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## Podcast Episode #3 - From scientist to entrepreneur for holodeck technology, evaluating startups, with Bernhard Petermeier of World Economic Forum, Switzerland

### RAW TRANSCRIPT OF INTERVIEW

**Balint:** I am honoured and upbeat to talk to Bernhard Petermeier, community leader of Technology Pioneers, global leadership fellow at the World Economic Forum in Geneva, Switzerland. Welcome, Bernhard to the Episode.

**Bernhard:** Thank you very much Balint, it is really an absolute pleasure to be in your podcast series.

**Balint:** Thanks a lot, I appreciate it, awesome to talk to you. Bernhard, before we address your current role and responsibilities, during the time prior to your scientific career at ABB, you founded a startup called CargoSoul. Can you tell us what this company did and your motivation for founding it?

**Bernhard:** Sure, absolutely. CargoSoul was basically my first entrepreneurial approach right at the time when I finished my PhD at the Vienna University of Technology. The idea behind it was, sounds probably a little bit trivial but actually it is very hard to find a technical solution to the problem. The idea is to develop something that is called omnidirectional transportation platform. So basically what it does is simply moving an object into any direction in a two-dimensional space without moving itself. Just consider e.g. a normal treadmill in a fitness studio but not working in one direction but in two directions. There are quite some engineering problems behind it and why do you need something like that? There are two things. First you could use it for a material handling device e.g. a handling platform that moves the aluminium containers in an airplane cargo or, and this is the way more interesting application, I think, for virtual reality application. If you have ever seen something like Star Trek then you know that they had something like a holodeck. A holodeck is nothing else then a platform where you can move and the platform keeps you steady in one position in space basically. You can bear the virtual reality goggles, you can walk, you can run and you will never come to a point where you have to turn around. And that was the idea behind it.

**Balint:** So you were inspired by Star Trek? Partially?

**Bernhard:** Partially yes. Although I am not a huge fan of Star Trek or the other kind of films. But I thought about the problem and you always have to be, as an entrepreneur I think, one step ahead of what is currently possible. We all already see the virtual reality applications at the moment, what they can do and those are a kind of baby steps. You always have to think what are the next logical steps. Once you know virtual reality is becoming a reality for everyone of us. People want to get rid of the goggles, they do not want to sit anymore, they want to be active in the virtual



reality space, right? So I think this is just a logical, next step in the whole or even the step after the next step in virtual reality. I am pretty sure, I am 100% sure it is gonna come at some point.

**Balint:** So you were the sole founder, right?

**Bernhard:** Yes. I have been the sole found. At that time, I have to acknowledge, or I have to admit that I was totally unexperienced at that time and I was pretty naive on starting my own business. I had the idea, I thought about it at night, at day to find the solution. It was just cracking this kind of problem that was driving me. I found the solution and I was just amazed what I could do with that and I filed a patent on it. I wanted to bring it forward, right? But on the other side I have been a little bit too scared about it because I did not know anything about entrepreneurship. I did not know what exactly to do, I did not have the necessary background so I did a few major mistakes, I would say. But I also did some things that were not that bad. So for example, I did not build a great team around me. I really thought that I could do everything myself which is something that you can not do as an entrepreneur. You need other people, right? And I did not sufficiently asked for input and help with people that had more experience in the field. Or at least started a business. Then one of the major mistakes I made was that I did not have full buy-in. I still was working as a scientist at ABB but at some point you have to devote all your time to your startup otherwise it is going nowhere. I did also some other kind of mistakes later in the project of starting this business but I think those were the big things that I really would do differently if I could do that again.

**Balint:** These three things as you mentioned: not relying on a team, not building it up.

**Bernhard:** Yes, build a great team around you. You need to get expertise and you do not have yourself. If you are an engineer or scientist and you bringing some other engineers it really does not add any value unless the other person is having a complete different expertise in the field that you do not have. So bringing people who know what they are doing, just do not sit alone in your room and think that you can pull off everything alone. It is not gonna happen. You really need to have a lot of input from other people. And the third point is the full buy-in. That is really, the three things.

**Balint:** Before asking the question which I am actually now asking already regarding the outcome of this project or this company, so before that question comes, what were the steps of founding because you kind of mentioned it now how you came up with this idea that you saw this problem and then you thought very hard about the technical solution how you could solve it and then you found the solution and also then these two applications that you described? So were there other steps involved?

**Bernhard:** I mean this is the typical kind of time line you have if you are trying to solve a problem. There are different approaches if you want to start up your business. Many of the entrepreneurs just want to solve a problem that is existing, others want to create something that is completely new, that never ever anyone had



thought about. There would be the steps a little bit different. For me it was clear. There is a problem. I want to solve it. I solved the problem. I patented it or I tried to patent my solution. I kind of did then all the business things, a business plan of course. You have to be aware of the main kind of business drivers, who is your customers, who is gonna manufacturing it for you, what is the budget, what is the necessity that you have in terms of people, time-line, a lot of things and when you have a business plan like that update it all the time, it should not be a steady kind of thing, it needs very dynamic document that life changes all the time and always at the latest stage. And this brings me to another point which is be very very open to pivot at anytime. So as soon as you see that something as you have imagined is not turning out well just switch around, think around how you can do it differently, how you can do it better. Those are the major steps besides the business steps, of course the official filing of a company, getting funding according to your business plan and all the other steps enclosed in the plan.

**Balint:** Thanks for describing these steps. What about the outcome of this project or company?

**Bernhard:** What I did was, I filed a patent and I knew it was going to take at least 3-4 years to get a patent granted and I came freshly out of university, just finished my PhD so I did not have any kind of private funds to keep that project up for the time I really have certainty that this is ok from IP prospective. This is why I took the job at ABB at that time. The thing went on, it took at least 2-3 years after I filed the patent until I got the first response. I filed it also world-wide, not only in several countries in Europe. You get a few responses from the patent office. They find patents that you have never seen before and this was also a case for me. I had few patents that I was not aware of before that were pretty close but not the same of course but came pretty close so I always had to cut away a little bit of the patent. You have to adjust all the time and respond to the patent office. In the end I had to cut all the times something away just because someone else has that before. So at the end I was just think like there is no kind of business sense left anymore, there is not in terms of technology but if I have to license all the other pieces of the pile then there is not enough anymore for me to really develop a solid business that is growing and would be healthy. So in the end I dropped it. But I am still working on the next version of it.

**Balint:** That is nice. There is this saying that the difference between an average person and a genius is that the average person has an idea, deals with it at the beginning then the person sees that there is a problem with it and then just discards the idea. The genius keeps it on the top of his head, maybe writes it down and then maybe there will be a moment which will come when there will be a solution. So you a kind of followed this path as I can see: you are waiting some years, even years patiently, and your mind is still working in this direction. You have not given it up completely.

**Bernhard:** No, absolutely not. And it is a raise that will take another few years because as I said before, I am 100% sure this kind of thing is going to come at some point. Probably in the more distant future than I thought at the beginning but it is



going to happen at some point. I am still thinking about it and pretty sure at some point I will have all the puzzles that I am missing at the moment and then I am starting again.

**Balint:** By education you are mechanical engineer, is that right?

**Bernhard:** Yes, I have a Master's degree in mechanical engineering and PhD in mechatronics. I live a little bit in between the worlds of a physical world but also a software world that is controlling the physical world. That was helping me tremendously of course in developing all the necessity, the technology basis for this kind patent.

**Balint:** And later you acquired an MBA which would help in the business administration aspect.

**Bernhard:** Absolutely. I can tell you, I learned a lot during my time, I focused only on entrepreneurship and there was so many lessons, we talked to so many entrepreneurs and you know I learned so much what I did wrong at the beginning and I would have a way more sophisticated approach now than I had at those times.

**Balint:** Ok, very interesting. You at one point, during our conversation we talked also little bit or you mentioned it, the budget aspect. That is also important, business plan, business drivers, budget, timeline, you mentioned it like this. Regarding the budget and also acquiring the budget, funding, so what kind of financial resources, funding do you see in the hardware field in Europe and more specifically in Switzerland?

**Bernhard:** Sure, it strongly depends on what kind of things you are producing or what you want to build. If you want to do something that is meant for a consumer, so consumer electronics or something like that where you can address directly the end customer, I think you should think about raising money through crowd-sourcing, like there are so many projects out there on Kickstarter for example. Then there is always the possibility to have a business angel, look for business angels that are financing your project at the beginning until you come to a stage where you can raise money from a venture capital organisation. Of course there is also an opportunity to apply for government funds. There is always government funds, every government is giving out funds to startups under certain conditions and there is also program of the European Union, of course the EU wants have also a healthy startup eco-system, so they are giving out their grants. Whatever kind of money you take just consider the pros and cons of it, for example if you are taking venture capital money or money from business angel, you will have to give a share of your business to the organisation or to the person. This is diluting kind of money so you give away a ratio of your business. When you ask for government money, this is non-diluting money so it might take longer, it might be bothersome applying for these grants because there is a lot of administration involved, lot of bureaucracy, but in the end you are getting money that is almost unconditional. So you are not giving away a share of your business. I think that is very worthwhile to consider. Just because everyone is raising venture capital money, it does not necessarily mean that venture capital money is the



best way to go for you. Or as I said the crowd-sourcing opportunity is definitely a way to go for consumer products.

**Balint:** These funds regarding the government funds, are they available at the seed stage or at a later stage when there is growth for the company?

**Bernhard:** This of course depends on what country you are in, what kind of funds you are applying for. I think in the seed stage it is always harder, especially if you are not spinning out of a university project. If you are spinning out from something that has already been granted by the European Union or research project funds then it might be hard because you have to prove also that this is more than an idea. You have to show that this is a viable idea. How it is specifically in the European Union I am not 100% sure, I think there is money for several things, especially for doing a study on a market, if there is a market for your idea. On development itself I am not 100% sure what kind of funds are available in EU.

**Balint:** Ok, I see. Let's move on now to your current role at the World Economic Forum, you are a global leadership fellow and can you elaborate on your current role and responsibilities?

**Bernhard:** Sure. I am in a team called Technology Pioneers. The Technology Pioneers consists of outstanding entrepreneurs that we are selecting every year. We are looking basically all around the world, what kind of startups do exist and what are they doing and we want to select between 30 to 50 of the most outstanding ones every year. So we are really having a look at which of the startups that we have, are the ones who can change business and society in the future. This has been very very successful in the past, the program already exists for 15 years now and we had amazing companies in the startup stage that everyone of us knows and just to give you a few names and it is really just a small selection. We had Google in 2000 when it has been still small and not many people knew it, we had Mozilla Corporation, Twitter, Dropbox, Kickstarter, Blue Energy. Lot of the companies that I just mentioned are software companies because everyone knows them but they are just in different fields of the technology. We have companies in energy, environmental, health care, biotech, IT, robotics, artificial intelligence. So a lot of different kinds of fields and we do not want to restrict ourselves to what kind of fields we want to have companies in, we just want to have the most progressive ones, the most bold ones that could tremendously change the people, society and business work in the future.

The way we are selecting them is basically we have five criteria. They are intentionally vague because since we have so many different kind of startups, it is really hard to narrow it down. The first and foremost criteria would be the innovation potential of this company. You are reaching out to the company, we ask them for further information, not only information that is publicly available but also numbers that are going deeper into the business plan and technology to really understand what they are doing and we want to select the truly innovative ones. So the ones coming up with completely new concepts. The second criteria is the potential impact of it. We are less interested in something that might be a niche application or not just work in a





specific region of the world, we are really looking something that can be scalable to all around the world and is applicable business to all around the world. Then the third criteria would be a working prototype or some kind of proof of a concept. We are looking for something where we can really find that this is more than just an idea. There is a viable idea, viable concept behind it so we know this is really gonna work in the future. The viability of the whole company is the fourth selection criteria. The company should have a well formulated plan for the future so we have to be sure that this is a future leader in this kind of market. Last but not least the leadership of the company. We of course have a look who is leading the company. What are those people, what did they do before, what is their experience and this is of course having an influence on our selection. As well as it does everywhere, it is a huge driver also for other business decision when you are a startup, when you e.g. apply for funds if you want to get funded by a VC e.g. so the leadership is a big thing of course.

Those are basically the five criteria that we have and as I said we are doing a selection every year. We are sourcing information from all startup hubs in the world, we end up with a number of around 600-800 companies every year that we screen. We screen them and we come up with a number of 30-50 companies that we bring into the World Economic Forum and we give them a voice as entrepreneurs, as innovators in the agenda of the World Economic Forum.

**Balint:** Interesting. Regarding these points do you look for traction that if the companies have already acquired customers, because as you know for example when a VC is looking for a company to invest into, they put quite some emphasis on that?

**Bernhard:** We do not have a formal criteria on you have to have certain number of customers. Or you have to have certain amount of revenue. Not at all. We have technology pioneers and we select technology pioneers that are completely pre-revenue sometimes, that are far away from having any sales or any customers. It strongly depends on what kind of company you are and of course it strongly depends on the technology behind it. If we think it is really something, if it's turning out well that is completely revolutionary then that does not make a difference at all but in general we do not have a formal criteria for sales or customers.

**Balint:** Regarding these topics do you have any tips for potential founders? You mentioned these criteria that are important for you. Are there more tips that you could give?

**Bernhard:** I think many people feel that hardware companies are way harder to build than software companies and I have to agree and also disagree. Hardware is definitely is completely different than software. A software company has many advantages in terms of building something very fast, less capital intensity, probably they can be earlier profitable than a hardware company. And scalability of course. But I think also building hardware companies is way easier than it was in the past. 10-15 years ago I think a hardware company was more capital intensive than it is now. There is so much that has been done in terms of using different kind of systems,



subsystems in your product that you can just buy off the shelves now or manufacturing. So look at companies like e.g. FitBit or GoPro. They have been turned out to be a very very successful and profitable, earlier than even some other software companies. So I think as always, it is very hard to give specific kind of tips but also important to point out that hardware is sure different than software but it is not completely impossible to build a very successful hardware business. I see more and more shift of Venture Capitalists that want to invest more into the combination of hardware and software. In the past VC tried to invest very much into software companies because of a faster return on investment of course. But since hardware is getting smarter and smarter all the time and there is way more shifting to the software side of a hardware product as well. I think if you are building a great hardware company that has both hardware and a very good and thoughtful software component in it, it is very attractive for VC to invest.

**Balint:** Thanks for these insights and now moving to the other topic, which you cover in your current role and work at World Economic Forum, artificial intelligence and robotics. These are pretty hot topics these days. I know AI is not per say a hardware topic but many times it is combined with hardware such as with cars, automative cars and also with robotics. So for AI I read that there was an open letter from big names, leading artificial intelligence and robotics experts that was last year and they argued against the development of autonomous weapons. It states that if any major military power reaches a high level of maturity in the development there could be a global race for autonomous weapons and this becomes inevitable. They say, they used the words that they become Kalashnikovs of tomorrow. This open letter calls for a ban on autonomous weapons without human intervention. It was signed by such names as Stephen Hawking, Stuart Russell, Elon Musk, Steve Wozniak, to name a few persons, and last but not least you as well. I was wondering that what do you think about this open letter and how you see the developments in the AI field and their effect on society and on our future?

**Bernhard:** First on this open letter and on the topic of autonomous weapons in general, I really have to say Stuart Russell is amazing in this field so he is one of the members of the council on AI and robotics and he is so active in this fields, he was also being part in the UN discussion around it. He was also the one who was coming up with the original open letter and was writing it basically. I think there is a lot of misunderstanding in the whole space because people are afraid, there is so many doomsday scenarios that are driven by Hollywood and people are scared about it. It is hard to have a normal discussion around it because there are different opinions. Some people always talk when they talk about AI about something that we call general AI so something that is really able to compete with humans in intelligence. And there is something what we have now which is AI that can do things which no software could do in previous years and we see so much traction that AI is getting at the moment. So I think first what you have to do is differentiate between the things around AI, how it could be in 50 years and how it is now. How it is now is definitely not something that is thinking or something like that or would be close to a human mind. But of course it is getting interesting in many applications and one of them of course is also military. One of the things that AI can do is of course making decisions



on who to kill and who not to kill. And this is a huge kind of deal because nobody on this planet would like to have machines that make independent decisions of who is gonna live and who is gonna die. But honestly many people see that the development of AI is going exactly in this direction. We have several countries that are giving huge funds into the development of autonomous weapon systems and I hear both kind of voices. People that are saying, probably machines can be more efficient in a crisis or in a war so you would have less human loss in the end. In a way of speaking it would be even more human to have machines that are very precise compared to people. Nevertheless I think as soon as we talk about lethal autonomous weapons, it should be really clear that everyone should discuss about total ban of lethal autonomous weapons. Nobody can really want to have a machine to decide in a fraction of a second of who is an enemy and who is a friend. Those are the discussions that have been going on with UN and they are going slowly on and on. So I think the open letter was one way of raising awareness that there is something that we need to be aware of and have a broader discussion about. Otherwise several countries could go on and develop those systems and of course for a government it might be quite attractive having a weapon that everyone is afraid of. Robotics combined with a computer system that is able to do certain things is a horrible scenario in my opinion. The open letter was a measure, a mean of getting more awareness out there and having high profile people saying we need to have a broader discussion about the values around AI because the values that we have and that want to bring into those systems in the end are the things that are defining what kind of systems we are developing in the end.

**Balint:** It is a difficult topic but this open letter helped to raise awareness.

**Bernhard:** It did absolutely. I think it was a great success and we are definitely going on with the council on doing things on autonomous weapons, for sure.

**Balint:** Excellent, it is interesting. We discussed now lot of topics regarding the CargoSoul, the World Economic Forum, your work there and more general about the AI. I would like to now go on with the interview to the other section which is the ultrafast round of questions. So I will ask you now four questions and it would be great if you could answer these relatively short. First question: if you could go back in time so time travel like in Back to the Future movie, you mentioned Star trek, Back to the Future movie is something similar, to the time when you were in your twenties, what notes would you take back from now in order to give yourself?

**Bernhard:** Honestly, there would be two reasons to do that. Either I wanna have a an edge over what I know now or I did a mistake that I think I should correct. I did not do a mistake, I think I would do the same way I did in the past. But if I could give me an edge in the past, of course I would go back with all my entrepreneurial knowledge that I have through my own kind of startup that I had and also through the knowledge that I gained now with the Technology Pioneers. Really those kind of big learnings like, be as inclusive as possible, gather around you amazing people that can inspire you and give you great recommendations and can give you their expertise, be aware of all the founding mechanisms, be aware of the capacities that you have to bring in,





in term of work life balance trade offs. All those kind of things I would things I would take back. If that is a reasonable answer for you? Interesting for me to know!

**Balint:** I like that your answer, part of it, was that you accept the mistakes you made because simply at that time you were not aware of those things.

**Bernhard:** Sure, actually specially in Europe I feel like we have this culture of always avoiding risk and thinking failure is something you have to be ashamed of. No, of course not. I think making mistakes is human and the only way to significantly grow in many things. So I would not be afraid of making mistakes.

**Balint:** We forget sometimes our childhood. In order to learn how to walk, we have to fall. Many many times.

**Bernhard:** Yes, many times. I totally miss this in leadership these days. Many of the companies are working in a way of going into the very predictable kind of success in the mid- or short-term rather than really taking some risks sometimes and coming up with something that is blowing you away. Also business education is having a stake in that and we have to rethink that.

**Balint:** The second question. If you had to name one or two books, which one or ones had the biggest impact on your career?

**Bernhard:** I have to admit that I am very impatient with books in general. When they do not come straight to the point I am not very interested in them anymore. But I can tell you one book that is really, absolutely amazing to read. It is called „The second machine age” from Erik Brynjolfsson and Andrew McAfee. They are professors at MIT. It is amazing. It shows you where artificial intelligence and robotics could go in the future and what we have to change in terms of education, what are their impacts on jobs and other things. So that is definitely a recommendation that I would like to give.

**Balint:** Thanks for this recommendation. I think, you listeners will appreciate this. I will also look it up myself because I have not read this. Third question: I am amazed and always inspired by habits and how these can influence us and reach our goals, also to have a positive effect on our life. Do you have some morning routine that gets you going for the day or any other habit that you use during your work?

**Bernhard:** I think the only routine that I have is that I do not have a routine. I hear that many times. I am surrounded by many successful people and I always this kind of myth that morning people would be the most successful people. I am not 100% sure if this is true. I hear a lot about getting up in the morning at 5 and writing your first blog and exercising and all these stuff. Honestly I think I am not a big fan of routines and I try not to get into routines because every routine is making you more rigid in your thinking. It is flexibility, capacity to really pivot and change very fast that is making a good entrepreneur. If it works out for people to have a routine, then they should do it. I simply do not have one.



**Balint:** Ok, fair enough. The fourth question: in your work, because you work cross borders and cultures, you truly do it, if you had to choose few critical things, cultural differences which ones would you mention now, which ones would you resolve or how did you resolve those issues in the past?

**Bernhard:** I am doing a lot of business worldwide and I have been also living in Asia. Of course, there are cultural differences but honestly I think they are not too strong because everyone who is doing business with you on a level has kind of adopted the same rules, right? There are few things, you need to be aware of, definitely in Asia like people tend not to speak up that much, especially not if they feel that you are in the hierarchy higher than them. Honestly I feel like those people that I work with are way closer to the way I am than probably the people that I grew up with, sometimes, right? People in my country are not necessarily the same way I am. But if I have a look at my friends from all over the world, they are completely in the same kind of mindset. The only thing that I would really recommend, everyone, is to adopt this kind of principal of charity. If you have someone coming from a different culture and you feel like this person is not corresponding with you very well, just take the way this person has said or is doing things to you in a way that makes sense in the least offensive and annoying way, right? There are misunderstanding, number one principle is just to be very tolerant with people and sometimes you can find out that there was absolutely no intention behind something.

**Balint:** I agree with that. Also during my trip whenever I travelled privately or during work trip I experienced different cultures, especially the Asian culture is quite different from the European. Of course the American one is also different from the European. It is important to have open eyes and be ready to learn from other people, to accept them and also even to learn because if you are tolerant then you do not have this barrier for your learning. You can pick up new things, even how to cook, wonderful food from certain countries or even business ideas. It is quite known that you can transfer ideas from one country to another.

**Bernhard:** Absolutely I think diversity is really a huge source of creativity and learning. You would cut yourself completely out if you would not be willing to go that route and deal with people from somewhere else.

**Balint:** Bernhard, I really appreciate again the conversation we have had. It was amazing. I could learn quite a lot and also you listeners I hope you liked these topics. I wish we could have talked even longer but everything has to come to an end. If you listener, would like to reach out to Bernhard I would like to make sure that you can do that. So Bernhard, what would be the best way?

**Bernhard:** It is pretty easy. I am on LinkedIn, I also have a Twitter account. Feel free just to send me a connection request on LinkedIn. That is the best way to do.

**Balint:** I will make sure that this is put in to the notes of this episode so this information will be also available written. Thanks very much Bernhard again.



**Bernhard:** Thank you, it has been really a pleasure! Thank you very much.