

# **Tech Writing**

In my time as a technical writer, I've worked on everything from research papers and instruction manuals for SONY, marketing and promotion for City of Hope cancer research institute, and computer software manuals for Osborne-McGraw-Hill to online courses teaching adult learners the ins and outs of operating systems, Photoshop, and video apps.

Most recently:

- I worked for Intel on the many and diverse uses of AI in three verticals Healthcare, Retail Banking, Hospitality and Education, and Industry;
- was the lead technical writer on a team that translated an in-person technical training class into an online and VR training program for the US ARMY; and
- Blogged for Device Solutions (an electrical engineering firm) about its products and services.

Technology is endlessly interesting to me so I'm always ready to learn.

# INTEL

Copywriter, editor, and social media post creator for Intel's Internet of Things Group podcast, "Health and Life Sciences at the Edge." The HLS podcast is designed to showcase Intel's products, services, and initiatives to potential business partners around the world. Duties included helping define and shape project briefs, coordinating interviews with SMEs, proofing and editing audio scripts and graphics, rewriting and editing summaries for publication, ensuring that the UX interface for each podcast was accurate, and generating social media posts for marketing and promotion.

I was also tasked with editing and laying out transcripts of a series of four, Intel-hosted "JAM" sessions for internal publication. The JAM sessions featured medical professionals from a

variety of leading-edge disciplines (robotics, VRx, tissue engineering, data mining, telehealth, haptics, and virtual training) who came together to present and discuss their latest findings with Intel and their peers.

### Example 1: Health and Life Sciences Group

Title: The Marriage of AI & Edge Computing is Changing How & Where Work Gets Done

The intersection of Artificial Intelligence (AI) and Edge computing is resulting in a fundamental change in how we perceive, access, learn from, and employ data across a wide range of industries. The need for edge computing, or using a distributed computing architecture to shift data processing and storage closer to where the data is created to provide faster access to insights, is critical for low latency, privacy, and cost-effective movement of data.

Advances in AI have been fueled by *compute* becoming more sophisticated, powerful, and able to deliver very complex computations in a short amount of time. "The fuel that feeds AI is data," says Wouhaybi. "We have a lot of data we've collected across domains. But we can't scale unless we can collect more data. It's become a snowball effect in which the more value you get out of AI, the more motivated you are to collect data. And the more data you collect the more value you get."

Wouhaybi discussed the four ways AI learning is being used to solve challenges in a variety of industries:

• Continuous Learning: A single AI looks for ways to improve without input from other AIs.

• Distributed Learning: Groups of AI are deployed together, in the cell of a manufacturing facility for example, where they learn from and share what they learn with one another.

• Transfer Learning: AI watches, monitors, and mimics what human beings are doing, then seeks to improve on the process.

• Federated Learning: Massive amounts of data from multiple data sets is pooled, and AI is employed to study, learn from, and deliver outcomes without compromising privacy.

Despite what she describes as "remarkable advances in technology and innovation" that have occurred in both edge computing and AI, Wouhaybi feels that AI at the Edge is still in its infancy. "The more people play with AI, the better AI will be," she says, "and the better we will be both as professionals and as human beings. I can't wait to see what else AI at the edge will accomplish going forward."

To learn more about Rita Wouhaybi:

- Connect with her on LinkedIn
- Visit <u>http://www.intel.com/oneAPI</u>

Subscribe to this channel on Apple Podcasts, Spotify and Google Podcasts to hear more from the Intel Internet of Things Group.

**Example 2:** Retail, Banking, Hospitality, and Education vertical **Title:** Hybrid Learning Options

Hybrid learning, meaning the use of technology to make alternatives to standard, in-classroom learning available, is nothing new. However, the pandemic has created an urgent need for more and more diverse hybrid learning options that work for both teachers and students. According to Duncan Peberdy of Learn From Anywhere, many colleges and universities have long recognized the need for hybrid options but are unsure where investments should be made. "Hybrid learning isn't just the acquisition of ed tech," says Peberdy. "It's how that tech gets used – how staff and students are trained. There are lots of aspects around the technology that are crucial to getting it embedded and brought into everyday use."

One solution to the complex and evolving needs of hybrid learning is The Visual Learning Lab (VLL). The VLL is a partnership between ViewSonic, Kramer, AVer, and Intel that seeks to democratize and improve hybrid learning using "standard kit," meaning readily available products and services. "The great thing about the partnership we've got," says Peabody, "is that those companies could've fathomed something out on their own, but we decided that by coming together we could potentially create something far greater." The VLL has been working with Glasgow University to deploy and test a variety of hybrid learning options including remote conferencing, large screen collaboration, movement tracking, air quality, lighting, temperature control, and digital signage.

Another, and equally vital part of the hybrid learning puzzle is data. "For me, collecting and analyzing data from all sensors in our kit to see how effective our solutions have been is the key to moving towards a Smart Campus," says Frost. Smart Campuses collect and make use of data from all sensors deployed in a building with a goal of better understanding and improving the educational environment and experience. "That research side is something we need to explore more," says Claxton, "because we're going to gain a lot of data, and we don't want to slip back to pre-COVID days. We want to actually change what future classrooms will look like."

Frost, Claxton, and Peberdy welcome feedback and communication via LinkedIn.

Subscribe to this channel on Apple Podcasts, Spotify, or Google Podcasts to hear more from the Intel Internet of Things Group.

Example 3: Industrial Vertical

**Title**: Reimagining Patient Rooms in Smart Hospitals of the Future **Subtitle**: Exploring how smart technologies deployed in patient rooms can create a more connected, cohesive, and effective healthcare system

## **KEY POINTS**

- Smart technologies in patient rooms improve workflow efficiencies and improve patient care.
- More than 30% of experienced nurses are considering leaving the profession, and 28% of new grads will leave within their first year.
- The three metrics of success positive outcomes for patients, hospitals, and staff must be met for hospitals to invest in smart technologies.

# WRITE-UP

The healthcare industry is undergoing dramatic changes thanks to rapid digitization and the adoption of AI. Nowhere are these changes more evident than in hospitals, where increased connectivity, data analysis at the edge, and patient monitoring are helping staff rethink patient care. In this episode of "Health and Life Sciences at the Edge," host Daniel Litman talks with Karen Perry, Intel's Chief Healthcare IoT Solution Architect, and Lisbeth Votruba, Chief Clinical Innovation Officer at AvaSure, about how smart technologies can improve care, particularly when implemented in patient rooms.

Karen Perry, whose job is to look at all parts of the Smart Hospital puzzle, says "We have to work closely with clinicians to make sure that when we introduce a technology it's something they can leverage."

Lisbeth Votruba agrees saying, "I believe we've reached an inflection point we've been heading towards for years. More and more nurses are considering leaving and more than 28% of new nurses will leave the profession within the first year."

The good news, according to Votruba, is that there's a new urgency and willingness to invest in smart solutions that support the workforce. "One of the big barriers to implementing forward thinking technology in hospitals is competing priorities," says Votruba. "I'm seeing more and more leaders prioritizing technologies that help educate, retain, and make the work of new staff easier."

Perry and Votruba are excited about the benefits of adding smart technologies to patient rooms, particularly computer vision and audio. However, Perry is quick to point out that the three metrics of success – positive outcomes for patients, the workforce, and the hospital – must be met. "As we introduce capabilities into hospitals, we have to create measurable goals," she says. "Those three metrics are like the three legs of a tripod. We have to hit every one of them for hospitals to invest."

Looking to the future, Perry and Votruba see the use of smart technologies as a journey. "What can happen next," says Perry, "is we follow patients on their journeys through the system. That will allow us to create a more connected, cohesive, and effective healthcare system."

I'm very hopeful," says Votruba. "I'm not afraid of technology. I've seen the benefits and believe that the investment we're making in technology will improve both the care patients receive and

the humanity of how it's delivered. Hopefully smart tech will let caregivers get back to the joy of why they chose this profession."

Connect with Karen Perry and Lisbeth Votruba on LinkedIn or visit: Intel Smart Hospitals, Intel Health and Life Sciences, AvaSure.

Subscribe to this channel on Apple Podcasts, Spotify, or Google Podcasts to hear more from the Intel Internet of Things Group.

KEYWORDS: Intel, IoT, internet of things, edge, edge computing, health and life sciences, thought leadership, healthcare, smart hospitals, HIMSS22, Healthcare Information and Management Systems Society, AI, MedTech, AvaSure

Example 4: Health and Life Sciences Group

**Title:** Improving the Accuracy of Medical Imaging Analysis with Artificial Intelligence **Subtitle:** Alex Flores joins Health and Life Sciences at the Edge to explore Intel's role in improving the accuracy of medical imaging analysis with artificial intelligence (AI).

### **KEY POINTS**

- Medical imaging is taking the lead in the use of AI and analytics to improve the way healthcare is delivered.
- A significant percentage of healthcare leaders began using or are planning to use Al since the onset of COVID-19.
- The use of Edge technology and AI in medical imaging demonstrates how data can be captured and analyzed to improve healthcare outcomes across healthcare industries.

### WRITE-UP

Medical imaging is pioneering the use of AI and analytics to improve the way healthcare is delivered. As the Head of Health Solutions for Intel's Internet of Things Group, in the Health and Life Sciences and Emerging Technology organization, Alex Flores is uniquely qualified to talk about how AI and Edge technologies are improving the accuracy of medical imaging analysis. This trend began about ten years ago and has accelerated rapidly over the past three years.

"In July of 2020, Intel conducted a survey of over 200 US healthcare leaders. We were looking at key technology trends and the way technology needs have changed post-COVID-19," Flores said. "We learned that about 45% of the respondents were using, or planning to use, AI in 2020 before COVID-19. That percentage jumped to about 84% since the onset of COVID-19."

Flores discussed the benefits and problems associated with integrating Edge technology and Al into medical imaging. While adding more compute to or next to devices can shorten the time needed for clinicians to do their jobs, it can also create challenges for manufacturers of Edge devices. "Edge computing is about doing more processing on or next to a device," said Flores.

"But when you add an external device, power consumption and acoustics become an issue. You can't just stuff more power-hungry GPUs into an Edge device because they will increase fan size and noise. Imagine sitting in a clinician's office reviewing your results but not being able to hear because the Edge server under their desk is too loud."

It's estimated that the health and life sciences industry produces about a third of the world's data. But less than three percent of that data has been analyzed. Flores believes that by partnering with health and life sciences industry leaders to address the challenges of harnessing these vast amounts of data Intel can help them come up with actionable insights. "In my opinion, we haven't even scratched the surface of what is possible," Flores said. "We work with our partners to architect optimum hardware platforms, then layer the right software tools to ensure that the solution is optimized to meet their needs. The exciting promise of AI in medical imaging is that it has progressed significantly and in my opinion is continuing to accelerate."

Learn more about improving the accuracy of medical imaging analysis with AI by connecting with Alex Flores on LinkedIn or visit <u>http://www.intel.com/healthcare</u>

Subscribe to this channel on Apple Podcasts, Spotify, Google Podcasts, or Simplecast to hear more from the Intel Internet of Things Group.

KEYWORDS: Intel, IoT, internet of things, medical imaging, edge, edge computing, health and life sciences, thought leadership, healthcare solutions, AI, medical imaging analysis

# **Device Solutions**

Device Solutions is an embedded engineering firm located in Research Triangle Park, North Carolina. It offers product development services including feasibility studies, embedded hardware and firmware design and development, industry and regulatory certifications and approvals, and manufacturing support. I served as the Device Solutions' blogger for twelve months. Our goal was to engage the interest of both the general public and end users who might know more about the technologies involved.

Example 1: The Heart of the Matter



# Reliant Health Video: <a href="https://www.youtube.com/watch?v=NmS0N1b8qW4">https://www.youtube.com/watch?v=NmS0N1b8qW4</a>

It would be hard to imagine a more compelling or challenging project to tackle than creating a wireless communication system for a ventricular assist device (VAD), but that's exactly what Device Solutions was asked to do in 2013.

Simply put, a VAD is a mechanical pump that helps support heart function and blood flow in people with weakened hearts. The device takes blood from a lower chamber of the heart and helps pump it throughout the body. VADs can be used to assist the left, right or both ventricles of the heart, but the most common is the LVAD. It helps the left ventricle pump blood to the aorta. VADs were originally developed to serve as a temporary bridge to heart recovery, and then as a bridge to transplant. Over the past 10 years, however, VADs have been approved by the US Food and Drug Administration to provide permanent or lifetime support for patients with end-stage heart failure.



Illustration of one of the first external VADS

Illustration of one of the first internal LVADs

Image credit National Institutes of Health

The specific VAD Device Solutions was asked to collaborate on is the LVAD produced by ReliantHeart Inc. known as the HeartAssist5 (HA5). Unlike the very first VADS, which were cumbersome external devices powered by 300 lb tanks of compressed air, the HeartAssist5 is a small 71mm x 38mm internal pump that is implanted within a patient's chest cavity.



HeartAssist5 - 71mm x 38mm

The HA5's predecessors were developed through a unique collaboration between engineers at Johnson Space Center, famed heart surgeons Drs. DeBakey and Noon at the DeBakey Heart Center at Baylor College, and researchers in NASA's Advanced Supercomputing (NAS) Division. The Johnson engineers built several versions of an internal device based on the criteria and feedback supplied by DeBakey's medical team, then the NASA team used their supercomputers and computational fluid dynamics technology to analyze blood flow through the battery-powered pump. As a result of this analysis, NASA was able to suggest design improvements that solved the problem of blood cells being damaged by friction, and clotting caused by stagnant regions in the pump. The first successful implantation of a left ventricular assist device was completed in 1966 by Dr. <u>DeBakey</u>.



# Inside the HeartAssist5 controller

ReliantHeart Inc. first approached Device Solutions in 2013 for help with their HeartAssistRemote Monitoring System. The technology included in the HeartAssist5's flow sensor consistently measures real-time blood flow and tracks speed and electrical current usage by the pump's motor. This invaluable information is sent via the LVAD's "driveline" to the "Conquest2 Controller," the external device which powers and controls the LVAD. Device Solutions expertise was needed to send this data via 2G cellular networks to secure computers and wireless devices so that patients could be monitored remotely by their medical teams.

According to William Graham, ReliantHeart's Director of Engineering, Device Solutions work on HeartAssistRemote was outstanding. "It was a huge accomplishment. Device solutions had to analyze the entire system and modify each component of the controller to operate with the cellular module." Device Solutions is now hard at work helping ReliantHeart make the transition from 2G to 3G cellular technology and collaborating on developing a Transcutaneous Energy Transfer System (TET) for the HeartAssist5. This means that the HA5 will be powered by an internal battery, which will be recharged through the skin. This will eliminate the need for wires exiting the body, dramatically reducing the chance of infection.



Illustration of HeartAssist5 new TET system

Mike Sink, Device Solutions' project manager overseeing this next phase of the collaboration says that he's proud of Device Solutions' increased involvement and is looking forward to the system testing phase. "That's when all the different components by all the different companies working on the project get integrated and we see how it all works together."

For his part, Device Solutions' co-founder and CTO Chris Lamb is proud not only of the work Device Solutions has done but excited by the opportunity to make a real difference in people's lives as well. "What can I say? I'm the geek who likes to make things work," he says, "and the challenge of making a device that helps people in the real-world just makes it better."

- Jena Ball for Device Solutions

# Example 2 - Engineering Speak: When Worlds Collide

Every industry, big or small, high or low tech, devoted to business development, food service, or transportation, has evolved its own lingo. Often referred to as "industry-speak," these are words and phrases that can cause great confusion to the uninitiated. Some favorites include "Incubator," a center where start-up companies are mentored; "Flying Donut," a CB radio term used by truckers to describe a police helicopter; and "86ed" used by bartenders when they will no longer serve a customer who has had enough to drink.

Engineering firms like Device Solutions, with their teams of tech-savvy employees, are natural incubators for "industry-speak." We thought it would be interesting to share some of the most common engineering terms heard at Device Solutions with non-engineers. What do non-engineers think, for example, when engineers start talking about transformers? Do they realize they are talking about a device used to transfer electrical energy from one circuit to another, or do they assume the conversation is about one of the sci-fi action movies called, "The Transformers?" Obviously it's a matter of context, but it was fun to see what happens when two very different worlds collide.

NOTE: Words and phrases were taken from actual conversations with Device Solutions' employees. Non-engineers were asked what came to mind when they heard the words listed Below.

### B.O.M.

Device Solutions' engineers do not spell out "B.O.M." when talking to one another. Instead they simply say "BOM," which the uninitiated assume means bomb. The immediate assumption is that the engineer is working on some kind of explosive device.

To engineers, "BOM" is the acronym for Bill of Materials, which is simply a list of the parts and their quantities needed to manufacture a product.

### Breadboard

To non-engineers, a bread board (two words) is a polished piece of wood used for cutting or kneading bread. To engineers, a breadboard (one word) is a perforated, reusable, plastic board that's used for testing and prototyping circuits. No solder is used on breadboards, which means they are good for doing fast and easy prototyping.

### Conductor

Our non-engineers wanted to know if we were asking them about an orchestra conductor or a train conductor. For engineers, accustomed as they are to directing and controlling the flow of electricity, the word conductor immediately conjures up a component or material that conducts electrical current, allowing it to flow in one or more directions.

# Flux

To non-engineers, flux refers to situations or conditions that are moving, changing or unresolved, such as travel plans that are dependent on uncertain weather. To be in a state of flux implies that a person is undecided. Mention flux to an engineer, however, and he/she will assume you are referring to the paste-like substance known used when soldering to reduce the oxides that form when hot metal comes in contact with air.

# Ohm

Though "ohm" and "Om" are spelled differently, they sound the same, so when asked, most non-engineers thought we were referring to the sacred sound in Indian religions that is often used as a mantra in Hinduism, Buddhism and Jainism. Engineers, on the other hand, heard "ohm" and assumed we were talking about the electrical resistance between two points of a conductor.

# Spin

Non-engineers were very clear about this one. To spin means to turn, as in take the car for a spin around the block, or ride a stationary bike in a spin class. For engineers, spin refers to the process of laying out, routing, populating and testing a printed circuit board. Essentially it means to redo, try again, or revise.

Given the vastly different uses of words like the ones above, the ever evolving lingo and the popularity of text messaging with auto-correct, it's no wonder people get confused when trying to communicate. Perhaps the most important thing to remember is consider the source and the context of the exchange. If you are in a Device Solutions' conference room discussing updates to a project, it's probably safe to assume that a bus has something to do with a metal strip that conducts electricity, not a 40-foot motor vehicle that carries passengers around town.

- Jena Ball for Device Solutions

## Example 3 - Putting Your Device to the Test

"Quality is never an accident; it is always the result of intelligent effort." - John Ruskin

Turning ideas into electronic devices that are functional, reliable and cost effective is no small feat. Some of the least understood, but critically important steps in manufacturing are related to testing – bare Printed Circuit Boards (PCBs), assembled PCBs, and fully assembled devices. Choices that are made for manufacturing testing will directly and indirectly impact the cost and quality of the final manufactured products. Manufacturing testing plays a critical role in identifying

and correcting potential issues before a product is shipped.

### Three Primary Points for Testing: Bare PCBs, Assembled PCBs, and Assembled Devices

Before a new electronic device can be assembled, Device Solutions' engineers create plans for all of the significant components, their interconnections, and how they and the final product will be tested. It is important to know what the test methods will be because many of those tests require that special features (such as test points, user interfaces, and communication ports) be included in the design and layout of a PCB.

Once the schematic has been created, connections between the components (resistors, capacitors, inductors, integrated circuits and displays) are laid out using a PCB design tool. These designs are then used to create the physical PCBs, a process known as fabrication. "Bare-board" tests can be done to ensure that the PCBs have been fabricated properly before components are placed on the PCBs.

After components have been placed and soldered to the PCB, called "populating the board," and before the populated PCB is enclosed in a protective outer case (such as the plastic case of a mobile phone) their functionality can be tested. Depending on the equipment needed, the number of tests, and the time required to complete the tests, human testing or more automated types of testing may be used. In some cases, additional PCBs, modules, and other peripherals may be connected together and tested before placing into the enclosure.

Another approach, referred to as an "In Circuit Test" or ICT, is an automated test performed by having probes make contact with predefined test points on a board. These tests measure the electrical responses between contact points and compare them to expected values. Including test points for purposes of running ICT on a board can complicate the PCB layout and can take up additional space on the PCB. However, ICT makes rapid, automated testing possible. Two common approaches to ICT include "Bed of Nails" and "Flying Probe" tests.

"Bed of Nails" refers to a custom built fixture that tests a specific PCB layout. It consists of anywhere from tens to hundreds of spring-loaded probes that simultaneously make contact with the test points on a PCB (bottom and/or top of the board).

"Flying Probes," on the other hand, are computer controlled test probes that make contact with test points on a PCB to take electrical readings. The advantage of this type of testing is that the fixture can be configured and programmed to test many different kinds of PCBs. However, testing times are longer and programming the probes adds additional costs.

The final step in manufacturing testing is referred to as "Final Assembly Testing." These tests are performed on fully assembled products and can be done in a couple of ways. The first way is a manual test by a human operator interacting with the device. The second way is a fully automated or "self" test. Since the device will be testing itself, significant expense is required to develop the software needed to program the device to run its own diagnostics. For very high volume products, however, this can be the most cost effective testing option.

# Not All Testing is Created Equal

Although manufacturing testing is a necessary part of product manufacturing, determining acceptable quality levels is also important. The cost of ensuring perfection, especially when perfection is not strictly necessary, can be prohibitive. On the other hand, if perfection is the goal, which is the case with life-saving medical devices, then additional testing costs are warranted. Device Solutions works with each individual client to evaluate all the data and parameters before deciding on the appropriate level of manufacturing testing. To quote Michael Pail, Device Solutions' Hardware Engineering Manager, "Deciding on the appropriate level and method of manufacturing testing can be reduced to a business case decision like most, if not all, other aspects of product design. The goal is to deliver a product with a known, acceptable quality level at the lowest possible overall cost."

- Jena Ball for Device Solutions

Example 4 - Connecting the Dots: The Brains and Brawn of Soldering

On the surface of things, soldering is a straightforward and fundamental part of how things get done in an electrical engineering firm. This is particularly true of a company like Device Solutions whose engineers spend their days designing, prototyping and iterating custom devices. However, much like the circuit boards they work with, soldering at Device Solutions is a multi-layered process that is as much about the people and the environment in which they work as it is about the physical act of soldering. But let's begin with the basics.

Simply put, soldering is the act of joining two (usually metal) pieces by melting and putting a filler material in the gap between them. The filler, known as "solder," is a metal or metallic alloy that has a lower melting point than the two pieces it is connecting. In addition to the solder itself, a substance known as "flux" is used to reduce the oxides that form when hot metal comes in contact with air. Many solders (which look like spools of metal thread) come with flux in their cores, but flux paste (in a jar or a tube) is also used.

In electrical engineering work, which uses very small parts, solder is melted using a hand tool called a soldering iron - basically a hot metal tip with an insulated handle. There are different sizes and shapes of tips depending on the size of the components being soldered. Some of the parts are so small that a microscope is required to see and solder them to a board. That gives you an idea of how skilled and precise the person soldering needs to be. This video illustrates the basics of simple soldering:

https://www.youtube.com/watch?v=5uiroWBkdFY

One of Device Solutions' resident soldering and building gurus is Nancy Kiesow. "My job is to fix or build anything that anybody brings me," Nancy says. This includes everything from fixing a broken door to soldering components to circuit boards. Interestingly, most engineers prefer to have Nancy or her colleague Rob Zeher do their soldering for them. "I've been in manufacturing since I was 18, so I know circuit boards inside and out," says Nancy. "I've also had A LOT of practice soldering, so it's faster and safer for me to do it. I tell the guys that if I smell burning skin I'm going to be mad," she adds. "But just to be safe I keep an aloe plant in the office." Another reason Nancy likes to be involved in the iteration process is that she knows what looks and works right. "I look at the bread boards (temporary circuit boards for testing and prototyping) and drawings the guys give me and ask questions about layout, wiring and connections. It's my job to understand what the engineers want to accomplish and translate that into a physical set-up that looks professional and works right," Nancy says.

Nancy refers to her collaboration with the engineers as a well-oiled machine. "The engineers have the brains and I have the brawn," she laughs. "They're so smart it's scary sometimes, but on the other hand, I'm really good at making those ideas work. We're a good team."

Once a initial prototype has been completed, the engineers go back to testing and fine tuning their ideas, and it's not unusual for them to come back and ask her to change things on a board several times. "You have to remember that while I'm working on the board, someone else is working on the software that will make it all run. It's a system of checks and balances."

How does she know when a project is finally completed? "Well, it's funny but the guys just gradually fade away. I see them less and less until one day I realize they haven't stopped by with a request for a while. That's when I know my job is done."

And the best part of being on the build and repair team? "It feels really good when a device I worked on goes into production," Nancy says. "I'm proud of what we've accomplished."

Jena Ball for Device Solutions