Terrasense Analytics – providing Ethical Artificial Intelligence to support Canada's Defense and Security as well as Allied Nations

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Interview conducted by:
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CEOCFO: *Mr. McGinty, what is the overall vision behind the company? What is the focus right now at TerraSense Analytics?*
Mr. McGinty: TerraSense is a defense, artificial intelligence company. Our vision is to provide ethical artificial intelligence support to human beings in Canada and our allied nations to support defense and security.

CEOCFO: *Would you define "ethical" in the context you are using it?*
Mr. McGinty: When we talk of the defense space, in the end, we are talking about conflict, where people's lives are on the line. Therefore, it is very important that we apply artificial intelligence to support humans, that we make sure that the influence of artificial intelligence, in that context, is appropriate to the safety of people and to support humans in making difficult decisions.

CEOCFO: *What products and services are available today? What might be in the works at TerraSense?*
Mr. McGinty: TerraSense is just pre-commercialization. We are in a serious phase of research and development. Our innovative technology won nearly $15 million in Canadian government defense innovation funding to date. We have built an artificial intelligence automatic object recognition system, to support operators in quickly and effectively detecting, recognizing, identifying, and locating possible objects or targets of interest in a complex world.

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CEOCFO: *What are some of the challenges using AI in this arena that might not be found where AI is used in other instances?*
Mr. McGinty: In some way, we touched on the ethical end. The consequences of failure in other industries can be serious, for example, if you were to look at an AI system that accesses stock, you could have financial consequences. Or if we were to examine the automotive industry, where we see AI that is used for things like autonomous vehicle operations, there is a safety component. The consequences of military use of AI are very serious decisions where people's lives are on the line, both people who are operating the system, and perhaps people who are on the other end of a military engagement.

AI system autonomy is something that we take very seriously. As consequences of failure are high, it's imperative that we manage and control AI usage to eliminate or at least minimize risks and failures.

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**CEOCFO: *How do you know you have reached critical mass with your AI?***
Mr. McGinty: It is about data: training data and testing data. Therefore, the answer is that we both bring in training data, but in the end, we have to do other testing data or testing environments and recognize that we never expect to get 100% solutions. What we typically do is provide support and guidance to human beings. There are still human beings who are in or on the loop, so I think that the answer is that as long as what we provide is useful to those human beings and we have tested it rigorously against appropriate data, we are therefore providing value.

CEOCFO: *TerraSense Analytics is pre-commercialization. What is the commercialization strategy, and who would be purchasing your systems and solutions?*
Mr. McGinty: : Most government and defense procurement is delivered by large prime contractors bidding on programs which are fulfilling the requirements of large government programs of record. We've been building a meaningful product

and integrating it with a large defense prime contractor, to have them place it on a significant program of record. However, the pace of defense procurement tends to be glacially slow. We've also projected that our technology can be used across multiple industries and organizations such as maritime surveillance companies and organizations, Coast Guards, border agencies, illegal fishing, oil detection, and marine mammal detection.

We are very fortunate to have won a number of IDEAs (Innovation for Defence Excellence and Security) challenges which are funding mechanisms to assist Canadian innovators in solving defence and security challenges. We won the largest award that has ever been given out, which has given us a multi-year runway and fantastic access to both data and user products, which really help to cross that commercialization chasm, and build a meaningful product.
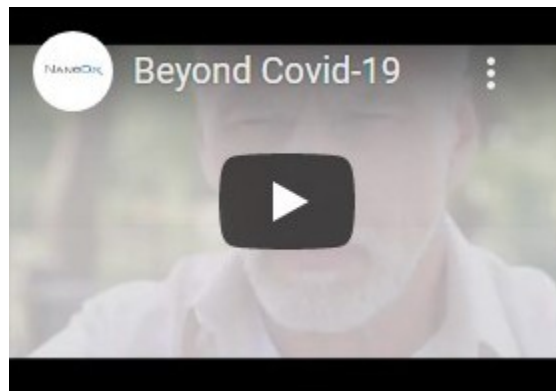
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CEOCFO: *Where does the use of AI stand today in defense? How common is it?*
Mr. McGinty: Emergent, but early, is the answer. In the month of June, the UK published its defense AI strategy. The US only published its defense DOD AI strategy within the last few months, so I think the answer is nascent. However, everyone recognizes that the volume of data that is available to modern systems: drones that we see in Ukraine, satellites, and mobile phones are ubiquitous, meaning that there is a vast quantity of data, more than individual human beings can process. This sensory overload requires the support of AI for defense users to understand what is happening. That is one imperative.

The other imperative was voiced recently by the head of the FBI and the head of MI5. Both had publically stated that adversarial nations, particularly China, take an extremely predatory view of our technology. They have a view of the world and neighbouring areas, like Taiwan, which could in the end cause conflict. That is one of the reasons why there is an increasing urgency amongst Western Nations to make sure that we have the technological ability to match, if not beat, the possible technologies that could come from nations that take a different view on the world from ours.

CEOCFO: *What is CRWN.ai? Would you tell us what the company is about and why it is a now a stand alone entity?*
Mr. Miller: CRWN.ai was initially established to provide a vessel in which we could move a platform that was historically developed under TerraSense. What the CRWN platform does is provide real-time insight into the condition of transmission systems from anywhere in the world, generating actionable intelligence to help utilities reduce costs, reduce greenhouse gas emissions caused by transmission loss, replace and repair components before they fail, and create more resilient transmission systems. On top of that, they get better situational awareness of the transmission asset. Therefore, it is a completely different business or separate platform, then what TerraSense now has, which is MIST (Multimodal Input Surveillance & Tracking). The reason we separated them was because the TerraSense MIST platform is really a defense maritime surveillance platform. CRWN is not.

CRWN is for linear infrastructure, and specifically, we are targeting transmission infrastructure. What this does is, for

example, currently, if a transmission company has a problem on their line, they will detect it between 2 substations. They do not necessarily know what is going on in between. In order for them to find that and figure out what it is, they either have to drive out and use manpower, or they have to go and fly out to it.

Knowing this system and challenges, CRWN built a small box which monitors the entire transmission line through its own communication network. You do not need cellular transmission, you do not need Wi-Fi, and it will communicate, geo reference, and classify issues that occur on the line and give the transmission company situational awareness. Now, it is not in the commercialization stage yet. It is at a Beta testing stage right now, and we are moving forward to work with some utility partners.

CEOCFO: ***How are you able to do this effectively? What do you understand or have you been able to create, that will allow for a system that works the way it really should?***
Mr. Miller: When we initially looked at the problem, we were already an artificial intelligence company. What we saw was a number of different industries out there with linear assets, and they had no real-time monitoring of those assets. We looked at where there were issues, and we already knew about the AI piece, plus also the communications capabilities of the new technologies. Therefore, by combining those two components we have actually developed something where you have AI embedded, built into a hardware piece that can actually communicate. The actual communications system is quite simple. It is a LoRa network (long range radio communication technique), which is very common in the public community now. We have tested the equipment thoroughly, and can confidently demonstrate that it works.

Now we know that we can move forward in that Beta testing phase, but the key thing here is that we need to work with a utilities partner. We'd like to understand the actual pain points they face so we can ensure that our AI service can properly detect, target and service the real problem areas they have. At the end of the day, our goal is to develop a system that actually ends up with predictive maintenance. Preventative and predictive maintenance can reduce the risk of fire, transmission failure that could cause fire, and a number of other solutions to problems, for instance, reducing energy losses on these transmission lines.

CEOCFO: ***What do you see as either the ease or the difficulty in getting a foot in the door to let the utilities know what you have, and hopefully want to take some steps to work with you?***
Mr. Miller: This is actually an excellent question because the utilities market is a very difficult market to penetrate. Our method is actually not to go after really large companies, but to go after smaller to medium-sized utility groups, that have more capacity to enact a quick decision-making process. We would target larger companies when CRWN is at a more developed stage like pre-commercialization, approximately 2 years down the road from now.

What we are targeting is more medium to small-sized utilities that can actually make quick decisions, that have the, let us say, agile capabilities to work with us and get it onto the transmission lines, and are willing to go out and test it.

CEOCFO: ***Are you primarily in Canada and/or the US??***
Mr. Miller: Right now, we currently have a Canadian utility partner, but will be targeting and looking at doing Beta testing down in the US, also potentially with EPRI (Electric Power Research Institute), which is the electrical producers' utilities group in the US.

CEOCFO: ***On the TerraSense website there is a great deal of information about your people, your culture and the fun that you have. How important is that for both of these companies? When did you realize the need and value for this type of company atmosphere?***
Mr. Miller: Mike and I can both answer this question. Back in 2017/2018, when we were getting TerraSense setup, some of the staff wanted to look at what is really important in a business. One of the key things here is that in the current tech environment, acquiring good, talented people is the number one challenge for these businesses. Now, it has been exacerbated with COVID, inflation, and young people entering the workforce, who have a completely different expectation of the work/life balance, from even 2 years ago.

Fortunately, prior to this, we wanted to set up a company culture that was very open, and transparent, that would really give the employees a say in the company. That open transparency is in all of the business components, whether it is

salaries, job positions, or benefits. Along with that, we have developed an internal shared system where all of the company information is put in a central location so that everyone can go in to read, input or learn more. What we wanted to do is really, truly empower everyone working for the company, and along with that, feel that our culture basically vibrated through everything. We were not just saying, we are a company that is actually enacting this culture. I will let Mike take over from now because he has really taken it to that next level with the group at TerraSense.

Mr. McGinty: First, I can start with that it is a great testament to Eric and the team that came before I was CEO here, that they set up such a good culture. As a tech company, we have IP, and we have people. Those are the things that really make us worth our salt. Therefore, the real heart of the business is the talent. To understand how our products are developed, you have to understand our people. We work hard at attracting, retaining, satisfying, and engaging our people. It is super important to us, so we really try to reinforce that. Our website is quite people-centric. Because we are not a B2C business, we are not actually selling to clients out there who are coming on to our website to look and see what they are buying. The people we are selling to are our employees, and prospective employees. Yes, there is a bit of serious stuff about big companies and the government. Actually, in the most immediate sense, the most important relationships we have are with our staff.

To get back to the question you asked me on the front end, there are a lot of pretty heavy answers; philosophical, life and death in context, and all that stuff which is really pretty heavy going. However, it is also important that we realize that we have to engage our staff in understanding and believing in that purpose, that we are doing a good, socially worthy, and just thing, which I strongly believe that we are, but also that just because that process is meaningful and consequential, it does not mean that working here has to be under this burden of it being quite so serious all the time. Of course, the work that we do is very serious as are the consequences, but we do want to have people to come here who love coming to work, and love coming to work with each other, and that it is a fun place to be, where we have built something that is actually making a difference in the world. We are just a little bit more, perhaps, accessible than some of those heavy news answers about purpose. It is really important.

CEOCFO: *Are you seeking funding, investment, or partnerships at this point for either company?*
Mr. Miller: Historically, we did a couple of Seed Rounds in TerraSense. In the future, there will likely be some form of a raise. With CRWN, we are just getting it started up with some Seed funding, but as CRWN moves forward, closer to pre-commercialization and in those stages, there will definitely be a Series A, potentially a Series B in CRWN, to get it up and through to cross that chasm into the commercialization stage. We will absolutely be looking to do some fundraising.

Mr. McGinty: From a TerraSense point of view, we have had some successful Seed money that Eric has very ably brought in for us, but it is very likely that to cross that chasm, despite the fact that we have a very excellent runway, and well-funded R & D, and quite a lot of excellent sources of funding, I think the next stage of commercialization will, in time, require a Series A round within the next 18 months or so, probably, to take us to that point.

It is fortunate for us, although not so fortunate for the world, that defense has become a more high-profile space, and that all of a sudden, perhaps investors might see the imperative, and indeed the opportunities, commercially, that exist there. That is not entirely why we got into this business. It was because we felt that we could build something that would make a difference. However, that will mean that at some point, yes, we will be looking to raise to help us to achieve that full commercialization and bring it to the potential that it has.

CEOCFO: *With so many new ideas, why is TerraSense Analytics important? Why is CRWN.ai important?*
Mr. McGinty: TerraSense is important because we are employing AI to do something that people, certainly in Canada, and in most western countries, are not yet able to do. We are able to automatically identify things, at the edge, with multiple sources, and provide information to human beings, to give them the proper tools to make really difficult and consequential decisions. That is what we are able to do, it is what we are going to be able to commercialize, to be able to deliver, and it is going to make a difference. It is Canadian: it is Canadian technology, and it will make a difference in Canadian safety and security.

Mr. Miller: For CRWN, it is similar. Again, it is a sister company to TerraSense. It is an artificial intelligence company,

and it is really focused on targeting a problem in the utilities market. At the end of the day, it provides situational awareness for a utility, on and in their critical assets. For example, you could put this system to monitor older transmission assets that could have the risk of having component failure, that could start a fire, for instance like we have seen in some of the cases in the United States. Utilization of a tool like CRWN could ensure preventative measures are taking place which would increase safety and could potentially reduce life loss related to hazards or outcomes of major transmission failures.

In addition, the system will give the utilities the capability of situational awareness on their lines, to actually understand the personnel of their lines, the micro-climatic effects, and other things that could influence their lines, and they can learn from the data they collect. You can train the AI to better manage, or oversee, or monitor assets for that utility, and then provide critical information to those very important decisions made by the utility and the maintenance personnel, which can be executed in an extremely efficient manner.