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Issue: July 5, 2021

## **STRAP Technologies CEO and Founder, Diego Roel, Wants to Replace the White Cane for the Blind...Using a Similar Technology Found in Driverless Cars**



**Interview conducted by:  
Lynn Fosse, Senior Editor  
CEOCFO Magazine**

**Diego Roel  
CEO / Founder STRAP Technologies**

**CEOCFO: *Mr. Roel, what is the vision behind Strap Technologies?***

**Mr. Roel:** The vision behind Strap Technologies is to give the visually impaired more independence and rights. There are more than 300 million visually impaired people in the world, and according to the World Health Organization every 5 seconds someone else loses their sight. We are talking about 70 thousand plus persons each day that lose their sight and with it, their independence. The fact is, as we are speaking now, or as you are reading this,

there are many things that the visually impaired person is trying to accomplish or to execute and they are unable to because of their impairment. This means they are not autonomous.

The vision of STRAP Technologies is the deployment of these kinds of high technology devices for the visually impaired and for them to be able to accomplish the same tasks with the same accuracy as a person who can see.

**CEOCFO: *Would you give us some examples of how you are able to do that, what type of task and what might be the technology that can help someone?***

**Mr. Roel:** Our device is a wearable device with strategically placed sensors that are "looking" all around; on the sides, at eye-level, on the floor, on the mid-section. All of these sensors are observing what is happening around the person wearing the device, so that if there is a possible collision, it will notify the user through a haptic feedback embedded in the body. Whenever you feel a vibration or the movement of the haptics, the user will know exactly what obstacle they have, how far it is, how big it is and how to avoid it.

STRAP will enable visually impaired people to do many things that today they cannot, or they may struggle to do. For example, right now there are many college students that attend university from home because they are unable to navigate correctly on time to the classroom, or go to the bathroom, or anything else they need. It forces them to stay home from school and that is not fair. In addition, over 85 percent of the visually impaired people in the US are unemployed. Imagine if we delivered a device that can make over 85 percent of unemployed visually impaired people rejoin the workforce, rejoin the path towards their jobs, because now, with these kinds of tools, they will have the ability to take new paths. They will be able to do things that normally they would not be able to.

We have other features that help and make it an immersive experience for the user. We have a lot of product specifications, such as straight-line navigation and orientation, which creates an imaginary straight line on the floor that notifies the user via the sensors should they move away from the line. We are helping the blind to be able to walk in a straight line or to navigate complex routes, with the ability to know exactly when they need to turn, which direction and without colliding into anyone or anything.

This is not just for detecting obstacles, but also to help identify objects as well. For example, the haptic sensors give you different indications as to whether there is a person, as opposed to whether it is a wall, a door, a chair, or even when it is a low-lying obstacle. This is a huge opportunity for the visually impaired to be able to move forward in life and to do even more tasks and accomplish more than they are doing up to date.

**CEO CFO: *How do you help a user become comfortable with STRAP? What is involved in learning to use the device?***

**Mr. Roel:** That is a great question. The device has another feature called Learning Mode, where you plug in headphones or use Bluetooth to hear the instruction manual explaining how to use the device. The training session is like a video game, so as the headphones are speaking and explaining the device to you, it will start to vibrate and show you in real time, all the experiences and all the haptics, to make sure that you are understanding correctly.

The haptic feedback language used in the STRAP device is something really easy to use and really easy to understand. Right now, our users are able to understand the haptic language, all the way from 6 years old to 70 years old. They can understand and learn all of the haptics in between 3 and 10 minutes, because they are super simple. In using the haptics, we are communicating with you, but through our language or patterns, or rhythms, of vibrations. We are not trying to translate or tell you if it is a chair. You will know this because of the kind of vibration that hits the obstacle. For example, when you are close to a down staircase, you will feel a vibration in kind of a gradient, from up to down, from the upper part of your chest, the middle part of your chest and then the lower part of your chest, super quickly. You will feel that motion from top to bottom, so that way you know that it is a down staircase. We do this by also changing the sequence. For example, to show you the size of the steps in a stairway, we imitate the rhythm of a bouncing ball, bouncing through the steps. If they are small steps you will build up a vibration closer to this, "boom, boom, boom." However, if you are in a downstairs stairway again, but with bigger steps, you will feel boom-boom-boom. That way, you are able to understand and map in your mind, what kind of obstacle, the dimensions and everything.

**"When we started the company to create assisted technologies only for the blind, we underestimated the technology needed to do that... Until the middle of last year the technologies to do this were not available. Now we have sensors with the characteristics and capability to do this. We finally have technology that enabled us to have this. Some people say we are the same as Tesla, but instead of using cars we are helping people." Diego Roel**

We communicate this in an intuitive way, so we are able to deliver complex pieces of information in a really simple and interesting way. We recommend that when you are first using the device, to use it along with your cane, so you can be more comfortable and have a little bit more security. As you feel comfortable you can put down the cane and go without the cane when you are more familiar with the haptics. After 2 or 3 weeks or so, this becomes like driving. For instance, when you start to drive you are thinking about everything. You are thinking about the people and these streetlights and all the cars and things. However, after some months of driving, you stop thinking about driving. You just drive. It goes right into the back of your mind, and you do it unconsciously, almost automatically. The haptic becomes like a 6<sup>th</sup> sense for the user. There is a point, a threshold, when our users are comfortable enough to move around to the point of not even thinking about the haptics.

**CEO CFO: *Is the product available today? Where are you in commercialization?***

**Mr. Roel:** A good question as well. Right now, STRAP is not yet in the market. Right now, we are focusing on finishing some manufacturing assembly line processes. However, you can preorder now if you go to our website, strap.tech, where the device has a discounted price of \$500. And right now, since the product is not yet on the market, we just ask you for an up-front amount of \$50 and when we send you the device you pay the rest.

**CEO CFO: *Not a lot of money for what it can do!***

**Mr. Roel:** For the price of a cell phone, you can have a huge, new life.

**CEO CFO: *What changed from your original concept to where you are today? What did you learn as you were putting all the various technologies together?***

**Mr. Roel:** When we started the company to create assisted technologies only for the blind, we underestimated the technology needed to do that. There are several technologies for the blind right now out there in the market. However, they are add-ons to the cane, or devices you would use at the same time with the cane. Until the middle of last year the technologies to do this were not available. Now we have sensors with the characteristics and capability to do this. We finally have technology that enabled us to have this. Some people say we are the same as Tesla, but instead of using cars we are helping people.

When we started the company, we started the research and development and realized the complex technology needed to accomplish this. We realized the device needed to be worn on the chest and perfectly detect that there is an obstacle; a bed, sidewalk, trees, cars, people and animals and everything visually impaired may need to detect. Therefore, we ended up taking a little bit more time than expected, much more money and research than expected, but I am confident we will deliver the best product possible. I am proud to say that we are the first company in the world that is delivering a product that a blind person can use, substituting the cane. This is the first replacement of the cane in history.

**CEO CFO: *How did you get involved personally in this endeavor?***

**Mr. Roel:** When I was 7 years old, I started learning robotics and since then I fell in love with robotics. Until today, it is one of my biggest passions. I was even a robotics teacher for 6 years. However, then I discovered that there were people in the world with impairments. When I was 10 years old, I was in a supermarket with my mom when I saw a man using a walker. He had some mobility impairments in the legs and one of his arms was shrunk, so he couldn't even grab an apple. Therefore, he needed another person to assist him. I remember thinking to myself, "Is it possible that something so easy to do for me and for you, could be impossible for him to do? That day I made a personal promise that someday I would do something to make that person able to grab that apple and live as a normal person can.

About 7 years later I had a flashback of this memory, so I started my research on the web, and I found out that there are a lot of companies and corporations spending millions of dollars to develop assisted technology for the mobility impaired, like wheelchairs. However, as I stated before, there are over 300 million blind people in the world, and no one was addressing their needs with assisted technologies. In almost a century nothing has changed. We started STRAP Technologies to address this need and enable visually impaired people to be able to physically go to college and to be able to have new opportunities of life, to be able to play new sports, to be able to do whatever they want.