

# ICSB Gazette

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## Sustainable start-up: Between candor and big lies

*(This is a case study based on real proceedings. Names have been anonymized, and organizational contexts and events have been disguised. Any similarity to real institutions and organizational contexts is coincidental.)*



*(Photo by: Jason Blackeye)*

**Start-ups are tricky and not least so in the wicked world of tech sustainability. This story is about a young engineer suddenly finding herself immersed in an entrepreneurial setting where she struggles to balance her idealistic vision of sustainable technology solutions with the hardcore realities of business-as-usual.**

### **Entrepreneur, oh really?**

I'm a millennial who grew up between the US, Denmark, and Spain, and ended up studying chemical engineering in Copenhagen. I did my master's in biotechnology and then gained my Ph.D. in Materials Science in Barcelona based on a project funded by the Spanish Research Council. I defended

my thesis about a year and a half ago based on research on the interface between biology and materials science, using surface modification to control cell behavior.

I've always been curious, but I never thought about or planned to become an entrepreneur. Though I've heard plenty about it since my parents rarely had "real jobs", rather, traditional employment like most other parents, but instead always talked about projects, cash flow (or lack of it), and start-up opportunities. They always told my siblings and me about the joy of doing what you want and when you want. And particularly the latter stuck with me.

After finishing my Ph.D., I took a couple of months break and visited several countries in Africa and Asia. Amongst others I had the "privilege" of visiting Mount Everest's basecamp and experience first-hand the plastic pollution problem at high altitude... images which later circulated on social media showing the camp – with the camp full of plastic bottles and polluting packing material. The problem in high mountains is single-use plastics instead of reusable packaging, the impact of commercial expeditions, and mass tourism. There is too little consciousness on the impact we have on the environment- microplastics, visual pollution, affecting water streams, and wildlife. As a lover of the outdoors this experience also stuck with me – almost like a personal injury - building on and strengthening earlier impressions of Caribbean beaches full of plastic bottles when visiting the San Blas islands.

After returning from my sabbatical, I casually checked in on a Danish "matchmaker" platform (after all Danish salaries and work-hours are very attractive among young scientists) and I eventually hooked up with a Danish start-up working on biodegradable packing material interested in my curriculum and my research skills.

Well, why not I thought, and in the excitement without further ado declining a good "life-time" employment offer from a Spanish pharmaceutical. The next, thing I knew I was employed by a mini-R&D firm dedicated to developing compostable plant-based packing material, with the owner placed in Copenhagen and me in Barcelona. It suits me very well with some distance between us, with him as the commercial spearhead and me as the scientist, and the only one that technically and scientifically really understands what we are doing and really what we are up against.

## **Selling sand in Sahara**

I have slowly but surely discovered that my boss is an incredible salesman. Already before I started, he had managed to establish a relationship with a major food and beverage conglomerate – challenged to find substitutes for candy, soups, dairy products, beverages, etc. commonly packed in cellophane.

Very much in line with the lean-startup philosophy, we intend to establish and maintain close relationships with clients, based on rough prototypes. In the case of the food conglomerate, my boss had managed to convince them of our plant-based biodegradable solution and early on established a temporary co-development agreement.



As part of this collaboration, I ended up staying 4 months in France forming part of the company's incubator program. This happened to be during wintertime, so it also perfectly matched my love for Alpine skiing (true, but maybe not suitable for a supposedly ultrarational story about entrepreneurial awakening...).

### **Feeling small in a corporate incubator**

Corporate life and forming part of the big-company-apparatus made an impression on me as a young scientist. Compared to the more relaxed, liberal, and more smiling Spanish research ambiance, this was like another and more serious planet. Perfect, formal, and rich. However, the program was new – with mostly internal employees – and after all not that impressive in terms of structure and mentoring. What struck me most, was the rigid and bureaucratic, though the systemic, approach to the R&D process and the short-sightedness of innovation-managers in the allocation of resources. Coming straight from hands-on research it was quite a change on how things were done: from being very precise and meticulous in gathering data for future scientific articles, I was now suddenly expected to sell an idea, highlighting and (I felt) exaggerating all the good and positive features of a prototype and the potential impacts without getting into too much detail.

This was extremely challenging, particularly as we learned that my incubator-mentors evaluated our project to be at TRL 5<sup>1</sup> with 9 being closest to market scale-up) and thus excluded us from entering the conglomerate's full-scale accelerator program reserved for innovations judged by product

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<sup>1</sup> TRL = Technology readiness level. TRL 5 – technology validated in industrially relevant environment regarding key enabling technologies), while TRL 9 – actual system proven in operational environment (competitive manufacturing).

managers and business tainted corporate scientists to be closest to scale-up. As a scientist balancing on the borderline of the open innovation funnel - ambivalent between wanting in, but afraid of being swallowed in the process or growing outside – it´s challenging to deal with this uncertainty and lack of stability (of funding and support). Notedly, almost all corporate incubator-support was focused on selling your idea vis-à-vis internal innovation "experts" and competing with others within the incubator-program. In many ways, it was an ambiance of fear of higher-ups in the in-house hierarchy, and with little technical support to progress in the lab and getting closer to TRL 9 and market scale-up.

Naturally, for me as a sole scientist representing a tiny Danish tech startup, both my boss and I were also very concerned about confidentiality – after all, we were as relative outsiders working literally on the inside of the conglomerate´s lab, but with lots of uncertainty concerns about how to protect our innovative idea. Open innovation sounds good, but after all, we felt unsure on how we could protect our IP-rights when working in the backyard of one of the world's most powerful consumer-oriented food and beverage companies.

Nevertheless, I learned a lot about corporate mindsets, hierarchy, reporting lines, even dress codes, and respect for working hours. As a natural scientist and engineer, I learned a completely new skillset – more artistic and social than what I was used to. Also by repeatedly defending (read: sell) my project in front of panels of "packaging-" and "sustainability" coaches, corporate mentors, and managerial supervisors, I eventually got fairly good at marketing along the way – quickly learning the business-language and understanding that corporate life indeed used a more liberal interpretation of the word objectivity... Little did I know in advance, despite my "sand-selling" boss, about the importance of a credible value proposition, systemic evaluation of go/no-go criteria, pivoting and scalability. Wow, what a learning experience it was for a budding entrepreneur to frantically push a tech start-up through the challenging thresholds on the path from incubation to acceleration.

### **Pitching my way**

I guess all born entrepreneurs are a fed "pitching-milk", however to me as a hardcore chemical engineer and laboratory scientist, the concept was completely new. While I had no problems in neither defending my Ph.D. nor answering extensive technical and research-related questions from peer-reviewers, professors, and other experts, cramming everything essential about our biodegradable and sustainable packing project into a 15-minute pitch was challenging. After all, everything seemed equally

important! In my scientific mind, 2+2 is 4 and not 6! I was simply bothered by the never-so-small exaggeration and marketing-rhetoric required for pitching.

But I quickly learned that it is essential to communicate well. Focus on the solution, the value-gain, and how to create a win-win outcome. I rehearsed with my sisters, brother, parents, and uncles – and I got plenty of both informal and formal feedback from a multitude of corporate incubators, accelerator mentors, venture capitalists, and also from presentations to research funding agencies and potential strategic partners. Depending on the audience's social and professional context, the feedback ranged from making money fast (venture capitalists searching for rapid scale-up) to scientific rigor and potential for academic success (international peer-reviewed publications based on research-funding). Sometimes, it felt like it was a greater focus on the scoring metrics than solving the challenge of developing compostable plant-based packaging material the protagonist's scientific perspective: Prioritize reduced consumption, reuse more, and only as a last option recycle- or compost material<sup>2</sup>!

I soon learned that getting funding required more than a potential minimum viable product – a concept from the lean startup vocabulary and adopted by "funding referees". Funding sources, for instance, EU's Horizon 2020, actually demands much more, such as proof of concept, track-record, third-party recommendations, and even historic sales records and customer-feedback, requirements which are impossible when your project is still at an early stage and due for more R&D including the outcome of a patenting process.

After my learning experience at the food and beverage incubator, I eventually returned to Barcelona and suggested to my boss to establish a basic research laboratory here. After some pro/con evaluations, we eventually agreed that based on a plan to hire at least one more scientist for lab-work, it would be less costly to establish a Spanish subsidiary, rent a basic laboratory and hire a local scientist in Barcelona rather than in Copenhagen. And so, we did, or to be truthful I did, since I'm still the only material scientist on the team.

### **The smell of mice...**

Wow, what a plan we had! I rented a lab and rapidly ordered material and basic lab equipment. Early morning in October, I rode my motorcycle to the lab and was ready to rock and roll. I sweated

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<sup>2</sup> The protagonist's scientific perspective: Prioritize reduced consumption, reuse more and only as a last option recycle- or compost material.

installing machine after machine and connecting tubes and unpacking material. Of course, realizing that my due diligence before signing the rent-contract was faulty as the lab-space lacked proper ventilation – so much for a Ph.D., here it would be better to be a plumber or at least a more hands-on technician.

After the first high, I little by little-noticed a seeping smell of some kind of animal... and a really bad smell it was once you became aware of it. Of course, I immediately called the owners of the lab-facility (several labs under the same roof) who explained that the smell came from the animal experimentation-room, on the other side of the corridor (smell of the food that comes in certain days of the week). I was offered to move once one of the other labs freed up...., but I´m still in the same space quite a few weeks later. A new learning experience for me – and proof of something lacking in my higher education so far – something more practical and hands-on like proper technical due diligence before signing any rent-contracts. This and, admittedly taking the time to ask more experienced entrepreneurs, or people with a broader range of knowledge. for their advice before making decisions. Sometimes, you simply learn the hard way that you are far from infallible.

### **The biggest surprises for a newcomer**

For a science-based startup, which in many cases will unwind or spinoff from a protected university lab or workshop environment, it´ s essential to appreciate early the difference in thinking between the natural sciences and the business world. Most of those on the other side of the table (the people with the money), though many of them with a natural sciences background, have been programmed with business´ short-term perspective and are normally focused on making a profit. And frequently sooner rather than later. Although this perspective has softened a bit, as even the most hardcore profiteer has gradually had to adopt a broader and more inclusive perspective of shared value and a touch of corporate social responsibility (CSR) including obligatory reporting on CSR, it is still very impregnated in management reasoning. Coming from a pure engineering world, this was a somewhat uncomfortable wake-up call – more than anything the expectation of so quick results.

As a scientist, I find this short-terminist perspective extremely challenging. But learning to build a narrative that appeals both to the world of the scientific innovator, the business world who often controls part of the resources and impacts the funding process is crucial.

As innovators and science-based entrepreneurs we, and here I include myself, have a longer perspective, including sometimes focused on an exploration of solutions to problems not yet known. We need perspective long enough for us to develop, learn to move through the various TRL-gates, and prepare for manufacturing and scale-up. People with a business/MBA-view of the world must learn to be patient and understand that science not always can be tightly scheduled – it takes time, and it requires support (commercial competence and funding) from you to succeed.

Another important early learning lesson is that it is hard to work alone – in the lab or at your pc crunching numbers, graphs, pitches, or handling the minimum administrative duties necessary for any start-up activity. In my case, for instance, I have spent a lot of time, and sometimes feeling a little lost having to renegotiate my work-contract with my boss. Most entrepreneurs appear to be ego-centric and seem to focus too much on minimizing costs (in this case my salary) and should instead adopt a more inclusive transformative perspective to create trust and buy-in in the project.

Curiously, in my case, we have also spent a disproportionate amount of time discussing IP-related issues. As the material scientist (and still the only one), I do represent a key-competence for the project. But despite this, the issue of IP-ownership and patent-rights have been a reoccurring topic of discussion – almost as if my boss thinks I am going to steal his invention. From my perspective, it appears to boil down to a perception of trust, but I believe entrepreneurs need to be very sensitive in terms of understanding who owns the key knowledge which after all is critical for the longer-term fruition of the project. Sometimes, I feel that I´ve wasted time on so much talk – and for sure it has been emotionally exhausting – a feeling that my scientific knowledge is not sufficiently appreciated – combined with a reluctance to grant me a motivating ownership-share while the firm is still this far from the point of systemic industrialization and market scale-up.

I guess my maybe impolite conclusion about key takeaways from working in a startup is that entrepreneurs appear to be penny-pinching, I suppose by necessity. Also, at least in my case, my boss is holding his cards too close to his chest and he lacks a touch of emotional intelligence to make our voyage a little bit smoother.

**No or maybe is not an answer...**

We have so far received several different versions of no, not yet or sorry the timing is not right. We have, however, also received some yes, amongst other governmental funding to continue towards the next TRL-gate. We have also gotten a new opportunity to pitch vis-à-vis Chinese investors.

Thus, a solid dose of resilience and not accepting no for an answer is necessary to navigate the sometimes rough seas of the start-up arena, especially if you´re still at an early stage or happen to be in a less in vogue industry and thus attracting less attention and money.

In our case, degradable and sustainable packaging is popular, but a lot is going on and it´s hard to distinguish yourself from the rest of the wolfpack. Another handicap we have is that we are still at such an early stage (TRL 5) and it is challenging to be a plausible scaleup contended in the eyes of (shorter-term focused) investors and funding agencies.

So, in many ways, I feel that we are expected to exaggerate and continue selling a bit of "sand in Sahara". For me, wanting to contribute to solving a real social sustainability problem, it is hard to play this hardball business game – a game where you are supposed to be lean, mean, and maximize short term profit. This is not my sort of game – it´s a game prepared by others belonging to an older MBA-trained generation. I think many co-millennials like me don´t want to play it and not on these terms!

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### **What I have learned, so far...**

The feedback we have received from our pitches so far confirms the key challenge of having a new promising formulation (i.e. the innovation is recognized by all), however, one that is not yet protected in terms of IP, industrial secret, or patent. This we are currently working on.

Other relevant feedback from the “business game referees” are:

- Missing performance and data to compare with other technologies. Also, clear objectives of the technology development plan and financial needs are lacking.
- A clearer message on what makes the technology better than other solutions (patenting is called for).

- Improved argumentation of competitive advantage.
- Evaluators are missing convincing (enough) numbers.
- A refined Business Plan and Value Proposition.

The fundamental message is crystal clear, if we are to win it, we must play based on the rules as perceived by the referees of the business game. There appears to be little room for other value creation or shared value perspectives. Money, markets, and rapid scaleup still rule.

### **Should I turn the table?**

I grew up in a rather libertarian home – I learned early that almost anything was possible if you worked hard (and did your homework...!). I was also always encouraged to follow my passion and work the system from the inside rather than through revolution. Of course, this foundation has since evolved as I have gained experience and grown in wisdom (and if you have never heard of millennial-wisdom – who do you think are going to clean up the mess from the baby boomers and the yuppies?).

With my sisters, we are now in the process of developing a project dedicated to sustainable business development where we are pooling our passions (the outdoors, sports, cooking, plant-based food, etc.) and cross-disciplinary competencies (engineering, design, management), convinced to follow our gut feel instincts and a joint perception that a radical and systemic sustainable change is coming and that we want to be part of it.

However, but for now, I´ll stay put with my Danish entrepreneur and learn those tricks of the trade which I think will be useful sometime in the future. It is an experiential learning process, and I am currently in it to my eyeballs and I am learning to roll with the punches. And while I am trying to avoid the know out and championing sustainability, I honestly do not yet know how long this match will last.

Am I cold-hearted, unappreciative, and too pragmatic? Yes, maybe but I am also a quick learner who wants to make a positive difference and I frankly much prefer a shared-value perspective with goals of merging the needs of individuals, society, the planet, and business – but the latter only as a means to achieve the other objectives.

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The ICSB Gazette is a weekly edition of a key topic that ICSB will showcase. The content is varied from research, practice, policy, and education. The editors of the ICSB Gazette is Mr. Kyle Lyon, ICSB Junior Project Manager and Mr. Skye Blanks, ICSB Junior Project Manager He will be soliciting ideas and articles from ICSB members world-wide.



### **Skye Blanks**

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