

CONNECTED PLACES

MASTER SCRIPT

EPISODE : 62 - MEET THE INNOVATORS

INTRODUCTION

[theme intro]

*Clips*

Eugene:

Eight, nine years ago, when the idea first came to me, it was very much, uh, oh, this is madness. This is like, I want to go to Mars and build a greenhouse. People did not wanna hear the message because in maritime, unlike automotive, a ship will be 30, 40, 50 years on the water, so they didn't want to hear it.

Victoria:

Driving for work is pretty much one of the most dangerous thing that anyone can do at work, I think because people do it sort of every day, they sort of forget about the dangers of it. But I mean, that's why we do what we do. You know, we try to make, you know, these professional drivers safer.

INTRO:

*Welcome to Connected Places; a podcast about the future of our towns and cities, and how we live and travel in them.*

*I'm Ivor Wells, the producer of Connected Places, which is brought to you by the Connected Places Catapult.*

*We're the UK's innovation accelerator for cities, transport and places.*

*We help to connect businesses and public sector leaders to cutting-edge research and new technologies that can spark innovation and grow new markets.*

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Ivor:

If you're a regular listener to this podcast, then you probably know a thing or two about the verb; to innovate.

You'll almost certainly know that innovating isn't easy. It's risky, it's fraught with failure and there's no guarantees of success at all.

In fact, you'll probably be aware of the old adage that the self-proclaimed innovator who isn't regularly failing, probably isn't innovating at all.

In this episode we meet two companies that have had to navigate innovation's emotional rollercoaster to get to where they are.

And they've both come out the other side with two ground-breaking products, some great stories to tell, and, yes, a few scars to prove it.

This is the first episode of its kind where we sit down with some of the companies we've worked with here at the Catapult, to talk in a bit more detail than we normally do about their own innovation journey.

And I have my colleague Mike Walter to thank for a lot of this material. Mike's our in-house journalist and throughout this year he's been publishing a regular series called 'Meet the Innovator', where we explore the stories of some of the most inspiring and impressive innovators we work at the Catapult.

All of Mike's articles are on our website and the links are in the show notes.

So in this episode we're going to meet two people with two very different innovations and of course two very different stories. Both companies have been supported by different accelerators and innovation research programmes that we run here at the Catapult.

Now, the first company is a road safety company called Esitu Solutions and they're using some really cool virtual reality technology to help improve driver training. But we'll hear from their CEO and co-founder Victoria Kroll later in the show.

But I want to start with a company called Ecomar Propulsion. Their mission is to create zero emission marine propulsion systems.

Eugene Bari is their CEO and his passion for all things maritime began when he was a kid.

**Eugene:**

My father bought a boat when I was nine years old. That had a 55 horsepower four stroke motor called a Bearcat and the Bearcat was a short lived but extremely innovative machine and I really liked it because it made, you know, sort of super proud as a kid that you've got something. It's a bit like I suppose these days if your dad buys a Tesla.

So that was the start and then three or four years later, my stepfather came into the picture and he was, a Danish ex mariner, ex Danish Navy. And I worked with him on school holidays and whatever else on a whole range of different boats. So we worked on fishing boats, we worked on luxury end yachts, we worked on ferries, you name it, he was on it. So that was really where it all came about, this maritime obsession.

But the UK maritime industry was very much a, and still is to a degree, a cottage industry. Unless you work for one of the big primes like BAE or one of those guys, there really wasn't any hope of doing anything. It was either that or you, you know, you're in a one man in a shed somewhere in

Padstow, gluing things together and making nice sailboats. And neither of those were appealed to me. So actually what I ended up doing was working to make a living and doing all the maritime stuff on the side with my own funds.

Ivor:

After a while, Eugene got tired of his day job, and by chance he got a job at a company called Powerboats P1. This was a job that really sparked his professional passion for the maritime sector, and it planted the seed of an idea.

An idea that would one day lead to Eugene creating his own company.

Eugene:

The genesis of Ecomar really is that I got fed up with buildings. So a job offer came in for a company called Powerboat P1. It's the first opportunity I had to do something I really loved and I really liked the guy who owned it. So he gave me a lot of opportunity to really go for it. So I took the skills that I'd learned with finance and with organisation and engineering and structure and all that sort of stuff. Put that all in training and we built the biggest race series in the world. And actually I was really proud of what we were doing with that

Ivor:

Eugene wanted to go one step further and actually create the first all-electric powerboat race.

But that didn't go down too well with his colleagues...

Eugene:

At the time, it was insanity. People are looking at this and going, that'll never happen. You're insane. And bear in mind that I spent the majority of my life surrounded by petrol heads. I mean, these guys are into 1200 1500 horsepower Lamborghinis in the back of a boat that they're gonna sink any minute now, you know, it, it, it was a, a really, really, really big mindset shift, but it was pretty clear that the business model for powerboat racing was never gonna work because it was very polluting. It was very noisy. That was part of the thrill. I mean, you fire one of these things up and my God, it's exciting, but it's not exactly the greenest.

I quit at P1 and just said, right, nobody wants to hear this message. So either I take the risk on and go at it, or you stick with the tried and true and the norms and all that lot. And it was, it got to a point where it was, that was an impossible situation. So stuff that, off we go

Ivor:

It's not easy thing to drop everything. It takes real belief. Belief that you can make a success of it, but more fundamentally, belief in the mission itself.

So where did Eugene's determination to go green actually come from?

**Eugene:**

Yeah you could say it's cognitive dissonance and all that, but the truth is, it's my daughter. I approached it from an academic perspective, if you will. So it's very much about, you know, read everything you can get all the manuals, find everything you can discover what's been done and, you know, Maxwell's equations and onwards. So you get all that stuff in your head and you try and figure out what you're going to do with it.

And what actually happened for me was there was a light bulb moment, as they say. My daughters told me something, she said, we're the spark that lights the flame.

I don't know why, but it suddenly stuck. And so from there, it was like, well, bloody hell, either do it or stop moaning about it. You've got two choices. You either hide, or you build a skin like a rhino. Now, honestly, the racing created a hide that was thick enough to take those initial barbs. And that's it. So I was having to go head to head with my peer group, the people that I knew, and say to them, you're wrong. And that is not very welcome.

**Ivor:**

Now, like any startup, the early days of Ecomar weren't easy.

Eugene was working out of a small shed, making batteries out of spare parts that he could find, and getting a lot of bruised fingers along the way.

But he knew he was onto something.

So what was at the core of his innovation - how does it work?

**Eugene:**

What we're trying to do at the moment is end to end, so it's throttle to prop. Now, that sounds really easy. Throttle to prop, zero emissions. The core principle that we use is no emissions whatsoever. If it creates emissions, you've got problems. We also look at how the products are made, so how you recycle them, all that second life stuff. So we have a target of 94%. Actually, we're hitting about 92 at the moment. But everything that goes into that machine, you should be able to take it out at the end of its life and make it into something else. That's a completely new way of thinking.

What's really interesting for me is that people have been building books since before Noah. It's been around a long time. So they know what they do and there are a lot of regulations and rules and, you know, how you put all

this, put a ship together. None of that applies anymore because electric motors have different characteristics from diesel motors.

The batteries, the fuel cells, the hydrate, everything is a completely new thing. So it's, it's the transition from sail to coal, coal to diesel. This is happening now. So the boats that we've got in front of us need a big, big change. And so we have had to look at everything from first principles, which means starting at the propeller, the propellers are not the same.

They're not appropriate. You can't put the same propeller on an electric motor as you put on a diesel. It's much more complicated than that. And then the next bit that we're going to have to all face, not just us, but the entire industry is, where does AI and all these other things, machine learning, come into it? That will, that won't be long. That will be five years or less. And I think at that point, it's a game changer.

Ivor:

And that's where some of the biggest challenges come in. Innovating, as I said earlier, isn't easy. That's true of so much of the process, including of course the technological side of things - making the product, testing the tech, creating the business case.

But the other part that's hard is the resistance that you so often get from people.

Eugene:

Eight, nine years ago, when, sort of the idea first came to me, it was very much, uh, oh, this is madness. This is like, I want to go to Mars and build a greenhouse. And actually until about three years ago, it wasn't just resistance, it was ignorance. People did not wanna hear the message because in maritime, unlike automotive, a ship will be 30, 40, 50 years on the water because it's such a massive investment, you know, you think an HUV is expensive with a hundred grand, you buy a ferry that's gonna cost you 40 million quid.

So you've got to get return on capital back. So they didn't want to hear it. Then the transformation of automotive starts to happen and people's mindsets shift and as important, if not more important than the technology is the understanding of the impact of what we've done. So building this and creating friendships, partnerships, you know, all the other things that have gone with the company has been a very careful progress.

Ivor:

I mentioned at the top of the show that Ecomar Propulsion have been collaborating with the Catapult for a while now - first on the Transport Research and Innovation Grant programme, or TRIG, in 2021, and then more recently they were invited to join our Maritime Accelerator programme.

Eugene:

My business partner, Antony, set it all up and said, right, we're a part of the catapult. You need to get involved. We were at a slightly peculiar stage for them because we weren't startup in the sense that, you know, green shed type. We'd spent a lot of money and invested a lot of money in technology developments.

So in one sense, we were quite mature. But in another sense, Engineering is not like software. It's not you make one widget and put it out on the internet and everybody can buy it tomorrow. This takes five years to develop anything. So we are in a state where we needed help with projections, planning. You know, all those sorts of things.

And actually, CPC has been really useful. CPC's ability to open doors at high government levels, is something we wouldn't have done. So that's been really helpful. But being included in those sorts of things gives you a lot of credibility and a lot of profile.

[STING]

Ivor:

I mentioned at the start, a company called Esitu Solutions. And they've also participated on the Transport Research and Innovation Grants programme.

Now, their speciality is road safety, and how to reduce the number of driving accidents on the road, specifically among professional Heavy Goods Vehicle drivers.

And they do this by creating hazard perception tests for drivers, which help to assess their driving competency and determine the level of risk they pose behind the wheel.

And the best part about the tests is they can now be taken via a virtual reality headset.

Dr Victoria Kröll is CEO and co-founder of Esitu Solutions. She explained how working with the Catapult has helped them develop bespoke training for HGV drivers and how they're now looking to do the same for ambulance drivers.

Victoria:

I think the best thing is it gives you that kind of bit of financing to do something that perhaps you haven't got the money to do necessarily. You think like with the ambulance stuff, we'

Driving for work is pretty much one of the most dangerous. In fact, it is the most dangerous thing that anyone can do at work, I think because people do it sort of every day, they sort of forget about the dangers of it. But I mean, that's why we do what we do. You know, we try to make, you know, these professional drivers safer.

Hazard perception is the only cognitive skills that's been consistently linked in research to collision risk. So we know that people who perform worse on the test are more likely to have a collision in the future. Those who perform better on the test are less likely to have a collision in the future.

Ivor:

Of course, like most things in life, Victoria didn't plan to do this for a living. She actually studied psychology at the Universities of Hull and Nottingham Trent Universities, and eventually got her doctorate.

She then answered an ad at the University that was looking for someone to help develop a hazard perception test for fire engine drivers.

The person who posted the ad was David Crundall, and it was David who she ended up co-founding Esitu with.

Victoria:

I think the interest in sort of road safety came from when I started doing job post-doc, and that was really because a lot of the research that I did in Ph.D. times had been theoretical. And I think that's what really stood out when I applied for the job.

I was developing these tests. And although we're testing on real drivers, a lot of these things, they never really see the light of day because you're at university and companies don't really kind of want to engage with universities necessarily, because I don't think they know that they can kind of offer them anything to be honest. And we knew that we were getting, you know, inquiries from sort of organizations that want the things we were doing. But as a university, we didn't sell anything because we were researchers.

Ivor:

That was until they started demonstrating their virtual reality tests at road safety events.

And it was this that eventually led to an opportunity with Innovate UK.

Victoria:

I think we went to an event one time where we'd taken some of our VR headsets. I think David the co-founder was doing a talk and they said, do you want to stall? And we said, okay, I've got a stall just to show this stuff. And people were asking sort of like, where do you buy these? And we were like, well, we don't sell them really. And then after that we kind of feel like this is more validation that maybe we should be thinking about starting a company. And we kind of went on thinking, we just at a company for quite a long time.

Then an opportunity came up, an Innovate UK opportunity and the program called ICURE so that's Innovation to Commercialisation of University Research. People who were successful then got sort of quite a large travel budget to go travel the world to test the proposition on lots of different kind of stakeholders. So we went on that journey know worldwide market validation came back and then had to pitch the idea to a kind of sounding board of experts to say what we thought when we thought we had enough to sell the company.

And the answer from that was yes. But what that then gave us was the ability to apply to innovate UK flows of ringfenced money, which you could only apply for if you been through this process. And we applied for that money and was successful in March 2020..

Ivor:

March 2020. We all know exactly what we were doing in March 2020 - almost to the day.

So yes, the rather small matter of a global pandemic was an early set back. But they eventually incorporated a few months later and then really started to grow rapidly.

But Victoria explained that the innovation at the heart of Esitu Solutions isn't in the use of virtual reality. That's, of course, the fun, shiny but.

The real innovation lies within the methodology and research that underpins the tests. And that's based on dozens of peer reviewed safety papers that Victoria and David have written.

Victoria:

It's more sort of the tests that are the kind of innovation which are filmed from vehicles to the vehicle specific, and it's not all in VR as well. So kind of like half the business is providing that online. And then we have like an online web app that provides an assessment to a driver to get a score, and then they can use that score to identify risk and drivers. So if someone goes to the test and is identified as a high risk driver and someone can, like a fleet manager can use that information to think, okay, right, we need to do something with this driver.

Ivor:

Of course, as with a lot of innovative training methodologies, the testing is not a replacement for on-road training.

Victoria:

It's never something that should be used as a replacement of on-road testing, it's supplementary to on-road training. So it's filmed from the perspective of the driver and it depends on the type of tests that you're doing. And you would be watching it and as soon as a hazard is about to onset, the screen would conclude and you'd get what happens next and you get four options that appear on the screen. So it's a variation of the UK



has a perception test, but we've demonstrated the version of the test is better at identifying risk in drivers than the traditional test.

The evidence suggests that with the need in the last ten years, the deaths have been plateauing is over 1800 deaths per year. Obviously, there was a bit of a dip in that number during kind of COVID time because there was less traffic on the roads. But it's kind of suggesting that something needs to be done because the number is not coming down. So it doesn't say it's any safer, it's not particularly honest, any safer.

One of the reasons that we set up the company is because the research that we did, we knew that it can make a difference and we wanted to make a difference and reduce collisions on the road. For us, that's a great success, but it's very, very hard to measure exactly how many collisions or fatal collisions or how many injuries you prevented for the stuff that you've done.

But we know one of the, you know, kind of side effects, if you will, of positive turning is that it will do time to kind of spend longer looking for hazards and looking for things. So yeah, they might have less, you know, harsh accelerations or great braking and stop. And also there is some evidence to suggest that, you know, this type of training makes you more aware of what's on the road, so you're less likely to engage with sort of secondary tasks. So, you know, using your phone whilst you're driving.

Ivor:

So what's next for Esitu Solutions, what's on the immediate horizon?

Victoria:

In sort of the next 3 to 5 years, it would be sort of establishing ourselves in the UK and ten years time it depends on how things go. We'd love to do things internationally. We have done research in different countries, we know that the test works in different countries. So it would be nice to kind of, you know, expand into into that. But it's still a little a little way off. Yeah, I think for now, just focusing on the UK market.

STING:

Ivor:

And what about Eugene and the team at Ecomar Propulsion?

Eugene:

We have to get products out the door. That's priority one. We are going to go through a big fundraiser. We have to do a Series A. Those are the two priorities for the company. I think the issue in a wider piece is that the UK has a problem with understanding what we do. As I say to the, to the guys, you know, the venture capitalists and people like that, if you're looking for a long-term, five year, 10 year win, where you can be the

equivalent of Bosch and you will never fall out of place, that's the stage we're trying to get to.

The primary rule is be the best at what you can do and everything else will follow into place. People want good stuff. You know, you could be a saddle maker. You only make three saddles a year, but by God, people will pay you if it's the best in the world.

Ivor:

Well, that's all we have time for in this episode.

If you'd like to know more about Ecomar Propulsion or Esitu Solutions then there's links in the shownotes to this episode.

And don't forget you can subscribe to the Connected Places Podcast on iTunes, Spotify or wherever you get your podcasts. If you'd like to find out more about the Connected Places Catapult, visit our website at [cp.catapult.org.uk](http://cp.catapult.org.uk).

I should also mention that registration for the Catapult's first ever Connected Places Summit is now open. It's going to be a two-day event from 20-21 March 2024 in central London. Across both days we'll be featuring interactive content, live project showcases, inspiring thought leadership and opportunities to connect with peers from the worlds of technology, transport, mobility, cities, academia, and Government.

Registration is now live and there are discounts for early birds, so do put 20-21 March in your diary now, and check out the link in the shownotes to register.

The theme music on this episode is by Phill Ward Music.

I'm Ivor Wells, this is Connected Places.

Thanks for listening.