although we are cautiously optimistic that normal operating levels could be achieved during the second half of 2021.

Additionally, many hospitals have restrictive social distancing guidelines in place in order to ensure the safety of their personnel and patients. These restrictions can make it difficult for external personnel who are not critical to the immediate operating needs of a hospital, such as our implementation staff, to gain access. These factors can vary considerably depending on the size of an organization, geographical location and local regulations. Given that we anticipate continued disruptions to our business, we believe there will be a continued impact on our software revenues throughout 2021. With regard to implementation services, these impacts have primarily resulted in delays in timing of revenue recognition, as associated revenue corresponds to our backlog of performance obligations ready to deliver at some point in the future.

Over the last several months of 2020, we began to see modest improvements in each of the aforementioned areas that have been impacted by the COVID-19 pandemic, and we are cautiously optimistic that we will continue seeing sequential improvement in these areas over the next several quarters. We are also optimistic that any lingering effects from COVID-19 will have a lesser impact on our financial results in 2021 than they did in 2020. As facts and circumstances continue to evolve over the coming months, we will continue to assess and communicate the anticipated impact on our business, and we continue to diligently pursue countermeasures to prudently manage operating expenses during this time, with a goal of neutralizing the impact of the pandemic on our cash flows into 2021. More specifically, we enacted a Company-wide plan that reduced work schedules with a related temporary reduction in compensation rates during the second, third and fourth quarters of 2020. For the year, these reduced work schedules resulted in realized savings of approximately $5.6 million in compensation expense.

We will continue to manage operating expenses and conserve cash for the duration of the pandemic. We expect to continue operating with reduced work schedules and a temporary reduction in compensation rates throughout 2021. We have also initiated a measure that will provide equity in lieu of cash for a portion of salary compensation for employees who meet the requisite criteria for consideration. Finally, non-employee Directors will continue to have the option of receiving Deferred Stock Units ("DSU") in lieu of cash compensation, that we began offering in the third quarter of 2020 (Refer to Note 8, "Stockholder Equity" in the Notes to Consolidated Financial Statements for further detail related to the alternative DSU plan). Each of these measures are described in further detail below and are subject to actual operating conditions experienced during the year.

- **Reduced work schedules:** Each of our employees, including our executive officers, will be subject to one week of reduced work schedules per quarter in 2021. We expect to realize savings of between $4.5 million and $6.5 million in compensation expense for the year.
- **Equity in Lieu of Cash Compensation:** Qualified employees will receive shares of the Company's common stock in lieu of partial cash compensation. These awards will be made in advance on a quarterly basis and vest immediately. This will affect approximately 450 of our employees, and we expect to achieve between $2.0 million and $3.0 million in cash savings for the year.
- **Non-Employee Director Alternative DSU Plan:** Non-Employee Directors have the option of receiving DSUs in lieu of cash compensation. Since inception of this alternative payment plan, which began in the third quarter of 2020, all non-employee Directors have voluntarily elected to receive DSUs in lieu of cash compensation. We anticipate all non-employee Directors will continue with this election through 2021 and we expect to achieve between $0.3 million and $0.5 million in cash savings for the year.

As we continue to see improvements in our operating levels, we are confident that the need to mitigate cash flow impacts through direct expense management will also continue to decline. While the Company has the ability to continue its countermeasures for the foreseeable future, we anticipate re-evaluating our position on a quarterly basis based on the progression of COVID-19, impacts on our business, and other facts and circumstances as deemed relevant by management. Additionally, we believe the Company will continue to see some benefits from the Coronavirus Aid Relief and Economic Security ("CARES") Act discussed in further detail below.

The CARES Act was signed into law on March 27, 2020, to provide stimulus and relief in response to the COVID-19 pandemic and resulting economic collapse. While the CARES Act provides a number of potential benefits to companies, the Company has made use of the following provisions:

- **Payroll Tax Deferral:** Allows for the deferral of payment on the Company's share of the 6.2% Social Security tax on wages paid beginning on March 27, 2020, and ending on December 31, 2020. Deferred amounts are payable in two installments, with 50% of such taxes due on December 31, 2021, and the remainder due on December 31, 2022. This resulted in a total deferral of $2.1 million in payroll taxes for the year ended December 31, 2020.
- **Employee Retention Credits:** Allows for a refundable tax credit for the Company's share of the 6.2% Social Security tax on wages. This tax credit applies to the first $10,000 in qualified wages paid to each employee commencing on March 13, 2020. To be eligible, the Company must (i) have had operations fully or partially suspended because of a shutdown order from a governmental authority related to COVID-19, or (ii) have had gross receipts decline by more than 50% in a calendar quarter when compared to the same quarter in 2019. Qualified wages are limited to wages paid to employees who were not providing services due to the COVID-19 pandemic. This resulted in a tax credit of $1.3 million for the year ended December 31, 2020.
- **Alternative Minimum Tax ("AMT") Credit:** Allows for an immediate refund of all refundable AMT credits resulting from passage of the CARES Act of 2020. This resulted in accelerated collection of approximately $1.3 million of other current assets that was received during the third quarter of 2020.

As previously mentioned, we believe our cost mitigation efforts, in addition to natural cost savings that have materialized as a result of the COVID-19 pandemic (e.g., reduced travel and events), will allow us to continue to offset any negative cash flow impact resulting from the pandemic during 2021.

2020 Highlights

Spok Go was released to the general market in early 2020. This was a significant milestone given the amount of effort and investment that has gone into the development of Spok Go over the last several years. Spok Go is an integrated cloud-native platform built on the foundation of a single, best-in-class architecture which we believe is uniquely positioned to meet healthcare industry needs around clinical communications. While this is a critical milestone in our transition from an on-premise oriented company to a SaaS provider, it is important to understand that this transition will likely take several years to complete.

Total revenue declined by 7.6% or $12.1 million during 2020 compared to 2019, primarily as a result of the continued and expected decline in wireless revenue as well as the significant impacts from COVID-19. The rate of decline in wireless revenues continues to trend favorably over the last several years as we saw the lowest level of erosion in the last five years, declining at a rate of only 5.2%.

In the fourth quarters of 2020 and 2019, we recognized non-cash pre-tax goodwill impairment charges of $25.0 million and $8.8 million, respectively. Excluding these goodwill impairment charges, our operating expenses decreased by 12.8% or $21.4 million during 2020 compared to 2019, driven primarily by savings from management's cost mitigation plan related to COVID-19 as well as the capitalization of software development costs.

In the fourth quarter of 2020, we recorded a non-cash valuation allowance of $22.1 million which resulted in a corresponding increase to income tax expense.

We returned approximately $9.8 million of capital to stockholders in the form of cash dividends.

Results of Operations

The following table is a summary of our Consolidated Statements of Operations for the years ended December 31, 2020, 2019 and 2018 and the discussion that follows compares the year ended December 31, 2020, to the year ended December 31, 2019. For a discussion and analysis of the year ended December 31, 2019, compared to the year ended December 31, 2018, please refer to Management's Discussion and Analysis of Financial Condition and Results of Operations included in Part II, Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2019, filed with the SEC on February 27, 2020:

(Dollars in thousands)	2020	Change		2019	Change		2018
Revenue:							
Wireless	$ 83,593	(4,574)	(5.2)%	$ 88,167	$ (6,110)	(6.5)%	$ 94,277
Software	64,587	(7,535)	(10.4)%	72,122	(3,075)	(4.1)%	75,197
Total revenue	148,180	(12,109)	(7.6)%	160,289	(9,185)	(5.4)%	169,474
Operating expenses:							
Cost of revenue (exclusive of items shown separately below)	28,542	(1,530)	(5.1)%	30,072	(2,336)	(7.2)%	32,408
Research and development	15,828	(11,715)	(42.5)%	27,543	3,079	12.6 %	24,464
Technology operations	29,843	(1,585)	(5.0)%	31,428	72	0.2 %	31,356
Selling and marketing	19,467	(3,703)	(16.0)%	23,170	(1,383)	(5.6)%	24,553
General and administrative	43,102	(2,685)	(5.9)%	45,787	(3,310)	(6.7)%	49,097
Depreciation, amortization and accretion	9,056	(193)	(2.1)%	9,249	(1,520)	(14.1)%	10,769
Goodwill impairment	25,007	16,158	182.6 %	8,849	8,849	— %	—
Total operating expenses	170,845	(5,253)	(3.0)%	176,098	3,451	2.0 %	172,647
Operating loss	(22,665)	(6,856)	43.4 %	(15,809)	(12,636)	398.2 %	(3,173)
Interest income	687	(964)	(58.4)%	1,651	13	0.8 %	1,638
Other income (expense)	208	(527)	(71.7)%	735	1,385	(213.1)%	(650)
Loss before income taxes	(21,770)	(8,347)	62.2 %	(13,423)	(11,238)	514.3 %	(2,185)
(Provision for) benefit from income taxes	(22,455)	(25,113)	(944.8)%	2,658	1,952	276.5 %	706
Net loss	$ (44,225)	$ (33,460)	310.8 %	$ (10,765)	$ (9,286)	627.9 %	$ (1,479)
Supplemental information:							
FTEs	602	(36)	(5.6)%	638	42	7.0 %	596
Active transmitters	3,646	(194)	(5.1)%	3,840	(94)	(2.4)%	3,934

Revenue

The table below details total revenue for the periods stated:

(Dollars in thousands)	2020	Change		2019	Change		2018
Revenue - wireless:							
Paging revenue	$ 79,916	$ (5,151)	(6.1)%	$ 85,067	$ (5,503)	(6.1)%	$ 90,570
Product and other revenue	3,677	577	18.6 %	3,100	(607)	(16.4)%	3,707
Total wireless revenue	83,593	(4,574)	(5.2)%	88,167	(6,110)	(6.5)%	94,277
Revenue - software:							
License	5,179	(3,771)	(42.1)%	8,950	(4,092)	(31.4)%	13,042
Services	17,910	(1,279)	(6.7)%	19,189	1,098	6.1 %	18,091
Equipment	2,841	(777)	(21.5)%	3,618	(1,377)	(27.6)%	4,995
Subscription	66	66	— %	—	—	— %	—
Operations revenue	25,996	(5,761)	(18.1)%	31,757	(4,371)	(12.1)%	36,128
Maintenance revenue	38,591	(1,774)	(4.4)%	40,365	1,296	3.3 %	39,069
Total software revenue	64,587	(7,535)	(10.4)%	72,122	(3,075)	(4.1)%	75,197
Total revenue	$ 148,180	$ (12,109)	(7.6)%	$ 160,289	$ (9,185)	(5.4)%	$ 169,474

Wireless Revenue

Wireless revenue consists of two primary components: paging revenue and product and other revenue. Paging revenue consists primarily of recurring fees associated with the provision of messaging services and fees for paging devices and is net of a provision for service credits. Product and other revenue reflects system sales, the sale of devices and charges for paging devices that are not returned and are net of anticipated credits.

Our core offering includes subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semiannual, or annual) service fee. This is generally based upon the type of service provided, the geographic area covered, the number of devices provided to the customer and the period of commitment. A subscriber to one-way messaging services may select coverage on a local, regional or nationwide basis to best meet their messaging needs. Two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract for a messaging device from us for an additional fixed monthly fee or they own a device, having purchased it either from us or from another vendor.

We also sell devices to resellers who lease or resell devices to their subscribers and then sell messaging services utilizing our networks. We offer ancillary services, such as voicemail and equipment loss or maintenance protection, which help increase the monthly recurring revenue we receive along with these traditional messaging services. We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers, which are configurable to support unencrypted or encrypted operation. When configured for encryption, they utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption enabled, these new secure paging devices enhance our service offerings to the healthcare community by adding HIPAA security capabilities to the low cost, highly reliable and availability benefits of paging (see Item 1. "Business" for more details).

The decrease in wireless revenue during 2020 compared to 2019 reflects the decrease in demand for our wireless services. Wireless revenue is generally based upon the number of units in service and the monthly Average Revenue Per User ("ARPU"). On a consolidated basis ARPU is affected by several factors, including the mix of units in service and the pricing of the various components of our services. The number of units in service changes based on subscribers added, referred to as gross placements, less subscriber cancellations, or disconnects. For the years ended December 31, 2020, and 2019, ARPU was $7.30 and $7.34, respectively. Total units in service were 0.9 million as of December 31, 2020, and 2019.

While demand for wireless services continues to decline, it has done so at a slower rate for each of the periods presented. While we are optimistic that this trend will continue in future periods, we believe that demand will continue to decline for the foreseeable future in line with recent and historical trends. As our wireless products and services are replaced with other competing technologies, such as the shift from narrowband wireless service offerings to broadband technology services, our wireless revenue will continue to decrease.

The following reflects the impact of subscribers and ARPU on the change in wireless revenue:

	Units in Service as of December 31,			Revenue for the Year Ended December 31,			Change Due To:	
(Units and Dollars in Thousands)	2020	2019	Change	2020	2019	Change	ARPU	Units
Total	885	938	(53)	$ 79,916	$ 85,067	$ (5,151)	$ (424)	$ (4,727)

As demand for one-way and two-way messaging has declined, we have developed or added service offerings such as encrypted paging and Spok Mobile with a pager number in order to increase our revenue potential and mitigate the decline in our wireless revenue. We will continue to explore ways to innovate and provide customers the highest value possible.

Software Revenue

Software revenue consists of two primary components: operations revenue and maintenance revenue. Operations revenue consists primarily of license and subscription revenues for our healthcare communications solutions, revenue from the sale of equipment that facilitate the use of our software solutions, and professional services revenue related to the implementation of our solutions. Maintenance revenue is for ongoing support of our software solutions or related equipment (typically for one year).

Operations Revenue

Software operations revenue decreased during 2020 when compared to 2019. The decrease in license revenue is the result of a decrease in bookings as well as the benefit received in 2019 due to amounts included from software licenses delivered to customers that were contracted for in a prior period. During 2019, the Company began delivering software licenses to customers in the same month they were contracted for, thus a similar benefit was not seen in 2020. Additionally, the delay in our sales cycle due to COVID-19 resulted in delivery of fewer software licenses and equipment products. Service revenue was lower, primarily resulting from the impact of COVID-19 as social distancing and other restrictions, as well as our customers' focus on COVID-19 mitigation efforts, led to delays in implementation projects, contributing to lower services revenue beginning in March 2020.

Maintenance Revenue

Software maintenance revenue decreased during 2020 when compared to 2019. The decrease in maintenance revenue primarily relates to lower license bookings, as discussed above, from which new maintenance revenue is derived, and the timing of certain revenue items reflected in the results for 2019 that did not occur at the same rate in 2020. Revenue items impacted by timing generally relate to specific renewal contracts that do not have auto-renewal terms and for which we must negotiate at the end of each term. We are generally precluded from recognizing revenue on these contracts until new terms have been agreed to even though we generally will continue to provide maintenance service for these customers while negotiations are ongoing. While certain commercial customers require this type of contract renewal, these contracts are generally limited to government organizations, including federal, state and local entities. When a renewal of this nature has been contracted, it is often accompanied by several months of "catch-up" revenue from services performed in past periods resulting in a one-time value that is greater than the normal monthly revenue expected over the life of the remaining term.

As we continue to focus the majority of our development efforts on Spok Go, we anticipate a continued decline in our ability to sell new licenses for the Care Connect Suite of products. While we have not seen a meaningful increase in our normal customer churn, our ability to replace this churn with new revenues will not likely replicate what we have accomplished historically nor do we expect to fully offset this with annual increases of our existing base. Our intent is to replace this churn with the sale of Spok Go as well as transition existing on-premise customers to our cloud based solution over the next several years. Given these dynamics, we believe annual maintenance revenue is likely to be relatively flat or slightly down as we move forward, especially as we begin the process of transitioning existing customers to a subscription model.

Operating Expenses

Our operating expenses are presented in functional categories. Certain of our functional categories are especially important to overall expense control and management. These operating expenses are categorized as follows:

- **Cost of Revenue.** These are expenses primarily for hardware, third-party software, outside service expenses and payroll and related expenses for our professional services, logistics, customer support and maintenance staff.
- **Research and Development.** These expenses relate primarily to the development of new software products and the ongoing maintenance and enhancement of existing products. This classification consists primarily of employee payroll and related expenses, outside services related to the design, development, testing and enhancement of our solutions and to a lesser extent hardware equipment. The research and development costs exclude any development costs that qualify for capitalization.
- **Technology Operations.** These are expenses associated with the operation of our paging networks. Expenses consist largely of site rent expenses for transmitter locations, telecommunication expenses to deliver messages over our paging networks, and payroll and related expenses for our engineering and pager repair functions. We actively pursue opportunities to consolidate transmitters and other service, rental and maintenance expenses in order to maintain an efficient network while simultaneously ensuring adequate service for our customers. We believe continued reductions in these expenses will occur for the foreseeable future as our networks continue to be consolidated, although the benefits of such network rationalization efforts and resulting costs savings will continue to decline.
- **Selling and Marketing.** The sales and marketing staff are involved in selling our communication solutions primarily in the United States. These expenses support our efforts to maintain gross placements of units in service, which mitigated the impact of disconnects on our wireless revenue base, and to identify business opportunities for additional or future software sales. We have a centralized marketing function, that is focused on supporting our products and vertical sales efforts by strengthening our brand, generating sales leads and facilitating the sales process. These marketing functions are accomplished through targeted email campaigns, webinars, regional and national user conferences, monthly newsletters and participation at industry trade shows. Expenses consist largely of payroll and related expenses, commissions and other costs such as travel and advertising costs.
- **General and Administrative.** These are expenses associated with information technology and administrative functions, including finance and accounting, human resources and executive management. This classification consists primarily of payroll and related expenses, outside service expenses, taxes, licenses and permit expenses, and facility rent expenses.
- **Depreciation, Amortization and Accretion.** These are expenses that may be associated with one or more of the aforementioned functional categories. This classification generally consists of depreciation from capital expenditures or other assets that are core to our ongoing operations, amortization of intangible assets, amortization of capitalized software development costs, and accretion of asset retirement obligations.

Cost of Revenue

Cost of revenue consisted primarily of the following items:

(Dollars in thousands)	2020	Change		2019	Change		2018
Payroll and related	$ 20,524	$ 523	2.6 %	$ 20,001	$ 466	2.4 %	$ 19,535
Cost of sales	5,841	(1,984)	(25.4)%	7,825	(2,746)	(26.0)%	10,571
Stock-based compensation	537	270	101.1 %	267	18	7.2 %	249
Other	1,640	(339)	(17.1)%	1,979	(74)	(3.6)%	2,053
Total cost of revenue	$ 28,542	$ (1,530)	(5.1)%	$ 30,072	$ (2,336)	(7.2)%	$ 32,408
FTEs	196	(6)	(3.0)%	202	24	13.5 %	178

Cost of revenue expense decreased for the year ended December 31, 2020, compared to December 31, 2019, primarily due to the decrease in cost of sales, partially offset by an increase in payroll and related expenses. The decrease in cost of sales is primarily related to lower sales in 2020 as well as significant project delays as a result of the COVID-19 pandemic. The increase in payroll and related expenses is primarily a reflection of full-year costs for a large number of personnel hired during the fourth quarter of 2019 as well as higher average cost per Full-Time Equivalent ("FTE") employee. This was partially offset by temporary cost reductions implemented by management beginning in the second quarter of 2020, in an effort to negate the impacts of COVID-19. These temporary cost reductions are outlined in more detail within our earlier discussion on COVID-19.

Research and Development

Research and development consisted primarily of the following items:

(Dollars in thousands)	2020	Change		2019	Change		2018
Payroll and related	$ 17,381	$ (1,659)	(8.7)%	$ 19,040	$ 1,473	8.4 %	$ 17,567
Outside services	7,858	432	5.8 %	7,426	1,277	20.8 %	6,149
Capitalized software development	(11,252)	(11,252)	— %	—	—	— %	—
Stock-based compensation	965	655	211.3 %	310	74	31.4 %	236
Other	$ 876	109	14.2 %	$ 767	255	49.8 %	$ 512
Total research and development	$ 15,828	$ (11,715)	(42.5)%	$ 27,543	$ 3,079	12.6 %	$ 24,464
FTEs	121	(11)	(8.3)%	132	11	9.1 %	121

Research and development expense decreased for the year ended December 31, 2020, compared to 2019, primarily due to the capitalization of certain development costs related to Spok Go. Refer to Note 1, "Organization and Significant Accounting Policies" and Note 5, "Consolidated Financial Statement Components" in the Notes to Consolidated Financial Statements for further detail. The payroll and related costs decreased primarily as a result of lower headcount as well as the temporary cost reductions implemented by management beginning in the second quarter of 2020, in an effort to mitigate the impacts of the COVID-19 pandemic. These temporary cost reductions are outlined in more detail within our discussion on the COVID-19 pandemic.

We continue to focus on the development efforts of our software solutions and intend to maintain these efforts based on their importance to our continued success. However, increases in development costs have grown at a slower pace when compared to prior years. Excluding the effects of capitalization, these costs will continue to substantially impact margins and our cash flow from operations. The benefits from our development efforts are contingent upon successful adoption of Spok Go in the marketplace, which we expect to gradually take place over the next several years.

Technology Operations

Technology operations consisted primarily of the following items:

(Dollars in thousands)	2020	Change		2019	Change		2018
Payroll and related	$ 9,637	$ (1,151)	(10.7)%	$ 10,788	$ (4)	— %	$ 10,792
Site rent	13,578	(137)	(1.0)%	13,715	(233)	(1.7)%	13,948
Telecommunications	3,768	(290)	(7.1)%	4,058	253	6.6 %	3,805
Stock-based compensation	190	67	54.5 %	123	28	29.5 %	95
Other	2,670	(74)	(2.7)%	2,744	28	1.0 %	2,716
Total technology operations	$ 29,843	$ (1,585)	(5.0)%	$ 31,428	$ 72	0.2 %	$ 31,356
FTEs	88	(4)	(4.3)%	92	—	— %	92

Technology operations expense decreased for the year ended December 31, 2020, compared to 2019, primarily due to the decrease in payroll and related and other minor expenses. The payroll and related costs decreased primarily as a result of lower headcount as well as temporary cost reductions implemented by management beginning in the second quarter of 2020, in an effort to mitigate the impacts of the COVID-19 pandemic. These temporary cost reductions are outlined in more detail within our discussion on the COVID-19 pandemic above.

The number of active transmitters declined 5.1% from December 31, 2019, to December 31, 2020. The number of active transmitters directly relates to the amount of site rent expenses we generally incur on a recurring basis. As we reach certain minimum frequency commitments, as outlined by the FCC, we may be unable to continue our efforts to rationalize and consolidate our networks.

Selling and Marketing

Selling and marketing consisted primarily of the following items:

(Dollars in thousands)	2020	Change		2019	Change		2018
Payroll and related	$ 11,806	$ (1,702)	(12.6)%	$ 13,508	$ 456	3.5 %	$ 13,052
Commissions	4,301	(693)	(13.9)%	4,994	(1,158)	(18.8)%	6,152
Stock-based compensation	767	177	30.0 %	590	87	17.3 %	503
Advertising and events	1,634	(1,692)	(50.9)%	3,326	(921)	(21.7)%	4,247
Other	959	207	27.5 %	752	153	25.5 %	599
Total selling and marketing	$ 19,467	$ (3,703)	(16.0)%	$ 23,170	$ (1,383)	(5.6)%	$ 24,553
FTEs	98	(7)	(6.7)%	105	8	8.2 %	97

Selling and marketing expense decreased for the year ended December 31, 2020, compared to 2019, primarily due to the decrease in payroll and related, commissions and advertising and events. The payroll and related expenses decreased primarily as a result of lower headcount as well as temporary cost reductions implemented by management beginning in the second quarter of 2020, in an effort to mitigate the impacts of the COVID-19 pandemic. These temporary cost reductions are outlined in more detail within our discussion on the COVID-19 pandemic above. The decrease in commissions expense primarily relates to a corresponding decrease in revenue. The decrease in advertising and events expenses was largely the result of restrictions on travel and trade events due to the COVID-19 pandemic.

General and Administrative

General and administrative consisted primarily of the following items:

(Dollars in thousands)	2020	Change		2019	Change		2018
Payroll and related	$ 14,338	$ (2,034)	(12.4)%	$ 16,372	$ (1,305)	(7.4)%	$ 17,677
Stock-based compensation	3,049	696	29.6 %	2,353	(1,518)	(39.2)%	3,871
Facility rent, office, and technology costs	9,016	(83)	(0.9)%	9,099	(862)	(8.7)%	9,961
Outside services	7,811	(626)	(7.4)%	8,437	646	8.3 %	7,791
Taxes, licenses and permits	3,141	(531)	(14.5)%	3,672	377	11.4 %	3,295
Bad debt	1,051	382	57.1 %	669	(955)	(58.8)%	1,624
Other	4,696	(489)	(9.4)%	5,185	307	6.3 %	4,878
Total general and administrative	$ 43,102	$ (2,685)	(5.9)%	$ 45,787	$ (3,310)	(6.7)%	$ 49,097
FTEs	99	(8)	(7.5)%	107	(1)	(0.9)%	108

General and administrative expense decreased for the year ended December 31, 2020, compared to 2019, primarily due to a decrease in payroll and related expenses, outside services and various other expenses, which were largely offset by increases in stock-based compensation and bad debt expense. Payroll and related expenses decreased primarily as a result of lower headcount as well as temporary cost reductions implemented by management beginning in the second quarter of 2020, in an effort to mitigate the impacts of the COVID-19 pandemic. These temporary cost reductions are outlined in more detail within our earlier discussion on the COVID-19 pandemic above. Outside service expenses declined primarily as a result of lower recruiting and hiring costs. The increase in bad debt expense was partly due to our adoption of Accounting Standards Update ("ASU") No. 2016-13, as we now carry an allowance for current unbilled receivables which was not included in 2019. The increase in stock-based compensation for the year was largely due to forfeitures related to the resignation of a named executive officer ("NEO") in 2019, as well as an expense related to the alternative deferred stock units ("DSU") plan available to our Board of Directors. Refer to Note 8, "Stockholder Equity" in the Notes to Consolidated Financial Statements for further detail related to the alternative DSU plan.

Depreciation, Amortization and Accretion

For the year ended December 31, 2020, compared to the same period in 2019, depreciation, amortization and accretion expenses decreased by $0.2 million. Depreciation expenses decreased by $1.3 million for the year, however this was largely offset by $1.1 million in amortization of capitalized software development costs.

Goodwill Impairment

For the years ended December 31, 2020, and December 31, 2019, we recognized non-cash, pre-tax goodwill impairment charges of $25.0 million and $8.8 million, respectively, resulting from the Company's annual goodwill impairment testing performed in the fourth quarter of each year. Despite these impairment charges, our outlook for the business continues to remain strong. We believe the launch of Spok Go is set to meet a significant need in the healthcare marketplace and will create significant value for shareholders in the coming years. Refer to Note 1, "Organization and Significant Accounting Policies," and Note 6, "Goodwill and Intangible Assets, Net" in the Notes to Consolidated Financial Statements for further discussion.

Interest Income, Other Income (Expense), and Income Tax (Benefit) Expense

Interest Income

Interest income decreased by $1.0 million for the year ended December 31, 2020, compared to 2019, primarily due to a decrease in interest earned on the Company's cash balances and short-term investments. This was driven by lower interest rates during the year, as the COVID-19 pandemic weighed on the U.S. economy.

Other Income (Expense)

For the year ended December 31, 2020, compared to 2019, other income (expense) decreased by $0.5 million, largely as a result of a decrease in gains on foreign currency.

Provision for (Benefit from) Income Taxes

The effects of foreign taxes are immaterial for all periods presented. The following provides the effective tax rate reconciliation for the years ended December 31, 2020, 2019 and 2018, respectively (See Note 9, "Income Taxes" in the Notes to Consolidated Financial Statements for further discussion on our income taxes):

(Dollars in thousands)	2020		2019		2018	
Loss before income taxes	$ (21,770)		$ (13,423)		$ (2,185)	
Income taxes computed at the federal statutory rate	$ (4,572)	21.0 %	$ (2,819)	21.0 %	$ (459)	21.0 %
State income taxes, net of federal benefit	(703)	3.2 %	(567)	4.2 %	306	(14.0)%
Goodwill impairment	6,341	(29.1)%	2,243	(16.7)%	—	— %
Change in valuation allowance	22,108	(101.6)%	—	— %	—	— %
Research and development and other tax credits	(1,316)	6.0 %	(1,790)	13.3 %	(1,144)	52.4 %
Excess executive compensation	266	(1.2)%	322	(2.4)%	281	(12.9)%
Other	331	(1.5)%	(47)	0.4 %	310	(14.2)%
Provision for (benefit from) income taxes	$ 22,455	(103.1)%	$ (2,658)	19.8 %	$ (706)	32.3 %

Provision for income taxes increased by $25.1 million for the year ended December 31, 2020, compared to the same period in 2019 due primarily to an increase in the deferred tax asset valuation allowance of $22.1 million and the goodwill impairment. Our investment in research and development qualifies for the research and development income tax credit under Section 41 of the Internal Revenue Code. Unused research and development tax credits have a 20-year carryover and will provide future tax benefits once Spok's net operating losses are fully utilized.

We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence, and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. This assessment is required to determine whether, based on all available evidence, it is more likely than not" (meaning a probability of greater than 50%) that all or some portion of our deferred income tax assets will be realized in future periods.

The cumulative loss incurred by the Company over the three-year period ended December 31, 2020 constitutes a piece of objective negative evidence which limits our ability to consider other subjective evidence. In addition, the uncertainty created by COVID-19 has significantly limited our ability to consider our projections for future profitability and growth in our assessment of the recoverability of our deferred income tax assets. Based on this evaluation, completed utilizing our annual long-range planning and forecasting updates that are traditionally completed in the fourth quarter of each year, we recorded a valuation allowance of $22.1 million, as of December 31, 2020, to reduce net deferred income tax assets as their realization did not meet the more-likely-than-not criterion. COVID-19 has significantly limited our ability to consider projections for future profitability as objectively verifiable positive evidence to support the realizability of deferred tax assets, as the projections rely on subjective estimates and assumptions regarding the market launch of our SaaS product, Spok Go. As a result, a valuation allowance was established against deferred tax assets associated with net operating losses and credits with set expiration dates.

Those deferred income tax assets which are not currently covered by a valuation allowance are those that are indefinite-lived, or whose temporary differences would reverse in the future and may result in the creation of an indefinite-lived deferred income tax asset, which we consider to be realized through future taxable income despite near term uncertainties. The amount of deferred income tax assets considered realizable, however, could be adjusted in the future if objective negative evidence in the form of cumulative losses is no longer present, additional weight is given to subjective evidence such as our projections for future profitability and growth, or other relevant factors arise. We did not record a valuation allowance during 2019.

Despite the need for a valuation allowance based on accounting guidance, our outlook for the business continues to remain strong. While we are limited in using only our projected future profitability and growth in assessing the recoverability of our deferred income tax assets based on Accounting Standards Codification ("ASC") 740, "Income Taxes," we are committed to generating taxable income and utilizing our deferred income tax assets prior to expiration. Refer to Note 1, "Organization and Significant Accounting Policies," and Note 9, "Income Taxes," for further discussion.

Liquidity and Capital Resources

Cash and Cash Equivalents

At December 31, 2020, we had cash and cash equivalents of $48.7 million. The available cash and cash equivalents consist of invested cash and cash in our operating accounts. The invested cash is invested in interest-bearing funds managed by third-party financial institutions. These funds invest in direct obligations of the government of the United States. To date, we have experienced no loss or lack of access to our invested cash or cash equivalents; however, we can provide no assurance that access to our invested cash and cash equivalents will not be impacted by adverse market conditions.

We maintain a level of liquidity sufficient to allow us to meet our cash needs in both the short-term and long-term. At any point in time, we maintain approximately $7.0 to $15.0 million in our operating accounts that are with third-party financial institutions. While we monitor daily the cash balances in our operating accounts and adjust the cash balances as appropriate, these cash balances could be impacted if the underlying financial institutions fail or are subject to other adverse conditions in the financial markets. To date, we have experienced no loss or lack of access to cash in our operating accounts.

We intend to use our cash on hand to provide working capital, to support operations, to invest in our business and to return value to stockholders through cash dividends and possible repurchases of our common stock. We may also consider using cash to fund or complete opportunistic investments and acquisitions that we believe will provide a measure of growth or revenue stability while supporting our existing operations. Because we intend to continue investing heavily in the development of Spok Go over the next several years, commensurate with declining revenues from our wireless business, we anticipate that our cash on hand will decrease significantly during that period and possibly longer until revenue from Spok Go begins to be realized.

Cash Flows Overview

In the event that net cash provided by operating activities and cash on hand are not sufficient to meet future cash requirements, we may be required to reduce planned capital expenses, reduce or eliminate our cash dividends to stockholders, not resume our common stock repurchase program, sell assets or seek additional financing. We can provide no assurance that reductions in planned capital expenses or proceeds from asset sales would be sufficient to cover shortfalls in available cash or that additional financing would be available on acceptable terms.

Based on current and anticipated levels of operations, we anticipate net cash provided by operating activities, together with the available cash on hand at December 31, 2020, should be adequate to meet anticipated cash requirements for the foreseeable future.

The following table sets forth information on our net cash flows from operating, investing, and financing activities for the periods stated:

	For the Year Ended December 31,		
(Dollars in thousands)	**2020**	**2019**	**2018**
Net cash provided by operating activities	$ 26,163	$ 11,693	$ 10,315
Net cash used in investing activities	(14,571)	(30,222)	(5,826)
Net cash used in financing activities	(10,373)	(17,153)	(24,276)

Cash Provided by Operating Activities

As discussed above, we are dependent on cash flows from operating activities to meet our cash requirements. Cash from operations varies depending on changes in various working capital items, including deferred revenues, accounts payable, accounts receivable, prepaid expenses and various accrued expenses.

Cash provided by operating activities in 2020 was $26.2 million, due primarily to non-cash items such as goodwill impairment of $25 million, valuation allowance of $22.1 million, depreciation, amortization and accretion of $9.1 million, stock-based compensation of $5.5 million, and other non-cash items of $1.7 million, partially offset by the 2020 net loss of $44.2 million. Cash provided by operating activities also increased resulting from changes in accounts payable, accrued liabilities and other of $4.0 million, deferred revenue of $3.2 million and prepaid and other assets of $1.4 million, partially offset by a change in accounts receivable of $1.6 million.

Cash provided by operating activities in 2019 was $11.7 million, due primarily to non-cash items such as goodwill impairment of $8.8 million, depreciation, amortization and accretion of $9.2 million, stock-based compensation of $3.6 million, and other non-cash items of $0.7 million, partially offset by the 2019 net loss of $10.8 million and deferred income benefit of $3.2 million. Cash provided by operating activities also increased resulting from changes in prepaid expenses and other assets of $2.9 million and accounts receivable of $1.0 million and deferred revenue of $0.1 million, partially offset by a change in accounts payable, accrued liabilities and other of $0.6 million.

Cash Used in Investing Activities

Cash used in investing activities in 2020 and 2019, was $14.6 million and $30.2 million, respectively, due primarily to the purchase and maturity of U.S. treasury securities, and capital expenditures. Additionally, in 2020 we began capitalizing certain software development costs.

Cash Used in Financing Activities

Cash used in financing activities was $10.4 million and $17.2 million for the years ended December 31, 2020, and 2019, respectively, primarily due to cash distributions to stockholders of $9.8 million in 2020 and in 2019 and the repurchase of common stock of $6.6 million in 2019.

On February 17, 2021, the Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2021, and a payment date of March 30, 2021. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

Commitments and Contingencies

The following table provides the Company's significant commitments and contractual obligations as of December 31, 2020:

	Payments Due by Period				
(Dollars in thousands)	**Total**	**Less than 1 year**	**1 to 3 years**	**3 to 5 years**	**More than 5 years**
Operating lease obligations	$ 19,757	6,844	$ 8,334	$ 3,109	$ 1,470
Unconditional purchase obligations	6,488	2,322	3,106	1,060	—
Total contractual obligations	$ 26,245	$ 9,166	$ 11,440	$ 4,169	$ 1,470

Our contractual payment obligations for operating leases apply to leases for office space and transmitter locations. Purchase obligations are defined as agreements to purchase goods or services that are enforceable, legally binding, non-cancelable, have a remaining term in excess of one year and that specify all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable pricing provisions; and the approximate timing of transactions. The amounts of such obligations are based on our contractual commitments, however, it is possible that we may be able to negotiate lower payments if we choose to exit these contracts before their expiration date.

Refer to Note 10, "Commitments and Contingencies," in the Notes to Consolidated Financial statements for further discussion of commitments and contingencies.

Off-Balance Sheet Arrangements

We do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. As such, we are not exposed to any financing, liquidity, market or credit risk that could arise if we had engaged in such relationships.

Related Parties

Refer to Note 12, "Related Parties" in the Notes to Consolidated Financial Statements for further discussion on our related party transactions.

Inflation

Inflation has not had a material effect on our operations to date. System equipment and operating costs have not significantly increased in price, and the price of wireless messaging devices has tended to decline in recent years. Our general operating expenses, such as salaries, site rent for transmitter locations, employee benefits and occupancy costs, are subject to normal inflationary pressures.

Critical Accounting Policies and Estimates

The Company's accounting policies are more fully described in Note 1 of the Consolidated Financial Statements. As disclosed in Note 1, the preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ significantly from those estimates. We believe that the following discussion addresses the Company's most critical accounting policies, which are those that are most important to the portrayal of the Company's financial condition and results of operations and require management's most difficult, subjective and complex judgments.

Revenue Recognition

The majority of our revenues are derived from short-term contracts related to the sale of wireless paging services and software solutions. Our arrangements exist primarily with customers in the healthcare market and to a lesser extent state and federal governments, as well as large enterprise businesses.

Under the typical payment terms of our software contracts, customers will normally pay a material amount of the contract price immediately upon execution of the contract. The remaining payments are required when the product is delivered, when services begin and, to a lesser extent, when services are completed. For SaaS contracts, the subscription and premium support services are generally billed annually in advance while professional services are billed at various milestones which reflect work completed. Wireless services are generally billed as incurred on a monthly basis. Our contracts will generally result in billings in excess of revenue recognized, which we present as deferred revenues on the Consolidated Balance Sheets, primarily due to the receipt of payment in advance of the product or services we provide. Amounts billed and due from our customers are classified as accounts receivable on the Consolidated Balance Sheets. At times, we may have contracts which require us to perform work or provide products prior to billing which will generally result in revenue recognized in excess of billings. This excess is presented as unbilled receivables in the Notes to the Consolidated Financial Statements. We generally do not have transactions that include a significant financing component (whether payments are made in advance or in arrears) as our contracts typically take less than 12 months to complete once started. We would not adjust the total consideration for the effects of a significant financing component if we anticipate, at contract inception, that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

We account for a contract when: (1) both parties have approved the contract through mutually signed agreements or through other methods such as purchase orders or master agreements; (2) the rights of the parties have been identified; (3) payment terms have been identified; (4) the contract has commercial substance; and (5) collectability of consideration is probable. We also evaluate whether two or more contracts should be combined and accounted for as a single contract. In our evaluation, we consider criteria such as, but not limited to, whether: (1) the contracts are negotiated as a package with a single commercial objective; (2) the amount of consideration to be paid in one contract is dependent on the price or performance of another contract; and (3) some or all of the goods or services promised in the contracts are a single performance obligation. Should we consider contracts related, we would account for those contracts as if they were a single contract. Evaluating whether two or more contracts should be combined and accounted for as a single contract requires significant judgment. In the aggregate, a decision to combine a group of contracts could significantly impact the amount of revenue and profit recorded in a given period.

We review each contract to determine whether to account for the various promises as one or more performance obligations. The assessment and determination of performance obligations for a given contract requires significant judgment. Wireless service contracts are generally considered to be a single promise and therefore accounted for as a single performance obligation. Contracts which include goods or services related to our software solutions and subscriptions are generally sold with multiple promises and therefore will often include multiple performance obligations. Material performance obligations related to the sale of our software solutions include software licenses, professional services, hardware and maintenance. Material performance obligations related to the sale of our SaaS platform include a SaaS subscription, professional services, and signature support services.

More often than not, total consideration will equate to the stated value on the contract taking into consideration any period or term over which services are to be provided, if applicable. However, we could have contracts in which variable consideration is present. It is common for our contracts that include wireless services to contain customer penalties if rental pagers are not returned and fees for usage of services in excess of the contractually allotted amount for a given period. It is also common for our contracts that include professional services to include travel-related costs. These are costs which we incur in the normal course of delivering professional services and are generally billable to the customer based on our incurred expenses. These elements of variable consideration are fully constrained when an agreement is initially executed and are generally not considered estimable until the penalties, fees or costs have been incurred or are otherwise known. We include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Estimating variable consideration requires significant judgment and our assessment includes all relevant information that is reasonably available to us including historical, current and forecasted information. We have elected to exclude from revenue all amounts collected on behalf of third parties, and therefore, items such as sales and use tax are excluded from our calculation of the total transaction price.

If a contract is separated into more than one performance obligation we allocate the total transaction price to each performance obligation proportionately based on the estimated relative standalone selling price ("SSP") of the promised goods or services underlying each performance obligation. We rarely sell goods or services as readily observable standalone sales, however, if we do, the observable standalone sales are used to determine the SSP. In most cases, we must estimate the relative SSP which requires significant judgment and estimates. In instances where SSP is not directly observable, we determine the SSP using information that may include contractually stated prices, market conditions, costs, renewal contracts, list prices and other observable inputs. A discount is present if the total transaction price is less than the sum of the estimated SSPs of the goods or services promised in the contract. Discounts are generally allocated proportionately based on the relative SSP of the identified performance obligations for a given contract.

Our wireless, professional, maintenance, and subscription services are generally recognized over time due to a customer's simultaneous receipt and consumption of the benefit as we perform the work. As we transfer control over time, we recognize revenue based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires significant judgment and is based on the nature of the products or services to be provided. Generally, we use the time-elapsed measure of progress for performance obligations that include wireless, maintenance, or subscription services. We believe this method best depicts the simultaneous transfer and consumption of the benefit based on our performance as these services are generally considered standby services. For professional services, we leverage an input methodology based on the number of hours worked on a project versus the total expected hours necessary to complete the project. Revenues are recognized proportionally as hours are incurred. This is a significant area of judgment as it requires an estimate at completion ("EAC") for each contract. Our initial EAC is primarily based on prior experience also taking into consideration any specific facts and circumstances for a given contract. As projects progress, the EAC is periodically updated and reviewed to ensure the timing of revenue recognition is appropriate. The creation, maintenance and review of a project's EAC requires significant judgment to determine an appropriate number of hours over which the remaining project is expected to be completed.

Our software licenses and hardware are generally recognized at a point in time when we have transferred control to the customer. For software licenses, revenue is not recognized until the related license(s) has been made available to the customer and the customer can begin to benefit from its right to use the license(s). Our software licenses represent a right to use Spok’s Intellectual Property ("IP") as it exists at a point in time at which the license is granted. Many of our software licenses have significant standalone functionality due to their ability to process a transaction or perform a function or task, and we do not need to maintain those products, once provided to the customer, for value to exist. While the functionality of IP that we license may substantively change during the license period, customers are not contractually or practically required to update their license as a result of those changes. In most contracts transfer of control for software licenses occurs in a short period of time after a contract has been executed and licenses are made electronically available.

Contracts may be modified to account for changes in a project's scope or other customer requirements. Most of our contract modifications are for goods or services that are distinct from the existing contract. In these instances, the contract modification would either be recognized as an entirely new and separate contract or the modification would be treated as if it were a termination of the existing contract and the creation of a new contract including all undelivered goods and services under the previous contract. Revenue would be recognized on a prospective basis and a cumulative catch-up would not be recognized.

Income Taxes

We file a consolidated U.S. federal income tax return and income tax returns in state, local and foreign jurisdictions as required. The provision for current income taxes is calculated and accrued on income and expenses expected to be included in current year U.S. and foreign income tax returns. The provision for current income taxes may also include interest, penalties and an estimated amount reflecting uncertain tax positions.

Deferred income tax assets and liabilities are calculated based on temporary differences between the financial statement values and the tax bases of assets and liabilities including net operating loss and tax credit carryforwards at the enacted tax rates expected to apply to taxable income when taxes are actually paid or recovered. Changes in deferred income tax assets and liabilities are included as a component of deferred income tax expense. Deferred income tax assets represent amounts available to reduce future income taxes payable. We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. This assessment is required to determine whether, based on all available evidence, it is "more likely than not" (meaning a probability of greater than 50%) that all or some portion of our deferred income tax assets will be realized in future periods. We provide a valuation allowance when we consider it "more likely than not" that a deferred income tax asset will not be fully recovered. The assessment of our deferred income tax assets requires significant judgment.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions fail to meet the "more likely than not" threshold based on the technical merits of the positions. We assess whether previously unrecognized tax benefits may be recognized when the tax position is (1) more likely than not of being sustained based on its technical merits, (2) effectively settled through examination, negotiation or litigation, or (3) settled through actual expiration of the relevant tax statutes. The assessment of an uncertain tax position requires significant judgment. We had no uncertain tax positions for the periods ended December 31, 2020, and 2019 (see Note 9, "Income Taxes," for additional details).

Impairment of Long-Lived Assets, Intangible Assets Subject to Amortization and Goodwill

We are required to evaluate the carrying value of our long-lived assets, amortizable intangible assets and goodwill. Amortizable intangible assets include customer-related intangibles that resulted from previous acquisitions. Such intangibles are amortized over periods up to ten years. Quarterly, we assess whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets may not be recoverable. When applicable, we assess the recoverability of the carrying value of our long-lived assets and certain amortizable intangible assets based on estimated undiscounted cash flows generated from such assets. In assessing the recoverability of these assets, we forecast estimated enterprise-level cash flows based on various operating assumptions such as revenue forecasted by product line and in-process research and development cost. If the forecast of undiscounted cash flows does not exceed the carrying value of the long-lived and amortizable intangible assets, we record an impairment charge to the extent the carrying value exceeded the fair value of such assets.

Goodwill is not amortized but is evaluated for impairment at least annually, or when events or circumstances suggest a potential impairment has occurred. We generally perform this annual impairment test in the fourth quarter of the fiscal year. We evaluate goodwill for impairment between annual tests if indicators of impairment exist. The impairment test involves comparing the fair value of the reporting unit with its carrying value. An impairment charge is recognized for the amount that the carrying value exceeds the reporting unit's fair value. For purposes of the goodwill impairment evaluation, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market-based approach using the fair value of the Company's common stock. The estimated fair value requires significant judgments, including timing and appropriateness of the price of common stock used (e.g. point-in-time application, simple moving average, exponential moving average), as well as application of an estimated control premium. The estimated control premium is based on a review of current and past market information published by a third-party resource, assessment of the Company's future projected discounted cash flows and other relevant information if available.

Based on our assessment during the fourth quarter of 2020, the estimated fair value exceeded the carrying value of the reporting unit and, therefore, an impairment existed. For additional details refer to Note 6, "Goodwill and Intangible Assets, Net."

We did not record any impairment of long-lived assets or definite-lived intangible assets for the years ended December 31, 2020, 2019 and 2018.

Recent accounting pronouncements

Refer to Note 2, "Recent and Pending Accounting Standards" in the Notes to Consolidated Financial Statements for a summary of recent and pending accounting standards.

ITEM 7A. *QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK*

Interest Rate Risk

At December 31, 2020, we had no outstanding borrowings or associated debt service requirements.

Foreign Currency Exchange Rate Risk

We conduct a limited amount of business outside the United States. The financial impact of transactions billed in foreign currencies is immaterial to our financial results and, consequently, we do not have any material exposure to the risk of foreign currency exchange rate fluctuations.

ITEM 8. ***FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA***

The consolidated financial statements are included in this Report beginning on Page F-1.

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

There are no reportable events.

ITEM 9A. *CONTROLS AND PROCEDURES*

Evaluation of Disclosure Controls and Procedures

Our management carried out an evaluation, as required by Rule 13a-15(b) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), with the participation of our principal executive officer and our principal financial officer, of the effectiveness of our disclosure controls and procedures, as of the end of our last fiscal year. Disclosure controls and procedures are defined under Rule 13a-15(e) under the Exchange Act as controls and other procedures of an issuer that are designed to ensure that the information required to be disclosed by the issuer in the reports that it files or submits under the Exchange Act (i) is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and (ii) is accumulated and communicated to the issuer's management, including its principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Based upon this evaluation, our principal executive officer and our principal financial officer have concluded that our disclosure controls and procedures were effective as of December 31, 2020.

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 the Exchange Act Rule 13a-15(f) and 15d-15(f). Management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Such internal controls include those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures are being made only in accordance with authorizations of management and members of the Board of Directors of the Company; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Based on our evaluation under the 2013 *Internal Control — Integrated Framework*, our management concluded that our internal control over financial reporting was effective as of December 31, 2020.

The effectiveness of our internal control over financial reporting as of December 31, 2020, has been audited by Grant Thornton LLP, an independent registered public accounting firm, as stated in its report which appears in this 2020 Form 10-K.

Changes in Internal Control Over Financial Reporting

There were no changes made in the Company's internal control over financial reporting during the quarter ended December 31, 2020, that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

ITEM 9B. *OTHER INFORMATION*

None.

PART III

Certain information called for by Items 10 through 14 is incorporated by reference from Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders, which will be filed with the SEC no later than April 30, 2021.

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE*

The following information required by this item is incorporated by reference from Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders:

- Information regarding directors is set forth under the caption "Election of Directors";
- Information regarding executive officers is set forth under the caption "Executive Officers";
- Information regarding our audit committee and designated "audit committee financial expert" is set forth under the caption "Committees of the Board of Directors"; and
- If applicable, information regarding compliance with Section 16(a) of the Exchange Act is set forth under the caption "Delinquent Section 16(a) Reports."

We also make available on our website, and in print, if any stockholder or other person so requests, our code of business conduct and ethics entitled "Code of Ethics" which is applicable to all employees and directors, our "Corporate Governance Guidelines," and the charters for all committees of our Board of Directors, including Audit, Compensation and Nominating and Governance. Any changes to our Code of Ethics or waiver, if any, of our Code of Ethics for executive officers or directors will be posted on that website.

ITEM 11. *EXECUTIVE COMPENSATION*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders entitled "Compensation Discussion and Analysis."

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

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders entitled "Security Ownership of Certain Beneficial Owners and Management."

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

The information required by this item with respect to certain relationships and related transactions is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders entitled "Related Person Transactions and Code of Conduct." The information required by this item with respect to director independence is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders entitled "Board of Directors and Governance Matters."

ITEM 14. *PRINCIPAL ACCOUNTANT FEES AND SERVICES*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2021 Annual Meeting of Stockholders entitled "Independent Registered Public Accounting Firm Fees."

PART IV

ITEM 15. *EXHIBITS AND FINANCIAL STATEMENT SCHEDULES*

The following documents are filed as part of this Form 10-K:

(a) 1. *Financial Statements*

2. *Financial Statement Schedules*

(b) *Exhibits*

The exhibits listed in the accompanying index to exhibits, that follows the Signatures page, are filed as part of this Form 10-K.

ITEM 16. FORM 10-K SUMMARY

None.

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 our behalf by the undersigned, thereunto duly authorized.

Spok Holdings, Inc.

By: /s/ Vincent D. Kelly
Vincent D. Kelly
President and Chief Executive Officer
February 18, 2021

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 and on the dates indicated.

Signature	Title	Date
/s/ Vincent D. Kelly Vincent D. Kelly	Director, President and Chief Executive Officer (principal executive officer)	February 18, 2021
/s/ Michael W. Wallace Michael W. Wallace	Chief Financial Officer (principal financial officer)	February 18, 2021
/s/ Calvin C. Rice Calvin C. Rice	Chief Accounting Officer (principal accounting officer)	February 18, 2021
/s/ Royce Yudkoff Royce Yudkoff	Chairman of the Board	February 18, 2021
/s/ N. Blair Butterfield N. Blair Butterfield	Director	February 18, 2021
/s/ Stacia A. Hylton Stacia A. Hylton	Director	February 18, 2021
/s/ Brian O’Reilly Brian O’Reilly	Director	February 18, 2021
/s/ Matthew Oristano Matthew Oristano	Director	February 18, 2021
/s/ Todd Stein Todd Stein	Director	February 18, 2021
/s/ Dr. Bobbie Byrne Dr. Bobbie Byrne	Director	February 18, 2021

/s/Christine M. Cournoyer Christine M. Cournoyer	Director	February 18, 2021
/s/Brett Shockley Brett Shockley	Director	February 18, 2021

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Spok Holdings, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of Spok Holdings, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2020 and 2019, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2020, and the related notes and financial statement schedule included under Item 15(a) (collectively referred to as 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, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2020, based on criteria established in the 2013 *Internal Control—Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), and our report dated February 18, 2021 expressed an unqualified opinion.

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 PCAOB and are required to be independent with respect to the Company in accordance with the 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. 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.

Critical audit matters

The critical audit matters communicated below are matters arising from the current period audit of the financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill Impairment

As described further in Note 6 to the financial statements, for purposes of the goodwill impairment assessment, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market-based approach using the fair value of the Company's common stock plus the application of an estimated control premium. Goodwill is assessed for impairment on an annual basis, or more frequently if indicators of impairment exist. We identified the evaluation of goodwill impairment as a critical audit matter.

The principal consideration for our determination that the evaluation of goodwill impairment is a critical audit matter is that there is significant judgement required in estimating the control premium applied to determine fair value of the Company's reporting unit. Changes in the estimates and judgments could have a significant impact on the fair value of the Company and the resulting amount of any goodwill impairment. Auditing management's estimates and judgments regarding the Company's estimated control premium involved a high degree of auditor subjectivity and required an increased extent of effort when performing audit procedures to evaluate the reasonableness of management's estimates and assumptions, including the need to involve a valuation specialist.

Our audit procedures related to goodwill impairment included the following, among others.

- We tested the design and operating effectiveness of key controls related to goodwill impairment.
- We obtained and tested the Company's key inputs and assumptions used by management to estimate the Company's control premium, including projected financial information used by management to quantify and corroborate the selected control premium.
- With the assistance of our valuation specialists, we evaluated the Company's applied control premium based on guideline public companies for the reporting unit by performing shadow calculations of income-based valuation models used by management to corroborate their selected control premium, through developing independent estimates of discount rates and other inputs, and testing the mathematical accuracy of the valuation models.

Realizability of Deferred Tax Assets and Valuation Allowance Assessment

As described further in Note 9 to the consolidated financial statements, the Company assesses the realizability of deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. The Company assesses the need for a valuation allowance by evaluating both positive and negative evidence that may exist. We identified the realizability of deferred tax assets and the assessment of the need for a valuation allowance as a critical audit matter.

The principal consideration for our determination that the realizability of deferred tax assets is a critical audit matter is that the forecast of future taxable income is an accounting estimate subject to a high level of estimation uncertainty. There is inherent uncertainty and subjectivity related to management's judgments and assumptions regarding the Company's future taxable income, which are complex in nature and require significant auditor judgment.

Our audit procedures related to the realizability of deferred tax assets and valuation allowance assessment included the following, among others.

- We tested the effectiveness of controls over management's estimates of the realization of the deferred tax assets, including those over management's long-range forecasts, which was the basis for the forecast of future taxable income, and the determination of whether it is more likely than not that the deferred tax assets will be realized prior to expiration.
- With the assistance of our income tax specialists, we evaluated the reasonableness of the methods, assumptions, and judgments used by management to assess available positive and negative evidence and determine whether a valuation allowance was necessary.
- With the assistance of our income tax specialists, we evaluated the nature of each of the deferred tax assets, including their expiration dates and their projected utilization when compared to projections of future taxable income.
- We evaluated management's ability to accurately estimate projected future taxable income by comparing actual results to management's historical estimates and evaluating whether there have been any changes that would affect management's ability to accurately estimate future taxable income.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2006.

Arlington, Virginia
February 18, 2021

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Spok Holdings, Inc.

Opinion on internal control over financial reporting

We have audited the internal control over financial reporting of Spok Holdings, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2020, based on criteria established in the 2013 *Internal Control-Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in the 2013 *Internal Control-Integrated Framework* issued by COSO.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated financial statements of the Company as of and for the year ended December 31, 2020, and our report dated February 18, 2021 expressed an unqualified opinion on those financial statements.

Basis for opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and limitations of internal control over financial reporting

A company's internal control over financial reporting is a process designed 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. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ GRANT THORNTON LLP

Arlington, Virginia
February 18, 2021

SPOK HOLDINGS, INC.
CONSOLIDATED BALANCE SHEETS

(Dollars in thousands, except share and per share amounts)	December 31, 2020	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 48,729	$ 47,361
Short-term investments	29,995	29,899
Accounts receivable, net	29,934	30,174
Prepaid expenses	8,958	7,517
Other current assets	1,269	2,714
Total current assets	118,885	117,665
Non-current assets:		
Property and equipment, net	7,815	8,000
Operating lease right-of-use assets	14,016	16,317
Capitalized software development, net	10,179	—
Goodwill	99,175	124,182
Intangible assets, net	417	2,917
Deferred income tax assets, net	25,826	48,983
Other non-current assets	978	1,808
Total non-current assets	158,406	202,207
TOTAL ASSETS	$ 277,291	$ 319,872
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 6,685	$ 3,615
Accrued compensation and benefits	14,103	11,680
Deferred revenue	27,686	25,944
Operating lease liabilities	5,264	5,437
Other current liabilities	3,702	4,507
Total current liabilities	57,440	51,183
Non-current liabilities:		
Asset retirement obligations	7,289	6,061
Operating lease liabilities	9,456	11,575
Other non-current liabilities	2,493	959
Total non-current liabilities	19,238	18,595
TOTAL LIABILITIES	76,678	69,778
COMMITMENTS AND CONTINGENCIES (Note 10)		
STOCKHOLDERS' EQUITY:		
Preferred stock—$0.0001 par value; 25,000,000 shares authorized; no shares issued or outstanding	$ —	$ —
Common stock—$0.0001 par value; 75,000,000 shares authorized; 19,384,192 and 19,071,614 shares issued and outstanding as of December 31, 2020 and December 31, 2019, respectively.	2	2
Additional paid-in capital	91,780	86,874
Accumulated other comprehensive loss	(1,452)	(1,601)
Retained earnings	110,283	164,819
TOTAL STOCKHOLDERS' EQUITY	200,613	250,094
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$ 277,291	$ 319,872

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS

(Dollars in thousands, except share and per share amounts)	For the Year Ended December 31, 2020	2019	2018
Revenue:			
Wireless	$ 83,593	$ 88,167	$ 94,277
Software	64,587	72,122	75,197
Total revenue	148,180	160,289	169,474
Operating expenses:			
Cost of revenue (exclusive of items shown separately below)	28,542	30,072	32,408
Research and development	15,828	27,543	24,464
Technology operations	29,843	31,428	31,356
Selling and marketing	19,467	23,170	24,553
General and administrative	43,102	45,787	49,097
Depreciation, amortization and accretion	9,056	9,249	10,769
Goodwill impairment	25,007	8,849	—
Total operating expenses	170,845	176,098	172,647
Operating loss	(22,665)	(15,809)	(3,173)
Interest income	687	1,651	1,638
Other income (expense)	208	735	(650)
Loss before income taxes	(21,770)	(13,423)	(2,185)
(Provision for) benefit from income taxes	(22,455)	2,658	706
Net loss	$ (44,225)	$ (10,765)	$ (1,479)
Basic and diluted net loss per common share	$ (2.32)	$ (0.56)	$ (0.08)
Basic and diluted weighted average common shares outstanding	19,028,918	19,089,402	19,667,891
Cash dividends declared per common share	$ 0.50	$ 0.50	$ 0.50

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

(Dollars in thousands)	For the Year Ended December 31, 2020	2019	2018
Net loss	$ (44,225)	$ (10,765)	$ (1,479)
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustments	149	(300)	(49)
Other comprehensive income (loss)	149	(300)	(49)
Comprehensive loss	$ (44,076)	$ (11,065)	$ (1,528)

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(Dollars in thousands, except share amounts)	Outstanding Common Shares	Common Stock	Additional Paid-In Capital and Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance, January 1, 2018	20,135,514	$ 2	$ 98,731	$ 191,796	$ 290,529
Net loss	—	—	—	(1,479)	(1,479)
Adjustment to beginning balance due to adoption of ASC 606 and related tax impact	—	—	(166)	5,110	4,944
Issuance of common stock under the Employee Stock Purchase Plan	20,120	—	247	—	247
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	199,991	—	—	—	—
Purchase of common stock for tax withholding	(62,432)	—	(976)	—	(976)
Amortization of stock-based compensation	—	—	4,954	—	4,954
Cash dividends declared	—	—	—	(10,133)	(10,133)
Common stock repurchase program including commissions	(929,116)	—	(13,483)	—	(13,483)
Issuance of restricted stock under the 2012 Equity Plan	24,989	—	—	—	—
Cumulative translation adjustment	—	—	(49)	—	(49)
Balance, December 31, 2018	19,389,066	$ 2	$ 89,258	$ 185,294	$ 274,554
Net loss	—	—	—	(10,765)	(10,765)
Issuance of common stock under the Employee Stock Purchase Plan	23,299	—	264	—	264
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	233,507	—	—	—	—
Purchase of common stock for tax withholding	(74,049)	—	(1,017)	—	(1,017)
Amortization of stock-based compensation	—	—	3,643	—	3,643
Cash dividends declared	—	—	—	(9,864)	(9,864)
Common stock repurchase program including commissions	(532,354)	—	(6,575)	—	(6,575)
Issuance of restricted stock under the 2012 Equity Plan and other	32,145	—	—	154	154
Cumulative translation adjustment	—	—	(300)	—	(300)
Balance, December 31, 2019	19,071,614	$ 2	$ 85,273	$ 164,819	$ 250,094
Net loss	—	—	—	(44,225)	(44,225)
Adoption of current expected credit loss ("CECL")	—	—	—	(365)	(365)
Issuance of common stock under the Employee Stock Purchase Plan	35,661	—	300	—	300
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	282,871	—	—	—	—
Purchase of common stock for tax withholding	(79,981)	—	(902)	—	(902)
Amortization of stock-based compensation	—	—	5,508	—	5,508
Cash dividends declared	—	—	—	(9,946)	(9,946)
Issuance of restricted stock under the Equity Plans	74,027	—	—	—	—
Cumulative translation adjustment	—	—	149	—	149
Balance, December 31, 2020	19,384,192	$ 2	$ 90,328	$ 110,283	$ 200,613

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

(Dollars in thousands)	For the Year Ended December 31, 2020	2019	2018
Cash flows from operating activities:			
Net loss	$ (44,225)	$ (10,765)	$ (1,479)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation, amortization and accretion	9,056	9,249	10,769
Goodwill impairment	25,007	8,849	—
Valuation allowance	22,108	—	—
Deferred income tax expense (benefit)	438	(3,253)	(1,692)
Stock-based compensation	5,508	3,643	4,954
Provisions for doubtful accounts, service credits, adjustments of non-cash transaction taxes and other	1,212	694	1,922
Changes in assets and liabilities:			
Accounts receivable	(1,588)	964	(915)
Prepaid expenses and other assets	1,445	2,913	(646)
Accounts payable, accrued liabilities and other	4,027	(643)	(1,732)
Deferred revenue	3,175	42	(866)
Net cash provided by operating activities	26,163	11,693	10,315
Cash flows from investing activities:			
Purchases of property and equipment	(3,455)	(4,837)	(5,915)
Capitalized software development	(11,252)	—	—
Purchase of short-term investments	(59,864)	(59,385)	(3,911)
Maturity of short-term investments	60,000	34,000	4,000
Net cash used in investing activities	(14,571)	(30,222)	(5,826)
Cash flows from financing activities:			
Cash distributions to stockholders	(9,771)	(9,819)	(10,064)
Purchase of common stock (including commissions)	—	(6,575)	(13,483)
Proceeds from issuance of common stock under the Employee Stock Purchase Plan	301	258	247
Purchase of common stock for tax withholding on vested equity awards	(903)	(1,017)	(976)
Net cash used in financing activities	(10,373)	(17,153)	(24,276)
Effect of exchange rate on cash	149	(300)	(49)
Net increase (decrease) in cash and cash equivalents	1,368	(35,982)	(19,836)
Cash and cash equivalents, beginning of period	47,361	83,343	103,179
Cash and cash equivalents, end of period	$ 48,729	$ 47,361	$ 83,343
Supplemental disclosure:			
Income taxes paid	$ 1	$ 901	$ 1,061

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

SPOK HOLDINGS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1 - ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES

Spok, Inc., a wholly owned subsidiary of Spok Holdings, Inc. (NASDAQ: SPOK) ("Spok," the "Company," "we," "us" and "our") is proud to be the global leader in healthcare communications. We deliver clinical information to care teams when and where it matters most to improve patient outcomes. Top hospitals rely on Spok products and services to enhance workflows for clinicians, support administrative compliance, and provide a better experience for patients.

We offer a focused suite of unified clinical communication and collaboration solutions that include call center operations, clinical alerting and notifications, one-way and advanced two-way wireless messaging services, mobile communications and public safety solutions.

We provide one-way and advanced two-way wireless messaging services, including information services, throughout the United States. These services are offered on a local, regional and nationwide basis, employing digital networks. One-way messaging consists of numeric and alphanumeric messaging services. Numeric messaging services enable subscribers to receive messages that are composed entirely of numbers, such as a phone number, while alphanumeric messages may include numbers and letters, which enable subscribers to receive text messages. Two-way messaging services enable subscribers to send and receive messages to and from other wireless messaging devices, including pagers, personal digital assistants and personal computers. We also offer voice mail, personalized greetings, message storage and retrieval, and equipment loss and/or maintenance protection to both one-way and two-way messaging subscribers. These services are commonly referred to as wireless messaging and information services.

We also develop, sell and support enterprise-wide systems for hospitals and other organizations needing to automate, centralize and standardize clinical communications. These solutions are used for contact centers, clinical alerting and notification, mobile communications and messaging and for public safety notifications. These areas of market focus compliment the market focus of our wireless services outlined above.

Basis of Presentation

The accompanying Consolidated Financial Statements include our accounts and the accounts of our wholly owned direct and indirect subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation. Our Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP") and the rules and regulations of the United States Securities and Exchange Commission (the "SEC"). In management's opinion, the Consolidated Financial Statements include all adjustments and accruals that are necessary for the presentation of the results of all periods reported herein and all such adjustments are of a normal, recurring nature, with the exception of our adoption of ASU No. 2016-13, Financial Instruments - Credit Losses (Topic 326), Measurement of Credit Losses on Financial Instruments, often referred to as Current Expected Credit Losses ("CECL"). For additional details refer to Note 2, "Recent Accounting Standards."

Amounts shown on the consolidated statements of operations within the operating expense categories of cost of revenue; research and development; technology operations; selling and marketing; and general and administrative are recorded exclusive of depreciation, amortization and accretion. These items are shown separately on the Consolidated Statements of Operations within operating expenses to the extent that they are considered material for the periods presented.

Certain immaterial prior period amounts in the consolidated financial statements have been reclassified to conform to the current period's presentation. These reclassifications had no effect on the reported results of operations or the statement of financial position.

Use of Estimates

The preparation of these consolidated financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues, expenses and related disclosures. On an ongoing basis, we evaluate estimates and assumptions, including but not limited to those related to the impairment of long-lived assets, intangible assets subject to amortization and goodwill, accounts receivable allowances, revenue recognition, depreciation expense, asset retirement obligations, and income taxes. We base our estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Revenue Recognition

The majority of our revenues are derived from short-term contracts related to the sale of wireless paging services and software solutions. Our arrangements exist primarily with customers in the healthcare market and to a lesser extent state and federal governments, as well as large enterprise businesses.

Under the typical payment terms of our software contracts, customers will normally pay a material amount of the contract price immediately upon execution of the contract. The remaining payments are required when the product is delivered, when services begin and, to a lesser extent, when services are completed. For Software as a Service ("SaaS") contracts, the subscription and premium support services are generally billed annually in advance while professional services are billed at various milestones which reflect work completed. Wireless services are generally billed as incurred on a monthly basis. Our contracts will generally result in billings in excess of revenue recognized, which we present as deferred revenues on the Consolidated Balance Sheets, primarily due to the receipt of payment in advance of the product or services we provide. Amounts billed and due from our customers are classified as accounts receivable on the Consolidated Balance Sheets. At times, we may have contracts which require us to perform work or provide products prior to billing which will generally result in revenue recognized in excess of billings. This excess is presented as unbilled receivables in the Notes to the Consolidated Financial Statements. We generally do not have transactions that include a significant financing component (whether payments are made in advance or in arrears) as our contracts typically take less than 12 months to complete once started. We would not adjust the total consideration for the effects of a significant financing component if we anticipate, at contract inception, that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

We account for a contract when: (1) both parties have approved the contract through mutually signed agreements or through other methods such as purchase orders or master agreements; (2) the rights of the parties have been identified; (3) payment terms have been identified; (4) the contract has commercial substance; and (5) collectability of consideration is probable. We also evaluate whether two or more contracts should be combined and accounted for as a single contract. In our evaluation, we consider criteria such as, but not limited to, whether: (1) the contracts are negotiated as a package with a single commercial objective; (2) the amount of consideration to be paid in one contract is dependent on the price or performance of another contract; and (3) some or all of the goods or services promised in the contracts are a single performance obligation. Should we consider contracts related, we would account for those contracts as if they were a single contract. Evaluating whether two or more contracts should be combined and accounted for as a single contract requires significant judgment. In the aggregate, a decision to combine a group of contracts could significantly impact the amount of revenue and profit recorded in a given period.

We review each contract to determine whether to account for the various promises as one or more performance obligations. The assessment and determination of performance obligations for a given contract requires significant judgment. Wireless service contracts are generally considered to be a single promise and therefore accounted for as a single performance obligation. Contracts which include goods or services related to our software solutions and subscriptions are generally sold with multiple promises and therefore will often include multiple performance obligations. Material performance obligations related to the sale of our software solutions include software licenses, professional services, hardware and maintenance. Material performance obligations related to the sale of our SaaS platform include a SaaS subscription, professional services, and signature support services.

More often than not, total consideration will equate to the stated value on the contract taking into consideration any period or term over which services are to be provided, if applicable. However, we could have contracts in which variable consideration is present. It is common for our contracts that include wireless services to contain customer penalties if rental pagers are not returned and fees for usage of services in excess of the contractually allotted amount for a given period. It is also common for our contracts that include professional services to include travel-related costs. These are costs which we incur in the normal course of delivering professional services and are generally billable to the customer based on our incurred expenses. These elements of variable consideration are fully constrained when an agreement is initially executed and are generally not considered estimable until the penalties, fees or costs have been incurred or are otherwise known. We include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Estimating variable consideration requires significant judgment and our assessment includes all relevant information that is reasonably available to us including historical, current and forecasted information. We have elected to exclude from revenue all amounts collected on behalf of third parties, and therefore, items such as sales and use tax are excluded from our calculation of the total transaction price.

If a contract is separated into more than one performance obligation we allocate the total transaction price to each performance obligation proportionately based on the estimated relative standalone selling price ("SSP") of the promised goods or services underlying each performance obligation. We rarely sell goods or services as readily observable standalone sales, however, if we do, the observable standalone sales are used to determine the SSP. In most cases, we must estimate the relative SSP which requires significant judgment and estimates. In instances where SSP is not directly observable, we determine the SSP using information that may include contractually stated prices, market conditions, costs, renewal contracts, list prices and other observable inputs. A discount is present if the total transaction price is less than the sum of the estimated SSPs of the goods or services promised in the contract. Discounts are generally allocated proportionately based on the relative SSP of the identified performance obligations for a given contract.

Our wireless, professional, maintenance, and subscription services are generally recognized over time due to a customer's simultaneous receipt and consumption of the benefit as we perform the work. As we transfer control over time, we recognize revenue based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires significant judgment and is based on the nature of the products or services to be provided. Generally, we use the time-elapsed measure of progress for performance obligations that include wireless, maintenance, or subscription services. We believe this method best depicts the simultaneous transfer and consumption of the benefit based on our performance as these services are generally considered standby services. For professional services, we leverage an input methodology based on the number of hours worked on a project versus the total expected hours necessary to complete the project. Revenues are recognized proportionally as hours are incurred. This is a significant area of judgment as it requires an estimate at completion ("EAC") for each contract. Our initial EAC is primarily based on prior experience also taking into consideration any specific facts and circumstances for a given contract. As projects progress, the EAC is periodically updated and reviewed to ensure the timing of revenue recognition is appropriate. The creation, maintenance and review of a project's EAC requires significant judgment to determine an appropriate number of hours over which the remaining project is expected to be completed.

Our software licenses and hardware are generally recognized at a point in time when we have transferred control to the customer. For software licenses, revenue is not recognized until the related license(s) has been made available to the customer and the customer can begin to benefit from its right to use the license(s). Our software licenses represent a right to use Spok's Intellectual Property ("IP") as it exists at a point in time at which the license is granted. Many of our software licenses have significant standalone functionality due to their ability to process a transaction or perform a function or task, and we do not need to maintain those products, once provided to the customer, for value to exist. While the functionality of IP that we license may substantively change during the license period, customers are not contractually or practically required to update their license as a result of those changes. In most contracts transfer of control for software licenses occurs in a short period of time after a contract has been executed and licenses are made electronically available.

Contracts may be modified to account for changes in a project's scope or other customer requirements. Most of our contract modifications are for goods or services that are distinct from the existing contract. In these instances, the contract modification would either be recognized as an entirely new and separate contract or the modification would be treated as if it were a termination of the existing contract and the creation of a new contract including all undelivered goods and services under the previous contract. Revenue would be recognized on a prospective basis and a cumulative catch-up would not be recognized.

Incremental Costs of Obtaining a Contract and Costs to Fulfill a Contract

Our incremental costs primarily relate to sales commissions. We capitalize commissions and proportionally recognize the related expense to revenue as it is recognized on the underlying performance obligations. Some of these costs may relate to specific future anticipated contracts, specifically future maintenance renewals, which we do not pay commensurate sales commissions on. We amortize commission costs proportionally with revenue, thus it is necessary for us to estimate future revenues when there are future anticipated contracts. We estimate future revenues based on anticipated renewal amounts over an expected useful life (e.g. the period over which we believe the initial sales commissions relate to future anticipated contracts). The expected useful life is based on a review of our product life cycles, customer upgrade patterns and the rate at which customers renew maintenance. Commission expense was $4.3 million, $5.0 million and $6.2 million for the years ended December 31, 2020, 2019 and 2018, respectively. Commission expense is classified within the selling and marketing operating expenses category.

Leases

Operating lease right-of-use ("ROU") assets and liabilities are recognized at the commencement date based on the present value of lease payments over the lease term. We have made an accounting policy election not to apply the recognition requirements of ASC 842, "Leases," to short-term leases. Those leases which have a term of less than 12 months will have lease payments recognized, in our Consolidated Statements of Operations, on a straight-line basis over the lease term. An optional renewal or termination is not recognized as part of the lease term unless we determine that it is reasonably certain that we will exercise that option. The term reasonably certain is a high threshold for which pervasive evidence generally does not exist, and therefore, optional renewal periods are generally excluded from our ROU assets and lease liabilities until they have been exercised. Lease expense is recognized on a straight-line basis over the lease term.

As most of our leases do not provide an implicit rate, we use an estimated incremental borrowing rate in determining the present value of lease payments. The Company uses a portfolio approach when determining the discount rate applied to its leases. Significant judgment is necessary when determining a discount rate because we must estimate the discount rate based on a number of factors and observable inputs including current market conditions, market yields, government bond rates, credit risk, and other factors as necessary. The Company must also exercise significant judgment when determining whether an option to renew or terminate a lease should be included in the lease term. This judgment includes an assessment of all relevant economic factors such as costs relating to the termination or extension of a lease, importance of the underlying asset to the Company's operations, and the terms and conditions of the optional periods in relation to current market rates.

Where we have lease agreements which contain lease and non-lease components, we have elected to make use of the practical expedient to account for each separate lease component and associated non-lease component as a single lease component.

Impairment of Long-Lived Assets, Intangible Assets Subject to Amortization and Goodwill

We are required to evaluate the carrying value of our long-lived assets, amortizable intangible assets and goodwill. Amortizable intangible assets include customer-related intangibles that resulted from previous acquisitions. Such intangibles are amortized over periods up to ten years. Quarterly, we assess whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets may not be recoverable. When applicable, we assess the recoverability of the carrying value of our long-lived assets and certain amortizable intangible assets based on estimated undiscounted cash flows generated from such assets. In assessing the recoverability of these assets, we forecast estimated enterprise-level cash flows based on various operating assumptions such as revenue forecasted by product line and in-process research and development cost. If the forecast of undiscounted cash flows does not exceed the carrying value of the long-lived and amortizable intangible assets, we record an impairment charge to the extent the carrying value exceeded the fair value of such assets.

Goodwill is not amortized but is evaluated for impairment at least annually, or when events or circumstances suggest a potential impairment has occurred. We generally perform this annual impairment test in the fourth quarter of the fiscal year. We evaluate goodwill for impairment between annual tests if indicators of impairment exist. The impairment test involves comparing the fair value of the reporting unit with its carrying value. An impairment charge is recognized for the amount that the carrying value exceeds the reporting unit's fair value. For purposes of the goodwill impairment evaluation, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market-based approach using the fair value of the Company's common stock. The estimated fair value requires significant judgments, including timing and appropriateness of the price of common stock used (e.g. point-in-time application, simple moving average, exponential moving average), as well as application of an estimated control premium. The estimated control premium is based on a review of current and past market information published by a third-party resource, assessment of the Company's future projected discounted cash flows and other relevant information if available.

Based on our assessment during the fourth quarter of 2020, the estimated fair value exceeded the carrying value of the reporting unit and, therefore, an impairment existed. For additional details refer to Note 6, "Goodwill and Intangible Assets, Net."

We did not record any impairment of long-lived assets or definite-lived intangible assets for the years ended December 31, 2020, 2019 and 2018.

Accounts Receivable Allowances

Our two most significant allowance accounts are: an allowance for doubtful accounts and an allowance for service credits. Provisions for these allowances are recorded on a monthly basis and are included as a component of general and administrative expenses, respectively.

Estimates are used in determining the allowance for doubtful accounts and are based on historical collection experience and current and forecasted trends, as well as known specific collection risks. In determining these estimates, we review historical write-offs, including comparisons of write-offs to provisions for doubtful accounts. We compare the ratio of the allowance to gross receivables to historical levels, and monitor amounts collected and related statistics. We write off receivables when they are deemed uncollectible. While write-offs of customer accounts have historically been within our expectations and the provisions established, we cannot guarantee that the future write-off experience will be consistent with historical experience, which could result in material differences when compared to the allowance for doubtful accounts and related provisions.

From time to time, we grant service credits for customer retention purposes or when there is an adjustment in the scope of work. The allowance for service credits related provisions are based on historical credit percentages, current credit and aging trends, historical actual payment trends and actual credit experience. We analyze our past credit experience over several time frames. Using this analysis along with current operational data, including existing experience of credits issued and the time frames in which credits are issued, we establish an appropriate allowance for service credits. This allowance also reduces accounts receivable for lost and non-returned pagers to the expected realizable amounts and for free wireless services. While credits issued have been within our expectations and the provisions established, we cannot guarantee that future credit experience will be consistent with historical experience, which could result in material differences when compared to the allowance for service credits and maintenance-related provisions.

Inventory

Inventories are stated at the lower of cost or net realizable value. Cost is computed using a weighted average cost approach which averages the prices at which goods are purchased from vendors. We evaluate our ending inventories for shrinkage and estimated obsolescence. Any shrinkage identified is written off to cost of goods sold in the period in which the shrinkage is identified. Further, we assess the impact of changing technology on our inventories and we write off inventories that are considered obsolete in the period in which the analysis takes place. Inventory consists primarily of finished goods. We do not account for inventory as work-in-process or raw materials as any such inventory would be immaterial to the consolidated financial statements.

Property and Equipment

Property and equipment are reported at cost and are depreciated using the straight-line method based on estimated useful lives which range from one to five years.

Transmitter assets are grouped into tranches based on our transmitter decommissioning forecast and are depreciated using the group life method on a straight-line basis. Depreciation expense is determined by the expected useful life of each tranche of the underlying transmitter assets. The expected useful life is based on our forecasted usage of those assets and their retirement over time and aligns the useful lives of these transmitter assets with their planned removal from service. Disposals are charged against accumulated depreciation with no gain or loss recognized. This rational and systematic method matches the underlying usage of these assets to the underlying revenue that is generated from these assets. Depreciation expense for these assets is subject to change based upon revisions in the timing of transmitter deconstruction resulting from our long-range planning and network rationalization process.

Asset Retirement Obligations

We recognize liabilities and corresponding assets for future obligations associated with the retirement of assets. We have paging equipment assets, principally transmitters, which are located at leased locations. The underlying leases generally require the removal of equipment at the end of the lease term; therefore, a future obligation exists. Asset retirement costs are reflected in paging equipment assets with depreciation expense recognized over the estimated lives, which range between one and five years. The asset retirement costs and the corresponding liabilities that have been recorded to date generally relate to either current plans to consolidate networks or to the removal of assets at a future terminal date. When an asset retirement obligation arises, the liabilities and corresponding assets are recorded at their present value using a discounted cash flow approach and the liabilities are accreted using the interest method.

The recognition of an asset retirement obligation requires that management make numerous assumptions regarding such factors as the cost and timing of deconstruction; the credit-adjusted risk-free rate to be used; inflation rates; and future advances in technology. The fair value estimate of contractor fees to remove each asset is assumed to escalate by 2% each year through the terminal date. The total estimated liability is based on the estimated future value of those costs and the timing of deconstruction.

We believe these estimates are reasonable at the present time, but we can give no assurance that changes in technology, our financial condition, the economy or other factors would not result in higher or lower asset retirement obligations. Any variations from our estimates would generally result in a change in the assets and liabilities in equal amounts, and operating results would differ in the future by any difference in depreciation expense and accretion expense (see Note 5, "Consolidated Financial Statement Components", and Note 7, "Asset Retirement Obligations" for additional details).

Income Taxes

We file a consolidated U.S. federal income tax return and income tax returns in state, local and foreign jurisdictions as required. The provision for current income taxes is calculated and accrued on income and expenses expected to be included in current year U.S. and foreign income tax returns. The provision for current income taxes may also include interest, penalties and an estimated amount reflecting uncertain tax positions.

Deferred income tax assets and liabilities are calculated based on temporary differences between the financial statement values and the tax bases of assets and liabilities including net operating loss and tax credit carryforwards at the enacted tax rates expected to apply to taxable income when taxes are actually paid or recovered. Changes in deferred income tax assets and liabilities are included as a component of deferred income tax expense. Deferred income tax assets represent amounts available to reduce future income taxes payable. We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. This assessment is required to determine whether based on all available evidence, it is "more likely than not" (meaning a probability of greater than 50%) that all or some portion of the deferred income tax assets will be realized in future periods. We provide a valuation allowance when we consider it "more likely than not" that a deferred income tax asset will not be fully recovered. The assessment of our deferred income tax assets requires significant judgment.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions fail to meet the "more likely than not" threshold based on the technical merits of the positions. We assess whether previously unrecognized tax benefits may be recognized when the tax position is (1) more likely than not of being sustained based on its technical merits, (2) effectively settled through examination, negotiation or litigation, or (3) settled through actual expiration of the relevant tax statutes. The assessment of an uncertain tax position requires significant judgment. We had no uncertain tax positions for the periods ended December 31, 2020 and 2019 (see Note 9, "Income Taxes," for additional details).

Research and Development

In accordance with ASC 985-20, Software to be Sold, Leased, or Marketed, certain software development costs are charged to operations and expensed as incurred until technological feasibility has been established. Material costs incurred after technological feasibility is established and before the product is ready for general release are capitalized and amortized on a straight-line basis over the estimated remaining economic life of the product or the ratio of current revenues to total projected product revenues, whichever is greater. To date, the time between technological feasibility and general release to the public has been extremely short and consequently expenses available for capitalization have been immaterial. Accordingly, all research and developments costs incurred to date, accounted for in accordance with ASC 985-20, have been expensed as incurred.

In accordance with ASC 350-40, Internal-Use Software, certain software development costs are capitalized while in the application development stage related to software developed for internal use or software sold in a Software as a Service ("SaaS") arrangement. This includes certain development costs for Spok Go which qualified for capitalization beginning in the first quarter of 2020. All other costs incurred during the preliminary project stage or the post-implementation stage, are expensed as incurred. Significant judgment is required when assessing costs and determining whether they fall within the preliminary project, application development, or post-implementation stage that determines whether the associated costs are expensed as incurred or capitalized. Capitalized software development is amortized on a straight-line basis over the estimated useful life of the asset, typically three years, beginning when those development efforts have been placed into service (e.g., generally once made commercially available). Determining the estimated useful life requires significant judgment as we consider factors such as the rapid and continuous developments in software technology, obsolescence and anticipated life of the service offering before enhancements are necessary. In a SaaS environment, customer needs are rapidly evolving and a shorter useful life is generally expected.

We incur shipping and handling costs to send and receive messaging devices and other equipment to/from our customers. Amounts billed to customers related to shipping and handling are classified as revenue and the Company's shipping and handling costs are classified as cost of revenue. These costs are expensed as incurred.

Advertising Expenses

Advertising costs are charged to operations when incurred. Advertising costs are classified as selling and marketing expenses. Advertising expenses were $1.3 million, $1.7 million and $2.4 million for the years ended December 31, 2020, 2019, and 2018, respectively.

Stock-Based Compensation

We account for share-based payments to employees, including restricted stock units ("RSUs"), restricted common stock ("restricted stock") and the option to purchase common stock under the Employee Stock Purchase Plan ("ESPP") based on their fair value and the estimated number of shares we expect will vest based on the performance metrics associated with the award, if applicable. Fair value is measured based on the closing fair market value of the Company's common stock on the date of grant. Compensation expense is recognized on a straight-line basis over the requisite service period. Forfeitures and withdrawals are accounted for on an as incurred basis.

Changes in our estimates of the expected attainment of performance targets are reflected in the amount of compensation expense that we recognize for the related instruments during the interim reporting period when the change in estimate is determined and may cause the amount of compensation expense that we record for each period to vary. Further information regarding stock-based compensation can be found in Note 8, "Stockholders' Equity."

Concentration of Credit Risk

Our financial instruments that are potentially subject to concentrations of credit risk consist primarily of cash, cash equivalents, short-term receivables and accounts receivable. While our cash and cash equivalents are managed by reputable financial institutions, deposits at these institutions and funds may, at times, exceed federally insured limits. Management believes that these financial institutions and funds are financially sound and, accordingly, that minimal credit risk exists.

Accounts receivable are typically unsecured and are derived from revenue earned from customers across different geographic locations, primarily within the U.S. We perform ongoing credit evaluations of our customers, and generally do not require collateral. We maintain an allowance for estimated credit losses. During the years ended December 31, 2020, 2019, and 2018, our bad debt expenses were $1.1 million, $0.7 million, and $1.6 million, respectively. In the event that accounts receivable collection cycles deteriorate, our operating results and financial position could be adversely affected. No customer represented 10% or more of total revenue or accounts receivable during the years ended December 31, 2020, 2019, and 2018.

Sales and Use Taxes

Sales and use taxes imposed on the ultimate consumer are excluded from revenue where we are required by law or regulation to act as collection agent for the taxing jurisdiction.

Fair Value Measurements and Financial Instruments

We account for certain assets and liabilities at fair value. We categorize each of our fair value measurements in one of the following three levels based on the lowest level input that is significant to the fair value measurement in its entirety. These levels are:

- ***Level 1*:** Inputs are based upon unadjusted quoted prices for identical instruments in active markets.
- ***Level 2*:** Inputs are based upon quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, inputs other than quoted prices that are observable for the asset or liability and inputs that are corroborated by other observable market data.
- ***Level 3*:** Unobservable inputs that cannot be corroborated by observable market data and typically reflect management's estimates of assumptions that market participants would use in pricing the asset or liability.

We consider all highly liquid interest-earning investments with a maturity of three months or less at the date of purchase to be cash equivalents. Those investments with an original maturity of greater than three months and less than one year are classified as short-term investments. Cash and cash equivalents consist primarily of cash on deposit with banks and investments in money market funds.

Our short-term investments consist entirely of U.S. Treasury securities which are classified as held-to-maturity and are measured at amortized cost on our Consolidated Balance Sheets. These investments are classified as Level 1 and mature within 12 months. The differences between carrying value and fair value are not material to the Consolidated Financial Statements.

Financial instruments including cash and cash equivalents, accounts receivable and accounts payable all have fair values that approximate their carrying values at December 31, 2020, and 2019 due to their short maturities.

Earnings Per Common Share

The calculation of earnings per common share is based on the weighted-average number of common shares outstanding during the applicable period. The calculation for diluted earnings per common share recognizes the effect of all potentially dilutive common shares that were outstanding during the respective periods, unless the impact would be anti-dilutive. Further information regarding earnings per common share can be found in Note 8, "Stockholders' Equity."

NOTE 2 - RECENT ACCOUNTING STANDARDS

In June 2016, the Financial Accounting Standards Board issued ASU No. 2016-13, or CECL. CECL requires early recognition of credit losses on financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. This guidance is effective for fiscal years beginning after December 15, 2019. On January 1, 2020, we adopted ASU No. 2016-13 which resulted in an immaterial adjustment to the beginning balance of retained earnings and an increase to allowance for doubtful accounts.

NOTE 3 - REVENUE, DEFERRED REVENUE AND PREPAID COMMISSIONS

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services.

The following table presents our revenues disaggregated by revenue type:

	For the Year Ended December 31,		
(Dollars in thousands)	**2020**	**2019**	**2018**
Revenue - wireless:			
Paging revenue	$ 79,916	$ 85,067	$ 90,570
Product and other revenue	3,677	3,100	3,707
Total wireless revenue	$ 83,593	$ 88,167	$ 94,277
Revenue - software:			
License	$ 5,179	$ 8,950	$ 13,042
Services	17,910	19,189	18,091
Equipment	2,841	3,618	4,995
Subscription	66	—	—
Operations revenue	25,996	31,757	36,128
Maintenance revenue	38,591	40,365	39,069
Total software revenue	$ 64,587	$ 72,122	$ 75,197
Total revenue	$ 148,180	$ 160,289	$ 169,474

The Company is currently structured as a single operating (and reportable) segment, a clinical communication and collaboration business. The U.S. was the only country that accounted for more than 10% of the Company's total revenue for the years ended December 31, 2020, 2019 and 2018. Revenue generated in the U.S. and internationally consisted of the following for the periods stated:

	For the Year Ended December 31,		
(Dollars in thousands)	**2020**	**2019**	**2018**
Revenue:			
United States	$ 145,349	$ 154,766	$ 164,558
International	2,831	5,523	4,916
Total revenue	**$ 148,180**	**$ 160,289**	**$ 169,474**

Deferred Revenues

Our deferred revenues represent payments made to, or due from, customers in advance of our performance. Changes in the balance of total deferred revenue during the twelve months ended December 31, 2020, are as follows:

(Dollars in thousands)	December 31, 2019	Additions	Revenue Recognized	December 31, 2020
Deferred Revenue	$ 26,621	$ 67,769	$ (64,594)	$ 29,796

During the twelve months ended December 31, 2020, the Company recognized $24.7 million of revenue related to amounts deferred as of December 31, 2019.

Prepaid Commissions

Our prepaid commissions represent payments made to employees in advance of our performance on the related underlying contracts. These costs have been incurred directly in relation to obtaining a contract. As such, these costs are amortized over the estimated period of benefit. Changes in the balance of total prepaid commissions during the year ended December 31, 2020, are as follows:

(Dollars in thousands)	December 31, 2019	Additions	Commissions Recognized	December 31, 2020
Prepaid Commissions	$ 2,431	$ 4,160	(4,301)	$ 2,290

Prepaid commissions are included within prepaid expenses in the Consolidated Balance Sheets and commissions expense is included within Selling and marketing on the Consolidated Statements of Operations.

Remaining Performance Obligations

The balance of remaining performance obligations at December 31, 2020, was $50.5 million. We expect to recognize approximately $37.0 million of these remaining performance obligations over the next 12 months, with the remaining balance recognized thereafter.

NOTE 4 - LEASES

We have operating lease arrangements for corporate offices, cellular towers, storage units and small building spaces. The building space is used to house infrastructure, such as transmitters, antennae and other various equipment for the Company's wireless paging services. For leases with a term of 12 months or less, renewal terms are generally of an evergreen nature (either month-to-month or year-to-year). For leases with a term greater than 12 months, renewal terms are generally explicit and provide for one to five optional renewals consistent with the initial term. Many of our leases, with the exception of those for our corporate offices, include options to terminate the lease within one year. Variable lease payments, residual value guarantees or purchase options are not generally present in these leases.

Lease costs are included in Technology Operations and General and Administrative expenses on the Consolidated Statements of Operations. The following table presents lease costs disaggregated by type:

	For the Year Ended December 31,	
(Dollars in thousands)	2020	2019
Operating lease cost	$ 5,797	$ 5,823
Short-term lease cost	7,991	8,281
Short-term lease cost - related party[(1)]	3,518	3,589
Total lease cost	$ 17,306	$ 17,693
Supplemental Disclosure:		
Cash paid for amounts included in the measurement of lease liabilities - operating leases	$ 5,685	$ 5,678
Weighted-average remaining lease term - operating leases (in years)	5.06	5.60
Weighted-average discount rate - operating leases	5.17%	5.45%

[(1)] A former member of our Board of Directors, who departed our Board during the third quarter of 2020, also serves as a director for an entity that leases transmission tower sites to the Company. Refer to Note 12, "Related Parties" for additional details.

We intend to relocate our corporate headquarters during the first half of 2021 to office space located in Alexandria, Virginia, consisting of approximately 26,000 square feet of space under a lease that will expire on September 30, 2026. We expect to record approximately $4.4 million in a right-of-use asset and corresponding operating lease liability for this lease at such time that we obtain control of the property.

Maturities of lease liabilities as of December 31, 2020, were as follows:

(Dollars in thousands)	For the Year Ended December 31,
2021	$ 5,273
2022	3,539
2023	2,395
2024	1,672
2025	1,050
Thereafter	2,816
Total future lease payments	16,745
Imputed interest	(2,025)
Total	$ 14,720

NOTE 5 - CONSOLIDATED FINANCIAL STATEMENTS' COMPONENTS

Depreciation, Amortization and Accretion

Depreciation, amortization and accretion consisted of the following for the periods stated:

	For the Year Ended December 31,		
(Dollars in thousands)	2020	2019	2018
Depreciation			
Leasehold improvements	$ 57	$ 63	$ 232
Asset retirement costs	(643)	(766)	(300)
Paging and computer equipment	5,291	6,526	7,397
Furniture, fixtures and vehicles	307	374	398
Total depreciation	5,012	6,197	7,727
Amortization			
Intangible assets	2,500	2,500	2,500
Capitalized software development costs	1,073	—	—
Total amortization	3,573	2,500	2,500
Accretion	471	552	542
Total depreciation, amortization and accretion expense	$ 9,056	$ 9,249	$ 10,769

Accounts Receivable, net

Accounts receivable was recorded net of an allowance of $1.7 million and $1.3 million for the years ended December 31, 2020, and 2019, respectively. Accounts receivable, net includes $7.0 million and $6.4 million of unbilled receivables for the years ended December 31, 2020, and 2019, respectively. Unbilled receivables are defined as the Company's right to consideration in exchange for goods or services that we have transferred to the customer but have not yet billed for, generally as a result of contractual billing terms.

Property and Equipment, net

Property and equipment, net consisted of the following for the periods stated:

(Dollars in thousands)	Useful Life (In Years)	For the Year Ended December 31, 2020	2019
Leasehold improvements	lease term	$ 3,628	$ 3,620
Asset retirement costs	1-5	3,717	1,922
Paging and computer equipment	1-5	92,608	96,562
Furniture, fixtures and vehicles	3-5	3,517	3,716
Total property and equipment		103,470	105,820
Accumulated depreciation		(95,655)	(97,820)
Total property and equipment, net		$ 7,815	$ 8,000

For purposes of assessing our asset retirement costs, we completed a review of the estimated useful life of our transmitter assets during the fourth quarter of 2020 (that are part of paging and computer equipment). This review was based on the results of our long-range planning and network rationalization process and indicated that the expected useful life of the last tranche of the transmitter assets was no longer appropriate. As a result of that review, the expected useful life of the final tranche of transmitter assets was extended from 2024 to 2025. This change resulted in a revision of the expected future depreciation expense for the transmitter assets and an immaterial impact to the consolidated financial statements beginning in 2021. We believe these estimates remain reasonable at the present time, but we can give no assurance that changes in technology, customer usage patterns, our financial condition, the economy or other factors would not result in changes to our transmitter decommissioning plans. Any further variations from our estimates could result in a change in the expected useful lives of the underlying transmitter assets and operating results could differ in the future by any difference in depreciation expense. The extension of the depreciable life was accounted for as a change in accounting estimate.

Capitalized Software Development

Capitalized software development is amortized on a straight-line basis over the estimated useful life of the asset, typically three years. Capitalized software development costs were $11.3 million for the year ended December 31, 2020, and no capitalized costs were recorded for the year ended December 31, 2019, respectively. Amortization expense with respect to software development costs was $1.1 million for the year ended December 31, 2020, and there was no amortization expense for the year ended December 31, 2019.

NOTE 6 - GOODWILL AND INTANGIBLE ASSETS, NET

Goodwill

For purposes of the goodwill impairment assessment, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market-based approach using the fair value of the Company's common stock. The estimated fair value requires significant judgments, including timing and appropriateness of the price of common stock used (e.g., point-in-time application, simple moving average, exponential moving average), as well as application of an estimated control premium. There are a number of judgmental factors that are incorporated into our assessment to establish an estimated control premium, including the review of current and past market information published by a third-party resource, assessment of the Company's future projected discounted cash flows and other relevant information if available.

While a formal impairment assessment is performed annually, the Company monitors its business environment for potential triggering events on a quarterly basis. During the quarter ended March 31, 2020, we determined, based on a qualitative assessment, that COVID-19 created a triggering event that required further assessment. As such, we performed a quantitative assessment, using data as of March 31, 2020. Based on that assessment, the estimated fair value of the reporting unit exceeded the carrying value of the Company, which indicated an impairment did not exist as of the interim balance sheet date.

During the quarter ended December 31, 2020, we performed our annual assessment of goodwill. Based on our assessment, using data as of October 31, 2020, the carrying value of the reporting unit exceeded the estimated fair value of the Company, which indicated an impairment existed. There is potential for further impairment charges in future periods based on these ongoing assessments.

The change in goodwill for the year ended December 31, 2020, was as follows:

(Dollars in thousands)	Change in Goodwill	
Goodwill at January 1, 2019	$	133,031
Impairment	$	(8,849)
Goodwill at January 1, 2020	$	124,182
Impairment		(25,007)
Goodwill at December 31, 2020	$	99,175

Intangible Assets

Amortizable intangible assets at December 31, 2020 and 2019 related primarily to customer relationships. Such intangible assets are amortized over a period of ten years. We did not record an impairment of our intangible assets during the years ended December 31, 2020, 2019 and 2018. The remaining amortization of $0.4 million is expected to be incurred in 2021.

The net consolidated balance of intangible assets consisted of the following at December 31, 2020, and 2019:

	As of December 31,					
	2020			2019		
(Dollars in thousands)	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Customer relationships	$ 25,002	$ (24,585)	$ 417	$ 25,002	$ (22,085)	$ 2,917

NOTE 7 - ASSET RETIREMENT OBLIGATIONS

The components of the changes in the asset retirement obligation liabilities for the periods stated were as follows:

(Dollars in thousands)	Short-Term Portion	Long-Term Portion	Total
Balance at January 1, 2019	$ 34	$ 6,513	$ 6,547
Accretion	39	513	552
Amounts paid	(177)	—	(177)
Additions	—	32	32
Reductions	14	(817)	(803)
Reclassifications	180	(180)	—
Balance at December 31, 2019	90	6,061	6,151
Accretion	(38)	509	471
Amounts paid	(352)	—	(352)
Additions	169	1,185	1,354
Reclassifications	466	(466)	—
Balance at December 31, 2020	$ 335	$ 7,289	$ 7,624

Increases and reductions other than accretion, reclassification and amounts paid primarily relate to changes in estimates of the underlying liability, specifically related to updates in estimated costs to remove a transmitter and the estimated timing of removal. Estimated removal costs and timing refinements due to ongoing network rationalization activities are expected to accrete to a total liability of $9.3 million.

Additional information regarding asset retirement costs and accretion expense can be found in Note 5, "Consolidated Financial Statements' Components."

NOTE 8 - STOCKHOLDERS' EQUITY

General

Our authorized capital stock consists of 75 million shares of common stock, par value $0.0001 per share, and 25 million shares of preferred stock, par value $0.0001 per share.

At December 31, 2020, and 2019, we had no stock options outstanding.

At December 31, 2020, and 2019, there were 19,384,192 and 19,071,614 shares of common stock outstanding, respectively, and no shares of preferred stock were outstanding.

Dividends

For each of the three years ending December 31, 2020, 2019 and 2018, our Board of Directors declared cash dividends of $0.50 per share of our outstanding common stock. An immaterial amount of dividends declared were related to unvested RSUs and unvested shares of restricted stock, which are accrued for and paid when the applicable vesting conditions are met. Accrued cash dividends on forfeited RSUs and restricted stock are also forfeited. Cash dividends paid as disclosed in the Consolidated Statements of Cash Flows for the years ended December 31, 2020, 2019 and 2018 included previously declared cash dividends on vested RSUs and on shares of vested restricted stock issued to non-executive members of our Board of Directors.

On February 17, 2021, the Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2021, and a payment date of March 30, 2021. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

Common Stock Repurchase Program

On July 31, 2008, our Board of Directors approved a program to repurchase our common stock in the open market. This program has been extended at various times. In August 2018, our Board of Directors authorized the repurchase of up to $10.0 million of our common stock through December 31, 2018, on the open market or in privately negotiated transactions. In November 2018, our Board of Directors extended the repurchase authority through December 31, 2019. The Company fully exhausted the repurchase authority in September 2019.

We used available cash on hand and net cash provided by operating activities to fund the common stock repurchase program. This repurchase authority allowed us, at management’s discretion, to selectively repurchase shares of our common stock from time to time in the open market depending upon market price and other factors.

Repurchased shares of our common stock were accounted for as a reduction to common stock and additional paid-in-capital in the period in which the repurchase occurred. All repurchased shares of common stock were returned to the status of authorized, but unissued, shares of the Company.

The Company did not repurchase any of its common stock during 2020. Common stock repurchased in 2019 and 2018 (excluding commission and the purchase of common stock for tax withholdings) was as follows:

(Dollars in thousands, except for shares purchased)	**2019**		**2018**	
For the Three Months Ended	**Shares Purchased**	**Amount**	**Shares Purchased**	**Amount**
March 31,	131,012	$ 1,806	127,792	$ 1,922
June 30,	—	—	501,782	7,520
September 30,	401,342	4,749	36,542	558
December 31,	—	—	263,000	3,446
Total	532,354	$ 6,555	929,116	$ 13,446

Net Loss per Common Share

Basic net loss per common share is computed on the basis of the weighted average common shares outstanding. Diluted net loss per common share is computed on the basis of the weighted average common shares outstanding plus the effect of all potentially dilutive common shares, including unvested and outstanding equity awards. The components of basic and diluted net loss per common share were as follows for the periods stated:

(In thousands, except for share and per share amounts)	For the Year Ended December 31, 2020	2019	2018
Numerator:			
Net loss	$ (44,225)	$ (10,765)	$ (1,479)
Denominator:			
Basic and diluted weighted average outstanding shares of common stock	19,028,918	19,089,402	19,667,891
Basic and diluted net loss per common share	$ (2.32)	$ (0.56)	$ (0.08)

For the years ended December 31, 2020, 2019 and 2018, the following securities were not included in the calculation of diluted shares outstanding as the effect would have been anti-dilutive:

	For the Year Ended December 31, 2020	2019	2018
Restricted stock units	297,757	189,862	178,279

Share-Based Compensation Plans

On March 23, 2012, our Board of Directors adopted the Spok Holdings, Inc. 2012 Equity Incentive Award Plan (the "2012 Equity Plan") that our stockholders subsequently approved on May 16, 2012. A total of 2,194,986 shares of common stock were reserved for issuance under this plan.

On April 29, 2020, our Board of Directors adopted the Spok Holdings, Inc. 2020 Equity Incentive Award Plan (the "2020 Equity Plan" and together with the 2012 Equity Plan, the "Equity Plans") that our stockholders subsequently approved on July 28, 2020. As of July 28, 2020, a total of 1,699,950 shares of common stock have been reserved for issuance under the 2020 Equity Plan, and no further grants will be made under the 2012 Equity Plan. However, the 2012 Equity Plan will continue to govern all outstanding awards thereunder.

Awards under the 2020 Equity Plan may be in the form of stock options, restricted common stock, RSUs, performance awards, dividend equivalents, stock payment awards, deferred stock, deferred stock units ("DSUs"), stock appreciation rights or other stock or cash-based awards.

Restricted stock awards generally vest one year from the date of grant. Related dividends accumulate during the vesting period and are paid at the time of vesting.

Contingent RSUs generally vest over a three-year performance period upon successful completion of the performance objectives. Non-contingent RSUs generally vest in thirds, annually, over a three-year period. Dividend equivalent rights generally accompany each RSU award and those rights accumulate and vest along with the underlying RSU.

Dividend equivalent rights generally accompany each DSU award and are paid to participants in cash on the Company's applicable dividend payment date whether the DSU is vested or unvested. The dividend equivalent right associated with a DSU continues until delivery of the underlying shares of common stock is made.

Payment of the underlying shares of common stock occurs at the earliest of a participant's separation from service, disability, death, or a change in control. Any shares subject to an award under the 2012 Equity Plan that are forfeited or expire will be available for the future grant of awards under the 2020 Equity Plan. As of December 31, 2020, there was an aggregate of 605,606 unvested RSUs and restricted stock outstanding under the 2012 Equity Plan.

The following table summarizes the activities under the Equity Plans from January 1, 2018, through December 31, 2020:

	Activity
Total equity securities available at January 1, 2018	1,140,658
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(236,221)
Total equity securities available at December 31, 2018	904,437
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(257,957)
Total equity securities available at December 31, 2019	646,480
Less: RSU, DSU and restricted stock awarded to eligible employees, net of forfeitures	(547,166)
Plus: Additional shares available for issuance under the 2020 Equity Plan	1,600,000
Total equity securities available at December 31, 2020	1,699,314

The following table details activities with respect to outstanding RSUs, DSUs, and restricted stock under the Equity Plans for the year ended December 31, 2020:

	Shares	Weighted-Average Grant Date Fair Value per Share
Unvested at January 1, 2020	419,426	$ 14.00
Granted	603,171	11.94
Vested	(329,870)	14.05
Forfeited	(56,005)	12.49
Unvested at December 31, 2020	636,722	$ 12.16

Of the 636,722 unvested RSUs and restricted stock outstanding at December 31, 2020, 354,125 RSUs include contingent performance requirements for vesting purposes. At December 31, 2020, there was $4.1 million of unrecognized net compensation cost related to RSUs and restricted stock, which is expected to be recognized over a weighted average period of 1.6 years.

During the years ended December 31, 2019 and 2018, the Company granted 388,321 and 343,102 RSUs, respectively, with a weighted-average grant date fair value of $13.27 and $15.65 per share, respectively. The fair value of RSUs that vested during the years ended December 31, 2019 and 2018 were $3.0 million and $2.7 million, respectively, based on the closing price of the Company's common stock of $12.23 and $13.26 at December 31, 2019 and December 31, 2018, respectively.

Employee Stock Purchase Plan

In 2016, our Board of Directors adopted the ESPP that our stockholders subsequently approved on July 25, 2016. A total of 250,000 shares of common stock were reserved for issuance under this plan.

The ESPP allows employees to purchase shares of common stock at a discounted rate, subject to plan limitations. Under the ESPP, eligible participants can voluntarily elect to have contributions withheld from their pay for the duration of an offering period, subject to the ESPP limits. At the end of an offering period, contributions will be used to purchase the Company's common stock at a discount to the market price based on the first or last day of the offering period, whichever is lower.

Participants are required to hold common stock for a minimum period of two years from the grant date. Participants will begin earning dividends on shares after the purchase date. Each offering period will generally last for no longer than six months. Once an offering period begins, participants cannot adjust their withholding amount. If a participant chooses to withdraw, any previously withheld funds will be returned to the participant, with no stock purchased, and that participant will be eligible to participate in the ESPP at the next offering period. If the participant terminates employment with the Company during the offering period, all contributions will be returned to the employee and no stock will be purchased.

The Company uses the Black-Scholes model to calculate the fair value of each offering period on the offer date. The Black-Scholes model requires the use of estimates for the expected term, the expected volatility of the underlying common stock over the expected term, the risk-free interest rate and the expected dividend payment.

For the year ended December 31, 2020, employees purchased 35,661 shares of common stock for a total price of $0.3 million. For the year ended December 31, 2019, employees purchased 23,299 shares of common stock for a total price of $0.3 million.

The following table summarizes the activities under the ESPP from January 1, 2018, through December 31, 2020:

	Activity
Total ESPP equity securities available at January 1, 2018	228,279
Less: common stock purchased by eligible employees	(20,120)
Total ESPP equity securities available at January 1, 2019	208,159
Less: common stock purchased by eligible employees	(23,299)
Total ESPP equity securities available at January 1, 2020	184,860
Less: common stock purchased by eligible employees	(35,661)
Total ESPP equity securities available at December 31, 2020	149,199

Amounts withheld from participants will be classified as a liability on the Consolidated Balance Sheets until funds are used to purchase shares. This liability amount is immaterial to the consolidated financial statements.

Stock-Based Compensation Expense

Compensation expense associated with common stock, RSUs and restricted stock was recognized based on the grant date fair value of the instruments, over the instruments' vesting period. The following table reflects stock-based compensation expense for the periods stated:

	For the Year Ended December 31,		
(Dollars in thousands)	**2020**	**2019**	**2018**
Performance-based RSUs	$ 2,019	$ 1,434	$ 2,127
Time-based RSUs and restricted stock	3,389	2,119	2,756
ESPP	100	90	71
Total stock based compensation	$ 5,508	$ 3,643	$ 4,954

NOTE 9 - INCOME TAXES

The significant components of our (provision for) benefit from income taxes attributable to current operations for the periods stated were as follows:

	For the Year Ended December 31,		
(Dollars in thousands)	**2020**	**2019**	**2018**
Loss before income taxes	$ (21,770)	$ (13,423)	$ (2,185)
Current:			
Federal tax	—	$ —	$ —
State tax	58	582	838
Foreign tax	(150)	13	148
Total current	(92)	595	986
Deferred:			
Federal tax	20,594	(2,121)	(1,467)
State tax	1,910	(1,239)	(532)
Foreign tax	43	107	307
Total deferred	22,547	(3,253)	(1,692)
(Provision for) benefit from income taxes	$ 22,455	$ (2,658)	$ (706)

Foreign income before income tax (benefit) expense is immaterial to consolidated income before income tax (benefit) expense. The following table summarizes the principal elements of the difference between the United States federal statutory rate of 21% and our effective tax rate for the years ended December 31, 2020, 2019 and 2018:

(Dollars in thousands)	2020		2019		2018	
Loss before income taxes	$ (21,770)		$ (13,423)		$ (2,185)	
Income taxes computed at the federal statutory rate	$ (4,572)	21.0 %	$ (2,819)	21.0 %	$ (459)	21.0 %
State income taxes, net of federal benefit	(703)	3.2 %	(567)	4.2 %	306	(14.0)%
Goodwill impairment	6,341	(29.1)%	2,243	(16.7)%	—	— %
Change in valuation allowance	22,108	(101.6)%	—	— %	—	— %
Research and development and other tax credits	(1,316)	6.0 %	(1,790)	13.3 %	(1,144)	52.4 %
Excess executive compensation	266	(1.2)%	322	(2.4)%	281	(12.9)%
Other	331	(1.5)%	(47)	0.4 %	310	(14.2)%
Provision for (benefit from) income taxes	$ 22,455	(103.1)%	$ (2,658)	19.8 %	$ (706)	32.3 %

The anticipated effective income tax rate is expected to continue to differ from the federal statutory rate primarily due to the effect of state income taxes, the benefit of the research and development tax credit, permanent differences between book and taxable income and certain discrete items. The earnings of non-U.S. subsidiaries are deemed to be indefinitely reinvested in non-U.S. operations.

The components of deferred income tax assets at December 31, 2020, and 2019 were as follows:

	December 31,	
(Dollars in thousands)	2020	2019
Capitalized research and development costs	$ 13,367	$ 18,605
Net operating loss carryforward	18,081	15,978
Property and equipment	5,353	6,092
Accrued liabilities, reserves and other expenses	5,063	3,718
Research and development credits	5,533	4,140
Tax credits	717	1,467
Stock based compensation	1,917	1,600
Other	132	121
Gross deferred income tax assets	50,163	51,721
Deferred income tax liabilities:		
Intangible assets	(2,015)	(2,430)
Prepaid and other expenses	(214)	(308)
Gross deferred income tax liabilities	(2,229)	(2,738)
Net deferred income tax assets	47,934	48,983
Valuation allowance	(22,108)	—
Total deferred income tax assets	$ 25,826	$ 48,983

The Coronavirus Aid Relief and Economic Security ("CARES") Act was signed into law on March 27, 2020, to provide stimulus and relief in response to the COVID-19 pandemic and resulting economic collapse. While the CARES Act provides a number of potential benefits to companies, the Company has made use of the following provisions:

- **Payroll Tax Deferral:** Allows for the deferral of payment on the Company's share of the 6.2% Social Security tax on wages paid beginning on March 27, 2020, and ending on December 31, 2020. Deferred amounts are payable in two installments, with 50% of such taxes due on December 31, 2021, and the remainder due on December 31, 2022. This resulted in a total deferral of $2.1 million in payroll taxes for the year ended December 31, 2020.
- **Employee Retention Credits:** Allows for a refundable tax credit for the Company's share of the 6.2% Social Security tax on wages. This tax credit applies to the first $10,000 in qualified wages paid to each employee commencing on March 13, 2020. To be eligible, the Company must (i) have had operations fully or partially suspended because of a shutdown order from a governmental authority related to COVID-19, or (ii) have had gross receipts decline by more than 50% in a calendar quarter when compared to the same quarter in 2019. Qualified wages are limited to wages paid to employees who were not providing services due to the COVID-19 pandemic. This resulted in a tax credit of $1.3 million for the year ended December 31, 2020.
- **Alternative Minimum Tax ("AMT") Credit:** Allows for an immediate refund of all refundable AMT credits resulting from passage of the CARES Act of 2020. This resulted in accelerated collection of approximately $1.3 million of other current assets that was received during the third quarter of 2020.

Net Operating Losses

As of December 31, 2020, we had approximately $79.7 million of net operating losses available to offset future taxable income, of which approximately $70.6 million were Federal net operating losses with expiration dates that begin expiring in 2026 and will fully expire in 2029. We have an immaterial amount of foreign tax credits available for future use.

Valuation Allowance

We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. This assessment is required to determine whether based on all available evidence, it is "more likely than not" (meaning a probability of greater than 50%) that all or some portion of the deferred income tax assets will be realized in future periods.

The cumulative loss incurred by the Company over the three-year period ended December 31, 2020, constitutes a piece of objective negative evidence which limits our ability to consider other subjective evidence. In addition, the uncertainty created by COVID-19, has meaningfully limited our ability to consider our projections for future profitability and growth in our assessment of the recoverability of our deferred income tax assets. Based on this evaluation, which we completed utilizing our annual long-range planning and forecasting updates that are traditionally completed in the fourth quarter of each year, we recorded a valuation allowance of $22.1 million, as of December 31, 2020, to reduce net deferred income tax assets as their realization did not meet the more-likely-than-not criterion. COVID-19 has significantly limited our ability to consider projections for future profitability as objectively verifiable positive evidence to support the realizability of deferred tax assets, as the projections rely on subjective estimates and assumptions regarding the market launch of our SaaS product, Spok Go. As a result, a valuation allowance was established against deferred tax assets associated with net operating losses and credits with set expiration dates.

Those deferred income tax assets which are not currently covered by a valuation allowance are those that are indefinite-lived, or whose temporary differences would reverse in the future and may result in the creation of an indefinite-lived deferred income tax asset, which we consider to be realized through future taxable income despite near term uncertainties. The amount of deferred income tax assets considered realizable, however, could be adjusted in the future if objective negative evidence in the form of cumulative losses is no longer present, additional weight is given to subjective evidence such as our projections for future profitability and growth, or other relevant factors arise. We did not record a valuation allowance during 2019 or 2018.

Income Tax Audits

The 2018, 2019 and 2020 federal and state income tax returns are within the statute of limitations (“SOL”) and are currently not under examination by any Federal or state tax authority.

We operate in all states and the District of Columbia and are subject to various state income and franchise tax audits. The states’ SOL varies from three to four years from the later of the due date of the return or the date filed. We usually file our federal and all state and local income tax returns on or before September 15 of the following year; therefore, the SOL for those states with a three-year SOL is open for calendar years ending 2017 through 2020, and for the four-year SOL states, the SOL is open for years ending from 2016 through 2020.

NOTE 10 - COMMITMENTS AND CONTINGENCIES

Contractual Obligations

We had no significant commitments and contractual obligations as of December 31, 2020.

Other Commitments

We have various LOCs outstanding with multiple state agencies which are considered to be immaterial to the consolidated financial statements. The LOCs typically have one to three-year contract requirements and contain automatic renewal terms.

Legal Contingencies

We are involved, from time to time, in lawsuits arising in the normal course of business. We believe the potential outcomes from these lawsuits will not have a material adverse impact on our financial position or statement of operations.

Operating Leases

We have operating leases for office and transmitter locations. Substantially all of these leases have lease terms ranging from one month to five years. We continue to review our office and transmitter locations, and intend to replace, reduce or consolidate leases, where possible.

Future minimum lease payments under non-cancelable operating leases at December 31, 2020, were as follows:

(Dollars in thousands)

For the Year Ended December 31,	Operating Leases
2021	$ 6,236
2022	4,541
2023	3,371
2024	1,879
2025	1,230
Thereafter	1,470
Total	$ 18,727

These leases typically include renewal options and escalation clauses. Where material, we recognize rent expense on a straight-line basis over the lease period.

Total rent expense under operating leases for the years ended December 31, 2020, 2019 and 2018, was approximately $17.3 million, $17.7 million and $17.5 million, respectively.

NOTE 11 - EMPLOYEE BENEFIT PLANS

The Company has a savings plan in the U.S., the Spok Holdings, Inc. Savings and Retirement Plan, which qualifies under Section 401(k) of the Internal Revenue Code. Participating U.S. employees may elect to contribute a percentage of their wages, subject to certain limitations. Matching contributions under the savings plan were approximately $1.6 million for the years ended December 31, 2020, 2019, and 2018.

NOTE 12 - RELATED PARTIES

A former member of our Board of Directors, who departed the Board during the third quarter of 2020, also serves as a director for an entity that leases transmission tower sites to the Company. We incurred $3.5 million for the year ended December 31, 2020, and $3.6 million for the years ended December 31, 2019, and 2018 for site rent expense from the entity on which the individual serves as a director for each of the years ended December 31, 2020, 2019 and 2018. These amounts are included in technology operations expenses.

A member of our Board of Directors who was appointed at the beginning of 2020 serves as Chief Information Officer for an entity that is also a customer of the Company. For the year ended December 31, 2020, we recognized revenues of $0.7 million related to contracts from the entity at which the individual is employed.

NOTE 13 - SELECTED QUARTERLY FINANCIAL INFORMATION (UNAUDITED)

Quarterly financial information for the years ended December 31, 2020, and 2019 is summarized below:

	For the Year Ended December 31, 2020			
(Dollars in thousands except per share amounts)	**First Quarter**	**Second Quarter**	**Third Quarter**	**Fourth Quarter[3]**
Revenues[1]	$ 37,267	$ 35,739	$ 37,693	$ 37,480
Operating (loss) income[1]	(4,108)	3,159	2,732	(24,449)
Net (loss) income[1]	(4,539)	3,759	3,165	(46,610)
Basic net (loss) income per common share[2]	(0.24)	0.20	0.17	(2.44)
Diluted net (loss) income per common share[2]	(0.24)	0.20	0.16	(2.44)

	For the Year Ended December 31, 2019			
(Dollars in thousands except per share amounts)	**First Quarter**	**Second Quarter**	**Third Quarter**	**Fourth Quarter[3][4]**
Revenues[1]	$ 41,764	$ 39,525	$ 39,453	$ 39,548
Operating income (loss)[1]	1,115	(1,992)	(2,692)	(12,239)
Net income (loss)[1]	742	(670)	(1,326)	(9,511)
Basic and diluted net income (loss) per common share[2]	0.04	(0.03)	(0.07)	(0.50)

(1) Slight variations in totals are due to rounding.

(2) Basic and diluted net income (loss) per common share is computed independently for each period presented. As a result, the sum of the quarterly basic and diluted net income (loss) per common share for the years ended December 31, 2020, and 2019 may not equal the total computed for the year.

(3) The Company recorded a goodwill impairment of $25.0 million and $8.8 million during the fourth quarters of 2020 and 2019, respectively. See Note 6 "Goodwill and Intangible Assets, Net" for additional details.

(4) The Company recorded a valuation allowance of $22.1 million during the fourth quarter of 2020. See Note 9 "Income Taxes" for additional details.

SCHEDULE II

SPOK HOLDINGS, INC.
VALUATION AND QUALIFYING ACCOUNTS

Allowance for Doubtful Accounts, Service Credits and Other (Dollars in thousands)	Balance at the Beginning of the Period	Charged to Operations	Write-offs	Balance at the End of the Period
Year ended December 31, 2020	$ 1,293	$ 1,382	$ (1,006)	$ 1,669
Year ended December 31, 2019	$ 1,705	$ 1,248	$ (1,660)	$ 1,293
Year ended December 31, 2018	$ 1,065	$ 2,125	$ (1,485)	$ 1,705

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	8-K	001-32358	3.1	7/8/2014	
3.2	Second Amended and Restated Bylaws	8-K	001-32358	3.1	12/20/2016	
3.3	Third Amended and Restated Bylaws of Spok Holdings, Inc.	8-K	001-32358	3.1	10/30/2020	
4.1*	Specimen of common stock certificate, par value $0.0001 per share	S-4/A	333-115769	4.1	10/6/2004	
10.1	Form of Indemnification Agreement for executive officers of Spok, Holding Inc.	10-Q	001-32358	10.1	10/25/2018	
10.2*	USA Mobility, Inc. Equity Incentive Plan Restricted Stock Agreement (For Board of Directors) (amended)	10-Q	001-32358	10.18	11/1/2007	
10.3*	Form of Director's Indemnification Agreement	10-Q	001-32358	10.24	10/30/2008	
10.4*	USA Mobility, Inc. 2012 Equity Incentive Award Plan	DEF 14A	001-32358	A	3/28/2012	
10.5†	Employment Agreement, between Spok Holdings, Inc. and Vince D. Kelly, dated as of January 1, 2019	8-K	001-32358	10.1	1/4/2019	
10.6*	Restricted Stock Unit Grant Notice for the USA Mobility, Inc. 2012 Equity Incentive Award Plan	10-K	001-32358	10.16	3/2/2017	
10.7	Restricted Stock Unit Grant Notice for the Spok Holdings, Inc. 2015 Long-Term Incentive Plan	10-K	001-32358	10.17	3/2/2017	
10.8†	Spok Holdings, Inc. Severance Pay Plan and Summary Plan Description (For certain C-Level, not including CEO) (amended and restated)	10-K	001-32358	10.18	3/2/2017	
10.9†	Spok Holdings, Inc. 2015 Long-Term Incentive Plan	10-K	001-32358	10.10	3/1/2018	
10.10†	Exhibits to Spok Holdings, Inc., 2015 Long-Term Incentive Plan for the 2016 - 2018 performance period	10-K	001-32358	10.10	2/28/2019	
10.11†	Exhibits to Spok Holdings, Inc., 2015 Long-Term Incentive Plan for the 2017 - 2019 performance period	10-K	001-32358	10.12	2/27/2020	
10.12†	Spok Holdings, Inc. 2018 Long-Term Incentive Plan					Filed
10.13†	Spok Holdings, Inc. 2018 Short-Term Incentive Plan	10-K	001-32358	10.15	2/28/2019	
10.14†	Spok Holdings, Inc. 2019 Short-Term Incentive Plan	10-K	001-32358	10.16	2/28/2019	
10.15†	Spok Holdings, Inc. 2020 Short-Term Incentive Plan	10-K	001-32358	10.16	2/27/2020	
10.16†	Spok Holdings, Inc. 2021 Short-Term Incentive Plan					Filed
10.17*	Amendment to the USA Mobility, Inc. 2012 Equity Incentive Award Plan	DEF 14A	001-32358	A	4/27/2017	
10.18†	NEO Severance and Change in Control Document	10-Q	001-32358	10.2	4/27/2017	
10.19†	Spok Holdings, Inc. 2020 Equity Incentive Award Plan	DEF 14A	001-32358	A	6/19/2020	
10.20†	Employment Agreement Extension Letter, by and between Spok Holdings, Inc. and Vincent D. Kelly, dated as of June 18, 2020	8-K	001-32358	10.1	6/18/2020	
10.21	Restricted Stock Unit Grant Notice for the Spok Holdings, Inc. 2020 Equity Incentive Award Plan					Filed
10.22	Cooperation Agreement, dated as of June 18, 2020 by and among Spok Holdings, Inc., White Hat Strategic Partners LP, White Hat SP GP LLC, White Hat Capital Partners LP, and White Hat Capital Partners GP LLC	8-K	001-32358	10.1	6/19/2020	
10.23	Spok Holdings, Inc. Deferred Compensation Plan For Non-Employee Directors					Filed

21	Subsidiaries of the Company	10-K	001-32358	21	3/1/2018	
23	Consent of Grant Thornton LLP					Filed
31.1	Certification of President and Chief Executive Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended					Filed
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended					Filed
32.1	Certification of President and Chief Executive Officer pursuant to 18 U.S.C. Section 1350					Furnished
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350					Furnished
101.INS	Inline XBRL Instance Document - the instance does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document**					Furnished
101.SCH	Inline XBRL Taxonomy Extension Schema**					Furnished
101.CAL	Inline XBRL Taxonomy Extension Calculation**					Furnished
101.DEF	Inline XBRL Taxonomy Extension Definition**					Furnished
101.LAB	Inline XBRL Taxonomy Extension Labels**					Furnished
101.PRE	Inline XBRL Taxonomy Extension Presentation**					Furnished
104	Cover Page Interactive Data File (the cover page XBRL tags are embedded within the Inline XBRL document and included in Exhibit 101)					

* On July 8, 2014, the Company changed its name from USA Mobility, Inc. to Spok Holdings, Inc.
** The financial information contained in these XBRL documents is unaudited.
† Denotes a management contract or compensatory plan or arrangement.

SPOK HOLDINGS, INC.
2018 LONG-TERM INCENTIVE PLAN

Adopted by the Board of Directors

Upon Recommendation of the Compensation Committee

on December 12, 2017

To Be Effective as of January 1, 2018

SPOK HOLDINGS, INC.

2018 LONG-TERM INCENTIVE PLAN

SECTION 1.
BACKGROUND, PURPOSE AND DURATION

1.1 Effective Date. The Board of Directors (the “Board”) adopted the Plan upon the recommendation of the Compensation Committee of the Board of Spok Holdings, Inc., (the “Company”) to be effective as of January 1, 2018.

1.2 Purposes of the Plan. The purposes of the Plan are to promote the success of the Company’s business, advance the interests of the Company, attract and retain the best available personnel for positions of substantial responsibility at the Company, and provide additional incentives to selected key employees of the Company for outstanding performance. The Plan permits the award of Restricted Stock Units to key employees as the Committee may determine. Upon attainment of Performance Goals for the Performance Period, Restricted Stock Units granted to Participants will convert and be paid in Common Stock, and dividend equivalent rights (if any) with respect to vested Restricted Stock Units will be paid in cash. To the extent available, Actual Awards to “Covered Employees” under the Plan (within the meaning of section 162(m) of the Code) are intended to qualify as Performance Based Compensation pursuant to Article 5 of the Spok Holdings, Inc. 2012 Equity Incentive Award Plan, as it may be amended or restated from time to time (“Equity Incentive Award Plan”).

SECTION 2.
DEFINITIONS

The following words and phrases shall have the following meanings unless a different meaning is plainly required by the context:

2.1 “Actual Award” means the vested portion of the Target Award (if any) payable to a Participant.

2.2 “Affiliate” means any corporation or other entity (including, but not limited to, partnerships and joint ventures) controlled by, controlling, or under common control with, the Company where “control” means the right to elect or appoint at least fifty percent (50%) of the directors, managing members, general partners, trustees or entities exercising similar powers with respect to the Company or the applicable entity whether by beneficial ownership of securities or other interests, by proxy or agreement, or both. Notwithstanding the preceding, an Affiliate that is not an affiliate within the meaning of the regulations under Code section 409A shall not constitute an Affiliate under this Plan.

2.3 “Award Agreement” means any written agreement, contract or other instrument or document evidencing a Target Award, including through an electronic medium.

2.4 “Board” means the Board of Directors of the Company.

2.5 “Cause” unless otherwise defined in an employment agreement between the Participant and the Company or an Affiliate, means (a) dishonesty of a material nature that relates to the performance of services for the Company by Participants; (b) criminal conduct (other than minor infractions and traffic violations) that relates to the performance of services for the Company by Participant; (c) the Participant’s willfully breaching or failing to perform his or her duties as an employee of the Company (other than any such failure resulting from the Participant having a disability (as defined herein)), within a reasonable period of time after a written demand for substantial performance is delivered to the Participant by the Board, which demand specifically identifies the manner in which the Board believes that the Participant has not substantially performed his or her duties; or (d) the willful engaging by the Participant in conduct that is demonstrably and materially injurious to the Company, monetarily or otherwise. No act or failure to act on the Participant’s part shall be deemed “willful” unless done, or omitted to be done, by the Participant not in good faith and without reasonable belief that such action or omission was in the reasonable best interests of the Company. Disability as used herein means a condition or circumstance such that the Participant has become totally and permanently disabled as defined or described in the Company’s long term disability benefit plan applicable to executive officers as in effect at the time the Participant incurs a disability.

2.6 “Change of Control” shall mean and includes each of the following:

(a) A transaction or series of transactions (other than an offering of Common Stock to the general public through a registration statement filed with the Securities and Exchange Commission) whereby any “person” or related “group” of “persons” (as such terms are used in Sections 13(d) and 14(d)(2) of the Exchange Act) (other than the Company, any of its subsidiaries, an employee benefit plan maintained by the Company or any of its subsidiaries or a “person” that, prior to such transaction, directly or indirectly controls, is controlled by, or is under common control with, the Company) directly or indirectly acquires beneficial ownership (within the meaning of Rule 13d-3 under the Exchange Act) of securities of the Company possessing more than 50% of the total combined voting power of the Company’s securities outstanding immediately after such acquisition; or

(b) During any period of two consecutive years, individuals who, at the beginning of such period, constitute the Board together with any new Director(s) (other than a Director designated by a person who shall have entered into an agreement with the Company to effect a transaction described in Section 2.6(a) or Section 2.6(c)) whose election by the Board or nomination for election by the Company’s stockholders was approved by a vote of at least two-thirds of the Directors then still in office who either were Directors at the beginning of the two-year period or whose election or nomination for election was previously so approved, cease for any reason to constitute a majority thereof; or

(c) The consummation by the Company (whether directly involving the Company or indirectly involving the Company through one or more intermediaries) of (x) a merger, consolidation, reorganization, or business combination or (y) a sale or other disposition of all or substantially all of the Company's assets in any single transaction or series of related transactions or (z) the acquisition of assets or stock of another entity, in each case other than a transaction:

(i) Which results in the Company's voting securities outstanding immediately before the transaction continuing to represent (either by remaining outstanding or by being converted into voting securities of the Company or the person that, as a result of the transaction, controls, directly or indirectly, the Company or owns, directly or indirectly, all or substantially all of the Company's assets or otherwise succeeds to the business of the Company (the Company or such person, the "Successor Entity")) directly or indirectly, at least a majority of the combined voting power of the Successor Entity's outstanding voting securities immediately after the transaction, and

(ii) After which no person or group beneficially owns voting securities representing 50% or more of the combined voting power of the Successor Entity; provided, however, that no person or group shall be treated for purposes of this Section 2.6(c)(i) as beneficially owning 50% or more of combined voting power of the Successor Entity solely as a result of the voting power held in the Company prior to the consummation of the transaction; or

(d) The Company's stockholders approve a liquidation or dissolution of the Company.

In addition, if a Change in Control constitutes a payment event or a toggle event with respect to any Award which provides for the deferral of compensation and is subject to Section 409A of the Code, the transaction or event described in subsection (a), (b), (c) or (d) with respect to such Award must also constitute a "change in control event," as defined in Treasury Regulation §1.409A-3(i)(5) to the extent required by Section 409A.

The Committee shall have full and final authority, which shall be exercised in its discretion, to determine conclusively whether a Change in Control of the Company has occurred pursuant to the above definition, and the date of the occurrence of such Change in Control and any incidental matters relating thereto.

2.7 "Code" means the Internal Revenue Code of 1986, as amended, and the regulations and other guidance issued by the Treasury Department and Internal Revenue Service thereunder.

2.8 "Committee" means the committee appointed by the Board to administer the Plan. Until otherwise determined by the Board, (a) the Company's Compensation Committee of the Board shall constitute the Committee, and (b) for administrative convenience, the independent, non-employee members of the Board also may act as the Committee from time to time. With respect to awards intended to qualify as “performance-based compensation” as described in Section 162(m)(4)(C) of the Code, each member of the Committee shall qualify as an "outside director" under Section 162(m) of the Code.

2.9 “Common Stock” means the common stock of the Company, par value $0.0001 per share.

2.10 “Company” means Spok Holdings, Inc., and Affiliates or any successor thereto.

2.11 “Effective Date” means January 1, 2018.

2.12 “Employee” means any key employee of the Company or Affiliate, whether such individual is so employed at the time the Plan is adopted or becomes so employed subsequent to the adoption of the Plan.

2.13 “Participant” means an Employee who has been selected by the Committee for participation in the Plan.

2.14 “Performance Goals” means the Minimum Performance Goals based on one or more performance criteria defined in the Equity Incentive Award Plan for the applicable Performance Period, as approved by the Committee, in writing, no later than the 90th day of the applicable Performance Period and communicated to each Participant. Subject to any limitations for “performance-based compensation” pursuant to Section 162(m)(4)(C) of the Code to the extent applicable, the Committee may revise the Performance Goals in the event of a Change of Control or other corporate reorganization, merger, or similar transaction, to take into account extraordinary events or as the Committee determines is in the best interests of the Company. Such extraordinary events shall include the implementation of changes in generally accepted accounting principles resulting from new accounting standards issued by the Financial Accounting Standards Board, Securities and Exchange Commission and/or other regulatory bodies responsible for the establishment of accounting standards applicable to the Company.

2.15 “Performance Period” means the applicable three-year period commencing on each of January 1, 2018, January 1, 2019 and January 1, 2020, and ending on December 31, 2020, December 31, 2021 and December 31, 2022, respectively, or such other performance period as may be determined by the Committee and specified in an Award Agreement or an employment agreement between the Participant and the Company.

2.16 “Person” shall have the meaning set forth in Sections 13(d) and 14(d) of the Exchange Act; provided, however, that Person shall exclude (i) the Company and (ii) any trustee or other fiduciary holding securities under an employee benefit plan of the Company or Affiliate.

2.17 “Plan” means the Spok Holdings, Inc. 2018 Long-Term Incentive Plan, as set forth in this instrument and as hereafter amended from time to time.

2.18 “Restricted Stock Unit” means the right to receive a share of Company Common Stock upon the attainment of the Performance Goals.

2.19 “Separation from Service” means separation from service as defined in the Treasury Regulations under Code section 409A. “Separates from Service” shall have a consistent meaning.

2.20 “Target Award” means the target award, at one hundred percent (100%) achievement of the Performance Goals payable under the Plan, as determined by the Committee in its sole discretion.

SECTION 3.
SELECTION OF PARTICIPANTS AND DETERMINATION OF AWARDS

3.1 Selection of Participants. The Committee, in its sole discretion, shall select the Employees who shall be Participants in the Plan and the Committee may, in its sole discretion, select Employees to participate in the Plan at any time during any Performance Period.

3.2 Determination of Target Awards. The Committee, in its sole discretion, shall establish and grant a Target Award that may be earned by each Participant. A Participant’s Target Award shall be established by the Committee in writing no later than the 90th day of the Performance Period, or, for employees newly hired or promoted during a Performance Period, before 25% of the remaining Performance Period has elapsed as measured from the date of hire or promotion, as applicable. The Committee may establish Target Awards in a different manner for different groups of Participants. The Target Award shall be granted in the form of Restricted Stock Units. Unless otherwise determined by the Committee, the number of Restricted Stock Units granted shall be based on the fair market value of the Company’s Common Stock as of the effective date of the grant; provided, for purposes of determining the number of Restricted Stock Units granted to an Employee who becomes a Participant after the beginning of an applicable Performance Period, the number of Restricted Stock Units may be determined, in the sole discretion of the Committee, based on (a) the fair market value of the Company’s Common Stock as of the effective date of the initial grants to Participants for the applicable Performance Period, reduced by the value of any cash dividends or cash distributions (regular or otherwise) that are paid with respect to the Company’s Common Stock from that date to the date of grant, (b) the fair market value of the Company’s Common Stock on the date on which the Participant commenced participation in the Plan, or (c) such other manner as the Committee may determine in its sole discretion. Restricted Stock Units shall be granted pursuant to the Equity Incentive Award Plan. Further, if at any time the Common Stock ceases to be registered as a class of equity securities under the Exchange Act, whether as a result of a Change of Control or otherwise, the Committee may in its sole discretion convert any Restricted Stock Units into a right to receive cash in lieu of shares of Common Stock based upon the fair market value of a share of Common Stock at the time of or immediately prior to the time the Common Stock was no longer registered under the Exchange Act.

3.3 Award Agreements. Target Awards granted pursuant to the Plan shall be evidenced by Award Agreements. Award Agreements may be amended by the Committee with the consent of the germane Participant from time to time and need not contain uniform provisions.

3.4 Dividend Equivalent Rights. A Participant shall be entitled to dividend equivalent rights with respect to Restricted Stock Units to the extent that any cash dividends or cash distributions (regular or otherwise) are paid with respect to the Company's Common Stock during the Performance Period, unless otherwise expressly set forth in an Award Agreement. The dividend equivalent rights will be subject to the vesting restrictions and the other terms and conditions under this Plan that are applicable to the Restricted Stock Units until such time, if ever, as the Restricted Stock Units with respect to which the dividend equivalent rights are paid vest.

SECTION 4.
VESTING AND PAYMENT OF AWARDS

4.1 Attainment of Performance Goals. In order for Actual Awards to be earned and paid for an applicable Performance Period, the Company must attain the Performance Goals for the applicable Performance Period and the Committee must certify the attainment of such Performance Goals in writing.

4.2 Vesting.

(a) Subject to Section 4.2(b) below, Target Awards shall vest upon the Committee's reasonable determination that the Performance Goals have been achieved at the end of the Performance Period. If the Performance Goals are met and certified by the Committee in writing, Participants will be entitled to the vested portion of a Target Award unless the Participant has otherwise forfeited a portion or all of the Target Award as set forth in Section 4.4 .

(b) In the event of a Change of Control, vesting shall be accelerated as follows, provided that the Company is on track to meet the Performance Goals as reasonably determined by the Committee (as comprised immediately prior to the Change of Control).

(i) If a Change of Control occurs during the first year of the applicable Performance Period, fifty percent (50%) of the Participant's Target Award shall vest.

(ii) If a Change of Control occurs during the second year of the applicable Performance Period, seventy-five percent (75%) of the Participant's Target Award shall vest.

(iii) If a Change of Control occurs during the final year of the applicable Performance Period, the Participant's Target Award shall vest in full.

With respect to an employee who becomes a Participant after the beginning of an applicable Performance Period, the accelerated vesting described above will apply on a prorated basis based on the number of days worked during the Performance Period, unless otherwise determined by the Committee. For clarity, if an employee becomes a Participant in the second year of the applicable Performance Period and a Change in Control occurs later during that second year of the applicable Performance Period, accelerated vesting of his Target Award (prorated as described in section 4.4, below) will be calculated as follows: seventy-five percent (75%) of a Participant's unvested Target Award will be multiplied by a fraction, the numerator of which is the number of days the Employee was a Participant in the Plan during the applicable Performance Period, and the denominator of which is the total number of days in the applicable Performance Period.

(c) All Actual Awards including pro-rated awards will be paid at the time provided in Section 4.3.

4.3 Time and Form of Payment.

(a) Each Actual Award shall be paid in Common Stock pursuant to the Award Agreements, subject to any required withholding for income and employment taxes. Dividend equivalent rights shall be paid in cash in a single lump sum to the extent earned.

(b) Actual Awards will be paid on or after the third business day after the Company's annual audit for the last fiscal year of the applicable Performance Period has been completed and the Company's annual report on Form 10-K for such fiscal year has been filed with the Securities and Exchange Commission, but in no event later than the last day of the calendar year that begins immediately following the end of the applicable Performance Period.

(c) Notwithstanding 4.3(b), in the event of a Participant's death, the Participant's estate will be eligible to receive an amount not greater than one-hundred percent (100%) of the Participant's Target Award, prorated to reflect the number of days he or she worked during the applicable Performance Period, and such amount, which will be determined in the Committee's sole discretion, will be paid in the year following Participant's death. For clarity, prorated awards will be calculated as follows: one-hundred percent (100%) of a Participant's Target Award will be multiplied by a fraction, the numerator of which is the number of days the Participant was continuously providing services to the Company during the applicable Performance Period through the date immediately prior to the Participant's death, and the denominator of which is the total number of days in the applicable Performance Period.

(d) Notwithstanding anything to the contrary in this Plan, no payments contemplated by this Plan will be paid during the six-month period following a Participant's Separation from Service unless the Company determines, in its good faith judgment, that paying such amounts at the times indicated in paragraphs 4.3(b) and (c) would not cause the Participant to incur an additional tax under Code section 409A, in which case the Actual Award shall be paid on the first day of the seventh month following the Participant's Separation from Service.

(e) The Compensation Committee of the Board may require forfeiture or a clawback of any incentive compensation awarded or paid under this Plan in excess of the compensation actually earned based on a restatement of the Company's financial statements as filed with the Securities and Exchange Commission for the period covered by this Plan.

4.4 Proration or Forfeiture of Target Award.

(a) Newly hired or promoted employees who are selected to participate in the Plan after the beginning of an applicable Performance Period will participate in the Plan on a prorated basis based on the number of days worked during the applicable Performance Period after being selected to participate in the Plan. The prorated award will be calculated as follows unless otherwise determined by the Committee: one-hundred percent (100%) of a Participant's unvested Target Award will be multiplied by a fraction, the numerator of which is the number of days the Employee was a Participant in the Plan during the applicable Performance Period, and the denominator of which is the total number of days in the applicable Performance Period.

(b) If the Participant involuntarily Separates from Service without Cause or due to disability, he or she will be eligible to receive a prorated Target Award if the Performance Goals for the applicable Performance Period are met provided that, in the event Participant involuntarily Separates from Service without Cause, he or she has executed a release, any waiting period in connection with such release has expired, he or she has not exercised any rights to revoke the release and he or she has followed any other applicable and customary termination procedures, as determined by the Company in its sole discretion. The unvested Target Award will be prorated to the date of Separation from Service, and the prorated award will be calculated as follows: one-hundred percent (100%) of a Participant's unvested Target Award will be multiplied by a fraction, the numerator of which is the number of days the Participant was continuously providing services to the Company during the applicable Performance Period through the date immediately prior to the Participant's Separation from Service, and the denominator of which is the total number of days in the applicable Performance Period. Prorated awards will be paid to the Participant at the time provided in Sections 4.3.

(c) Notwithstanding Section 4.4(b), any Participant who involuntarily Separates from Service without Cause during his or her first year of participation in the Plan shall forfeit any right to receive an Actual Award.

(d) Any Participant whose employment is terminated for Cause or who voluntarily Separates from Service prior to the date Actual Awards are paid shall forfeit any right to receive an Actual Award, unless otherwise authorized by the Committee in its sole discretion.

SECTION 5.
ADMINISTRATION

5.1 Committee is the Administrator. The Plan shall be administered by the Committee. The Committee shall consist of not less than two (2) members of the Board, and no member of the Committee shall be a Participant. The members of the Committee shall be appointed from time to time by, and serve at the pleasure of, the Board.

5.2 Committee Authority. It shall be the duty of the Committee to administer the Plan in accordance with the Plan's provisions. The Committee shall have all powers and discretion necessary or appropriate to administer the Plan and to control its operation, including, but not limited to, the power to (a) determine which Employees shall be granted awards, (b) prescribe the terms and conditions of awards, (c) interpret the Plan and the awards, (d) adopt such procedures and subplans as are necessary or appropriate to permit participation in the Plan by Employees who are foreign nationals or employed outside of the United States, (e) adopt rules or principles for the administration, interpretation and application of the Plan as are consistent therewith, and (f) interpret, amend or revoke any such rules or principles. No member of the Committee shall be personally liable for any action, determination or interpretation made in good faith with respect to an award granted pursuant to this Plan.

5.3 Decisions Binding. All determinations and decisions made by the Committee, the Board, and any delegate of the Committee pursuant to the provisions of the Plan shall be final, conclusive, and binding on all persons, and shall be given the maximum deference permitted by law.

5.4 Delegation by the Committee. The Committee, in its sole discretion and on such terms and conditions as it may provide, may delegate all or part of its authority and powers under the Plan to one or more directors and/or officers of the Company.

SECTION 6.
GENERAL PROVISIONS

6.1 Unsecured General Creditor. Actual Awards shall be paid solely from the general assets of the Company. Nothing in this Plan shall be construed to create a trust or to establish or evidence any Participant's claim of any right other than as an unsecured general creditor having the status of an employee of the Company or an Affiliate thereof with respect to any payment to which he or she may be entitled.

6.2 Tax Withholding. The Company shall be entitled to withhold from, or in respect of, any payment to be made an amount sufficient to satisfy all federal, state, local or foreign tax withholding requirements (including, but not limited to, the Participant's FICA and Social Security obligations). The Committee may permit a Participant to satisfy all or part of his or her tax withholding obligations by having the Company withhold an amount from any cash amounts otherwise due or to become due from the Company to the Participant or, with respect to Restricted Stock Units, having the Company withhold a number of shares of Common Stock that become vested having a fair market value equal to the tax withholding obligations. The fair market value of the shares to be withheld or delivered will be determined as of the date that the taxes are required to be withheld.

6.3 No Rights as Employee. Nothing in the Plan or any documents relating to the Plan shall (a) confer on a Participant any right to continue in the employ of the Company; (b) constitute any contract or agreement of employment; or (c) interfere in any way with the Company's right to terminate the Participant's employment at any time, with or without cause. For purposes of the Plan, transfer of employment of a Participant between the Company and any one of its Affiliates (or between Affiliates) shall not be deemed a Separation from Service.

6.4 Participation. No Employee shall have the right to be selected to receive an award under this Plan. Participation in the Plan in one Performance Period does not connote any right to participate in the Plan in any future Performance Period.

6.5 Successors. This Plan shall be binding upon and inure to the benefit of the Company and any successor to the Company and the Participant's heirs, executors, administrators and legal representatives.

6.6 Payment in the Event of Death. In the event of a Participant's death, any vested benefits remaining unpaid shall be paid to the Participant's estate.

6.7 Nontransferability of Awards. No award granted under the Plan may be sold, transferred, pledged, assigned, or otherwise alienated or hypothecated, other than by the laws of descent and distribution. All rights with respect to an award granted to a Participant shall be available during his or her lifetime only to the Participant.

SECTION 7.
AMENDMENT, TERMINATION AND DURATION

7.1 Amendment, Suspension or Termination. The Board, in its sole discretion and without prior notice to Participants, may amend or terminate the Plan, or any part thereof, at any time and for any reason, to the extent such action will not cause adverse tax consequences to a Participant under Code section 409A. Except as provided in Section 2.18, the amendment, suspension or termination of the Plan shall not, without the consent of the Participant, alter or materially impair any rights or obligations under any Award Agreement. No award may be granted during any period of suspension or after termination of the Plan.

7.2 Duration of the Plan. The Plan shall commence on January 1, 2018 and, subject to Section 7.1 (regarding the Board's right to amend or terminate the Plan), shall remain in effect thereafter.

SECTION 8.
LEGAL CONSTRUCTION

8.1 Code Section 409A. The Plan is intended to be a nonqualified deferred compensation plan within the meaning of Code section 409A and shall be interpreted to meet the requirements of Code section 409A. To the extent that any provision of the Plan would cause a conflict with the requirements of Code section 409A, or would cause the administration of the Plan to fail to satisfy Code section 409A, such provision shall be deemed null and void to the extent permitted by applicable law. Nothing herein shall be construed as a guarantee of any particular tax treatment to a Participant.

8.2 Gender and Number. Except where otherwise indicated by the context, any masculine term used herein also shall include the feminine; the plural shall include the singular and the singular shall include the plural.

8.3 Severability. In the event any provision of the Plan shall be held illegal or invalid for any reason, the illegality or invalidity shall not affect the remaining parts of the Plan, and the Plan shall be construed and enforced as if the illegal or invalid provision had not been included.

8.4 Requirements of Law. The granting of awards under the Plan shall be subject to all applicable laws, rules and regulations, and to such approvals by any governmental agencies or national securities exchanges as may be required.

8.5 Governing Law. The Plan and all awards shall be construed in accordance with and governed by the laws of the State of Delaware, but without regard to its conflict of law provisions.

8.6 Captions. Captions are provided herein for convenience only, and shall not serve as a basis for interpretation or construction of the Plan.

EXHIBIT A

List of Spok Holdings, Inc. Participants (as of January 1, 2018)

Employee Name	Job Title
Kelly, Vincent*	President & CEO
Goel, Hemant	President
Wallace, Michael W.	Chief Financial Officer
Saine, Thomas G.	Chief Information Officer
Culp-Fingerhut, Bonnie K.	EVP, HR & Admin
Woods Keisling, Sharon	Corp Secretary &Treasurer
Costanza, Mark A.	SVP, Prof Services
Scott, Donna R.	SVP, Marketing
LaLonde, John**	CTO
Edds, Brian	VP, Product Strategy
Ling, Michael J.	VP, Maintenance Revenue
Van Wijk, Elize M.	VP, Technical Support
Giorgi, Vincent W.	VP, Alliances
Deboer, John	VP, Tech Engineering
Czop, Michael	VP, Technology Ops
Mellin, Andrew F.	Chief Medical Officer
Guyton, Nate M.	Chief Nursing Officer
Peterman, Ted M.	Controller
Soucy, Donald P.	EVP, Sales
Robinson, Donna	DVP, Sales
Kendzierski II, Michael A.	DVP, Sales
Stein, James E.	VP, Account Management
Mancherian, Randy C.	VP, Regional Sales
Wax, Jonathan A.	VP, Regional Sales
Anderson, Brian J.	VP, Regional Sales
Gildea, Brian J.	VP, Regional Sales
Raimondi, Nicholas A.	VP, Wireless

*The Chief Executive Officer participates in the Plan pursuant to his employment agreement.
**The CTO participates upon actual hire date.

EXHIBIT B

Performance Objectives

2018-2020 Performance Period

Spok 2018 Long Term Incentive Plan (LTIP) Payout Scale
Based on LRP_17

(Wireless Revenue - 20%; Software Revenue - 20%)
(Software Operations Bookings - 30%; Operating & Capital Expenses - 30%)

Wireless Revenue (20%) ($ in millions)	Result	Performance	Payout
Over Perform	$268.008	110.0%	130.0%
	$255.826	105.0%	120.0%
	$249.735	102.5%	110.0%
	$246.080	101.0%	105.0%
Target	**$243.644**	**100.0%**	**100.0%**
Under Perform	$231.462	95.0%	95.0%
	$219.280	90.0%	90.0%
	$207.097	85.0%	85.0%
	$194.915	80.0%	80.0%
	< $194.915	< 80.0%	0.0%

Software Revenue (20%) ($ in millions)	Result	Performance	Payout
Over Perform	$286.925	110.0%	130.0%
	$273.883	105.0%	120.0%
	$267.362	102.5%	110.0%
	$263.450	101.0%	105.0%
Target	**$260.841**	**100.0%**	**100.0%**
Under Perform	$247.799	95.0%	95.0%
	$234.757	90.0%	90.0%
	$221.715	85.0%	85.0%
	$208.673	80.0%	80.0%
	< $208.673	< 80.0%	0.0%

Operating and Capital Expenses (30%)(1) ($ in millions)	Result	Performance	Payout
Over Perform	$396.312	80.0%	125.0%
	$421.082	85.0%	120.0%
	$445.851	90.0%	115.0%
	$470.621	95.0%	107.5%
Target	**$495.390**	**100.0%**	**100.0%**
Under Perform	$520.160	105.0%	95.0%
	$544.929	110.0%	90.0%
	$569.699	115.0%	85.0%
	$594.468	120.0%	80.0%
	> $594.468	>120.0%	0.0%

Operations Bookings (30%) ($ in millions)	Result	Performance	Payout
Over Perform	$172.417	110.0%	150.0%
	$164.580	105.0%	137.5%
	$160.661	102.5%	125.0%
	$158.310	101.0%	112.5%
Target	**$156.743**	**100.0%**	**100.0%**
Under Perform	$148.906	95.0%	95.0%
	$141.068	90.0%	90.0%
	$133.231	85.0%	85.0%
	$125.394	80.0%	80.0%
	< $125.394	< 80.0%	0.0%

(1) Operating and Capital Expenses excludes severance and stock based compensation expense.

Amount is calculated as follows:		2018	2019	2020	Total
Operating Expenses		$ 161,399	$ 166,352	$ 167,795	$ 495,547
Capital Expenses		6,162	5,060	4,688	15,910
Add Back-	Severance	(89)	(42)	(42)	(173)
	Stock Based Compensation	(5,151)	(5,341)	(5,401)	(15,893)
Operating and Capital Expenses		$ 162,321	$ 166,029	$ 167,040	$ 495,390
Wireless Revenue		$ 90,784	$ 80,671	$ 72,189	$ 243,644
Software Revenue		$ 78,994	$ 85,396	$ 96,452	$ 260,841
Operations Bookings		$ 40,000	$ 52,149	$ 64,594	$ 156,743

Spok Holdings, Inc.
2021 Short-Term Incentive Plan
(Effective January 1, 2021)

I. Effective Date. The 2021 Short-Term Incentive Plan (the "Plan") for Spok Holdings, Inc., was adopted by the Compensation Committee of the Board of Directors (the "Compensation Committee") of Spok Holdings, Inc., (the "Parent" or the "Company"), a Delaware corporation for the employees of Spok, Inc., a Delaware corporation and an indirect wholly-owned subsidiary of the Parent ("Spok") on December 2, 2020. The Plan is effective as of January 1, 2021 and supersedes and replaces all former management short-term incentive plans, including the Spok Holdings, Inc., 2020 Short-Term Incentive Plan.

II. Purpose. The Plan is designed to attract, motivate, retain and reward key employees for their performance during the calendar year, from January 1 through December 31, 2021 (the "Performance Period"). The Plan rewards key employees by allowing them to receive cash bonuses based on how well the Company performs against the performance objectives as set forth by the Compensation Committee and, as may be adjusted by the Compensation Committee in the event of a Change of Control or other corporate reorganization, merger, similar transaction, to take into account extraordinary events or as the Compensation Committee determines is in the best interests of the Company. In order for bonuses to be earned, the Company must meet the quantitative Performance Objectives and the Management by Objective (MBO) criteria as by December 31, 2021. Performance Objectives are based solely on the consolidated performance of the Company. For clarity, Performance Objectives and the attainment thereof does not include revenue or expenses related to acquisitions or due diligence expenses occurring after the Effective Date of this Plan except as directed by the Compensation Committee.

III. Eligibility. Participation in the Plan is limited to those key employees who are selected for participation in the Plan by the Compensation Committee, in its sole discretion (each such individual, a "Participant"). Individuals selected by the Compensation Committee to participate as of January 1, 2021 are listed on Exhibit A. Newly hired or promoted employees, or employees who otherwise become eligible to participate, who are selected to participate in the Plan after January 1, 2021 but before October 1, 2021 will participate in the Plan on a prorated basis based on the number of days worked during the performance period after becoming bonus eligible. Employees who are newly hired or promoted on or after October 1, 2021 will not be eligible to participate in the Plan.

IV. Target Bonus. The target bonus for each Participant is based on a percentage of the Participant's annual (or prorated, if applicable) salary as of January 1, 2021 (or date of hire or promotion to an eligible position, if later). The applicable percentage is determined by the Compensation Committee with respect to executives earning $250,000 or more and by the CEO for other management and need not be identical among Participants. The earned bonus may be greater than or less than the target bonus depending on the level at which the Performance Objectives are attained.

V. Payment of Earned Bonus.

a. Except as provided herein, each earned bonus under the Plan will be calculated based on the attainment of the Performance Objectives and will be paid in a lump sum (subject to any required withholding for income and employment taxes) after the 2021 annual audit of the Parent's consolidated financial statement has been completed and the Parent's 2021 Annual Report on Form 10-K has been filed with the Securities and Exchange Commission but in no event later than December 31, 2022.

b. If the Participant involuntarily Separates from Service without Cause or due to disability or dies prior to December 31, 2021, he or she will be eligible to receive a prorated bonus provided that the Company is on track to attain the Performance Objectives as reasonably determined by the Compensation Committee and provided further that, in the event Participant involuntarily Separates from Service without Cause, he or she has executed a release, any waiting period in connection with such release has expired, he or she has not exercised any rights to revoke the release and he or she has followed any other applicable and customary termination procedures, as determined by the Parent in its sole discretion. The bonus will be prorated to the date of Participant's Separation from Service or death, calculated as follows: one-hundred percent (100%) of a Participant's target bonus will be multiplied by a fraction, the numerator of which is the number of days the Participant was continuously providing services to the Company from January 1, 2021 through the date immediately prior to the Participant's Separation from Service or death, and the denominator of which is 365 days. Prorated bonuses will be paid to the Participant, or in the event of Participant's death, the Participant's estate, on the sixty-fifth (65th) day following the date of Participant's Separation from Service or death.

i. For purposes of the Plan, "Separation from Service" shall have the meaning provided in the Treasury Regulations under section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), and "Separates from Service" shall have a consistent meaning. Unless otherwise defined in an employment agreement between the Participant and the Parent or the Company, for purposes of the Plan, "Cause" means (i) dishonesty of a material nature that relates to the performance of services for the Company by Participants; (ii) criminal conduct (other than minor infractions and traffic violations) that relates to the performance of services for the Company by Participant; (iii) the Participant's willfully breaching or failing to perform his or her duties as an employee of the Company (other than any such failure resulting from the Participant having a disability (as defined herein)), within a reasonable period of time after a written demand for substantial performance is delivered to the Participant by the Compensation Committee, which demand specifically identifies the manner in which the Compensation Committee believes that the Participant has not substantially performed his duties; or (iv) the willful engaging by the Participant in conduct that is demonstrably and materially injurious to the Parent, Company or an Affiliate, monetarily or otherwise. No act or failure to act on the Participant's part shall be deemed "willful" unless done, or omitted to be done; by the Participant not in good faith and without reasonable belief that such action or omission was in the reasonable best interests of the Parent, Company and Affiliates. For this purpose, "disability" means a condition or circumstance such that the Participant has become totally and permanently disabled as defined or described in the Parent's long term disability benefit plan applicable to executive officers as in effect at the time the Participant incurs a disability.

c. Notwithstanding anything to the contrary in this Plan, no payments contemplated by this Plan will be paid during the six-month period following a Participant's Separation from Service unless the Company determines, in its good faith judgment, that paying such amounts at the time indicated in paragraph b above would not cause the Participant to incur an additional tax under Code section 409A (a)(2)(B)(i), in which case the bonus payment shall be paid in a lump sum on the first day of the seventh month following the Participant's Separation from Service.

VI. Forfeiture. Any Participant whose employment is terminated for Cause or who voluntarily Separates from Service prior to the date bonuses are paid shall forfeit any right to receive a bonus award.

VII. Clawback. The Compensation Committee of the Board may require forfeiture or a clawback of any incentive compensation awarded or paid under this Plan in excess of the compensation actually earned based on a restatement of the Company's financial statements as filed with the Securities and Exchange Commission for the period covered by this Plan.

VIII. Administrator. The Compensation Committee shall administer the Plan in accordance with its terms, and shall have full discretionary power and authority to construe and interpret the Plan; to prescribe, amend and rescind rules and regulations, terms, and notices hereunder; and to make all other determinations necessary or advisable in its discretion for the administration of the Plan. Any actions of the Compensation Committee with respect to the Plan shall be conclusive and binding upon all persons interested in the Plan. The Compensation Committee, in its sole discretion and on such terms and conditions as it may provide, may delegate all or part of its authority and powers under the Plan to one or more directors and/or officers of the Parent or the Company.

IX. Amendment; Termination. The Compensation Committee, in its sole discretion, without prior notice to Participants, may amend or terminate the Plan, or any part thereof, including the Performance Objectives as described in Section II, at any time and for any reason, to the extent such action will not cause adverse tax consequences to a participant under Code section 409A. Any amendment or termination must be in writing and shall be communicated to all Participants. No award may be granted during any period of suspension or after termination of the Plan.

X. Miscellaneous.

a. No Rights as Employee. Nothing contained in this Plan or any documents relating to this Plan shall (a) confer on a Participant any right to continue in the employ of the Company; (b) constitute any contract or agreement of employment; or (c) interfere in any way with the Company's right to terminate the Participant's employment at any time, with or without Cause.

b. Tax Withholding. To the extent required by applicable federal, state, local or foreign law, the Company shall withhold all applicable taxes (including, but not limited to, the Participant's FICA and Social Security obligations) from any bonus payment.

c. Transferability. A Participant may not sell, assign, transfer or encumber any of his or her rights under the Plan.

d. Unsecured General Creditor. Participants (or their beneficiary) may seek to enforce any rights or claims for payment under the Plan solely as an unsecured general creditor of the Parent or Spok.

e. Successors. This Plan shall be binding upon and inure to the benefit of the Parent, Company and any successor to the Company and the Participant's heirs, executors, administrators and legal representatives.

f. Code Section 409A. The Plan is intended to be a nonqualified deferred compensation plan within the meaning of Code section 409A and shall be interpreted to meet the requirements of Code section 409A. To the extent that any provision of the Plan would cause a conflict with the requirements of Code section 409A, or would cause the administration of the Plan to fail to satisfy Code section 409A, such provision shall be deemed null and void to the extent permitted by applicable law. Nothing herein shall be construed as a guarantee of any particular tax treatment to a Participant.

g. Governing Law. All questions pertaining to the validity, construction and administration of the Plan shall be determined in accordance with the laws of the State of Delaware, without regard to conflicts of law provisions.

h. Integration. This document and each exhibit hereto represent the entire agreement and understanding between the Company and the Participants and supersede any and all prior agreements or understandings, whether oral or written, with the Company relating to the subject matter covered by this Plan.

i. Severability. In case any provision of this Plan shall be held illegal or invalid, such illegality or invalidity shall be construed and enforced as if said illegal or invalid provision had never been inserted herein and shall not affect the remaining provisions of this Plan, but shall be fully severable, and the Plan shall be construed and enforced as if any such illegal or invalid provision were not a part hereof.

[Execution page follows]

IN WITNESS WHEREOF, Spok Holdings, Inc., by its duly authorized officer acting in accordance with a resolution duly adopted by the Compensation Committee of the Board of Directors of Spok Holdings, Inc., has executed this Plan for the benefit of employees of Spok Holdings, Inc. and subsidiaries, effective as of January 1, 2021.

SPOK HOLDINGS, INC.

/s/ Vincent D. Kelly

Vincent D. Kelly, President & CEO

SPOK HOLDINGS, inc.
2020 Equity incentive AWARD plan

RESTRICTED STOCK Unit Grant Notice

Spok Holdings, Inc., a Delaware corporation (the "Company"), pursuant to its 2020 Equity Incentive Award Plan, as amended from time to time (the "Plan"), hereby grants to the holder listed below ("Participant") the number of Restricted Stock Units (the "RSUs") set forth below. The RSUs are subject to the terms and conditions set forth in this Restricted Stock Unit Grant Notice (the "Grant Notice"), the Restricted Stock Unit Agreement attached hereto as Exhibit A (the "Agreement") and the Plan, all of which are incorporated herein by reference. Unless otherwise defined herein, the terms defined in the Plan shall have the same defined meanings in the Grant Notice and the Agreement.

Participant:	
Employer:	
Grant Date:	
Number of RSUs:	
Type of Shares Issuable:	Common Stock of Spok Holdings, Inc.
Vesting Schedule:	[Specified in individual agreements]

By Participant's signature, and the Company's signature below, Participant agrees to be bound by the terms and conditions of the Plan, the Agreement and the Grant Notice. Participant has reviewed the Agreement, the Plan and the Grant Notice in their entirety, has had an opportunity to obtain the advice of counsel prior to executing the Grant Notice and fully understands all provisions of the Grant Notice, the Agreement and the Plan. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator upon any questions arising under the Plan, the Grant Notice, or the Agreement.

SPOK HOLDINGS, INC.		**PARTICIPANT**	
HOLDER:			
By:	_________ _________	By:	_________ _________
Name: Title:	_________ _________	Name:	_________ _________
Title:	_________ _________		
		Address:	_________ _________ _________ _________

Exhibit A
TO RESTRICTED STOCK UNIT Grant Notice

RESTRICTED STOCK UNIT AGREEMENT

Pursuant to the Grant Notice to which this Agreement is attached, the Company has granted to Participant the number of RSUs set forth in the Grant Notice.

ARTICLE I.

GENERAL

1.1 Defined Terms. Capitalized terms not specifically defined herein shall have the meanings specified in the Plan or the Grant Notice.

(a) "Cause," means (i) if Participant is a party to a written employment or consulting agreement with the Company or any of its Subsidiaries in which the term "cause" is defined (a "Relevant Agreement"), "Cause" as defined in the Relevant Agreement, and (ii) if no Relevant Agreement exists, (a) dishonesty of a material nature that relates to the performance of services for the Company by Participants; (b) criminal conduct (other than minor infractions and traffic violations) that relates to the performance of services for the Company by Participant; (c) the Participant's willfully breaching or failing to perform his or her duties as an employee of the Company (other than any such failure resulting from the Participant having a Disability), within a reasonable period of time after a written demand for substantial performance is delivered to the Participant by the Board, which demand specifically identifies the manner in which the Board believes that the Participant has not substantially performed his or her duties; or (d) the willful engaging by the Participant in conduct that is demonstrably and materially injurious to the Company, monetarily or otherwise. No act or failure to act on the Participant's part shall be deemed "willful" unless done, or omitted to be done, by the Participant not in good faith and without reasonable belief that such action or omission was in the reasonable best interests of the Company.

(b) "Disability" as used herein means a condition or circumstance such that the Participant has become totally and permanently disabled as defined or described in the Company's long-term disability benefit plan applicable to executive officers as in effect at the time the Participant incurs a disability.

(c) "Qualifying Termination" means a Participant's Termination of Service by the Company without Cause or due to Participant's death or Disability.

1.1 Incorporation of Terms of Plan. The RSUs and the shares of Common Stock ("Stock") issued to Participant hereunder ("Shares") are subject to the terms and conditions set forth in this Agreement and the Plan, which is incorporated herein by reference. In the event of any inconsistency between the Plan and this Agreement, the terms of the Plan shall control.

ARTICLE II.

AWARD OF RESTRICTED STOCK UNITS AND DIVIDEND EQUIVALENTS

2.1 Award of RSUs and Dividend Equivalents.

(a) In consideration of Participant's past and/or continued employment with or service to the Company or a Subsidiary and for other good and valuable consideration, effective as of the grant date set forth in the Grant Notice (the "Grant Date"), the Company has granted to Participant the number of RSUs set forth in the Grant Notice, upon the terms and conditions set forth in the Grant Notice, the Plan and this Agreement, subject to adjustments as provided in Section 14.3 of the Plan. Each RSU represents the right to receive one Share or, at the option of the Company, an amount of cash as set forth in Section 2.3(a), in either case, at the times and subject to the conditions set forth herein. However, unless and until the RSUs have vested, Participant will have no right to the payment of any Shares subject thereto. Prior to the actual delivery of any Shares, the RSUs will represent an unsecured obligation of the Company, payable only from the general assets of the Company.

(b) The Company hereby grants to Participant an Award of Dividend Equivalents with respect to each RSU granted pursuant to the Grant Notice for all ordinary cash dividends which are paid to all or substantially all holders of the outstanding shares of Stock between the Grant Date and the date when the applicable RSU is distributed or paid to Participant or is forfeited or expires. The Dividend Equivalents for each RSU shall be equal to the amount of cash which is paid as a dividend on one share of Stock. All such Dividend Equivalents shall be credited to Participant and shall be subject to the same vesting, distribution, transferability, and forfeitability provisions which apply to the underlying RSU to which such additional RSU relates such that Dividend Equivalents shall only be paid out to the extent the underlying RSU vests and is distributable. Dividend Equivalents, to the extent vested and distributable, shall be distributed solely as a lump sum payment.

2.2 Vesting of RSUs and Dividend Equivalents.

(a) Subject to Participant's continued employment with or service to the Company or a Subsidiary on each applicable vesting date and subject to the terms of this Agreement, the RSUs shall vest in such amounts and at such times as are set forth in the Grant Notice. Dividend Equivalents pursuant to Section 2.1(b) hereof shall vest whenever the underlying RSU to which such additional RSU relates vests.

(b) In the event Participant incurs a Termination of Service, except as set forth in the Grant Notice, the Participant shall immediately forfeit any and all RSUs and Dividend Equivalents granted under this Agreement which have not vested or do not vest on or prior to the date on which such Termination of Service occurs, and Participant's rights in any such RSUs and Dividend Equivalents which are not so vested shall lapse and expire.

2.3 Distribution or Payment of RSUs and Dividend Equivalents.

(a) Participant's RSUs shall be distributed in Shares. Dividend Equivalents shall be distributed in Shares or paid in cash in a single lump sum. All distributions shall be subject to any required withholding for income and employment taxes.

(b) Distributions for vested RSUs and Dividend Equivalents will be paid as soon as administratively practicable after the vesting of the applicable RSU, but in no event more than sixty (60) days after the RSU's vesting date. Notwithstanding the foregoing, the Company may delay any payment under this Agreement that the Company reasonably determines would violate Applicable Law until the earliest date the Company reasonably determines the making of the payment will not cause such a violation (in accordance with Treasury Regulation Section 1.409A-2(b)(7)(ii)), provided the Company reasonably believes the delay will not result in the imposition of excise taxes under Section 409A (as defined below).

(c) In no event shall any distributions be paid during the six-month period following a Participant's "Separation from Service" (as defined in Section 409A) unless the Company determines, in its good faith judgment, that paying such amounts at the times indicated in paragraph (b), above, would not cause the Participant to incur an additional tax under Code section 409A, in which case the distribution shall be paid on the first day of the seventh month following the Participant's Separation from Service.

2.4 Certificates. Unless the Administrator otherwise determines or Applicable Laws require, he Company shall not be required to issue or deliver any certificate or certificates for any Shares and such Shares may instead be recorded in the books of the Company (or, as applicable, its transfer agent or stock plan administrator).

2.5 Tax Withholding. Notwithstanding any other provision of this Agreement:

(a) The Company and its Subsidiaries have the authority to deduct or withhold, or require Participant to remit to the Company or the applicable Subsidiary, an amount sufficient to satisfy applicable federal, state, local and foreign taxes (including the employee portion of any FICA obligation) required by law to be withheld with respect to any taxable event arising pursuant to this Agreement. The Company and its Subsidiaries may withhold or the Participant may make such payment in one or more of the forms specified below:

(i) by cash or check made payable to the Company or the Subsidiary with respect to which the withholding obligation arises;

(ii) by the deduction of such amount from other compensation payable to Participant;

(iii) with respect to any withholding taxes arising in connection with the distribution of the RSUs, with the consent of the Administrator, by requesting that the Company and its Subsidiaries withhold a net number of vested shares of Stock otherwise issuable pursuant to the RSUs having a then-current Fair Market Value not exceeding the amount necessary to satisfy the withholding obligation of the Company and its Subsidiaries based on the minimum applicable statutory withholding rates for federal, state, local and foreign income tax and payroll tax purposes;

(iv) with respect to any withholding taxes arising in connection with the distribution of the RSUs, with the consent of the Administrator, by tendering to the Company vested shares of Stock having a then-current Fair Market Value not exceeding the amount necessary to satisfy the withholding obligation of the Company and its Subsidiaries based on the minimum applicable statutory withholding rates for federal, state, local and foreign income tax and payroll tax purposes;

(v) with respect to any withholding taxes arising in connection with the distribution of the RSUs, through the delivery of a notice that Participant has placed a market sell order with a broker acceptable to the Company with respect to shares of Stock then issuable to Participant pursuant to the RSUs, and that the broker has been directed to pay a sufficient portion of the net proceeds of the sale to the Company or the Subsidiary with respect to which the withholding obligation arises in satisfaction of such withholding taxes; *provided* that payment of such proceeds is then made to the Company or the applicable Subsidiary at such time as may be required by the Administrator, but in any event not later than the settlement of such sale; or

(vi) in any combination of the foregoing.

(b) With respect to any withholding taxes arising in connection with the RSUs, in the event Participant fails to provide timely payment of all sums required pursuant to Section 2.5(a), the Company shall have the right and option, but not the obligation, to treat such failure as an election by Participant to satisfy all or any portion of Participant's required payment obligation pursuant to Section 2.5(a)(ii) or Section 2.5(a)(iii) above, or any combination of the foregoing as the Company may determine to be appropriate. The Company shall not be obligated to deliver any certificate representing shares of Stock issuable with respect to the RSUs to Participant or his or her legal representative unless and until Participant or his or her legal representative shall have paid or otherwise satisfied in full the amount of all federal, state, local and foreign taxes applicable with respect to the taxable income of Participant resulting from the vesting or settlement of the RSUs or any other taxable event related to the RSUs.

(c) In the event any tax withholding obligation arising in connection with the RSUs will be satisfied under Section 2.5(a)(iii), then the Company may elect to instruct any brokerage firm determined acceptable to the Company for such purpose to sell on Participant's behalf a whole number of shares from those shares of Stock then issuable to Participant pursuant to the RSUs as the Company determines to be appropriate to generate cash proceeds sufficient to satisfy the tax withholding obligation and to remit the proceeds of such sale to the Company or the Subsidiary with respect to which the withholding obligation arises. Participant's acceptance of this Award constitutes Participant's instruction and authorization to the Company and such brokerage firm to complete the transactions described in this Section 2.5(c), including the transactions described in the previous sentence, as applicable. The Company may refuse to issue any shares of Stock in settlement of the RSUs to Participant until the foregoing tax withholding obligations are satisfied, *provided* that no payment shall be delayed under this Section 2.5(c) if such delay will result in a violation of Section 409A of the Code.

(d) Participant is ultimately liable and responsible for all taxes owed in connection with the RSUs, regardless of any action the Company or any Subsidiary takes with respect to any tax withholding obligations that arise in connection with the RSUs. Neither the Company nor any Subsidiary makes any representation or undertaking regarding the treatment of any tax withholding in connection with the awarding, vesting or payment of the RSUs or the subsequent sale of Shares. The Company and the Subsidiaries do not commit and are under no obligation to structure the RSUs to reduce or eliminate Participant's tax liability.

2.1 Rights as Stockholder. Neither Participant nor any person claiming under or through Participant will have any of the rights or privileges of a stockholder of the Company in respect of any Shares deliverable hereunder unless and until certificates representing such Shares (which may be in book-entry form) will have been issued and recorded on the records of the Company or its transfer agents or registrars, and delivered to Participant (including through electronic delivery to a brokerage account). Except as otherwise provided herein, after such issuance, recordation and delivery, Participant will have all the rights of a stockholder of the Company with respect to such Shares, including, without limitation, the right to receipt of dividends and distributions on such Shares.

ARTICLE III.

OTHER PROVISIONS

3.1 Administration. The Administrator shall have the power to interpret the Plan, the Grant Notice and this Agreement and to adopt such rules for the administration, interpretation and application of the Plan, the Grant Notice and this Agreement as are consistent therewith and to interpret, amend or revoke any such rules. All actions taken and all interpretations and determinations made by the Administrator will be final and binding upon Participant, the Company and all other interested persons. To the extent allowable pursuant to Applicable Law, no member of the Committee or the Board will be personally liable for any action, determination or interpretation made with respect to the Plan, the Grant Notice or this Agreement.

3.2 RSUs Not Transferable. The RSUs may not be sold, pledged, assigned or transferred in any manner other than by will or the laws of descent and distribution, unless and until the Shares underlying the RSUs have been issued, and all restrictions applicable to such Shares have lapsed. No RSUs or any interest or right therein or part thereof shall be liable for the debts, contracts or engagements of Participant or his or her successors in interest or shall be subject to disposition by transfer, alienation, anticipation, pledge, encumbrance, assignment or any other means whether such disposition be voluntary or involuntary or by operation of law by judgment, levy, attachment, garnishment or any other legal or equitable proceedings (including bankruptcy), and any attempted disposition thereof shall be null and void and of no effect, except to the extent that such disposition is permitted by the preceding sentence.

3.3 Adjustments. The Administrator may accelerate the vesting of all or a portion of the RSUs in such circumstances as it, in its sole discretion, may determine. Participant acknowledges that the RSUs and the Shares subject to the RSUs are subject to adjustment, modification and termination in certain events as provided in this Agreement and Section 14.3 of the Plan.

3.4 Notices. Any notice to be given under the terms of this Agreement to the Company shall be addressed to the Company in care of the Secretary of the Company at the Company's principal office, and any notice to be given to Participant shall be addressed to Participant at Participant's last address reflected on the Company's records. By a notice given pursuant to this Section 3.4, either party may hereafter designate a different address for notices to be given to that party. Any notice shall be deemed duly given when sent via email or when sent by certified mail (return receipt requested) and deposited (with postage prepaid) in a post office or branch post office regularly maintained by the United States Postal Service.

3.5 Titles. Titles are provided herein for convenience only and are not to serve as a basis for interpretation or construction of this Agreement.

3.6 Governing Law. The laws of the State of Delaware shall govern the interpretation, validity, administration, enforcement and performance of the terms of this Agreement regardless of the law that might be applied under principles of conflicts of laws.

3.7 Conformity to Securities Laws. Participant acknowledges that the Plan, the Grant Notice and this Agreement are intended to conform to the extent necessary with all Applicable Laws, including, without limitation, the provisions of the Securities Act and the Exchange Act, and any and all regulations and rules promulgated thereunder by the Securities and Exchange Commission, and state securities laws and regulations. Notwithstanding anything herein to the contrary, the Plan shall be administered, and the RSUs are granted, only in such a manner as to conform to Applicable Law. To the extent permitted by Applicable Law, the Plan and this Agreement shall be deemed amended to the extent necessary to conform to Applicable Law.

3.8 Amendment, Suspension and Termination. To the extent permitted by the Plan, this Agreement may be wholly or partially amended or otherwise modified, suspended or terminated at any time or from time to time by the Administrator or the Board, *provided* that, except as may otherwise be provided by the Plan, no amendment, modification, suspension or termination of this Agreement shall adversely affect the RSUs in any material way without the prior written consent of Participant.

3.9 Successors and Assigns. The Company may assign any of its rights under this Agreement to single or multiple assignees, and this Agreement shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer set forth in Section 3.2 and the Plan, this Agreement shall be binding upon and inure to the benefit of the heirs, legatees, legal representatives, successors and assigns of the parties hereto.

3.10 Limitations Applicable to Section 16 Persons. Notwithstanding any other provision of the Plan or this Agreement, if Participant is subject to Section 16 of the Exchange Act, the Plan, the RSUs (including RSUs which result from the deemed reinvestment of Dividend Equivalents), the Dividend Equivalents, the Grant Notice and this Agreement shall be subject to any additional limitations set forth in any applicable exemptive rule under Section 16 of the Exchange Act (including any amendment to Rule 16b-3 of the Exchange Act) that are requirements for the application of such exemptive rule. To the extent permitted by Applicable Law, this Agreement shall be deemed amended to the extent necessary to conform to such applicable exemptive rule.

3.11 Not a Contract of Employment. Nothing in this Agreement or in the Plan shall confer upon Participant any right to continue to serve as an employee or other service provider of the Company or any Subsidiary or shall interfere with or restrict in any way the rights of the Company and its Subsidiaries, which rights are hereby expressly reserved, to discharge or terminate the services of Participant at any time for any reason whatsoever, with or without cause, except to the extent expressly provided otherwise in a written agreement between the Company or a Subsidiary and Participant.

3.12 Entire Agreement. The Plan, the Grant Notice and this Agreement (including any exhibit hereto) constitute the entire agreement of the parties and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof.

3.13 Section 409A. This Award is intended to be exempt from or comply with Section 409A of the Code (together with any Department of Treasury regulations and other interpretive guidance issued thereunder, including without limitation any such regulations or other guidance that may be issued after the date hereof, "Section 409A") such that no adverse tax consequences, interest, or penalties under Section 409A apply. Notwithstanding any other provision of the Plan, the Grant Notice or this Agreement, the Administrator may, without the Participant's consent, adopt such amendments to the Plan, the Grant Notice or this Agreement, or adopt other policies and procedures (including amendments, policies and procedures with retroactive effect), or take any other actions as the Administrator determines are necessary or appropriate to preserve the intended tax treatment of this Award, including actions to exempt this Award from Section 409A or to comply with the requirements of Section 409A.

3.14 Agreement Severable. In the event that any provision of the Grant Notice or this Agreement is held invalid or unenforceable, such provision will be severable from, and such invalidity or unenforceability will not be construed to have any effect on, the remaining provisions of the Grant Notice or this Agreement.

3.15 Limitation on Participant's Rights. Participation in the Plan confers no rights or interests other than as herein provided. This Agreement creates only a contractual obligation on the part of the Company as to amounts payable and shall not be construed as creating a trust. Neither the Plan nor any underlying program, in and of itself, has any assets. Participant shall have only the rights of a general unsecured creditor of the Company with respect to amounts credited and benefits payable, if any, with respect to the RSUs and Dividend Equivalents.

3.16 Counterparts. The Grant Notice may be executed in one or more counterparts, including by way of any electronic signature, subject to Applicable Law, each of which shall be deemed an original and all of which together shall constitute one instrument.

3.17 Broker-Assisted Sales. In the event of any broker-assisted sale of shares of Stock in connection with the payment of withholding taxes as provided in Section 2.5(a)(iii) or Section 2.5(a)(v): (A) any shares of Stock to be sold through a broker-assisted sale will be sold on the day the tax withholding obligation arises or as soon thereafter as practicable; (B) such shares of Stock may be sold as part of a block trade with other participants in the Plan in which all participants receive an average price; (C) Participant will be responsible for all broker's fees and other costs of sale, and Participant agrees to indemnify and hold the Company harmless from any losses, costs, damages, or expenses relating to any such sale; (D) to the extent the proceeds of such sale exceed the applicable tax withholding obligation, the Company agrees to pay such excess in cash to Participant as soon as reasonably practicable; (E) Participant acknowledges that the Company or its designee is under no obligation to arrange for such sale at any particular price, and that the proceeds of any such sale may not be sufficient to satisfy the applicable tax withholding obligation; and (F) in the event the proceeds of such sale are insufficient to satisfy the applicable tax withholding obligation, Participant agrees to pay immediately upon demand to the Company or its Subsidiary with respect to which the withholding obligation arises an amount in cash sufficient to satisfy any remaining portion of the Company's or the applicable Subsidiary's withholding obligation.

* * *

SPOK HOLDINGS, INC.
DEFERRED COMPENSATION PLAN FOR NON-EMPLOYEE DIRECTORS

1. Purpose and Effective Date. The purpose of this Plan is to provide the non-employee members of the Board of Directors (the "*Board*") of Spok Holdings, Inc., a Delaware corporation, and it successors (the "*Company*") with an opportunity to defer payment of all their Eligible Director Compensation (as defined below). The Plan shall be effective as of April 29, 2020 (the "*Effective Date*").

2. Definitions. The following terms shall have the meanings given in this section unless a different meaning is clearly implied by the context:

(a) *"Change in Control"* shall have the same meaning as defined in the Existing Equity Plan as in effect on the Effective Date; provided, that, for purposes of the Plan, in no event will a Change in Control be deemed to have occurred if the transaction is not also a "change in control event" under Section 409A of the Code.

(b) *"Common Stock"* means the common stock of the Company.

(c) *"Compensation Committee"* means the Compensation Committee of the Board.

(d) "*Deferral Election Form*" means an election form, in a form approved by the Plan Administrator, to be provided to directors by the Plan Administrator, pursuant to which they may elect to defer Eligible Director Compensation under this Plan.

(e) *"Deferred Compensation Account"* means an account maintained for each director who makes a deferral election as described in Section 4.

(f) *"Deferred Stock Unit"* means a Stock Unit that is received by a participant pursuant to this Plan and provides for the deferred receipt of compensation.

(g) "*Director Compensation*" means the compensation payable to a director for his or her service as a director in the applicable Plan Year.

(h) *"Eligible Director Compensation"* means such portion of Director Compensation that the Board designates on an approved Deferral Election Form as eligible for deferral under this Plan.

(i) *"Equity Plan"* means the Existing Equity Plan and any successor or replacement plan as in effect from time to time. For the avoidance of doubt, following and subject to the approval of the Spok Holdings, Inc. 2020 Equity Incentive Award Plan at the Company's 2020 annual meeting of stockholders, "Equity Plan" shall mean and be deemed to refer to such 2020 Equity Incentive Award Plan and any successor or replacement plan.

(j) "*Existing Equity Plan*" means the 2012 Spok Holdings, Inc. Equity Incentive Plan.

(k) *"Fair Market Value"* means "Fair Market Value" as defined in the Equity Plan.

(l) *"Plan"* means the Spok Holdings, Inc. Deferred Compensation Plan for Non-Employee Directors.

(m) *"Plan Year"* means a calendar year.

(n) *"Plan Administrator"* means the Compensation Committee or its designee.

(o) *"Section 409A"* means Section 409A of the Internal Revenue Code of 1986, as amended.

(p) *"Separation from Service"* means a "separation from service" within the meaning of Section 409A.

(q) "*Stock Award*" means a fully vested award of Common Stock granted to a director for serving as a member of the Board.

(r) *"Stock Unit"* means an economic unit equal in value to one share (or fraction thereof) of Common Stock.

3. Eligibility. All members of the Board who are not employees of the Company or any subsidiary of the Company shall be eligible to participate in the Plan.

4. Election to Defer Director Compensation.

(a) *Manner and Amount of Deferral Election*. A participant may elect to defer receipt of his or her Eligible Director Compensation by giving written notice on a Deferral Election Form specifying the deferral. A participant's election to defer is irrevocable and may not be changed, except as may be provided in the election form.

(b) *Time of Election*. Elections to defer the Eligible Director Compensation shall be made at the following times:

(i) A director may elect to defer Eligible Director Compensation at such time or times during the calendar year as permitted by the Plan Administrator. Notwithstanding the foregoing, for the initial partial 2020 Plan Year, a director may elect to defer his or her 2020 Eligible Director Compensation at any time prior to May 28, 2020 and such election shall apply to compensation earned for service from and after May 28, 2020.

(ii) A nominee for election to director (who is not at the time of nomination a sitting director and was not previously eligible to participate in this Plan) may elect to defer Eligible Director Compensation no later than 30 days after the date of the director's commencement of services as a director. Such deferral election shall be effective for Eligible Director Compensation, following the later of (A) the date of the director's commencement of services as a director, and (B) the date an irrevocable election form is filed with the Company.

(c) *Duration of Deferral Election*. Unless otherwise permitted by the Plan Administrator and specified in an applicable deferral election form, a deferral election will only apply to one Plan Year and a participant must make a new deferral election with respect to each Plan Year that the participant decides to defer Eligible Director Compensation. The Plan Administrator may provide pursuant to the terms of an approved deferral election form that such deferral election shall carry forward from year-to-year and continue to apply to Eligible Director Compensation for subsequent years, in each case as specified in the applicable deferral election form.

5. Deferred Compensation Accounts. The Company shall establish on its books and records a Deferred Compensation Account with sub accounts for each participant, as provided below.

(a) *Crediting of Eligible Director Compensation*. Deferred Eligible Director Compensation, if applicable, shall be credited to the participant's Deferred Compensation Sub Account in the form of Deferred Stock Units on the date the it would otherwise have been paid or granted, as applicable. On such date, the Company shall credit to the Deferred Compensation Account with a number of Deferred Stock Units equal to the Eligible Director Compensation that was deferred. With respect to deferred cash compensation, the number of Deferred Stock Units will be equal to (i) the portion of the cash compensation that the participant elected to defer, divided by (ii) the Fair Market Value of a share of Common Stock on such date, rounded down to the nearest whole Deferred Stock Unit. No fractional Deferred Stock Units will be credited to a participant's account. Unused cash attributable to a fractional Deferred Stock Unit will be refunded to the participant in cash as soon as practicable following the original payment date. A participant will be fully vested in each Deferred Stock Unit that relates to deferred cash compensation.

(b) *Dividend Equivalents*. Each Deferred Stock Unit credited to a participant's Deferred Compensation Account shall carry with it a right to receive dividend equivalents in respect of the share of Common Stock underlying such Deferred Stock Unit. Dividend equivalents shall be paid to participants in cash on the Company's applicable dividend payment date based on the number of Deferred Stock Units, whether vested or unvested, held in the director's Deferred Compensation Account on the applicable Company record date. The dividend equivalent right associated with a Deferred Stock Unit shall remain outstanding until the delivery to the participant of the share of Common Stock underlying such Deferred Stock Unit.

(c) *Adjustment of Deferred Stock Units*. If the number of outstanding shares of Common Stock is increased or decreased or the shares of Common Stock are changed into or exchanged for a different number or kind of stock or other securities of the Company on account of any recapitalization, reclassification, stock split, reverse split, combination of stock, exchange of stock, stock dividend, or other distribution payable in capital stock, or other increase or decrease in such stock effected without receipt of consideration by the Company occurring after the Effective Date, the Plan Administrator will make appropriate adjustments to (i) the number and kind of shares of Common Stock for which Deferred Stock Units are outstanding, and (ii) the number of Deferred Stock Units credited to each participant's Deferred Compensation Account.

6. Payment of Deferred Compensation.

(a) *Distributions*. Payment from the Deferred Stock Units shall be made in one lump sum on the earliest to occur of:

(i) within 90 days following the participant's Separation From Service;

(ii) immediately prior to, on or within 30 days following a Change in Control;

(iii) within 90 days following the participant's Disability;

(iv) the participant's death.

Notwithstanding anything to the contrary in the Plan, if on the date of the participant's Separation from Service, the participant is a "*specified employee*" within the meaning of Section 409A, the payment will occur on the later to occur of (x) the scheduled distribution date and (y) the first day of the seventh month following the date of the participant's Separation from Service or, if earlier, the date of the participant's death.

(b) *Medium of Payment*. Payments from the Deferred Compensation Account shall be made in whole shares of Common Stock for each whole Deferred Stock Unit, and in cash for any fractional Deferred Stock Unit; provided, that, the Company may choose in its discretion to pay the participant cash in lieu of all or a portion of the shares of Common Stock. Deferred Stock Units issued to and shares of Common Stock paid to participants under the Plan shall be issued and paid from the Equity Plan.

7. Unfunded Promise to Pay; No Segregation of Funds or Assets. Nothing in this Plan shall require the segregation of any assets of the Company or any type of funding by the Company, it being the intention of the parties that the Plan be an unfunded arrangement for federal income tax purposes. No participant shall have any rights to or interest in any specific assets or shares of Common Stock by reason of the Plan, and any participant's rights to enforce payment of the obligations of the Company hereunder shall be those of a general creditor of the Company.

8. Nonassignability; Beneficiary Designation. The right of a participant to receive any unpaid portion of the participant's Deferred Compensation Account shall not be assigned, transferred, pledged or encumbered or subjected in any manner to alienation or anticipation. However, in the event of a participant's death, the Company will pay the unpaid portion of the participant's Deferred Compensation Account to the participant's designated beneficiaries. If the participant fails to complete a valid beneficiary designation, the participant's beneficiary will be his or her estate.

9. Administration. The Plan will be administered under the supervision of the Plan Administrator. The Plan Administrator will prescribe guidelines and forms for the implementation and administration of the Plan, interpret the terms of the Plan, and make all other substantive decisions regarding the operation of the Plan. The Plan Administrator's decisions in its administration of the Plan are conclusive and binding on all persons.

10. Construction. The Plan is intended to comply with Section 409A and any regulations and guidance thereunder and shall be interpreted and operated in accordance with such intent. Notwithstanding anything to the contrary in the Plan, neither the Company, its affiliates, the Board, nor the Committee will have any obligation to take any action to prevent the assessment of any excise tax or penalty on any participant under Section 409A, and neither the Company, its affiliates, the Board, nor the Committee will have any liability to any participant for such tax or penalty. The laws of the State of Delaware shall govern all questions of law arising with respect to the Plan, without regard to the choice of law principles of any jurisdiction, except where the laws governing the Plan are preempted by the laws of the United States. The Plan is intended to be construed so that participation in the Plan will be exempt from Section 16(b) of the Securities Exchange Act of 1943, as amended, pursuant to regulations and interpretations issued from time to time by the Securities and Exchange Commission. If any provision of the Plan is held to be illegal or void, such illegality or invalidity shall not affect the remaining provisions of the Plan, but shall be fully severable, and the Plan shall be construed and enforced as if the illegal or

invalid provision had never been inserted. This document constitutes the entire Plan, and supersedes any prior oral or written agreements on the subject matter hereof.

11. Claw-back. All awards of Deferred Stock Units under the Plan will be subject to mandatory repayment by the participant to the Company to the extent the participant is, or in the future becomes, subject to any Company or affiliate "claw-back" or recoupment policy that is adopted to comply with the requirements of any applicable law, rule, regulation or otherwise, or any law, rule, or regulation that imposes mandatory recoupment, under circumstances set forth in such law, rule or regulation.

12. Amendment and Termination. The Board may amend, suspend, or terminate the Plan at any time and for any reason. No amendment, suspension, or termination will, without the consent of the participant, materially impair rights or obligations under any Deferred Stock Units previously awarded to the participant under the Plan, except as provided below. The Board may terminate the Plan and distribute the Deferred Compensation Accounts to participants in accordance with and subject to the rules of Treas. Reg. Section 1.409A-3(j)(4)(ix), or successor provisions, and any generally applicable guidance issued by the Internal Revenue Service permitting such termination and distribution.

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our reports dated February 18, 2021, with respect to the consolidated financial statements and internal control over financial reporting included in the Annual Report of Spok Holdings, Inc. on Form 10-K for the year ended December 31, 2020. We consent to the incorporation by reference of said reports in the Registration Statements of Spok Holdings, Inc. on Forms S-8 (File No. 333-182444, File No. 333-212724 and File No. 333-240213).

/s/ GRANT THORNTON LLP

Arlington, Virginia
February 18, 2021

Exhibit 31.1

**CERTIFICATION PURSUANT TO RULE 13A-14(A) OR 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Vincent D. Kelly, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spōk Holdings, Inc.;

2. Based on my knowledge, this 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 report;

3. Based on my knowledge, the financial statements, and other financial information included in this 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 report;

4. The registrant's other certifying officer(s) 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 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 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 report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    d. Disclosed in this 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(s) 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 the registrant's board of directors (or persons performing the equivalent functions):

    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.

Dated: February 18, 2021

/s/ Vincent D. Kelly
Vincent D. Kelly
President and Chief Executive Officer

Exhibit 31.2

**CERTIFICATION PURSUANT TO RULE 13A-14(A) OR 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Michael W. Wallace, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spok Holdings, Inc.;

2. Based on my knowledge, this 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 report;

3. Based on my knowledge, the financial statements, and other financial information included in this 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 report;

4. The registrant's other certifying officer(s) 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 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 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 report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this 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(s) 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 the registrant's board of directors (or persons performing the equivalent functions):

   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.

Dated: February 18, 2021

/s/ Michael W. Wallace
Michael W. Wallace
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. § 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Spōk Holdings, Inc. (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying Annual Report on Form 10-K of the Company for the year ended December 31, 2020 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

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

Dated: February 18, 2021

/s/ Vincent D. Kelly

Vincent D. Kelly
President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. § 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Spok Holdings, Inc. (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying Annual Report on Form 10-K of the Company for the year ended December 31, 2020 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

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

Dated: February 18, 2021

/s/ Michael W. Wallace
Michael W. Wallace
Chief Financial Officer

Reconciliation from Operating Expenses to Adjusted Operating Expenses

(Dollars in thousands)

	For the year ended	
	12/31/2020	12/31/2019
Operating expenses	**$170,845**	**$176,098**
Add back:		
Depreciation, amortization and accretion	$9,056	$9,249
Goodwill impairment	$25,007	$8,849
Capitalized software development costs	$11,252	——
Adjusted operating expenses	**$148,034**	**$158,000**

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Board of Directors
(as of 6/1/2021)

Royce Yudkoff
Chairman of the Board, Spok Holdings, Inc. and Co-Founder, ABRY Partners, LLC

Vincent D. Kelly
President and Chief Executive Officer, Spok, Inc

N. Blair Butterfield
Chairman of Wind River Advisory Group, LLC

Stacia A. Hylton
Principal of LS Advisory

Brian O'Reilly
Former Managing Director, Toronto Dominion Bank

Matthew Oristano
Chairman and Chief Executive Officer, Reaction Biology Corporation

Todd Stein
Co-Investment Manager, Braeside Investments, LLC

Christine M. Cournoyer
Former Chairperson and Chief Executive Officer, N-of-One, Inc.

Dr. Bobbie Byrne
Chief Information Officer, Advocate Aurora Health

Brett Shockley
Chief Executive Officer and Chairman
Journey AI, Inc.

Corporate Officers

Vincent D. Kelly
President and Chief Executive Officer

Michael W. Wallace
Chief Operating Officer, Chief Financial Officer

Sharon Woods Keisling
Corporate Secretary and Treasurer

Annual Meeting

A formal notice of the meeting is being mailed to each stockholder. The proxy statement, proxy card and 2020 Annual Report on Form 10-K are available at www.proxyvote.com.

This annual report contains the 2020 Annual Report on Form 10-K filed with the Securities and Exchange Commission. Spok Holdings, Inc. will provide without charge to each stockholder of record additional copies of the Company's 2020 Annual Report on Form 10-K. Please send your request to:

Investor Relations
Spok Holdings, Inc.
5911 Kingstowne Village Parkway, 6th floor
Alexandria, VA 22315

Investor and Media Information
Inquiries from investors, the financial community, and news organizations should be directed to Investor Relations and Corporate Communications at the address noted above, by calling (800) 611-8488, or by visiting our website at www.spok.com.

Securities Listing
The common stock of Spok Holdings, Inc., trading symbol "SPOK," trades on the NASDAQ National Market®.

Transfer Agent and Registrar
Computershare
P.O. Box 505000
Louisville, KY 40233
Direct: (781) 575-2725
Toll Free: (877) 498-8865
Hearing Impaired: TDD (800) 952-9245
www.computershare.com/investor

Independent Public Accountants
Grant Thornton LLP
1000 Wilson Boulevard, Suite 1400
Arlington, VA 22209

Corporate Counsel
Latham & Watkins LLP
555 Eleventh Street, NW, Suite 1000
Washington, DC 20004-1304

Spok, Inc.
5911 Kingstowne Village Parkway, 6th floor
Alexandria, VA 22315

Telephone (800) 611-8488
Fax (866) 382-1662
www.spok.com

ABOUT SPOK, INC.

Spok, Inc., a wholly owned subsidiary of Spok Holdings, Inc. (NASDAQ: SPOK), headquartered in Alexandria, Virginia, is proud to be a global leader in healthcare communications. We deliver clinical information to care teams when and where it matters most to improve patient outcomes. Top hospitals rely on the Spok Go® and Spok Care Connect® platforms to enhance workflows for clinicians and support administrative compliance. Our customers send over 100 million messages each month through their Spok® solutions. When seconds count and patients' lives are at stake, Spok enables smarter, faster clinical communication. For more information, visit spok.com or follow @spoktweets on Twitter.

spok.com

/Spoktweets

Rev: 5/21