

ETH Podcast - Episode 4 - ANYbotics - Transcript

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INTRO

(Jennifer Khakshouri:) *A start-up company believes in its 4 legged robot.*

(Péter Fankhauser:) I'm 100 percent convinced that this has a future which is got to make sure we'll have a place in this future.

(Jennifer Khakshouri:) *Their supporter has a mission.*

(Roland Siegwart:) It is a very important element that these young people develop from scientists to really entrepreneurs.

(Jennifer Khakshouri:) *The CEO of the start-up is the only one who has experience as a businessman.*

(Hanspeter Fässler:) You somehow need to dare to go into the unknown.

(Jennifer Khakshouri:) *A risk of failing - which is exactly one specific challenge the start-up has to overcome with its robot that moves around on four legs. The name of the robot is ANYmal. The start-up is called ANYbotics.*

This is the new podcast by ETH Zurich. The first four episodes focus on entrepreneurship at ETH on all levels, from student projects, to successful spin-offs.

I am Jennifer Khakshouri.

Chapter 1

(Jennifer Khakshouri:) *Chapter 1 - What it takes to begin*

(Hanspeter Fässler:) My name is Hanspeter Fässler. I am the executive chairman of ANYbotics and we're now in the offices here at ANYbotics in the center of Zurich.

(Jennifer Khakshouri:) *We are sitting in the meeting room right next to the open-plan office space of the ANYbotics team. Around a dozen of young men are working at their computers. Workaday life in a start-up seems to be pretty unspectacular - at first sight. But under the surface it's quite challenging.*

(Hanspeter Fässler:) Whenever a startup is being founded people are always told you need to see the market first and then think about the product. In our case it's actually quite some extent the other way around. We have a new product that will open many new options and applications and we're exploring now which applications are the first ones to be used.

(Jennifer Khakshouri:) *The new product is a machine with four legs, about the size of a Bulldog.*

(Hanspeter Fässler:) It is extremely mobile meaning it can basically walk wherever a human can walk.

(Jennifer Khakshouri:) *Over obstacles, through bushes, up and down stairs. And - the big advantage....*

(Hanspeter Fässler:) If the robot falls down it's able to stand up again.

(Jennifer Khakshouri:) *This is an important thing, the ability of the machine to stand up.*

So, there should be a market for this four legged creature. We will talk about who's interested in having a robot animal. but first, let's quickly look into the past.

(Roland Siegwart:) The technology for ANYmal was starting in my lab about 10 years ago and so I'm really still extremely dedicated. I'm following

up with all the steps and I'm really excited to see how this makes one step after the other to the market.

(Jennifer Khakshouri:) *This is Roland Siegwart, one of the pioneers in robotics at ETH. He is co-founder and co-director of Wyss Zurich, a joint research and development center of the University of Zurich and ETH. This center was made possible by a 120-million-dollar donation from the Swiss entrepreneur and philanthropist Hansjörg Wyss. Wyss Zürich wants to overcome the so-called Valley of Death.*

Valley of death, has nothing to do with historical sites or places. It's a common term in the world of start ups and indicates the gap between the work of the people in the start up and the income they potentially generate from customers at a later stage for their product.

Wyss Zurich supports promising start-ups with money and infrastructure in order to bridge the Valley of Death. And ANYbotics is one of the promising start-ups.

(Roland Siegwart:) We need crazy people which really believe too that this technology really make it to market and to really go over all the risky and really difficult situations.

(Jennifer Khakshouri:) *That's what the professor and co-head of Wyss Zurich says. Hanspeter the CEO of ANYbotics himself was once one of those crazy people. 35 years ago he was the first Ph.D. student in Robotics at ETH Zurich.*

(Hanspeter Fässler:) I remember one fellow student when we described the project that we wanted to do with our students namely a robot playing ping pong. He said You're crazy. This is never going to work. In the end it did work. So we were a little bit more adventurous. I would say than most of our fellow students who were more on the theoretical part in this institute for mechanics.

(Jennifer Khakshouri:) *Soon after earning a Ph.D. in robotics, he had a successful career in industry and was CEO of two big companies. And then...*

(Hanspeter Fässler:) I decided this was the end of corporate life and I was looking for something new and by chance more or less the ANYbotics startup idea came along and I decided yes this is something now I want to engage myself for the next phase of life.

(Jennifer Khakshouri:) *In his sixties he is by far the eldest of his start-up team, more than double the age of most of the men working with him.*

(Hanspeter Fässler:) What I can bring is certainly all the financial know-how. How do you do a business plan? How do you treat customers? How do you write contracts? All this, all the HR aspects, all the non-technical aspects I can cover with some experience that I can bring along from the last few years.

(Jennifer Khakshouri:) *On the other hand he also learns much from people in his team.*

(Hanspeter Fässler:) I had to learn how to work simultaneously three people at the same time on the same google document. Just this new way of working that was part of the learning. And then of course I was getting into technology again but only up to a level that I could understand what we're doing. I'm not the person who is bringing in any technical ideas. That's not my task and for that my knowledge is too outdated.

(Jennifer Khakshouri:) *Here's someone who has the technical know how.*

(Péter Fankhauser:) Péter Fankhauser. I'm a co-founder of ANYbotics and I work as the chief business developer and the software engineer. I did my Ph.D. in robotics and during our studies we had a group of people developing an awesome robot and we decided to go from research to a company and our group together formed a company so all of us became co-founders...

(Hanspeter Fässler:) The basic ideas behind the animal they all came from the ETH developed as part of Ph.D. theses master at ETH. about 10 years of research went into that device already. And the end stage was a device that was basically working but not reliable at all. And we now need to take

the step from a device working in principle to a device working repeatedly and reliably and being robust and sturdy.

(Jennifer Khakshouri:) *Taking this step sometimes means you have to get over unexpected hurdles.*

(Péter Fankhauser:) We had to learn how do you first get off of a helicopter which is sinking upside down. How do you get out.

(Jennifer Khakshouri:) *This might sound strange. Soon it will make sense.*

CHAPTER 2

(Jennifer Khakshouri:) *Chapter 2 - What it takes to find customers*

There is a product, a walking machine called ANYmal. It can fulfill inspection or manipulation tasks. Its four legs allow the robot to crawl, walk, run, dance, jump, climb, carry — whatever the task requires. But who in the world needs ANYmal, where is the market? Hanspeter and his team have some ideas and are considering a bunch of fields including: agriculture, forestry, railways tracks and even security. Imagine ANYmal as a watchdog!

(Hanspeter Fässler:)...when an intruder wants to enter and a camera probably detects that then the dog goes out and starts barking. This would be the ANYmal going out, maybe with a loudspeaker and some message, maybe with a blue light, maybe with some additional sound, a siren or whatever which I think would be equally impressive to a big dog.

(Jennifer Khakshouri:) *Some companies in the field of safety are interested, but Hanspeter's vision is broader than only that one field.*

(Hanspeter Fässler:) We need to explore in different directions and at the same time still stay focused in order not to diversify too much because we have limited resources.

(Jennifer Khakshouri:) *The limited resources are put into the one project at the moment where the hope is high for business: sending ANYmal to off-shore platforms.*

(Hanspeter Fässler:) The ones who have signaled a lot of interest are large production companies in the power area that can either be production of electrical power or it is oil and gas companies. And for both of those especially the offshore applications are very interesting because that's a very very costly operation for to have people out there and they are interested in maybe complementing the people or even replacing it with a device like ANYmal.

(Jennifer Khakshouri:) *ANYbotics is exploring exactly that for a specific electrical power company, that owns huge windmill parks in the North Sea. ANYmal has to prove if it is able to make rounds of control on a converter platform. Péter will be responsible for the test on the platform - that's why he had to perform a sea survival training.*

And Hanspeter will observe the mission from Switzerland.

(Hanspeter Fässler:) Well, what makes me really nervous is whether ANYmal will already be able to perform reliably.

CHAPTER 3

(Jennifer Khakshouri:) *Chapter 3: Off-Shore*

(Péter Fankhauser:) All right. I gonna have to talk a little silent because it's already 11 thirty here and most of the people I guess are asleep. So hello. Today is the second day on the platform. So yesterday morning early we took out from the northern coast of Germany and flew in for roughly 45 minutes towards this platform. When we arrived I was struck by the size of it. First of all it's pretty big it's an area it's like roughly 80 on 80 metres and it's got seven levels so roughly 50 meters high and it's standing on six legs I think like 20 to 30 meters above water. Around it are really tons and tons of wind mills that many that you see them up to the horizon. Tomorrow we'll have our first autonomous mission where we do inspections. So that's going to be exciting that's really where we think the value of this robot will

come in in the future. I think that's it for today. We're all happy tired and we're looking forward to the next couple of days. Have a good night.

What we didn't know is that they have one of the biggest problems is leakage detection. So there there's many pipes are drawn here that contain oil water cooling water dirt water all of it. And they have the problem that these pipes and machines leak which can cause big damage to the entire platform. So in these cases ANYmal will be a great tool to go around and check for leakage because there is now no fixed insulation that can do that. Funny anecdote actually animal found one oil leak during our tests. It was not by inspection but rather it slipped on it. That's OK because while this is not the most efficient the operators agreed that they would rather have a robot fall than a human.

All in all I think all of us agree that this week totally fulfilled our expectations. We were able to show autonomous routine inspections over multiple hundred meters that included stairs various room and very many different sensor types. Of course there are still many things that need to be optimized and we are going home with a long to do list.

CHAPTER 4

(Jennifer Khakshouri:) *Chapter 4 - Making the customer happy*

We meet Péter and Hanspeter after the off-shore test. I want to know what is on the to-do list now.

(Péter Fankhauser:) The robot something needed to take a break to cool down the actuation especially when climbing stairs because that's heavy loads on the drives.

(Jennifer Khakshouri:) *plus they're working on making it run smoothly for many hours to be able to move for a couple of hundred meters. And*

...another thing ANYmal struggled with, was opening doors on the platform.

(Péter Fankhauser:) Those doors are very very heavy. So even a human struggle sometimes to open them. So that will be one of the major challenges apart from that if we can equip some of the doors with some electric openers etc. Then I can foresee within the next one or two years. It's absolutely feasible to have a robot there doing remote control or autonomous inspection tasks.

(Jennifer Khakshouri:) *For the head of Wyss Zurich, Roland Siegwart, the platform test is a crucial step in the entire process.*

(Roland Siegwart:) For start-ups it's extremely important to really be close to the customer and see with the customer what you can do. I think this is a wonderful type of applications. I think there is not a lot of risk of ANYmal but there is probably also a risk that there is some disappointment...

(Jennifer Khakshouri:) *...that ANYmal cannot do what the customer wants it to do. That's what made Hanspeter nervous. So how did the customer respond to the off-shore test?*

(Hanspeter Fässler:) That reaction is very good. They are looking forward to the second test. They were very happy with the results of the first one. We're going to have the discussion how is this going to continue. Because that's not going to be the end of the project. Instead it's going to be kind of step one in a several years program I would expect.

The end goal is to have an animal robot out on that platform and the platform basically being unmanned at least during a period of time. And for that of course we need to be sure that this is working reliably and also over longer term.

(Jennifer Khakshouri:) *The first tests on the platform are at least promising, which makes the CEO and business expert Hanspeter rather confident.*

(Hanspeter Fässler:) There is such an obvious payback. You know it's so terribly expensive for people to travel out of the platform with the helicopter etc. then you have to pay pretty high wages also for people working out

there they have to stay probably a week in a row all the time out there. So it's a very expensive exercise to have people out there.

(Jennifer Khakshouri:) *In addition, on other platforms like oil and gas platforms there is always a risk of explosions. ANYmal might be a viable solution for that. Therefore many more companies could be interested. But it should be more than a dream.*

(Hanspeter Fässler:) Whether the market will really adopt at this point in time that's the important thing and it doesn't help us if 10 years down the road indeed this is a good solution. We need it to be good solution now in the next one to two years. Otherwise we're bankrupt before we reach the 10 years. So that's still a risk. We are not absolutely sure.

(Jennifer Khakshouri:) *Which means: For Hanspeter being the CEO of this start-up company is not only fun. (ev. Which means: For Hanspeter being the CEO of this start-up company is fun and it also is a job where he has to consider many possibilities).*

(Hanspeter Fässler:) We're now having 25 people on the payroll. That's a monthly a big six digit monthly amount that goes out and that has to come in again. And I would say the majority of the responsibility for that is lying on my shoulder and that creates some pressure.

(Jennifer Khakshouri:) *How does he handle the pressure?*

(Hanspeter Fässler:) Well, probably partly with my experience. It is not the first time that I am in a similar situations. I have some confidence that it will actually work out. I have a feeling for how do we mitigate that risk also and what would be plan B if it would start to deteriorate. So it's basically by assessing the risk and trying to think about mitigation actions at an early stage.

OUTRO

(Jennifer Khakshouri:) *There is one question left. How did the people working on the off-shore platform react to ANYmal? Are they afraid of being replaced by the robot one day?*

(Hanspeter Fässler:) It turned out that they started to like ANYmal. That's probably not quite the same with being replaced by ANYmal whether they like that or not. It's definitely an issue I think that needs to be addressed. To some extent it's true I mean part of the work will be done by animal but this development towards unmanned operation of these platforms is kind of a major trend and it will happen anyhow.

(Jennifer Khakshouri:) *Roland Siegwart, the pioneer in Robotics, doesn't see ANYmal and other robots as competitors for human workforce.*

(Roland Siegwart:) No. Not at all. I think all the complex and interactive jobs will remain for humans and hopefully the robots will really take the jobs which we don't like. Imagine today robots are really painting or spraying are all our cars. Imagine humans would have to do this. This is extremely unhealthy. And so we are happy to have robots in some applications.

(Jennifer Khakshouri:) *...where there probably is a place for ANYmal - which would lay ground for the success of the start-up company of Hanspeter, Peter and their colleagues.*

(Jennifer Khakshouri:) *This is the podcast by ETH Zurich.*

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