

From University to Start-Up: The Experience of Akina

By Francesco Missiroli^{1b}

Transition from university to a company is always a challenging task. Sometimes you want to keep going in the direction of your studies, focusing on a particular aspect of interest; other times you want to start your own business based on an idea or a technology that you developed during your studies.

In this column, we propose a quick overview about the transition process from university and a Ph.D. program to a start-up.

A start-up is a company or a project undertaken by an entrepreneur to seek, develop, and validate a scalable business model. The main difference from a company is that a start-up does not have a business model, so it has to rely on the talent of the founder and cofounders to find out the way the start-up should develop in the market.

To understand this concept better, we looked at a start-up that is developing in this moment at the Eidgenössische Technische Hochschule (ETH) in Zurich, Akina, and we asked one of the founders, Michele Xiloyannis (Figure 1), to explain and give us his point of view about the basic concepts and advice that could be useful for students.

Akina analyzes patient movements in real time via webcam and provides clinical feedback on the exercises performed using artificial intelligence-based software. The cloud platform also gives healthcare professionals access to the data. This allows the software to be seam-

lessly integrated into existing treatment protocols, significantly reducing costs.

At the same time, Akina provides an interface to numerous virtual entertainment services and creates an immediate incentive for patients to engage in independent therapy. Regularly performed exercises can drastically reduce follow-up treatment and avoid costs.

In collaboration with leading Swiss clinics, Akina has already been successfully validated in 28 clinical pilot sessions and in over 8,000 movements. The software is now being finalized for market entry in cooperation with the Schulthess Clinic; letters of intent for future cooperation with additional clinics have already been signed. AKINA is also in talks with selected health insurers for the integration of the offering into a holistic treatment package.

HOW TO SET THINGS UP

The first point that emerged during the discussion is how to approach the idea of developing a start-up and which are the common mistakes to avoid.

Several start-ups coming from university begin their development starting from the technological contribution they want to introduce in the market. This product can be hardware- or software-based, and from that they want to find a business model and a market in which this technology can fit. Even if this approach is common and seems logical, it can be dangerous and can lead to several problems. According to the founder of Akina, it is not a good idea to force the market to accept technological innovation because the market might not be ready for the

technology that you want to propose, or the infrastructures and the legal systems might not support your product.

In rehabilitation robotics, for example, the technology is too complex for the market and, in several countries, there are no specific mechanisms to handle the costs and the reimbursements for the customers. Since the technology itself is expensive, only few private customers can afford it; for this reason rehabilitation robots are part of a very specialized market, such as hospitals and clinics. The first advice given by Xiloyannis is to check if there is a viable business model to sell your product or service and, specifically for medical technology, if there is a relevant benefit of your device compared to other treatments that are already on the market and adopted by the clinics.

Those are the main problems that you should face when you develop a technological innovation and you want to make business out of it. The approach that was adopted by the founders of Akina was different. Both founders had extensive experience in the field of rehabilitation and they realized that the benefits coming from proposing a way to exercise day by day while treated had larger significant effects than adopting expensive equipment to measure the performance obtained by the patient.

IS A START-UP THE BEST OPTION?

Sometimes, the best way to put your research into the market is to license your technology to another company. Eventually, you might build a start-up and turn your technology into a product.

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Before turning the idea into a product that could be introduced into the market, some good advice is to stop and check if it is worth building a start-up around it. Can the product that you developed be converted into a business or not?

From the point of view of the founder of Akina, if you developed a product that can be innovative for the industry and can revolutionize the market, a good option could be to focus on the innovation itself. The correct question that you should ask yourself at this point is: “Is that a product that I can sell on the market or is it a technology I could license to an established company in the field?”

If you think that your device is just a technological contribution, the best thing is to license it to a bigger company. Sometimes, even if you have the right technology, you do not have access to the market.

Another thing worth considering at this stage is your team. A key factor in the development of a start-up is to have a team with different and complementary backgrounds. In the specific case of Akina they needed people focusing on business, on technology, and on medical knowledge as well.

FROM THE IDEA TO THE PRODUCT

From this consideration, they started figuring out their own project: they wanted to motivate people to do the exercises in an independent and accessible way.

However, the initial idea had to be refined. At the beginning, the idea was to develop a box to handle the communication between a commercially available rehabilitation robot and a commercially available gaming console, but this approach was limited. People could not afford a robot for rehabilitation at home and for this reason there was a smaller market for it.

Following this, they tried to use inertial measurement units (IMUs) to monitor the movement of the patient at home. Even if this approach was promising, to obtain accurate measurements from the sensors the system needed a calibration process and there could be problems in wearing the system in the proper way.

The third idea that came up in the development of the proper technology

to face the problem, was to use the IMUs, inside the smartphone of the user, to perform some exercises based on balance tasks.

This approach seemed promising; however, when it started working, they realized that probably there was a better option for acquiring the kinematic data of the user via a computer vision algorithm. They took off the wearable part of the hardware from the sensing architecture, keeping just the camera of a smart device to acquire the kinematic data and the communication box, and they did a feasibility study with seven patients in 2021. After that, it was the right moment to start talking with potential investors. One of the most recurrent concerns from venture capitalists and angel investors was the plan to manufacture, distribute, and maintain an additional piece of hardware. Could the same vision be achieved with a software-only product?

They realized that the best approach to solve their problem and create a product suitable for the market was to use devices with a front-facing camera that are already ubiquitous on the market (laptops, tablets, smartphones), while their product would be purely software and run on the cloud.

From this process, they understood that technology is a detail; a key factor in a start-up is to keep in mind the problem you want to solve and to design a product that solves it, while having the least possible “friction” with the user. Sometimes a complete change from the technology that you developed for several years during a Ph.D. is the way to put your technology into the market. Some great advice coming from this conversation was that if you want to hit the market with your idea, you have to keep your mind open to changes to follow the vision that you had.

EARLY FUNDRAISING

If you are sure that there is a specific market for your idea, the right decision is to find investors for your start-up.

As a university spin-off, you will be in a privileged position: you can tap into sources of nondilutive funding (i.e., funding that you do not have to exchange for company shares). This can give you some advantages in terms of fundraising because it can provide the opportunity to immediately get the first funds without selling part of the company to the investors.

The best private investors at the beginning are called *friends*, *family*, and *fools*. The terms here are very favorable

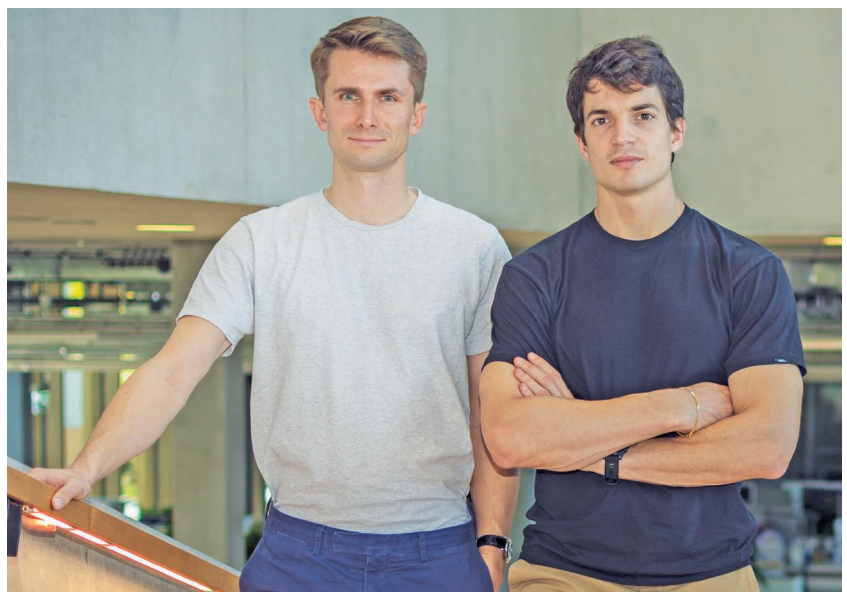


FIGURE 1. The two founders of Akina, Florian Haufe (left) and Michele Xiloyannis (right). Haufe is a driven healthcare entrepreneur with a Ph.D. degree in rehabilitation technology and human data analysis from ETH Zurich, and he has research experience from Harvard Medical School. Xiloyannis is a passionate innovator and engineer with a Ph.D. degree in robotics and neurotechnology from Imperial College, and he has research experience from Nanyang Technological University Singapore, and ETH Zurich.

for the investors: reward the risk they are taking in this very early stage. Starting from that, you can build at least one prototype or demonstrator for your company so you can convince venture capitalists or professional angel investors. After this period, a typical way to structure this round is to offer early investors convertible loans with a generous discount or valuation cap on the next priced round.

Convertible loans are a form of debt financing. They will appear on the balance sheet as *liabilities*, and the investors become *creditors* of the company until the next investment round, in which they become *shareholders*.

They are granted from investors who give you some money but they do not get the shares immediately. These people help the start-up in the early stage (pre-seed round); they invest less money but in a stage in which the company has high risk and elevated profit. They are usually in the field of the company because they have to understand the market in which the company is moving.

Setting up your business in this stage with convertible loans is important because in the early stage, the start-up does not have a high value on the market and the company shares are low. With the convertible loans, the investors will get shares at the next evaluation round but with some benefits, like discounts or a cap on the valuation.

CHOOSE YOUR INVESTORS

There are investors who just look at the company as a profit unit for the first five years, which means that they are not close to you in the development of a company and they do not help you find new contacts, investors, or make your product attractive for the market.


From the experience of Akina you should look for private investors who are in your same field or on a similar one. They can give you the possibility to grow because they know the market, so they can help you with strategic decisions.

After that, you can start studying your business plan and getting your first

clients, showing that the product can be successful and attractive. If you show that you have traction, you can start planning another round of funding.

It is important to attract investors and show them that your vision is promising.

During the negotiation phase, make sure to educate yourself well about typical contract terms and what they imply, not only in the short term but also thinking about how they could affect future rounds or an exit event. Furthermore, you should always be accompanied, in negotiations, by a good legal counselor. The last advice coming from the founder of Akina is that it is worth investing in good lawyers or in the transfer office of the university for IT protection. This can give to the start-up the ability to defend intellectual propriety and create a business from your initial idea.

Transition from university to company is always challenging, but if you have an idea and you find a group of enthusiastic people with a similar or complementary vision, maybe a start-up can be promising. 



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